



Documentation for Confluence 6.6

# Contents

Confluence administrator's guide	7
Getting Started as Confluence Administrator	8
Manage Users	10
Add and Invite Users	11
Delete or Disable Users	16
Restore Passwords To Recover Admin User Rights	17
Edit User Details	18
Change a Username	20
Managing Site-Wide Permissions and Groups	21
Confluence Groups for Administrators	21
Adding or Removing Users in Groups	25
Global Permissions Overview	27
Setting Up Public Access	32
Configuring User Directories	33
Configuring the Internal Directory	34
Connecting to an LDAP Directory	35
Configuring the LDAP Connection Pool	43
Configuring an SSL Connection to Active Directory	44
Connecting to an Internal Directory with LDAP Authentication	54
Connecting to Crowd or Jira for User Management	60
Reverting from Crowd or Jira applications to Internal User Management	68
Managing Multiple Directories	72
Managing Nested Groups	75
Synchronizing Data from External Directories	77
Diagrams of Possible Configurations for User Management	79
User Management Limitations and Recommendations	85
Requesting Support for External User Management	89
Disabling the Built-In User Management	91
SAML SSO for Confluence Data Center	91
Managing Add-ons or Plugins	94
Writing User Macros	95
User Macro Template Syntax	103
Customizing your Confluence Site	108
Changing the Look and Feel of Confluence	109
Customizing the Confluence Dashboard	109
Changing the Site Logo	110
Customizing Color Schemes	111
Styling Confluence with CSS	112
Basic Styling Tutorial	114
Styling Fonts in Confluence	115
Working with Themes	116
Applying a Theme to a Site	117
Creating a Theme	117
Customizing Site and Space Layouts	117
Upgrading Customized Site and Space Layouts	119
Working With Decorator Macros	120
Custom Decorator Templates	121
Customizing a Specific Page	123
Customizing the Login Page	123
Modify Confluence Interface Text	124
Customizing Email Templates	125
Changing the Default Behavior and Content in Confluence	125
Administering Site Templates	126
Importing Templates	126
Changing the Site Title	128
Choosing a Default Language	129

Configuring the Administrator Contact Page .....	130
Configuring the Site Home Page .....	131
Customizing Default Space Content .....	132
Editing the Site Welcome Message .....	133
Integrating Confluence with Other Applications .....	135
Linking to Another Application .....	135
Configuring Workbox Notifications .....	136
Integrating Jira and Confluence .....	140
Registering External Gadgets .....	141
Configuring the Office Connector .....	144
Managing your Confluence License .....	146
Managing Confluence Data .....	148
Database Configuration .....	148
Database JDBC Drivers .....	150
Database Setup for Oracle .....	151
Configuring an Oracle Datasource in Apache Tomcat .....	155
Database Setup for PostgreSQL .....	155
Configuring a PostgreSQL Datasource in Apache Tomcat .....	157
Database Setup for SQL Server .....	157
Configuring a SQL Server Datasource in Apache Tomcat .....	160
Database Setup For MySQL .....	160
Configuring a MySQL Datasource in Apache Tomcat .....	165
Embedded H2 Database .....	165
Migrating to Another Database .....	165
Configuring Database Character Encoding .....	170
Configuring database query timeout .....	171
Surviving Database Connection Closures .....	172
Configuring a datasource connection .....	173
Site Backup and Restore .....	178
Production Backup Strategy .....	179
Configuring Backups .....	180
User Submitted Backup & Restore Scripts .....	182
Manually Backing Up the Site .....	184
Restoring a Site .....	185
Restoring a Space .....	188
Restoring a Test Instance from Production .....	190
Restoring Data from other Backups .....	191
Retrieving File Attachments from a Backup .....	191
Troubleshooting failed XML site backups .....	193
Troubleshooting XML backups that fail on restore .....	196
Attachment Storage Configuration .....	200
Configuring Attachment Size .....	202
Hierarchical File System Attachment Storage .....	203
Confluence Data Model .....	205
Finding Unused Spaces .....	210
Data Import and Export .....	211
Import a Text File .....	211
Audit log .....	212
Configuring a Confluence Environment .....	213
Confluence Home and other important directories .....	214
Application Server Configuration .....	217
Managing Application Server Memory Settings .....	217
Java Policy Settings for Enterprise or Webhosting Environments .....	218
Web Server Configuration .....	218
Configuring Web Proxy Support for Confluence .....	218
Running Confluence behind Apache .....	220
General Apache Configuration Notes .....	220
Using Apache with mod_proxy .....	221
Using Apache with virtual hosts and mod_proxy .....	226
Using Apache with mod_jk .....	226
Using mod_rewrite to Modify Confluence URLs .....	226
Configuring Apache to Cache Static Content via mod_disk_cache .....	227

Starting Confluence Automatically on System Startup .....	228
Start Confluence Automatically on Linux .....	228
Start Confluence Automatically on Windows as a Service .....	232
Configuring Confluence .....	234
Viewing System Information .....	235
Live Monitoring Using the JMX Interface .....	235
Tracking Customizations Made to your Confluence Installation .....	238
View Space Activity .....	238
Viewing Site Statistics .....	239
Viewing System Properties .....	242
Configuring the Server Base URL .....	242
Configuring the Confluence Search and Index .....	243
Configuring Indexing Language .....	243
Configuring Quick Navigation .....	244
Content Index Administration .....	244
Enabling OpenSearch .....	247
Rebuilding the Ancestor Table .....	247
Setting Up Confluence to Index External Sites .....	247
Setting Up an External Search Tool to Index Confluence .....	248
Configuring Mail .....	248
Configuring a Server for Outgoing Mail .....	248
Setting Up a Mail Session for the Confluence Distribution .....	249
Configuring the Recommended Updates Email Notification .....	250
The Mail Queue .....	251
Configuring Character Encoding .....	252
Troubleshooting Character Encodings .....	252
"€" Euro character not displaying properly .....	253
MySQL 3.x Character Encoding Problems .....	254
Other Settings .....	254
Configuring a WebDAV client for Confluence .....	255
Configuring HTTP Timeout Settings .....	260
Configuring Number Formats .....	260
Configuring Shortcut Links .....	261
Configuring Time and Date Formats .....	262
Enabling the Remote API .....	262
Enabling Threaded Comments .....	263
Installing a Language Pack .....	263
Installing Patched Class Files .....	264
Configuring System Properties .....	265
Recognized System Properties .....	268
Working with Confluence Logs .....	292
Configuring Logging .....	294
log4j Logging Levels .....	296
Troubleshooting SQL Exceptions .....	296
Configuring Confluence Security .....	298
Confluence Security Overview and Advisories .....	298
Confluence Cookies .....	300
Configuring Secure Administrator Sessions .....	302
Using Fail2Ban to limit login attempts .....	303
Securing Confluence with Apache .....	306
Using Apache to limit access to the Confluence administration interface .....	306
Trackback and External Referrers .....	308
Best Practices for Configuring Confluence Security .....	311
Hiding the People Directory .....	312
Configuring Captcha for Spam Prevention .....	312
Hiding External Links From Search Engines .....	313
Configuring Captcha for Failed Logins .....	313
Configuring XSRF Protection .....	315
User Email Visibility .....	316
Anonymous Access to Remote API .....	316
Running Confluence Over SSL or HTTPS .....	317
Connecting to LDAP or Jira applications or Other Services via SSL .....	322

Configuring RSS Feeds .....	324
Preventing and Cleaning Up Spam .....	325
Running Confluence behind NGINX with SSL .....	327
Scheduled Jobs .....	330
Configuring the Whitelist .....	335
Configuring the Time Interval at which Drafts are Saved .....	336
Performance Tuning .....	336
Cache Performance Tuning .....	339
Cache Statistics .....	342
Memory Usage and Requirements .....	343
Requesting Performance Support .....	345
Access Log Scripts .....	348
Compressing an HTTP Response within Confluence .....	348
Garbage Collector Performance Issues .....	349
Troubleshooting Slow Performance Using Page Request Profiling .....	350
Identifying Slow Performing Macros .....	352
Data Collection Policy .....	353
Administering Collaborative Editing .....	354
Troubleshooting Collaborative Editing .....	360
Migrate from Confluence Cloud to Server .....	362
Confluence installation and upgrade guide .....	364
System Requirements .....	365
Server Hardware Requirements Guide .....	366
Example Size and Hardware Specifications From Customer Survey .....	370
Running Confluence in a Virtualized Environment .....	371
Confluence Installation Guide .....	372
Installing Confluence .....	373
Installing a Confluence trial .....	374
Installing Confluence on Windows .....	376
Installing Confluence on Windows from Zip File .....	381
Uninstalling Confluence from Windows .....	386
Installing Confluence on Linux .....	387
Installing Confluence on Linux from Archive File .....	392
Uninstalling Confluence from Linux .....	399
Unattended installation .....	400
Change listen port for Confluence .....	401
Start and Stop Confluence .....	402
Installing Confluence Data Center .....	404
Moving to Confluence Data Center .....	409
Upgrading Confluence Data Center .....	414
Adding and Removing Data Center Nodes .....	416
Change Node Discovery from Multicast to TCP/IP .....	417
Running Confluence Data Center in AWS .....	418
Getting started with Confluence Data Center on Azure .....	422
Administering Confluence Data Center on Azure .....	429
Moving from Data Center to Server .....	430
Installing Java for Confluence .....	431
Setting the JAVA_HOME Variable in Windows .....	432
Creating a Dedicated User Account on the Operating System to Run Confluence .....	433
Confluence Setup Guide .....	434
Configuring Jira Integration in the Setup Wizard .....	440
Upgrading Confluence .....	443
Upgrading Beyond Current Licensed Period .....	449
Confluence Post-Upgrade Checks .....	450
Migration from Wiki Markup to XHTML-Based Storage Format .....	451
Migration of Templates from Wiki Markup to XHTML-Based Storage Format .....	455
Upgrading Confluence Manually .....	456
Create a staging environment for upgrading Confluence .....	462
Supported Platforms .....	465
End of Support Announcements for Confluence .....	467
Supported Platforms FAQ .....	483
Migrating Confluence Between Servers .....	484

From Confluence Evaluation through to Production Installation .....	485
Confluence Data Center .....	487
Confluence Data Center Technical Overview .....	488
Administer your Data Center search index .....	496
Configuring Synchrony for Data Center .....	497
Restricted Functions in Confluence Data Center .....	501
Confluence Data Center Performance .....	502
Confluence Data Center disaster recovery .....	505
Data Center Troubleshooting .....	511
Troubleshooting a Data Center cluster outage .....	514
Getting help and support .....	516
Confluence Resources .....	516
Support Policies .....	517
Bug Fixing Policy .....	517
New Features Policy .....	519
Security Bugfix Policy .....	520
Troubleshooting Problems and Requesting Technical Support .....	520
Content Anonymizer for Data Backups .....	522
Enabling Detailed SQL Logging .....	522
Generating a Heap Dump .....	523
Generating a Thread Dump .....	525
Generating a Thread Dump Externally .....	526
Getting Java Crash Log File .....	527
Profiling using the YourKit Plugin .....	528

# Confluence administrator's guide

## About the Confluence administrator's guide

This guide covers features and functions that are only available to administrators.

For information on creating and administering spaces, See [Spaces](#).

This guide assumes that you are using the Confluence default theme. If your Confluence site has been customized the header may look different, and menu items appear in different locations to the examples given in this guide.

- [Getting Started as Confluence Administrator](#)
- [Manage Users](#)
  - [Add and Invite Users](#)
  - [Delete or Disable Users](#)
  - [Restore Passwords To Recover Admin User Rights](#)
  - [Edit User Details](#)
  - [Change a Username](#)
  - [Managing Site-Wide Permissions and Groups](#)
  - [Configuring User Directories](#)
  - [SAML SSO for Confluence Data Center](#)
- [Managing Add-ons or Plugins](#)
- [Writing User Macros](#)
  - [User Macro Template Syntax](#)
- [Customizing your Confluence Site](#)
  - [Changing the Look and Feel of Confluence](#)
  - [Changing the Default Behavior and Content in Confluence](#)
- [Integrating Confluence with Other Applications](#)
  - [Linking to Another Application](#)
  - [Configuring Workbox Notifications](#)
  - [Integrating Jira and Confluence](#)
  - [Registering External Gadgets](#)
  - [Configuring the Office Connector](#)
- [Managing your Confluence License](#)
- [Managing Confluence Data](#)
  - [Database Configuration](#)
  - [Site Backup and Restore](#)
  - [Attachment Storage Configuration](#)
  - [Confluence Data Model](#)
  - [Finding Unused Spaces](#)
  - [Data Import and Export](#)
  - [Import a Text File](#)
  - [Audit log](#)
- [Configuring a Confluence Environment](#)
  - [Confluence Home and other important directories](#)
  - [Application Server Configuration](#)
  - [Web Server Configuration](#)
  - [Starting Confluence Automatically on System Startup](#)
- [Configuring Confluence](#)
  - [Viewing System Information](#)
  - [Configuring the Server Base URL](#)
  - [Configuring the Confluence Search and Index](#)

## Downloads



[Download the Confluence documentation in PDF format.](#)

## Other resources

[Confluence installation and upgrade guide](#)

[Confluence Knowledge Base](#)

[Atlassian Answers](#)

- [Configuring Mail](#)
- [Configuring Character Encoding](#)
- [Other Settings](#)
- [Configuring System Properties](#)
- [Working with Confluence Logs](#)
- [Configuring Confluence Security](#)
- [Scheduled Jobs](#)
- [Configuring the Whitelist](#)
- [Configuring the Time Interval at which Drafts are Saved](#)
- [Performance Tuning](#)
  - [Cache Performance Tuning](#)
  - [Memory Usage and Requirements](#)
  - [Requesting Performance Support](#)
  - [Compressing an HTTP Response within Confluence](#)
  - [Garbage Collector Performance Issues](#)
  - [Troubleshooting Slow Performance Using Page Request Profiling](#)
- [Data Collection Policy](#)
- [Administering Collaborative Editing](#)
  - [Troubleshooting Collaborative Editing](#)
- [Migrate from Confluence Cloud to Server](#)

## Getting Started as Confluence Administrator

If you're just starting out as Confluence administrator, this page is for you. You'll find this page useful if your Confluence site is brand new, or if you're learning to administer an existing site.

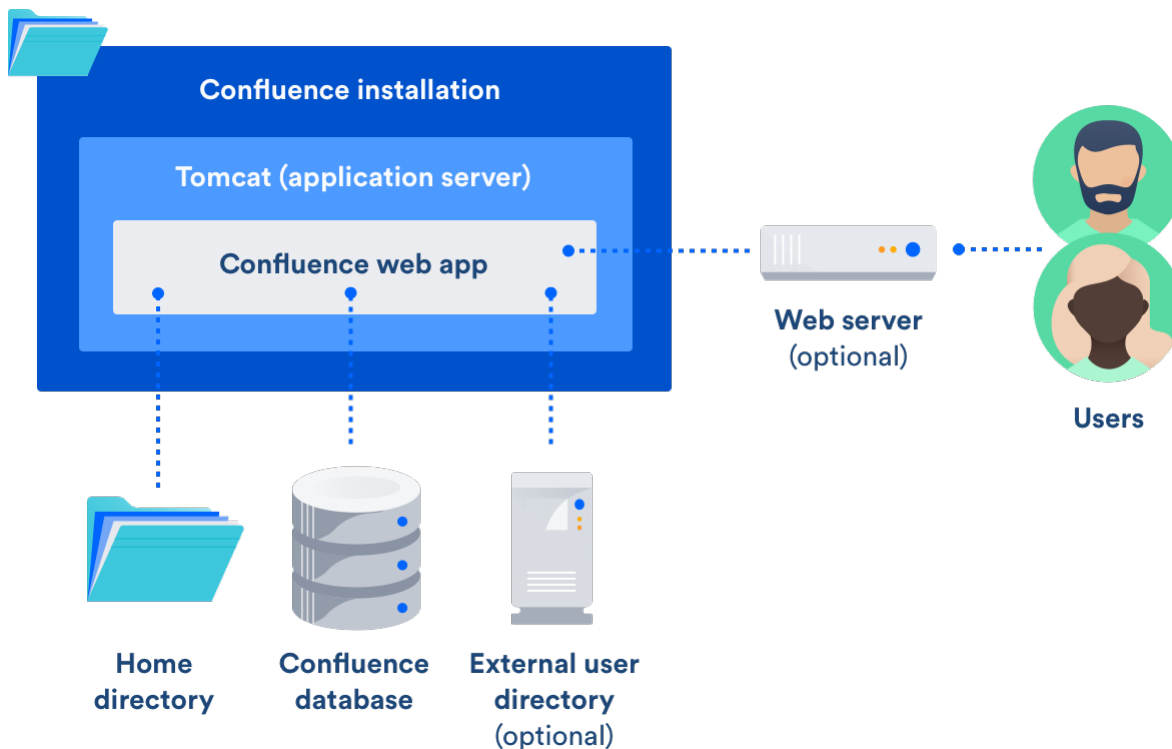
Confluence is a Java-based web application. For the [supported environments](#), there is an installer that will set up an application server and copy the application files to the designated directories on your server machine. If you prefer, you can install Confluence from a zip file. See the [Confluence Installation Guide](#) for details.

### On this page:

- [Quick access to administrative functions via Confluence search](#)
- [How to administer and configure Confluence](#)
- [Getting started on a new Confluence site](#)
- [Getting to know an existing Confluence site](#)

*Diagram: A Confluence installation*



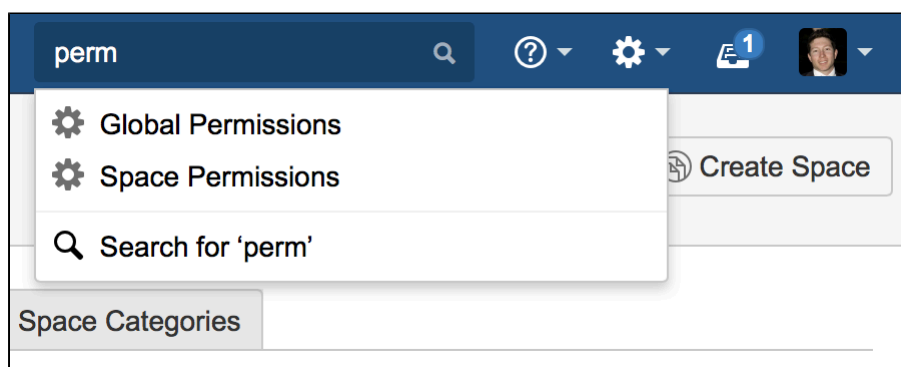


## Quick access to administrative functions via Confluence search

**Quick tip for getting to administration screens:** Start typing what you want to do into the Confluence search box at top right of the screen. The matching administrative functions will appear with a cog icon at the top of the dropdown search results.

**Even faster via /:** Press / on your keyboard then continue typing the action you want. Notes about finding admin options via quick search:

- Pressing / puts your cursor in the search field (as it does in Jira applications).
- System admin, Confluence admin, and space admin options may appear in the search results.
- Confluence permissions determine the admin options that appear in search results. You'll only see the options you're allowed to perform.



### How to administer and configure Confluence

After installing Confluence, you will perform the initial configuration via a web interface called the [Confluence Setup Wizard](#). **Introducing the Confluence Administration Console:** From this point onwards, many of the admin functions are available from the Confluence Administration Console, which is part of the Confluence web interface. If you have administrative permissions, you'll have access to the Confluence Administration Console via your web browser, using the standard Confluence URL for your site.

#### To access the Confluence Administration Console:

1. Open your Confluence URL in your web browser

## 2. Choose



> **General Configuration** in the header

**For further configuration options**, you can edit the XML and properties files that are part of your Confluence installation directory. To get started, take a look at the [Confluence Home and other important directories](#). The Confluence administration guide will lead you through tasks such as [configuring the log files](#) and [configuring system properties](#).

## Getting started on a new Confluence site

Is this a new Confluence site? Here are some things to get started with:

- Decide whether you want to allow public (anonymous) access to your site. See [Setting Up Public Access](#).
- Add a space and some content. See [Create a Space](#) then [Pages and blogs](#).
- Invite some users to your site. See [Add and Invite Users](#).
- Decide whether you will manage your users in Confluence or hook up an external LDAP directory. See [Configuring User Directories](#).
- Make sure you have set up an email server. The above task list will include this step, but it is worth mentioning it here again. Email notifications are an important part of collaborating on Confluence. See [Configuring a Server for Outgoing Mail](#).

Now you can continue getting to know your site, as described in the next section.

## Getting to know an existing Confluence site

Has the site been around a while, but you are new to Confluence administration? Take a look at these topics:

- Understand the Confluence permission scheme. See [Permissions and restrictions](#).
- Get to know the power of add-ons (also called plugins), for extending and customizing your Confluence site. See [Managing Add-ons or Plugins](#).
- Investigate more ways of customizing Confluence. See [Customizing your Confluence Site](#).

## Manage Users

A Confluence user is a person who can read or update a Confluence site. You can choose whether your Confluence site is accessible to anonymous users (people who have not logged in) or only to logged-in users. See [Setting Up Public Access](#).

### Confluence user management

You can add users to Confluence, and then assign them permissions that determine their access to the content and administrative functions in your Confluence site. You can also collect users into groups, and assign the permissions to groups for easier management. See the following topics:

- [Add and Invite Users](#)
- [Delete or Disable Users](#)
- [Managing Site-Wide Permissions and Groups](#)

By default, Confluence stores its users and groups in the Confluence database. This is called the internal directory. You can choose to connect Confluence to an external userbase instead, such as Microsoft Active Directory or another LDAP server. You can also use Atlassian [Crowd](#) and [Jira](#) applications as directory managers. When you add a user or group to Confluence, it will be added to the external directory too, based on your configuration options. See [Configuring User Directories](#).

#### On this page:

- [Confluence user management](#)
- [Authentication](#)
  - [Seraph](#)
  - [XML-RPC and SOAP authentication](#)
  - [Password authentication](#)
  - [SAML single sign-on](#)

#### Related pages:

- [Configuring Confluence Security](#)

## Authentication

### Seraph

Almost all authentication in Confluence (and Jira applications) is performed through [Seraph](#), Atlassian's open source web authentication framework. The goal of Seraph is to provide a simple, extensible authentication system that we can use on any application server.

Seraph is implemented as a servlet filter. Its sole job is, given a web request, to associate that request with a particular user (or no user if the request is anonymous). It supports several methods of authentication, including HTTP Basic Authentication, form-based authentication, and looking up credentials already stored in the user's session.

Seraph itself performs no user management functions. It merely checks the credentials of the incoming request and delegates any user management functions (looking up a user, checking a user's password) to Confluence's user management system.

If you want to integrate Confluence with your own single sign-on (SSO) infrastructure, you would do so by installing [Atlassian Crowd](#) or by writing a [custom Seraph authenticator](#). See our developer documentation on [HTTP authentication with Seraph](#).

### XML-RPC and SOAP authentication

Normally, requests for [Confluence's XML-RPC and SOAP APIs](#) (deprecated) will include an authentication token as the first argument. With this method of authentication, XML-RPC and SOAP authentication requests are checked directly against the user management framework, and tokens are assigned directly by the remote API subsystem. These requests do not pass through Seraph authenticators.

However, if the token argument is blank, Seraph will be used as a fallback authentication method for remote API requests. So, to use a custom Seraph authenticator with XML-RPC or SOAP requests, ensure that you pass an empty string as the authentication token to remote API methods.

### Password authentication

By default, password authentication is delegated from Seraph to the user management system. This is not necessary, however. Single sign-on systems may have no password authentication at all, and get all the necessary credentials from the SSO provider.

### SAML single sign-on

If you have a Confluence Data Center license you can connect Confluence to your SAML 2.0 identity provider for authentication and single sign-on.

See [SAML SSO for Confluence Data Center](#) for more information.

## Add and Invite Users

There are a number of ways to add users to Confluence:

- **By user signup:** If [user signup](#) is enabled on your Confluence site, people can add themselves as users of the site.
- **Via an invitation link:** You can [invite people to sign up](#) by sending them an invitation link. You can copy and paste the link, or prompt Confluence to send the link in an email message.
- **By adding users manually:** If you have Administrator or System Administrator [permission](#), you can [manually add new users](#).
- **Via an external user directory:** See [Configuring User Directories](#).

You may also be interested in information about [allowing anonymous users access to your site](#). Anonymous users don't count against your Confluence license totals.

## Allow user signup

If you enable user signup, a 'Sign Up' option will appear on the Confluence screens. The option will be on the login screen, and also in the header on public sites. People can choose the option to create their own usernames on Confluence.

### On this page:

- [Allow user signup](#)
- [Manage user signup notifications](#)
- [Invite people to sign up](#)
- [Reset the invitation link](#)
- [Add users manually](#)
- [Notes](#)

### Related pages:

- [Manage Users](#)
- [Setting Up Public Access](#)
- [Configuring a Server for Outgoing Mail](#)

You can restrict the signup to people whose email addresses are within a given domain or domains. This is useful if you want to ensure that only people within your organization can add their own usernames.

You will still be able to add or invite users manually, whether user signup is enabled or not.

You need Confluence Administrator or System Administrator [permissions](#) to change the signup options.

### To set the user signup options:

1. Choose



> **User management**


2. Select the **User Signup Options** tab
3. Choose **Allow people to sign up to create their account**
4. Choose one of the following options:
  - **Restricted by domain(s)** – Note: You need to set up a [mail server](#) for Confluence before you can configure domain restricted signup. When you choose this option, you'll see a text box. Enter one or more domains, separated by commas. People will only be able to sign up if their email address belongs to one of the domains specified here. Confluence will send the person an email message, asking them to click a link to confirm their email address. For example: mydomain.com, mydomain.net
  - **No restrictions** – Anyone will be able to sign up to Confluence. Confluence will not send any email message requesting confirmation.
5. Choose **Notify administrators by email when an account is created** if you want Confluence to send an email message to all administrators (people with Confluence Administrator or System Administrator permissions) every time someone signs up to Confluence

## Manage user signup notifications

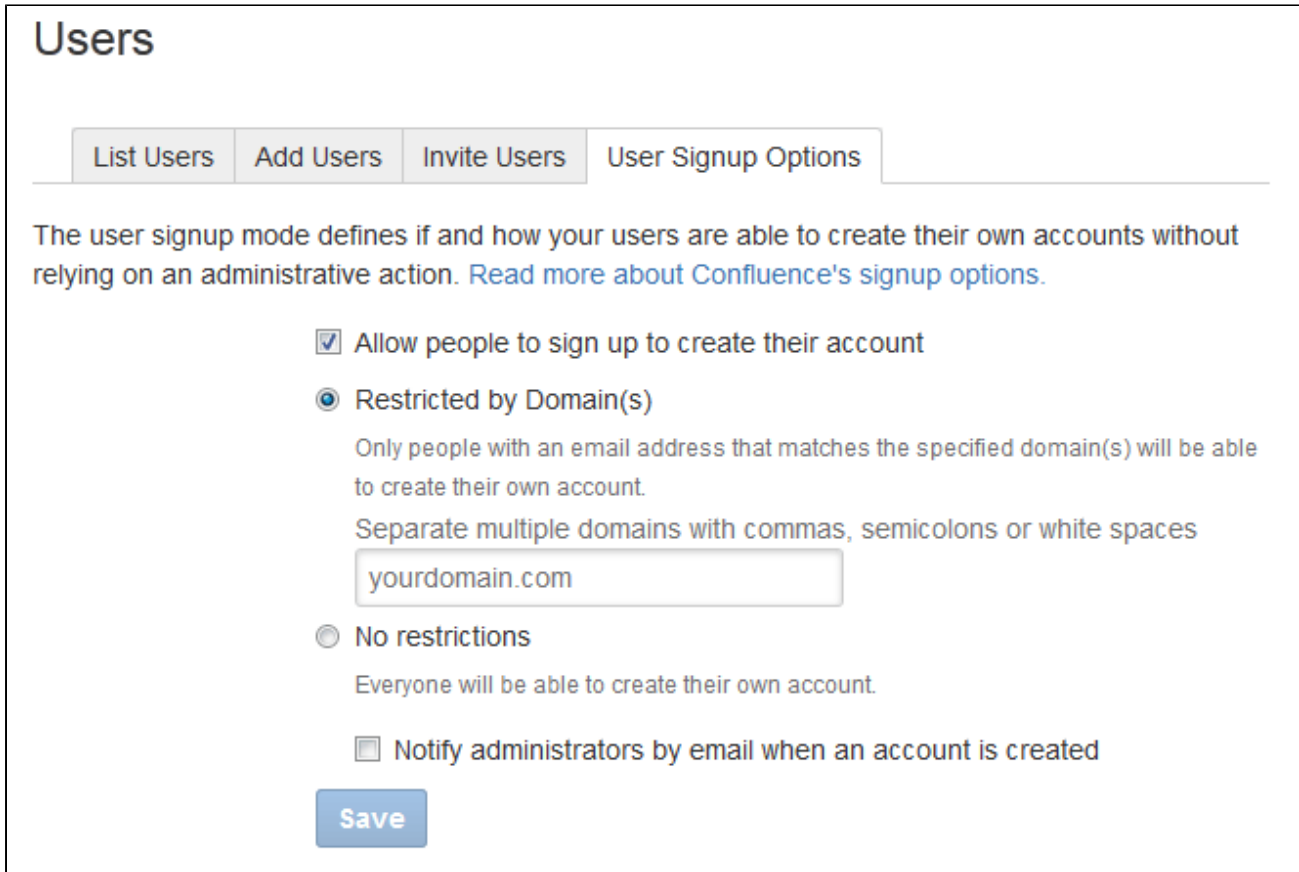
By default, Confluence will send an email notification to all Confluence administrators whenever someone signs up to your Confluence site. The administrators (people with Confluence Administrator or System Administrator permissions) will receive this message when someone signs up either by clicking the 'Sign Up'

link or by clicking the invitation URL sent by an administrator.

#### To disable this notification:

1. Choose 
  - > **User management**
2. Select the **User Signup Options** tab
3. Remove the tick from **Notify administrators by email when an account is created**
4. Choose **Save**

Screenshot: User signup options




#### Invite people to sign up

You can invite new users to the site by sending them a signup URL, called an 'invitation link'. You can copy the invitation link and paste it onto a page or into an email message, or you can prompt Confluence to send an email message containing the same link.

The option to send invitations is independent of the signup options. You can send invitations if signup is open to all, restricted by domain, or disabled entirely. Even if signup is restricted or disabled, a person who has received an invitation will be able to sign up.

When someone visits the invitation link in a browser, a Confluence signup screen will appear.

#### To invite people to sign up:

1. Choose 
  - > **User management**
2. Select the **Invite Users** tab
3. Do either of the following:
  - Copy the **Invitation Link** and paste it into an email message, or onto a page on your intranet, for example

- Alternatively, prompt Confluence to send an email message for you:
  - a. Enter one or more email addresses in the field labeled **Email To**  
Separate the addresses with commas. For example: john@example.com, sarah@example.com
  - b. Change the **Message** if you want to
  - c. Choose **Send**

### Reset the invitation link

The invitation link includes a security token, like this:

```
http://confluence.example.com/signup.action?token=d513a04456312c47
```

This security token is a shared token – individual invitations don't have unique tokens. Anyone who obtains this token will be able to sign up to Confluence.

You can change the token at any time, by choosing **Reset**. The previous invitation link will then become unusable.

*Screenshot: Inviting users*

**Users**

List Users Add Users **Invite Users** User Signup Options

Inviting users is the easiest way to get your team collaborating on Confluence. Just share the link below with your team, either by copying and pasting it, or by using the email option below.

Invitation Link <http://localhost:8090/signup.action?token=25bee249fe9fe7e1>

**Reset**

Resetting the invitation URL will stop people from signing up via a previously-sent URL.

Email To

Message

Hi,

Join me and the rest of the team on Sample Site!

It's the one place to create, share, discuss and store our ideas, projects and documents.


You will send less email, have fewer meetings and get more done.

Please accept this invitation to get started!

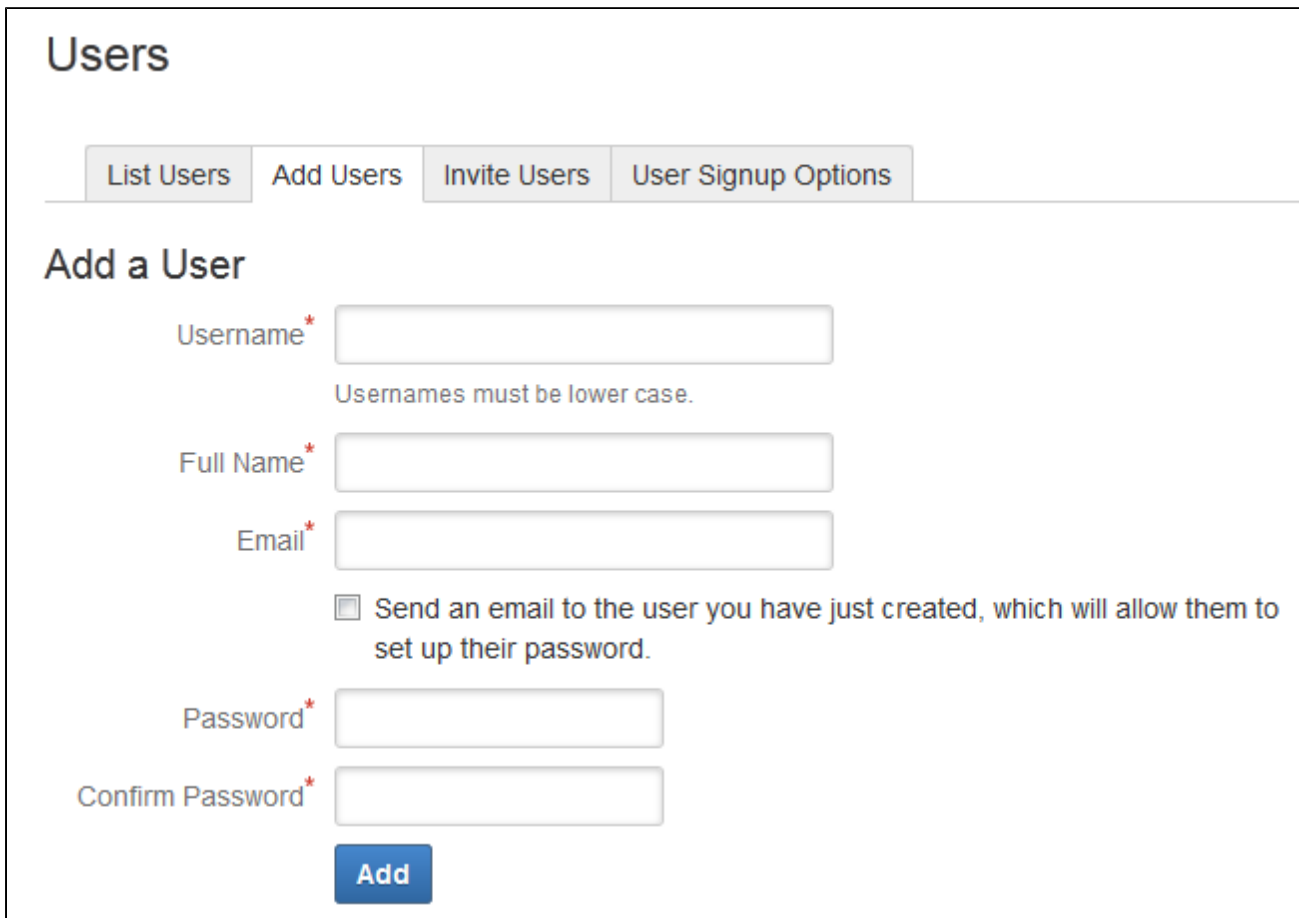
**Send**

## Add users manually

### To add a new user:

1. Choose   
> **User management**
2. Select the **Add Users** tab
3. Enter the user's details
4. Choose whether Confluence should send an **email** message informing the person of their new username  
The email message will contain a link that the person can use to reset their password.
5. Choose **Create**

Screenshot: Adding users



**Users**

List Users Add Users Invite Users User Signup Options

**Add a User**

Username\*   
Usernames must be lower case.

Full Name\*

Email\*

☐ Send an email to the user you have just created, which will allow them to set up their password.

Password\*

Confirm Password\*

**Add**

### Notes

- **Multiple directories** – You can define multiple user directories in Confluence, so that Confluence looks in more than one place for its users and groups. For example, you could use the default Confluence **internal directory** and connect to an **LDAP** directory server. In that case, you can define the **directory order** to determine where Confluence looks first when processing users and groups.

Here is a summary of how the directory order affects the processing:

- The order of the directories is the order in which they will be searched for users and groups.
- Changes to users and groups will be made only in the first directory where the application has permission to make changes.

See [Managing Multiple Directories](#).

- **Email server required for domain restricted signup and for invitations** – You need to set up a [mail](#)



l [server](#) for Confluence, before you can configure domain restricted signup or send email invitations to users.

- **Are the user management options not visible?** If you have external user management turned on, internal user management is disabled. To configure external user management, go to



> **General Configuration**> **Security Configuration**. See [Disabling the Built-In User Management](#).

- **Avoid hash, slash and question characters in usernames** - there is a known issue where users

with #, ? or / in their username cannot create spaces. See [CONFSERVER-43494](#) [OPEN](#) and

[CONFSERVER-13479](#) [OPEN](#)

for more information.

## Delete or Disable Users

You can **delete** a user from Confluence if they haven't yet added or edited any content on the site. Content includes pages and blog posts, and edits and comments on existing pages.

If a user has contributed content, you should **disable** their user account. Disabling a user account won't remove the content they've created.

### Related pages:

- [Manage Users](#)
- [Configuring User Directories](#)

Someone with a disabled user account can no longer log in to Confluence, and they don't add to your license count.

### To delete or disable a user:

1. Choose



> **User management**


2. Search for a user or click **Show all users**
3. Select the user
4. Do either of the following:
  - Choose **Delete** if the user hasn't contributed any content
  - Choose **Disable** to deactivate a user account if the user has contributed content

*Screenshot: Administering a user*



## View User: ewan

« [Back to Users](#)

User	ewan
Full Name	Ewan User
Email	<a href="mailto:sample@email.com.au">sample@email.com.au</a>
Directory	Crowd Repository
Created	Apr 24, 2013 10:36
Last Updated	Apr 24, 2013 10:36
Login	<b>Last Login:</b> Apr 26, 2013 15:21 <b>Current Failed Login Count:</b> 0
Groups	 <a href="#">confluence-users</a>
<a href="#">View Profile</a> <a href="#">Edit Groups</a> <a href="#">Edit Details</a> <a href="#">Set Password</a> <a href="#">Delete</a> <a href="#">Disable</a>	

### Notes

- The **Administer User** link is only visible if you are logged in as an administrator.
- You can also delete or disable users using the [Administration Console](#).
- You can [edit the groups](#) that a user belongs to, to change their permissions without completely preventing their access to Confluence.
- **Multiple user directories** – You can define multiple user directories in Confluence, so that Confluence looks in more than one place for its users and groups. For example, you could use the default Confluence **internal directory** and connect to an **LDAP** directory server. In that case, you can define the **directory order** to determine where Confluence looks first when processing users and groups.

Here is a summary of how the directory order affects the processing:

- The order of the directories is the order in which they will be searched for users and groups.
- Changes to users and groups will be made only in the first directory where the application has permission to make changes.

See [Managing Multiple Directories](#).

- **Number of users and your license** – The Confluence ['License Details'](#) screen tells you how many users your Confluence instance is licensed to support, and how many are currently registered. The number of registered users includes only users who have the 'Can Use' global permission. Deactivated users, as described above, aren't included. Choose **Refresh** to make sure you see the latest count.
- If the user resides in a Read Only external directory, the option to disable the user won't appear.

### Restore Passwords To Recover Admin User Rights

If you're unable to log in to Confluence as an administrator (for example, you've lost the administrator password) you can start Confluence in recovery mode to recover your admin user rights.

If you know the admin username, and it has a valid email address, you can reset the password using the forgot password link on the log in screen. We'll send a link to your admin email account to reset your password.

As an administrator, you may find yourself locked out of Confluence because:

#### On this page:

- [Use recovery mode to restore access](#)

- You've imported a site from Cloud, and it does not contain a system administrator account.
- You've forgotten the password to the administrator account, and don't have access to the email address associated with it.
- You're using an external directory or Jira for user management, have disabled the built in user management, and your external directory is not currently available.
- You need to make a change to the configuration of an external user directory in Confluence while that directory is not available.

In any of these situations you can use recovery mode to restore administrator access to Confluence.

**Using Confluence 6.5.0 or earlier?** You'll need to use the database method to recover your admin user rights. See [the earlier documentation](#).

## Use recovery mode to restore access

Recovery mode works by creating a virtual user directory with a temporary admin account. You set the password for this admin account when applying the system property. Users can continue to log in and access Confluence while it is in recovery mode.

To recover administrator user rights:

1. Stop Confluence.
2. Edit `<installation-directory>/bin/setenv.sh` or `setenv.bat` and add the following system property, replacing `<your-password>` with a unique, temporary password.

```
-Datlassian.recovery.password=<your-password>
```

See [Configuring System Properties](#) for more information on using system properties.

3. Start Confluence **manually** using `<installation-directory>/bin/start-confluence.sh` or `start-confluence.bat` (don't start Confluence as a service).
4. Log in to Confluence with the username **recovery\_admin** and the temporary password you specified in the system property.
5. Reset the password for your existing admin account, or create a new account and add it to the appropriate administrator group.
6. Confirm that you can successfully log in with your new account.
7. Stop Confluence.
8. Edit `<installation-directory>/bin/setenv.sh` or `setenv.bat` and remove the system property.
9. Restart Confluence using your usual method (manually or by starting the service).

### Good to know:

- Remove the system property as soon as you have restored admin access.
- Don't leave Confluence in recovery mode, or use the `recovery_admin` account as a regular administrator account.
- Your temporary password should be a unique. Don't use an existing password or the one you intend to use for your admin account.

## Edit User Details

You can view and edit the details of Confluence users, including their name, password, email address, group membership, and ability to access Confluence.

### Edit a user's details

1. Choose



> **User management**

2. Do either of the following:

- Choose **Show all users** to list everyone in the 'confluence-users' or 'users' group
- Enter a username, full name or email address in the **Find User** field and hit **Search**

If you're already viewing someone's profile, choose **Administer User** in the sidebar.

2. Select the user you want to manage

**On this page:**

- [Edit a user's details](#)
- [Reset login count](#)

**Related pages:**

- [Delete or Disable Users](#)
- [Adding or Removing Users in Groups](#)
- [Add and Invite Users](#)

Now you'll see the person's current details and links allowing you to edit them.

- **View Profile** — View the user's profile.
- **Edit Groups** — [Add or remove](#) this user from a group.
- **Edit Details** — Change details such as the user's name, email address, contact details and team or department information. In some instances you may be able to change usernames as well. See [Change a Username](#) for information.
- **Set Password** — Edit the user's password details.
- **Delete** — You can [delete](#) a user permanently if the user has not added or edited any content on the site.
- **Disable** — You can [disable](#) (i.e. deactivate) access for a user who has already added or edited any content on the site.

## View User: juser

[« Back to Users](#)User **juser**Full Name **Josh User**Email [josh@user.com](mailto:josh@user.com)Directory **Confluence Internal Directory**Created **Feb 24, 2015 10:13**Last Updated **Feb 24, 2015 10:13**

Login **Last Login: Jun 22, 2015 10:56**  
**Current Failed Login Count: 0**

Groups  **confluence-users**
[View Profile](#) [Edit Groups](#) [Edit Details](#) [Set Password](#) [Delete](#) [Disable](#)

## Reset login count

Confluence records the number of failed login attempts made against each user account. When the login attempts exceed a preset number, the user is prompted to authenticate using CAPTCHA until they successfully log in.

If the user you're administering has any failed login attempts, you can manually set the failed login count for a user back to zero by clicking **Reset Failed Login Count**.

### Multiple user directories

You can define multiple user directories in Confluence, so that Confluence looks in more than one place for its users and groups. For example, you could use the default Confluence **internal directory** and connect to an **LDAP** directory server. In that case, you can define the **directory order** to determine where Confluence looks first when processing users and groups.

Here is a summary of how the directory order affects the processing:

- The order of the directories is the order in which they will be searched for users and groups.
- Changes to users and groups will be made only in the first directory where the application has permission to make changes.

See [Managing Multiple Directories](#).

## Change a Username

As a Confluence administrator, you can change a user's username. This could be for any reason, but might happen when someone changes their name, for example.

Each active users must have a unique username, so no two *active* users can have the same username. You can, however, assign the username of a [disabled user](#) to another active user.

The procedure for changing a username depends on where you manage your users. See [Configuring User Directories](#) for more info.

### On this page:

- [Confluence-managed users](#)
- [Users managed in an external directory](#)
- [Notes](#)

## Confluence-managed users

If you manage your users in the Confluence internal directory, you can rename your user in Confluence. You'll need Confluence Administrator permissions to change a username.

### To change a username:

1. Choose



> **User management**

2. Search for the user or choose **Show all users**
3. Select the user you'd like to edit and choose **Edit Details**
4. Enter the new username and choose **Submit**

That person will need to use their new username to log in to Confluence from now on. The new username will also be reflected throughout Confluence, including in [@mentions](#).

## Users managed in an external directory

If you don't manage your users in the Confluence internal directory, you may still be able to change someone's username. Confluence can't update external users, but it will detect changes in usernames coming from *some* external directories.

The following table shows the instances where you may be able to change a username in your external

directory and have the change detected in Confluence.

User directory	Where to rename the user
Internal directory with LDAP authentication	Rename the user in the LDAP directory, Confluence will detect the renamed user.  Note: you must have 'Copy User on Login' enabled. See <a href="#">Copying Users on Login</a> for more information.
Jira 6.1 or later	Rename the user in Jira, Confluence will automatically detect the renamed user.
Atlassian Crowd 2.7 or later	Rename the user in Crowd, Confluence will automatically detect the renamed user.
LDAP	Rename the user in your LDAP directory, Confluence will automatically detect the renamed user.

## Notes

Some important things to note about changing usernames:

- **Mentions and page history** – Any user mentions in current pages will automatically reflect the user's new username, but any mentions in page versions created prior to Confluence 5.3 will include the user's old username.
- **Personal Spaces** – If a Confluence Administrator renames a user who has a personal space, the space key for that space will remain as the original username. For example, if jsmith's username is changed to jbrown, their personal space key will remain ~jsmith.

## Managing Site-Wide Permissions and Groups

Permissions determine what people can do on your Confluence site. Confluence recognizes permissions at [site level](#) and at [space level](#), as well as [page-level restrictions](#).

You can create [groups](#) and allocate people to them, so that you can assign permissions to a number of people at once. It's quicker to give a group access to Confluence than giving every member access individually.

You can also set the access levels for [anonymous users](#) or deny access to unlicensed users from linked applications, such as Jira Service Desk.

### Related pages:

- [Confluence Security Overview and Advisories](#)
- [Global Permissions Overview](#)

## Confluence Groups for Administrators

[Grouping users](#) in Confluence is a great way to cut down the work required when managing permissions and restrictions. Once you have a group of users, you can assign that group a set of [global permissions](#). For example, if you don't want that group of users to be able to create spaces, you can revoke the 'Create Space(s)' permission.

Other users can also take advantage of Confluence groups. [Space admins](#) can assign a set of [space permissions](#) to a group rather than to each individual user, and other users with the 'Add/Delete Restrictions' space permission can add and remove [page restrictions](#) for groups.

### Special groups

There are two special default groups in Confluence:

1. **confluence-administrators**: This is a group of 'super-users' who can

access the Confluence administration screens ('administration console') and perform site-wide administration. Members of this group can also see all spaces and pages in the Confluence site. Any user who is a member of this group has site-wide administration powers, regardless of any other setting. The settings on the [global permissions screen](#) do **not** affect the powers allowed to members of this group.

2. **confluence-users**: This is the default group for all new users. Permissions you assign to this group will be assigned to all newly created users.

#### On this page:

- [Special groups](#)
- [Anonymous users](#)
- [Add or delete groups](#)
- [Confluence Administrator permission vs confluence-admin group comparison](#)
- [Notes](#)

#### Related pages:

- [Manage Users](#)
- [Global Permissions Overview](#)

**The Confluence administrator global permission and the confluence-administrators group are not related.** Going by the names, you would think they are the same thing, but they are not. Granting a user or a group Confluence administrator global permission provides access to a sub-set of administrative functions. Granting membership to the `confluence-administrators` group gives complete access to all functions and content.


[View the comparison table.](#)

### Anonymous users

All users who don't log in when they access Confluence are considered 'anonymous'. You can [grant anonymous users the 'Use Confluence' permission](#) via the Global Permissions screen if you need to. This will allow non-registered users to access pages and spaces in Confluence. A space administrator can further control anonymous access per space via the [space permissions](#).


### Add or delete groups

#### To add a new group:

1. Choose the **cog icon**  , then choose **General Configuration** under Confluence Administration
2. Choose **Groups** in the left-hand panel
3. Choose **Add Group**
4. Enter a name for your group and choose **Save**

You're now ready to start [adding users](#) to the group.

#### To delete a group:

1. Choose the **cog icon** 

- , then choose **General Configuration** under Confluence Administration
2. Choose **Groups** in the left-hand panel  
You will see a list of all existing groups along with links to remove them.
3. Choose **Delete** next to the group you want to remove

#### Confluence Administrator permission vs confluence-admin group comparison



Granting the Confluence Administrator permission to someone allows them access to many, but not all, options in the administration console (



> **General configuration**). Expand the comparison table to view the options available to people granted the Confluence Administrator permission, and to those in the confluence-admin group.

▼ [Click to view the comparison table](#)

Administration option	Confluence Admin permission	confluence-administrators group
<b>CONFIGURATION</b>		
General Configuration		
Further Configuration		
Manage Referrers		
Languages		
Shortcut Links		
Global Templates and Blueprints		
Import Templates		
Mail Servers		
Recommended Updates Email		
User Macros		
In-app Notifications		
HipChat Integration		
Attachment Storage		
Spam Prevention		
PDF Export Language Support		
Configure Code Macro		
WebDAV Configuration		
Office Connector		
<b>ATLASSIAN MARKETPLACE</b>		
Find new add-ons		
Manage add-ons		

Purchased add-ons		
<b>USERS &amp; SECURITY</b>		
Users		
Groups		
Security Configuration		
Global Permissions		
Space Permissions		
User Directories		
Whitelist		
<b>LOOK AND FEEL</b>		
Themes		
Color Scheme		
Layouts		
Stylesheet		
Site Logo and Favicon		
PDF Layout		
PDF Stylesheet		
Default Space Logo		
		Custom HTML
<b>ADMINISTRATION</b>		
System Information		
Backup & Restore		
Content Indexing		
Mail Queue		
Cache Management		
Scheduled Jobs		
License Details		
Logging and Profiling		
Thread Dump		
Application Links		
Application Navigator		
Analytics		



Import from Another Wiki		
Atlassian Support Tools		
Clustering		

## Notes

- **Multiple user directories:** You can define multiple user directories in Confluence, so that Confluence looks in more than one place for its users and groups. For example, you could use the default Confluence **internal directory** and connect to an **LDAP** directory server. In that case, you can define the **directory order** to determine where Confluence looks first when processing users and groups.

Here is a summary of how the directory order affects the processing:

- The order of the directories is the order in which they will be searched for users and groups.
- Changes to users and groups will be made only in the first directory where the application has permission to make changes.

See [Managing Multiple Directories](#).


## Adding or Removing Users in Groups

If you are a [Confluence Administrator](#), you can add users and groups, and assign users to groups, in order to determine their permissions.

This page tells you how to add a user to a group or remove a user from a group. For an overview of users and groups, please refer to [Confluence Groups](#) and [Manage Users](#).

You can edit group membership in two places:

- From the group management screen
- From the user management screen for a particular user

 If you're using Confluence Cloud head to [Manage users and groups](#) to find out how to do this in your site.

### Add and remove members via group management

This is the recommended method. It allows you to manage the group membership for a number of users at the same time.

To add members to a group:

1. Choose the **cog icon**



, then choose **General Configuration** under Confluence Administration

2. Choose **Groups** in the left-hand panel
3. Choose the group to which you want to add users
4. Choose **Add Members**
5. Type the username(s) of the people you want to add to the group
  - If you want to add more than one member, separate the usernames with commas
  - You can also search for and select users by choosing the search icon
6. Choose **Add** to add the member(s) to the group

To remove members from a group:

1. Choose the **cog icon**

### On this page:

- [Add and remove members via group management](#)
- [Edit group membership via user management](#)

### Related pages:

- [Manage Users](#)
- [Global Permissions Overview](#)



- , then choose **General Configuration** under Confluence Administration
2. Choose **Groups** in the left-hand panel
3. Choose the group from which you want to remove the user
4. Choose the **Delete user from group** icon next to the user whose group membership you want to remove

*Screenshot: Adding members*

Group Members: techwriters

[Groups](#) [Cancel](#)

techwriters

Add Members  Enter a comma separated list of user names to add users to this group

[Cancel](#)

### Edit group membership via user management

You can update a user's group membership from the user management screen. This functionality allows you to update one user at a time.

To add a user to a group or remove a user from a group:

1. Go to the user management screen for the user concerned. There are two ways to do this:
  - Either,
    - Go to the user's [Profile](#) and choose **Administer User** on the user's profile screen.
  - Or, Choose the **cog icon**
    - , then choose **General Configuration** under Confluence Administration
      - a. Choose **Users** in the left-hand panel
      - b. Choose **Show all users**, or search for a specific user by entering all or part of their username, full name or email address
      - c. Choose the username you want to edit
2. Choose **Edit Groups**
3. Select the group(s) for this user
 

To remove a user from a group, remove the tick mark in the relevant check box.

*Screenshot: Editing a user's groups*

Edit User Groups : connie

[« Return to view user: connie](#)

Select group memberships for **connie**

☐ confluence-administrators

☒ confluence-users

☐ developers

☐ techwriters

[Select All Groups](#) · [Deselect All Groups](#)

You can define multiple user directories in Confluence, so that Confluence looks in more than one place for its users and groups. For example, you could use the default Confluence **internal directory** and connect to an **LDAP** directory server. In that case, you can define the **directory order** to

determine where Confluence looks first when processing users and groups.

Here is a summary of how the directory order affects the processing:


- The order of the directories is the order in which they will be searched for users and groups.
- Changes to users and groups will be made only in the first directory where the application has permission to make changes.

See [Managing Multiple Directories](#).

## Global Permissions Overview

Global Permissions determine the actions which a user is allowed to perform in Confluence at a site level. To assign global permissions to a user or group you need Confluence Administrator or greater permissions.

The first system administrator is created in the setup wizard when Confluence is first set up. This user has the system administrator global permission and is a member of the `confluence-administrators` group.

 The default `confluence-administrators` group is a special, super-user group. [Learn more](#).

### On this page:

- [Overview of global permissions](#)
- [Comparing the System Administrator permission with the Confluence Administrator permission](#)
- [Comparing the confluence-administrators group with the administrator permissions](#)
- [Updating global permissions](#)
- [Revoking access for unlicensed users from Jira Service Desk](#)
- [Error messages you may see](#)

## Overview of global permissions

The following global permissions can be applied to groups and individuals.

Global Permission	Description
Can Use	This is the most basic permission that allows users to access the site. Users with this permission count towards the number of users allowed by your license.
Attach Files to User Profile	This allows the user to upload files to be stored in their user profile. This feature was made obsolete by the introduction of personal spaces in Confluence 2.2. Hence, this permission is no longer relevant. Attachments can be accessed from a user profile view (for example, an image within the 'About Me' field of a profile view) by attaching these files to a page within that user's personal space and referencing them using appropriate wiki markup code.
Personal Space	This permission allows the user to create a personal space.
Create Space(s)	This permission allows users to create new spaces within your Confluence site. When a space is created, the creator automatically has the 'Admin' permission <a href="#">for that space</a> and can perform space-wide administrative functions.
Confluence Administrator	This permission allows users to access the 'Administration Console' that controls site-wide administrative functions. Users with this permission can perform most, but not all, of the Confluence administrative functions. See the comparison of 'System Administrator' and 'Confluence Administrator' below.

System Administrator	This permission allows users to access the 'Administration Console' that controls site-wide administrative functions. Users with this permission can perform all the Confluence administrative functions, including the ones which the 'Confluence Administrator' permission does not allow. See the comparison of 'System Administrator' and 'Confluence Administrator' below. Refer also to the note about the 'confluence-administrators' group below.
----------------------	---

### Comparing the System Administrator permission with the Confluence Administrator permission

Confluence recognizes two levels of administrator:

- **System Administrator** – Users with this permission can perform all the Confluence administrative functions, including the ones which the 'Confluence Administrator' permission does not allow.
- **Confluence Administrator** – Users with this permission can perform most, but not all, of the Confluence administrative functions.

The two-tier administration is useful when you want to delegate some administrator privileges to project managers or team leaders. You can give 'Confluence Administrator' permission to users who should be able to perform most administrative functions, but should not be able to perform functions that can compromise the security of the Confluence system.

The following functions are granted to the 'System Administrator' permission but excluded from the 'Confluence Administrator' permission:

Administration Screen	Excluded from Confluence Administrator permission
General Configuration	The following functionality is disallowed: <ul style="list-style-type: none"> <li>• Server Base URL</li> <li>• Public Signup</li> <li>• Connection Timeouts</li> </ul>
Further Configuration	The following functionality is disallowed: <ul style="list-style-type: none"> <li>• Remote API plugin</li> </ul>
Security Configuration	The following functionality is disallowed: <ul style="list-style-type: none"> <li>• External user management</li> <li>• Append wildcards to user and group searches</li> <li>• Enable Custom Stylesheets for Spaces</li> <li>• Show system information on the 500 page</li> <li>• Maximum RSS Items</li> <li>• XSRF Protection</li> </ul>
Plugins	The following functionality is disallowed: <ul style="list-style-type: none"> <li>• Upgrade</li> <li>• Install</li> <li>• Confluence Upgrade Check</li> </ul>
Daily Backup Admin	This function is disallowed entirely.
Mail Servers	This function is disallowed entirely.
User Macros	This function is disallowed entirely.
Attachment Storage	This function is disallowed entirely.
Layouts	This function is disallowed entirely.

Custom HTML	This function is disallowed entirely.
Backup & Restore	This function is disallowed entirely.
Logging and Profiling	This function is disallowed entirely.
Cluster Configuration	This function is disallowed entirely.
Scheduled Jobs	This function is disallowed entirely.
Application Links	People with the 'Confluence Administrator' permission can add, modify and remove application links and project links. For example, they can link Confluence to Jira. However, Confluence administrators can configure only OAuth authentication for application links.
Office Connector configuration	This function is disallowed entirely.

### Comparing the confluence-administrators group with the administrator permissions

The default `confluence-administrators` group is a special, 'super-user' group that gets permissions above and beyond the Confluence administrator and system administrator global permissions. Members of this group can perform site-wide administration functions, and also see the content of all pages and spaces in the Confluence site, regardless of [space permissions](#) or [page restrictions](#).

Restricted pages and blog posts are not visible to members of the `confluence-administrators` group in the dashboard, blog roll, search and most macros, but will be visible in the following places:

- In the sidebar (visible with Page Tree navigation, but not visible with Child Pages navigation)
- Pages index page
- Reorder pages screen
- Page tree macro
- Content by user macro
- Quicknav

Members of this group can also see restricted pages and blog posts if they have the page URL.

Granting a user the system administrator and Confluence administrator global permissions does not allow that user to automatically see all spaces in your site, or see restricted pages. These permissions only give access to administration tools. Be aware, however, that users with system administrator global permission could add themselves to the `confluence-administrators` group.

You can't change the global permissions granted to the `confluence-administrators` group. If you don't want your admins to be able to see all spaces and restricted pages, you can create a new group, and grant that group the Confluence administrator and system administrator global permissions.

**The Confluence administrator global permission and the confluence-administrators group are not related.** Going by the names, you would think they are the same thing, but they are not. Granting a user or a group Confluence administrator global permission provides access to a sub-set of administrative functions. Granting membership to the `confluence-administrators` group gives complete access to all functions and content.

### Updating global permissions

**To view the global permissions for a group or user:**

1. Choose the **cog icon**



- , then choose **General Configuration** under Confluence Administration
2. Choose **Global Permissions** in the left-hand panel. The 'View Global Permissions' screen appears.

Add or edit group and user permissions as follows:

**To add permissions for a group:**

1. First add the group to Confluence, if you have not already done so.
2. Choose **Edit Permissions**. The 'Edit Global Permissions' screen appears.
3. Enter the group name in the **Grant browse permission to** box in the 'Groups' section. You can search for the group name.
4. Choose **Add**.
5. The group will appear in the list and you can now edit its permissions.

**To add permissions for a specific user:**

(Consider adding the user to a group and then assigning the permissions to the group, as described above, instead of assigning permissions to the specific user.)

1. First add the user to Confluence, if you have not already done so.
2. Choose **Edit Permissions**. The 'Edit Global Permissions' screen appears.
3. Enter the username in the **Grant browse permission to** box in the 'Individual Users' section. You can search for the username.
4. Choose **Add**.
5. The username will appear in the list and you can now edit its permissions.

**To add or edit the permissions for a user or group:**

1. Select, or clear, the check box under the relevant permission in the row for the relevant user/group. A selected check box indicates that the permission is granted.
2. To allow anonymous access to your Confluence site, select the 'Use Confluence' and 'View User Profile' options in the 'Anonymous Access' section.
3. Choose **Save All** to save your changes.

*Screenshot: Editing global permissions*

## Edit Global Permissions

Global permissions define what people can do in your site. You can grant permissions to groups and individuals, and choose to open up your site to anonymous users.

See [Global Permissions overview](#) to find out more about managing permissions for your entire Confluence site.

### Licensed Users

#### Groups

Grant permissions for the entire site to all the members of a group.

		Attach Files to User Profile <a href="#">[?]</a>	Personal Space <a href="#">[?]</a>	Create Space(s) <a href="#">[?]</a>	Confluence Administrator <a href="#">[?]</a>	System Administrator <a href="#">[?]</a>
administrators	<input checked="" type="checkbox"/> can use	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
confluence-users	<input checked="" type="checkbox"/> can use	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
site-admins	<input checked="" type="checkbox"/> can use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
system-administrators	<input checked="" type="checkbox"/> can use	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Grant browse permission to

#### Individual Users

Grant permissions to individual users, regardless of which groups they are a member of.

No users currently have individual global permissions.

Grant browse permission to

### Anonymous Access

Make your Confluence site public. You can choose which spaces anonymous users can access. Anonymous users are not included in your license count.


	Use Confluence <a href="#">[?]</a>	View User Profiles <a href="#">[?]</a>
Anonymous	<input type="checkbox"/> can use	<input type="checkbox"/>

[Cancel](#)

### Revoking access for unlicensed users from Jira Service Desk

If you're using Confluence as a knowledge base for Jira Service Desk, you can choose to allow all active users and customers (that is logged in users who do not have a Confluence license) to view pages in specific spaces. This permission can only be turned on via Jira Service Desk.

To revoke access for unlicensed users:

- Go to  **> General Configuration > Global Permissions.**
- Choose **Edit Permissions**
- Deselect the '**Can Use**' permission under **Unlicensed Access.**

Unlicensed users will no longer be able to access pages in your Confluence site. This can only be re-enabled via Jira Service Desk.

You can also choose to revoke access for individual spaces from the Space Permissions screen in each space.

*Screenshot: Unlicensed access section of the Global Permissions page.*



### Unlicensed Access

Allow any active user, including those who don't have a Confluence license, to view spaces (for example, users from JIRA Service Desk). You can choose which spaces unlicensed users can view. If you disable this permission, it can only be enabled again through JIRA Service Desk.

Use Confluence [\[?\]](#)

View User Profiles [\[?\]](#)

Unlicensed	<input checked="" type="checkbox"/> can use	<input type="checkbox"/>
------------	---	--------------------------

This section only appears on the Global Permissions page in Confluence if you have linked a space to your Service Desk project (as a Knowledge base), and chosen to allow all active users and customers to access without a Confluence license. See [Serving customers with a knowledge base](#) in the Service Desk documentation for more info.

### Error messages you may see

Confluence will let you know if there is a problem with some permissions. In rare situations, you may see the following error messages below a permission:

- 'User/Group not found' - This message may appear if your LDAP repository is unavailable, or if the user/group has been deleted after the permission was created.
- 'Case incorrect. Correct case is: xxxxxx' - This message may appear if the upper/lower case in the permission does not match the case of the username or group name. If you see a number of occurrences of this message, you should consider running the [routine supplied to fix the problem](#).

## Setting Up Public Access

You can enable anonymous access (also known as public access) to your Confluence site by granting the 'Use Confluence' permission to 'anonymous' users. An 'anonymous' user is someone who has not logged in to the Confluence site. The 'Use Confluence' permission is also called 'can use'.

This user category gives you an easy way to administer users who have not logged into the site. Permissions assigned to this category apply to all anonymous users of the site.

### Enabling anonymous access to the site

If you want to make your site visible to everyone, including people who have not logged in, you must enable anonymous access at site level.

To enable anonymous access to your site:

1. Choose the **cog icon**



, then choose **General Configuration** under Confluence Administration

2. Choose **Global Permissions** in the left-hand panel.
3. Choose **Edit Permissions**.
4. In the 'Anonymous Access' section, select the **can use** check box to enable anonymous access to the content on your site.
5. If you want to allow anonymous users to see [user profiles](#), select the check box in the **View User Profiles** section.  
*Note:* You must grant the 'can use' permission as well, if you want to grant the 'View User Profiles' permission.
6. Choose **Save All**.

### On this page:

- [Enabling anonymous access to the site](#)
- [Disabling anonymous access to the site](#)
- [Granting public access to a space](#)
- [Notes](#)

### Related pages:

- [Configuring Captcha for Spam Prevention](#)
- [Add and Invite Users](#)
- [Global Permissions Overview](#)



### Disabling anonymous access to the site

To disable anonymous access to your site, deselect the **can use** check box, then choose **Save All**. People will not be able to see the content on the site until they have logged in.

### Granting public access to a space

To enable public access to a Confluence space, you must grant the following permissions to anonymous users:

- The site-wide 'can use' permission, as described above.
- The relevant [space permissions](#). If you want a space to be publicly accessible, the anonymous user must have at least the 'View Space' permission. To set space permissions, choose **Browse > Space Admin > Permissions**.

### Notes

- You can't grant Space Admin or Restrict permissions to anonymous users.
- You can allow people to sign up for usernames themselves, and choose other options for user signup and invitations. See [Add and Invite Users](#).


## Configuring User Directories

A user directory is a place where you store information about users and groups. User information includes the person's full name, username, password, email address and other personal information. Group information includes the name of the group, the users that belong to the group, and possibly groups that belong to other groups.

The **internal** directory stores user and group information in the Confluence database. You can also connect to **external** user directories, and to Atlassian **Crowd** and **Jira** applications as directory managers.

### Configuring User Directories in Confluence

To configure your Confluence user directories:

1. Choose the **cog icon** , then choose **General Configuration** under Confluence Administration
2. Click '**User Directories**' in the left-hand panel.

#### On this page:

- [Configuring User Directories in Confluence](#)
- [Connecting to a Directory](#)
- [Updating Directories](#)

#### Related pages

- [Configuring the Internal Directory](#)
- [Connecting to an LDAP Directory](#)
- [Connecting to an Internal Directory with LDAP Authentication](#)
- [Connecting to Crowd or Jira for User Management](#)
- [Managing Multiple Directories](#)
- [Managing Nested Groups](#)
- [Synchronizing Data from External Directories](#)
- [Diagrams of Possible Configurations for User Management](#)
- [User Management Limitations and Recommendations](#)
- [Requesting Support for External User Management](#)
- [Disabling the Built-In User Management](#)
- [Add and Invite Users](#)
- [Managing Site-Wide Permissions and Groups](#)

### Connecting to a Directory

You can add the following types of directory servers and directory managers:

- Confluence's internal directory. See [Configuring the Internal Directory](#).
- Microsoft Active Directory. See [Connecting to an LDAP Directory](#).
- Various other LDAP directory servers. See [Connecting to an LDAP Directory](#).

- An LDAP directory for delegated authentication. See [Connecting to an Internal Directory with LDAP Authentication](#).
- Atlassian Crowd or Jira 4.3 or later. See [Connecting to Crowd or Jira for User Management](#).

You can add as many external user directories as you need. Note that you can define the **order** of the directories. This determines which directory Confluence will search first, when looking for user and group information. See [Managing Multiple Directories](#).

## Updating Directories

### Limitations when Editing Directories

You cannot edit, disable or remove the directory your user belongs to. This precaution is designed to prevent administrators from locking themselves out of the application by changing the directory configuration in a way that prevents them logging in or removes their administration permissions.

This limitation applies to all directory types. For example:


- You cannot disable the internal directory if your user is an internal user.
- You cannot disable or remove an LDAP or a Crowd directory if your user comes from that directory.

In some situations, reordering the directories will change the directory that the current user comes from, if a user with the same username happens to exist in both. This behavior can be used in some cases to create a copy of the existing configuration, move it to the top, then remove the old one. Note, however, that duplicate usernames are not a supported configuration.

You cannot remove the internal directory. This precaution aligns with the recommendation below that you always keep an administrator account active in the internal directory.

### Recommendations

The recommended way to edit directory configurations is to log in as an internal user when making changes to external directory configuration.

 We recommend that you keep either an administrator or system administrator user active in your internal directory for troubleshooting problems with your user directories.

### Enabling, Disabling and Removing Directories







You can enable or disable a directory at any time. If you disable a directory, your configuration details will remain but the application will not recognize the users and groups in that directory.

You have to disable a directory before you can remove it. Removing a directory will remove the details from the database.

#### User Directories

The table below shows the user directories currently configured for Confluence.

The order of the directories is the order in which they will be searched for users and groups. Changes to users and groups will be made in the first directory where Confluence has permission to make changes. It is recommended that users only exist in a single directory.

Directory Name	Type	Order	Operations
Confluence Internal Directory	Internal	 	
OpenLDAP	OpenLDAP (Read-Write)	 	<a href="#">Disable</a> <a href="#">Edit</a> <a href="#">Synchronise</a> Last synchronised at 14/01/11 3:07 PM (took 65s).
Crowd	Atlassian Crowd	 	<a href="#">Disable</a> <a href="#">Edit</a> <a href="#">Synchronise</a> Last synchronised at 14/01/11 2:39 PM (took 0s).

[Add Directory](#)

#### Additional Configuration

- [LDAP Connection Pool Configuration](#)

Screenshot above: Configuring user directories

## Configuring the Internal Directory

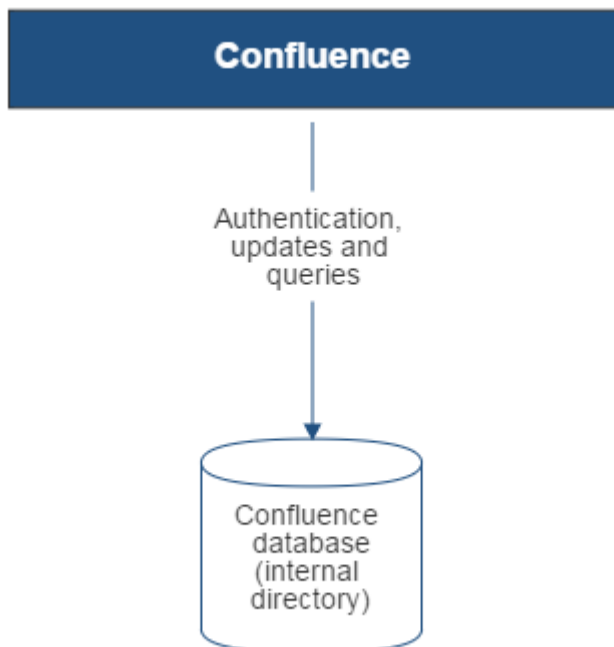
The internal directory stores user and group information in the Confluence database.

### Overview

The internal directory is enabled by default at installation. When you create the first administrator during the setup procedure, that administrator's username and other details are stored in the internal directory.

If needed, you can configure one or more additional user directories. This is useful if you want to grant access to users and groups that are stored in a corporate directory or other directory server.

### Diagram of Possible Configuration



*Diagram above: Confluence using its internal directory for user management.*

## Connecting to an LDAP Directory

You can connect your Confluence application to an LDAP directory for authentication, user and group management.

### Overview

An LDAP directory is a collection of data about users and groups. LDAP (Lightweight Directory Access Protocol) is an Internet protocol that web applications can use to look up information about those users and groups from the LDAP server.

We provide built-in connectors for the most popular LDAP directory servers:

### On this page:

- [Overview](#)
- [Diagram of Possible Configuration](#)

### Related pages:

- [Configuring User Directories](#)
- [How to Reenable the Internal Directory \(Knowledge base article\)](#)

- Microsoft Active Directory
- Apache Directory Server (ApacheDS)
- Apple Open Directory
- Fedora Directory Server
- Novell eDirectory
- OpenDS
- OpenLDAP
- OpenLDAP Using Posix Schema
- Posix Schema for LDAP
- Sun Directory Server Enterprise Edition (DSEE)
- A generic LDAP directory server

**When to use this option:** Connecting to an LDAP directory server is useful if your users and groups are stored in a corporate directory. When configuring the directory, you can choose to make it read only, read only with local groups, or read/write. If you choose read/write, any changes made to user and group information in the application will also update the LDAP directory.

#### On this page:

- [Overview](#)
- [Connecting to an LDAP Directory in Confluence](#)
- [Server Settings](#)
- [Schema Settings](#)
- [Permission Settings](#)
  - [Adding Users to Groups Automatically](#)
- [Advanced Settings](#)
- [User Schema Settings](#)
- [Group Schema Settings](#)
- [Membership Schema Settings](#)
- [Diagrams of Some Possible Configurations](#)

#### Related pages:

- [Configuring User Directories](#)

### Connecting to an LDAP Directory in Confluence

#### To connect Confluence to an LDAP directory:

1. Choose the **cog icon**



, then choose **General Configuration** under Confluence Administration

2. Click **User Directories** in the left-hand panel.
3. **Add** a directory and select one of these types:
  - **Microsoft Active Directory** – This option provides a quick way to select AD, because it is the most popular LDAP directory type.
  - **LDAP** – You will be able to choose a specific LDAP directory type on the next screen.
4. Enter the values for the settings, as described below.
5. Save the directory settings.
6. Define the **directory order** by clicking the blue up- and down-arrows next to each directory on the 'User Directories' screen. Here is a summary of how the directory order affects the processing:
  - Changes to users and groups will be made only in the first directory where the application has permission to make changes.
  - The order of the directories is the order in which they will be searched for users and groups (by default Confluence aggregates group membership from all directories, so the order does not impact membership itself).

For details see [Managing Multiple Directories](#).

### Server Settings

Setting	Description
Name	Enter a meaningful name to help you identify the LDAP directory server. Examples: <ul style="list-style-type: none"> <li>• Example Company Staff Directory</li> <li>• Example Company Corporate LDAP</li> </ul>
Directory Type	Select the type of LDAP directory that you will connect to. If you are adding a new LDAP connection, the value you select here will determine the default values for many of the options on the rest of screen. Examples: <ul style="list-style-type: none"> <li>• Microsoft Active Directory</li> <li>• OpenDS</li> <li>• And more.</li> </ul>

Hostname	<p>The host name of your directory server. Examples:</p> <ul style="list-style-type: none"> <li>• <code>ad.example.com</code></li> <li>• <code>ldap.example.com</code></li> <li>• <code>opens.example.com</code></li> </ul>
Port	<p>The port on which your directory server is listening. Examples:</p> <ul style="list-style-type: none"> <li>• 389</li> <li>• 10389</li> <li>• 636 (for example, for SSL)</li> </ul>
Use SSL	<p>Check this if the connection to the directory server is an SSL (Secure Sockets Layer) connection. Note that you will need to configure an SSL certificate in order to use this setting.</p>
Username	<p>The distinguished name of the user that the application will use when connecting to the directory server. Examples:</p> <ul style="list-style-type: none"> <li>• <code>cn=administrator,cn=users,dc=ad,dc=example,dc=com</code></li> <li>• <code>cn=user,dc=domain,dc=name</code></li> <li>• <code>user@domain.name</code></li> </ul> <div style="border: 1px solid red; padding: 10px; margin-top: 10px;"> <p>By default, all users can read the <code>uSNChanged</code> attribute; however, only administrators or users with relevant permissions can access the Deleted Objects container. The specific privileges required by the user to connect to LDAP are "Bind" and "Read" (user info, group info, group membership, update sequence number, deleted objects), which the user can obtain by being a member of the Active Directory's built-in administrators group.</p> <p>Note that the incremental sync will fail silently if the Active Directory is accessed by a user without these privileges. This has been reported as <a href="#">CWD-3093</a>.</p> </div>
Password	<p>The password of the user specified above.</p> <p><b>Note:</b> Connecting to an LDAP server requires that this application log in to the server with the username and password configured here. As a result, this password cannot be one-way hashed - it must be recoverable in the context of this application. The password is currently stored in the database in plain text without obfuscation. To guarantee its security, you need to ensure that other processes do not have OS-level read permissions for this application's database or configuration files.</p>

### Schema Settings

Setting	Description
Base DN	<p>The root distinguished name (DN) to use when running queries against the directory server. Examples:</p> <ul style="list-style-type: none"> <li>• <code>o=example,c=com</code></li> <li>• <code>cn=users,dc=ad,dc=example,dc=com</code></li> <li>• For Microsoft Active Directory, specify the base DN in the following format: <code>dc=domain1,dc=local</code>. You will need to replace the <code>domain1</code> and <code>local</code> for your specific configuration. Microsoft Server provides a tool called <code>ldp.exe</code> which is useful for finding out and configuring the the LDAP structure of your server.</li> </ul>
Additional User DN	<p>This value is used in addition to the base DN when searching and loading users. If no value is supplied, the subtree search will start from the base DN. Example:</p> <ul style="list-style-type: none"> <li>• <code>ou=Users</code></li> </ul>

Additional Group DN	<p>This value is used in addition to the base DN when searching and loading groups. If no value is supplied, the subtree search will start from the base DN. Example:</p> <ul style="list-style-type: none"> <li>ou=Groups</li> </ul>
---------------------	---

If no value is supplied for **Additional User DN** or **Additional Group DN** this will cause the subtree search to start from the base DN and, in case of huge directory structure, could cause performance issues for login and operations that rely on login to be performed.

### Permission Settings

**Note:** You can only assign LDAP users to local groups when 'External Management User Management' is not selected.

Setting	Description
Read Only	LDAP users, groups and memberships are retrieved from your directory server and can only be modified via your directory server. You cannot modify LDAP users, groups or memberships via the application administration screens.
Read Only, with Local Groups	<p>LDAP users, groups and memberships are retrieved from your directory server and can only be modified via your directory server. You cannot modify LDAP users, groups or memberships via the application administration screens. However, you can add groups to the internal directory and add LDAP users to those groups.</p> <p>Note for Confluence users: Users from LDAP are added to groups maintained in Confluence's internal directory the first time they log in. This is only done once per user. There is a known issue with Read Only, with Local Groups in Confluence that may apply to you. See <a href="#">CONFSERVER-28621</a> - User Loses all Local Group Memberships If LDAP Sync is Unable to find the User, but the User appears again in subsequent syncs <b>RESOLVED</b></p>
Read/Write	LDAP users, groups and memberships are retrieved from your directory server. When you modify a user, group or membership via the application administration screens, the changes will be applied directly to your LDAP directory server. Please ensure that the LDAP user specified for the application has modification permissions on your LDAP directory server.

### Adding Users to Groups Automatically

Setting	Description
---------	-------------

Default Group Memberships	<p><i>Option available in Confluence 3.5 and later, and JIRA 4.3.3 and later.</i> This field appears if you select the 'Read Only, with Local Groups' permission. If you would like users to be automatically added to a group or groups, enter the group name(s) here. To specify more than one group, separate the group names with commas.</p> <p><i>In Confluence 3.5 to Confluence 3.5.1:</i> Each time a user logs in, their group memberships will be checked. If the user does not belong to the specified group(s), their username will be added to the group(s). If a group does not yet exist, it will be added locally.</p> <p><i>In Confluence 3.5.2 and later, and JIRA 4.3.3 and later:</i> The first time a user logs in, their group memberships will be checked. If the user does not belong to the specified group(s), their username will be added to the group(s). If a group does not yet exist, it will be added locally. On subsequent logins, the username will <i>not</i> be added automatically to any groups. This change in behavior allows users to be removed from automatically-added groups. In Confluence 3.5 and 3.5.1, they would be re-added upon next login.</p> <p>Please note that there is no validation of the group names. If you mis-type the group name, authorization failures will result – users will not be able to access the applications or functionality based on the intended group name.</p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• confluence-users</li> <li>• confluence-users, jira-administrators, jira-core-users</li> </ul>
---------------------------	---

### Advanced Settings

Setting	Description
Enable Nested Groups	Enable or disable support for nested groups. Some directory servers allow you to define a group as a member of another group. Groups in such a structure are called <i>nested groups</i> . Nested groups simplify permissions by allowing sub-groups to inherit permissions from a parent group.
Manage User Status Locally	If true, you can activate and deactivate users in Crowd independent of their status in the directory server.
Filter out expired users	<p>If true, user accounts marked as expired in ActiveDirectory will be automatically removed. For cached directories, the removal of a user will occur during the first synchronization after the account's expiration date.</p> <p><b>Note:</b> This is available in Embedded Crowd 2.0.0 and above, but not available in the 2.0.0 m04 release.</p>
Use Paged Results	Enable or disable the use of the LDAP control extension for simple paging of search results. If paging is enabled, the search will retrieve sets of data rather than all of the search results at once. Enter the desired page size – that is, the maximum number of search results to be returned per page when paged results are enabled. The default is 1000 results.
Follow Referrals	Choose whether to allow the directory server to redirect requests to other servers. This option uses the node referral (JNDI lookup <code>java.naming.referral</code> ) configuration setting. It is generally needed for Active Directory servers configured without proper DNS, to prevent a 'javax.naming.PartialResultException: Unprocessed Continuation Reference(s)' error.



Naive DN Matching	<p>If your directory server will always return a consistent string representation of a DN, you can enable naive DN matching. Using naive DN matching will result in a significant performance improvement, so we recommend enabling it where possible.</p> <p>This setting determines how your application will compare DN's to determine if they are equal.</p> <ul style="list-style-type: none"> <li>• If this checkbox is selected, the application will do a direct, case-insensitive, string comparison. This is the default and recommended setting for Active Directory, because Active Directory guarantees the format of DN's.</li> <li>• If this checkbox is not selected, the application will parse the DN and then check the parsed version.</li> </ul>
Enable Incremental Synchronization	<p>Enable incremental synchronization if you only want changes since the last synchronization to be queried when synchronizing a directory.</p> <p>Please be aware that when using this option, the user account configured for synchronization must have read access to:</p> <ul style="list-style-type: none"> <li>• The <code>uSNChanged</code> attribute of all users and groups in the directory that need to be synchronized.</li> <li>• The objects and attributes in the Active Directory deleted objects container.</li> </ul> <p>If at least one of these conditions is not met, you may end up with users who are added to (or deleted from) the Active Directory not being respectively added (or deleted) in the application.</p> <p>This setting is only available if the directory type is set to "Microsoft Active Directory".</p>
Synchronization Interval (minutes)	<p>Synchronization is the process by which the application updates its internal store of user data to agree with the data on the directory server. The application will send a request to your directory server every x minutes, where 'x' is the number specified here. The default value is 60 minutes.</p>
Read Timeout (seconds)	<p>The time, in seconds, to wait for a response to be received. If there is no response within the specified time period, the read attempt will be aborted. A value of 0 (zero) means there is no limit. The default value is 120 seconds.</p>
Search Timeout (seconds)	<p>The time, in seconds, to wait for a response from a search operation. A value of 0 (zero) means there is no limit. The default value is 60 seconds.</p>
Connection Timeout (seconds)	<p>This setting affects two actions. The default value is 0.</p> <ul style="list-style-type: none"> <li>• The time to wait when getting a connection from the connection pool. A value of 0 (zero) means there is no limit, so wait indefinitely.</li> <li>• The time, in seconds, to wait when opening new server connections. A value of 0 (zero) means that the TCP network timeout will be used, which may be several minutes.</li> </ul>

#### User Schema Settings

Setting	Description
User Object Class	<p>This is the name of the class used for the LDAP user object. Example:</p> <ul style="list-style-type: none"> <li>• <code>user</code></li> </ul>
User Object Filter	<p>The filter to use when searching user objects. Example:</p> <ul style="list-style-type: none"> <li>• <code>(&amp;(objectCategory=Person)(sAMAccountName=*))</code></li> </ul> <p>More examples can be found in our knowledge base. See <a href="#">How to write LDAP search filters</a>.</p>



User Name Attribute	<p>The attribute field to use when loading the username. Examples:</p> <ul style="list-style-type: none"> <li>• <code>cn</code></li> <li>• <code>sAMAccountName</code></li> </ul> <p>NB: In Active Directory, the 'sAMAccountName' is the 'User Logon Name (pre-Windows 2000)' field. The User Logon Name field is referenced by 'cn'.</p>
User Name RDN Attribute	<p>The RDN (relative distinguished name) to use when loading the username. The DN for each LDAP entry is composed of two parts: the RDN and the location within the LDAP directory where the record resides. The RDN is the portion of your DN that is not related to the directory tree structure. Example:</p> <ul style="list-style-type: none"> <li>• <code>cn</code></li> </ul>
User First Name Attribute	<p>The attribute field to use when loading the user's first name. Example:</p> <ul style="list-style-type: none"> <li>• <code>givenName</code></li> </ul>
User Last Name Attribute	<p>The attribute field to use when loading the user's last name. Example:</p> <ul style="list-style-type: none"> <li>• <code>sn</code></li> </ul>
User Display Name Attribute	<p>The attribute field to use when loading the user's full name. Example:</p> <ul style="list-style-type: none"> <li>• <code>displayName</code></li> </ul>
User Email Attribute	<p>The attribute field to use when loading the user's email address. Example:</p> <ul style="list-style-type: none"> <li>• <code>mail</code></li> </ul>
User Password Attribute	<p>The attribute field to use when loading a user's password. Example:</p> <ul style="list-style-type: none"> <li>• <code>unicodePwd</code></li> </ul>
User Unique ID Attribute	<p>The attribute used as a unique immutable identifier for user objects. This is used to track username changes and is optional. If this attribute is not set (or is set to an invalid value), user renames will not be detected — they will be interpreted as a user deletion then a new user addition.</p> <p>This should normally point to a UUID value. Standards-compliant LDAP servers will implement this as 'entryUUID' according to <a href="#">RFC 4530</a>. This setting exists because it is known under different names on some servers, e.g. 'objectGUID' in Microsoft Active Directory.</p>

### Group Schema Settings

Setting	Description
Group Object Class	<p>This is the name of the class used for the LDAP group object. Examples:</p> <ul style="list-style-type: none"> <li>• <code>groupOfUniqueNames</code></li> <li>• <code>group</code></li> </ul>
Group Object Filter	<p>The filter to use when searching group objects. Example:</p> <ul style="list-style-type: none"> <li>• <code>(&amp;(objectClass=group)(cn=*))</code></li> </ul>

Group Name Attribute	The attribute field to use when loading the group's name. Example: <ul style="list-style-type: none"><li>• <code>cn</code></li></ul>
Group Description Attribute	The attribute field to use when loading the group's description. Example: <ul style="list-style-type: none"><li>• <code>description</code></li></ul>

### Membership Schema Settings

Setting	Description
Group Members Attribute	The attribute field to use when loading the group's members. Example: <ul style="list-style-type: none"><li>• <code>member</code></li></ul>
User Membership Attribute	The attribute field to use when loading the user's groups. Example: <ul style="list-style-type: none"><li>• <code>memberOf</code></li></ul>
Use the User Membership Attribute, when finding the user's group membership	Check this if your directory server supports the group membership attribute on the user. (By default, this is the 'memberOf' attribute.) <ul style="list-style-type: none"><li>• If this checkbox is selected, your application will use the group membership attribute on the user when <b>retrieving the list of groups to which a given user belongs</b>. This will result in a more efficient retrieval.</li><li>• If this checkbox is not selected, your application will use the members attribute on the group ('member' by default) for the search.</li><li>• If the <b>Enable Nested Groups</b> checkbox is selected, your application will ignore the <b>Use the User Membership Attribute</b> option and will use the members attribute on the group for the search.</li></ul>
Use the User Membership Attribute, when finding the members of a group	Check this if your directory server supports the user membership attribute on the group. (By default, this is the 'member' attribute.) <ul style="list-style-type: none"><li>• If this checkbox is selected, your application will use the group membership attribute on the user when <b>retrieving the members of a given group</b>. This will result in a more efficient search.</li><li>• If this checkbox is not selected, your application will use the members attribute on the group ('member' by default) for the search.</li></ul>

### Diagrams of Some Possible Configurations

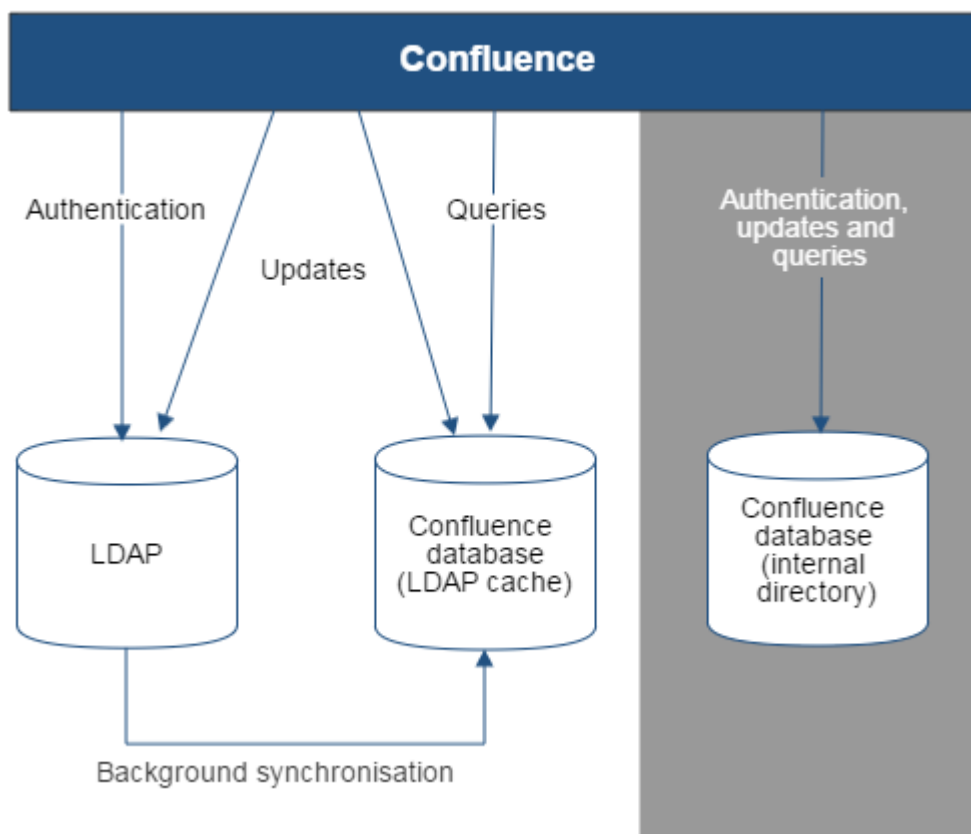


Diagram above: Confluence connecting to an LDAP directory.

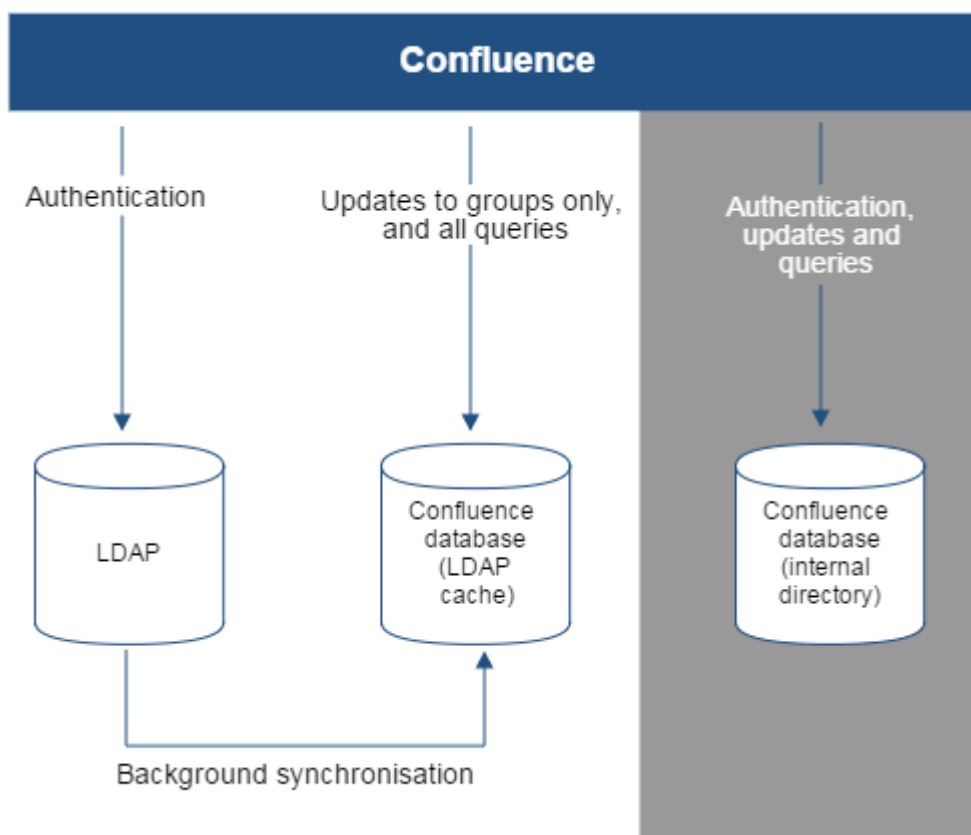


Diagram above: Confluence connecting to an LDAP directory with permissions set to read only and local groups.

### Configuring the LDAP Connection Pool

When connection pooling is enabled, the LDAP directory server maintains a pool of connections and assigns them as needed. When a connection is closed, the directory server returns the connection to the pool for future use. This can improve performance significantly.

**Related pages:**

- [Connecting to an LDAP Directory](#)
- [Configuring User Directories](#)

**To configure your LDAP connection pool:**

1. Choose the **cog icon**



, then choose **General Configuration** under Confluence Administration

2. Click '**User Directories**' in the left-hand panel.
3. Click '**LDAP Connection Pool Configuration**' in the 'Additional Configuration' section.

Setting	Description	Default Value
Initial Pool Size	The number of LDAP connections created when initially connecting to the pool.	1
Preferred Pool Size	The optimal pool size. LDAP will remove idle connections when the number of connections grows larger than this value. A value of 0 (zero) means that there is no preferred size, so the number of idle connections is unlimited.	10
Maximum Pool Size	The maximum number of connections. When the number of connections reaches this value, LDAP will refuse further connections. As a result, requests made by an application to the LDAP directory server will be blocked. A value of 0 (zero) means that the number of connections is unlimited.	0
Pool Timeout (seconds)	The length of time, in seconds, that a connection may remain idle before being removed from the pool. When the application is finished with a pooled connection, the connection is marked as idle, waiting to be reused. A value of 0 (zero) means that the idle time is unlimited, so connections will never be timed out.	30
Pool Protocol	Only these protocol types will be allowed to connect to the LDAP directory server. If you want to allow multiple protocols, enter the values separated by a space. Valid values are: <ul style="list-style-type: none"> <li>• plain</li> <li>• ssl</li> </ul>	plain ssl (Both plain and ssl)
Pool Authentication	Only these authentication types will be allowed to connect to the LDAP directory server. If you want to allow multiple authentication types, enter the values separated by a space. See <a href="#">RFC 2829</a> for details of LDAP authentication methods. Valid values are: <ul style="list-style-type: none"> <li>• none</li> <li>• simple</li> <li>• DIGEST-MD5</li> </ul>	simple

**Notes:**

- The connection pool settings are system wide and will be used to create a new connection pool for every configured LDAP directory server.
- You must restart your application server for these settings to take effect.

**Configuring an SSL Connection to Active Directory**

If you want to configure a read/write connection with Microsoft Active Directory, you will need to install an SSL certificate, generated by your Active Directory

server, onto your Confluence server and then install the certificate into your JVM keystore.

**On this page:**

- [Prerequisites](#)
- [Step 1. Install the Active Directory Certificate Services](#)
- [Step 2. Obtain the Server Certificate](#)
- [Step 3. Import the Server Certificate](#)

**Related pages:**

- [Connecting to an LDAP Directory](#)
- [Configuring User Directories](#)

There's a [Confluence SSL plugin](#) that facilitates this process.

Updating user, group, and membership details in Active Directory requires that your Atlassian application be running in a JVM that trusts the AD server. To do this, we generate a certificate on the Active Directory server, then import it into Java's `keystore`.

**Prerequisites**

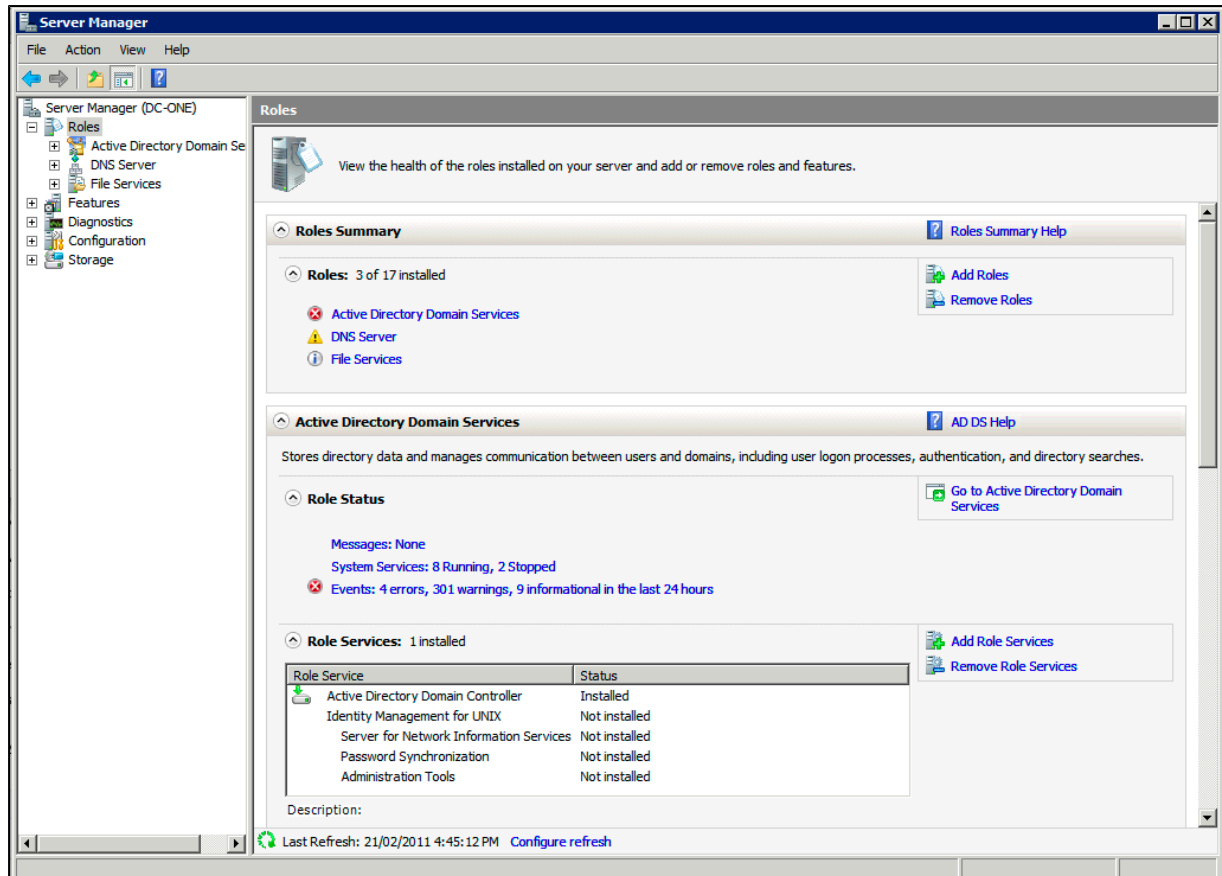
To generate a certificate, you need the following components installed on the Windows Domain Controller to which you're connecting.

Required Component	Description
Internet Information Services (IIS)	This is required before you can install Windows Certificate Services.
Windows Certificate Services	This installs a certification authority (CA) which is used to issue certificates. Step 1, below, explains this process.
Windows 2000 Service Pack 2	Required if you are using Windows 2000
Windows 2000 High Encryption Pack (128-bit)	Required if you are using Windows 2000. Provides the highest available encryption level (128-bit).

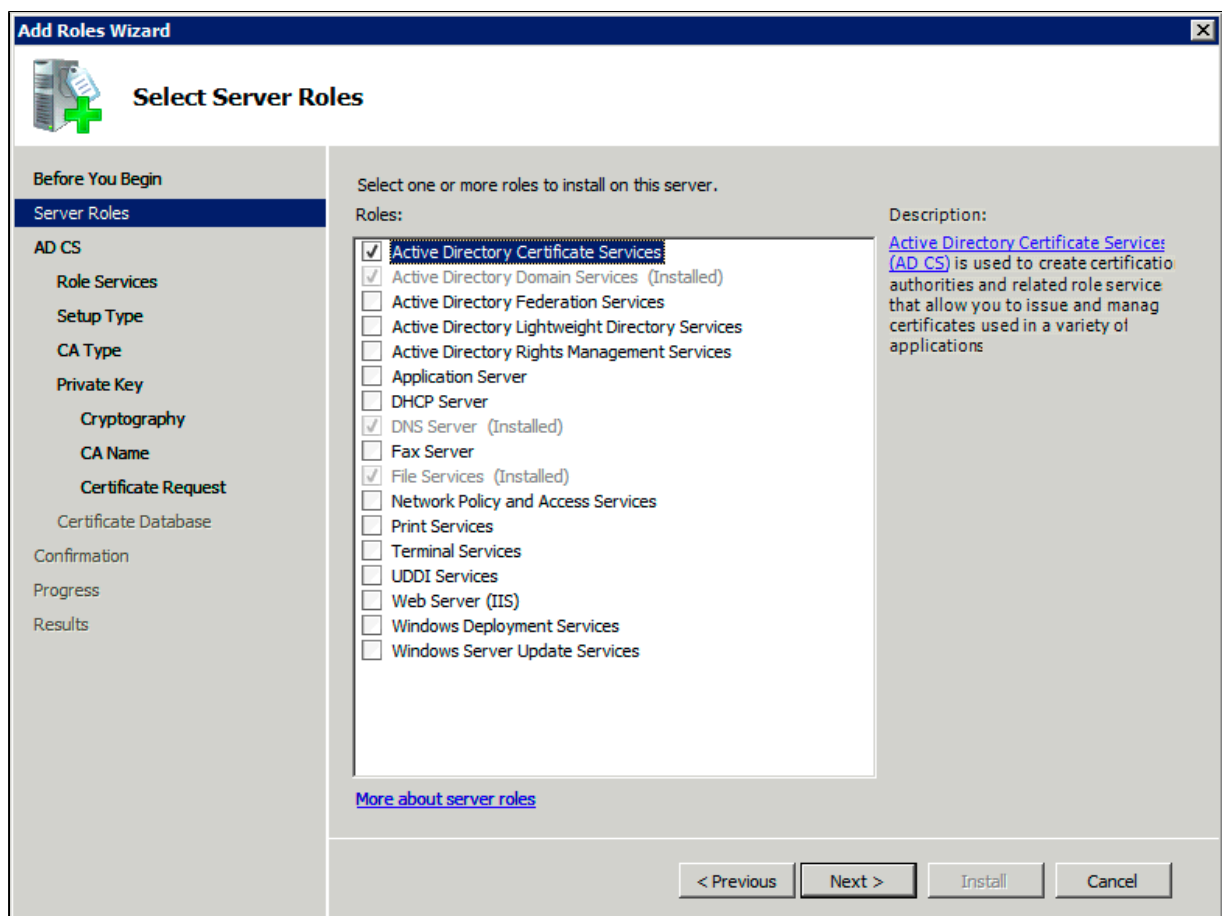
**Step 1. Install the Active Directory Certificate Services**

If Certificate Services are already installed, skip to step 2, below. The screenshots below are from Server 2008, but the process is similar for Server 2000 and 2003.

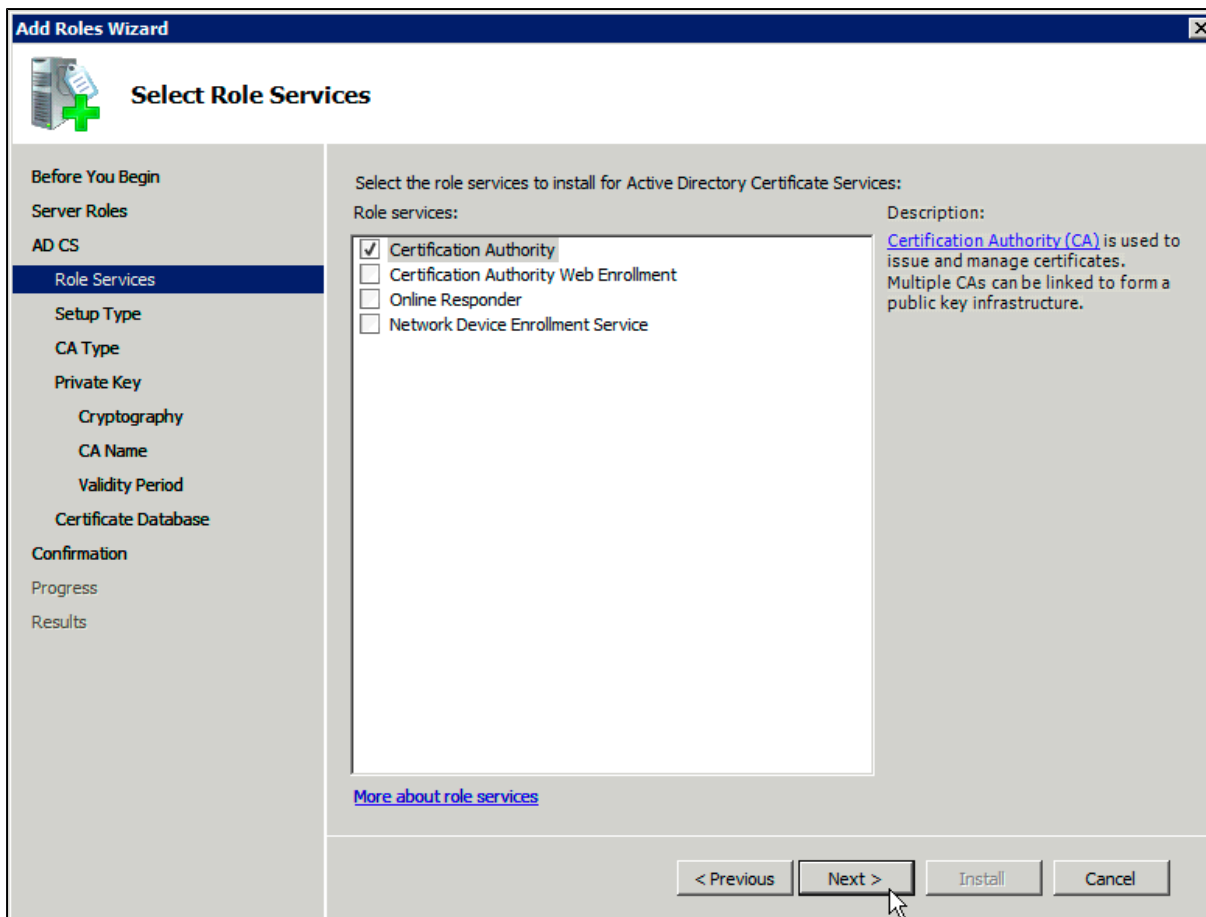
1. Log in to your Active Directory server as an administrator.
2. Click **Start**, point to **Administrative Tools**, and then click **Server Manager**.
3. In the **Roles Summary** section, click **Add Roles**.



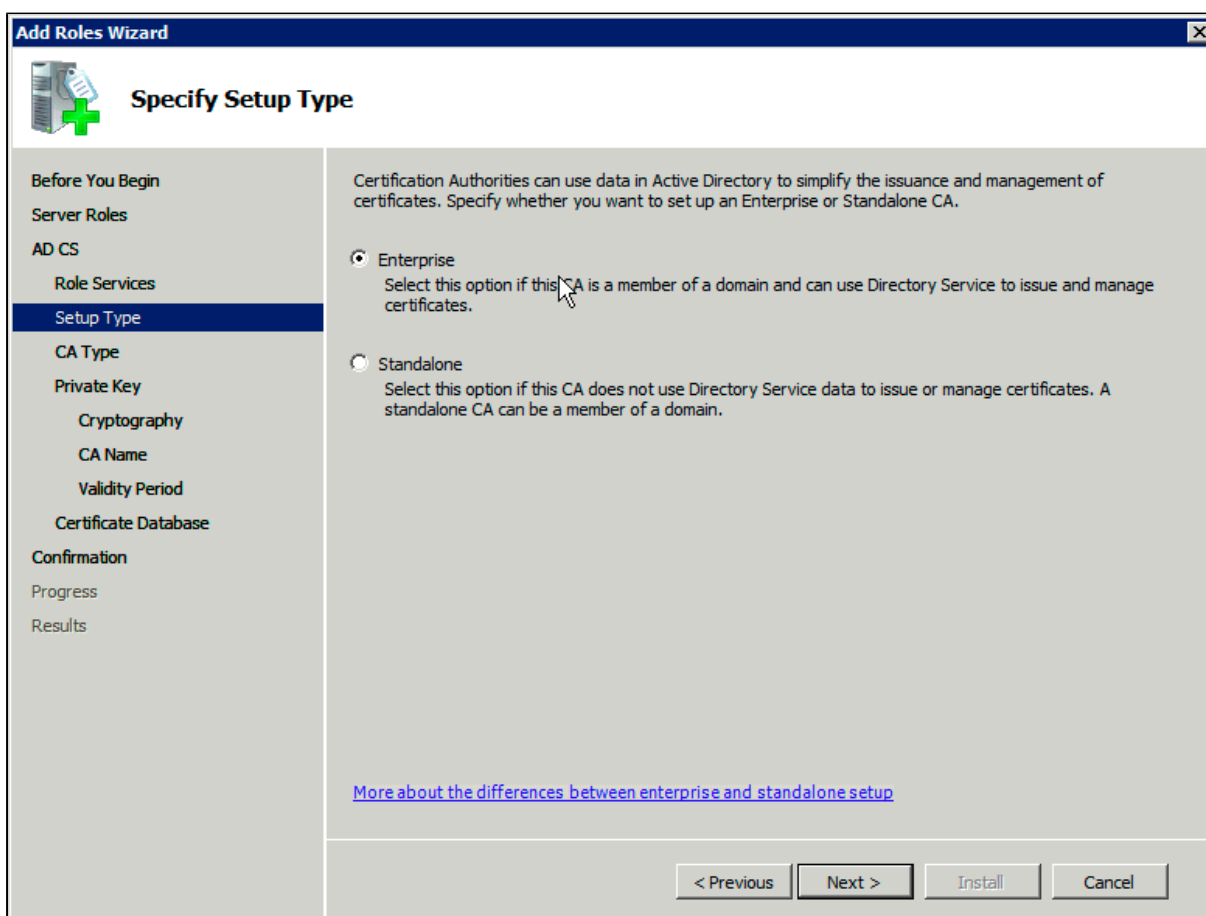
4. On the **Select Server Roles** page, select the **Active Directory Certificate Services** check box. Click **Next** twice.



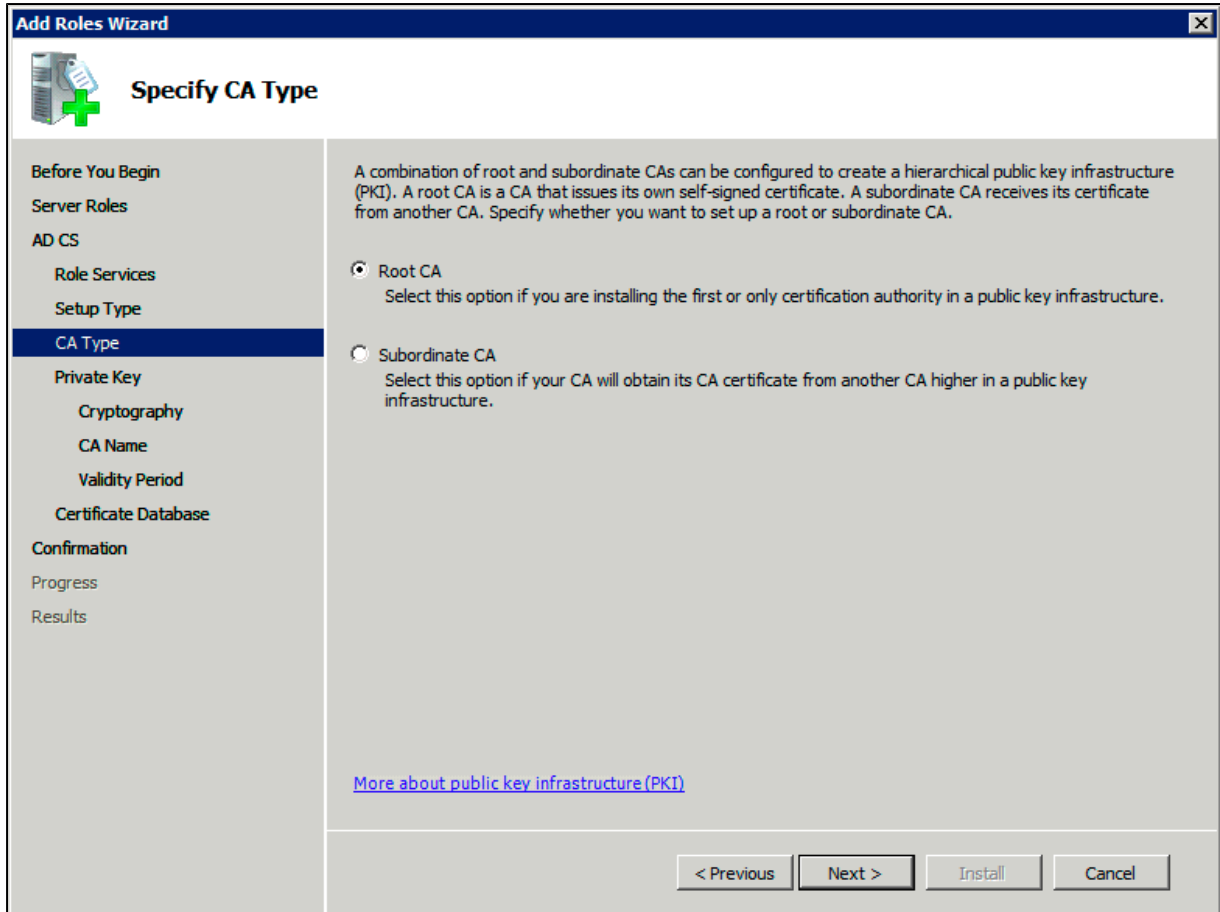
5. On the **Select Role Services** page, select the **Certification Authority** check box, and then click **Next**



6. On the **Specify Setup Type** page, click **Enterprise**, and then click **Next**.

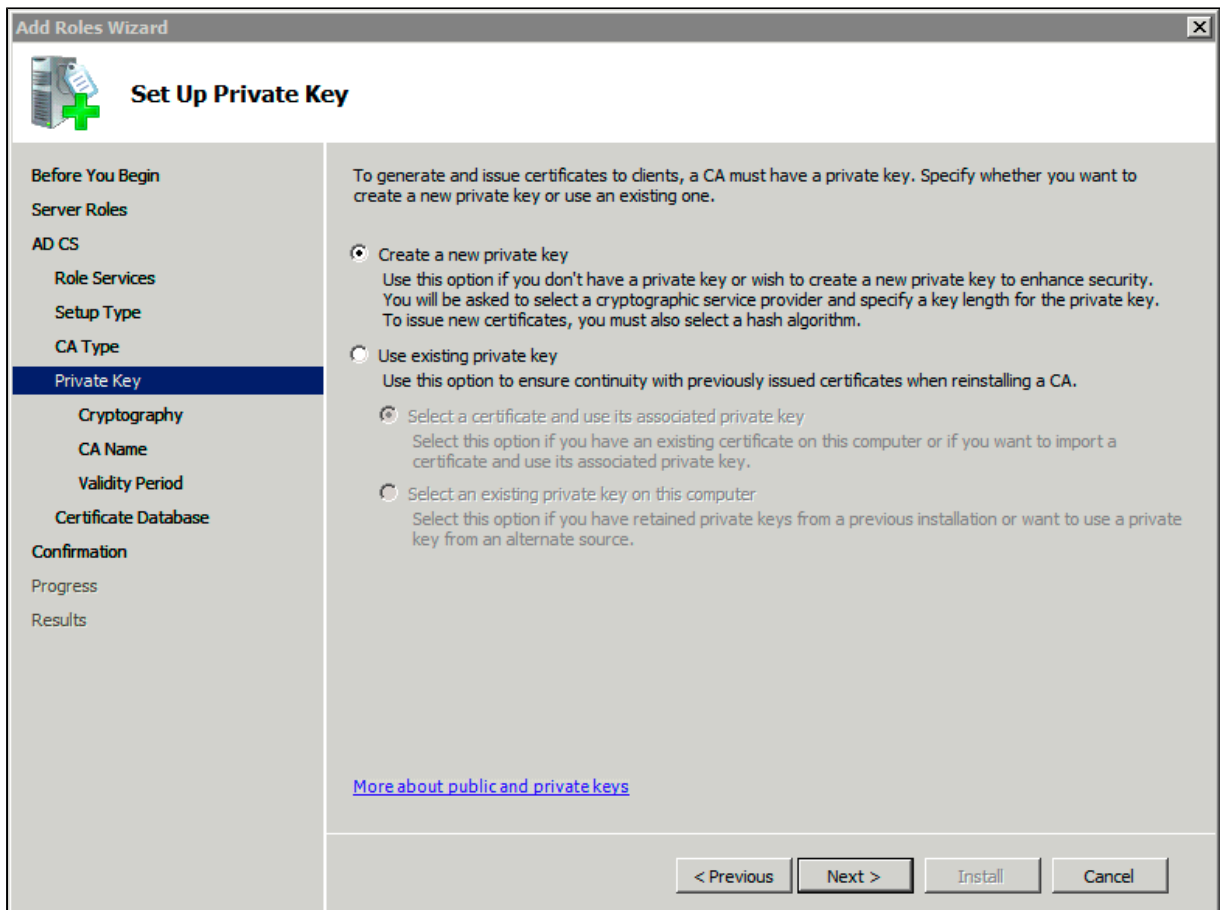


7. On the **Specify CA Type** page, click **Root CA**, and then click **Next**.



The screenshot shows the 'Specify CA Type' page of the 'Add Roles Wizard'. The left sidebar contains a tree view with the following items: 'Before You Begin', 'Server Roles', 'AD CS', 'Role Services', 'Setup Type', 'CA Type' (highlighted), 'Private Key', 'Cryptography', 'CA Name', 'Validity Period', 'Certificate Database', 'Confirmation', 'Progress', and 'Results'. The main content area has a title 'Specify CA Type' with a green plus icon. Below the title is a paragraph explaining that a combination of root and subordinate CAs can be configured to create a hierarchical public key infrastructure (PKI). Two radio button options are presented: 'Root CA' (selected) and 'Subordinate CA'. The 'Root CA' option includes the instruction: 'Select this option if you are installing the first or only certification authority in a public key infrastructure.' The 'Subordinate CA' option includes the instruction: 'Select this option if your CA will obtain its CA certificate from another CA higher in a public key infrastructure.' At the bottom of the main area is a link: '[More about public key infrastructure \(PKI\)](#)'. The bottom of the wizard features four buttons: '< Previous', 'Next >', 'Install', and 'Cancel'.

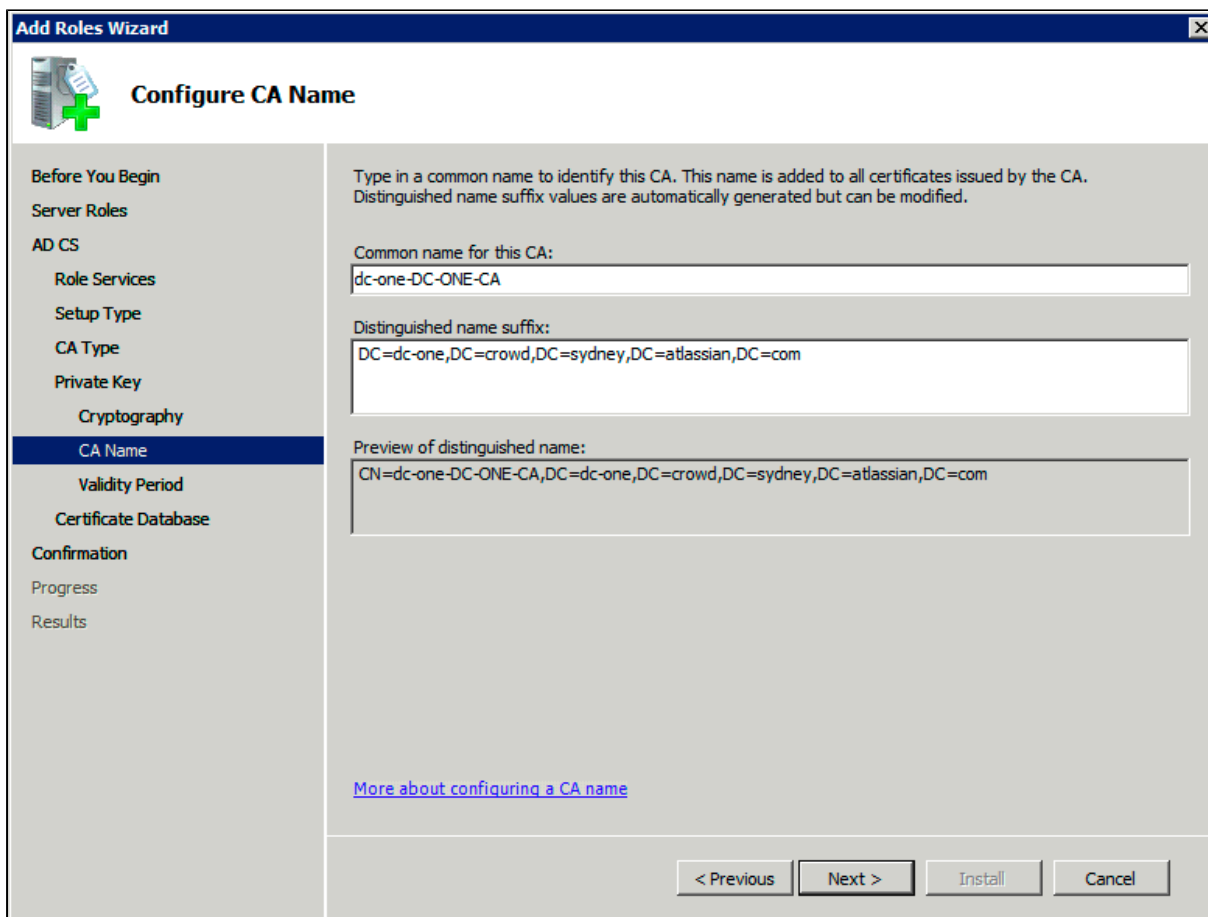
8. On the **Set Up Private Key** and **Configure Cryptography for CA** pages, you can configure optional configuration settings, including cryptographic service providers. However, the default values should be fine. Click **Next** twice.



The screenshot shows the 'Set Up Private Key' page of the 'Add Roles Wizard'. The left sidebar is identical to the previous screenshot, with 'Private Key' highlighted. The main content area has a title 'Set Up Private Key' with a green plus icon. Below the title is a paragraph explaining that to generate and issue certificates to clients, a CA must have a private key. Two radio button options are presented: 'Create a new private key' (selected) and 'Use existing private key'. The 'Create a new private key' option includes the instruction: 'Use this option if you don't have a private key or wish to create a new private key to enhance security. You will be asked to select a cryptographic service provider and specify a key length for the private key. To issue new certificates, you must also select a hash algorithm.' The 'Use existing private key' option includes the instruction: 'Use this option to ensure continuity with previously issued certificates when reinstalling a CA.' Below this, there are two more radio button options: 'Select a certificate and use its associated private key' and 'Select an existing private key on this computer'. The 'Select a certificate and use its associated private key' option includes the instruction: 'Select this option if you have an existing certificate on this computer or if you want to import a certificate and use its associated private key.' The 'Select an existing private key on this computer' option includes the instruction: 'Select this option if you have retained private keys from a previous installation or want to use a private key from an alternate source.' At the bottom of the main area is a link: '[More about public and private keys](#)'. The bottom of the wizard features four buttons: '< Previous', 'Next >', 'Install', and 'Cancel'.

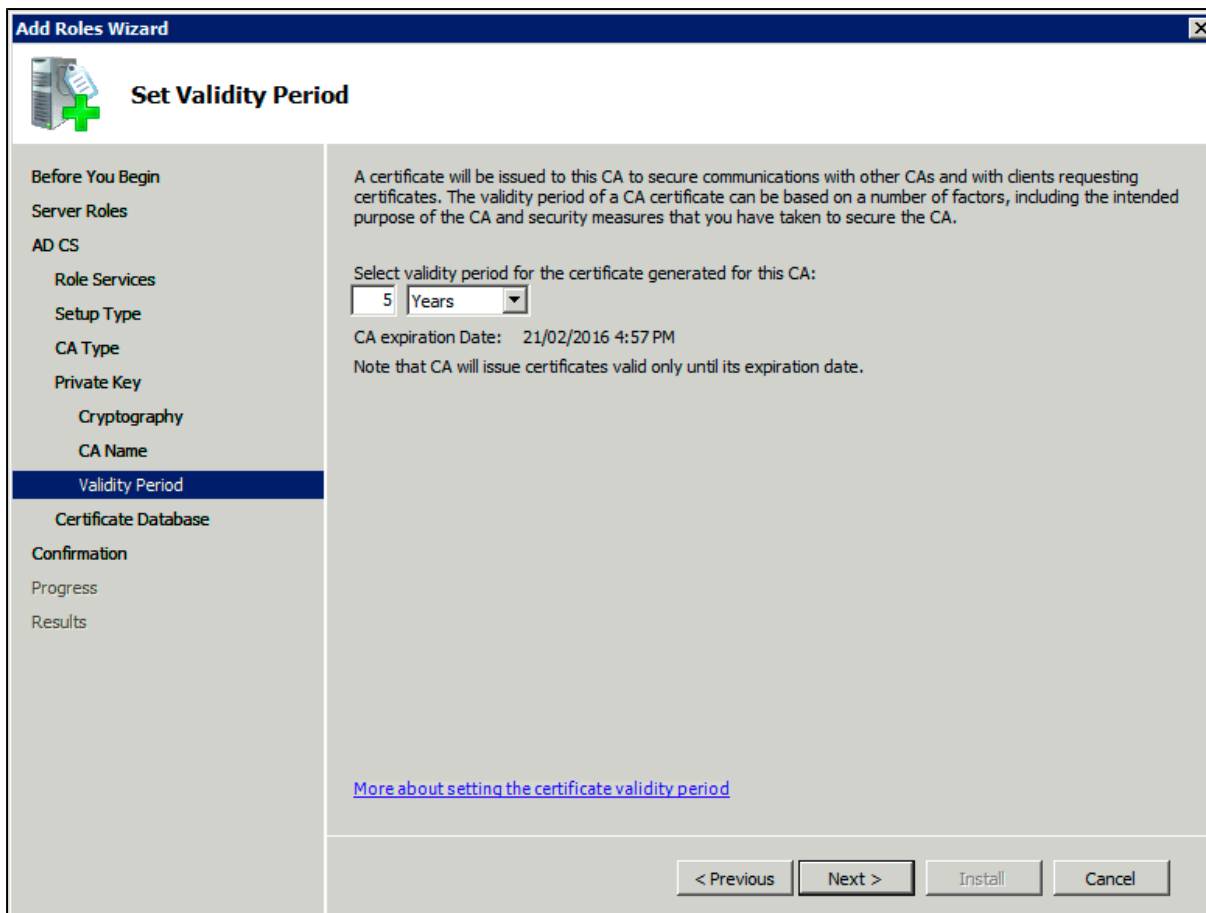


9. In the **Common name for this CA** box, type the common name of the CA, and then click **Next**.



The screenshot shows the 'Add Roles Wizard' window with the title bar 'Add Roles Wizard' and a close button. The main window has a title bar 'Configure CA Name' and a green plus icon. On the left is a navigation pane with the following items: 'Before You Begin', 'Server Roles', 'AD CS' (expanded), 'Role Services', 'Setup Type', 'CA Type', 'Private Key', 'Cryptography', 'CA Name' (selected), 'Validity Period', 'Certificate Database', 'Confirmation', 'Progress', and 'Results'. The main area contains the following text: 'Type in a common name to identify this CA. This name is added to all certificates issued by the CA. Distinguished name suffix values are automatically generated but can be modified.' Below this are three text boxes: 'Common name for this CA:' with the value 'dc-one-DC-ONE-CA', 'Distinguished name suffix:' with the value 'DC=dc-one,DC=crowd,DC=sydney,DC=atlassian,DC=com', and 'Preview of distinguished name:' with the value 'CN=dc-one-DC-ONE-CA,DC=dc-one,DC=crowd,DC=sydney,DC=atlassian,DC=com'. At the bottom right are four buttons: '< Previous', 'Next >', 'Install', and 'Cancel'. A link 'More about configuring a CA name' is located at the bottom left of the main area.

10. On the **Set Validity Period** page, accept the default values or specify other storage locations for the certificate database and the certificate database log, and then click **Next**.



**Add Roles Wizard**

### Set Validity Period

**Before You Begin**

**Server Roles**

**AD CS**

- Role Services
- Setup Type
- CA Type
- Private Key
  - Cryptography
  - CA Name
- Validity Period**
- Certificate Database
- Confirmation
- Progress
- Results

A certificate will be issued to this CA to secure communications with other CAs and with clients requesting certificates. The validity period of a CA certificate can be based on a number of factors, including the intended purpose of the CA and security measures that you have taken to secure the CA.

Select validity period for the certificate generated for this CA:

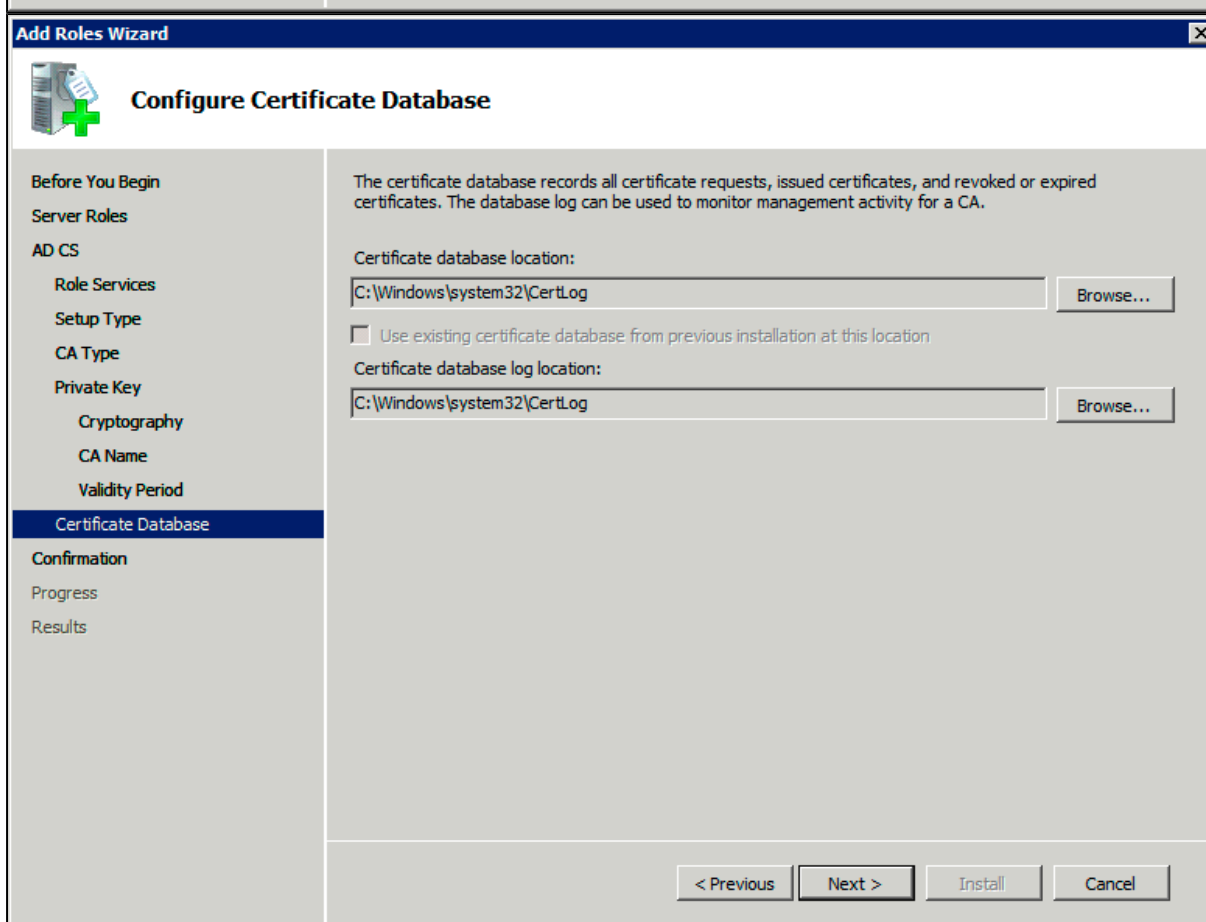
5 Years

CA expiration Date: 21/02/2016 4:57 PM

Note that CA will issue certificates valid only until its expiration date.

[More about setting the certificate validity period](#)

< Previous   Next >   Install   Cancel



**Add Roles Wizard**

### Configure Certificate Database

**Before You Begin**

**Server Roles**

**AD CS**

- Role Services
- Setup Type
- CA Type
- Private Key
  - Cryptography
  - CA Name
- Validity Period
- Certificate Database**
- Confirmation
- Progress
- Results

The certificate database records all certificate requests, issued certificates, and revoked or expired certificates. The database log can be used to monitor management activity for a CA.

Certificate database location:

C:\Windows\system32\CertLog   Browse...

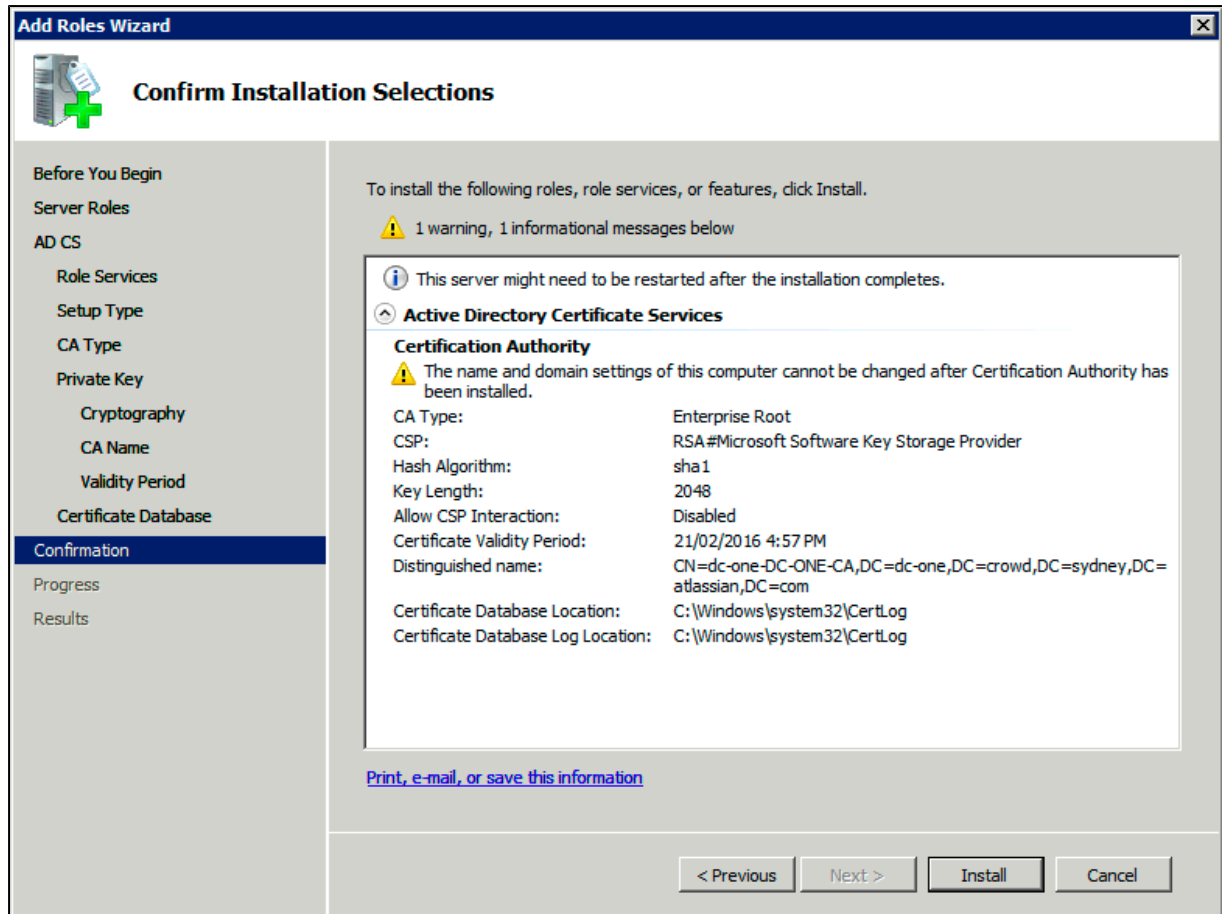
☐ Use existing certificate database from previous installation at this location

Certificate database log location:

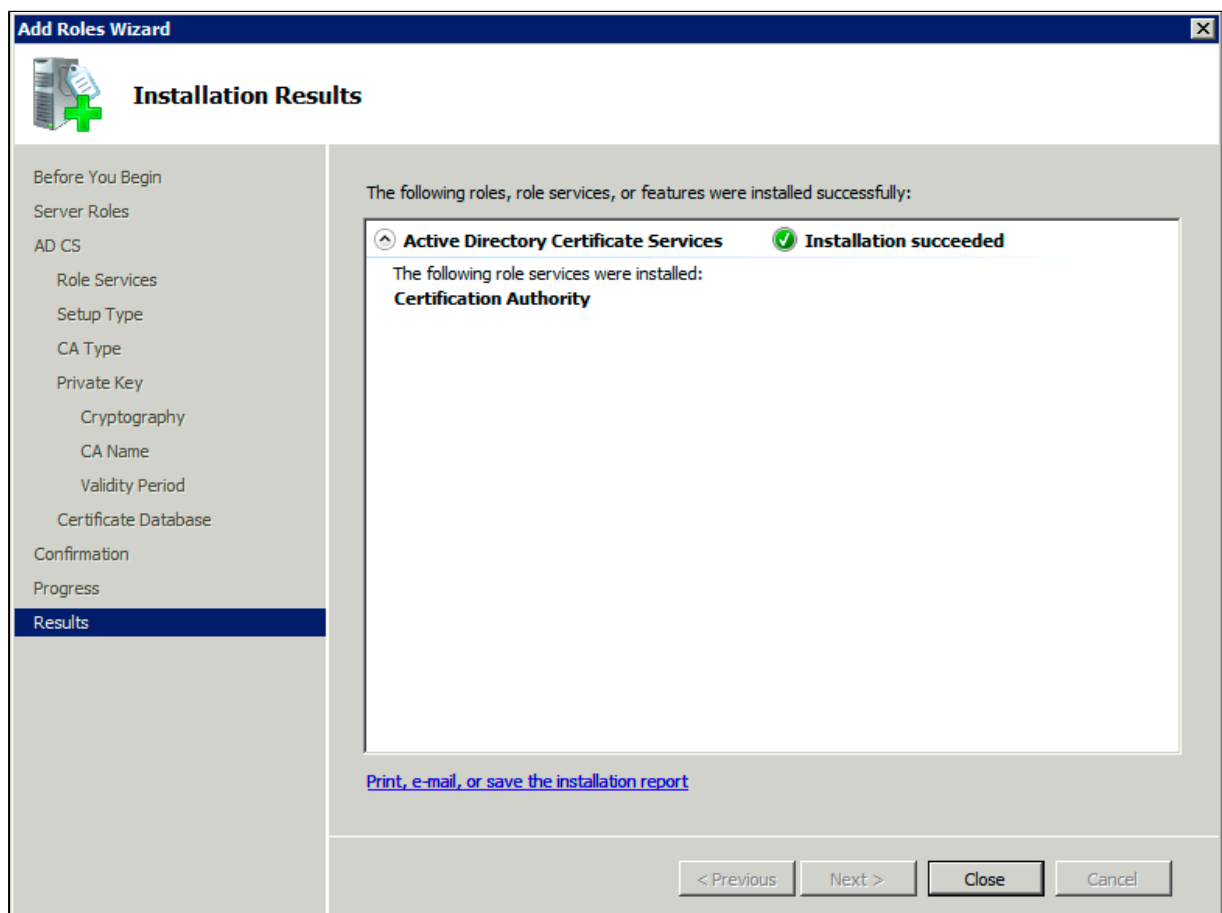
C:\Windows\system32\CertLog   Browse...

< Previous   Next >   Install   Cancel

11. After verifying the information on the **Confirm Installation Selections** page, click **Install**.



12. Review the information on the results screen to verify that the installation was successful.



## Step 2. Obtain the Server Certificate

The steps above describe how to install the certification authority (CA) on your Microsoft Active Directory server. Next, you will need to add the Microsoft Active Directory server's SSL certificate to the list of accepted certificates used by the JDK that runs your application server.

The Active Directory certificate is automatically generated and placed in root of the C:\ drive, matching a file format similar to the tree structure of your Active Directory server. For example: c:\ad2008.ad01.atlassian.com\_ad01.crt.

You can also export the certificate by executing this command on the Active Directory server:

```
certutil -ca.cert client.crt
```

You might still fail to be authenticated using the certificate file above. In this case, Microsoft's [LDAP over SSL \(LDAPS\) Certificate](#) page might help. Note that you need to:

1. Choose "No, do not export the private key" in step-10 of [Exporting the LDAPS Certificate and Importing for use with AD DS](#) section
2. Choose "DER encoded binary X.509 (.CER)" in step-11 of [Exporting the LDAPS Certificate and Importing for use with AD DS](#) section. This file will be used in the following step.

### Step 3. Import the Server Certificate

For an application server to trust your directory's certificate, the certificate must be imported into your Java runtime environment. The JDK stores trusted certificates in a file called a keystore. The default keystore file is called cacerts and it lives in the jre\lib\security sub-directory of your Java installation.

In the following examples, we use server-certificate.crt to represent the certificate file exported by your directory server. You will need to alter the instructions below to match the name actually generated.

Once the certificate has been imported as per the below instructions, you will need to restart the application to pick up the changes.

#### Windows

1. Navigate to the directory in which Java is installed. It's probably called something like C:\Program Files\Java\jdk1.5.0\_12.

```
cd /d C:\Program Files\Java\jdk1.5.0_12
```

2. Run the command below, where server-certificate.crt is the name of the file from your directory server:

```
keytool -importcert -keystore .\jre\lib\security\cacerts -file  
server-certificate.crt
```

3. keytool will prompt you for a password. The default keystore password is changeit.
4. When prompted Trust this certificate? [no]: enter yes to confirm the key import:

```
Enter keystore password:  changeit
Owner: CN=ad01, C=US
Issuer: CN=ad01, C=US
Serial number: 15563d6677a4e9e4582d8a84be683f9
Valid from: Tue Aug 21 01:10:46 ACT 2007 until: Tue Aug 21
01:13:59 ACT 2012
Certificate fingerprints:
    MD5:  D6:56:F0:23:16:E3:62:2C:6F:8A:0A:37:30:A1:84:BE
    SHA1:
73:73:4E:A6:A0:D1:4E:F4:F3:CD:CE:BE:96:80:35:D2:B4:7C:79:C1
Trust this certificate? [no]:  yes
Certificate was added to keystore
```

You may now change '**URL**' to use LDAP over SSL (i.e. ldaps://<HOSTNAME>:636/) and use the '**Secure SSL**' option when connecting your application to your directory server.

#### UNIX

1. Navigate to the directory in which the Java used by JIRA is installed. If the default JAVA installation is used, then it would be

```
cd $JAVA_HOME
```

2. Run the command below, where `server-certificate.crt` is the name of the file from your directory server:

```
sudo keytool -importcert -keystore ./jre/lib/security/cacerts
-file server-certificate.crt
```

3. `keytool` will prompt you for a password. The default keystore password is `changeit`.
4. When prompted `Trust this certificate? [no]:` enter `yes` to confirm the key import:

```
Password:
Enter keystore password:  changeit
Owner: CN=ad01, C=US
Issuer: CN=ad01, C=US
Serial number: 15563d6677a4e9e4582d8a84be683f9
Valid from: Tue Aug 21 01:10:46 ACT 2007 until: Tue Aug 21
01:13:59 ACT 2012
Certificate fingerprints:
    MD5:  D6:56:F0:23:16:E3:62:2C:6F:8A:0A:37:30:A1:84:BE
    SHA1:
73:73:4E:A6:A0:D1:4E:F4:F3:CD:CE:BE:96:80:35:D2:B4:7C:79:C1
Trust this certificate? [no]:  yes
Certificate was added to keystore
```

You may now change '**URL**' to use LDAP over SSL (i.e. ldaps://<HOSTNAME>:636/) and use the '**Secure SSL**' option when connecting your application to your directory server.

#### Mac OS X

1. Navigate to the directory in which Java is installed. This is usually

```
cd /Library/Java/Home
```

2. Run the command below, where `server-certificate.crt` is the name of the file from your directory server:

```
sudo keytool -importcert -keystore ./jre/lib/security/cacerts
-file server-certificate.crt
```

3. `keytool` will prompt you for a password. The default keystore password is `changeit`.
4. When prompted `Trust this certificate? [no]:` enter `yes` to confirm the key import:

```
Password:
Enter keystore password:  changeit
Owner: CN=ad01, C=US
Issuer: CN=ad01, C=US
Serial number: 15563d6677a4e9e4582d8a84be683f9
Valid from: Tue Aug 21 01:10:46 ACT 2007 until: Tue Aug 21
01:13:59 ACT 2012
Certificate fingerprints:
    MD5:  D6:56:F0:23:16:E3:62:2C:6F:8A:0A:37:30:A1:84:BE
    SHA1:
73:73:4E:A6:A0:D1:4E:F4:F3:CD:CE:BE:96:80:35:D2:B4:7C:79:C1
Trust this certificate? [no]:  yes
Certificate was added to keystore
```

You may now change '**URL**' to use LDAP over SSL (i.e. `ldaps://<HOSTNAME>:636/`) and use the '**Secure SSL**' option when connecting your application to your directory server.

## Connecting to an Internal Directory with LDAP Authentication

You can connect your Confluence application to an LDAP directory for delegated authentication. This means that Confluence will have an internal directory that uses LDAP for authentication only. There is an option to create users in the internal directory automatically when they attempt to log in, as described in the settings section.

### Overview

An internal directory with LDAP authentication offers the features of an internal directory while allowing you to store and check users' passwords in LDAP only. Note that the 'internal directory with LDAP authentication' is separate from the default 'internal directory'. On LDAP, all that the application does is to check the password. The LDAP connection is read only. Every user in the internal directory with LDAP authentication must map to a user on LDAP, otherwise they cannot log in.

**When to use this option:** Choose this option if you want to set up a user and group configuration within your application that suits your needs, while

### On this page:

- [Overview](#)
- [Connecting Confluence to an Internal Directory with LDAP Authentication](#)
- [Server Settings](#)
  - [Copying Users on Login](#)
- [Schema Settings](#)
- [Advanced Settings](#)
- [User Schema Settings](#)
- [Group Schema Settings](#)
- [Membership Schema Settings](#)
- [Diagrams of Possible Configurations](#)

### Related pages:

[Configuring User Directories](#)

checking your users' passwords against the corporate LDAP directory. This option also helps to avoid the performance issues that may result from downloading large numbers of groups from LDAP.

### Connecting Confluence to an Internal Directory with LDAP Authentication

#### To connect to an internal directory but check logins via LDAP:

1. Choose the **cog icon**



, then choose **General Configuration** under Confluence Administration

2. Click '**User Directories**' in the left-hand panel.
3. **Add** a directory and select type '**Internal with LDAP Authentication**'.
4. Enter the values for the settings, as described below.
5. Save the directory settings.
6. If you want LDAP users to be used in place of existing internal users, move the 'Internal with LDAP Authentication' directory to the top of the list. You can define the **directory order** by clicking the blue up- and down-arrows next to each directory on the '**User Directories**' screen. Here is a summary of how the directory order affects the processing:
  - Changes to users and groups will be made only in the first directory where the application has permission to make changes.
  - The order of the directories is the order in which they will be searched for users and groups (by default Confluence aggregates group membership from all directories, so the order does not impact membership itself).

For details see [Managing Multiple Directories](#).

7. Add your users and groups in Confluence. See [Add and Invite Users](#) and [Managing Site-Wide Permissions and Groups](#).

#### Server Settings

Setting	Description
Name	A descriptive name that will help you to identify the directory. Examples: <ul style="list-style-type: none"> <li>• Internal directory with LDAP Authentication</li> <li>• Corporate LDAP for Authentication Only</li> </ul>
Directory Type	Select the type of LDAP directory that you will connect to. If you are adding a new LDAP connection, the value you select here will determine the default values for some of the options on the rest of screen. Examples: <ul style="list-style-type: none"> <li>• Microsoft Active Directory</li> <li>• OpenDS</li> <li>• And more.</li> </ul>
Hostname	The host name of your directory server. Examples: <ul style="list-style-type: none"> <li>• ad.example.com</li> <li>• ldap.example.com</li> <li>• opens.example.com</li> </ul>
Port	The port on which your directory server is listening. Examples: <ul style="list-style-type: none"> <li>• 389</li> <li>• 10389</li> <li>• 636 (for example, for SSL)</li> </ul>
Use SSL	Check this box if the connection to the directory server is an SSL (Secure Sockets Layer) connection. Note that you will need to configure an SSL certificate in order to use this setting.

Username	<p>The distinguished name of the user that the application will use when connecting to the directory server. Examples:</p> <ul style="list-style-type: none"> <li>• <code>cn=administrator,cn=users,dc=ad,dc=example,dc=com</code></li> <li>• <code>cn=user,dc=domain,dc=name</code></li> <li>• <code>user@domain.name</code></li> </ul>
Password	The password of the user specified above.

### Copying Users on Login

Setting	Description
Copy User on Login	<p>This option affects what will happen when a user attempts to log in. If this box is checked, the user will be created automatically in the internal directory that is using LDAP for authentication when the user first logs in and their details will be synchronized on each subsequent log in. If this box is not checked, the user's login will fail if the user wasn't already manually created in the directory.</p> <p>If you check this box the following additional fields will appear on the screen, which are described in more detail below:</p> <ul style="list-style-type: none"> <li>• Default Group Memberships</li> <li>• Synchronize Group Memberships</li> <li>• User Schema Settings (described in a separate section below)</li> </ul>
Update User attributes on Login	<p>Whenever your users authenticate to the application, their attributes will be automatically updated from the LDAP server into the application. After you select this option, you won't be able to modify or delete your users directly in the application.</p> <ul style="list-style-type: none"> <li>• If you need to modify a user, do it on the LDAP server; it will be updated in the application after authenticating.</li> <li>• If you need to delete a user, do it on the LDAP server, but also in the application. If you delete the user only on the LDAP server, it will be rejected from logging in to the application, but it won't be set as inactive, which will affect your license. You'll need to disable the <b>Update User attributes on Login</b> option to delete the user, and then enable it again.</li> </ul>
Default Group Memberships	<p>This field appears if you check the <b>Copy User on Login</b> box. If you would like users to be automatically added to a group or groups, enter the group name(s) here. To specify more than one group, separate the group names with commas. Each time a user logs in, their group memberships will be checked. If the user does not belong to the specified group(s), their username will be added to the group(s). If a group does not yet exist, it will be added to the internal directory that is using LDAP for authentication.</p> <p>Please note that there is no validation of the group names. If you mis-type the group name, authorization failures will result – users will not be able to access the applications or functionality based on the intended group name.</p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• <code>confluence-users</code></li> <li>• <code>bamboo-users,jira-administrators,jira-core-users</code></li> </ul>
Synchronize Group Memberships	<p>This field appears if you select the <b>Copy User on Login</b> checkbox. If this box is checked, group memberships specified on your LDAP server will be synchronized with the internal directory each time the user logs in.</p> <p>If you check this box the following additional fields will appear on the screen, both described in more detail below:</p> <ul style="list-style-type: none"> <li>• Group Schema Settings (described in a separate section below)</li> <li>• Membership Schema Settings (described in a separate section below)</li> </ul>



Note: 'Copy Users on Login' must be enabled if you want to be able to [change usernames](#).

### Schema Settings

Setting	Description
Base DN	<p>The root distinguished name (DN) to use when running queries against the directory server. Examples:</p> <ul style="list-style-type: none"> <li>• <code>o=example,c=com</code></li> <li>• <code>cn=users,dc=ad,dc=example,dc=com</code></li> <li>• For Microsoft Active Directory, specify the base DN in the following format: <code>dc=domain1,dc=local</code>. You will need to replace the <code>domain1</code> and <code>local</code> for your specific configuration. Microsoft Server provides a tool called <code>ldp.exe</code> which is useful for finding out and configuring the the LDAP structure of your server.</li> </ul>
User Name Attribute	<p>The attribute field to use when loading the username. Examples:</p> <ul style="list-style-type: none"> <li>• <code>cn</code></li> <li>• <code>sAMAccountName</code></li> </ul>

### Advanced Settings

Setting	Description
Enable Nested Groups	<p>Enable or disable support for nested groups. Some directory servers allow you to define a group as a member of another group. Groups in such a structure are called <i>nested groups</i>. Nested groups simplify permissions by allowing sub-groups to inherit permissions from a parent group.</p>
Use Paged Results	<p>Enable or disable the use of the LDAP control extension for simple paging of search results. If paging is enabled, the search will retrieve sets of data rather than all of the search results at once. Enter the desired page size – that is, the maximum number of search results to be returned per page when paged results are enabled. The default is 1000 results.</p>
Follow Referrals	<p>Choose whether to allow the directory server to redirect requests to other servers. This option uses the node referral (JNDI lookup <code>java.naming.referral</code>) configuration setting. It is generally needed for Active Directory servers configured without proper DNS, to prevent a 'javax.naming.PartialResultException: Unprocessed Continuation Reference(s)' error.</p>

### User Schema Settings

Note: this section is only visible when **Copy User on Login** is enabled.

Setting	Description
Additional User DN	<p>This value is used in addition to the base DN when searching and loading users. If no value is supplied, the subtree search will start from the base DN. Example:</p> <ul style="list-style-type: none"> <li>• <code>ou=Users</code></li> </ul>
User Object Class	<p>This is the name of the class used for the LDAP user object. Example:</p> <ul style="list-style-type: none"> <li>• <code>user</code></li> </ul>
User Object Filter	<p>The filter to use when searching user objects. Example:</p> <ul style="list-style-type: none"> <li>• <code>(&amp;(objectCategory=Person)(sAMAccountName=*))</code></li> </ul>

User Name RDN Attribute	The RDN (relative distinguished name) to use when loading the username. The DN for each LDAP entry is composed of two parts: the RDN and the location within the LDAP directory where the record resides. The RDN is the portion of your DN that is not related to the directory tree structure. Example: <ul style="list-style-type: none"> <li>cn</li> </ul>
User First Name Attribute	The attribute field to use when loading the user's first name. Example: <ul style="list-style-type: none"> <li>givenName</li> </ul>
User Last Name Attribute	The attribute field to use when loading the user's last name. Example: <ul style="list-style-type: none"> <li>sn</li> </ul>
User Display Name Attribute	The attribute field to use when loading the user's full name. Example: <ul style="list-style-type: none"> <li>displayName</li> </ul>
User Email Attribute	The attribute field to use when loading the user's email address. Example: <ul style="list-style-type: none"> <li>mail</li> </ul>

### Group Schema Settings

Note: this section is only visible when both **Copy User on Login** and **Synchronize Group Memberships** are enabled.

Setting	Description
Additional Group DN	This value is used in addition to the base DN when searching and loading groups. If no value is supplied, the subtree search will start from the base DN. Example: <ul style="list-style-type: none"> <li>ou=Groups</li> </ul>
Group Object Class	This is the name of the class used for the LDAP group object. Examples: <ul style="list-style-type: none"> <li>groupOfUniqueNames</li> <li>group</li> </ul>
Group Object Filter	The filter to use when searching group objects. Example: <ul style="list-style-type: none"> <li>(objectCategory=Group)</li> </ul>
Group Name Attribute	The attribute field to use when loading the group's name. Example: <ul style="list-style-type: none"> <li>cn</li> </ul>
Group Description Attribute	The attribute field to use when loading the group's description. Example: <ul style="list-style-type: none"> <li>description</li> </ul>

### Membership Schema Settings

Note: this section is only visible when both **Copy User on Login** and **Synchronize Group Memberships** are enabled.

Setting	Description
Group Members Attribute	The attribute field to use when loading the group's members. Example: <ul style="list-style-type: none"> <li>member</li> </ul>

User Membership Attribute	The attribute field to use when loading the user's groups. Example: <ul style="list-style-type: none"><li>• memberOf</li></ul>
Use the User Membership Attribute, when finding the user's group membership	Check this box if your directory server supports the group membership attribute on the user. (By default, this is the 'memberOf' attribute.) <ul style="list-style-type: none"><li>• If this box is checked, your application will use the group membership attribute on the user when <b>retrieving the members of a given group</b>. This will result in a more efficient retrieval.</li><li>• If this box is not checked, your application will use the members attribute on the group ('member' by default) for the search.</li></ul>

#### Diagrams of Possible Configurations

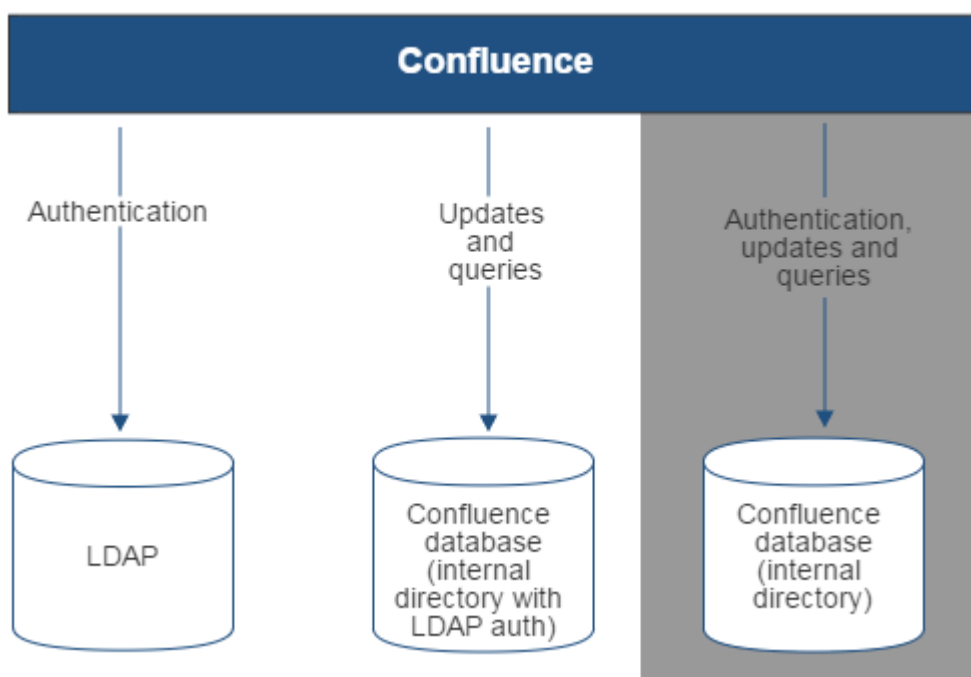


Diagram above: Confluence connecting to an LDAP directory for authentication only.

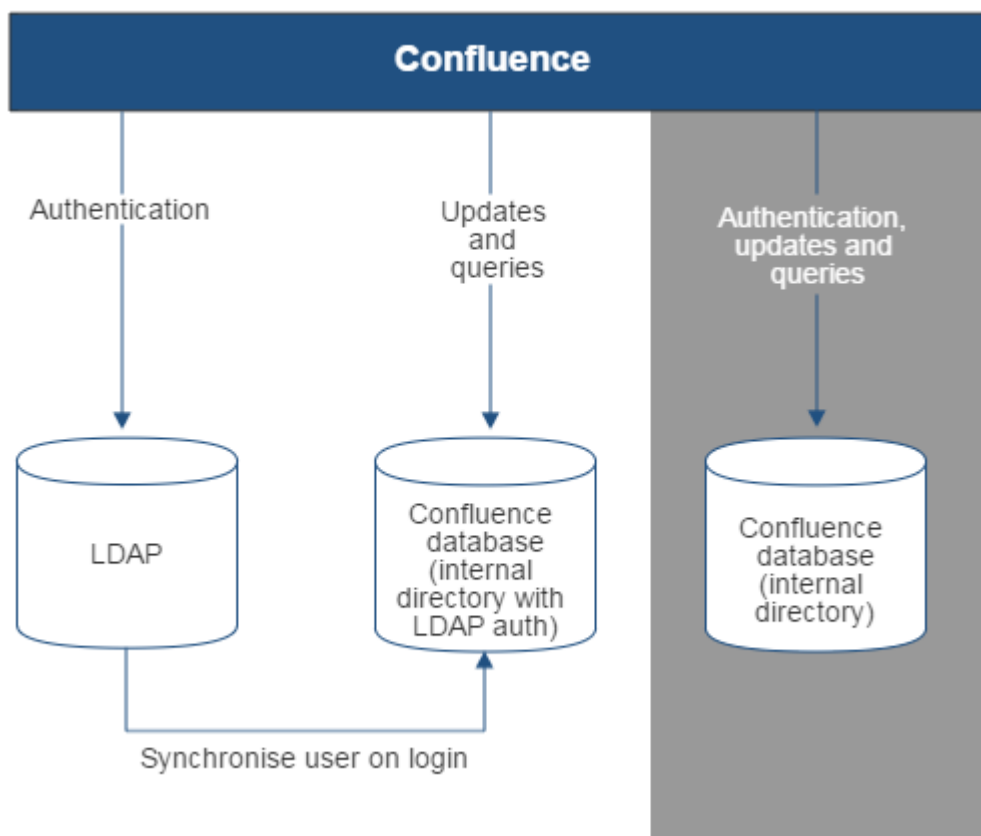


Diagram above: Confluence connecting to an LDAP directory for authentication only, with each user synchronized with the internal directory that is using LDAP authentication when they log in to Confluence.

## Connecting to Crowd or Jira for User Management

You can connect your Confluence application to Atlassian Crowd or to a Jira application (version 4.3 or later) for management of users and groups, and for authentication.

### Connecting Confluence to Crowd for User Management

Atlassian Crowd is an application security framework that handles authentication and authorization for your web-based applications. With Crowd you can integrate multiple web applications and user directories, with support for single sign-on (SSO) and centralized identity management. The Crowd Administration Console provides a web interface for managing directories, users and their permissions. See the [Administration Guide](#).

**When to use this option:** Connect to Crowd if you want to use the full Crowd functionality to manage your directories, users and groups. You can connect your Crowd server to a number of directories of all types that Crowd supports, including custom directory connectors.

#### To connect Confluence to Crowd:

1. Go to your **Crowd Administration Console** and define the Confluence application to Crowd. See the

#### On this page:

- [Connecting Confluence to Crowd for User Management](#)
- [Connecting Confluence to Jira applications for User Management](#)
- [Diagrams of Some Possible Configurations](#)
- [Troubleshooting](#)

#### Related pages:

- [Configuring User Directories](#)

Crowd documentation: [Adding an Application](#).

2. Choose the **cog icon**



, then choose **General Configuration** under Confluence Administration

3. Click '**User Directories**' in the left-hand panel.
4. **Add** a directory and select type '**Atlassian Crowd**'. Enter the settings as described below.
5. Save the directory settings.
6. Define the **directory order** by clicking the blue up- and down-arrows next to each directory on the '**User Directories**' screen. Here is a summary of how the directory order affects the processing:
  - Changes to users and groups will be made only in the first directory where the application has permission to make changes.
  - The order of the directories is the order in which they will be searched for users and groups (by default Confluence aggregates group membership from all directories, so the order does not impact membership itself).

For details see [Managing Multiple Directories](#).

7. If required, configure Confluence to use Crowd for single sign-on (SSO) too. See the Crowd documentation: [Integrating Crowd with Atlassian Confluence](#).

### Crowd Settings in Confluence

Setting	Description
Name	A meaningful name that will help you to identify this Crowd server amongst your list of directory servers. Examples: <ul style="list-style-type: none"> <li>• Crowd Server</li> <li>• Example Company Crowd</li> </ul>
Server URL	The web address of your Crowd console server. Examples: <ul style="list-style-type: none"> <li>• <a href="http://www.example.com:8095/crowd/">http://www.example.com:8095/crowd/</a></li> <li>• <a href="http://crowd.example.com">http://crowd.example.com</a></li> </ul>
Application Name	The name of your application, as recognized by your Crowd server. Note that you will need to define the application in Crowd too, using the Crowd administration Console. See the Crowd documentation on <a href="#">adding an application</a> .
Application Password	The password which the application will use when it authenticates against the Crowd framework as a client. This must be the same as the password you have registered in Crowd for this application. See the Crowd documentation on <a href="#">adding an application</a> .

Note: There is a known issue where the password is not saved in some instances

**CONFSERVER-33979** - New JIRA/Crowd password not saved after test

[OPEN](#)

when configuring

Confluence to use Jira/Crowd as a external user directory.

### Crowd Permissions

Setting	Description
Read Only	The users, groups and memberships in this directory are retrieved from Crowd and can only be modified via Crowd. You cannot modify Crowd users, groups or memberships via the application administration screens.

Read/Write	The users, groups and memberships in this directory are retrieved from Crowd. When you modify a user, group or membership via the application administration screens, the changes will be applied directly to Crowd. Please ensure that the application has modification permissions for the relevant directories in Crowd. See the Crowd documentation: <a href="#">Specifying an Application's Directory Permissions</a> .
------------	--

### Advanced Crowd Settings

Setting	Description
Enable Nested Groups	Enable or disable support for nested groups. Before enabling nested groups, please check to see if the user directory or directories in Crowd support nested groups. When nested groups are enabled, you can define a group as a member of another group. If you are using groups to manage permissions, you can create nested groups to allow inheritance of permissions from one group to its sub-groups.
Enable Incremental Synchronization	Enable or disable incremental synchronization. Only changes since the last synchronization will be retrieved when synchronizing a directory. Note that full synchronization is always executed when restarting Fisheye.
Synchronization Interval (minutes)	Synchronization is the process by which the application updates its internal store of user data to agree with the data on the directory server. The application will send a request to your directory server every x minutes, where 'x' is the number specified here. The default value is 60 minutes.

### Connecting Confluence to Jira applications for User Management

Note that the license tiers for your Jira application and Confluence do not need to match to use this feature. For example, you can manage a Confluence 50 user license with Jira Software, even if Jira Software only has a 25 user license.

Subject to certain limitations, you can connect a number of Atlassian applications to a single JIRA application for centralized user management.

**When to use this option:** You can connect to a server running **JIRA 4.3** or later, **JIRA Software 7.0** or later, **JIRA Core 7.0** or later, or **JIRA Service Desk 3.0** or later. Choose this option as an alternative to Atlassian Crowd, for simple configurations with a limited number of users.

### To connect Confluence to a Jira application:

1. In your Jira application go to



> **User Management** > **Jira User Server**.

(For Jira 6.4 and earlier go to your Jira administration screen then **Users** > **Jira User Server**)

- Click **Add Application**.
  - Enter the **application name** and **password** that Confluence will use when accessing Jira.
  - Enter the **IP address** or addresses of your Confluence server. Valid values are:
    - A full IP address, e.g. 192.168.10.12.
    - A wildcard IP range, using CIDR notation, e.g. 192.168.10.1/16. For more information, see the introduction to [CIDR notation on Wikipedia](#) and [RFC 4632](#).
  - **Save** the new application.
2. Set up the Jira user directory in Confluence:
    - Choose the **cog icon**



- , then choose **General Configuration** under Confluence Administration
  - Click '**User Directories**' in the left-hand panel.
  - **Add** a directory and select type '**Atlassian Jira**'.
  - Enter the settings as described below. When asked for the **application name** and **password**, enter the values that you defined for your Confluence application in the settings on Jira.
  - Save the directory settings.
  - ⚠ Don't change the directory order until you have done the next step or you may accidentally lock yourself out of the Confluence admin console.
3. In order to use Confluence, users must be a member of the `confluence-users` group or have Confluence 'can use' permission. Follow these steps to configure your Confluence groups in your JIRA application:
    - a. Add the `confluence-users` and `confluence-administrators` groups in your JIRA application.
    - b. Add your own username as a member of both of the above groups.
    - c. Choose one of the following methods to give your existing JIRA users access to Confluence:
      - Option 1: In your JIRA application, find the groups that the relevant users belong to. Add the groups as members of one or both of the above Confluence groups.
      - Option 2: Log in to Confluence using your JIRA account and go to the Confluence **Administration Console**. Click '**Global Permissions**' and assign the 'can use' permission to the relevant JIRA groups.
  4. In Confluence you can now define the **directory order** by clicking the blue up- and down-arrows next to each directory on the '**User Directories**' screen. Here is a summary of how the directory order affects the processing:
    - The order of the directories is the order in which they will be searched for users and groups.
    - Changes to users and groups will be made only in the first directory where the application has permission to make changes.

For details see [Managing Multiple Directories](#).

Ensure that you have added Confluence URL into Jira Whitelist in Jira Administration >> System >> Security >> Whitelist. For example: <https://confluence.atlassian.com/> or refer to this guide: [Configuring the whitelist](#).

### Jira Settings in Confluence

Setting	Description
Name	A meaningful name that will help you to identify this Jira server in the list of directory servers. Examples: <ul style="list-style-type: none"> <li>• Jira Service Desk Server</li> <li>• My Company Jira</li> </ul>
Server URL	The web address of your Jira server. Examples: <ul style="list-style-type: none"> <li>• <a href="http://www.example.com:8080">http://www.example.com:8080</a></li> <li>• <a href="http://jira.example.com">http://jira.example.com</a></li> </ul>
Application Name	The name used by your application when accessing the Jira server that acts as user manager. Note that you will also need to define your application to that Jira server, via the ' <b>Other Applications</b> ' option in the 'Users, Groups & Roles' section of the 'Administration' menu.
Application Password	The password used by your application when accessing the Jira server that acts as user manager.

### Jira Permissions

Setting	Description
---------	-------------



Read Only	The users, groups and memberships in this directory are retrieved from the JIRA server that is acting as user manager. They can only be modified via that JIRA server.
-----------	--

**Advanced Jira Settings**

Setting	Description
Enable Nested Groups	Enable or disable support for nested groups. Before enabling nested groups, please check to see if nested groups are enabled on the JIRA server that is acting as user manager. When nested groups are enabled, you can define a group as a member of another group. If you are using groups to manage permissions, you can create nested groups to allow inheritance of permissions from one group to its sub-groups.
Synchronization Interval (minutes)	Synchronization is the process by which the application updates its internal store of user data to agree with the data on the directory server. The application will send a request to your directory server every x minutes, where 'x' is the number specified here. The default value is 60 minutes.

**Diagrams of Some Possible Configurations**

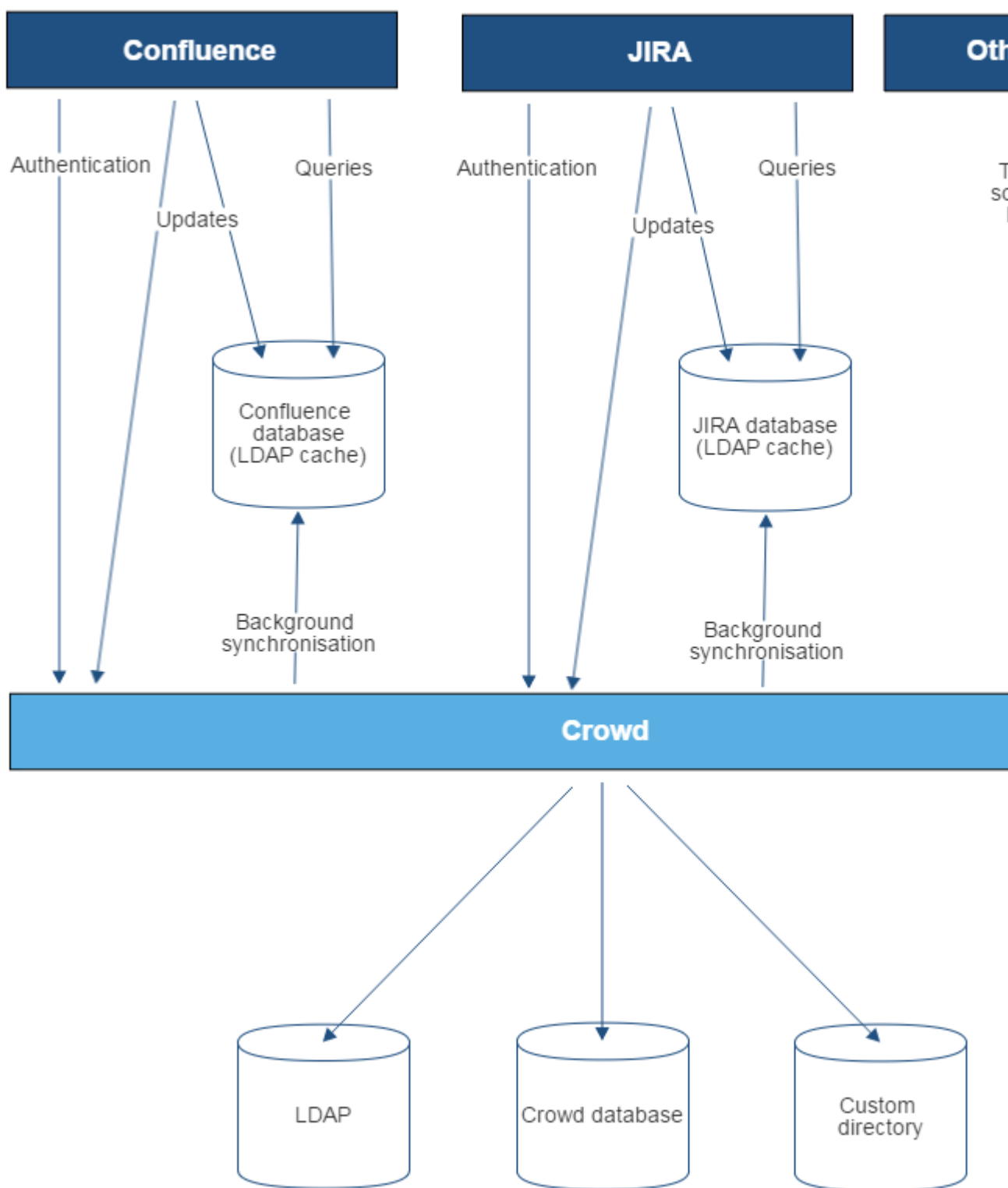


Diagram above: Confluence, JIRA and other applications connecting to Crowd for user management.

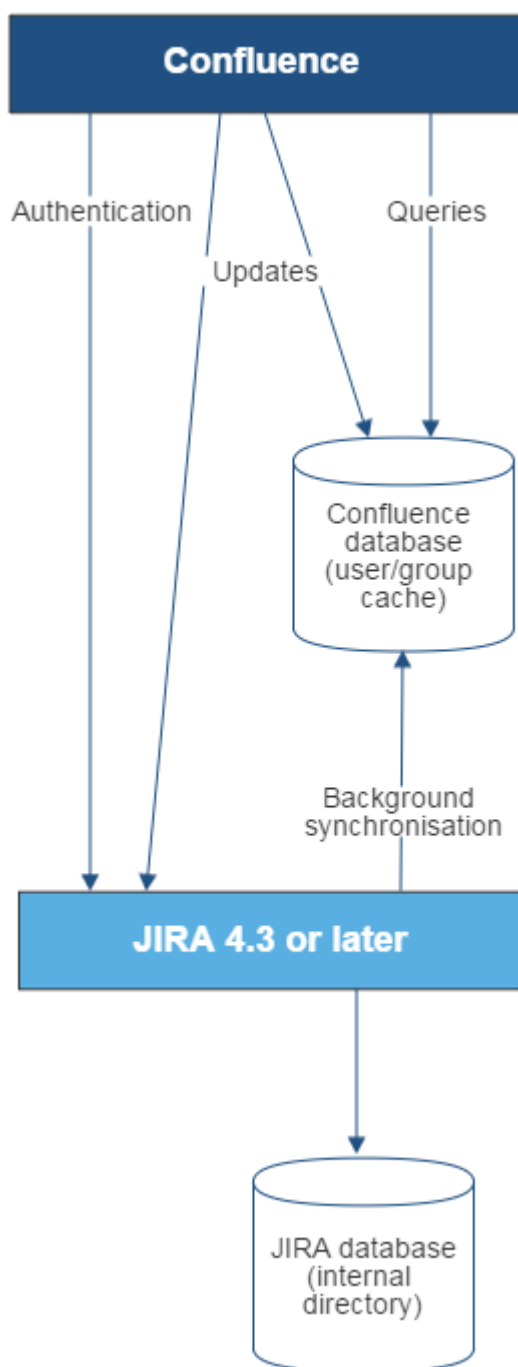


Diagram above: Confluence connecting to JIRA for user management.

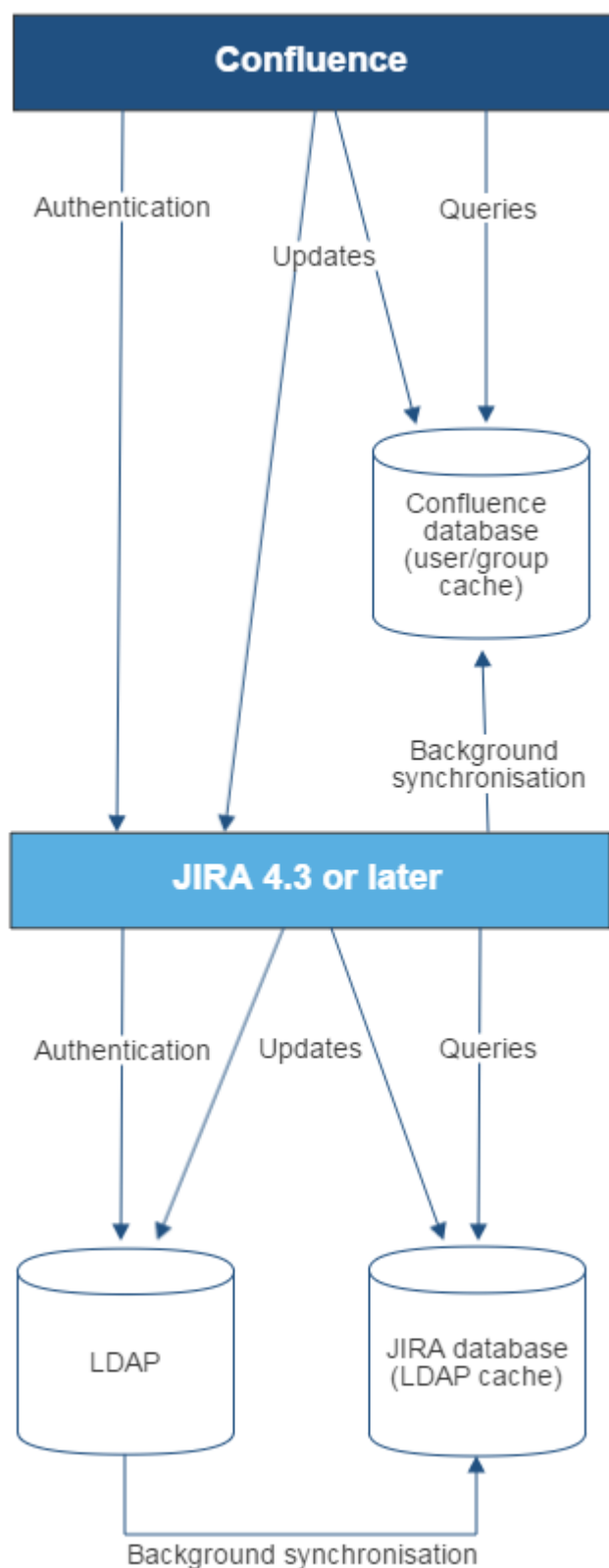


Diagram above: Confluence connecting to JIRA for user management, with JIRA in turn connecting to LDAP.

### Troubleshooting

Below are some error messages you may encounter. If you run into problems, you should turn on WARN logging for the relevant class. See [Configuring Logging](#).

Error	Message	Cause
-------	---------	-------

error.jirabaseurl.connection.refused	Connection refused. Check if an instance of Jira is running on the given url	This may be because: <ul style="list-style-type: none"> <li>• Jira url is incorrect</li> <li>• Jira instance is not running on the specified url.</li> <li>• Jira instance running on the specified url is not 4.3 or later.</li> </ul>
error.applicationlink.connection.refused	Failed to establish application link between Jira server and Confluence server.	Unable to create an application link between Jira and Confluence. This may be because: <ul style="list-style-type: none"> <li>• Confluence or Jira url is incorrect</li> <li>• the instance is not running on the specified url</li> <li>• credentials are incorrect.</li> </ul> Refer to the Confluence log files for further troubleshooting information.
error.jirabaseurl.not.valid	This is not a valid url for a Jira application.	A runtime exception has occurred. Refer to the Confluence log files for further troubleshooting information.

## Reverting from Crowd or Jira applications to Internal User Management

If your Confluence site currently uses Crowd or a Jira application for user management, you can revert to internal user management as described below. If your Confluence instance has only a few users, it is easier to recreate the users and groups in Confluence manually. If you have a large number of users and groups, it is more efficient to migrate the relevant users and groups into the Confluence Internal directory.

### On this page:

- [Option 1 – Manually Recreate Users and Groups in Confluence](#)
- [Option 2 – Transfer Crowd/Jira application Users and Groups to the Confluence Database](#)

Both options provided below will reset the affected users' passwords. When done, be sure to notify them to use the 'Reset My Password' link on the Confluence log in page before they attempt to log in.

### Option 1 – Manually Recreate Users and Groups in Confluence

Use this option if you have only a few users and groups.

1. Log in to Confluence as a Confluence system administrator.
2. Go to the user directories administration screen and move the **internal** directory to the top of the list of directories, by clicking the arrows in the '**Order**' column.
3. Make sure that you have at least one user from the **internal** directory in each of the `confluence-users` and `confluence-administrators` groups.
4. Make sure that you have a username in the **internal** directory with Confluence system administrator permissions.
  - If you do not have such a user, add a new one now, and log out of Confluence.
  - Log back in as the user you just added, and go back to the user directories administration screen.
5. Disable the '**Atlassian Crowd**' directory.
6. Manually add the required users and groups in Confluence. They will be added to the internal

directory, because you have moved it to the top of the list of directories.

- If you have assigned Confluence permissions to a group which exists in your Jira application, you must create a group in Confluence with the same name.
  - If a user who exists in your Jira application has created content or has had permissions assigned to them in Confluence, you must also create that user in Confluence.
7. Add the users to the required groups.

### **Option 2 – Transfer Crowd/Jira application Users and Groups to the Confluence Database**

Use this option to migrate External Application (Crowd or Jira applications) users into the Confluence database. You need a knowledge of SQL to perform this task.

The SQL commands given below are tailored for **MySQL**. If you are using a database other than MySQL, you will need to modify the SQL to work in your database.

#### **Step 1. Create Backups**

Creating backups is the only way to restore your data if something goes wrong.

1. From Confluence, create a full XML site backup including attachments.
2. Stop Confluence.
3. Make a backup copy of the Confluence home and installation directories.
4. Repeat the above steps for your External Application.
5. From your MySQL administration tool, create a database backup for the Crowd/Jira application and Confluence databases.

#### **Step 2. Replace Confluence User Management**

Use the SQL below to move groups and users from your External Application to Confluence by transferring table content. The SQL provided is specific to MySQL and must be modified for other databases.

Find the IDs for your Directories

1. Run the following command and take note of the resulting number. It will be referenced throughout the following instructions as <Confluence Internal ID>.

```
select id from cwd_directory where directory_name='Confluence
Internal Directory';
```

2. From the User Directories administration page, find the name of the directory who's users/groups you want to move. Run the following command and take note of the resulting number. It will be referenced throughout the following instructions as <External Application ID>.

```
select id from cwd_directory where directory_name='<External
Directory Name>';
```

#### **Move Groups to Confluence**

1. It is possible that you have several groups in your Internal Directory that have the same name as groups in your External Application. To find these, run:

```
select distinct a.id, a.directory_id, a.group_name,
d.directory_name from cwd_group a join cwd_group b on
a.group_name=b.group_name join cwd_directory d on
d.id=a.directory_id where a.directory_id != b.directory_id;
```

- a. If you have results from the previous query, for each of the group names that have duplicates, find the id for the group in the Confluence Internal Directory (<internal group id>) and the External Application (<external group id>). Run the following:

```
update cwd_group_attribute set group_id=<internal group id>, directory_id=<Confluence Internal Id> where
group_id=<external group id>;
update cwd_membership set child_group_id=<internal group id> where child_group_id=<external group id>;
update cwd_membership set parent_id=<internal group id> where parent_id=<external group id>;
delete from cwd_group where id=<external group id>;
```

2. Move all the groups in the External Application to the Confluence Internal Directory.

```
update cwd_group set directory_id=<Confluence Internal ID> where
directory_id=<External Application ID>;
```

### Move Users to Confluence

1. It is possible that you have several users in your Internal Directory that have the same name as users in your External Application. To find these, run:

```
select distinct a.id, a.directory_id, a.user_name,
d.directory_name from cwd_user a join cwd_user b on
a.user_name=b.user_name join cwd_directory d on
d.id=a.directory_id where a.directory_id != b.directory_id;
```

- a. If you have results from the previous query, for each of the user names that have duplicates, find the id for the user in the Confluence Internal Directory (<internal user id>) and the External Application (<external user id>). Run the following:

```
update cwd_membership set child_user_id=<internal user id>
where child_user_id=<external user id>;
update cwd_user_credential_record set user_id=<internal user id> where user_id=<external user id>;
update cwd_user_attribute set user_id=<internal user id>,
directory_id=<Confluence Internal ID> where
user_id=<external user id>;
delete from cwd_user where id=<external user id>;
```

2. Move all the users in the External Application to the Confluence Internal Directory.

```
update cwd_user set directory_id=<Confluence Internal ID> where
directory_id=<External Application ID>;
```

### Delete the External Application directory

1. You need to change the order of your directories so that the Internal directory is at the top, and active.
  - a. If you have only two directories - the Internal and the External Application directory you are deleting, then do the following:



```
update cwd_app_dir_mapping set list_index = 0 where
directory_id = <Confluence Internal ID>;
```

- b. If you have more than two directories, you need to rearrange them so the Internal Directory is at the top (list\_index 0) and the External Application directory you are deleting is at the bottom.

- List the directories and their order using

```
select d.id, d.directory_name, m.list_index from
cwd_directory d join cwd_app_dir_mapping m on
d.id=m.directory_id order by m.list_index;
```

- Change the list indexes so that they are in the order you want. Directory order can be rearranged using

```
update cwd_app_dir_mapping set list_index = <position>
where directory_id = <directory id>;
```

- c. Check that the internal directory is enabled.

- List the internal directory. An enabled directory will have its 'active' column set to 'T'

```
select id, directory_name, active from cwd_directory
where id = <Internal Directory id>;
```

- If the internal directory is not active, activate it by

```
update cwd_directory set active = 'T' where id =
<Internal Directory id>;
```

2. When the directories are ordered correctly, delete the External Application directory from the directory order:

```
delete from cwd_app_dir_operation where app_dir_mapping_id =
(select id from cwd_app_dir_mapping where directory_id =
<External Application ID>);
delete from cwd_app_dir_mapping where directory_id = <External
Application ID>;
```

3. The External Application directory is referenced in several other tables in the database. You need to remove the remaining references to it:

```
delete from cwd_directory_attribute where directory_id=<External
Application ID>;
delete from cwd_directory_operation where directory_id=<External
Application ID>;
```

4. All references to the External Directory should now have been removed. Delete the directory using:

```
delete from cwd_directory where id = <External Application ID>;
```

### Reset passwords

1. All users who were in the External Directory you deleted, including admins, will be unable to log in. Their passwords need to be reset by choosing the 'Forgot your password?' link on the login page. Alternatively, use the instructions at [Restore Passwords To Recover Admin User Rights](#) to reset the administrator password, then set the users' passwords for them via the Manage Users page in the administration screen.

## Managing Multiple Directories

This page describes what happens when you have defined more than one user directory in Confluence. For example, you may have an internal directory and you may also connect to an LDAP directory server and/or other types of user directories. When you connect to a new directory server, you also need to define the **directory order**.

**Avoid duplicate usernames across directories.** If you are connecting to more than one user directory, we recommend that you ensure the usernames are unique to one directory. For example, we do not recommend that you have a user `jsmith` in both 'Directory1' and 'Directory2'. The reason is the potential for confusion, especially if you swap the order of the directories. Changing the directory order can change the user that a given username refers to.

### On this page:

- [Overview](#)
- [Configuring the Directory Order](#)
- [Effect of Directory Order](#)
  - [Login](#)
  - [Permissions](#)
  - [Updating Users and groups](#)





### Overview

Here is a summary of how the directory order affects the processing:

- The order of the directories is the order in which they will be searched for users and groups.
- Changes to users and groups will be made only in the first directory where the application has permission to make changes.

### Configuring the Directory Order

You can change the order of your directories as defined to Confluence. Select '**User Directories**' from the Confluence Administration Console and click the blue up- and down-arrows next to each directory.

Directory Name	Type	Order
Confluence Internal Directory	Internal	 
OpenLDAP	OpenLDAP (Read-Write)	 

### Notes:

- Please read the rest of this page to understand what effect the directory order will have on authentication (login) and permissions in Confluence, and what happens when you update users and groups in Confluence.
- Before you move an external directory above Confluence's internal directory, make sure you (and your admin users) are members of a group called `confluence-administrators` in your external directory or you may accidentally lock yourself out of the Confluence admin console.

### Effect of Directory Order

This section summarizes the effect the order of the directories will have on login and permissions, and on the updating of users and groups.

### Login

The directory order is significant during the authentication of the user, in cases where the same user exists in multiple directories. When a user attempts to log in, the application will search the directories in the order specified, and will use the credentials (password) of the *first occurrence of the user* to validate the login attempt.

### Permissions

#### Aggregating membership (default)

The directory order **is not** significant when granting the user permissions based on group membership as Confluence uses an aggregating membership scheme by default. If the same username exists in more than one directory, the application will aggregate (combine) group membership from all directories where the username appears.

Example:

- You have connected two directories: The Customers directory and the Partners directory.
- The Customers directory is first in the directory order.
- A username `jsmith` exists in both the Customers directory and the Partners directory.
- The user `jsmith` is a member of group `G1` in the Customers directory and group `G2` in the Partners directory.
- The user `jsmith` will have permissions based on membership of both `G1` and `G2` regardless of the directory order.

For administrators upgrading to Confluence 5.7 or later:

How group memberships are determined for users that belong to multiple user directories (such as LDAP, Active Directory, Crowd) changed in Confluence 5.7. Group memberships are now aggregated from *all* directories, not the first one the user appears in. In most cases, this change will have no impact as users generally only exist in one directory, or their memberships are correctly synchronized between user directories. In some rare cases, where group memberships are out of synch, the change may lead to users gaining permissions to view spaces and pages (if they are a member a group in a user directory that was previously being ignored by Confluence).

▼ [Here's an example scenario...](#)



This is Issac. Something went wrong a while ago, so he's got the same username in two user directories, but belongs to different groups.

Right now, the user directories in his organization's Confluence site look like this:

### Confluence User Directories

Active Directory	1
Confluence internal directory	2

and Issac's group memberships in each directory looks like this:

1 Active Directory		Confluence internal directory 2
confluence-users sydney		confluence-users developers sydney

The 'Dev Team' page is restricted to the developers group.

- In Confluence 5.6 and earlier, Issac couldn't see this page as we determined his group membership from Active Directory - because it's the first directory in the list it had the highest

- priority.
- In Confluence 5.7 and beyond, Issac will see the page because we determine his group membership from *all* directories, not just the highest one.

To Confluence his group membership looks like this:



This means after the 5.7 upgrade he can see any pages and spaces that are restricted to the 'developers' group.

#### Non-aggregating membership

It is possible to use the REST API to tell Confluence to use a non-aggregating membership scheme as follows:

##### ▼ [Turning on non-aggregating membership...](#)

The REST resource supported JSON and XML. You'll need to be a system administrator and logged in to do this.

```
# To GET the current setting
curl -H 'Accept: application/json' -u <username>
<base-url>/rest/crowd/latest/application

# To PUT the setting
curl -H 'Content-type: application/json' -X PUT -d
'{"membershipAggregationEnabled":true}' -u <username>
<base-url>/rest/crowd/latest/application
```

If you've chosen non-aggregating membership, the directory order is significant. If the same username exists in more than one directory, the application will look for group membership only in the first directory where the username appears, based on the directory order.

Example:

- You have connected two directories: The Customers directory and the Partners directory.
- The Customers directory is first in the directory order.
- A username `jsmith` exists in both the Customers directory and the Partners directory.
- The user `jsmith` is a member of group `G1` in the Customers directory and group `G2` in the Partners directory.
- The user `jsmith` will have permissions based on membership of `G1` only, not `G2`.

#### Updating Users and groups

If you update a user or group via the application's administration screens, the update will be made in the first directory where the application has write permissions.

Example 1:

- You have connected two directories: The Customers directory and the Partners directory.
- The application has permission to update both directories.
- The Customers directory is first in the directory order.
- A username `jsmith` exists in both the Customers directory and the Partners directory.
- You update the email address of user `jsmith` via the application's administration screens.

- The email address will be updated in the Customers directory only, not the Partners directory.

#### Example 2:

- You have connected two directories: A read/write LDAP directory and the internal directory.
- The LDAP directory is first in the directory order.
- All new users will be added to the LDAP directory. It is not possible to add a new user to the internal directory.

#### RELATED TOPICS

#### Configuring User Directories

- [Configuring the Internal Directory](#)
- [Connecting to an LDAP Directory](#)
- [Connecting to an Internal Directory with LDAP Authentication](#)
- [Connecting to Crowd or Jira for User Management](#)
- [Managing Multiple Directories](#)
- [Managing Nested Groups](#)
- [Synchronizing Data from External Directories](#)
- [Diagrams of Possible Configurations for User Management](#)
- [User Management Limitations and Recommendations](#)
- [Requesting Support for External User Management](#)
- [Disabling the Built-In User Management](#)

#### Managing Nested Groups

Some directory servers allow you to define a group as a member of another group. Groups in such a structure are called *nested groups*. Nested groups simplify permissions by allowing sub-groups to inherit permissions from a parent group.

This page describes how Confluence handles nested groups that exist in one or more of your directory servers.

#### Enabling Nested Groups

You can enable or disable support for nested groups on each directory individually. Go to the '**User Directories**' section of the Confluence Administration Console, **edit** the directory and select '**Enable Nested Groups**'. See [Configuring User Directories](#).

#### Notes:

- Before enabling nested groups for a specific directory type in Confluence, please make sure that your directory server supports nested groups.
- Please read the rest of this page to understand what effect nested groups will have on authentication (login) and permissions in Confluence, and what happens when you update users and groups in Confluence.
- You can't edit the directory you are currently logged in via. This means that in most cases you need to log in with an administrator account stored in the internal directory.

#### On this page:

- [Enabling Nested Groups](#)
- [Effect of Nested Groups](#)
  - [Login](#)
  - [Permissions](#)
  - [Viewing lists of group members](#)
  - [Adding and updating group membership](#)
- [Examples](#)
  - [Example 1: User is member of sub-group](#)
  - [Example 2: Sub-groups as members of the jira-developers group](#)
- [Notes](#)

#### Related pages:

- [Configuring User Directories](#)

## Effect of Nested Groups

This section explains how nested groups affect logging in, permissions, and viewing and updating users and groups.

### Login

When a user logs in, they can access the application if they belong to an authorized group or any of its sub-groups.

### Permissions

The user can access a function if they belong to a group that has the necessary permissions, or if they belong to any of its sub-groups.

### Viewing lists of group members

If you ask to view the members of a group, you will see all users who are members of the group and all users belonging its sub-groups, consolidated into one list. We call this a *flattened* list.

You can't view or edit the nested groups themselves, or see that one group is a member of another group.

### Adding and updating group membership

If you add a user to a group, the user is added to the named group and not to any other groups.

If you try to remove a user from a [flattened](#) list, the following will happen:

- If the user is a member of the top group in the hierarchy of groups in the flattened list, the user is removed from the top group.
- Otherwise, you see an error message stating that the user is not a direct member of the group.

## Examples

### Example 1: User is member of sub-group

Imagine the following two groups exist in your directory server:

- staff
- marketing

Memberships:

- The **marketing** group is a member of the **staff** group.
- User **jsmith** is a member of **marketing**.

You will see that **jsmith** is a member of both **marketing** and **staff**. You will not see that the two groups are nested. If you assign permissions to the **staff** group, then **jsmith** will get those permissions.

### Example 2: Sub-groups as members of the jira-developers group

In an LDAP directory server, we have the groups **engineering-group** and **techwriters-group**. We want to grant both groups developer-level access to the JIRA. We will have a group called **jira-developers** that has developer-level access.

- Add a group called **jira-developers**.
- Add the **engineering-group** as a sub-group of **jira-developers**.
- Add the **techwriters-group** as a sub-group of **jira-developers**.

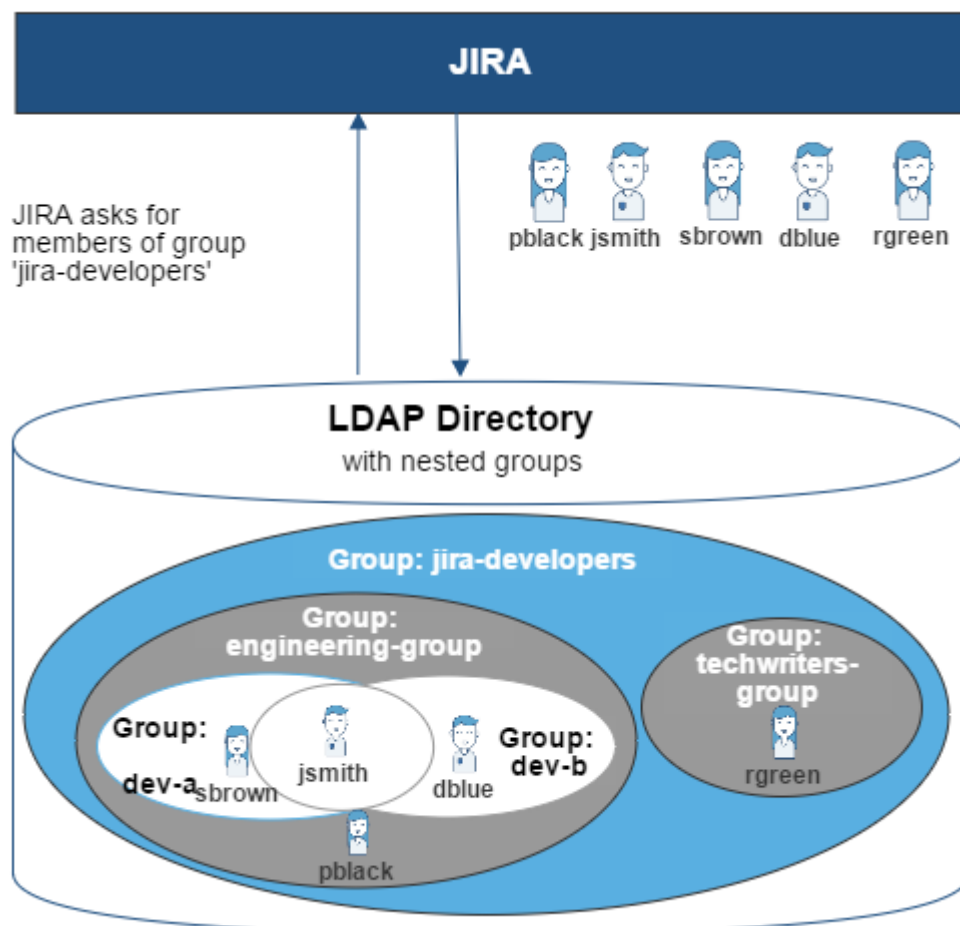
Group memberships are now:

- **jira-developers** — sub-groups: **engineering-group**, **techwriters-group**
- **engineering-group** — sub-groups: **dev-a**, **dev-b**; users: **pblack**
- **dev-a** — users: **jsmith**, **sbrown**
- **dev-b** — users: **jsmith**, **dblue**
- **techwriters-group** — users: **rgreen**

When the JIRA application requests a list of users in the **jira-developers** group, it receives the following list:

- pblack
- jsmith
- sbrown
- dblue
- rgreen

*Diagram: Sub-groups as members of the **jira-developers** group*



#### Notes

- **Possible impact on performance.** Enabling nested groups may result in slower user searches.
- **Definition of nested groups in LDAP.** In an LDAP directory, a nested group is a child group entry whose DN (Distinguished Name) is referenced by an attribute contained within a parent group entry. For example, a parent group **Group One** might have an `objectClass=group` attribute and one or more `member=DN` attributes, where the DN can be that of a user or that of a group elsewhere in the LDAP tree:

```
member=CN=John Smith,OU=Users,OU=OrgUnitA,DC=sub,DC=domain
member=CN=Group
Two,OU=OrgUnitBGroups,OU=OrgUnitB,DC=sub,DC=domain
```

#### Synchronizing Data from External Directories

For certain directory types, Confluence stores a



cache of directory information (users and groups) in the application database, to ensure fast recurrent access to user and group data. A synchronization task runs periodically to update the internal cache with changes from the external directory.

**On this page:**

- [Affected Directory Types](#)
- [How it Works](#)
- [Finding the Time Taken to Synchronize](#)
- [Manually Synchronizing the Cache](#)
- [Configuring the Synchronization Interval](#)

**Related pages:**

- [Configuring User Directories](#)

### Affected Directory Types

Data caching and synchronization apply to the following user directory types:

- **LDAP** (Microsoft Active Directory and all supported LDAP directories) where permissions are set to **read only**.
- **LDAP** (Microsoft Active Directory and all supported LDAP directories) where permissions are set to **read only, with local groups**.
- **LDAP** (Microsoft Active Directory and all supported LDAP directories) where permissions are set to **read/write**.
- **Atlassian Crowd**.
- **Atlassian JIRA**.

Data caching and synchronization do not occur for the following user directory types:

- **Internal Directory with LDAP Authentication**.
- **Internal Directory**.

### How it Works

Here is a summary of the caching functionality:

- The caches are held in the application database.
- When you connect a new external user directory to the application, a synchronization task will start running in the background to copy all the required users, groups and membership information from the external directory to the application database. This task may take a while to complete, depending on the size and complexity of your user base.
- Note that a user will not be able to log in until the synchronization task has copied that user's details into the cache.
- A periodic synchronization task will run to update the database with any changes made to the external directory. The default synchronization interval, or polling interval, is one hour (60 minutes). You can change the synchronization interval on the directory configuration screen.
- You can manually synchronize the cache if necessary.
- If the external directory permissions are set to read/write: Whenever an update is made to the users, groups or membership information via the application, the update will also be applied to the cache and the external directory immediately.
- All authentication happens via calls to the external directory. When caching information from an external directory, the application database does not store user passwords.
- All other queries run against the internal cache.

### Finding the Time Taken to Synchronize

The '**User Directories**' screen shows information about the last synchronization operation, including the length of time it took.

### Manually Synchronizing the Cache



You can manually synchronize the cache by clicking '**Synchronize**' on the '**User Directories**' screen. If a synchronization operation is already in progress, you cannot start another until the first has finished.

*Screen snippet: User directories, showing information about synchronization*

OpenLDAP	OpenLDAP (Read-Write)	<a href="#">↑</a> <a href="#">↓</a>	<a href="#">Disable</a> <a href="#">Edit</a> <a href="#">Synchronise</a> Last synchronised at 14/01/11 3:07 PM (took 65s).
Crowd	Atlassian Crowd	<a href="#">↑</a> <a href="#">↓</a>	<a href="#">Disable</a> <a href="#">Edit</a> <a href="#">Synchronise</a> Last synchronised at 14/01/11 2:39 PM (took 0s).

### Configuring the Synchronization Interval

**Note:** The option to configure the synchronization interval for Crowd and Jira directories is available in **Confluence 3.5.3 and later**. Earlier versions of Confluence allow you to configure the interval for LDAP directories only.

You can set the '**Synchronization Interval**' on the directory configuration screen. The synchronization interval is the period of time to wait between requests for updates from the directory server.

The length you choose for your synchronization interval depends on:

- The length of time you can tolerate stale data.
- The amount of load you want to put on the application and the directory server.
- The size of your user base.

If you synchronize more frequently, then your data will be more up to date. The downside of synchronizing more frequently is that you may overload your server with requests.

If you are not sure what to do, we recommend that you start with an interval of 60 minutes (this is the default setting) and reduce the value incrementally. You will need to experiment with your setup.

### Diagrams of Possible Configurations for User Management

The aim of these diagrams is to help people understand each directory type at a glance. We have kept the diagrams simple and conceptual, with just enough information to be correct.

Some things that we do **not** attempt to show:

- In most cases, we do not attempt to show that you can have multiple directory types mapped to Confluence at the same time. We illustrate that fact in just the first two LDAP diagrams.
- We have not included a diagram for Confluence's legacy connection to Jira database.
- We do not attempt to show all of the possible configurations and layered connections that are available now that you can use Jira as a directory manager.

#### On this page:

- [Confluence Internal Directory](#)
- [Confluence with Read/Write Connection to LDAP](#)
- [Confluence with Read-Only Connection to LDAP, with Local Groups](#)
- [Confluence Internal Directory with LDAP Authentication](#)
- [Confluence with LDAP Authentication, Copy Users on First Login](#)
- [Confluence Connecting to Jira](#)
- [Confluence Connecting to Jira and Jira Connecting to LDAP](#)
- [Confluence and Jira Connecting to Crowd](#)

#### Related pages:

- [Configuring User Directories](#)

### Confluence Internal Directory

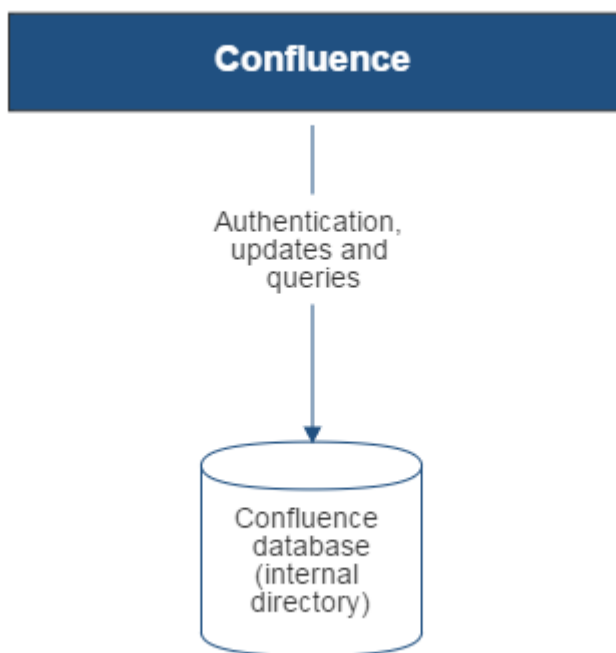


Diagram above: Confluence using its internal directory for user management.

#### Confluence with Read/Write Connection to LDAP

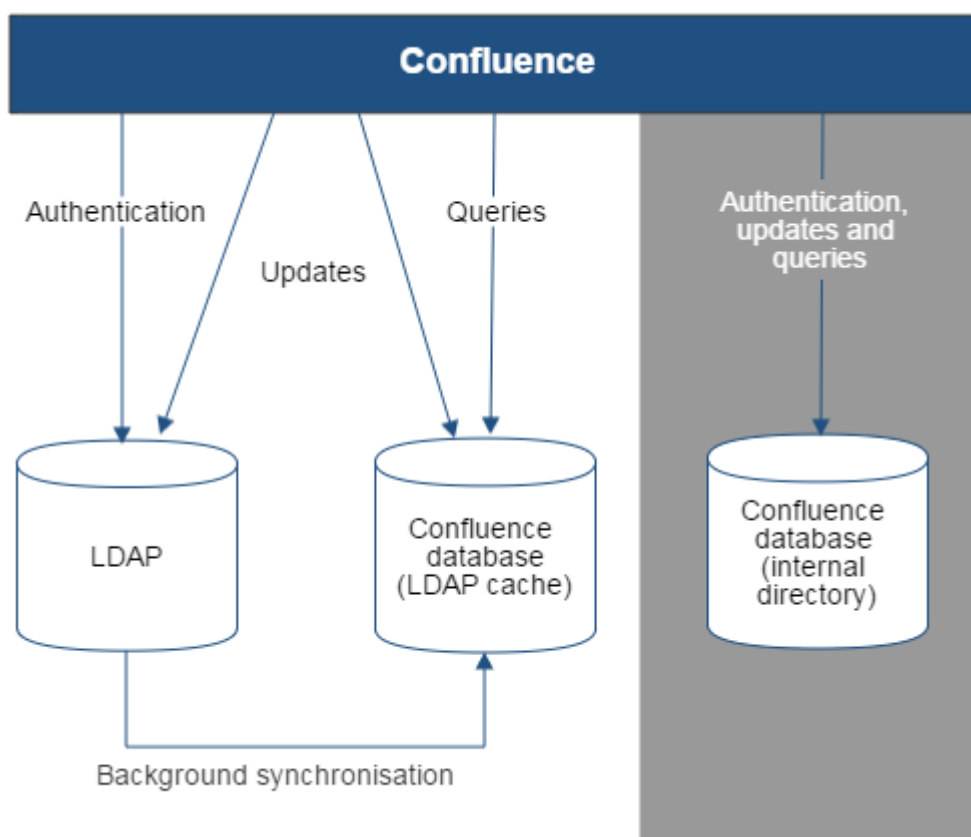


Diagram above: Confluence connecting to an LDAP directory.

#### Confluence with Read-Only Connection to LDAP, with Local Groups

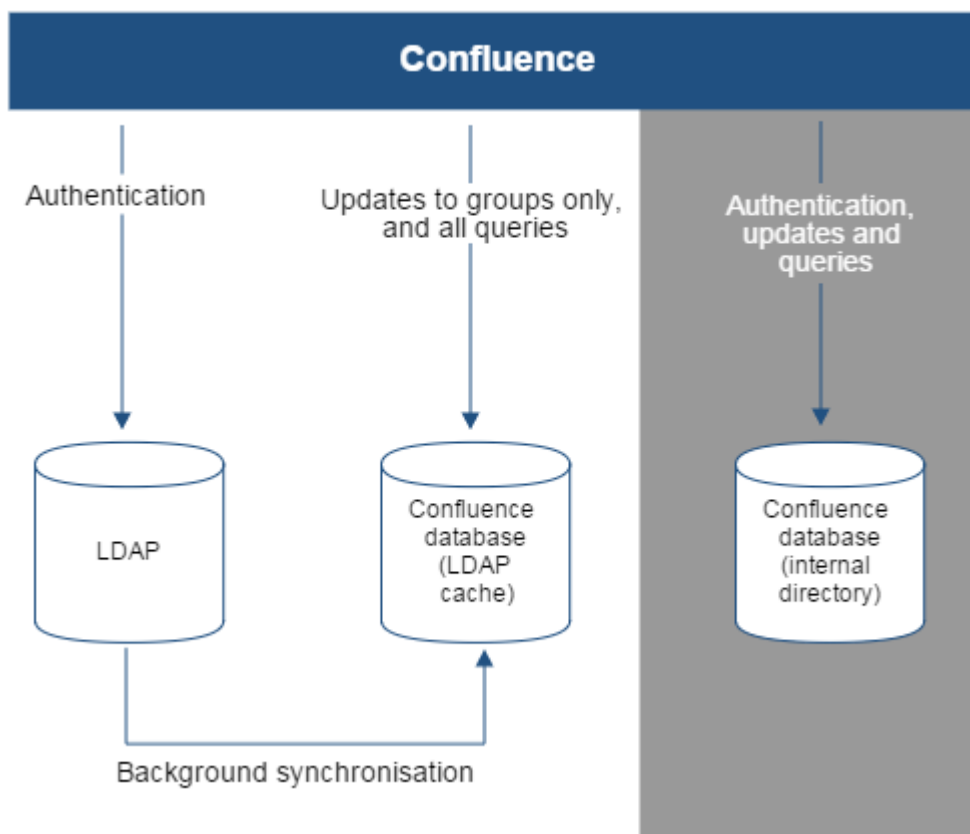


Diagram above: Confluence connecting to an LDAP directory with permissions set to read only and local groups.

#### Confluence Internal Directory with LDAP Authentication

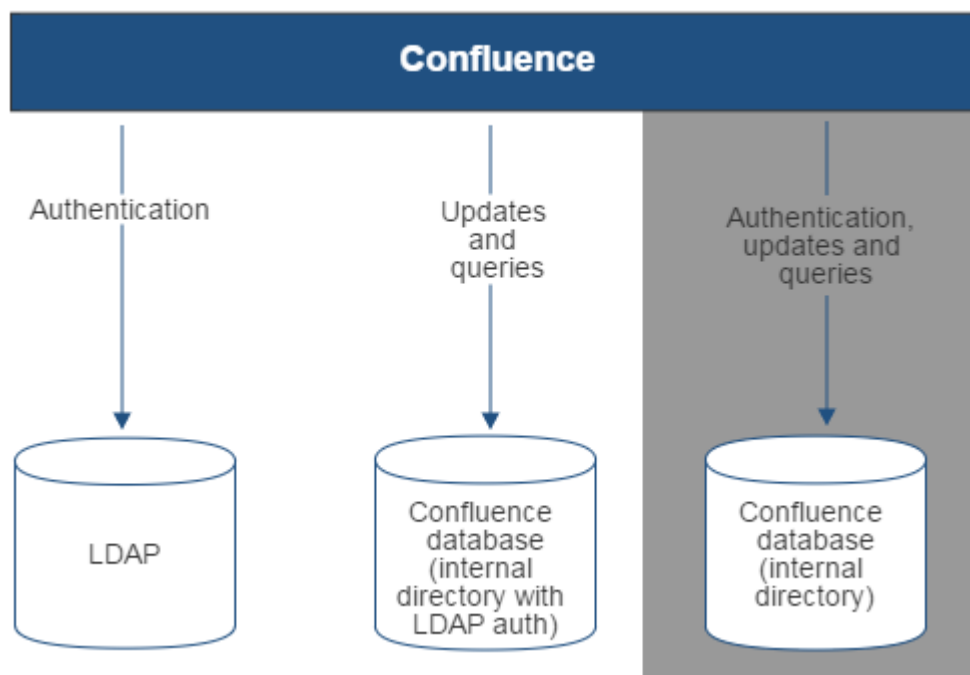


Diagram above: Confluence connecting to an LDAP directory for authentication only.

#### Confluence with LDAP Authentication, Copy Users on First Login

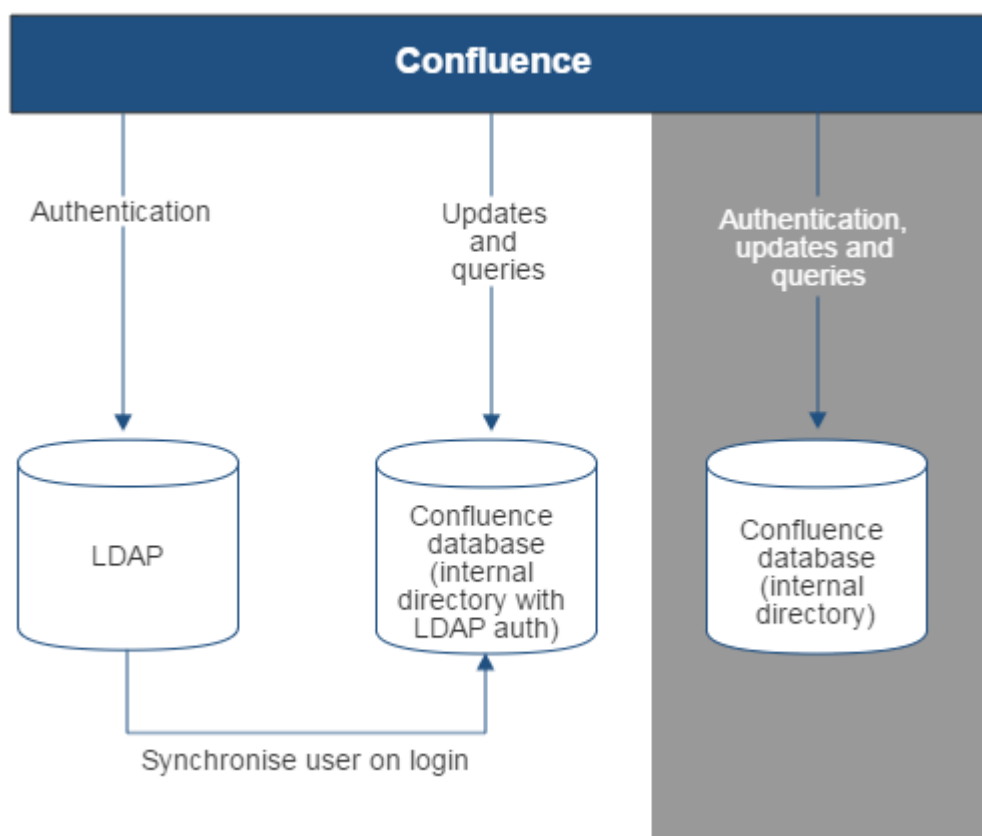


Diagram above: Confluence connecting to an LDAP directory for authentication only, with each user synchronized with the internal directory that is using LDAP authentication when they log in to Confluence.

#### Confluence Connecting to Jira

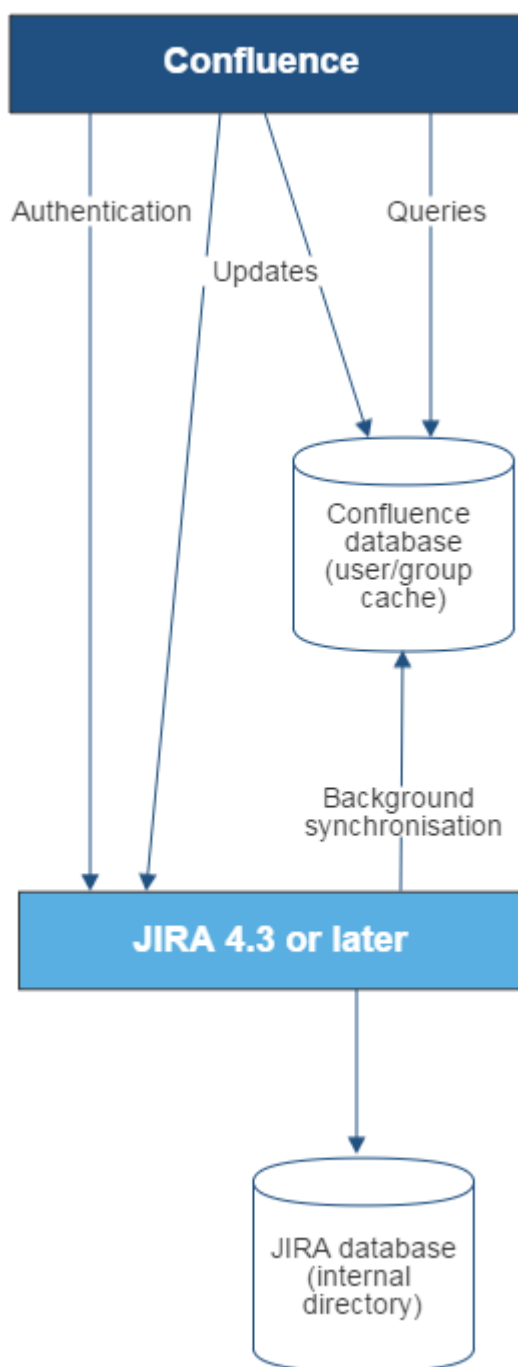


Diagram above: Confluence connecting to JIRA for user management.

Confluence Connecting to Jira and Jira Connecting to LDAP

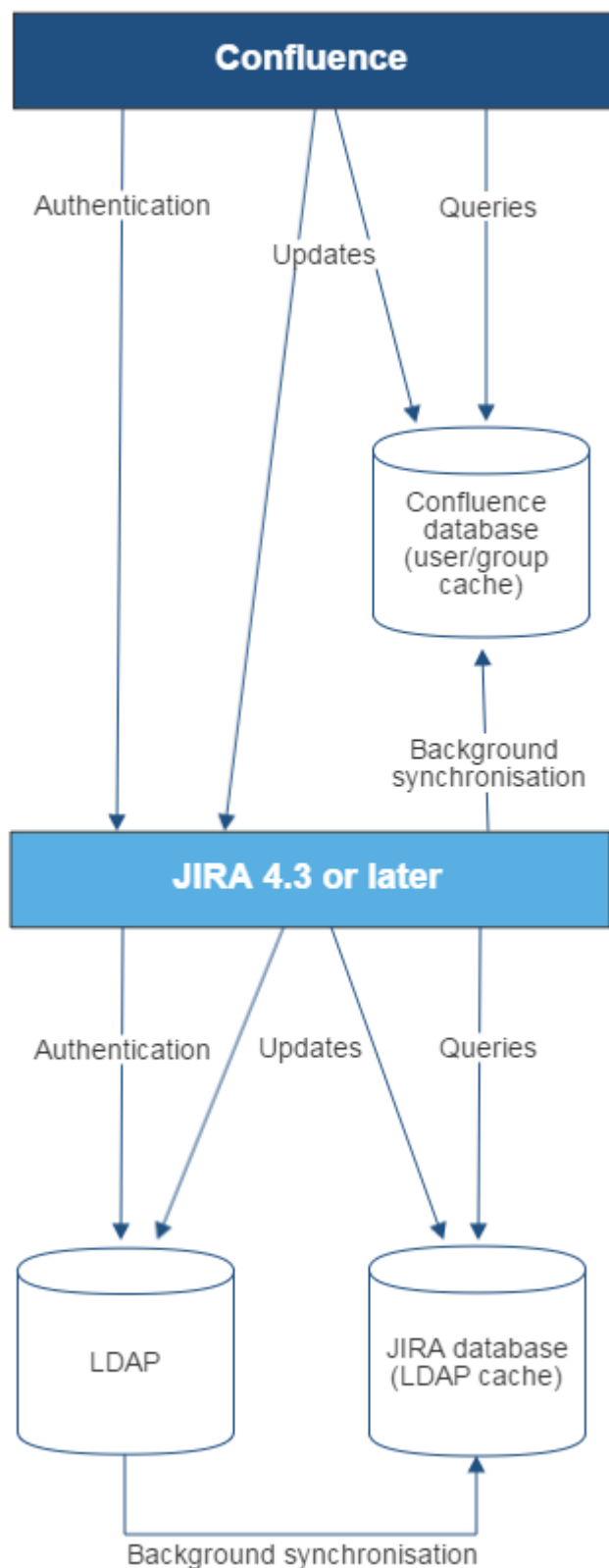


Diagram above: Confluence connecting to JIRA for user management, with JIRA in turn connecting to LDAP.

#### Confluence and Jira Connecting to Crowd

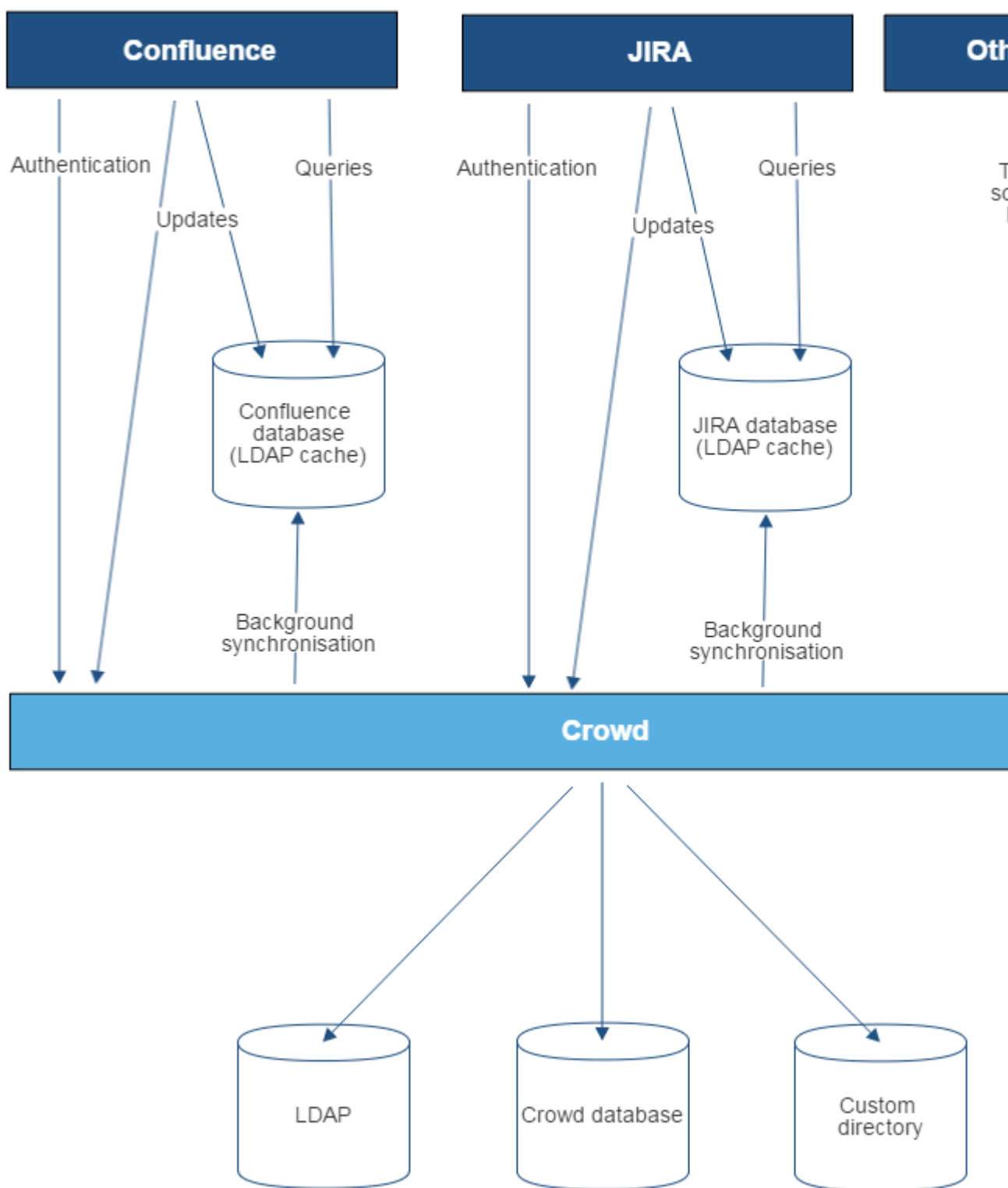


Diagram above: Confluence, JIRA and other applications connecting to Crowd for user management.

### User Management Limitations and Recommendations

This page describes the optimal configurations and limitations that apply to user management in Confluence.

#### General Recommendations

- **Avoid duplicate usernames across directories.** If you are connecting to more than one user directory, we recommend that you ensure the usernames are unique to one directory. For example, we do not recommend that you have a user `jsmith` in both 'Directory1' and 'Directory2'. The reason is the potential for confusion, especially if you swap the order of the directories. Changing the directory order can change the user that a given username refers to.
- **Be careful when deleting users in remote directories.** If you are connecting to an LDAP directory, a Crowd directory or a Jira directory, please take care when deleting users from the remote directory. If you delete a user that is associated with data in Confluence, this will cause problems in Confluence.
- **Avoid hash, slash and question characters in usernames** - there is a known issue where users with `#`, `?` or `/` in their username cannot create spaces. See



and  
for more  
information.

#### On this page:

- [General Recommendations](#)
- [Recommendations for Connecting to LDAP](#)
  - [Optimal Number of Users and Groups in your LDAP Directory](#)
  - [Redundant LDAP is Not Supported](#)
  - [Specific Notes for Connecting to Active Directory](#)
- [Recommendations for Connecting to Jira for User Management](#)
  - [Single Sign-On Across Multiple Applications is Not Supported](#)
  - [Custom Application Connectors are Not Supported](#)
  - [Custom Directories are Not Supported](#)
  - [Load on your JIRA instance](#)
  - [JIRA Cloud applications not supported](#)
  - [Recommendations](#)

#### Related pages:

- [Connecting to an LDAP Directory](#)
- [Connecting to Crowd or Jira for User Management](#)
- [Configuring User Directories](#)

### Recommendations for Connecting to LDAP

Please consider the following limitations and recommendations when connecting to an LDAP user directory.

#### *Optimal Number of Users and Groups in your LDAP Directory*

The connection to your LDAP directory provides powerful and flexible support for connecting to, configuring and managing LDAP directory servers. To achieve optimal performance, a background synchronization task loads the required users and groups from the LDAP server into the application's database, and periodically fetches updates from the LDAP server to keep the data in step. The amount of time needed to copy the users and groups rises with the number of users, groups, and group memberships. For that reason, we recommended a maximum number of users and groups as described below.

This recommendation affects connections to LDAP directories:

- Microsoft Active Directory
- All other LDAP directory servers

The following LDAP configurations are **not** affected:

- Internal directories with LDAP authentication
- LDAP directories configured for 'Authentication Only, Copy User On First Login'

Please choose one of the following solutions, depending on the number of users, groups and memberships in your LDAP directory.

Your environment	Recommendation
------------------	----------------



Up to 10 000 (ten thousand) users, 1000 (one thousand) groups, and 20 (twenty) groups per user	Choose the ' <b>LDAP</b> ' or ' <b>Microsoft Active Directory</b> ' directory type. You can make use of the full synchronization option. Your application's database will contain all the users and groups that are in your LDAP server.
More than the above	Use LDAP filters to reduce the number of users and groups visible to the synchronization task.

#### *Our Test Results*

We performed internal testing of synchronization with an AD server on our local network consisting of 10 000 users, 1000 groups and 200 000 memberships.

We found that the initial synchronization took about 5 minutes. Subsequent synchronizations with 100 modifications on the AD server took a couple of seconds to complete.

Please keep in mind that a number of factors come into play when trying to tune the performance of the synchronization process, including:

- **Size of userbase.** Use LDAP filters to keep this to the minimum that suits your requirements.
- **Type of LDAP server.** We currently support change detection in AD, so subsequent synchronizations are much faster for AD than for other LDAP servers.
- **Network topology.** The further away your LDAP server is from your application server, the more latent LDAP queries will be.
- **Database performance.** As the synchronization process caches data in the database, the performance of your database will affect the performance of the synchronization.
- **JVM heap size.** If your heap size is too small for your userbase, you may experience heavy garbage collection during the synchronization process which could in turn slow down the synchronization.

#### *Redundant LDAP is Not Supported*

The LDAP connections do not support the configuration of two or more LDAP servers for redundancy (automated failover if one of the servers goes down).

#### *Specific Notes for Connecting to Active Directory*

When the application synchronizes with Active Directory (AD), the synchronization task requests only the changes from the LDAP server rather than the entire user base. This optimizes the synchronization process and gives much faster performance on the second and subsequent requests.

On the other hand, this synchronization method results in a few limitations:

1. **Externally moving objects out of scope or renaming objects causes problems in AD.** If you move objects out of scope in AD, this will result in an inconsistent cache. We recommend that you do not use the external LDAP directory interface to move objects out of the scope of the sub-tree, as defined on the application's directory configuration screen. If you do need to make structural changes to your LDAP directory, manually synchronize the directory cache after you have made the changes to ensure cache consistency.
2. **Synchronizing between AD servers is not supported.** Microsoft Active Directory does not replicate the uSNChanged attribute across instances. For that reason, we do not support connecting to different AD servers for synchronization. (You can of course define multiple different directories, each pointing to its own respective AD server.)
3. **Synchronizing with AD servers behind a load balancer is not supported.** As with synchronizing between two different AD servers, Microsoft Active Directory does not replicate the uSNChanged attribute across instances. For that reason, we do not support connecting to different AD servers even when they are load balanced. You will need to select one server (preferably one that is local) to synchronize with instead of using the load balancer.
4. **You must restart the application after restoring AD from backup.** On restoring from backup of an AD server, the uSNChanged timestamps are reverted to the backup time. To avoid the resulting confusion, you will need to flush the directory cache after a Active Directory restore operation.
5. **Obtaining AD object deletions requires administrator access.** Active Directory stores deleted objects in a special container called cn=Deleted Objects. By default, to access this container you need

to connect as an administrator and so, for the synchronization task to be aware of deletions, you must use administrator credentials. Alternatively, it is possible to change the permissions on the cn=Deleted Objects container. If you wish to do so, please see [this Microsoft KB article](#).

6. **The User DN used to connect to AD must be able to see the uSNChanged attribute.** The synchronization task relies on the uSNChanged attribute to detect changes, and so must be in the appropriate AD security groups to see this attribute for all LDAP objects in the subtree.

### Recommendations for Connecting to Jira for User Management

Please consider the following limitations and recommendations when connecting to a JIRA server for user management.

#### **Single Sign-On Across Multiple Applications is Not Supported**

When you connect to a JIRA application for user management, you will not have single sign-on across the applications connected in this way. JIRA, when acting as a directory manager, does not support SSO.

#### **Custom Application Connectors are Not Supported**

JIRA applications, Confluence, FishEye, Crucible and Bamboo can connect to a JIRA server for user management. Custom application connectors will need to use the new REST API.

#### **Custom Directories are Not Supported**

Earlier versions of JIRA supported OSUser Providers. It was therefore possible write a special provider to obtain user information from any external user directory. This is no longer the case.

#### **Load on your JIRA instance**

If your JIRA instance is already under high load, then using it as a User Server will increase that load.

#### **JIRA Cloud applications not supported**

You cannot use JIRA Cloud applications to manage standalone users. Cloud users and users within your self-hosted Atlassian applications need to be managed separately.

### Recommendations

Your environment	Recommendation
<p>If <b>all</b> the following are true:</p> <ul style="list-style-type: none"> <li>• Your JIRA application is not under high load.</li> <li>• You want to share user and group management across just a few applications, such as one JIRA Software server and one Confluence server, or two JIRA servers.</li> <li>• You do not need single sign-on (SSO) between your JIRA application and Confluence, or between two JIRA servers.</li> <li>• You do not have custom application connectors. Or, if you do have them, you are happy to convert them to use the new REST API.</li> <li>• You are happy to shut down all your servers when you need to upgrade your JIRA application.</li> </ul>	<p>Your environment meets the optimal requirements for using a JIRA application for user management.</p>

<p>If <b>one or more</b> of the following are true:</p> <ul style="list-style-type: none"> <li>• If your JIRA application is already under high load.</li> <li>• You want to share user and group management across more than 5 applications.</li> <li>• You need single sign-on (SSO) across multiple applications.</li> <li>• You have custom applications integrated via the Crowd SOAP API, and you cannot convert them to use the new REST API.</li> <li>• You are not happy to shut down all your servers when you need to upgrade JIRA.</li> </ul>	<p>We recommend that you install <a href="#">Atlassian Crowd</a> for user management and SSO.</p>
<p>If you are considering creating a custom directory connector to define your own storage for users and groups...</p>	<p>Please see if one of the following solutions will work for you:</p> <ul style="list-style-type: none"> <li>• If you have written a custom provider to support a specific LDAP schema, please check the supported LDAP schemas to see if you can use one of them instead.</li> <li>• If you have written a custom provider to support nested groups, please consider enabling nested groups in the supported directory connectors instead.</li> <li>• If you have written a custom provider to connect to your own database, please consider loading the data into the application's database instead.</li> <li>• If you need to keep the custom directory connection, please consider whether <a href="#">Atlassian Crowd</a> meets your requirements. See the documentation on <a href="#">Creating a Custom Directory Connector</a>.</li> </ul>

## Requesting Support for External User Management

This page gives guidelines on how to request help from the Atlassian support team if you are having problems with external user management. External user management includes connections to Active Directory, other LDAP servers, Atlassian Crowd or a Jira application for user management. The information on this page is provided in addition to the more general page on [Troubleshooting Problems and Requesting Technical Support](#).

The cause of such problems may be:

- The LDAP server is not responding.
- The application password is incorrectly configured, causing the LDAP server or other directory to return an authentication error.
- Other LDAP settings are incorrectly configured.

### Troubleshooting the Connection to your External User Directory

The configuration screen for external directories in Confluence has a '**Test Settings**' button. This will help you to diagnose problems with user management in Active Directory and other LDAP servers.

#### To test your directory connection:

1. Choose the **cog icon**

#### On this page:

- [Troubleshooting the Connection to your External User Directory](#)
- [Problems During Initial Setup](#)
- [Complex Authentication or Performance Problems](#)

#### Related pages:

- [Troubleshooting Problems and Requesting Technical Support](#)
- [Configuring User Directories](#)



- , then choose **General Configuration** under Confluence Administration
2. Click '**User Directories**' in the left-hand panel.
3. **Edit** the relevant directory.
4. Click '**Test Settings**'.
5. The results of the test will appear at the top of the screen.

Please refer to our knowledge base articles for [troubleshooting user management and login issues](#).

If the above resources do not help, continue below.

### Problems During Initial Setup

Raise a [support request](#) and include the following information.

- Download an LDAP browser to make sure you have the right settings in your LDAP directory. Atlassian recommends [LDAP Studio](#). Include screenshots of your user and group DNs.
- If you can start up Confluence and access the Administration Console, review your directory settings. See [Connecting to an LDAP Directory](#). Attach screenshots of all your settings.

### Complex Authentication or Performance Problems

Raise a [support request](#) and include the following information.

#### Confluence Server

Log in to Confluence and access the Administration Console.

- Take a screenshot of the '**System Information**' screen, or save the page as HTML.
- Take a screenshot of the '**Global Permissions**' screen, if people are having problems with logging in.
- Go to '**Space Admin**' for the relevant space and take a screenshot of the '**Permissions**' page, if you are having problems with space or page permissions.

#### Confluence Configuration Files

- If you have implemented a custom authenticator or in any way modified `seraph-config.xml` or `seraph-paths.xml`, please provide the modified file.

#### User Management System

- Include the name and version of your LDAP server.
- Does your LDAP server use dynamic or static groups?
- Review your directory settings. See [Connecting to an LDAP Directory](#). Attach screenshots of all your settings.

#### Diagnostics

- Enable profiling. See [Performance Tuning](#).
- Enable detailed user management logging, by editing `confluence/WEB-INF/classes/log4j.properties`.

Change this section:

```
###
# Atlassian User
###
#log4j.logger.com.atlassian.user=DEBUG
#log4j.logger.com.atlassian.confluence.user=DEBUG
#log4j.logger.bucket.user=DEBUG
#log4j.logger.com.atlassian.seraph=DEBUG
#log4j.logger.com.opensymphony.user=DEBUG
```

Remove the '#' signs at the beginning of the lines, so that it looks like this:

```
###
# Atlassian User
###
log4j.logger.com.atlassian.user=DEBUG
log4j.logger.com.atlassian.confluence.user=DEBUG
log4j.logger.bucket.user=DEBUG
log4j.logger.com.atlassian.seraph=DEBUG
log4j.logger.com.opensymphony.user=DEBUG
```

- After enabling both the above, please attempt a Confluence LDAP account login and attach a copy of the log files that are produced when the problem occurs. To do this, locate your install directory, then zip the full `/logs` directory into a single file for us to examine. The logs directory is located in your Confluence Home directory.

## Disabling the Built-In User Management

In some circumstances you may want to disable Confluence's built in user management, and delegate all user management to an external application, such as Jira Software or Jira Service Desk. You can disable internal user management by turning on Confluence's **External User Management** setting. You'll need to be a [system administrator](#) to do this.

You might disable Confluence's internal user management:

- When [Crowd's directory permissions](#) are configured so that Confluence cannot update the Crowd directories (as a system error will occur when Confluence attempts to write data into Crowd). See [Connecting to Crowd or Jira for User Management](#) for more information.
- If you are using a Jira application for user management. This centralizes all user management in that Jira app. See [Connecting to Crowd or Jira for User Management](#).

To disable management of users and groups within Confluence:



1. > **General Configuration > Security Configuration.**
2. Click **Edit**.
3. Select the **External user management** checkbox then **Save** your change.

**Note:** If you turn on **External user management**:

- You will not be able to add users or groups in Confluence.
- You will not be able to use public signup in your site.
- The **Forgot Password** link will not appear on the Confluence login page.
- Users will not be able to reset their password in Confluence.

## SAML SSO for Confluence Data Center

Security Assertion Markup Language (SAML) is an XML-based data format that allows a service to exchange authorization data with an identity provider (IdP). The most common use case is allowing a user to sign in to multiple software applications using the same authentication details, usually a username and password. This is referred to as single sign-on (SSO).

We provide the functionality for Confluence Data Center to connect to your IdP so that you can provide your users with an SSO experience. This *only* handles authentication. Application access and any required authorizations, such as ensuring that users belong to the appropriate groups/roles and

### On this page:

- [Supported Identity Providers](#)
- [Set up single sign-on](#)
- [Set up SSL/TLS](#)
- [Set up your identity provider](#)
- [Configure SAML Authentication in your Atlassian application](#)
- [Best practices](#)
- [Troubleshooting](#)

have the necessary permissions, should be configured in the user directory and/or the application itself.

### Supported Identity Providers

SAML single sign-on should work with any identity provider implementing the SAML 2.0 Web Browser SSO Profile, using the HTTP POST binding.

We currently perform tests with the following identity providers:

- [Microsoft Active Directory \(using ADFS 3.0\)](#)
- [Microsoft Azure Active Directory](#)
- [OneLogin](#)
- [Okta](#)
- [PingIdentity](#)

### Set up single sign-on

You'll need to configure your application and your IdP to provide single sign-on for your users.

### Set up SSL/TLS

To make sure that SAML authentication is secure and private, you need to set up SSL/TLS in the application. See [Running Confluence Over SSL or HTTPS](#) for more information.

Once set up, you need to make sure that the application's [configured base URL](#) is using the HTTPS protocol.

If you want to use a **reverse proxy**, check out the following guides:

- [Proxying Atlassian server applications with Apache HTTP Server \(mod\\_proxy\\_http\)](#)
- [Securing your Atlassian applications with Apache using SSL](#)

When using a reverse proxy that terminates SSL/TLS, you need to make sure that the request URL the application server sees matches the fully-qualified domain name for the reverse proxy. This is usually achieved by configuring the `<Connector>` directive with the appropriate `proxyName`, `proxyPort`, `secure` and `scheme` settings. Please check the documentation above for specific examples.

### Set up your identity provider

If you want Confluence to provide SSO, you'll need to add it to your IdP. The exact process varies depending on the IdP, but you'll usually need to:

- Define an 'application' in your IdP
- Provide some data about the application, including data you can access on your application's [Authentication](#) screen
- Make sure the NameID attribute of the users in your IdP is set to the username in your Atlassian application
- Give the appropriate users permission to use the application

At the end of the setup process your IdP will provide you with a set of data that you'll need to configure your Atlassian application.

### Configure SAML Authentication in your Atlassian application

To configure SAML authentication in Confluence:

1. Go to



> **General Configuration**

> **SAML Authentication.**

2. Select **SAML single sign-on**.

Configure the following settings:

---



Setting	Notes
Single sign-on issuer	<p>This value is provided by your IdP, as part of setting up SAML. It's sometimes also called 'Entity ID'</p> <p>The issuer is the IdP your application will be accepting authentication requests from</p>
Identity provider single sign-on URL	<p>This value is provided by your IdP, as part of setting up SAML.</p> <p>It defines the URL your users will be redirected when logging in.</p>
X.509 Certificate	<p>This value is provided by your IdP, as part of setting up SAML. This is sometimes referred to as a 'Signing certificate'. The key usually starts with '-----BEGIN CERTIFICATE-----'.</p> <p>This contains the public key we'll use to verify that all received SAML authentication requests have been issued by your IdP.</p>
Login mode	<p>This defines how your users can use single-sign on. The options are:</p> <ul style="list-style-type: none"> <li>• <b>Use SAML as secondary authentication</b> – the default way to log in will be the standard application login form. You can log in using SAML if you go to your IdP and select your application, or by using the this URL to log in: <i>BASE-URL/plugin/servlet/external-login</i>. We recommended this method so you can test that everything is configured correctly, and that users can log in using SSO.</li> <li>• <b>Use SAML as primary authentication</b> – in this mode, all browser-based users will be redirected from the application's login screen to the IdP to log in. It's still possible to authenticate by: <ul style="list-style-type: none"> <li>• Basic Auth</li> <li>• Form-based auth via dedicated REST endpoint</li> <li>• Existing Remember Me tokens</li> </ul> </li> </ul> <p>You should only enable this mode once you've verified that SAML authentication is working as expected.</p>
Remember user logins	<p>When checked, successful user logins will be remembered in the user's browser. When browsing to their application, users will be logged in automatically without having to authenticate again using SAML.</p> <p>Confluence Data Center uses 'remember me' to enable users to move seamlessly between nodes. Turning <b>Remember user logins</b> off in this screen can override this Confluence behaviour and lead to users needing to log in again each time they move to another node. We recommend keeping <b>Remember user logins</b> enabled.</p>

3. The following information is provided on the Authentication screen, and will be required to configure your IdP:

Setting name	Notes
Assertion Consumer Service URL	This is the URL the IdP will return SAML authentication requests to.
Audience URL (Entity ID)	This is the URL the IdP will prepare SAML authentication requests for.

4. Click **Save configuration**.

Once you've configured both your application and your IdP, you're ready to start using SSO.

#### Best practices

- SAML authentication requests are only valid for a limited time. You should make sure the clocks on

the server running your application/s and the IdP are synchronised.

- If users and groups in your application are configured using [User Directories](#), you'll usually want to use the same LDAP directory to be the source of users for both your IdP and Atlassian application. Users need to exist in the user directory *before* they can log in using SSO.

### Troubleshooting

- If you make a mistake configuring the SAML authentication, or are unable to log in using your IdP, you can restore login form authentication by using issuing a DELETE request (using a username and password for an administrator configured in your user directory):

```
curl -u admin_user:admin_password -X DELETE
http://base-url/product/rest/authconfig/1.0/saml
```

- If an authentication error occurs, the user will only see basic details about what went wrong. For security reasons, the details about the underlying problem are not shown. You'll need to check the application logs to see the cause of the problem.
- In some cases you might also experience errors shown by your IdP. For those you will need to use the support and tools provided by your IdP, rather than Atlassian support.
- When using **SAML as primary authentication** and you have CAPTCHA enabled in the application, users that use HTTP basic authentication (for example in REST resource calls) may get locked out if they enter an incorrect password too many times. In these cases, an administrator will need to reset the user's CAPTCHA in the user list screen.

## Managing Add-ons or Plugins

An **add-on** is a separately installed component that provides Confluence functionality. The terms 'plugin' and 'add-on' are often used interchangeably.

There are two main types of add-ons:

- System add-ons - these are bundled with Confluence and provide core functionality
- User installed add-ons - these are usually downloaded from [The Marketplace](#) and may have been created by Atlassian or by a third party developer.

For information about developing your own add-ons for Confluence, see the [Confluence Server Developer documentation](#).

### About the Universal Plugin Manager

Add-ons are managed via the Universal Plugin Manager (known as the UPM). The UPM can be found in most Atlassian applications, and provides a consistent experience for administering add-ons. To visit the UPM, go to



> **Add-ons** in the Confluence header.

The UPM allows you to:

- Discover and install new add-ons from the [Atlassian Marketplace](#).
- Install or remove add-ons.
- Configure add-on settings.
- Enable or disable add-ons and their component modules.
- Confirm add-on compatibility before upgrading Confluence.

You'll need Confluence Administrator permissions to access the UPM. See [Request Add-ons](#) for information on how users can find and request add-ons.

See the [Universal Plugin Manager documentation](#) for more information on using the UPM.

### Disable and uninstall add-ons

You can disable or unsubscribe from user installed add-ons that are no longer being used on your site. See [Disa](#)



[bling and enabling add-ons](#) to find out how to do this.

Once the add-on is disabled, its features are immediately unavailable. If the add-on included macros, pages that contained those macros will show an 'unknown macro' error. To avoid this, you can check which macros are being used on your site before disabling an add-on by checking the macro usage statistics.

Go to



> **General Configuration**  
> **Macro Usage.**

## Writing User Macros

User macros are useful if you want to create your own custom macros. These can be to perform specific actions, apply custom formatting and much more.

User macros are created and managed within Confluence itself, you do not need to develop an add-on. You will need some coding skills though.

You'll need System Administrator permissions to create and manage user macros.

### On this page:


- [Create a User Macro](#)
- [Edit a user macro](#)
- [Delete a user macro](#)
- [Best practices](#)
- [Example user macros](#)

### Related Pages:

- [User Macro Module](#) (Developer documentation)

### Create a User Macro

To add a new user macro:

1. Go to  > **General Configuration** > **User Macros**
2. Choose **Create a User Macro**
3. Enter the macro details (see table below)
4. Click **Add**


Macro details field	Description
<b>Macro name</b>	This is the name of the macro, as it appears in the code.
<b>Visibility</b>	<p>This controls who can see this macro in the macro browser or auto-complete. Options are:</p> <ul style="list-style-type: none"> <li>• Visible to all users</li> <li>• Visible only to system administrators</li> </ul> <p>Note that if you select Visible only to system administrators, users will still see the output of the macro on a page, and the macro placeholder will still be visible when a user edits a page. It is only hidden in the macro browser and autocomplete.</p> <p>All macro information is discoverable, including the macro title, description, parameter names and other metadata. Do not include confidential data anywhere in the definition of a user macro, even if it is marked as visible only to system administrators.</p>
<b>Macro Title</b>	This is the title that will appear in the macro browser and auto-complete.
<b>Description</b>	This is the description that will appear in the macro browser. The macro browser's search will pick up matches in both the title and description.

<b>Categories</b>	Select one or more macro browser categories for your macro to appear in.
<b>Icon URL</b>	Enter an absolute URL (for example <code>http://mysite.com/mypath/status.png</code> ) or path relative to the Confluence base URL (for example <code>/images/icons/macrobrowser/status.png</code> ) if you want the macro browser to display an icon for your macro.
<b>Documentation URL</b>	If you have documentation for your macro, enter the URL here.
<b>Macro Body Processing</b>	<p>Specify how Confluence should process the body before passing it to your macro.</p> <p>The macro body is the content that is displayed on a Confluence page. If your macro has a body, any body content that the user enters will be available to the macro in the <code>\$body</code> variable.</p> <p>Options for processing the macro body include:</p> <ul style="list-style-type: none"> <li>• <b>No macro body</b> Select this option if your macro does not have a body.</li> <li>• <b>Escaped</b> Confluence will add escape characters to the HTML markup in the macro body. Use this if you want to show actual HTML markup in the rendered page. For example, if the body is <code>&lt;b&gt;Hello World&lt;/b&gt;</code> it will render as <code>&lt;b&gt;Hello World&lt;/b&gt;</code>.</li> <li>• <b>Unrendered</b> HTML in the body will be processed within the template before being output. Ensure that HTML is ultimately output by the template.</li> <li>• <b>Rendered</b> Confluence will recognize HTML in the macro body, and render it appropriately. For example, if the body is <code>&lt;b&gt;Hello World&lt;/b&gt;</code> it will render as <b>Hello World</b>.</li> </ul>
<b>Template</b>	<p>This is where you write the code that determines what the macro should do.</p> <ul style="list-style-type: none"> <li>• Use HTML and Confluence-specific XML elements in the macro template.</li> <li>• You can use the <a href="#">Velocity</a> templating language. Here is more information on <a href="#">the Velocity project</a>.</li> <li>• If your macro has a body, your template can refer to the macro body text by specifying <code>'\$body'</code>.</li> <li>• Each parameter variable you use must have a matching metadata definition. Use <code>@param</code> to define metadata for your macro parameters.</li> <li>• When using the information passed using parameters, refer to your parameters as <code>\$paramXXX</code> where 'XXX' is the parameter name that you specified in the <code>@param</code> metadata definition.</li> <li>• Use <code>@noparams</code> if your macro does not accept parameters.</li> </ul> <p>See <a href="#">User Macro Template Syntax</a> for more information and examples.</p>

**Do you need a plugin instead?**

If you want to distribute your user macro as a plugin, please refer to the developer's guide to the [User Macro plugin module](#). If you want to create more complex, programmatic macros in Confluence, you may need to write a [Macro plugin](#).


**Edit a user macro****To edit a user macro:**

1. Go to  **> General Configuration > User Macros**
2. Click **Edit** next to the relevant macro

3. Update the macro details
4. Click **Save**

## Delete a user macro

To delete a user macro:

1. Go to  **> General Configuration > User Macros**
2. The currently configured user macros will appear
3. Click **Delete** next to the relevant macro

Before deleting a user macro, you should [search](#) for all occurrences of the macro in pages and blog posts. Users will see an 'unknown macro' error if you delete a user macro that is still in use on a page.

## Best practices

This section contains tips and suggestions for best practices when creating your own user macros.

### Add a descriptive header to your macro template

We recommend that you include a short description as a comment at the top of the **Template** field as shown below.

```
## Macro title: My macro name
## Macro has a body: Y or N
## Body processing: Selected body processing option
## Output: Selected output option
##
## Developed by: My Name
## Date created: dd/mm/yyyy
## Installed by: My Name

## Short description of what the macro does
```

### Expose your parameters in the macro browser

The macro browser is the easiest way for users to configure your macro. You can specify the macro category, link to an icon, define the parameters that the macro browser will use to prompt the user for information, and more.

### Supply default values for macro parameters

As you can't guarantee that a user has supplied parameters, one of the first things to do in the macro is check that you have received some value if you expect to rely on it later on in the macro code.

In the example below, the macro expects three parameters, and substitutes sensible defaults if they are not supplied.

```
#set($spacekey= $paramspacekey)
#set($numthreads= $paramnumthreads)
#set($numchars= $paramnumchars)

## Check for valid space key, otherwise use current
#if (!$spacekey)
    #set ($spacekey=$space.key)
#end

## Check for valid number of threads, otherwise use default of 5
#if (!$numthreads)
    #set ($numthreads=5)
#end

## Check for valid excerpt size, otherwise use default of 35
#if (!$numchars)
    #set ($numchars=35)
#end
```

### Consider security implications

We recommend thoroughly testing your user macro with a number of permission scenarios, such as restricted pages and space permissions to avoid inadvertently displaying content that a user has no permission to see. See [User Macro Template Syntax](#) for more information.

### Example user macros

#### ▼ Hello World

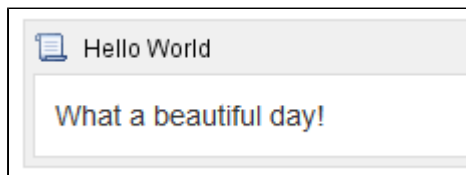
This example demonstrates how to create a user macro that displays the text 'Hello World!' and any text that the user places in the body of the macro.

Field	Value
<b>Macro name</b>	helloworld
<b>Visibility</b>	Visible to all users in the Macro Browser
<b>Macro Title</b>	Hello World
<b>Description</b>	Displays "Hello World" and the macro body.
<b>Categories</b>	Confluence Content
<b>Icon URL</b>	You can leave this field blank
<b>Documentation URL</b>	You can leave this field blank
<b>Macro body processing</b>	Rendered

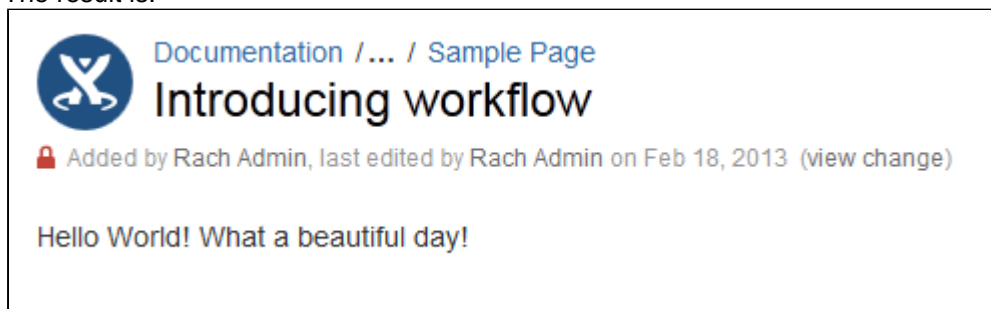
<b>Template</b>	<p>Enter the code below in the template field - this example will print the text straight onto the page.</p> <pre>## @noparams Hello World! \$body</pre> <p>If you wanted the text to appear in a panel you could include the relevant <a href="#">AUI message class</a> as shown here.</p> <pre>## @noparams &lt;div class="aui-message closeable"&gt; Hello World! \$body &lt;/div&gt;</pre>
-----------------	--

### Using the 'Hello World' macro on a page

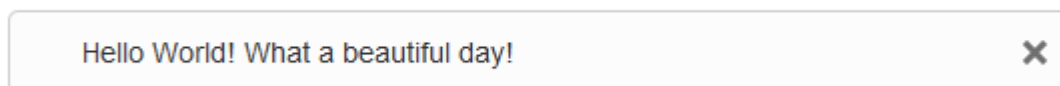
Now you can add the macro to your Confluence page using the Macro Browser, or by typing {hello in the editor and selecting the macro from the list of suggestions.



The result is:



If you chose to include a panel, the result would be:



### ▼ NoPrint

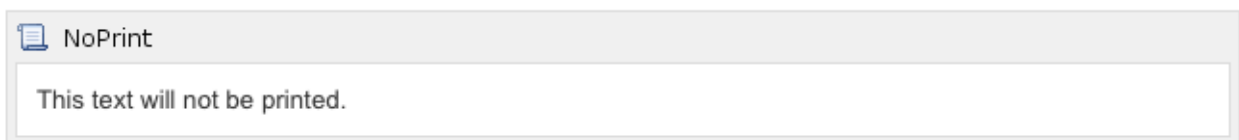
This example demonstrates how to create a user macro that can contain text that is visible when viewing a page, but does not print.

Field	Value
<b>Macro name</b>	noprint
<b>Visibility</b>	Visible to all users in the Macro Browser

<b>Macro Title</b>	No Print
<b>Description</b>	Hides text from printed output.
<b>Categories</b>	Confluence Content
<b>Icon URL</b>	You can leave this field blank
<b>Documentation URL</b>	You can leave this field blank
<b>Macro body processing</b>	Rendered
<b>Template</b>	<div>Enter the code below in the template field.<div><pre>## @noparams &lt;div class="noprint"&gt;\$body&lt;/div&gt;</pre></div></div>

### Using the 'NoPrint' Macro on a page

Now you can add the macro to your Confluence page using the Macro Browser. Text entered into the body of the macro placeholder will not be printed, but will appear when the page is viewed online.



### Making the PDF export recognize the NoPrint macro

See [Advanced PDF Export Customizations](#).

#### ▼ Color and Size

This example demonstrates how you can pass parameters to your macro. We'll create a font style macro which has two parameters to allow the user to specify the color and size of the text contained in the macro body.

Field	Value
<b>Macro name</b>	stylish
<b>Visibility</b>	Visible to all users in the Macro Browser
<b>Macro Title</b>	Stylish
<b>Description</b>	Applies colour and size to text.
<b>Categories</b>	Confluence Content
<b>Icon URL</b>	You can leave this field blank
<b>Documentation URL</b>	You can leave this field blank
<b>Macro body processing</b>	Rendered

<b>Template</b>	<p>Enter the code below in the template field. If your macro requires more than one parameter, you can use variables \$param0 to \$param9 to represent them.</p> <pre>## @param 0:title=colour type=string ## @param 1:title=size type=string &lt;span style="color: \$param0; font-size: \$param1"&gt;\$body&lt;/span&gt;</pre> <p>Alternatively, you can also use explicitly-named parameters in your macro. These macro parameters will appear as variables with the name \$param&lt;x&gt; where &lt;x&gt; is the name of your parameter.</p> <pre>## @param Colour:title=colour type=string ## @param Size:title=size type=string &lt;span style="color: \$paramColour; font-size: \$paramSize"&gt;\$body&lt;/span&gt;</pre>
-----------------	--

#### Formatted Panel

This example demonstrates how to write a user macro that creates a panel that is preformatted with specific colors. It will create a panel that looks like this:

(Title)

**Note:** The panel's title will be empty if the user does not give a value for the title parameter.

Field	Value
<b>Macro name</b>	formpanel
<b>Visibility</b>	Visible to all users in the Macro Browser
<b>Macro Title</b>	Formatted Panel
<b>Description</b>	Creates a panel preformatted with specific colors
<b>Categories</b>	Formatting
<b>Icon URL</b>	You can leave this field blank
<b>Documentation URL</b>	You can leave this field blank
<b>Macro body processing</b>	Escaped

<b>Template</b>	<p>Enter the code below in the template field. See below for a more detailed explanation of</p> <pre>## @param Title:title=Title type=string desc=Title &lt;ac:structured-macro ac:name="panel"&gt;   &lt;ac:parameter ac:name="titleBGColor"&gt;#ccc&lt;/ac:parameter&gt;   &lt;ac:parameter ac:name="borderStyle"&gt;solid&lt;/ac:parameter&gt;   &lt;ac:parameter ac:name="borderColor"&gt;#6699CC&lt;/ac:parameter&gt;   &lt;ac:parameter ac:name="borderWidth"&gt;2&lt;/ac:parameter&gt;   &lt;ac:parameter ac:name="titleColor"&gt;#000000&lt;/ac:parameter&gt;   &lt;ac:parameter ac:name="title"&gt;\${paramTitle}&lt;/ac:parameter&gt;   &lt;ac:rich-text-body&gt;\$body&lt;/ac:rich-text-body&gt; &lt;/ac:structured-macro&gt;</pre>
-----------------	--

### Explanation of the code in the macro template

Below is a breakdown of the user macro template code.

Item	Description
## @param Title:title=Title type=string desc=Title	<p>@param defines the metadata for your macro parameters.</p> <p>@param Title</p> <p>This parameter is called "Title".</p> <p>title=Title</p> <p>defines the parameter title that will appear in the macro browser as "Title".</p> <p>type=string</p> <p>defines the field type for the parameter as a text field.</p> <p>desc=Title</p> <p>defines the description of the parameter in the macro browser.</p>



<pre>&lt;ac:structured-macro ac:name="panel"&gt;</pre>	<p>This calls the Confluence <a href="#">Panel</a> macro.</p> <p>The easiest way to find out the code name of a Confluence macro by viewing the Storage Format of a page containing the macro. You'll need Confluence Administrator permissions to view the storage format.</p>
<pre>&lt;ac:parameter ac:name="titleBGColor"&gt;#ccc&lt;/ac:parameter&gt; &lt;ac:parameter ac:name="borderStyle"&gt;solid&lt;/ac:parameter&gt; &lt;ac:parameter ac:name="borderColor"&gt;#6699CC&lt;/ac:parameter&gt; &lt;ac:parameter ac:name="borderWidth"&gt;2&lt;/ac:parameter&gt; &lt;ac:parameter ac:name="titleColor"&gt;#000000&lt;/ac:parameter&gt;</pre>	<p>Sets the parameters for the macro: the background color, border style, border color, border width and title color.</p> <p>To discover the names of the parameters for a Confluence macro, view the storage format as described above.</p>
<pre>&lt;ac:parameter ac:name="title"&gt;\${!paramTitle}&lt;/ac:parameter&gt;</pre>	<p>Enters the value stored in the 'Title' parameter into the title section of the macro.</p> <p>The ! tells the macro to leave the title blank, when there is no data in the "Title" parameter.</p>
<pre>&lt;ac:rich-text-body&gt;\$body&lt;/ac:rich-text-body&gt;</pre>	<p>Users can enter data that is stored in the body of the macro. This line enables the macro to access and store the body content passed to your macro.</p>
<pre>&lt;/ac:structured-macro&gt;</pre>	<p>This command marks the end of the macro.</p>

## User Macro Template Syntax

See [Writing User Macros](#) for an introduction to writing a user macro.

This page provides information about the code you can enter in a user macro template.

### Accessing your macro's body

Use the `$body` object within your user macro template to access the content passed to your macro in the macro body.

The `$body` object is available if you have specified that your macro has a body (in other words, if you have *not* selected **No macro body**).

**Example:** Let's assume your macro is called `hello world`.

Enter the following code in your template:

```
Hello World: $body
```

A user, when editing a Confluence page, chooses your macro in the macro browser and then enters the following in the macro placeholder that is displayed in the edit view:

```
From Matthew
```

The wiki page will display the following:

```
| Hello World: From Matthew
```

### Using parameters in your user macro

You can specify parameters for your macro, so that users can pass it information to determine its behavior on a Confluence page.

#### How your macro parameters are used on a Confluence page

When adding a macro to a Confluence page, the macro browser will display an input field for each macro parameter. The field type is determined by the parameter type you specify.

#### Defining the parameters

A parameter definition in the template contains:

- `@param`
- The parameter name
- A number of attributes (optional).

Format:

```
## @param MYNAME:title=MY TITLE|type=MY TYPE|desc=MY  
DESCRIPTION|required=true|multiple=true|default=MY DEFAULT VALUE
```

#### On this page:

- [Accessing your macro's body](#)
- [Using parameters in your user macro](#)
- [Objects available to your macro](#)
- [Controlling parameter appearance in the editor placeholder](#)

#### Related pages:

- [Writing User Macros](#)

Additional notes:

- The order of the parameters in the template determines the order in which the macro browser displays the parameters.
- We recommend that you define the parameters at the top of the template.
- There may be additional attributes, depending on the parameter type you specify.

The sections below describe each of the attributes in detail.

Attribute name	Description	Required / Recommended / Optional
(an unnamed, first attribute)	A unique name for the parameter. The parameter name is the first attribute in the list. The name attribute itself does not have a name. See the section on <a href="#">name</a> below.	Required
title	The parameter title will appear in the macro browser. If you do not specify a title, Confluence will use the parameter name.	Recommended
type	The field type for the parameter. See the section on <a href="#">type</a> below.	Recommended
desc	The parameter description will appear in the macro browser.	Optional
required	Specifies whether the user must enter information for this parameter. Defaults to false.	Optional
multiple	Specifies whether the parameter accepts multiple values. Defaults to false.	Optional
default	The default value for the parameter.	Optional

#### Parameter name

The parameter name is the first attribute in the list. The name attribute itself does not have a name.

**Example:** The following code defines 2 parameters, named 'foo' and 'bar':

```
## @param foo
## @param bar
```

#### Parameter type

The field type for the parameter. If you do not specify a type, the default is `string`.

Parameter type	Description
boolean	Displays a checkbox to the user and passes the value 'true' or 'false' to the macro as a string.
enum	Offers a list of values for selection. You can specify the values to appear in a dropdown in the macro browser. Example of specifying the enum values: <div><pre>## @param colour:title=Colour   type=enum   enumValues=Grey,Red,Yellow,Green</pre></div> <p><i>Note about i18n:</i> Confluence does not support internationalization of the enum values. The user sees is the one passed to the macro as the parameter value, with the capitalization case 'Grey', 'Red', etc.</p>

string	<p>A text field. This is the default type. Example with a required field:</p> <pre>## @param status:title=Status type=string required=true desc=Status to display</pre>
confluence-content	<p>Offers a control allowing the user to search for a page or blog post. Example:</p> <pre>## @param page:title=Page type=confluence-content required=true desc=S a page do use</pre>
username	<p>Search for user.</p> <pre>## @param user:title=Username type=username desc=Select user to display</pre>
spacekey	<p>Offers a list of spaces for selection. Passes the space key to the macro. Example:</p> <pre>## @param space:title=Space type=spacekey</pre>
date	<p>Confluence accepts this type, but currently treats it in the same way as 'string'. Example:</p> <pre>## @param fromDate:title=From Date type=date desc=Date to st from. Format: dd/mm/YYYY</pre> <p><i>Note about dates:</i> A user can enter a date in any format, you should validate the date for user macro.</p>
int	<p>Confluence accepts this type, but treats it in the same way as 'string'. Example with a default value:</p> <pre>## @param numPosts:title=Number of Posts type=int default=15 desc=Number of posts to display</pre>
percentage	<p>Confluence accepts this type, but treats it in the same way as 'string'. Example:</p> <pre>## @param pcent:title=Percentage type=percentage desc=Number posts to display</pre>

### Using the parameters in your macro code

The parameters are available in your template as `$paramfoo`, `$parambar` for parameters named "foo" and "bar".

Normally, a parameter like `$paramfoo` that is missing will appear as '`$paramfoo`' in the output. To display nothing when a parameter is not set, use an exclamation mark after the dollar sign like this: `$!paramfoo`

### Using no parameters

If your macro does not accept parameters, you should use `@noparams` in your template.

If the user macro contains no parameters and does not specify `@noparams`, then the macro browser will display a free-format text box allowing users to enter undefined parameters. This can be confusing if the macro does not accept parameters.

**Example:** Add the following line at the top of your template:

```
## @noparams
```

### Objects available to your macro

Including the macro body and parameters, the following Confluence objects are available to the macro:

Variable	Description	Class Reference
<code>\$body</code>	The body of the macro (if the macro has a body)	String
<code>\$paramfoo</code> , <code>\$parambar</code> , ... <code>\$param&lt;name&gt;</code>	Named parameters ("foo", "bar") passed to your macro.	String
<code>\$config</code>	The <code>BootstrapManager</code> object, useful for retrieving Confluence properties.	<a href="#">BootstrapManager</a>
<code>\$renderContext</code>	The <code>PageContext</code> object, useful for (among other things) checking <code>\$renderContext.outputType</code>	<a href="#">PageContext</a>
<code>\$space</code>	The <code>Space</code> object that this content object (page, blog post, etc) is located in (if relevant).	<a href="#">Space</a>
<code>\$content</code>	The current <code>ContentEntity</code> object that this macro is a included in (if available).	<a href="#">ContentEntityObject</a>

Macros can also access objects available in the default Velocity context, [as described in the developer documentation](#).

#### Security consideration

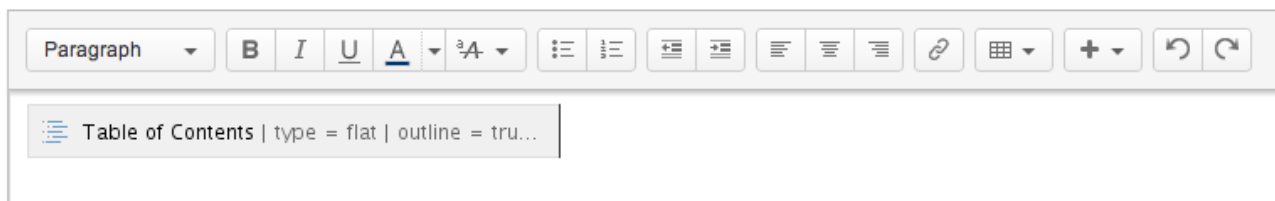
When creating a User Macro you should avoid using `$content.getChildren()` or `$content.getDescendants()` as these methods will list all pages, regardless of page restrictions or space permissions. This may lead to page viewers seeing pages that they do not have permission to see.

We also recommend thoroughly testing your user macro with a number of permission scenarios, such as restricted pages and space permissions.

### Controlling parameter appearance in the editor placeholder

You can determine which macro parameters should appear in the placeholder in the Confluence editor.

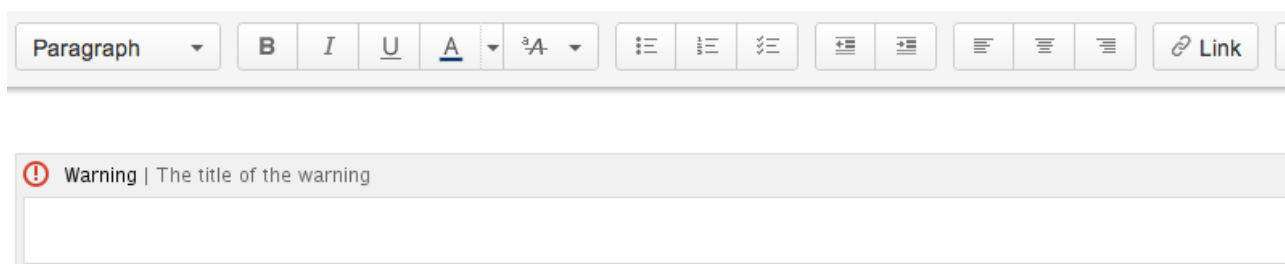
By default as many parameters as can fit will be displayed in the placeholder, as shown here:



You can control which parameters you want to display here, to ensure the most relevant information is visible to the author.

For example, the Confluence Warning macro has two parameters, *title* and *icon*. We consider *title* to be the most interesting parameter, so we have configured the Warning macro to show only the value of the *title* parameter.

Let's assume an author adds the Warning macro to a page, and gives it a title of 'The title of the warning'. The macro configuration leads to a placeholder as shown here:



To configure the macro placeholder for a user macro, you will add attributes to the `@param` entry in the template.

For example, if our Warning macro is a user macro, the configuration for the *title* parameter is as follows:

```
## @param
title:type=string|option-showNameInPlaceholder=false|option-showValue
InPlaceholder=true
```

The attribute `showNameInPlaceholder` specifies that the *title* parameter's *name* should not be shown.

The attribute `showValueInPlaceholder` specifies that the *title* parameter's *value* should be shown.

If none of the parameters in a macro include any of the above attributes, then the default behavior is to show all the parameters that fit in the placeholder: full title and value.

If one or more parameters has either attribute set, then all parameters that do not include the attributes will default to false (that is, they will not be shown).

## Customizing your Confluence Site

This page is an introduction to customizing Confluence at site level. This is of interest to Confluence administrators – people with System Administrator or Confluence Administrator permissions.

For guidelines on customizations at a personal and space level, see [Your User Profile](#) or [Customize your Space](#).

We've documented the customizations under two broad headings:

- You can change the **appearance** of Confluence by customizing the dashboard, adjusting the colors, adding a site logo, and more. See [Changing the Look and Feel of Confluence](#).
- You can determine the **default behavior** by setting various options, or define the **default content** that appears in new spaces, on the dashboard, and in other Confluence locations. See [Changing the Default Behavior and Content in Confluence](#).

**Related pages:**

- [Integrating Confluence with Other Applications](#)
- [Tracking Customizations Made to your Confluence Installation](#)
- [Confluence administrator's guide](#)

## Changing the Look and Feel of Confluence

You can change the appearance, or look and feel of Confluence for the whole site (globally) or for individual spaces.

Changes you make to the whole site will also apply to all spaces that are inheriting the global look and feel. Users with space administrator permissions can further customize the appearance of a space and override the global look and feel for that space. See [Customize your Space](#) for more.

**Related pages:**

- [Administering Site Templates](#)
- [Working With Decorator Macros](#)
- [Customizing a Specific Page](#)
- [Upgrading Customized Site and Space Layouts](#)

**Ways to customize the look and feel of your site:**

- Add your own site logo. See [Changing the Site Logo](#).
- Change the **color scheme** of the user interface. See [Customizing Color Schemes](#).
- Use **themes** for advanced layout customization. See [Working with Themes](#).
- Change the **site or space layouts**, which determine how the controls are laid out in the site. This does not change the actual page layouts, but it does change the way the surrounding controls appear in the page. See [Customizing Site and Space Layouts](#).

## Customizing the Confluence Dashboard

The dashboard is the default landing page for your Confluence site. It gives people all the tools they need to discover pages, resume their work and quickly jump to their favorite spaces and pages.

**Editing the site welcome message**

The site welcome message appears on the right hand side of the dashboard and is the perfect place to inject some of your organization's personality.

See [Editing the Site Welcome Message](#) to find out how to add announcements, useful links, images, macros and more.

You'll need Confluence administrator permissions to edit the site welcome message.

**Using a page as the site landing page**

If you want more control, you can choose to use an ordinary Confluence page as your site landing page, instead of sending people to the dashboard. See [Configuring the Site Home Page](#) to find out more.

Using a page instead of the dashboard can be useful if most people will be reading, rather than creating, pages in your site. However, for sites where you want to encourage teams to collaborate, the dashboard provides the best tools for resuming work in progress and keeping up with what is happening in the site.

**Advanced customizations**

You can further customize the dashboard by editing the global layout file. See [Customizing Site and Space](#)

**On this page:**

- [Editing the site welcome message](#)
- [Using a page as the site landing page](#)
- [Advanced customizations](#)

**Related pages:**

- [Save for later](#)
- [Changing the Look and Feel of Confluence](#)

[Layouts](#) for more information on how to do this. You'll need some knowledge of [Velocity](#) to modify the layout files.

There are two locations that you can add content to:

- Web panels added to `atl.dashboard.secondary` will appear below the site welcome message.
- Web items added to `system.dashboard.button` will appear next to the Create space and Invite users button at the top right of the dashboard.

If you modify layouts in Confluence you will need to reapply your modifications each time you upgrade Confluence. The more dramatic your customizations are, the harder it may be to reapply the changes when upgrading. See [Upgrading Customized Site and Space Layouts](#) to find out what will be involved before modifying the layouts.

## Changing the Site Logo

You can customize the look and feel of your Confluence site by changing the logos.

You can change:

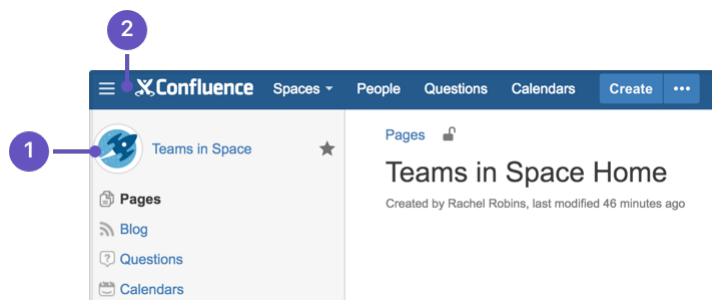
- the **site logo**
- the **default space logo** for all spaces
- the **space logo** for individual spaces.

### On this page:

- [Changing the site logo](#)
- [Changing the site icon \(favicon\)](#)
- [Changing the default space logo](#)
- [Changing a specific space logo](#)

### Related pages:

- [Changing the Look and Feel of Confluence](#)



1. **Space logo:** appears in the sidebar and on the dashboard.
2. **Site logo:** always visible, click the logo to go to the dashboard (or site homepage).

## Changing the site logo

The Site Logo appears in the header and is visible throughout Confluence. You need Confluence Administrator permissions to change the site logo.

**To change the site logo:**

1. Choose the **cog icon**



, then choose **General Configuration** under Confluence Administration

2. Choose **Site Logo and Favicon**.
3. Choose **Browse** to upload a new logo.
4. Choose **Show Logo Only** or **Show Logo and Title** depending on whether you wish the Site Title to display in the header.
5. Choose **Save**.

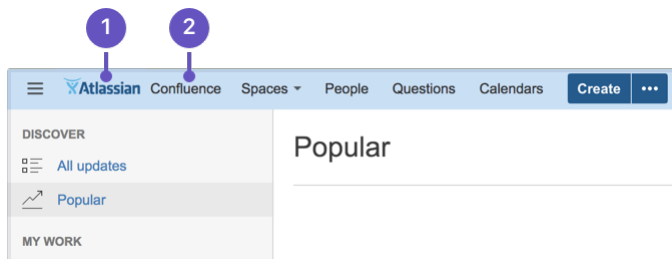
Confluence's Auto Look and Feel will detect the colors in your new logo, and change the site color scheme to match.

If you would prefer to use the default [color scheme](#) with your custom logo go to





> **General Configuration** > **Color Scheme** > **Edit** and then choose **Reset** to revert back to the default scheme.



1. **Site logo:** auto look and feel has updated the header colours to complement the logo.
2. **Site title:** this is the name of your site.

### Changing the site icon (favicon)

You can also change the site favicon (the icon that appears in your browser tab). You need Confluence Administrator permissions to do this.

1. Go to 
  - > **General Configuration**
  - > **Site Logo and Favicon.**
2. Locate your image file and choose **Upload**.


You can upload PNG, GIF, JPEG, or ICO files. For best results images should be square, and at least 48x48 pixels.

### Changing the default space logo

The Space Logo appears in the sidebar and as an icon in the Sites Directory. The default space logo applies to all spaces that do not have a custom space logo applied - see [Configure the Sidebar](#).

You need to be a Confluence Administrator to change the default space logo.

#### To change the default space logo:

1. Go to 
  - > **General Configuration**
  - > **Default Space Logo.**
2. Choose **Logo:ON**
3. Choose **Browse** to upload a new logo
4. Choose **Upload Logo**
5. Choose **Save**.

### Changing a specific space logo

Space Administrators can change the logo for their space. This overrides the default space logo and any changes to the default space logo will not appear in these spaces. See example above - 'Sample Space' has a custom logo.

See [Configure the Sidebar](#) to find out how to change the logo in a specific space.

### Customizing Color Schemes

Confluence administrators can configure a new color scheme for the site. The default color scheme for the site will also become the default for all spaces within it.

**To change the site's color scheme:**

1. Choose the **cog icon**



, then choose **General Configuration** under Confluence Administration

2. Choose **Color Scheme** in the left-hand panel
3. Click **Edit**
4. Enter standard HTML/CSS2 color codes, or use the color-picker



to choose a new color from the palette provided.

5. Hit **Save**

Any changes you make will immediately be reflected across the Confluence site.

**On this page**

- [Reset your color scheme after uploading a site logo](#)

**Related pages:**

- [Changing the Look and Feel of Confluence](#)

**Reset your color scheme after uploading a site logo**

When you upload a site logo, Confluence automatically detects the colors in your logo and customizes the color scheme for you.

You can change the color scheme as above, or reset your color scheme back to the default (and still keep your new site logo).

To reset the color scheme:

1. Choose the **cog icon**



, then choose **General Configuration** under Confluence Administration

2. Choose **Color Scheme** in the left-hand panel
3. Click **Edit**
4. Hit **Reset**

**Styling Confluence with CSS**

This page explains the facility for changing the look and feel of Confluence with CSS.

**Introduction**

Cascading Style Sheets (CSS) are an industry-standard way of styling a web page. The content of a page is rendered with HTML, and its look and feel is determined by CSS files. You can upload a CSS text file, or simply type in a stylesheet, and apply it to a space or even a whole Confluence site.

**Note:** By default, only system administrators can edit the CSS for a space or for the site. To allow any user with Space Admin permissions to edit the CSS for a space, go to



> **General Configuration** > **Security Configuration** and select **Custom Stylesheets for Spaces**.

Creating CSS styles that work seamlessly across different browsers is a delicate task for basic web sites, and reasonably challenging when customizing web applications like Confluence. It is important to test each change that you make and ensure it works as expected in all areas of Confluence – for example, on the Confluence dashboard as well as on regular pages.

In order to get you started, we have compiled this introduction, a [basic styling tutorial](#).

**On this page:**

- [Introduction](#)
- [Considerations for Using Custom CSS](#)
- [Getting Started](#)
- [CSS Resources](#)

**Related pages:**

- [Basic Styling Tutorial](#)
- [Styling Fonts in Confluence](#)

## Considerations for Using Custom CSS

### *CSS Knowledge is Required*

If you are not familiar with CSS, see the links in the [CSS Resources section](#) below. You should spend some time to become confident with Cascading Style Sheets before you start editing your Confluence style sheets.

### *Security*

Custom CSS can be used to inject scripts into a page, opening the risk of cross-site scripting (XSS) attacks. With this feature enabled, space administrators could upload styles that steal other users' login credentials, trick their browsers into performing actions on the wiki without their knowledge, or even obtain global administration privileges. As such, this feature is disabled by default. Confluence administrators should only enable custom CSS if they are comfortable with the risks listed in this paragraph.

### *Scaling*

Each page needs to scale. Depending on the resolution of the user's screen, the content should render intelligently. Your designs needs to degrade gracefully. Try resizing each page that exists in Confluence. There are quite a few pages in the browse-space-section, like drafts, labels, page hierarchy, and so on. Your style has to work everywhere, not just in the first page you happen to be looking at.

### *Features Cannot Be Disabled*

It is easy to turn off certain links, headers, or even menu items by simply setting their style to 'hidden'. This can help you to roll out Confluence to users that may not be very Wiki-savvy yet. The simpler the UI, the easier it may be for them to use. However, please remember that removing the link to a part of the application does not mean that the functionality is not available. Every user can still change their style from within their browsers, or access the URL directly. Don't rely on CSS to disable parts of Confluence.

### *Features Should Not Be Disabled*

Users familiar with Confluence will expect to find the same controls that they are accustomed to. Removing buttons or controls from the interface is not advised as it may frustrate your users and cause them to circumvent your design by using direct URL access, as mentioned above.

### *Custom CSS does not apply to Admin screens*

Any CSS styling applied to your site will not be applied to the Administration console. This is to ensure changes to CSS do not prevent administrators from accessing Admin functions in future.

### *Confluence Version Compatibility*

Be aware of any plans to upgrade your Confluence instance. Future versions of Confluence may not be compatible with your custom CSS — this may cause your CSS to break, requiring maintenance when Confluence is upgraded. Ask your Confluence administrator for more information.

### *Test on Different Web Browsers*

As a rule you should test your modifications on the various web browsers supported by Confluence.

### *CSS Customization is Not Supported*

As creating custom CSS has potentially limitless possibilities, Atlassian will not support issues that are caused by or related to CSS customization.

## Getting Started


### *Editing the CSS*

**To edit a space's CSS style sheets:**

1. Go to the space and choose **Space tools > Look and Feel** from the bottom of the sidebar
2. Choose **Stylesheet** then **Edit**.
3. Paste your custom CSS into the text field.

4. Save your changes. The new CSS will be visible on all content pages in the space.

#### To edit your global CSS stylesheet:

1. Choose the **cog icon**  , then choose **General Configuration** under Confluence Administration
2. Choose **Stylesheet**.
3. Choose **Edit**.
4. Paste your custom CSS into the text field.
5. Choose **Save**.

#### Note:

- The new CSS will be visible across all spaces, provided they do not define their own custom stylesheet and are not using a theme. This CSS will also overwrite all styles defined in custom global themes.
- You may be able to add CSS to your site by choosing **Custom HTML** in the administration section, and adding your CSS definitions to the HEAD or BODY of the page. You should only use this option if you cannot achieve the desired results via the global stylesheet.

#### Follow the Tutorial

Follow the examples in the [Basic Styling Tutorial](#) to get started.

#### CSS Resources

- [W3C CSS Standards](#)
- [Mozilla Developer Network](#)
- [W3resource.com](#)

### Basic Styling Tutorial

This page contains instructions on how to get started with custom CSS styling in Confluence.

#### CSS Editing Quick-Start

#### To edit a space's CSS style sheets:

1. Go to the space and choose **Space tools > Look and Feel** from the bottom of the sidebar
2. Choose **Stylesheet** then **Edit**.
3. Paste your custom CSS into the text field.
4. Save your changes. The new CSS will be visible on all content pages in the space.

#### On this page:

- [CSS Editing Quick-Start](#)
- [Tutorial: Changing the Header Background](#)
- [CSS Editing Tips](#)
- [Notes](#)

#### Related pages:

- [Styling Confluence with CSS](#)

#### Tutorial: Changing the Header Background

The header is the menu area at the top of a default Confluence page where the **Breadcrumb Links**, **Browse** menu, **User** menu and the **Quick Search** box reside. In this example, we are going to change the background of the header to include a custom graphic.

1. Create a custom graphic. For this example, we created a custom header graphic of 1046 x 61 pixels.
2. Upload the custom graphic to a page in the space that you are customizing.
3. Note the page ID of the page where you uploaded the new graphic. (in this example, the page ID was '658833839').
4. Compose your custom CSS for the header. The example below loads the new graphic (called 'header.png') from a specific page (denoted by page ID '658833839') in the same space.

```
#header .aui-header {  
  
background-image:url('../download/attachments/658833839/header.png');  
background-repeat: no-repeat;  
}
```

5. Log in as the Space Administrator.
6. Open the Space Admin page.
7. Click **Stylesheet**.
8. Click **Edit** to change the code in the text field.
9. Paste your custom CSS into the text field.
10. Click **Save** and then reload the page (you may have to shift-reload). The background of the header will change.
11. The custom header will be visible on all content pages in the space. To revert your change, simply delete the custom code from the 'Stylesheet' page and click **Save**.

### CSS Editing Tips

#### Begin With a Space Stylesheet

A space stylesheet is a good starting point for CSS customization, as it already includes all of the elements that can be changed. When you work on the space stylesheet it styles all content pages in the space. Build and test it at space-level, before considering applying the new stylesheet to your entire site. Once you are satisfied with your space design, test it thoroughly until you are confident that it has no problems. Then, you can look into advanced customization of the Confluence CSS such as adjusting the Search page, the Dashboard and other integral pages.

#### Use the Right Tools

As the Confluence CSS is reasonably sophisticated, web development applications will help you to understand how the page styles have been created. In particular, you will need to view the existing source for the pages you're starting to work on. If you don't already have some, tools such as the following free applications will allow you to do this.

##### 1. Firebug

Firebug, a plugin for the Firefox web browser, allows you to take a look at the style of each element on your page. This is very useful to see what styles are currently applied, for example styles applied to the header only.

##### 2. Web Developer

The Web Developer plugin for Firefox allows you to edit CSS inline and create new page designs.

##### 3. CSS Edit

CSS Edit is a stand-alone CSS editor for Macintosh that extracts all existing styles from a given page and allows you to overwrite these.

#### Edit Simple Elements First

Begin by editing simple elements and checking that they work. By making changes, then checking that each one worked, you can easily isolate any CSS code that is causing problems. Be aware that some page elements are more suited to customization than others. For example, adding a gradient to the toolbar is less likely to 'break' the page than changing the page width. Editing reasonably static elements such as background graphics will render more predictably than designs which attempt to completely change the user interface or the Javascript-powered drop-down menus (which we don't recommend editing).

### Notes

**Note:** By default, only system administrators can edit the CSS for a space or for the site. To allow any user with Space Admin permissions to edit the CSS for a space, go to



> **General Configuration** > **Security Configuration** and select **Custom Stylesheets for Spaces**.

## Styling Fonts in Confluence

Confluence provides the ability to adjust its visual style via Cascading Style Sheets (CSS). This tutorial shows you to change the fonts and font sizes of a Confluence page, using a few lines of CSS.

Below is the code for the custom font. Copy and paste it into the Space Stylesheet form within the Space Administration section.

### Changing the fonts

In order to customize the fonts in Confluence, you first need to set the body font to the font you want. Secondly, you may want to adjust the font size because different fonts have different relative sizes.

The relevant CSS is shown below. It changes Confluence's font from the default of Helvetica/Arial – *sans serif* to Times/Times New Roman – *serif*. To adjust for the fact that Times is a bit smaller than Helvetica, we increase the font size to 14 pixels. The many styles that 'wiki-content' in their definition are necessary to change the font size for all the tags in the wiki content.

```
body {
    font-family: Times, "Times New Roman", serif;
    font-size: 14px;
}
.wiki-content,
.wiki-content p,
.wiki-content table,
.wiki-content tr,
.wiki-content td,
.wiki-content th,
.wiki-content ol,
.wiki-content ul,
.wiki-content li {
    font-size: 14px;
}
```

#### Related pages:

- [Basic Styling Tutorial](#)
- [Styling Confluence with CSS](#)

### Notes

**Note:** By default, only system administrators can edit the CSS for a space or for the site. To allow any user with Space Admin permissions to edit the CSS for a space, go to



> **General Configuration** > **Security Configuration** and select **Custom Stylesheets for Spaces**.

## Working with Themes

Themes are used to change the appearance of your Confluence site or spaces.

Confluence comes with a single default theme installed, or you can download and install other themes from [The Atlassian Marketplace](#).

Once a theme is installed it can be applied to the whole site or to individual spaces.

**To see the themes installed in your site:**

1. Go to



> **General Configuration**  
> **Themes**.

#### Related pages:

- [Apply a Theme to a Space](#)
- [Applying a Theme to a Site](#)
- [Creating a Theme](#)

2. You'll see a list of all the themes installed in your site.


When a new space is created, whichever theme is applied to the whole site will be applied by default to the new space. The space theme can then be changed by anyone with space administrator permissions for that space.

#### Note about the Documentation theme

The Documentation theme was available in Confluence 5.9 and earlier. Many of the Documentation theme features are now available in the Confluence default theme. Check out [Develop Technical Documentation in Confluence](#) for more information about using Confluence for documentation using the default theme.

## Applying a Theme to a Site

Themes are used to change the appearance of your Confluence site. See [Working with Themes](#) for an overview of how themes apply to your whole site, and how you can add more themes. **To apply a theme across the site:**

1. Go to  **> General Configuration** **> Themes.**
2. The screen will display all available themes. Choose a theme.
3. Choose **Confirm**.

All spaces that have the **Global look and feel** applied as their space theme will inherit this theme and any customizations you make to it.

#### Related pages:

- [Apply a Theme to a Space](#)

## Creating a Theme

If you want to create your own theme, you will need to write a Confluence plugin. Please refer to the following pages in our developer documentation:

- Get started with [plugin development](#).
- Follow the developer's tutorial for [writing a Confluence theme](#).
- Create a theme using the [theme plugin module](#).

#### Related pages:

- [Applying a Theme to a Site](#)
- [Apply a Theme to a Space](#)

## Customizing Site and Space Layouts

You can modify Confluence's look and feel by editing layout files (also known as decorators). Editing these files allows you to change the look and feel of the whole Confluence site, or just an individual space.

When you edit a site layout, you'll be modifying the default decorators in every space in your site, except for those that have already been edited in a space. See [Customize Space Layouts](#) for more information on how to edit the decorators for a single space.

You'll need [System Administrator](#) permissions to edit site layouts.

#### On this page:

- [Editing a site decorator file](#)
- [Using Velocity macros](#)
- [Advanced customizations](#)

#### Related pages:

- [Velocity Template Overview](#)
- [Basic Introduction to Velocity](#)
- [Customizing your Confluence Site](#)

If you modify layouts in Confluence you will need to reapply your modifications each time you upgrade Confluence. The more dramatic your customizations are, the harder it may be to reapply the changes when upgrading. See [Upgrading Customized Site and Space Layouts](#) to find out what will be involved before modifying the layouts.



Confluence is built on top of the open source [SiteMesh](#) library, a web-page layout system.

To edit the layout of Confluence, you will need to modify these decorator files. A decorator file is a `.vmd` file and is written in Velocity. You can learn more from the [Velocity User Guide](#).


Once you are familiar with Velocity, you can edit the decorator files to personalize the appearance of Confluence.

The decorator files in Confluence are grouped into the following categories:

- **Site layouts:** These are used to define the controls that surround each page in the site. For example, the header, footer and dashboard.
- **Content layouts:** These control the appearance of content such as pages and blog posts. They do not change the way the pages themselves are displayed, but allow you to alter the way the surrounding comments or attachments are displayed.
- **Export layouts:** These control the appearance of spaces and pages when they are exported to HTML.

#### Editing a site decorator file

To edit a site decorator:

1. Go to  **> General Configuration > Layouts** (under **Look and Feel**)
2. Click **Create Custom** next to the decorator `.vmd` file you want to modify.
3. Make your changes and click **Update**.

**If something goes wrong:** Hit **Reset Default** to revert to the original layouts.

#### Using Velocity macros

When editing Custom Decorator Templates, there are a number of macros available to define complex or variable parts of the page such as menus and breadcrumbs. You may insert these macros anywhere in your templates. More information on [Working With Decorator Macros](#).

#### Advanced customizations

##### Overriding Velocity templates

The `velocity` directory is at the front of Confluence's Velocity template search path. As such, you can override *any* of Confluence's Velocity templates by placing an identically named file in the right place. While we don't recommend you do this unless you know exactly what you're doing, it does give you complete control over the look of every aspect of Confluence. It also means that you can edit your templates in a text-editor if you wish, rather than through the web interface.

##### Caching

Velocity is configured to cache templates in memory. When you edit a page from within Confluence, it knows to reload that page from disk. If you are editing the pages on disk, you will either have to turn off velocity's caching temporarily in `WEB-INF/classes/velocity.properties`, or restart the server to make your changes visible.

##### Location of Velocity files

You will find the Velocity files in your Confluence installation directory. The primary Velocity files are located in the `<CONFLUENCE-INSTALLATION>\confluence\decorators` directory. For example, you will find the following files in that directory: `main.vmd`, `space.vmd`, `form-aui.vmd`, `global.vmd`, and more.

##### Finding the layout via the URL



If the layout has changed so extensively as to not be visible, you can browse to the URL directly:

```
http://<confluence base
url>/admin/resetdecorator.action?decoratorName=decorators/main.vmd
```

Substitute the base URL and the appropriate .vmd file.

## Upgrading Customized Site and Space Layouts

As Confluence evolves, so do the default site and space layouts that drive the rendering of every page. As new functionality is added or current functionality is changed, the default layouts are modified to support these changes.

### Related pages:

- [Customizing Site and Space Layouts](#)

If you are using [custom layouts](#) based on defaults from a previous Confluence version, you run the risk of **breaking functionality**, or worse, **missing out on great new features!**

Take care on each new release of Confluence to reapply your changes to the new default templates.

To reapply your custom layouts, you need to:

1. Obtain the source of your custom layouts from your current version of Confluence.
2. Reapply your customizations to the new default layouts.

### Step 1. Obtain your Custom Layouts

Ideally, you should keep a record of each customization you have applied to each of your Confluence site or space layouts.

If not, you should be able to find your customizations using the following method. This method extracts all site- and space-level layouts from your Confluence site as a single output. From this output, you should be able to identify your customizations.

This method is handy to use if you have:

- Many spaces with space layout customizations, or
- Do not have an independent record of your site or space layout customizations.

Custom layouts are stored in the `DECORATOR` table within your Confluence database. You can `SELECT` for the source of the layout using SQL like this:

```
mysql> select SPACEKEY,DECORATORNAME,BODY from DECORATOR;
+-----+-----+-----+
| SPACEKEY | DECORATORNAME | BODY |
+-----+-----+-----+
| NULL    | decorators/main.vmd | ... |
+-----+-----+-----+
1 row in set (0.03 sec)
```

*This example was tested on **MySQL**, but should be applicable to all SQL databases.*

### Step 2. Reapply your Customizations

When you upgrade Confluence to another major release of Confluence, you will need to manually reapply any customizations you made to any site-wide or space-specific layouts. Unless otherwise stated, you should not need to reapply customizations after conducting a minor release upgrade of Confluence.

**What are 'major' and 'minor' releases?** Major release upgrades are ones where the 1st digit of Confluence's version number or the 1st digit after the 1st decimal place differ after the upgrade, for example,

when upgrading from Confluence 3.0 to 3.1, or 2.8 to 3.0. Minor release upgrades are ones where the 1st digit of Confluence's version number and the 1st digit after the 1st decimal place remain the same after the upgrade, for example, when upgrading Confluence 3.0 to 3.0.1.

If you have made Confluence site-wide layout customizations:

1. Choose the **cog icon**



- , then choose **General Configuration** under Confluence Administration
2. Select **Layouts** in the left-hand navigation panel. The decorators are grouped under **Site**, **Content** and **Export** layouts.
3. Ensure you have all your customizations available (preferably in a form which can be copied and pasted).
4. Click **Reset Default** next to the layout whose customizations need to be reapplied.
5. Click **Create Custom** next to the same layout and reapply your customizations (by copying and pasting them) into the appropriate locations within the new default layout.
6. Click the **Save** button.
7. Repeat this procedure from step 4 for each layout whose customizations need to be reapplied.

If you have made space-specific layout customizations:

1. Go to the space and choose **Space tools > Look and Feel** from the bottom of the sidebar
2. Choose **Layout**. The decorators are grouped under **Site**, **Content** and **Export** layouts.
3. Ensure you have all your customizations available (preferably in a form which can be copied and pasted).
4. Click **Reset Default** next to the layout whose customizations need to be reapplied.
5. Click **Create Custom** next to the same layout and reapply your customizations (by copying and pasting them) into the appropriate locations within the new default layout.
6. Click the **Save** button.
7. Repeat this procedure from step 5 for each layout whose customizations need to be reapplied.

### Step 3. Test your Modifications Carefully

Changes may interact unpredictably with future versions of Confluence. When upgrading, you should always test your custom modifications thoroughly before deploying them on a live site. It's beyond the scope of Atlassian Support to test and deploy these changes.

### Turning Off Caching

Velocity is configured to cache templates in memory. When you edit a page from within Confluence, it knows to reload that page from disk. If you are editing the pages on disk, you will either have to turn off Velocity's caching temporarily in `WEB-INF/classes/velocity.properties`, or restart the server to make your changes visible.

The `velocity.properties` file is available in the `confluence-x.x.x.jar` file, where `x.x.x` is the Confluence version number. The JAR file is located in the `WEB-INF/lib` directory. If you wish to make modification to the files in the JAR, we recommend the following steps:

1. Stop Confluence.
2. Make a backup copy of the JAR file.
3. Un-jar the file
4. Locate and edit the appropriate file that you wish to modify.
5. Re-jar the `confluence-x.x.x.jar` file.
6. Relocate the JAR file to the appropriate directory.
7. Restart Confluence.

### Working With Decorator Macros

Decorator Macros are [Velocity](#) macros which are used to draw complex or variable parts of the page such as menus and breadcrumbs when editing [Custom decorators](#). Decorator macros can be inserted anywhere in your templates.

The macro is called by inserting a string of the form: `#macroName("argument1" "argument2" "argument3")`. There are no commas between the arguments. Unless otherwise noted, these macros take no arguments.

**NOTE:** These macros will only work reliably when customizing `main.vmd`. They may not work in other Velocity decorators. Decorator macros will not work inside normal confluence pages.

Macro	Usage
<code>#breadcrumbs()</code>	Draws the "You are here" breadcrumbs list, like the one found above the page name in the default template.
<code>#includePage(pageTitle)</code>	Includes a confluence page with the specified title. If you have 2 or more pages with the same title across multiple spaces, this macro will include the page belonging to the space you are currently viewing.
<code>#searchbox()</code>	Inserts a search box into the page, like the one to the far right of the breadcrumbs in the default template.
<code>#globalnavbar(type)</code>	Draws the global navigation bar, as found in the top right-hand corner of the default template. The navigation bar can be displayed in two modes:
<code>#globalnavbar("table")</code>	Displays the navigation bar in its default mode: drawn as a table of links with colored backgrounds and mouse-over effects.
<code>#globalnavbar("text")</code>	Displays the navigation bar as series of text links separated by   characters.
<code>#usernavbar()</code>	Draws the user-specific navigation-bar. This bar contains the links to the user's profile and history, or to the login and signup pages if the user is not logged in.
<code>#helpicon()</code>	Draws the help icon, and link to the Confluence help page.
<code>#printableicon()</code>	On pages where a printable version is available, draws the printable page icon, linking to the printable version of the page. Otherwise, draws nothing
<code>#pagetitle(class)</code>	When you are viewing a page in a Confluence space, draws the name of the space that page is in. Otherwise, writes the word "CONFLUENCE". The "class" argument is the CSS class that the title should be drawn in. Unless you have customized your Confluence installation's CSS file, you should call this with "spacename" as the class: <code>#pagetitle("spacename")</code>
<code>#poweredby()</code>	Writes out the "Powered by Confluence" and Confluence version-number boilerplate found at the bottom of the default template.
<code>#bottomshadow()</code>	Draws the fading shadow-effect found at the bottom of the content area in the default template.
<code>#dashboardlink()</code>	Inserts a link to the dashboard page.

## Custom Decorator Templates

### About Decorators

Confluence is built on top of the Open Source SiteMesh library, a web-page layout system that provides a consistent look and feel across a site. SiteMesh works through "decorators" that define a page's layout and structure, and into which the specific content of the page is placed. If you are interested, you can read more in the [SiteMesh](#) documentation.

What this means for Confluence is that you can customize the look and feel of parts of your Confluence site through editing decorators, for example:

- The "Main" decorator defines the generic header and footer
- The "Page" decorator defines how a page is displayed
- The "Printable" decorator defines the look and feel of the printable versions of pages.

You can view and edit these decorators from within Confluence. Changes to the decorators will affect all spaces in that Confluence installation.

The decorator that is used to draw Confluence's administrative pages cannot be edited from within Confluence. This means that if you make a mistake that renders the rest of the site unuseable, the administrative pages should still be available for you to fix the template.

### Browsing the Default Decorators

At any time, you can browse the default decorators that come packaged with Confluence by following the "View Default" links on the "Site Layouts" page. The template browser also allows you to view the "#parsed" templates that are included within the template when it is compiled. While you can't edit these included templates, you will probably have to copy some or all of them into your custom template as you do your customization.

### Editing Custom Decorators

To edit Confluence decorators you will need a good knowledge of [HTML](#), and some understanding of the [Velocity templating language](#).

To edit a decorator:

1. Go to **Confluence Admin > Layouts**.
2. Choose **Create Custom** beside the decorator you wish to edit.
3. Save your changes.

If you make a mistake or want to undo your changes, choose **Reset Default** beside the edited decorator.

Alternatively, the custom templates are stored in the DECORATOR table in the database. If you have somehow managed to render Confluence completely unuseable through editing your templates, delete the relevant entries from the DECORATOR table.

### Macros

Some parts of the page are drawn using Velocity macros, including the navigation bar. The macros you should know about when editing decorators are described in [Working With Decorator Macros](#).

### For Advanced Users

The `velocity` directory is at the front of Confluence's velocity template search path. As such, you can override *any* of Confluence's velocity templates by placing an identically named file in the right place.

While we don't recommend you do this, it does give you complete control over the look of every aspect of Confluence. It also means that you can edit your templates in a text-editor if you wish, rather than through your browser.

There are, however, two important caveats:

1. Velocity is configured to cache templates in memory. When you edit a page from within Confluence, it knows to reload that page from disk. If you are editing the pages on disk, you will either have to turn off velocity's caching temporarily in `WEB-INF/classes/velocity.properties`, or restart the server to make your changes visible.
2. Changes may interact unpredictably with future versions of Confluence. When upgrading, you should

always test your custom modifications thoroughly before deploying them on a live site.

## Customizing a Specific Page

If you'd like to change the appearance of a specific page, you can modify the corresponding Velocity template. Here's how to find out which one:

1. Access the page. Note the name of the action. For example, the "Contact Administrators" page is `<baseUrl>/administrators.action`.
2. Browse to `<confluence-install>/confluence/WEB-INF/lib/confluence-x.y.jar`. Copy the file.
3. Unzip or unjar the file using a standard unzipper or the [java jar utility](#).
4. Open `xwork.xml`. Search the file for the name of the action corresponding to the page you'd like to modify. You'll see an entry like:

```
<action name="administrators"
class="com.atlassian.confluence.user.actions.AdministratorsAction">
    <interceptor-ref name="defaultStack"/>
    <result name="success"
type="velocity">/administrators.vm</result>
</action>
```

5. The file to look for is the `vm` or `vmd` file. In the above example, it's `administrators.vmd`. Because there is no context path (just a `/` before the name of the file), it's in the root of the Confluence webapp. For the stand-alone, that's `<confluence-install>/confluence` folder.
6. Modify the file.

For details on how to configure the file, check the [Velocity Template Overview](#).

## Customizing the Login Page

This page gets you started on customizing the Confluence login page, to add your own logo or custom text. This will not customize the login *process*, just what users sees when they log in.

### Notes:

- Customizations to the Confluence login page will need to be reapplied when you upgrade Confluence. Consider this before making drastic changes to the layout, and be sure to keep a list of what you have changed for your upgrade process later.
- Please test your changes on a **test** Confluence site first.

Only administrators with access to the server where Confluence is running can modify the Confluence login page.

### Related pages:

- [Changing the Site Logo](#)
- [Velocity Template Overview](#)
- [Customizing Site and Space Layouts](#)
- [Changing the Look and Feel of Confluence](#)
- [Modify Confluence Interface Text](#)

### To change the login page:

1. Shut down your Confluence server.
2. In the Confluence installation directory, find the file `confluence/login.vm`.
3. Make a copy of this file as a backup.
4. Edit the file with a text editor to make the required changes. The content contains a mixture of HTML and Velocity. See [Velocity Template Overview](#) (in our developer documentation).
5. Start Confluence and test your changes.

The same process can be applied to modify most of the templates in the Confluence web application. Be careful to test your changes before applying them to a live site. The templates contain code that is vital for

Confluence to function, and it is easy to accidentally make a change that prevents use of your site.

## Modify Confluence Interface Text

All Confluence UI text is contained in a single Java properties file. This file can be modified to change the default text, and also to translate Confluence into languages other than English.

The UI text file is `ConfluenceActionSupport.properties`. From your Confluence install directory:

```
\confluence\WEB-INF\lib\confluence-x.x.x.jar
```

Replace "x.x.x" with your Confluence version, for example for 4.3.2, it will be named "confluence-4.3.2.jar".

Within this File, the relevant file to edit is

```
:\com\atlassian\confluence\core\ConfluenceActionSupport.properties.
```

Refer to [Editing jar files](#) for reference.

The file contains parameters with `name=value` pairs, in the format:

```
parameter.name=Parameter value
```

Parameter names are any text before the '=' character and should never be modified. Any text after the '=' character is the parameter value, which can be modified freely and can also contain variables. An example involving variables is:

```
popular.labels=The three most popular labels are {0}, {1} and {2}.
```

For more information on replacing values, check out [Translating ConfluenceActionSupport Content](#). Note that plugins store their text internally, so you must modify plugin text individually.

### Steps For Modification

1. Stop Confluence
2. Under your install directory, open `\confluence\WEB-INF\lib\confluence-x.x.x.jar\com\atlassian\confluence\core\ConfluenceActionSupport.properties`
3. Search for the text you wish to modify, replace it and save the file in `<Confluence-Install>\confluence\WEB-INF\classes\com\atlassian\confluence\core`. Please create this folder structure, if it does not exist already.

If you re-bundle the JAR file, rather than re-deploy the class in the `WEB-INF\classes` directory, make sure to move the backup JAR file out of the `/lib` directory, or the backup may be deployed by mistake.

4. Restart Confluence

### Modify Keyboard Shortcuts

Confluence provides a set of [keyboard shortcuts](#). You could customize the shortcuts by making modifications inside the `ConfluenceActionSupport.properties` file.

- To disable a particular shortcut, you can simply just comment out a respective line of code. One may like to disable the shortcut to one of the navigation links: *View*, *Edit*, *Attachments*, *Info*. For instance, to disable shortcut to *Attachments* one would comment out the following line:



```
#navlink.attachments.accesskey=a
```

- To modify an access key, one could simply just change the letter, bearing in mind the fact that the letter must be unique.

## Customizing Email Templates

Customizing the Confluence email templates is **not supported**. If you do decide to edit the templates we strongly recommend you use a test instance of Confluence.

Any customizations you make to the Confluence email notification templates will need to be reapplied after upgrading Confluence.

Email notification templates are contained within the `confluence-email-notifications` plugin, which is a bundled plugin (add-on) that is installed automatically when you install Confluence.

Only administrators with access to the Confluence installation directory can modify the Confluence email templates.

Confluence uses Soy templates (also known as Closure templates) for email notifications. You can find out more in the [Google Developer docs](#) or see our [developer tutorial](#) which contains a short introduction to using Soy templates.

### To change the email notification templates:

1. In the Confluence web application folder, find the file `/confluence/WEB-INF/atlassian-bundled-plugins/confluence-email-notifications-plugin-x.x.jar`  
Note: This plugin is independently versioned, the version number will not necessarily match Confluence's version number.
2. Copy this file to a working location and extract the jar file. Find out more about how to [edit files within .jar archives](#).
3. Within the jar file, templates are stored in the `/templates/` folder. Edit the Soy templates to make your changes.
4. Zip all the files and change the file extension to `.jar` (or refer to the [guide on editing files within .jar archives](#) for other methods).
5. Drop the new jar file into the `/confluence/WEB-INF/atlassian-bundled-plugins` folder (replacing the original file - you might want to make a copy of the original file for easy roll back) and then restart your instance.
6. Test your changes carefully before installing the updated plugin in production.

We strongly recommend you use a test instance for editing the templates contained within the plugin. If you are unable to enable the plugin, check the Confluence logs for information, it may be that there are problems with your edits to the Soy templates.

### RELATED TOPICS

- [Customizing Site and Space Layouts](#)
- [Changing the Look and Feel of Confluence](#)
- [Modify Confluence Interface Text](#)

## Changing the Default Behavior and Content in Confluence

Confluence comes with some handy default settings that determine what people see when they first enter the Confluence site, and the default content that is put into new spaces and other areas of Confluence.

Confluence administrators can change the settings to customize the behavior and the default content of their Confluence site:

- [Administering Site Templates](#)
- [Importing Templates](#)

### Related pages:

- [Changing the Look and Feel of Confluence](#)

- [Changing the Site Title](#)
- [Choosing a Default Language](#)
- [Configuring the Administrator Contact Page](#)
- [Configuring the Site Home Page](#)
- [Customizing Default Space Content](#)
- [Editing the Site Welcome Message](#)

## Administering Site Templates


A template is a predefined page that can be used as a prototype when creating new pages. Templates can be created by users, or provided by a blueprints. See [Page Templates](#) and [Blueprints](#).

Administrators can import templates, to make them available to other people using Confluence. See [Importing Templates](#).

Confluence also provides 'system templates' which contain default content for the site welcome message (see [Editing the Site Welcome Message](#)) and [default space content](#) (see [Customizing Default Space Content](#)).

Administrators can also disable templates and blueprints, to stop them appearing in the Create and Create Space dialogs anywhere in their Confluence site.

To **disable** a template or blueprint across the entire Confluence site:

- Choose the **cog icon**  , then choose **General Configuration** under Confluence Administration
- Choose **Global Templates and Blueprints**.
- Choose **Disable** next to the template, page blueprint or space blueprint you wish to disable.

Administrators can re-enable these templates and blueprints at any time.

## Importing Templates

A template is a predefined page that can be used as a prototype when creating new pages. Templates are useful for giving pages a common style or format.

You can create your own templates within Confluence. See [Create a Template](#).

In addition, you can download pre-defined templates from the [Atlassian Marketplace](#) in the form of a template bundle. Each template bundle contains one or more templates, created by Atlassian or third parties. Here is a summary of the steps required:

- Download the template bundle from the Atlassian Marketplace.
- Install the template bundle into your Confluence site.
- Make the templates available by importing them into the site or into an individual space.

You need 'System Administrator' permission to install template bundles into your Confluence site. You need 'Confluence Administrator' permission to manage the existing template bundles on your Confluence site. See [Global Permissions Overview](#).

### Step 1. Check the template bundles installed on your Confluence site

**To see the template bundles that are currently available for import on your Confluence site:**

1. Log in to Confluence as a System Administrator or Confluence Administrator.
2. Choose the **cog icon**



### On this page:

- [Step 1. Check the template bundles installed on your Confluence site](#)
- [Step 2. \(Optional\) Download and install additional template bundles from the Atlassian Marketplace](#)
- [Step 3. Import the templates to make them available to users](#)
- [Notes](#)

### Related pages:

- [Pages and blogs](#)
- [Page Templates](#)




- , then choose **General Configuration** under Confluence Administration
3. Choose **Import Templates** in the left-hand panel. You will see a list of the template bundles installed on your Confluence site, and the templates included in each bundle.

### Step 2. (Optional) Download and install additional template bundles from the Atlassian Marketplace

Follow the steps below if you want to add more template bundles to your site.

*Before installing an add-on (also called a plugin) into your Confluence site, please check the add-on's information page to see whether it is supported by Atlassian, by another vendor, or not at all. See our guidelines on [add-on support](#).*


#### To upload more templates:

1. Go to the [Atlassian Marketplace](#) and download the template bundle that you need. It will be in the form of a JAR file. Save the JAR file somewhere in your file system.
2. Log in to Confluence as a System Administrator.
3. Choose the **cog icon**  
 , then choose **General Configuration** under Confluence Administration
4. Choose **Manage Add-ons** in the left-hand panel.
5. Choose **Upload Add-on**.
6. Browse to find the template bundle that you downloaded, and upload it to Confluence. The template bundle will appear in the list under 'User-installed Add-ons'.

### Step 3. Import the templates to make them available to users

You now have one or more template bundles on your site. The templates are not available until you have 'imported' them.

#### To import a template:

1. Log in to Confluence as a System Administrator or Confluence Administrator.
2. Choose the **cog icon**  
 , then choose **General Configuration** under Confluence Administration
3. Choose **Import Templates** in the left-hand panel. You will see the template bundles installed on your Confluence site and the templates included in each bundle.  
Note: You can see a preview of the template by choosing the template name.
4. Select the templates to be imported by ticking the check boxes next to the relevant template names.
5. Choose the import destination for the templates in the **Import To** dropdown menu. If you want the templates to be available to only a specific space, choose the name of the space, otherwise choose **Global Templates** to make the templates available to all spaces.
6. Choose **Import**.

*Screenshot: Importing a template*

## Import Templates

The following template package plugins were found. To import templates, tick the checkboxes for the desired templates, select where to import the templates to, and click the Import button.

### Human Resources Templates (8)

[Check All](#) [Uncheck All](#)

- ☐ HOW-TO Guide
- ☐ Induction Tasks
- ☐ Job Description
- ☐ Meeting Minutes
- ☐ Recruitment Dashboard
- ☐ Space Home Page
- ☐ Time Sheet
- ☒ Wiki Induction

Import To: Global Templates ▼

- Global Templates
- Spaces**
  - Demonstration Space
  - Documentation

#### Notes

- **Building your own template bundles.** You can build a template bundle as an add-on (also called a 'plugin') and then upload it to your Confluence site. You can then import the templates from your custom template bundle, as described above. You will need some programming knowledge to develop a template bundle. See [Creating A Template Bundle](#).
- **Duplicate template names.** If a template with the same name already exists on import, a duplicate template of the same name will be created. You will need to check the templates and rename them manually.
- **Removing the template.** Removing the add-on that contains a template will not remove the template from your Confluence site if you have already imported it. You will need to remove the template manually via the administration console or space administration screen.

### Changing the Site Title

The site title appears in your browser's title bar. By default, it is set to 'Confluence'.

**To change the title of your Confluence site:**

1. Choose the **cog icon**



, then choose **General Configuration** under Confluence Administration

2. Choose '**General Configuration**' in the left-hand panel.
3. Choose '**Edit**' at the top of the '**Site Configuration**' screen.
4. Enter a new title for your site in the input field next to '**Site Title**'.
5. Choose '**Save**'.

**Related pages:**

- [Changing the Site Logo](#)
- [Editing the Site Welcome Message](#)
- [Customizing your Confluence Site](#)
- [Confluence Administrator's Guide](#)

**Choosing a Default Language**

Administrators can define a default language to be applied to all spaces in your Confluence site. Note that individual users can select a language preference for their session.

**Setting the default language**

To change the default language for the Confluence site:

1. Choose the **cog icon**



, then choose **General Configuration** under Confluence Administration

2. Select '**Languages**' in the 'Configuration' section of the left-hand panel.
3. Choose **Edit** and select the language you want to use as the default language for your Confluence site.

**Related pages:**

- [Edit Your User Settings](#)
- [Recognized System Properties](#)
- [Configuring Indexing Language](#)
- [Installing a Language Pack](#)

Confluence comes with the following languages installed and ready to use:

- eština (eská republika | Czech Republic)
- Deutsch (Deutschland | Germany)
- Eesti (Eesti | Estonia)
- English (UK)
- English (US)
- Español (España | Spain)
- Français (France)
- Íslenska (Ísland | Iceland)
- Italiano (Italia | Italy)
- Magyar (Magyarország | Hungary)
- Nederlands (Nederland | The Netherlands)
- Norsk (Norge | Norway)
- Polski (Polska | Poland)
- Português (Brasil | Brazil)
- Român (România | Romania)
- Slovenina (Slovenská republika | Slovak Republic)
- Suomi (Suomi | Finland)
- Svenska (Sverige | Sweden)
- ( | Russia)
- ( | China)
- ( | Japan)
- ( | Republic of Korea)

**Other settings that affect the language**

Individual users can choose the language that Confluence will use to display screen text and messages. Note that the list of supported languages depends on the language packs installed on your Confluence site.

The language used for your session will depend on the settings below, in the following order of priority from highest to lowest:

- The language preference defined in your user profile. Note that you need to be logged in for this setting to take effect.
- The language that you choose by clicking an option at the bottom of the Confluence login screen. Confluence stores this value in a cookie. When the cookie expires, the setting will expire too.
- The language set in your browser. The browser sends a header with a prioritized list of languages. Confluence will use the first supported language in that list. Confluence administrators can disable this option by setting the `confluence.browser.language.enabled` [system property](#) to `false`.
- The default language for your site, as defined by your Confluence site administrator.

### Showing User Interface Key Names for Translation

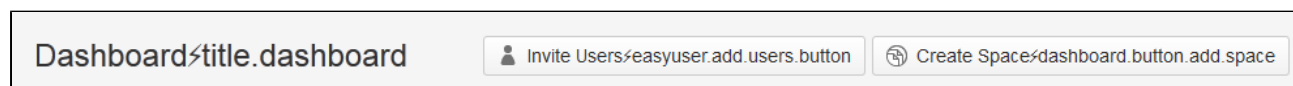
This feature is useful if you are working on creating translations of the Confluence user interface. After opening the Confluence dashboard, you can add the following action to the end of your Confluence URL:

```
?i18ntranslate=on
```

For example `http://myconfluencesite.com?i18ntranslate=on`

This will cause each element of the user interface to display its special **key name**. This makes it easier to find the context for each key within the user interface. You can then search for the key on <http://translations.atlassian.com> where you can enter an appropriate translation for your custom language pack.

The key names are displayed with a 'lightning bolt' graphic. For example:



To turn off the translation view, add the following to the end of the Confluence URL:

```
?i18ntranslate=off
```

### Configuring the Administrator Contact Page

The administrator contact page is a form that allows a user of Confluence to send a message to the administrators of their Confluence site. (In this context, administrators are the members of the default administrators group.)

See the explanation of [Confluence Groups for Administrators](#).

The title of the administrator contact page is 'Contact Site Administrators'. Typically, Confluence users may get to this page by clicking a link on an error screen such as the '500 error' page.

#### On this page:

- [Customizing the Administrator Contact Message](#)
- [Disabling the Administrator Contact Form](#)
- [Configuring Spam Prevention](#)

#### Related pages:

- [Configuring Captcha for Spam Prevention](#)

### Customizing the Administrator Contact Message

You can customize the message that is presented to the user on the '**Contact Site Administrators**' page.  
**To edit the administrator contact message:**

1. Choose the **cog icon**



, then choose **General Configuration** under Confluence Administration

2. Choose **General Configuration** in the left-hand panel.
3. Choose **Edit** at the top of the 'Site Configuration' section.
4. Enter your text in the **Custom Contact Administrators Message** box. You can enter any text or [Confluence wiki markup](#).
5. Choose **Save**.

### The Default Administrator Contact Message

By default, the 'contact administrators message' looks much like the highlighted area in the screenshot below, starting with 'Please enter information...'.  
 Screenshot: The default 'Contact Site Administrators' message

**Contact Site Administrators**

Please enter information about your request for the site administrators. If you are reporting an error please be sure you include information on what you were doing and the time the problem occurred.

↑

To

From

Subject\*


Request Details\*

To restore the message to its default simply remove the custom message you entered when following the instructions [above](#), so that the 'Custom Contact Administrators Message' field is empty.

### Disabling the Administrator Contact Form

If you prefer to disable the ability for users to send an email message to the site administrators, you can disable the form portion of this screen. You can only disable the form if you first provide a 'Custom Contact Administrators Message' as described [above](#).

#### To enable or disable the administrator contact form:

1. Choose the **cog icon** , then choose **General Configuration** under Confluence Administration
2. Choose **General Configuration** in the left-hand panel.
3. Choose **Edit** at the top of the 'Site Configuration' section.
4. Select **on** or **off** for the 'Contact Administrators Form'.
5. Choose **Save**.

### Configuring Spam Prevention

You can configure Confluence to use Captcha to help prevent spam, including the spamming of Confluence administrators. The administrator contact form is covered by the site-wide Captcha settings as documented in [Configuring Captcha for Spam Prevention](#).

### Configuring the Site Home Page

The dashboard is the default home page for your site, but you can choose to use a space homepage as the landing page for your site.


This can be useful if most people will be reading, rather than creating, pages in your site. However, for sites where you want to encourage teams to collaborate, the dashboard provides the best tools for resuming work in progress and keeping up with what is happening in the site.

#### Related pages:

- [Editing the Site Welcome Message](#)
- [Changing the Site Title](#)
- [Changing the Site Logo](#)

Users can also choose to override the site homepage and use the dashboard or a different page as their landing page in their [personal settings](#).

#### To use a page as your site home page:

1. Go to  > **General Configuration** > **Further Configuration**.
2. Choose **Edit**.
3. Select a space from the **Site Homepage** dropdown menu.  
When users log in or click the site logo, Confluence will go to the home page of the space you choose here.
4. Choose **Save**.

##### Note about permissions


Before changing the site homepage you should check that the default 'confluence-users' or 'users' groups have permissions to view the space the page was created in, and that the page itself is not restricted to particular people or groups.

If your site is public, you'll also need to make sure anonymous users have permissions to view the space, otherwise anonymous users will be directed to the dashboard instead.

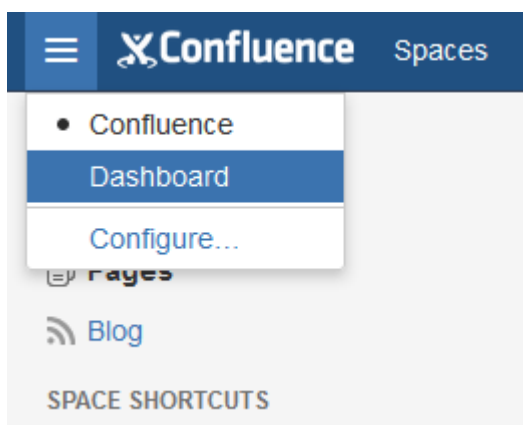
#### Accessing the dashboard with a site homepage set

If you choose to set a page as your site homepage but would like your users to still be able to access the Confluence dashboard, you can add a link to the Application Navigator.

#### To add the Confluence Dashboard to the Application Navigator:

1. Go to  > **General Configuration** > **Application Navigator**.
2. Enter the name for your link, for example, 'Dashboard'.
3. Enter the URL for your site dashboard, for example, `https://yoursite.com/wiki/dashboard.action`.
4. Choose **Add**.

A link to the dashboard will now appear in the Application Navigator.



#### Customizing Default Space Content

[Confluence Administrators](#) can edit the template that is used to create the home page for new sites. This default content appears on the home page when a new space is created. There is a different template for site spaces, personal spaces and space blueprints.

The default content in the template only appears for new spaces (those that

are created after you have defined the content). Changes to the template do not affect existing home pages.

#### Edit the default home page for a blank space

##### To edit the default (blank) space content template:

1. Choose the **cog icon**



, then choose **General Configuration** under Confluence Administration

2. Choose **Global Templates and Blueprints** in the left-hand panel.
3. Choose **Edit** next to 'Default Space Content' or 'Default Personal Space Content' depending on whether you want to customize the content for new site space or personal space home pages.
4. Enter the content that you want to appear on the home page for new blank spaces. you can add variables, macros and other content in the same way as edited a page template.
5. Choose **Save**.

The following variables are available to be added to the default space content templates.

- **\$spaceKey** - inserts the space key into the site space homepage
- **\$spaceName** - inserts the space name into the site space homepage
- **\$userFullName** - inserts the user (owner of the personal space) into the personal space homepage
- **\$userEmail** - inserts the email address of the user (owner of the personal space) into the personal space homepage.

Default space templates differ from ordinary page templates in that they do not present the user with a form to complete, so variables should be limited to those listed in the **Variables** menu.

Some macros, such as the Table of Contents macro, may not display correctly when you preview the template as they are designed to work on a page. The macros will display correctly on the home page when you create a new space. For more information on editing a template, including adding macros see - [Adding Content to a Template](#).

#### Reset the original default content

##### To reset the original default content:

1. Choose the **cog icon**



, then choose **General Configuration** under Confluence Administration

2. Choose **Global Templates and Blueprints** in the left-hand panel.
3. Choose **Reset to default** next to the template you wish to reset.

From this point on, all new space home pages will be created with the original default content.

#### Editing the Site Welcome Message

Give your site's landing page some personality by editing the site welcome message.

The site welcome message appears on the right hand side of the dashboard and is perfect for adding announcements, useful links, or a fun photo from your last office party or team outing.

You'll need Confluence administrator permissions to edit the site welcome message.

##### To edit the site welcome message:

Confluence administrators can either click the **Edit** link below the site welcome message on the

#### On this page:

- [Edit the default home page for a blank space](#)
- [Reset the original default content](#)

#### Related pages:

- [Spaces](#)
- [Page Templates](#)

#### On this page:

- [Hints for using the template editor](#)
- [Allowing other people to edit the site welcome message](#)

#### Related pages:

- [Configuring the Site Home Page](#)
- [Changing the Site Title](#)
- [Changing the Site Logo](#)



dashboard, or:

1. Go to

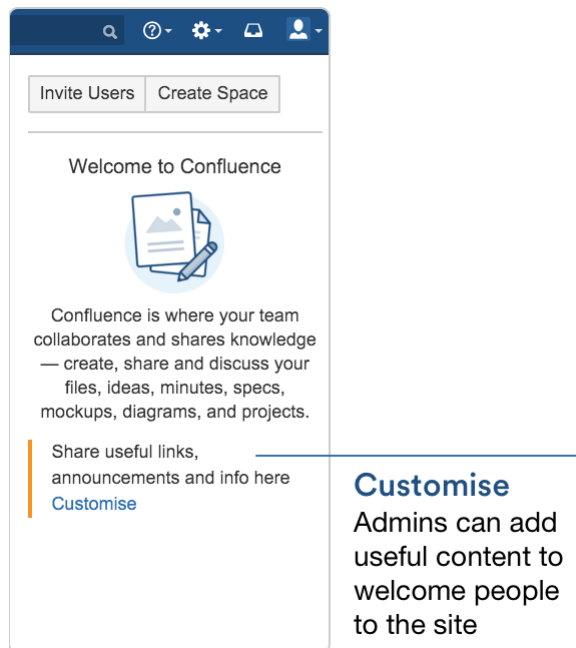


> **General Configuration** > **Global Templates and Blueprints**.

2. Scroll down to the System templates and choose **Edit** next to **Default Welcome Message**.
3. Add your content and choose **Save**.

You can go back to the original welcome message at any time - choose **Reset to Default** next to the **Default welcome message** template.

*Screenshot: Default site welcome message*



### Hints for using the template editor

The site welcome message is a template, not a page, so you'll be using the template editor to make your changes.

You can add text, links and macros, as you would in any Confluence page, but the process for adding files, including images is a little different.

You can't upload an image or other file into a template directly. First you'll need to upload the file to a page in your site, then in your template, choose **Insert** > **Files** > **Search on other pages** to embed the file or image.

You can't use template variables in the site welcome message.

### Allowing other people to edit the site welcome message

You can allow people who are not Confluence administrators to edit the site welcome message by using the [Include Page](#) macro to include content from elsewhere in your site, rather than adding content directly to the template.

### To include content from a page in the site welcome message:

1. Create a new page in a space that is visible to all users. It's important that all users can see content in that space - if a person does not have permissions to view the space where you've created the page, they won't be able to see the page content on the dashboard.
2. Add some text, images or macros, then save the page.
3. [Restrict](#) who can edit the page (this is optional, but useful if you only want to allow some people to



- change the content).
- 4. Edit the site welcome message template (as described above) and use the [Include page](#) macro to include the contents of your newly created page.
- 5. Save the template.

People with permission to edit the page will now be able to make changes at any time, and their changes will be visible on the dashboard as soon as the page is saved.

## Integrating Confluence with Other Applications

You can integrate Confluence with other applications using **Application Links**. The Application Links feature allows you to link Confluence to applications such as JIRA Software or JIRA Service Desk.

Linking two applications allows you to share information and access one application's functions from within the other. For example, you can display a list of issues on a Confluence page using the [Jira Issues Macro](#).

### Related Topics

- [Linking to Another Application](#)
- [Configuring Workbox Notifications](#)
- [Integrating Jira and Confluence](#)
- [Registering External Gadgets](#)
- [Configuring the Office Connector](#)

### Linking to Another Application

Application Links (sometimes called "AppLinks") is a bundled plugin that allows you to link Atlassian applications to each other. Linking two applications allows you to share information and access one application's functions and resources from within the other.

Atlassian recommends only using OAuth authentication for application links, because of the greater security inherent with that protocol. We no longer recommend the Trusted Applications and Basic authentication types.

Linking Confluence to other applications allows you to include information from those applications in pages or blogs that you create in Confluence. For example, you could link Confluence to Jira Software and display issues on a Confluence page using the [Jira Issues Macro](#).

1. Go to



> **General Configuration** > **Application links**.

The Application Links configuration page appears and lists any links you already have set up.

2. Enter the URL of the application you want to link to, then click **Create new link**.
  - If you check **The servers have the same set of users...** then this link will be configured using OAuth (with impersonation) authentication.
  - If you are *not* an admin on both servers you won't be able to set up a 2-way (reciprocal) application link. If you want to go ahead and create a 1-way link anyway, clear the **I am an administrator on both instances** checkbox.
3. Use the wizard to finish configuring the link. If the application you are linking to does not have the Application Links plugin, you must supply additional information to set up a link with OAuth authentication.

When you complete the wizard, the Application Links plugin will create the link between your applications using the most secure authentication method that is supported between the two applications. See the [Application Links User Guide](#) for more information.

The new link will appear on the "Configure Application Links" page, where you can:

- Edit the settings of the application link (for example, to [change the authentication type](#) of the link) using the **Edit** icon.
- Specify the default instance if you have multiple links to the same type of application (for example, to multiple Jira servers) using the **Make Primary** link. See [Making a primary link for links to the same application type](#) for more information.

#### Having trouble integrating your Atlassian products with application links?

We've developed a [guide to troubleshooting application links](#), to help you out. Take a look at it if you

need a hand getting around any errors or roadblocks with setting up application links.

## Configuring Workbox Notifications

You can view and manage in-app notifications and tasks in your Confluence workbox. In addition, you can receive notifications from Jira applications and other Confluence servers in your Confluence workbox. To make this possible, your Confluence server must be linked to the other server(s) via [application links](#).

Possible configurations:

- Your Confluence server provides in-app notifications and displays them in its own workbox. There are two sub-configurations here:
  - This Confluence server is the only server involved.
  - Alternatively, this Confluence server displays its own in-app notifications, and also displays notifications from Jira and/or other Confluence servers.
- Your Confluence server does not provide or display in-app notifications.
- Your Confluence server sends in-app notifications to another Confluence server.

Notes:

- **Workbox includes notifications and tasks:** When you enable in-app notifications, personal tasks are also enabled in the workbox. When you disable in-app notifications, the workbox no longer appears and personal tasks are therefore not available on this server.

### On this page:

- [Which notifications are included?](#)
- [Configuring the polling intervals](#)
- [Including notifications from Jira](#)
- [Stopping Jira applications from sending notifications to Confluence](#)
- [Including notifications from another Confluence server](#)
- [Sending Confluence notifications to another Confluence server](#)
- [Disabling workbox and in-app notifications in Confluence](#)

### Which notifications are included?

The workbox displays a notification when someone does one of the following in Confluence:

- [Shares](#) a page or blog post with you.
- [Mentions](#) you in a page, blog post, comment or task.
- Comments on a page or blog post that you are [watching](#).
- [Likes](#) a page or blog post that you are watching.

The workbox does **not** show notifications triggered because you are watching a space. Only watches on pages and blog posts are relevant here.

The notification in your workbox appears as 'read' if you have already viewed the page or blog post.

If your Confluence site is linked to a Jira application, you will also see the following Jira notifications in your workbox:

- Comments on issues that you are watching.
- Mentions.
- Shares of issues, filters and searches.

### Configuring the polling intervals

The polling intervals are used by the Confluence server that displays in-app notifications and tasks in its workbox.

Option	Description
--------	-------------

Active polling interval	This is the number of seconds that Confluence will wait before checking (polling) for new notifications relevant to the page that the user is currently viewing. This setting applies to the page open in the browser tab that currently has focus. It does not matter whether the user has the workbox open or not.
Inactive polling interval	<p>This is the number of seconds that Confluence will wait before checking (polling) for new notifications relevant to all pages that are not currently in focus. These pages may be on the Confluence server that displays the workbox, or on other Confluence or Jira servers that send their notifications to this server.</p> <p>This setting defines an upper limit. For inactive pages, Confluence starts with a polling interval equal to the active polling interval, then gradually increases the interval between polls until it reaches the limit defined here.</p>

### Including notifications from Jira

If your Confluence site is connected to a Jira application, you can include notifications from your Jira application, for example Jira Software or Jira Service Desk.

#### To include notifications from a Jira application:

Your Jira application and Confluence must be connected via an application link. See [Linking to Another Application](#).

1. Choose the **cog icon**



, then choose **General Configuration** under Confluence Administration

2. Choose **In-app Notifications** in the left-hand panel of the Confluence administration console.
3. Choose **displays in-app notifications from other servers**.

- Your Jira application will appear in the list of linked applications below this option.
- People will see Jira notifications in their workbox, as described in [Workbox Notifications](#).

#### Notes:

- Jira sends its notifications to the Confluence server that is configured as the **primary** application link.
- Your Jira server must be running **Jira 5.2 or later**.
- The following plugins must be present and enabled in Jira. The plugins are shipped with Jira 5.2 and later:
  - 'Workbox – Common Plugin'
  - 'Workbox – Jira Provider Plugin'
- You do not need to configure Jira. The plugins are enabled by default in Jira, and Jira will automatically send notifications to Confluence.
- The application link must use OAuth authentication. If you don't see your Jira application listed, you will need to edit the application link (in both applications) to change the authentication type.
- Confluence can display notifications from more than one server.

*Screenshot: This Confluence server displays in-app notifications from itself and from Jira*

**This Confluence server:**

☒ displays in-app notifications from other servers

Linked applications send notifications to this server. These are:

Application	URL
Your Company JIRA	http://pyko:2991/jira-client

[Modify linked applications](#)

Active polling interval  seconds  
Time to wait before checking for new notifications on the page the user is currently viewing.

Inactive polling interval  seconds  
Time to wait before checking for new notifications when the user isn't focused on a page.

☐ does not provide in-app notifications

In-app notifications are disabled on this server.

## Stopping Jira applications from sending notifications to Confluence

You may wish to configure Confluence to display its own notifications in its workbox, but prevent notifications from Jira applications from appearing in the workbox, even when JIRA applications and Confluence are linked via application links.

The Jira administration interface does not offer a way of disabling notifications sent to Confluence.

**To stop Jira applications from sending notifications to Confluence:** Disable the following plugins in Jira. (See the [Universal Plugin Manager guide to disabling plugins](#).)


- 'Workbox – Common Plugin'
- 'Workbox – Jira Provider Plugin'

## Including notifications from another Confluence server

Confluence workbox can include notifications from another Confluence server.

Let's assume that you have two Confluence servers, *ConfluenceChatty* and *ConfluenceQuiet*. Let's also assume that you want *ConfluenceChatty* to display a workbox, and to include notifications from *ConfluenceQuiet*.

**To include notifications from other Confluence servers:**

1. Connect *ConfluenceChatty* and *ConfluenceQuiet* via application links. In *ConfluenceChatty*:
  - Choose the **cog icon** , then choose **General Configuration** under Confluence Administration
  - Choose **Application Links** in the left-hand panel.
  - Set up the link as described in [Linking to Another Application](#).
2. Configure the notification settings in *ConfluenceChatty*:
  - Choose **In-app Notifications** in the left-hand panel of the Confluence administration console.
  - Choose **displays in-app notifications from other servers**.
3. Configure the notification settings in *ConfluenceQuiet*:
  - Choose **In-app Notifications** in the left-hand panel of the Confluence administration console.
  - Choose **sends in-app notifications to another server**.
  - Select the Confluence server that will display the workbox – in our example, this is *ConfluenceChatty*. (The entry for *ConfluenceChatty* will appear here only if you have already configured *ConfluenceChatty* to display in-app notifications.)

**Notes:**

- Your Confluence servers must be running **Confluence 4.3.3 or later**.
- Confluence can display notifications from more than one server.
- Confluence can send notifications to only one server.
- Only one of the linked Confluence servers can display the in-app notifications.

*Screenshot: This Confluence server displays in-app notifications from itself, from Jira, and from another Confluence server*

**This Confluence server:**

☒ displays in-app notifications from other servers

Linked applications send notifications to this server. These are:

Application	URL
Your Company JIRA	http://pyko:2991/jira-client
pyko	http://pyko:1991/confluence-client

[Modify linked applications](#)

Active polling interval  seconds  
Time to wait before checking for new notifications on the page the user is currently viewing.

Inactive polling interval  seconds  
Time to wait before checking for new notifications when the user isn't focused on a page.

☐ sends in-app notifications to another server  
Notifications from this Confluence server are sent to the specified server.

☐ does not provide in-app notifications  
In-app notifications are disabled on this server.

**Sending Confluence notifications to another Confluence server**

You can configure Confluence to send all notifications to a different Confluence server. In this case, the current Confluence server will not display the workbox.

**To send notifications to another Confluence server:** Follow the instructions in our example for *ConfluenceQuiet* [above](#).

*Screenshot: This Confluence server sends its in-app notifications to another Confluence server*

**This Confluence server:**

☐ displays in-app notifications from other servers  
Linked applications send notifications to this server.

☒ sends in-app notifications to another server  
Notifications from this Confluence server are sent to the specified server.

Application	URL
<input checked="" type="radio"/> pyko	http://pyko:1991/confluence-client

☐ does not provide in-app notifications  
In-app notifications are disabled on this server.

## Disabling workbox and in-app notifications in Confluence

If you choose **does not provide in-app notifications**:

- The Confluence workbox icon will no longer be visible and people will be unable to access their workboxes on this server.
- This Confluence server will no longer send notifications to its workbox, and will not send notifications to any other Confluence server.

## Integrating Jira and Confluence

Jira applications and Confluence complement each other. Collect your team's thoughts, plans and knowledge in Confluence, track your issues in your Jira application, and let the two applications work together to help you get your job done.

[Learn more about what you can do with Jira and Confluence](#)

Here's some ways you can get Jira and Confluence working together.

### On this page:

- [Installing Jira and Confluence together](#)
- [Use Jira and Confluence together](#)
- [Delegate user management to Jira](#)
- [Connect Jira and Confluence with an application link](#)

### Installing Jira and Confluence together

We recommend running Jira and Confluence in separate stand-alone instances behind an Apache Web Server. The following documentation will guide you through the installation processes:

- [Installing Confluence](#)
- [Installing JIRA applications](#)
- [Running Confluence behind Apache](#)
- [Integrating JIRA with Apache](#)

We don't support deploying Confluence and any other application (including Jira) in the same Tomcat container. See [Can Multiple Atlassian Products Be Deployed in a Single Tomcat Container?](#) for more information.

### Use Jira and Confluence together

This is the fun stuff. Check out [Use Jira applications and Confluence together](#) to find out about all the integration points, great time saving features, and to check exactly which Jira application and version you'll need.

### Delegate user management to Jira

If you already have a Jira application you can choose to delegate user management to Jira, and manage all your users in one place. You can control which Jira groups also have permissions to use Confluence. Your license tiers for each application do not need to be the same.

See [Configuring Jira Integration in the Setup Wizard](#) to delegate user management to Jira when installing Confluence for the first time.

See [Connecting to Crowd or Jira for User Management](#) to delegate user management to Jira for an existing Confluence site.

### Connect Jira and Confluence with an application link

See [Linking to Another Application](#) to find out how to connect Confluence to your Jira application using an application link. This only needs to be done once.

If you delegated user management to Jira as part of Confluence's setup process, an application link to Jira will be all set up and ready to go.



**Having trouble integrating your Atlassian products with application links?**

We've developed a [guide to troubleshooting application links](#), to help you out. Take a look at it if you need a hand getting around any errors or roadblocks with setting up application links.

## Registering External Gadgets

You can register gadgets from external sites (such as [Jira](#) applications), so the gadgets appear in the [macro browser](#) and people can add them to Confluence pages using the [gadget macro](#).

There's two ways to register external gadgets:

- **Subscribe to all of the external application's gadgets:** You can add all the gadgets from your [Jira](#) application, [Bamboo](#), [FishEye](#) or [Crucible](#) site – or from another Confluence site – to your Confluence gadget directory. People can then pick and choose the gadgets to add to their Confluence pages.
- **Register the external gadgets one by one:** If you cannot subscribe to an application's gadgets, you will need to add the gadgets one by one. This is necessary for applications and websites that do not support gadget subscription, and for applications where you cannot establish a trusted relationship via Application Links.

Both methods are described below. First, consider whether you need to set up a trust relationship between Confluence and the other application.

### Setting up a trust relationship with the other application

In addition to registering the external gadgets, we recommend that you set up an OAuth or Trusted Application relationship between the application that serves the gadget (the service provider) and Confluence (the consumer). The trust relationship is required for gadgets that access restricted data from the external web application.

See how to configure OAuth or Trusted Applications Authentication, using [Application Links](#).

If the external web application provides anonymous access to all the data you need in the gadgets, then you do not need a trust relationship.

For example, if your gadgets will retrieve data from Jira and your Jira server includes projects and issues that are restricted to logged-in users, then you will need a trust relationship between Confluence and Jira. If you do not set up the trust relationship, then the gadgets will show only the information that Jira makes visible to anonymous users.

### Subscribing to all of the application's gadgets

You can add all the gadgets from your Jira, Bamboo, FishEye or Crucible site – or from another Confluence site – to your Confluence gadget directory. People can then pick and choose the gadgets to add to their Confluence pages.

#### To subscribe to another site's gadgets:

1. Go to



> **General Configuration > External Gadgets**

#### On this page:

- [Setting up a trust relationship with the other application](#)
- [Subscribing to all of the application's gadgets](#)
- [Registering individual gadgets](#)
- [Removing access to external gadgets](#)

#### Related pages:

- [Configuring the Whitelist](#)
- [The big list of Atlassian gadgets](#)
- [Linking to Another Application](#)

2. Choose the **Gadget Feeds** tab.
3. Enter the base URL of the application you want to subscribe to, for example, `http://example.com/jira` or `http://example.com/confluence`.
4. Choose **Add**. Confluence will convert the URL to a gadget feed and place it in the list of 'Added Gadget Feeds'.

*Screenshot: Subscribing to a gadget feed*

## External Gadgets

Only add gadgets that you trust! Gadgets can allow unwanted or malicious code onto your web page.

Gadget Specifications
Gadget Feeds
Gadget Whitelist

### Add a new Gadget Feed

Gadget Feed URL

Add

### Added Gadget Feeds

Gadget Feed URL	Actions
<a href="https://pug.jira.com/rest/gadgets/1.0/g/feed">https://pug.jira.com/rest/gadgets/1.0/g/feed</a>	Delete
<a href="https://pug.jira.com/rest/gadgets/1.0/g/feed/">https://pug.jira.com/rest/gadgets/1.0/g/feed/</a>	Delete

## Registering individual gadgets

If you cannot subscribe to an application's gadgets, you will need to register the gadgets one by one. This is necessary for applications and websites that do not support gadget subscription, and for applications where you cannot establish a trusted relationship via Application Links.

First you will need to get the gadget URL and copy it to your clipboard.

### Getting a gadget's URL from an Atlassian application

If your application is another Atlassian application:

A gadget's URL points to the gadget's XML specification file. In general, a gadget's URL looks something like this:

```
http://example.com/my-gadget-location/my-gadget.xml
```

If the gadget is supplied by a plugin, the URL will have this format:

```
http://my-app.my-server.com:port/rest/gadgets/1.0/g/my-plugin.key:my-gadget/my-path/my-gadget.xml
```

For example:

```
http://mycompany.com/jira/rest/gadgets/1.0/g/com.atlassian.streams.streams-jira-plugin:activitystream-gadget/gadgets/activitystream-gadget.xml
```

### To find a gadget's URL in JIRA:

- Go to your dashboard by clicking the **Dashboards** link at the top left of the screen.
- Click **Add Gadget** to see the list of gadgets in the directory.
- Find the gadget you want, using one or more of the following tools:
  - Use the scroll bar on the right to move up and down the list of gadgets.
  - Select a category in the left-hand panel to display only gadgets in that category.



- Start typing a key word for your gadget in the **Search** textbox. The list of gadgets will change as you type, showing only gadgets that match your search term.
- Right-click the **Gadget URL** link for that gadget and copy the gadget's URL into your clipboard.

#### To find a gadget's URL in Confluence:

- Choose **Help > Confluence Gadgets** to see the list of available Confluence gadgets.
- Find the gadget you want.
- Right-click the **Gadget URL** link for that gadget and copy the gadget's URL into your clipboard.


#### Getting a gadget's URL from another application

If the gadget comes from a non-Atlassian web application or web site, please consult the relevant documentation for that application to get the gadget URL.

#### Registering the gadget for use in Confluence

Now that you have the gadget's URL, you can register it in Confluence, so that people can add it to their pages. You need system administrator permissions to register a gadget.

#### To register the gadget in Confluence:

1. Go to  **> General Configuration > External Gadgets**
2. Paste your gadget's URL into the **Gadget Specification URL** field in the 'Add a new Gadget' section.
3. Choose **Add**. Your gadget will be shown in the list of registered gadgets below and it will also become available in the [macro browser](#).

*Screenshot: Registering external gadgets one by one*

## External Gadgets

**Only add gadgets that you trust! Gadgets can allow unwanted or malicious code onto your web page.**

Gadget Specifications
Gadget Feeds
Gadget Whitelist

You can add gadgets from Atlassian applications such as Confluence, JIRA and others. You can also add gadgets from other websites such as iGoogle. Many public gadgets will work on a Confluence page. Some gadgets may rely on specific OpenSocial features that will not work properly in Confluence.

If you are adding gadgets from another Atlassian Application you need to either setup the other application to trust Confluence using Trusted Applications (make sure you add the '/rest/' path to the allowed URL paths) or add Confluence as an OAuth Consumer to the other application.

A gadget's URL looks something like this: `http://example.com/my-gadget-location/my-gadget.xml`

### Add a new Gadget

Gadget Specification URL

Add

### Added Gadgets

Gadget Specification URL	Actions
<a href="https://pug.jira.com/rest/gadgets/1.0/g/com.atlassian.streams.streams-jira-plugin:activitystream-gadget/gadgets/activitystream-gadget.xml">https://pug.jira.com/rest/gadgets/1.0/g/com.atlassian.streams.streams-jira-plugin:activitystream-gadget/gadgets/activitystream-gadget.xml</a>	Delete
<a href="https://pug.jira.com/rest/gadgets/1.0/g/com.atlassian.jira.gadgets:created-vs-resolved-issues-chart-gadget/gadgets/createdvsresolved-gadget.xml">https://pug.jira.com/rest/gadgets/1.0/g/com.atlassian.jira.gadgets:created-vs-resolved-issues-chart-gadget/gadgets/createdvsresolved-gadget.xml</a>	Delete

## Removing access to external gadgets

To remove a single gadget from Confluence, click the **Delete** button next to the gadget URL.

If you have subscribed to an application's gadgets, you will need to remove the entire subscription. You cannot unregister a single gadget. Click the **Delete** button next to the gadget feed URL.

The gadget(s) will no longer be available in the macro browser, and people will not be able to add them using the Gadget macro. Any pages that already use the gadget will show a broken gadget link.

## Configuring the Office Connector

The Office Connector allows Confluence users to view, edit and import content from Microsoft Office and Open Office files attached to a page.

The Office Connector add-on is bundled with Confluence, but a [System Administrator](#) can enable or disable parts of the Office Connector and can configure options.

### On this page:

- [Enabling and disabling the Office Connector](#)
- [Configuring the Office Connector Options](#)


### Related pages:

- [Office Connector Prerequisites](#)
- [Office Connector Limitations and Known Issues](#)

## Enabling and disabling the Office Connector

If you want to limit access to all or part of the Office Connector you can disable the add-on, or some modules in the add-on.

### To enable or disable the Office Connector modules:

1. Go to  **> Add-ons**
2. Choose **System** from the filter drop down and then search for **Office Connector**
3. Expand the Office Connector add-on listing. From here you can:
  - Choose **Configure** to specify preferences for the Office Connector (this opens the configuration screen described [below](#))
  - Click **Disable** to disable all modules of the add-on
  - Expand the **modules** list to enable or disable selected Office Connector modules

Note: only some Office Connector modules can be disabled. Modules that are integral to the operation of the add-on cannot be disabled, and do not have an **Enable** or **Disable** button. Modules that can be disabled include the button and provide a brief, on-screen description of the module.

## Configuring the Office Connector Options

Users with System Administrator permissions can configure the behavior of the Office Connector.

### To set the configuration options for the Office Connector:

1. Go to  **> General Configuration > Office Connector**  
*Screenshot: Configuring the Office Connector options*

## Configure Office Connector plugin

### User Interface

Edit in word button location: ☒ Page action icon  
☐ View page tab

### Importing From Word

Warnings: ☐ Show a warning before allowing a user to perform an import

Advanced Formatting Options: ☐ Use the footnote macro for Word footnotes

Maximum imported image size:  height (pixels)  
 width (pixels)

### System Resource Usage

Temporary storage for viewfile macro: ☒ Confluence home directory: C:\Program Files\Atlassian\Application Data\Confluence\viewfile  
☐ No directory specified in the properties file. Please set a correct value in resources/directories.properties.

Maximum file space for cache(MB):


Number of Conversion Queues:  [Manage Queues](#)

### Security

Authentication: ☐ Allow authentication tokens in the URL path

2. Set the configuration options as described in the table below

Option	Default Value	Description
Edit in word button location	Page action icon	Where the button for editing the content in Word is located. You can configure action icon or from the view page tab. <b>Note:</b> This setting has no effect in the Confluence default theme.
Warnings: Show a warning before allowing a user to perform an import	Disabled	If this option is enabled, the user will receive a warning when importing a Word user when they are about to overwrite existing content.

Advanced Formatting Options: Use the footnote macro for Word footnotes	Disabled	<p> <b>Note:</b> This feature requires a third party add-on that is not supported for Confluence.</p> <p>If this option is enabled, a Confluence page created from an imported Word document from <a href="#">Adaptavist</a> to render any footnotes contained in the document. Note that you need to add this add-on onto your Confluence site. For more information about this add-on and <a href="#">add-on</a>.</p>
Authentication: Allow authentication tokens in the URL path	Disabled	<p>If this option is enabled, the Office Connector will use authentication tokens in the URL path. This needs to be enabled to edit Office 2013 documents.</p>
Temporary storage for viewfile macro	The Confluence Home directory.	<p>The {viewfile} macro will cache data temporarily. This option allows you to set the following settings are:</p> <ul style="list-style-type: none"> <li>• <b>Confluence home directory</b> – The temporary file will be stored in your Confluence home directory.</li> <li>• <b>A directory specified in the <code>directories.properties</code> file</b> – You can specify a custom directory in the Office Connector's <code>directories.properties</code> file: <ol style="list-style-type: none"> <li>1. Locate the <code>OfficeConnector-x.xx.jar</code> file (where x.xx is the version) in the Confluence Home directory and copy it to a temporary location</li> <li>2. Unzip the JAR file and find the <code>resources/directories.properties</code> file and edit it like this: <pre>#Complete the following line to set a custom cache directory #If resetting to blank, don't delete anything before the '=' com.benryan.confluence.word.edit.cacheDir=</pre> </li> </ol> </li> </ul> <ol style="list-style-type: none"> <li>3. Edit the last line, adding the path to your required temporary location directory. For example: <ul style="list-style-type: none"> <li>• On Windows: <pre>com.benryan.confluence.word.edit.cacheDir=c:\temp\</pre> </li> <li>• On Linux: <pre>com.benryan.confluence.word.edit.cacheDir=/home/temp/</pre> </li> </ul> </li> <li>4. Save the file, recreate the JAR and put it back in your Confluence Home directory.</li> </ol>
Maximum file space for cache (MB)	500	This is the maximum size of the cache used by the {viewfile} macro. (See above for more details)
Number of Conversion Queues	6	<p>This is the maximum number of threads used to convert PowerPoint, Excel files. This setting is used to manage Confluence performance, by limiting the number of threads used to convert files. This does not consume too many resources.</p> <p>Click <b>Manage Queues</b> to view attachments that are still pending conversion.</p>

## Managing your Confluence License

Your license entitles you to run Confluence and be

eligible for support and upgrades for a specified period. It also defines the number of users who are entitled to use Confluence.

To quickly check the status of your license you can go to




> **General Configuration > Troubleshooting and support tools.**

You'll need need Confluence Administrator or System Administrator permissions to view and edit your license.

## Viewing your license details

### To view your Confluence license:

1. Go to  > **General Configuration**.
2. Choose **License Details** in the left-hand panel.

The License Details page tells you:


- The type of license (for example: Commercial, Academic, Community, or Evaluation).
- Number of users you are licensed for, and how many are currently in use.
- Your license expiry date, for support and upgrade eligibility.
- Your server ID which is generated when you install Confluence for the first time and remains the same for the life of the installation (including after upgrades or changes to your license).
- Your support entitlement number (SEN).

## Updating your license

*Screenshot: License details*

If you change your license (for example to a license with more users), or migrate from Confluence Cloud and you will need to update your license.

### To update your Confluence license:

1. Go to  > **General Configuration > License Details**
2. Enter your new license in the **License** field.
3. Choose **Save**.

## Understanding the user count for your license

The number of registered users allowed on your Confluence site may be limited, depending on your license type.

The License Details page will indicate the number of users currently signed up (your registered user count). It:

- includes only users who have the 'can use' [global permissions](#) for the Confluence site.
- does not include anonymous users, who may access your Confluence site if you have [allowed anonymous access](#).
- does not include [deactivated users](#).

### On this page:

- [Viewing your license details](#)
- [Updating your license](#)
- [Understanding the user count for your license](#)
- [Exceeding your licensed user count](#)
- [Reducing your user count](#)
- [Downgrading your license](#)
- [Finding your Support Entitlement Number \(SEN\)](#)

### Related pages:

- [Upgrading Beyond Current Licensed Period](#)
- [Confluence installation and upgrade guide](#)
- [Confluence administrator's guide](#)

**License Details**

This page shows your current licensing information.

You can use the form below to update the license Confluence is running with.

Organisation	Atlassian Docs
Date Purchased	Dec 08, 2013
License Type	Confluence: Developer
Licensed Users	25 (5 signed up currently) <input type="button" value="Refresh"/>
Support Period	Your commercial Confluence support and updates are available until <b>Dec 08, 2014</b> .
Support Entitlement Number	SEN-L2180
Server ID	BC1S-1234-8T5O-ABCD (Atlassian sales or support may ask you to provide this ID)
License	<div></div> <input type="button" value="Save"/>

## Exceeding your licensed user count

If you exceed the number of users included in your license, your Confluence instance will become read-only, that means no users will be able to create or edit content until you reduce the number of users.

## Reducing your user count

You can reduce your user count by removing or deactivating users who do not require access to Confluence. See [Delete or Disable Users](#).

If you have [connected Confluence to an LDAP directory](#), you may want configure Confluence to only synchronize a subset of users from LDAP rather than all users. See [How to change the number of users synchronized from LDAP to Confluence](#) in the Knowledge Base. This can be a complicated process and we recommend that you only use this method if necessary.


## Downgrading your license

If you decide to downgrade your Confluence license to pay for fewer users you need to ensure that the number of users currently signed up (as shown on the License Details page) is lower than the number allowed by your new license before you apply the new license.

If you have more users than your new license allows you will need to reduce your user count before applying the new license.

## Finding your Support Entitlement Number (SEN)

You can find your Support Entitlement Number (SEN) in three places:

- In Confluence - go to  **> General Configuration > License Details**)
- At [my.atlassian.com](https://my.atlassian.com)
- On your Atlassian invoice.

See [How to find your Support Entitlement Number \(SEN\)](#) for more general information about how Atlassian Support uses this number.

## Managing Confluence Data

This page is an overview of recommended techniques for managing the data on your Confluence site. This is of interest to Confluence administrators – people with System Administrator or Confluence Administrator permissions.

- [Database Configuration](#)
- [Site Backup and Restore](#)
- [Attachment Storage Configuration](#)
- [Confluence Data Model](#)
- [Finding Unused Spaces](#)
- [Data Import and Export](#)
- [Import a Text File](#)
- [Audit log](#)

### Related pages:

- [Managing Add-ons or Plugins](#)
- [Integrating Confluence with Other Applications](#)
- [Getting Started as Confluence Administrator](#)
- [Confluence administrator's guide](#)

## Database Configuration

This document provides information on connecting Confluence to an external database.

### Choosing an external database

**Note:** Take time to choose your database wisely. The XML backup built into Confluence is not suited for migration or backup of large data sets. If you need to migrate later, you may need to use a third party database migration tool.

Below is more information on selecting and migrating to an external database:

- [Migrating to a Different Database](#)
- [Supported Databases](#)
- [Database Troubleshooting](#)

### About the embedded H2 database

Your Confluence installation includes an embedded H2 database, to enable you to try Confluence without setting up an external database. The embedded H2 database is **only** supported while you are evaluating Confluence. You must migrate to a [supported](#) external database before using Confluence as a production system.

To find out if you are still using the embedded database, go to



> **General Configuration > Troubleshooting and support tools.**

### Database setup

To find out how to set up your database, see:

- [Database Setup for Oracle](#)
- [Database Setup For MySQL](#)
- [Database Setup for PostgreSQL](#)
- [Database Setup for SQL Server](#)

### Database drivers

You must use a supported database driver. See [Database JDBC Drivers](#) for the drivers we support.

If you attempt to use an unsupported or custom JDBC driver (or a `driverClassName` from an unsupported or custom driver in your JINDI datasource connection) collaborative editing will fail.

### Database connection methods

You can connect Confluence to your database using a JDBC URL or a JNDI datasource.

By default the setup wizard only provides the option to use a JDBC connection, as this is the recommended connection method.

If you want to use a JNDI datasource, see [Configuring a datasource connection](#) for the steps you'll need to take before you set up Confluence, as the setup wizard will only provide the option to use a datasource if it detects a datasource in your Tomcat configuration.

### Database troubleshooting

For database-related problems see [Database Troubleshooting](#).

#### On this page:

- [Choosing an external database](#)
- [About the embedded H2 database](#)
- [Database setup](#)
- [Database drivers](#)
- [Database connection methods](#)
- [Database troubleshooting](#)

#### Related pages:

- [Database JDBC Drivers](#)
- [Supported Platforms](#)
- [Embedded H2 Database](#)
- [Managing Confluence Data](#)



If you need more help, check out [Troubleshooting Problems and Requesting Technical Support](#).

## Database JDBC Drivers

This page provides the download links for the JDBC drivers for all supported databases.

Due to licensing constraints, we are not able to bundle MySQL or Oracle database drivers with Confluence, so you will need to manually download and install the driver listed below before you can set up Confluence.

If you use PostgreSQL or Microsoft SQL Server, the drivers are bundled with Confluence, so you're ready to.

### Adding your database driver (MySQL and Oracle)

The Confluence setup wizard will stop you at the Database configuration step if it can't find an appropriate driver for the database you select.

To make your database driver available to Confluence:

1. Stop Confluence.
2. Download and extract the appropriate driver from the list below.
3. Drop the .jar file in your <installation-directory>/confluence/WEB-INF/lib directory.
4. Restart Confluence then go to <http://localhost:<port>> in your browser to continue the setup process.

The setup wizard will return to the database configuration step, and you're back on your way.

### Supported drivers

Database	Driver bundled?	JDBC drivers	Notes	More information
PostgreSQL		<a href="#">9.4-1202 JDBC 41 driver download</a>	We recommend that you use the bundled JDBC 4 driver.  If you want to use a later driver, you can download it from the <a href="#">PostgreSQL website</a> . The JDBC 41 driver will work under the 1.8 JVM.	<a href="#">Database Setup for PostgreSQL</a>
Microsoft SQL Server		<a href="#">Microsoft JDBC Driver for SQL Server download</a>	We recommend that you use the bundled Type 4 JDBC driver.  If you decide to use a later version, we may not be able to provide support for any problems you encounter.	<a href="#">Database setup for Microsoft SQL Server</a>
		<a href="#">jTDS 1.3.1 driver download</a>	This driver is deprecated. New Confluence installations use the Microsoft JDBC Driver for SQL Server (above).  If you're upgrading an existing Confluence site to Confluence 6.4 you should continue to use the bundled jTDS driver. We'll help you migrate to the Microsoft driver in a later release.	


#### On this page:

- [Adding your database driver \(MySQL and Oracle\)](#)
- [Supported drivers](#)

#### Related pages:

- [Database Configuration](#)
- [Supported Platforms](#)



MySQL		<a href="#">Connector/J 5.1.42 driver download</a>	Due to licensing constraints, MySQL drivers are not bundled with Confluence.  Confluence is currently tested with the 5.1.42 driver.	<a href="#">Database setup for MySQL</a>
Oracle		<a href="#">JDBC driver downloads</a>	Due to licensing constraints, Oracle drivers are not bundled with Confluence.  For Oracle 12c use the 12.2.0.x driver (ojdbc8.jar)  We recommend using the thin drivers only. See the <a href="#">Oracle JDBC driver FAQ</a> .	<a href="#">Database setup for Oracle</a>

If you attempt to use an unsupported or custom JDBC driver (or a `driverClassName` from an unsupported or custom driver in your JINDI datasource connection) collaborative editing will fail. You must use a supported driver.

## Database Setup for Oracle

This page provides instructions for configuring Confluence to use an Oracle database.

### Before you start

- See [Supported Platforms](#) to check your version of Oracle is supported. You may need to upgrade your database before installing Confluence.
- If you're switching from another database, including the embedded evaluation database, read [Migrating to Another Database](#) before you begin.

You'll need an experienced Oracle database administrator (DBA) to set up and maintain your database.

Our support team can assist with Confluence problems, but are unable to help you administer your Oracle database.

If you don't have access to an experienced Oracle DBA, consider using a different [supported database](#).

### On this page:

- [Before you start](#)
- [1. Install Oracle](#)
- [2. Create database user](#)
- [3. Install Confluence](#)
- [4. Download and install the Oracle thin driver](#)
- [5. Enter your database details](#)
- [6. Test your database connection](#)
- [Troubleshooting](#)

### Related pages:

- [Database Configuration](#)
- [Known Issues for Oracle](#)
- [Confluence installation and upgrade guide](#)

## 1. Install Oracle

If you don't already have an operational Oracle server, [download](#) and install it now. See the [Oracle documentation](#) for instructions.

When setting up your Oracle server:

- **Character encoding** must be set to AL32UTF8 (this the Oracle equivalent of Unicode UTF-8).

## 2. Create database user

To create the user and assign its privileges:

1. Use the `sqlplus` command to access Oracle via the command line

```
sqlplus user/password <as sysdba|as sysoper>
```

If you're logging in with the user 'sys' you'll need to include the "as sysdba" or "as sysoper" to determine which sys role you want to use.

2. Create a Confluence user (for example `confluenceuser`), and grant the following roles only to that user:

```
create user <user> identified by <password> default tablespace
<tablespace_name> quota unlimited on <tablespace_name>;
grant connect to <user>;
grant resource to <user>;
grant create table to <user>;
grant create sequence to <user>;
grant create trigger to <user>;
```

- It is very important that the user is granted the exact privileges indicated above. Confluence requires only these privileges so you should *grant specific privileges* to the user, and *not assign a role* to the user.
- Do not grant the user the `select any table` permission. That permission can cause problems with other schemas.
- When you create a user, specify the `tablespace` for the table objects as shown above.

### 3. Install Confluence

Check out the [Confluence Installation Guide](#) for step-by-step instructions on how to install Confluence on your operating system.

### 4. Download and install the Oracle thin driver

Due to licensing restrictions, we're not able to bundle an Oracle driver with Confluence. To make your database driver available to Confluence:

1. Stop Confluence.
2. Head to [Database JDBC Drivers](#) and download the appropriate driver. The driver file will be called something like `ojdbc8.jar`
3. Drop the `.jar` file in your `<installation-directory>/confluence/WEB-INF/lib` directory.
4. Restart Confluence then go to `http://localhost:<port>` in your browser to continue the setup process.

### 5. Enter your database details

The Confluence setup wizard will guide you through the process of connecting Confluence to your database.

#### *Use a JDBC connection (default)*

JDBC is the recommended method for connecting to your database.

The Confluence setup wizard will provide you with two setup options:

- **Simple** - this is the most straightforward way to connect to your database.
- **By connection string** - use this option if you want to specify additional parameters and are comfortable constructing a database URL.

Depending on the setup type, you'll be prompted for the following information.

Setup type	Field	Description
------------	-------	-------------

Simple	Hostname	This is the hostname or IP address of your database server.
Simple	Port	This is the Oracle port. If you didn't change the port when you installed Oracle, it will default to 1521.
Simple	Service name	This is the service name (of your confluence database.
By connection string	Database URL	<p>The database URL is entered in this format: <code>jdbc:oracle:thin:@//&lt;HOST&gt;:&lt;PORT&gt;/&lt;SERVICE&gt;</code></p> <p>&lt;SERVICE&gt; can be either the SID or Service Name. For example: <code>jdbc:oracle:thin:@//localhost:1521/confluence</code></p> <p>By default, we use the new style URL provided by the thin driver. You can also use the <code>tnsnames</code> style.</p>
Both	Username	This is the username of your dedicated database user. In the example above, this is <code>confluenceuser</code> .
Both	Password	This is the password for your dedicated database user.

▼ [Not sure how to find your hostname, port and SID?](#)

To determine the host, port, service name, and/or SID, execute the following command as the user running Oracle (usually 'Oracle'):

```
lsnrctl status
```

Here's an example of the output:

```

SNRCTL for Linux: Version 11.2.0.2.0 - Beta on 29-JUN-2012 15:20:59
Copyright (c) 1991, 2010, Oracle. All rights reserved.
Connecting to
(DESCRIPTION=(ADDRESS=(PROTOCOL=IPC)(KEY=EXTPROC_FOR_XE)))
STATUS of the LISTENER
-----
Alias                        LISTENER
Version                      TNSLSNR for Linux: Version 11.2.0.2.0 -
Beta
Start Date                   06-JUN-2012 08:36:34
Uptime                       23 days 6 hr. 44 min. 25 sec
Trace Level                  off
Security                     ON: Local OS Authentication
SNMP                         OFF
Default Service              XE
Listener Parameter File
/u01/app/oracle/product/11.2.0/xe/network/admin/listener.ora
Listener Log File
/u01/app/oracle/diag/tnslsnr/<HOSTNAME>/listener/alert/log.xml
Listening Endpoints Summary...
  (DESCRIPTION=(ADDRESS=(PROTOCOL=ipc)(KEY=EXTPROC_FOR_XE)))

  (DESCRIPTION=(ADDRESS=(PROTOCOL=tcp)(HOST=<HOSTNAME>)(PORT=1521)))

  (DESCRIPTION=(ADDRESS=(PROTOCOL=tcp)(HOST=<HOSTNAME>)(PORT=8080))(P
resentation=HTTP)(Session=RAW))
Services Summary...
Service "PLSExtProc" has 1 instance(s).
  Instance "PLSExtProc", status UNKNOWN, has 1 handler(s) for this
service...
Service "XE" has 1 instance(s).
  Instance "XE", status READY, has 1 handler(s) for this service...
Service "XEXDB" has 1 instance(s).
  Instance "XE", status READY, has 1 handler(s) for this service...
The command completed successfully

```

- The host and port are determined by the line containing `PROTOCOL=tcp` (the line **without** `Presentation=HTTP`).
- Under `Services Summary`, each service which has an instance with `READY` status is a connectable service. The name following `Service` is a service name for connecting to the database name following `Instance` on the next line.
- The SID is the name of the database instance, as defined by the `$ORACLE_SID` variable when you have sourced the Oracle environment to your shell.

For example, if you are running Confluence on the same server as the Oracle database, with the above `lsnrctl` status output, you would use one of the following URLs:

```

jdbc:oracle:thin:@//localhost:1521/XE
jdbc:oracle:thin:@localhost:1521:XE

```

The URL can be used in either a direct JDBC connection or a datasource.

See [the Oracle JDBC FAQ](#) for more information on Oracle JDBC URLs.

#### Use a JNDI datasource

If you want to use a JNDI datasource, see [Configuring a datasource connection](#) for the steps you'll need to take before you set up Confluence, as the setup wizard will only provide the option to use a datasource if it detects a datasource in your Tomcat configuration.

## 6. Test your database connection

In the database setup screen, hit the **Test connection** button to check:

- that Confluence can connect to your database server
- that the database character encoding is correct
- that your database user has appropriate permissions for the database
- that your database user has NOT been granted the SELECT ANY TABLE privilege

Once the test is successful, hit **Next** to continue with the Confluence setup process.

### Troubleshooting

- If Confluence complains that it is missing a class file, you may have placed the JDBC driver in the wrong folder.
- The following page contains common issues encountered when setting up your Oracle database to work with Confluence: [Known Issues for Oracle](#).

## Configuring an Oracle Datasource in Apache Tomcat

Error rendering macro 'viewport-redirect' : null

### Database Setup for PostgreSQL

This page provides instructions for configuring Confluence to use a PostgreSQL database.

#### Before you start

- See [Supported Platforms](#) to check your version of PostgreSQL is supported. You may need to upgrade your database before installing Confluence.
- If you're switching from another database, including the embedded evaluation database, read [Migrating to Another Database](#) before you begin.

#### On this page:

- [Before you start](#)
- [1. Install PostgreSQL](#)
- [2. Create a database user and database](#)
- [3. Install Confluence](#)
- [4. Enter your database details](#)
- [5. Test your database connection](#)
- [Troubleshooting](#)

#### Related pages:

- [Database Configuration](#)
- [Known issues for PostgreSQL](#)

## 1. Install PostgreSQL

If you don't already have PostgreSQL installed, [download](#) and install it now.

A few tips when installing PostgreSQL:

- The **password** you provide during the installation process is for the 'postgres' account, which is the database root-level account (the super user). Remember this username and password as you'll need it each time you log in to the database.
- The **default port** for PostgreSQL is 5432. If you decide to change the default port, make sure it does not conflict with any other services running on that port.
- Choose the **locale** that best matches your geographic location.
- Don't launch **Stack Builder** at the completion of the installer.

## 2. Create a database user and database

Once you've installed PostgreSQL:

1. Create a database user, for example `confluenceuser`.
  - Your new user must be able to **create database objects** and must have **can login** permission.
2. Next, create a database (for example `confluence`):
  - **Owner** is your new database user (for example `confluenceuser`)
  - **Character encoding** must be set to `utf8` encoding.
  - **Collation** must also be set to `utf8`. Other collations, such as "C", are known to cause issues with Confluence.

You can use [pgAdmin](#) as an alternative to the command line to complete this step.

## 3. Install Confluence

Check out the [Confluence Installation Guide](#) for step-by-step instructions on how to install Confluence on your operating system.

## 4. Enter your database details

The Confluence setup wizard will guide you through the process of connecting Confluence to your database. Be sure to select **"My own database"**.

### Use a JDBC connection (default)

JDBC is the recommended method for connecting to your database.

The Confluence setup wizard will provide you with two setup options:

- **Simple** - this is the most straightforward way to connect to your database.
- **By connection string** - use this option if you want to specify additional parameters and are comfortable constructing a database URL.

Depending on the setup type, you'll be prompted for the following information.

Setup type	Field	Description
Simple	Hostname	This is the hostname or IP address of your database server.
Simple	Port	This is the PostgreSQL port. If you didn't change the port when you installed Postgres, it will default to 5432.
Simple	Database name	This is the name of your confluence database. In the example above, this is <code>confluence</code>

By connection string	Database URL	<p>The database URL is entered in this format:</p> <pre>jdbc:postgresql://&lt;server&gt;:&lt;port&gt;/&lt;database&gt;</pre> <p>For example:</p> <pre>jdbc:postgresql://localhost:5432/confluence</pre> <p>If you need to connect to an SSL database, add the <code>ssl=true</code> parameter in the database URL. For example:</p> <pre>jdbc:postgresql://localhost:5432/confluence?ssl=true</pre>
Both	Username	This is the username of your dedicated database user. In the example above, this is <code>confluenceuser</code> .
Both	Password	This is the password for your dedicated database user.

### Use a JNDI datasource

If you want to use a JNDI datasource, see [Configuring a datasource connection](#) for the steps you'll need to take before you set up Confluence, as the setup wizard will only provide the option to use a datasource if it detects a datasource in your Tomcat configuration.

## 5. Test your database connection

In the database setup screen, hit the **Test connection** button to check:

- that Confluence can connect to your database server
- that the database character encoding is correct
- that your database user has appropriate permissions for the database

Once the test is successful, hit **Next** to continue with the Confluence setup process.

If Confluence and PostgreSQL are hosted on different servers, see the [PostgreSQL documentation on how to set up pg\\_hba.conf](#) to make sure Confluence and PostgreSQL can communicate remotely.

### Troubleshooting

- If Confluence complains that it is missing a class file, you may have placed the JDBC driver in the wrong folder.
- If you're unable to connect to the database from Confluence and they are on different machines, most likely you have a firewall in between the two machines or your `pg_hba.conf` file is misconfigured. Verify that your firewall is set to allow connections through 5432 or double check your [hba configuration](#).
- The following page contains common issues encountered when setting up your PostgreSQL database to work with Confluence: [Known issues for PostgreSQL](#).

## Configuring a PostgreSQL Datasource in Apache Tomcat

Error rendering macro 'viewport-redirect' : null

### Database Setup for SQL Server

This page provides instructions for configuring Confluence to use a Microsoft SQL Server database.

#### Before you start

Check the following before you start:

- See [Supported Platforms](#) to check your version of PostgreSQL is supported. You may need to upgrade your database before installing Confluence.

- If you're switching from another database, including the embedded evaluation database, read [Migrating to Another Database](#) before you begin.

**On this page:**

- [Before you start](#)
- [1. Install SQL Server](#)
- [2. Create a database and database user](#)
- [3. Install Confluence](#)
- [4. Enter your database details](#)
- [5. Test your database connection](#)
- [Database driver changes](#)
- [Troubleshooting](#)

**Related pages:**

- [Database Configuration](#)
- [Known issues for SQL Server](#)
- [Confluence installation and upgrade guide](#)

## 1. Install SQL Server

If you don't already have Microsoft SQL Server installed, [download](#) and install it now. See [Installation for SQL Server](#) on MSDN for step-by-step instructions.

▼ [Note about authentication modes...](#)

SQL Server allows two types of authentication: SQL Server Authentication and Windows Authentication. To make sure Confluence will be able to connect to your database you'll need to set your SQL server to allow Mixed Authentication (both SQL Server and Windows modes). This setup is generally found under Properties > Security > Server Authentication.

## 2. Create a database and database user

Once you've installed SQL Server, create a database user and database for Confluence as follows:

1. Using your SQL administrator permissions, create a new database (for example `confluence`)
2. Set the default collation for the database to **SQL\_Latin1\_General\_CP1\_CS\_AS** (case sensitive).

```
ALTER DATABASE <database-name> COLLATE
SQL_Latin1_General_CP1_CS_AS
```

If you see a 'database could not be exclusively locked to perform the operation' error, you may need to prevent other connections by setting the mode to single user for the transaction

```
ALTER DATABASE <database-name> SET SINGLE_USER WITH ROLLBACK
IMMEDIATE;
<your ALTER DATABASE query>
ALTER DATABASE <database-name> SET MULTI_USER;
```

3. Check the database isolation level of **READ\_COMMITTED\_SNAPSHOT** is ON.

```
SELECT is_read_committed_snapshot_on FROM
sys.databases WHERE name= 'database-name'
```

If this query returns **1**, then **READ\_COMMITTED\_SNAPSHOT** is ON, and you're good to go.

If this query returns **0**, **READ\_COMMITTED\_SNAPSHOT** option is OFF and you will need to turn it on



as follows:

```
ALTER DATABASE <database-name>
SET READ_COMMITTED_SNAPSHOT ON
WITH ROLLBACK IMMEDIATE;
```

4. Using your SQL administrator permissions, create a new SQL user account for Confluence (for example, confluenceuser).
5. Give this user full create, read and write permissions for the database tables. Confluence must be able to create its own schema. Refer to the SQL Server documentation for how to do this.

### 3. Install Confluence

Check out the [Confluence Installation Guide](#) for step-by-step instructions on how to install Confluence on your operating system.

#### 4. Enter your database details

The Confluence setup wizard will guide you through the process of connecting Confluence to your database.

##### *Use a JDBC connection (default)*

JDBC is the recommended method for connecting to your database.

The Confluence setup wizard will provide you with two setup options:

- **Simple** - this is the most straightforward way to connect to your database.
- **By connection string** - use this option if you want to specify additional parameters and are comfortable constructing a database URL.

Depending on the setup type, you'll be prompted for the following information.

Setup type	Field	Description
Simple	Hostname	This is the hostname or IP address of your database server.
Simple	Port	This is the SQL Server port. If you didn't change the port when you installed SQL Server, it will default to 1433.
Simple	Database name	This is the name of your confluence database. In the example above, this is confluence
Simple	Instance name	<p>To find out your instance name, connect to your database and run one of the following:</p> <pre>select @@SERVICENAME;</pre> <pre>SELECT SERVERPROPERTY('InstanceName');</pre> <p>If you have a default named instance setup in SQL Server, you won't need to specify this parameter.</p>

By connection string	Database URL	The database URL is entered in this format: <code>jdbc:sqlserver://&lt;hostname&gt;:&lt;port&gt;;database=&lt;database&gt;</code>  For example: <code>jdbc:sqlserver://yourserver:1433;database=confluence</code>
Both	Username	This is the username of your dedicated database user. In the example above, this is <code>confluenceuser</code> .
Both	Password	This is the password for your dedicated database user.

### Use a JNDI datasource

If you want to use a JNDI datasource, see [Configuring a datasource connection](#) for the steps you'll need to take before you set up Confluence, as the setup wizard will only provide the option to use a datasource if it detects a datasource in your Tomcat configuration.

## 5. Test your database connection

In the database setup screen, hit the **Test connection** button to check:

- Confluence can connect to your database server
- the database collation and isolation level is correct
- your database user has appropriate permissions for the database

Once the test is successful, hit **Next** to continue with the Confluence setup process.

### Database driver changes

We are replacing the open source jTDS driver for Microsoft SQL Server with the official Microsoft JDBC Driver for SQL Server. From Confluence 6.4, all new Confluence installations will use the Microsoft JDBC Driver for SQL Server by default.

Existing instances will continue to use the bundled jTDS driver. We'll help you migrate to the Microsoft driver in a later release.

### Troubleshooting

- If you get the following error message, check you've given the `confluenceuser` user all the required database permissions when connecting from `localhost`.

```
Could not successfully test your database: : Server connection
failure during transaction. Due to underlying exception:
'java.sql.SQLException: Access denied for user
'confluenceuser'@'localhost' (using password: YES)'
```

- You may need to open additional ports. See this [Microsoft KB](#) about the ports required for SQL Server.
- The following page contains common issues encountered when setting up your SQL Server database to work with Confluence: [Known Issues for SQL Server](#).

## Configuring a SQL Server Datasource in Apache Tomcat

Error rendering macro 'viewport-redirect' : null

### Database Setup For MySQL

This page provides instructions for configuring Confluence to use a MySQL database.

**Before you start**

- See [Supported Platforms](#) to check your version of PostgreSQL is supported. You may need to upgrade your database before installing Confluence.
- If you're switching from another database, including the embedded evaluation database, read [Migrating to Another Database](#) before you begin.

Confluence will not work on MySQL variants such as MariaDB ([CONFSERVER-29060](#)) and Percona Server ([CONFSERVER-36471](#))

**On this page:**

- [Before you start](#)
- [1. Install MySQL Server](#)
- [2. Configure MySQL Server](#)
- [3. Create database and database user](#)
- [4. Install Confluence](#)
- [5. Download and install the MySQL driver](#)
- [6. Enter your database details](#)
  - [Use a JDBC connection \(default\)](#)
  - [Use a JNDI datasource](#)
- [7. Test your database connection](#)
- [Troubleshooting](#)

**Related pages:**

- [Database Configuration](#)
- [Known issues for MySQL](#)
- [Confluence installation and upgrade guide](#)

**1. Install MySQL Server**

If you don't already have MySQL installed, [download](#) and install it now. See the [MySQL documentation](#) for step-by-step instructions.

**2. Configure MySQL Server**

In this step, you will configure your MySQL database server.

**Note:** *If you intend to connect Confluence to an existing MySQL database server, we strongly recommend that you reconfigure this database server by running through the configuration steps in the MySQL installation wizard as described below .*

**To configure MySQL Server:**

1. Run the MySQL installation wizard:
  - a. If you are connecting Confluence to your existing MySQL server, choose **Reconfigure Instance**.
  - b. Choose **Advanced Configuration**.
  - c. Choose the **type of MySQL Server** that best suits your hardware requirements. This will affect the MySQL Server's usage of memory, disk and CPU resources. Refer to the [MySQL documentation](#) for further information.
  - d. Choose **Transactional Database Only** to ensure that your MySQL database will use **InnoDB** as its default storage engine.  
*You must use the InnoDB storage engine with Confluence. Using the MyISAM storage engine can lead to data corruption in Confluence.*
  - e. Set the **InnoDB Tablespace** settings to your requirements. (The default settings are acceptable.)
  - f. Set the approximate **number of concurrent connections** permitted to suit your Confluence usage requirements. You can use one of the presets or enter a number manually. Refer to the [MySQL documentation](#) for further information.
  - g. For the **networking options**, ensure the **Enable TCP/IP Networking** and **Enable Strict Mode** options are selected (default). Refer to the MySQL documentation on setting the [networking and server SQL modes](#) for further information.
  - h. For the MySQL server's **default character set**, choose **Best Support For Multilingualism** (in other words, UTF-8). This will ensure Confluence's support for internationalization. For more information, see [Configuring Database Character Encoding](#).
  - i. For the Windows configuration option, choose whether or not to install the MySQL Server as a Windows service. If your hardware is going to be used as a dedicated MySQL Server, you may

wish to choose the options to **Install As Windows Service** (and **Launch the MySQL Server automatically**). Refer to the [MySQL documentation](#) for further information.

**Note:** If you choose not to install the MySQL Server as a Windows Service, you will need to ensure that the database service has been started before running Confluence.

- j. Select **Modify Security Settings** to enter and set your MySQL Server (root) access password.
2. Edit the `my.cnf` file (`my.ini` on Windows operating systems) in your MySQL server. Locate the `[mysqld]` section in the file, and add or modify the following parameters:

(Refer to [MySQL Option Files](#) for detailed instructions on editing `my.cnf` and `my.ini`.)

Locate the `[mysqld]` section in the file, and add or modify the following parameters:

- Specify the default character set to be UTF-8:

```
[mysqld]
...
character-set-server=utf8
collation-server=utf8_bin
...
```

- Set the default storage engine to InnoDB:

```
[mysqld]
...
default-storage-engine=INNODB
...
```

- Specify the value of `max_allowed_packet` to be at least 256M:

```
[mysqld]
...
max_allowed_packet=256M
...
```

- Specify the value of `innodb_log_file_size` to be at least 2GB:

```
[mysqld]
...
innodb_log_file_size=2GB
...
```

- Ensure the `sql_mode` parameter does not specify `NO_AUTO_VALUE_ON_ZERO`

```
// remove this if it exists
sql_mode = NO_AUTO_VALUE_ON_ZERO
```

- Ensure that the global transaction isolation level of your Database had been set to `READ-COMMITTED`.

```
[mysqld]
...
transaction-isolation=READ-COMMITTED
...
```

- Check that the binary logging format is configured to use 'row-based' binary logging.

```
[mysqld]
...
binlog_format=row
...
```

3. Restart your MySQL server for the changes to take effect:

- On Windows, use the Windows Services manager to restart the service.
- On Linux:
  - Run one of the following commands, depending on your setup: '/etc/init.d/mysqld stop' or '/etc/init.d/mysql stop' or 'service mysqld stop'.
  - Then run the same command again, replacing 'stop' with 'start'.
- On Mac OS X, run 'sudo /Library/StartupItems/MySQLCOM/MySQLCOM restart'.

### 3. Create database and database user

Once you've installed and configured MySQL, create a database user and database for Confluence as follows:

1. Run the 'mysql' command as a MySQL super user. The default user is 'root' with a blank password.
2. Create an empty Confluence database schema (for example confluence):

```
CREATE DATABASE <database-name> CHARACTER SET utf8 COLLATE
utf8_bin;
```

3. Create a Confluence database user (for example confluenceuser):

```
GRANT ALL PRIVILEGES ON <database-name>.* TO
'<confluenceuser>'@'localhost' IDENTIFIED BY '<password>';
```

If Confluence is not running on the same server, replace localhost with the hostname or IP address of the Confluence server.

### 4. Install Confluence

Check out the [Confluence Installation Guide](#) for step-by-step instructions on how to install Confluence on your operating system.

### 5. Download and install the MySQL driver

Due to licensing restrictions, we're not able to bundle the MySQL driver with Confluence. To make your database driver available to Confluence:

1. Stop Confluence.
2. Head to [Database JDBC Drivers](#) and download the appropriate driver. The driver file will be called something like mysql-connector-java-5.1.xx-bin.jar
3. Drop the .jar file in your <installation-directory>/confluence/WEB-INF/lib directory.
4. Restart Confluence then go to <http://localhost:<port>> in your browser to continue the setup process.

### 6. Enter your database details

The Confluence setup wizard will guide you through the process of connecting Confluence to your database.

**Use a JDBC connection (default)**

JDBC is the recommended method for connecting to your database.

The Confluence setup wizard will provide you with two setup options:

- **Simple** - this is the most straightforward way to connect to your database.
- **By connection string** - use this option if you want to specify additional parameters and are comfortable constructing a database URL.

Depending on the setup type, you'll be prompted for the following information.

Setup type	Field	Description
Simple	Hostname	This is the hostname or IP address of your database server.
Simple	Port	This is the MySQL port. If you didn't change the port when you installed MySQL, it will default to 3306.
Simple	Database name	This is the name of your confluence database. In the example above, this is <code>confluence</code>
By connection string	Database URL	The database URL is entered in this format: <code>jdbc:mysql://&lt;hostname&gt;:&lt;port&gt;/&lt;database&gt;</code>  For example: <code>jdbc:mysql://localhost:3306/confluence</code>
Both	Username	This is the username of your dedicated database user. In the example above, this is <code>confluenceuser</code> .
Both	Password	This is the password for your dedicated database user.

**Use a JNDI datasource**

If you want to use a JNDI datasource, see [Configuring a datasource connection](#) for the steps you'll need to take before you set up Confluence, as the setup wizard will only provide the option to use a datasource if it detects a datasource in your Tomcat configuration.

**7. Test your database connection**

In the database setup screen, hit the **Test connection** button to check:

- Confluence can connect to your database server
- the database character encoding, collation, isolation level and storage engine are correct
- your database user has appropriate permissions for the database.

Once the test is successful, hit **Next** to continue with the Confluence setup process.

**Troubleshooting**

- If Confluence complains that it is missing a class file, you may have placed the JDBC driver in the wrong folder.
- If you get the following error message, verify that you have given the `confluenceuser` user all the required database permissions when connecting from `localhost`.

```
Could not successfully test your database: : Server connection
failure during transaction. Due to underlying exception:
'java.sql.SQLException: Access denied for user
'confluenceuser'@'localhost' (using password: YES)'
```

- The following page contains common issues encountered when setting up your MySQL database to

work with Confluence: [Known issues for MySQL](#)

## Configuring a MySQL Datasource in Apache Tomcat

Error rendering macro 'viewport-redirect' : null

### Embedded H2 Database

To enable you to try Confluence without setting up an external database, your Confluence installation includes an embedded H2 database.

The embedded H2 database is used by default when you choose the **Trial** installation path.

The embedded database files are stored in your Confluence home directory `<confluence-home>/database`.

The embedded H2 database is **only** supported while you are evaluating Confluence. You must migrate to a [supported](#) external database before using Confluence as a production system.

To find out if you are still using the embedded database, go to



> **General Configuration** > **Troubleshooting and support tools**.

#### Related pages:


- [Confluence Home and other important directories](#)
- [Database Configuration](#)

### Connect to the embedded H2 database using DB Visualizer

[DBVisualizer](#) is just one database administration tool. You can use any administration tool that supports embedded H2 databases. The steps will be similar.

1. Shut down Confluence.
2. Back up your `<confluence-home>/database` directory.
3. Launch [DBVisualizer](#).
4. Choose **Create new database connection** and follow the prompts to set up the connection.

The information you'll need is:

- **Database driver:** H2 embedded
- **Database Userid:** sa
- **Database password:** leave this field blank
- **Database filename:** `<confluence-home>/database/h2db`  
 leave off the `.h2.db` file extension.

5. Connect to the database.

Refer to the [DBVisualizer documentation](#) for help using DBVisualizer.

### Connect to the embedded H2 database using the H2 console

Alternatively you can connect using the browser based H2 console. The easiest way to access the console is to double click the H2 database jar file at `<installation-directory>\confluence\WEB-INF\lib\h2-x.x.x.jar`.

## Migrating to Another Database

This document describes how to migrate your Confluence data from your existing database to another database. The instructions are designed primarily for migrating from an evaluation to a production database.

Large data sets will require third party database migration tools.

This page covers the following scenarios:

- Moving from the embedded, trial database to



- a supported external database.
- Moving from one external database to another, for example from Oracle to PostgreSQL (provided your dataset is not large)
- Upgrading to a new version of the same external database. Note: you don't need to migrate your data if you're upgrading the database in place.

If you are moving your database from one server to another you can change the JDBC URL in `<confluence-home>/confluence.cfg.xml` (if you are using a direct JDBC connection) or in the definition of your datasource (if you are connecting via a datasource).

#### On this page:

- [Limitations of database migration](#)
- [Database migration](#)
- [Method one – standard procedure](#)
  - [Step 1: Take note of your add-ons](#)
  - [Step 2: Back up your data](#)
  - [Step 3: Set up the new database](#)
  - [Step 4. Install Confluence \(same version number\) in a new location](#)
  - [Step 5. Download and install the database driver if necessary](#)
  - [Step 6. Run the Confluence setup wizard and copy your data to your new database](#)
  - [Step 7. Re-install your add-ons](#)
  - [Step 8. Check settings for new machine](#)
- [Method two – for installations with a large volume of attachments](#)
  - [Before you start](#)
  - [Step 1: Take note of your add-ons](#)
  - [Step 2: Back up your data](#)
  - [Step 3: Set up the new database](#)
  - [Step 4. Install Confluence \(same version number\) in a new location](#)
  - [Step 5. Download and install the database driver if necessary](#)
  - [Step 6. Run the Confluence setup wizard and copy your data to your new database](#)
  - [Step 7: Copy your attachments across](#)
  - [Step 8. Re-install your add-ons](#)
  - [Step 9. Check settings for new machine](#)
- [A note about case sensitivity in your database](#)
  - [Setting up a new Confluence instance](#)
  - [Migrating an existing Confluence instance to a different database](#)
- [Troubleshooting](#)

#### Related pages:

- [Database Configuration](#)
- [Confluence Home and other important directories](#)

#### Limitations of database migration



**Note:** The XML export built into Confluence is not suited for the backup or migration of large data sets. There are a number of third party tools that may be able to assist you with the data migration. If you would like help in selecting the right tool, or help with the migration itself, we can put you in touch with one of the [Atlassian Experts](#).

### Database migration

There are two ways you can perform the migration, both described on this page:

1. **Method one** is the standard procedure.
2. Use **method two** if the total size of attachments in your installation exceeds 500MB.

#### Method one – standard procedure

##### Step 1: Take note of your add-ons

Take note of the add-ons (plugins) currently installed and enabled in Confluence, so that you can reinstate them later. Make a note of the following for each add-on:

- Add-on name
- Version
- Enabled or disabled status. This is useful if you have enabled or disabled modules yourself, making your configuration differ from the default.

##### Step 2: Back up your data

1. Create an XML backup of your existing data. See [Manually Backing Up the Site](#). Make a note of the location where you put the XML file. You will need it later to import your Confluence data into your new database.
2. Stop Confluence.
3. Make a copy of the [Confluence Home](#) directory. This is a precautionary measure, to ensure you can recover your data if it is mistakenly overwritten.
4. If you are using an external database, make a separate backup using the utilities that were installed with that database. This also is a precautionary measure.

##### Step 3: Set up the new database

Choose the [database setup instructions](#) for your new database, and follow those instructions to do the following:

- Install the database server.
- Perform any required configuration of the database server, as instructed.
- Add the Confluence database and user. Make a note of the username and password that you define in this step. You will need them later, when running the Confluence Setup Wizard.

##### Step 4. Install Confluence (same version number) in a new location

Now you will install Confluence again, with a different home directory path and installation path.

**Note:** You must use the same version of Confluence as the existing installation. (If you want to upgrade Confluence, you must do it as a separate step.) For example, if your current site is running Confluence 5.1.2, your new installation must also be Confluence 5.1.2.

When running the [Confluence installer](#):

- Choose **Custom Install**. (Do **not** choose to upgrade your existing installation.)
- Choose a **new destination directory**. This is the installation directory for your new Confluence. It must not be the same as the existing Confluence installation.
- Choose a **new home directory**. This is the data directory for your new Confluence. It must not be the same as the existing Confluence installation.

##### Step 5. Download and install the database driver if necessary

Note that Confluence bundles some database drivers, but you'll need to install the driver yourself if it is not bundled. Follow the [database setup instructions](#) for your new database, to download and install the database

driver if necessary.

#### Step 6. Run the Confluence setup wizard and copy your data to your new database

When running the Confluence setup wizard:

- Enter your license key, as usual.
- Choose **Production Installation** as the installation type.
- Choose **My own database** then select your particular database from the **Database type** dropdown menu.
- When prompted to choose **My own database**, then select your new **Database type**.
- Enter your database details. Use **test connection** to check your database is set up correctly.
- On the load content step, choose **Restore From Backup**. This is where you will import the data from your XML backup. There are two options for accessing the XML file:
  - Browse to the location of your XML backup on your network, and choose **Upload and Restore**.
  - Alternatively, put the XML file in the Confluence home directory of the new site (<CONFLUENCE-HOME-DIRECTORY>\restore) then choose **Restore**. This is the recommended method for large XML files.

**Note:** If you choose not to restore during the Confluence setup wizard, you can do the import later. Go to the Confluence administration console and choose to restore an XML backup. See [Site Backup and Restore](#).

#### Step 7. Re-install your add-ons

Re-install any add-ons (plugins) that are not bundled with Confluence.

- Use the same version of the add-on as on your old Confluence site.
- The data created by the add-ons will already exist in your new Confluence site, because it is included in the XML backup.

#### Step 8. Check settings for new machine

If you are moving Confluence to a different machine, you need to check the following settings:

- Configure your new base URL. See [Configuring the Server Base URL](#).
- Check your application links. See [Linking to Another Application](#).
- Update any gadget subscriptions from external sites pointing to this Confluence site. For example, if your Jira site subscribes to Confluence gadgets, you will need to update your Jira site.
- Review any other resources that other systems are consuming from Confluence.

### Method two – for installations with a large volume of attachments

#### Before you start

These instructions only apply to attachments stored in the file system. If you store attachments in the database see [Attachment Storage Configuration](#) to find out how to migrate between different attachment storage methods.

#### Step 1: Take note of your add-ons

Take note of the add-ons (plugins) currently installed and enabled in Confluence, so that you can reinstate them later. Make a note of the following for each add-on:

- Add-on name
- Version
- Enabled or disabled status. This is useful if you have enabled or disabled modules yourself, making your configuration differ from the default.

#### Step 2: Back up your data

1. Create an XML backup of your existing data. See [Manually Backing Up the Site](#). Make a note of the location where you put the XML file. You will need it later to import your Confluence data into your new database.
2. Stop Confluence.
3. Make a copy of the attachments directory (<CONFLUENCE-HOME-DIRECTORY>\attachments) in your Confluence Home directory. You will need it later to copy your Confluence attachments data into

your new Confluence installation.

4. If you are using an external database, make a separate backup using the utilities that were installed with that database. This also is a precautionary measure.

#### Step 3: Set up the new database

Choose the [database setup instructions](#) for your new database, and follow those instructions to do the following:

- Install the database server.
- Perform any required configuration of the database server, as instructed.
- Add the Confluence database and user. Make a note of the username and password that you define in this step. You will need them later, when running the Confluence Setup Wizard.

#### Step 4. Install Confluence (same version number) in a new location

Now you will install Confluence again, with a different home directory path and installation path.

**Note:** You must use the same version of Confluence as the existing installation. (If you want to upgrade Confluence, you must do it as a separate step.) For example, if your current site is running Confluence 5.1.2, your new installation must also be Confluence 5.1.2.

When running the [Confluence installer](#):

- Choose **Custom Install**. (Do **not** choose to upgrade your existing installation.)
- Choose a **new destination directory**. This is the installation directory for your new Confluence. It must not be the same as the existing Confluence installation.
- Choose a **new home directory**. This is the data directory for your new Confluence. It must not be the same as the existing Confluence installation.

#### Step 5. Download and install the database driver if necessary

Note that Confluence bundles some database drivers, but you'll need to install the driver yourself if it is not bundled. Follow the [database setup instructions](#) for your new database, to download and install the database driver if necessary.

#### Step 6. Run the Confluence setup wizard and copy your data to your new database

When running the Confluence setup wizard:

- Enter your license key, as usual.
- Choose **Production Installation** as the installation type.
- Choose **My own database** then select your particular database from the **Database type** dropdown menu.
- When prompted to choose **My own database**, then select your new **Database type**.
- Enter your database details. Use **test connection** to check your database is set up correctly.
- On the load content step, choose **Restore From Backup**. This is where you will import the data from your XML backup. There are two options for accessing the XML file:
  - Browse to the location of your XML backup on your network, and choose **Upload and Restore**.
  - Alternatively, put the XML file in the Confluence home directory of the new site (<CONFLUENCE-HOME-DIRECTORY>\restore) then choose **Restore**. This is the recommended method for large XML files.

**Note:** If you choose not to restore during the Confluence setup wizard, you can do the import later. Go to the Confluence administration console and choose to restore an XML backup. See [Site Backup and Restore](#).

#### Step 7: Copy your attachments across

Copy the contents of the attachments directory (<CONFLUENCE-HOME-DIRECTORY>\attachments) from your old Confluence Home directory to your new Confluence Home directory.

#### Step 8. Re-install your add-ons

Re-install any add-ons (plugins) that are not bundled with Confluence.

- Use the same version of the add-on as on your old Confluence site.
- The data created by the add-ons will already exist in your new Confluence site, because it is included

in the XML backup.

#### Step 9. Check settings for new machine

If you are moving Confluence to a different machine, you need to check the following settings:

- Configure your new base URL. See [Configuring the Server Base URL](#).
- Check your application links. See [Linking to Another Application](#).
- Update any gadget subscriptions from external sites pointing to this Confluence site. For example, if your Jira site subscribes to Confluence gadgets, you will need to update your Jira site.
- Review any other resources that other systems are consuming from Confluence.

#### A note about case sensitivity in your database

'Collation' refers to a set of rules that determine how data is sorted and compared. Case sensitivity is one aspect of collation. Other aspects include sensitivity to kana (Japanese script) and to width (single versus double byte characters).

#### Setting up a new Confluence instance

For new Confluence instances, we recommend using **case sensitive** collation for your Confluence database. This is the default collation type used by many database systems.

Note: Even if the database is configured for case sensitive collation, Confluence reduces all usernames to lower case characters before storing them in the database. For example, this means that 'joebloggs', 'joeBloggs' and 'JoeBloggs' will be treated as the same username.

#### Migrating an existing Confluence instance to a different database

The default Confluence configuration uses case sensitive database collation. This is typical of databases created under default conditions. If you are migrating from this type of configuration to a new database, we recommend that the new database uses case sensitive collation. If you use case insensitive collation, you may encounter data integrity problems after migration (for example, via an XML import) if data stored within your original Confluence site required case sensitive distinctions.

#### Troubleshooting

See our [troubleshooting guide](#) if you're unable to restore your XML backup.

### Configuring Database Character Encoding

Confluence and your database must be configured to use the same character encoding.

Confluence uses UTF-8 character encoding, so your database will also need to be configured to use UTF-8 (or the equivalent for your database, for example, AL32UTF8 for Oracle databases).

#### On this page:

- [New installations](#)
- [Existing installations](#)

#### Related pages:

- [Troubleshooting Character Encodings](#)
- [Configuring Character Encoding](#)
- [Known issues for MySQL](#)

#### New installations

When installing Confluence for the first time you will need to consider character encoding:

- when creating your database
- when connecting to the database via a JDBC connection string or datasource (if you use the simple setup method in the Confluence setup wizard, we'll take care of this for you).

The Confluence setup wizard will alert you if there is a problem with your character encoding, this will make sure you don't experience problems down the track. It is much easier to solve problems now, than later when you have Confluence data in your database.

The setup guide for each of our supported databases outlines how to configure character encoding correctly when creating your database:

- [Database Setup for PostgreSQL](#)
- [Database Setup For MySQL](#)
- [Database Setup for SQL Server](#)
- [Database Setup for Oracle](#)

### Existing installations

For existing Confluence sites, where the first version of Confluence installed was 6.4 or earlier, we may not have checked the collation or character encoding of your database during the initial setup.

If your database is not correctly configured to use UTF-8 character encoding (or the equivalent for your database, for example AL32UTF8 for Oracle databases):

- you may see a health check warning while using Confluence
- you may not be able to start Confluence after an upgrade.

If this happens, you'll need to change the character encoding for your existing database. The way you do this will depend on your database.

Also see [Troubleshooting Character Encodings](#) for help diagnosing character encoding problems.

### MySQL

See [How to Fix the Collation and Character Set of a MySQL Database](#) for details of what you'll need to do to fix the character encoding in your database. You should also make sure the collation is correct.

### Microsoft SQL Server

See [How to fix the collation of a Microsoft SQL Server Confluence database](#) for details of what you'll need to do to fix the character encoding in your database.

### PostgreSQL

If you use PostgreSQL, the best option is to recreate your database.

See [Database Setup for PostgreSQL](#) for how to create your database using the correct character encoding, then follow the steps in [Migrating to Another Database](#).

### Oracle

If you use Oracle, the best option is to recreate your database.

See [Database Setup for Oracle](#) for how to create your database using the correct character encoding, then follow the steps in [Migrating to Another Database](#).

### Configuring database query timeout

If database queries are taking too long to perform, and your application is becoming unresponsive, you can configure a timeout for database queries. There is no default timeout in Confluence. To configure a database query timeout, do the following on your test server:


1. Shut down Confluence.
2. Extract `databaseSubsystemContext.xml` from the `confluence-x.x.x.jar` that is in `confluence/WEB-INF/lib/`, and put a copy in `confluence/WEB-INF/classes/`.
3. Edit `confluence/WEB-INF/classes/databaseSubsystemContext.xml` to add the `defaultTimeout` property to the "transactionManager" bean:

```
<bean id="tenantedTransactionManager"
class="org.springframework.orm.hibernate.HibernateTransactionManager"
plugin:available="true">
    <property name="sessionFactory" ref="sessionFactory"/>
    <property name="defaultTimeout" value="120"/>
</bean>
```

The timeout is measured in seconds and will forcibly abort queries that take longer than this. In some cases, these errors are not handled gracefully by Confluence and will result in the user seeing the Confluence error page.

#### 4. Start Confluence.

Once the timeout is working properly in your test environment, migrate the configuration change to Confluence.

 You will need to reapply these changes when upgrading Confluence, as the original `databaseSubsystemContext.xml` file changes from version to version.

### Surviving Database Connection Closures

When a database server reboots or a network failure has occurred, all connections in the database connection pool are broken. To overcome this issue, Confluence would normally need to be restarted.

However, database connections in the database connection pool can be validated by running a simple SQL query. If a broken database connection is detected in the pool, a new one is created to replace it.

To do this, Confluence can use a validation query for your database connection. This is **enabled by default on new installations** (Confluence 6.5 and later), but if you've upgraded from an older Confluence version you can choose to enable this manually by following the steps below.

#### Determine the validation query SQL for your database

Different databases have slightly different SQL syntax requirements for their validation query. The validation query should be as simple as possible, as this is run every time a connection is retrieved from the pool.

The following validation queries are recommended for the following types of databases:

Database Type	Validation Query
MySQL	<code>select 1</code>
Microsoft SQL Server	<code>select 1</code>
Oracle	<code>select 1 from dual</code>
PostgreSQL	<code>select 1</code>

#### Enable validation query with a direct JDBC connection

To ensure Confluence validates database connections in the database connection pool:

1. Stop Confluence.
2. Edit the `<home-directory>confluence.cfg.xml` file.
3. Insert the following properties for your particular database.

**For PostgreSQL, SQL Server, and MySQL**

```
<property name="hibernate.c3p0.validate">true</property>
<property name="hibernate.c3p0.preferredTestQuery">select
1</property>
```

**For Oracle**

```
<property name="hibernate.c3p0.validate">true</property>
<property name="hibernate.c3p0.preferredTestQuery">select 1 from
dual</property>
```

4. Save `confluence.cfg.xml`
5. If you're using Confluence 5.10.3 or earlier you'll need to add the following [system property](#) with the validation query for your database.  
For example:

```
-Dc3p0.preferredTestQuery="select 1"
```

6. Restart Confluence.

You should now be able to recover from a complete loss of all connections in the database connection pool without the need to restart Confluence.

**Enable validation query with a datasource connection**

To ensure Confluence validates database connections in the database connection pool:

1. Stop Confluence.
2. Edit the `<installation-directory>/conf/server.xml` file (or wherever you have configured your datasource).
3. Find the Resource element for your data source, and add the "validationQuery" parameter as in the example for PostgreSQL below. Remember to give it the appropriate value for your database type.

**server.xml (excerpt)**

```
...
<Resource name="jdbc/confluence" auth="Container"
type="javax.sql.DataSource"
    username="postgres"
    password="postgres"
    driverClassName="org.postgresql.Driver"
    url="jdbc:postgresql://localhost:5432/yourDatabaseName"
    maxTotal="60"
    maxIdle="20"
    validationQuery="select 1" />
...
```

4. Save `conf/server.xml`
5. Restart Confluence.

You should now be able to recover from a complete loss of all connections in the database connection pool without the need to restart Confluence.

**Configuring a datasource connection**



This guide covers how to configure a JNDI datasource connection to your database. With this type of connection, Confluence asks the application server (Tomcat) for your database connection information.

If you'd prefer to use a JDBC connection see the guide for your database:

- [Database Setup for PostgreSQL](#)
- [Database Setup for SQL Server](#)
- [Database Setup For MySQL](#)
- [Database Setup for Oracle](#)

Direct JDBC is the most common way to connect Confluence to your database and is the easiest method when it comes time to upgrade Confluence.

**On this page:**

- [New Confluence installation](#)
- [Existing Confluence installation](#)
- [Upgrading Confluence with a datasource](#)

**Related pages:**

- [Database JDBC Drivers](#)

### New Confluence installation

The Confluence setup wizard will only provide an option to use a datasource if it detects one in your Tomcat configuration. If you want to use a datasource, follow the steps below.

## 1. Stop Confluence

In the Confluence setup wizard, you'll be prompted to choose your database. At this point, you should:

1. Use `bin/stop-confluence.sh` or `bin/stop-confluence.bat` to stop Confluence.
2. Back up the following files, in case you need to revert your changes:
  - `<installation-directory>/conf/server.xml`
  - `<installation-directory>/confluence/WEB-INF/web.xml`
  - `<home-directory>/confluence.cfg.xml`

### 2. Add your database driver

Copy your database driver into the `<installation-directory>/lib` directory.

Here's where to find the driver for your database:

- **PostgreSQL:** bundled with Confluence at `<installation-directory>/confluence/WEB-INF/lib/postgresql-x.x.x.jar`
- **Microsoft SQL Server:** bundled with Confluence at `<installation-directory>/confluence/WEB-INF/lib/mssql-jdbc-x.x.x.x.jar`
- **MySQL:** head to [Database JDBC Drivers](#) to download the driver
- **Oracle:** head to [Database JDBC Drivers](#) to download the driver

### 3. Configure the datasource in Tomcat

Next, add the datasource configuration to Tomcat.

1. Edit `<installation-directory>/conf/server.xml`
2. Find the following lines:

```
<Context path="/" docBase="../confluence" debug="0"
reloadable="true">
<!-- Logger is deprecated in Tomcat 5.5. Logging configuration
for Confluence is
specified in confluence/WEB-INF/classes/log4j.properties -->
```



3. Insert the following `DataSource` `Resource` element for your specific database directly after the lines above (inside the `Context` element, directly after the opening `<Context.../>` line, before `Manager`).

▼ PostgreSQL...

```
<Resource name="jdbc/confluence" auth="Container"
type="javax.sql.DataSource"
  username="<database-user>"
  password="<password>"
  driverClassName="org.postgresql.Driver"
  url="jdbc:postgresql://<host>:5432/<database-name>"
  maxTotal="60"
  maxIdle="20"
  validationQuery="select 1"/>
```

▼ Microsoft SQL Server...

```
<Resource name="jdbc/confluence" auth="Container"
type="javax.sql.DataSource"
  username="<database-user>"
  password="<password>"

  driverClassName="com.microsoft.sqlserver.jdbc.SQLServerDriver"

  url="jdbc:sqlserver://<host>:1433;database=<database-name>"
  maxTotal="60"
  maxIdle="20"
  validationQuery="select 1"/>
```

If you're using Confluence 6.3 or earlier, you'll need to specify the jTDS driver for SQL Server. See [Configuring a SQL Server Datasource in Apache Tomcat](#) in our 6.3 documentation for a sample configuration.

▼ MySQL...

```
<Resource name="jdbc/confluence" auth="Container"
type="javax.sql.DataSource"
  username="<database-user>"
  password="<password>"
  driverClassName="com.mysql.jdbc.Driver"

  url="jdbc:mysql://<host>:3306/<database-name>?useUnicode=true&
  amp;characterEncoding=utf8"
  maxTotal="60"
  maxIdle="20"
  defaultTransactionIsolation="READ_COMMITTED"
  validationQuery="Select 1"/>
```

▼ Oracle...

```
<Resource name="jdbc/confluence" auth="Container"
type="javax.sql.DataSource"
  driverClassName="oracle.jdbc.OracleDriver"
  url="jdbc:oracle:thin:@<host>:1521:<SID>"
  username="<database-user>"
  password="<password>"
  connectionProperties="SetBigStringTryClob=true"
  accessToUnderlyingConnectionAllowed="true"
  maxTotal="60"
  maxIdle="20"
  maxWaitMillis="10000"/>
```

See [how to find your Oracle URL](#).

Replace `<database-user>`, `<password>`, `<host>` and `<database-name>` (or `<SID>` for Oracle) with details of your own database. You may also need to change the port, if your database server is not running on the default port.

4. Configure the connection pool and other properties. See the [Apache Tomcat 8 Datasource documentation](#) for more information.

#### ▼ Configurable properties...

Here are the configuration properties for Tomcat's standard data source resource factory (`org.apache.tomcat.dbcp.dbcp.BasicDataSourceFactory`):

- `driverClassName` - Fully qualified Java class name of the JDBC driver to be used.
- `maxTotal` - The maximum number of active instances that can be allocated from this pool at the same time.
- `maxIdle` - The maximum number of connections that can sit idle in this pool at the same time.
- `maxWaitMillis` - The maximum number of milliseconds that the pool will wait (when there are no available connections) for a connection to be returned before throwing an exception.
- `password` - Database password to be passed to the JDBC driver.
- `url` - Connection URL to be passed to the JDBC driver. (For backwards compatibility, the property `driverName` is also recognized.)
- `user` - Database username to be passed to the JDBC driver.
- `validationQuery` - SQL query that can be used by the pool to validate connections before they are returned to the application. If specified, this query MUST be an SQL SELECT statement that returns at least one row. When a database server reboots, or there is a network failure, all the connections in the connection pool are broken and this normally requires a application server reboot. However, the Commons DBCP (Database Connection Pool) used by Tomcat can validate connections before issuing them by running a simple SQL query, and if a broken connection is detected, a new one is created to replace it. To do this, you will need to set the "validationQuery" option on the database connection pool.

5. If you plan to use collaborative editing, you'll need to make sure:
  - You're using a supported database driver. Collaborative editing will fail if you're using an unsupported or custom JDBC driver or `driverClassName` in your datasource. See [Database JDBC Drivers](#) for the list of drivers we support.
  - Your database connection pool allows enough connections to support both Confluence and Synchrony (which defaults to a maximum pool size of 15)
  - You're using simple username and password authentication for your database.

#### 4. Configure the Confluence web application

Configure Confluence to use this datasource:

1. Edit `<CONFLUENCE_INSTALLATION>/confluence/WEB-INF/web.xml`.
2. Insert the following element just before `</web-app>` near the end of the file:

```
<resource-ref>
  <description>Connection Pool</description>
  <res-ref-name>jdbc/confluence</res-ref-name>
  <res-type>javax.sql.DataSource</res-type>
  <res-auth>Container</res-auth>
</resource-ref>
```

### 5. Restart Confluence and continue setup process

Now that your datasource is configured, you can continue with the setup wizard.

1. Use `bin/start-confluence.sh` or `bin/start-confluence.bat` to restart Confluence
2. Go to `http://localhost:8090` to return to the setup wizard.
3. When prompted choose **My own database (datasource)**.
4. Enter the JNDI name of your datasource, for example, `java:comp/env/jdbc/confluence`
5. Follow the prompts to finish setting up Confluence.

### Existing Confluence installation

If you want to switch from using a direct JDBC connection to a datasource:

- Stop Confluence.
- Back up the following files, in case you need to revert your changes:
  - `<installation-directory>/conf/server.xml`
  - `<installation-directory>/confluence/WEB-INF/web.xml`
  - `<home-directory>/confluence.cfg.xml`
- Follow the steps above for a new installation and copy your driver and add the datasource to the appropriate files. You can find the details of your current database connection in `<home-directory>/confluence.cfg.xml`.
- Edit the `<home-directory>/confluence.cfg.xml` file and remove any line that contains a property that begins with `hibernate`.
- Insert the following at the start of the `<properties>` section.

```
<property name="hibernate.setup"><![CDATA[true]]></property>
<property
name="hibernate.dialect"><![CDATA[com.atlassian.hibernate.dialect
t.MySQLDialect]]></property>
<property
name="hibernate.connection.datasource"><![CDATA[ java:comp/env/jd
bc/confluence]]></property>
```

- Restart Confluence.

### Upgrading Confluence with a datasource

If you're upgrading Confluence (manually or using the installer) you will need to:

- Stop Confluence (if you have attempted to start it).
- Copy your database driver into the `<installation-directory>/lib` directory.
- Edit `<installation-directory>/conf/server.xml` and add your datasource resource.
- Edit `<installation-directory>/confluence/WEB-INF/web.xml` to configure Confluence to use this datasource.

If you forget to do these steps, Confluence will not start up after upgrade and you'll see the following error:

```
HTTP Status 500 - Confluence is vacant, a call to tenanted [public
abstract org.hibernate.Session
org.hibernate.SessionFactory.getCurrentSession() throws
org.hibernate.HibernateException] is not allowed.
```

## Site Backup and Restore


Atlassian recommends establishing a [backup strategy using a native database tool](#) for production installations of Confluence.

By default, Confluence backs up all data and attachments once a day to an XML backup file. These files are called XML site backups, and are stored in the `backups` directory of Confluence home. You can also create XML site backups manually. This mechanism is intended for small to medium-sized deployments of Confluence. It is not intended for use with large deployments with lots of pages and attachments (see below).

- [Restore your site from an XML site backup](#)
- [Manually create an XML site backup](#)
- [Configuring Backups](#)
- [User Submitted Backup & Restore Scripts](#)

XML site backups are fine for most small to medium-sized instances of Confluence, containing a few thousand pages and attachments. However, large instances of Confluence may find that backups become slow to create and use large amounts of disk space.

**Note:** Plugins are not included in the XML backup. After importing your backup into a new Confluence site, you will need to re-install all plugins (add-ons) that are not bundled with Confluence. (The `plugindata` table is not backed up in a manual backup.)

 *The information on this page **does not apply** to Confluence Cloud.*

### Backups for large installations

XML site backups are unsuitable for installations of Confluence that contain thousands of pages, as XML backups take progressively longer to complete as the amount of text increases. Another issue with XML site backups is that Confluence instances with gigabytes of attachments will consume disk space rapidly. This is because each site backup contains all content needed for a site restore. For example, if a 1 GB instance of Confluence is backed up daily, it will create 30 GB of backups per month if left unattended. When administering a large instance, you can reduce disk space by setting XML site backups to exclude attachments, then manually scheduling a backup of your attachments from the Confluence [home directory](#) or database. The backup manager can save space by saving changed files instead of all content.

Creation Delay	Disk Usage	Recommended Backup Method
Acceptable	Acceptable	XML site backup with attachments
Acceptable	Unacceptable	XML site backup minus attachments, plus manual backup of attachments
Unacceptable	Unacceptable	Manual backup of database and attachments

**Creation Delay** is the time it takes to create an XML site backup *minus attachments*.

**Disk Usage** can be estimated by multiplying the frequency of your XML site backups by their current size.

## Manual backups

Confluence's [Attachment Storage Configuration](#) can be set to store attachments in the Confluence [home directory](#), or in the database.

### Database backup

Use your Database Administration Tool to create a backup of your Confluence database. If your database is storing your attachments, importing this later will restore all content. For instances with big attachments, please note that currently Confluence migrate attachments in a single transaction: [CONF-9888](#).

### Attachment backup

If stored on the filesystem, attachments are placed under the `attachments` directory of your Confluence home directory. Copy this directory to create a backup of all attachments.

To restore from these backups, please refer to [Restoring Data from other Backups](#).

### Production Backup Strategy

Confluence automatic daily XML backup is suitable if you:

- are evaluating Confluence
- do not have database administration familiarity, and your Confluence installation is small

Once your Confluence installation reaches more than a few thousand pages, the XML backup facility can be inefficient compared to your database's own backup tools. The built in backup functionality requires a lot of memory to run and is less reliable when restoring data.

#### On this page:


- [Establishing a production system backup solution](#)
- [Which files need to be backed up?](#)
- [How do I back up?](#)
- [How do I restore?](#)
- [Other processes](#)

#### Related pages:

- [Site Backup and Restore](#)

### Establishing a production system backup solution

Atlassian recommends establishing an alternative database backup strategy:

- Create a backup or dump of your database using tools provided by your database  
 To avoid any data inconsistency and corruption, it is recommended to shut down Confluence before creating a database backup or dump.
- Create a file system backup of your Confluence home directory
- Create a file system backup of your shared home directory (Clustered instances only)

Once this is in place, disable the daily backups through the [scheduled jobs](#) feature via '**Administration Console > Administration > Scheduled Jobs**'.

We want to stress that creating these two backups is *better* than having a Confluence XML backup. It is more robust and far more reliable for large production instances. You will be able to restore your whole site, including all data, attachments and configuration information intact with these two backups. See [Restoring Data from other Backups](#).

### Which files need to be backed up?

Backing up the whole home directory is the safest option, however most files and directories are populated on startup and can be ignored. At minimum, these files/directories *must* be backed up:

- `<conf-home>/confluence.cfg.xml`
- `<conf-home>/attachments` (you can [exclude extracted text](#) files if space is an issue)

The rest of the directories will be auto-populated on start up. You may also like to backup these directories:

- `<conf-home>/config` – if you have modified your ehcache.xml file.
- `<conf-home>/index` – if your site is large or reindexing takes a long time – this will avoid the need for a full reindex when restoring.

The location of the home directory is configured on installation and is specified in the `confluence.init.p`

roperties file. For installation created with the automatic installer the default locations are:

- Windows C:\Program Files\Atlassian\Application Data\Confluence
- Linux /var/atlassian/application-data/confluence

**For Clustered instances only:** Backing up the whole shared home directory is the safest option, however some files and directories are populated at runtime and can be ignored:

- <conf-home>/thumbnails
- <conf-home>/viewfile.

#### How do I back up?

The commands to back up your database will vary depending on your database vendor, for example the command for PostgreSQL is `pg_dump dbname > outfile`.

You should refer to the documentation for your particular database to find out more.

#### How do I restore?

Our guide on [Migrating Confluence Between Servers](#) has instructions on restoring a backup using this technique.

#### Other processes

XML backups are described and used for other processes in Confluence, like upgrading and moving servers. Using the backup strategy described above will work for those processes too.

- Our [upgrade guide](#) does not require the use of an XML backup (although the earlier Confluence upgrade procedure, and the Jira upgrade guide, do use XML backups).
- Our [migrate server procedure](#)— used to set up a test server — can use a SQL dump as well.
- The [database migration](#) procedure uses the XML backup for small data sets. Large data sets will require third party database migration tools.

**Note:** The XML export built into Confluence is not suited for the backup or migration of large data sets. There are a number of third party tools that may be able to assist you with the data migration. If you would like help in selecting the right tool, or help with the migration itself, we can put you in touch with one of the [Atlassian Experts](#).

### Configuring Backups

Confluence automatically backs up your data daily at 2:00am, by performing a full site export. The zipped xml backup file is stored in the `backups` directory of your [Confluence Home](#) directory.

The default naming convention for the backup files is 'backup-yyyy\_MM\_dd'. Confluence can write backups to both local and mapped network drives.

You can choose to:

- Change the naming convention of backup files.
- Include or exclude attachments in backups.
- Change the automated backup schedule so it runs at a different time
- Store the backup files in a different location (this option is disabled by default, find out how to enable it below)

You'll need System Administrator global permissions to configure automated backups.

For production sites, we strongly recommend you don't rely on the automatic backups, and instead back up your database, installation directory and home directory manually.

See [Production Backup Strategy](#) for more information.

#### On this page:

- [Configuring automated backups](#)
- [Configuring manual backups](#)

If you're running Confluence Data Center the default backup path will be `<shared-home>/backups`. You can find the location of your shared home in the `confluence.cfg.xml` file, look for the `confluence.cluster.home` property.

### Configuring automated backups

To configure Confluence backups:

1. Go to



> **General Configuration > Backup administration.**

2. Choose **Edit** to:

- Change the backup file name prefix.
- Use a different date format (uses the syntax described in [simple date format](#)).
- Choose whether to include or exclude attachments from backups (attachments are included by default).
- Choose to store backup files in a custom location (this is disabled by default - see [Enabling backup path configuration](#) below).

3. **Save** your changes.

## Backup Administration

Perform a backup of your site daily to a chosen directory on your filesystem.

### Backup Settings

Backup File Prefix	<input type="text" value="backup-"/>
Backup File Date Pattern	<input type="text" value="yyyy_MM_dd"/>
Backup Path	<input type="text"/>

Custom backup paths are not enabled. [More about custom backup paths](#)

☒ Backup Attachments

[Cancel](#)

### Enabling Backup Path Configuration

For security reasons, the ability to change the backup file location via the Confluence administration console is disabled by default.

To enable custom backup paths:

1. Stop Confluence.
2. Edit the `<confluence-home>/confluence.cfg.xml` file.
3. Change the value of the following property to true:

```
<property
name="admin.ui.allow.daily.backup.custom.location">true</propert
y>
```

4. Restart Confluence to pick up the change.
5. Go to





> **General Configuration** > **Backup administration** to enter the new path.

The directory must be on either a local drive or a mounted network drive. Make sure the mounted drive is on a physical server and not a Virtual Machine image.


If you migrate Confluence to a new server or change your architecture, you will need to update this path.

Changing your home directory location will not automatically update your backup file path if you've enabled custom paths.

#### *Disable automatic backups*


If you have an appropriate [Production Backup Strategy](#), you may want to disable automatic backups to save on disk space.

To disable automatic backups entirely:

1. Go to  > **General Configuration** > **Scheduled jobs**.
2. Choose **Disable** next to the **Back up Confluence** job
3. Enter the new schedule using a [cron expression](#).

#### *Change the backup schedule*

To change the frequency of backups, or to change the time the backup runs each day:

1. Go to  > **General Configuration** > **Scheduled jobs**.
2. Choose **Edit** next to the **Back up Confluence** job
3. Enter the new schedule using a [cron expression](#).

The time zone used for the scheduled job is taken from the server on which Confluence is running. Go to



> **General Configuration** > **System Information** to look up the **System Time**.

#### *Configuring manual backups*

If you need a one-off backup, you can manually perform a site export. See [Manually Backing Up the Site](#) for more information.

These files are not saved to the same location as the automated backups, they are saved in the `temp` directory. You can change where the zipped XML files are saved by changing the location of your `<Confluence-home>/temp` directory. See [Confluence Home and other important directories](#) for more information on how to do this.

### **User Submitted Backup & Restore Scripts**

These scripts are user-submitted and should be used with caution as they are not covered by Atlassian technical support. If you have questions on how to use or modify these scripts, please [post them to Atlassian Answers](#).

#### **Delete Old Backups - Wscript Script On Windows**

This script examines backup filename and deletes them if necessary, it may need to be edited.



```
'If you want 3 day old files to be deleted then insert 3 next to Date -
"your number here"
'This script will search out and delete files with this string in them
".2005-12-04-" This of course depends on the number you enter.
'You can always do a wscript.echo strYesterday or strFileName to see
what the script thinks you are searching for.
```

```
dtmYesterday = Date - 3

strYear = Year(dtmYesterday)

strMonth = Month(dtmYesterday)
If Len(strMonth) = 1 Then
    strMonth = "0" & strMonth
End If

strDay = Day(dtmYesterday)
If Len(strDay) = 1 Then
    strDay = "0" & strDay
End If

strYesterday = strYear & "-" & strMonth & "-" & strDay

strFileName = "C:\test*." & strYesterday & "-*"

Set objFSO = CreateObject("Scripting.FileSystemObject")
objFSO.DeleteFile(strFileName)
```

#### Delete Old Backups - Basic Bash Script For Linux

Old XML backups can be deleted automatically by inserting a nightly or weekly automation script or cron similar to the following:

```
ls -t <path to your backup dir>/* | tail -n +6 | xargs -i rm {}
```

Or, using the older form of the `tail` command if your system does not support the standard form:

```
ls -t <path to your backup dir>/* | tail +6 | xargs -i rm {}
```

#### Delete Old Backups - Advanced Bash Script For Linux

Old XML backups can be deleted automatically by inserting a nightly or weekly automation script or cron similar to the following. Set the `BACKUP_DIR` and `DAYS_TO_RETAIN` variables to appropriate values for your site. Between runs, more files than `DAYS_TO_RETAIN` builds up.

```
#!/bin/sh

# Script to remove the older Confluence backup files.
# Currently we retain at least the last two weeks worth
# of backup files in order to restore if needed.

BACKUP_DIR="/data/web/confluence/backups"
DAYS_TO_RETAIN=14

find $BACKUP_DIR -maxdepth 1 -type f -ctime +$DAYS_TO_RETAIN -delete
```

#### Manual Database & Home Backup - Bash Script For Linux

This backs up a mySQL database and the Confluence home directory.

```
#!/bin/bash
CNFL=/var/confluence
CNFL_BACKUP=/backup/cnflBackup/`date +%Y%m%d-%H%M%S`

rm -rf $CNFL/temp/*
mkdir $CNFL_BACKUP
mysqldump -uroot -p<password> confluence|gzip >
$CNFL_BACKUP/confluence.mysql.data.gz
tar -cjvf $CNFL_BACKUP/data.bzip $CNFL > $CNFL_BACKUP/homedir.status
```

#### Backup by Date - Postgres

```
export d=`date +%u`
mkdir -p /home/backup/postgres/$d

sudo -u postgres pg_dumpall | bzip2 > /home/backup/postgres/$d/sql.bz2
```

### Manually Backing Up the Site

Confluence is configured to back up its data automatically, as a zipped XML file. You can also manually perform this backup from the **Administrati on Console**.

You'll need [System Administrator](#) permissions to do this.

#### Related pages:

- [Restoring a Site](#)
- [Configuring Backups](#)
- [Production Backup Strategy](#)

#### Good to know:

- We recommend you use the [Production backup strategy](#), especially if you have a large or mission critical site, rather than relying on XML exports as your main backup method.
- Add-ons are not included in the XML export. After importing your site export file into a new Confluence site, you'll need to re-install all add-ons that are not bundled with Confluence as the `plugindata` table is not backed up in a manual backup.
- You can't import a site export file into a version of Confluence that is earlier than the one it was exported from.

#### Create the site export file

### To create an XML export of your site:

1. Go to



> **General Configuration** > **Backup & Restore**.

2. Choose **Archive to backups folder** to store a copy of the backup in the same folder as Confluence's backups.

If you do not archive the backup it will be made available for you to download, and then deleted from the server after 24 hours.

3. Choose **Backup attachments** to include attachments in your backup.
4. Choose **Backup**.

The process can take some time.

If you repeatedly experience timeout errors, try creating the export directly from Tomcat. This will speed up the process and prevent timeouts.

For example, your URL might normally be something like `http://<domain>.com`. To bypass this and access Tomcat directly, use this URL: `http://localhost:8090/confluence/admin/backup.action` directly from your server.

#### What's included in the export?

The site export includes spaces (including pages, blogs, comments, attachments, and unpublished changes), users and groups. Essentially everything in your site except add-ons.

#### Retrieving the site export file

Confluence will create the backup as a zipped XML file in your `<home-directory>/backups` directory. You'll need access to the Confluence server itself in order to retrieve this file.

#### Allow export files to be downloaded from within Confluence

By default, you can't retrieve the backup file from within Confluence. This feature is disabled for security reasons, but you can choose to enable it. Once enabled, Confluence will prompt you to download the backup file when the backup process finished. We recommend that you keep this feature **off** in production environments.

### To enable download of the backup file from within Confluence:

1. Stop Confluence.
2. Edit the `<confluence-home>\confluence.cfg.xml` file.
3. change `admin.ui.allow.manual.backup.download` to `true`.
4. Restart Confluence.

If the value of the above configuration property is 'true', it will be possible to download the backup file after manually backing up the site via the Confluence Administration Console. If the value of this property is 'false' or the property is not present in the configuration file, you will need to retrieve the backup file from the file system on the Confluence server. By default, the value is 'false'.

#### Restoring the site export file

There are some restrictions on which Confluence versions you will be able to import this file into. The most important is that you **can't import into an earlier version of Confluence**. See [Restoring a Site](#) for more information and troubleshooting tips.

### Restoring a Site

This page describes how to restore data from an XML site export file into an existing Confluence site.

If you want to import data into a new site, see [restoring from backup during setup](#).

You need [System Administrator](#) permissions in order to perform this function.

**On this page:****Related pages:**

- [Production Backup Strategy](#)
- [Exporting a site](#)
- [Importing a Space](#)

Importing a site export file will:

- Overwrite all existing Confluence content in your database. Back up your database before you start.
- Log you out of Confluence. Make sure you know the login details contained in the file you're about to import.

**Before you start:**

- **All content replaced.** Importing a site will replace all your content and users. Back up your database before you start.
- **Selective space restoration not possible.** You can't select a single space to restore from the entire site backup.
- **Version compatibility.** Confluence accepts site backups from many previous Confluence versions. You can check which versions are accepted in the Backup and Restore screen. You can only import into a **later version** of Confluence, not an earlier one.
- **For best results**, export from and import into the same Confluence version.
- **XML export files should not be used to upgrade Confluence.** Upgrade Confluence by following [Upgrading Confluence](#).

**Check your export is compatible**

To check that your site export can be successfully restored:

1. Start up the Confluence site you'll be importing into.
2. Go to



> **General Configuration > Backup and Restore.**

3. Check the accepted Confluence version - it's listed under **Upload and restore a site/space backup.**

Here's what it looks like for Confluence 5.9. The accepted versions for your Confluence version may be different.

**Upload and restore a site/space backup.**

This site accepts full site imports from Confluence 4.0 and later, and space imports from Confluence 5.3 and later.

To allow you to search your data, Confluence needs to build an index. You can postpone this to later by unchecking the box below.

☒ Build Index

No file selected.

You can't import into an **earlier version** of Confluence.


For example, if your site export was generated from Confluence 5.9, you can't import it into Confluence 5.5.

If your export is from Confluence Cloud you can **only** import it into Confluence 6.0 or later.


## Import a Confluence site

There are two ways to import a site - by uploading a file, or from a directory on your Confluence server. Uploading a file is only suitable for small sites. For best results, we recommend importing from the restore directory.

### To upload and import a small site:

1. Go to  > **General Configuration** > **Backup and Restore**.
2. Choose **Choose File** and browse for the site export file.
3. Uncheck **Build Index** if you want to create the index at a later stage.
4. Choose **Upload and Restore**.

### To import a site from the restore directory:

1. Copy your export file to `<confluence-home>/restore`.  
(If you're not sure where this directory is located, the path is listed in the **Backup and Restore** screen)
2. Go to  > **General Configuration** > **Backup and Restore**.
3. Select your site export file under **Restore a backup from the Confluence Home Directory**.
4. Uncheck **Build Index** if you want to create the index at a later stage.
5. Choose **Restore**.

Building the index is optional during the import process. The content of your site won't be searchable until the index is created, but if you have a very large site, you may choose to [rebuild the index manually](#) after the import is complete.

#### *Using Confluence Data Center?*

If you're using Confluence Data Center with collaborative editing enabled there are a few extra steps. You need to stop Synchrony completely, and we also recommend performing the import with just one Confluence node running, and directing traffic away from that node.

Once the import is complete, you can restart Synchrony, and then restart your remaining nodes (one at a time).

## Troubleshooting

If you have problems importing a site, check out these hints.

- **Is your file too large to upload?**  
This is a very common problem. It happens when the file can't be uploaded to the server in time. To avoid this problem, drop your export file into the `<confluence-home>/restore` directory and import it from there.
- **Are you trying to import into an earlier version of Confluence?**  
This is not possible. You can only import a site into the same version or a later compatible version.
- **Is the import timing-out or causing out of memory errors?**  
If the site to be imported is large, you may need to temporarily increase the memory available to Confluence. See [How to fix out of memory errors by increasing available memory](#).
- **Is your username or password not recognized?**  
All user data was overwritten during the import process. You need to log in with a system administrator account from the site that was exported. If you don't know the password, you'll need to reset it from the database. See [Restore Passwords To Recover Admin User Rights](#).
- **Is your site export from Confluence Cloud?**  
You can only import into Confluence 6.0 or later. The Cloud export does not include a system

administrator account, so you will need to start Confluence in recovery mode, create a new system administrator account, and make it a member of the confluence-administrators group. See [Restore Passwords To Recover Admin User Rights](#) for more.

- **Did you download the export file on a Mac?**

If you get an error saying that Confluence can't find the `exportDescriptor.properties` file, chances are OS X has unzipped the backup for you and sent the original zipped file to the trash. You need to retrieve the original zip file from the trash and then try the import again.

- **Importing into a Confluence Data Center site?**

You must stop Synchrony before commencing the site import.

#### Note about using site exports as backups

- **Production backup strategy preferred.** We recommend that you follow the [Production Backup Strategy](#) (which involves backing up your database and home directory) for your production Confluence site, because Confluence XML exports are not recommended as the sole backup mechanism.
- **Restoring from other backups.** If your daily backup zip files can't be restored for some reason, but you have backups of both your database and your Confluence home directory, you'll be able to [restore from these backups](#).

## Restoring a Space

You can [export a space](#) – including pages, comments and attachments – to a zip that contains an XML file and, optionally, all the attachments in the space. To import the space to another Confluence site, restore the zip as described below.

You need [System Administrator](#) permissions in order to restore a space from an XML zip file.

#### Export and import compatibility

To find out which versions your current Confluence version can accept space exports from, go to



> **General Configuration** > **Backup and Restore**.

If you need to import a space from Confluence 5.3 or earlier, you'll need to [follow a workaround](#).

#### On this page:

- [Export and import compatibility](#)
- [Importing a space from an XML backup](#)
- [Troubleshooting](#)
- [Workaround for restoring spaces from Confluence 5.3 and earlier](#)

#### Related pages:

- [Restoring a Site](#)

You can't import into an **earlier version** of Confluence.


For example, if you export a space from Confluence 5.9, you can't import it into Confluence 5.5.

If your export is from Confluence Cloud, you can only import it into Confluence 6.0 or later.


## Importing a space from an XML backup

There are two ways to import a space – by uploading a file, or from a directory on your Confluence server. Uploading a file is only suitable for small spaces. For best results, we recommend importing from the restore directory.

**To upload and import a small space:**

1. Go to  > **General Configuration** > **Backup and Restore**.
2. Click **Choose File** and browse for your space export file.
3. Uncheck **Build Index** if you want to create the index at a later stage.
4. Choose **Upload and Restore**.

**To import a space from the restore directory:**

1. Copy your space export file to `<confluence-home>/restore`.  
(If you're not sure where this directory is located, the path is listed in the **Backup and Restore** screen)
2. Go to  > **General Configuration** > **Backup and Restore**.
3. Select your space export file under **Restore a backup from the Confluence Home Directory**.
4. Uncheck **Build Index** if you want to create the index at a later stage.
5. Choose **Restore**.

Building the index is optional during the import process. The content of your imported space won't be searchable until the index is created, but, if you have a very large site, rebuilding the index can take a long time and impact your site's performance. Alternatively, you can [rebuild the index manually](#) at a low peak time.

**Troubleshooting**

If you have problems importing a space, check out these hints.

- **Is your file too large to upload?**  
This is a very common problem. It happens when the file can't be uploaded to the server in time. To avoid this problem, drop your export file into the `<confluence-home>/restore` directory and import it from there.
- **Are you trying to import into an earlier version of Confluence?**  
This is not possible. You can only import a space into the same version or a later compatible version.
- **Is your space export file from Confluence Cloud?**  
You can only import this file into Confluence 6.0 or later. Trying to import into earlier versions can cause major problems.
- **Does a space with the same space key already exist?**  
Space keys are unique, so if you already have a space with the same key, you'll need to delete the existing space before importing the new one.
- **Is the import timing-out or causing out of memory errors?**  
If the space to be imported is very large, you may need to temporarily increase the memory available to Confluence. See [How to fix out of memory errors by increasing available memory](#).
- **Did you download the export file on a Mac?**  
If you get an error saying that Confluence can't find the `exportDescriptor.properties` file, chances are OS X has unzipped the backup for you and sent the original zipped file to the trash. You need to retrieve the original zip file from the trash and then try the import again.

**Workaround for restoring spaces from Confluence 5.3 and earlier**

If you need to import a space from a version prior to Confluence 5.3 into a later version of Confluence, you can use a temporary Confluence installation to upgrade the space export to the right version number:

1. Download the same version of Confluence as the version you exported the space from (you can get older versions of Confluence at the [Confluence Downloads Archive](#)).
2. Install that version of Confluence on a temporary server.
3. Import the space into this temporary Confluence site.




4. Upgrade Confluence on your temporary site to the same version as the site where you want to import the space (see [Upgrading Confluence](#) for instructions).
5. Export the space from your temporary Confluence site (it'll now have the right version number).
6. Import the space into your production Confluence site.

## Restoring a Test Instance from Production

See [Migrating Confluence Between Servers](#) for a more comprehensive explanation.

Many Confluence administrators will have a production instance running the "live" version of Confluence, as well as a test instance for testing upgrades and so on. In this situation, it's quite common that the two instances are running different versions of Confluence. This document describes how to copy the data from a production instance to a test instance, where the production version may be different to the test version.

Before proceeding with this guide, ensure you have read and understood the [normal procedure for upgrading Confluence](#).

 *The information on this page **does not** apply to Confluence Cloud.*

### Upgrading a test Confluence instance with production data

Essentially, we are copying both the production home directory and database to the test instance. We then update the database details on the test instance to point to the test database, leaving all other instance metadata (most importantly the Confluence *build number*) the same as production.

1. Shut down your test instance.
2. Restore the production database to the test database server.
3. Create a backup of the `confluence.cfg.xml` file found in the home directory of the test instance.
4. Copy the production confluence-home directory to the test application server.
5. Open the `confluence.cfg.xml` which has been copied in a text editor. Change the database settings to match the test database server. **Ensure you do not point to your production database.** (You can compare with the backup you made in Step 3 if you need to get the database settings. Don't just copy this file – you need the build number unchanged from production to indicate the database is from an older version of Confluence.)

Before starting your test instance, you need to do the following steps to ensure no contact with production systems.

### Ensuring no contact with production systems

To ensure no contact with external systems, you will need to disable both inbound and outbound mail services.

1. Disable global outbound mail by running the following database query:

```
SELECT * FROM BANDANA WHERE BANDANAKEY =  
'atlassian.confluence.smtp.mail.accounts';
```

2. Disable space-level mail archiving by running the following database query:

```
SELECT * FROM BANDANA WHERE BANDANAKEY =  
'atlassian.confluence.space.mailaccounts';
```

Change the 'SELECT \*' to a 'DELETE' in the above queries once you are sure you want to remove the specified accounts.

Once this is done, you can start your test instance without any mails being sent or retrieved. Think carefully about other plugins which may access production systems (SQL macro, etc.). These should be disabled



promptly after starting the test instance.

You can create a [developer](#) license for this server and update the License Details after starting up.

**See also**

[Upgrading Confluence](#)

[Migrating Confluence Between Servers](#)

[Restoring to a Test Instance of Confluence from Production](#)

### Restoring Data from other Backups

Typically, Confluence data is restored from the [Administration Console](#) or from the [Confluence Setup Wizard](#).

If you are experiencing problems restoring from a zipped XML backup file, it is still possible to restore provided you have:

1. A backup of your home directory.
2. A backup of your database (if you're using an external database).

Instructions for this method of restoring differ depending on whether you are using the embedded database or an external database (like Oracle, MS SQL Server, MySQL or Postgres).

#### Embedded Database

If you are running against the embedded database, the database is located inside the `database` folder of your Confluence Home Directory. Hence, all you need to do is:

1. Retrieve the most recent backup of your home directory.
2. Unpack the Confluence distribution and point the `confluence-init.properties` file to this directory.

#### External Database

*If you're using an external database, you need to do the following.*

1. Prepare backups of your home directory and database (preferably backups that are dated the same). That is, make sure the home directory is accessible on the filesystem and the database available to be connected to.
2. If this database happens to have a different name, or is on a different server, you need to modify the `jdbc url` in the `confluence.cfg.xml` file inside the Confluence Home Directory. The value of this property is specified as `hibernate.connection.url`.
3. Unpack the Confluence distribution and point the `confluence-init.properties` file to the home directory.

### Retrieving File Attachments from a Backup

File attachments on pages can be retrieved from a backup without needing to import the backup into Confluence. This is useful for recovering attachments that have been deleted by users.

Both [automated](#) and [manual](#) backups allow this, as long as the 'Include attachments' property was set. If you want to restore pages, spaces or sites, see the [Confluence Administrator's Guide](#) instead.

Before following the instructions for recovering attachments below, we will review how backups store file and page information.



*The information on this page **does not** apply to Confluence Cloud.*

### How Backups Store File and Page Information

The backup zip file contains `entities.xml`, an XML file containing the Confluence content, and a directory for storing attachments.

#### Backup Zip File Structure

Page attachments are stored under the attachments directory by page and attachment id. Here is an example listing:

```
Listing for test-2006033012_00_00.zip
\attachments\98\10001
\attachments\98\10002
\attachments\99\10001
entities.xml
```

Inside the attachment directory, each numbered directory inside is one page, and the numbered file inside is one attachment. The directory number is the page id, and the file number is the attachment id. For example, the file `\attachments\98\10001` is an attachment with page id 98 and attachment id 10001. You can read `entities.xml` to link those numbers to the original filename. `Entities.xml` also links each page id to the page title.

#### ***Entities.xml Attachment Object***

Inside the `entities.xml` is an Attachment object written in XML. In this example, the page id is [98](#), the attachment id is [10001](#) and the filename is [myimportantfile.doc](#). The rest of the XML can be ignored:

```
<object class="Attachment" package="com.atlassian.confluence.pages">
  <id name="id">98</id>
  <property name="fileName"><![CDATA[myimportantfile.doc]]></property>
  ...
  <property name="content" class="Page"
package="com.atlassian.confluence.pages"><id name="id">10001</id>
  </property>
  ...
</object>
```

#### ***Entities.xml Page Object***

This XML describes a page. In this example, the page id is [98](#) and the title is [Editing Your Files](#). The rest of the XML can be ignored:

```
<object class="Page" package="com.atlassian.confluence.pages">
  <id name="id">98</id>
  <property name="title"><![CDATA[Editing Your Files]]></property>
  ...
</object>
```

### **Instructions for Recovering Attachments**

Each file must be individually renamed and re-uploaded back into Confluence by following the instructions below. Choose one of the three methods:

#### **Choice A - Recover Attachments By Filename**

Best if you know each filename you need to restore, especially if you want just a few files:

1. Unzip the backup directory and open `entities.xml`.
2. Search `entities.xml` for the filename and find the attachment object with that filename. Locate its page and attachment id.
3. Using the page and attachment id from `entities.xml`, go to the attachments directory and open that directory with that page id. Locate the file with the attachment id.
4. Rename the file to the original filename and test it.
5. Repeat for each file.
6. To import each file back into Confluence, upload to the original page by attaching the file from within

Confluence.

#### Choice B - Restore Files By Page

Best if you only want to restore attachments for certain pages:

1. Unzip the backup directory and open entities.xml.
2. Search entities.xml for the page title and find the page object with that title. Locate its page id.
3. Go to the attachments directory and open that directory with that page id. Each of the files in the directory is an attachment that must be renamed.
4. Search entities.xml for attachment objects with that page id. Every attachment object for the page will have an attachment id and filename.
5. Rename the file with that attachment id to the original filename and test it.
6. Repeat for each page.
7. To import each file back into Confluence, upload to the original page by attaching the file from within Confluence.

#### Choice C - Restore All Files

Best if you have a small backup but want to restore many or all the attachments inside:

Following process is applicable to **space** export only. Site xml backups do not require page id to be updated manually due to the nature of persistent page\_id's.

1. Unzip the backup directory and open entities.xml.
2. Go to the attachments directory and open any directory. The directory name is a page id. Each of the files in the directory is an attachment that must be renamed.
3. Search entities.xml for attachment objects with that page id. When one is found, locate the attachment id and filename.
4. Rename the file with that attachment id to the original filename and test it.
5. Find the next attachment id and rename it. Repeat for each file in the directory.
6. Once all files in the current directory are renamed to their original filenames, search entities.xml for the page id, eg directory name. Find the page object with that page id and locate its page title.
7. Rename the directory to the page title and move on to the next directory. Repeat for each un-renamed directory in the attachments directory.
8. To import each file back into Confluence, upload to the original page by attaching the file from within Confluence.

#### Troubleshooting failed XML site backups

XML site backups are only necessary for migrating to a new database. [Setting up a test server](#) or [Establishing a reliable backup strategy](#) is better done with an SQL dump.

#### Related pages:

- [Enabling detailed SQL logging](#)

Seeing an error when creating or importing a backup?

Problem	Solution
Exception while creating backup	Follow instructions below
Exception while importing backup	Follow <a href="#">Troubleshooting XML backups that fail on restore</a> instead

#### Common problems

- **Is the export timing out or causing out of memory errors?**  
If your site is large, you may need to temporarily increase the memory available to Confluence. See [How to fix out of memory errors by increasing available memory](#).

## Resolve Errors With Creating An XML Backup

The errors may be caused by a slightly corrupt database. If you're seeing errors such as '[Couldn't backup database data](#)' in your logs, this guide will help you correct the error on your own. We strongly recommend that you backup your database and your Confluence home directory beforehand, so that you can [restore your site from those](#) if required. If you are unfamiliar with SQL, we suggest you contact your database administrator for assistance.

### *Preferable solution*

The [Production Backup Strategy](#) is a very reliable and more efficient way to do backups. If you are running into problems with XML backups - whether memory related or because of problems like the one described here - use the native backup tool as an alternate solution.

### *To Identify And Correct The Problem*

To work out where the data corruption or problems are, increase the status information reported during backup, then edit the invalid database entry:

1. Stop Confluence.
2. If you have an external database, use a database administration tool to create a manual database backup.
3. Backup your Confluence home directory. You will be able to [restore your whole site](#) using this and the database backup.
4. Open the `my_confluence_install/confluence/WEB-INF/classes/log4j.properties` and add this to the bottom and save:

```
log4j.logger.com.atlassian.confluence.importexport.impl.XMLDatabaseB
inder=DEBUG, confluencelog
log4j.additivity.com.atlassian.confluence.importexport.impl.XMLD
atabaseBINDER=false
```

5. Find your [atlassian-confluence.log](#). Move or delete all existing Confluence logs to make it easier to find the relevant logging output.
6. Restart Confluence and login.
7. Begin a backup so that the error reoccurs.
8. You must now check your log files to find out what object could not be converted into XML format. Open `confluence-home/logs/atlassian-confluence.log`. Scroll to the bottom of the file.
9. Do a search for 'ObjectNotFoundException'. You should see an error similar to this:

```

01 2005-08-24 00:00:33,743 DEBUG
[DOCPRIV2:confluence.importexport.impl.XMLDatabinder] Writing
object: com.atlassian.confluence.core.ContentPermission with ID:
5 to XML.
02 2005-08-24 00:00:33,743 DEBUG
[DOCPRIV2:confluence.importexport.impl.XMLDatabinder] Writing
property: type
03 2005-08-24 00:00:33,743 DEBUG
[DOCPRIV2:confluence.importexport.impl.XMLDatabinder] Writing
property: group
04 2005-08-24 00:00:33,743 DEBUG
[DOCPRIV2:confluence.importexport.impl.XMLDatabinder] Writing
property: expiry
05 2005-08-24 00:00:33,743 DEBUG
[DOCPRIV2:confluence.importexport.impl.XMLDatabinder] Writing
property: content
06 [DOCPRIV2:ERROR] LazyInitializer - Exception initializing
proxy <net.sf.hibernate.ObjectNotFoundException: No row with the
given identifier exists: 2535,
07 of class:
com.atlassian.confluence.core.ContentEntityObject>net.sf.hiberna
te.ObjectNotFoundException:
08 No row with the given identifier exists: 2535, of class:
com.atlassian.confluence.core.ContentEntityObject
09 at
net.sf.hibernate.ObjectNotFoundException.throwIfNull(ObjectNotFo
undException.java:24)
10 at
net.sf.hibernate.impl.SessionImpl.immediateLoad(SessionImpl.java
:1946)
11 at
net.sf.hibernate.proxy.LazyInitializer.initialize(LazyInitializ
er.java:53)
12 at
net.sf.hibernate.proxy.LazyInitializer.initializeWrapExceptions(
LazyInitializer.java:60)
13 at
net.sf.hibernate.proxy.LazyInitializer.getImplementation(LazyIni
tializer.java:164)
14 at
net.sf.hibernate.proxy.CGLIBLazyInitializer.intercept(CGLIBLazyI
nitializer.java:108)
15 at
com.atlassian.confluence.core.ContentEntityObject$$EnhancerByCGL
IB$$cc2f5557.hashCode(<generated>)
16 at java.util.HashMap.hash(HashMap.java:261)
17 at java.util.HashMap.containsKey(HashMap.java:339)
18 at
com.atlassian.confluence.importexport.impl.XMLDatabinder.toGener
icXML(XMLDatabinder.java:155)

```

10. Open a DBA tool such as DbVisualizer and connect to your database instance. Scan the table names in the schema. You will have to modify a row in one of these tables.
11. To work out which table, open `catalina.out`, check the first line of the exception. This says there

was an error writing the `ContentPermission` object with id 5 into XML. This translates as *the row with primary key 5 in the CONTENTLOCK table* needs fixing. To work out what table an object maps to in the database, here's a rough guide:

- Pages, blogposts, comments --> CONTENT table
  - attachments --> ATTACHMENTS table
  - More information can be found in the [schema documentation](#)
12. Now you must find the primary key of the incorrect row in this table. In this case, you can check the first line and see that the row has a primary key of 5.
  13. Each property is written to a column, so the last property that was being written has the incorrect value. The row being written to when the exception was thrown was `CONTENT` (line 5) with a value of 2535 (line 6). Now you know the column and value. This value 2535 is the id of an entry that no longer exists.
  14. Using a database administrative tool, login to the Confluence database. Locate the row in the relevant table and correct the entry. Check other rows in the table for the default column value, which may be null, 0 or blank. Overwrite the invalid row value with the default.
  15. Restart Confluence.
  16. Attempt the backup again. If the backup fails and you are stuck, please [lodge a support request](#) with your latest logs.

### Troubleshooting "Duplicate Key" related problems

If you are encountering an error message such as:

```
could not insert:
[bucket.user.propertyset.BucketPropertysetItem#bucket.user.propertyse
t.BucketPropertysetItem@a70067d3]; SQL []; Violation of PRIMARY KEY
constraint 'PK_OS_PROPERTYENTRY314D4EA8'. Cannot insert duplicate key
in object 'OS_PROPERTYENTRY'.; nested exception is
java.sql.SQLException: Violation of PRIMARY KEY constraint
'PKOS_PROPERTYENTRY_314D4EA8'. Cannot insert duplicate key in object
'OS_PROPERTYENTRY'.
```

this indicates that the Primary Key constraint 'PK\_OS\_PROPERTYENTRY\_314D4EA8' has duplicate entries in table 'OS\_PROPERTYENTRY'.

You can locate the constraint key referring to 'PK\_OS\_PROPERTYENTRY\_314D4EA8' in your table 'OS\_PROPERTYENTRY' and locate any duplicate values in it and remove them, to ensure the "PRIMARY KEY" remains unique. An example query to list duplicate entries in the 'OS\_PROPERTYENTRY' table is:

```
SELECT ENTITY_NAME, ENTITY_ID, ENTITY_KEY, COUNT(*) FROM
OS_PROPERTYENTRY GROUP BY ENTITY_NAME, ENTITY_ID, ENTITY_KEY HAVING
COUNT(*) > 1
```

### To Help Prevent This Issue From Reoccurring

1. If you are using the embedded database, be aware that it is bundled for evaluation purposes and does not offer full transactional integrity in the event of sudden power loss, which is why an external database is recommended for production use. You should [migrate to an external database](#).
2. If you are using an older version of Confluence than [the latest](#), you should consider [upgrading](#) at this point.

### Troubleshooting XML backups that fail on restore

XML site backups are only necessary for migrating to a new database. [Upgrading Confluence](#), [Setting up a test server](#) or [Production Backup Strategy](#) is better done with an SQL dump.

Seeing an error when creating or importing a site or space backup?

Problem	Solution
Exception while creating backup	See <a href="#">Troubleshooting failed XML site backups</a>
Exception while importing backup	See instructions below

#### On this page:


- [Common problems](#)
- [Resolve Errors When Attempting To Restore An XML Backup](#)
  - [Troubleshooting "Duplicate Entry" for key "cp\\_" or "cps\\_"](#)
  - [Troubleshooting "Duplicate Key" related problems](#)
  - [Troubleshooting "net.sf.hibernate.PropertyValueException: not-null" related problems](#)
  - [To Help Prevent this Issue from Recurring](#)

#### Related Topics:


- [Troubleshooting failed XML site backups](#)

### Common problems

#### To upload and import a small site:

1. Go to  > **General Configuration** > **Backup and Restore**.
2. Choose **Choose File** and browse for the site export file.
3. Uncheck **Build Index** if you want to create the index at a later stage.
4. Choose **Upload and Restore**.

#### To import a site from the restore directory:

1. Copy your export file to `<confluence-home>/restore`.  
(If you're not sure where this directory is located, the path is listed in the **Backup and Restore** screen)
2. Go to  > **General Configuration** > **Backup and Restore**.
3. Select your site export file under **Restore a backup from the Confluence Home Directory**.
4. Uncheck **Build Index** if you want to create the index at a later stage.
5. Choose **Restore**.

### Resolve Errors When Attempting To Restore An XML Backup

The errors may be caused by a slightly corrupt database. You will need to find the XML backup file entry that is violating the DB rules, modify the entry and recreate the XML backup:

1. On the instance being restored, follow the instructions to disable batched updates (for simpler debugging), log SQL queries and log SQL queries **with parameters** at [Enabling Detailed SQL Logging](#).
2. Once all three changes have been made, restart Confluence.
3. Attempt another restore.
4. Once the restore fails, check your log files to find out what object could not be converted into XML format. For Confluence distribution users, check your Confluence install directory under the `/logs/` and check both `atlassian-confluence.log` and `catalina.out` file. The correct file will contain SQL debug output.
5. Scroll to the bottom of the file and identify the last error relating to a violation of the database constraint. For example:



```

2006-07-13 09:32:33,372 ERROR
[confluence.importexport.impl.ReverseDatabinder] endElement
net.sf.hibernate.exception.ConstraintViolationException:
    could not insert:
[com.atlassian.confluence.pages.Attachment#38]
net.sf.hibernate.exception.ConstraintViolationException: could
not insert: [com.atlassian.confluence.pages.Attachment#38]
...
Caused by: java.sql.SQLException: ORA-01400: cannot insert NULL
into ("CONFUSER"."ATTACHMENTS"."TITLE")
at
oracle.jdbc.driver.DatabaseError.throwSQLException(DatabaseError
.java:112)
at oracle.jdbc.driver.T4CTTIoer.processError(T4CTTIoer.java:331)
at oracle.jdbc.driver.T4CTTIoer.processError(T4CTTIoer.java:288)

```

This example indicates a row in your attachment table with ID = 38 that has a null title.

6. Go to the server that the backup was created on. You must have a copy of the database from which the backup was created. If you do not have this, use a DBA tool to restore a manual backup of the database.
7. Open a DBA tool and connect to the original database instance and scan the table names in the schema. You will have to modify a row in one of these tables.
8. To work out which table, open `catalina.out`, check the first line of the exception. To work out what table an object maps to in the database, here's a rough guide:
  - Pages, blogposts, comments --> CONTENT table.
  - attachments --> ATTACHMENTS table.
9. To correct the example error, go to the attachment table and find that attachment object with id 38. This will have a null title. Give a title using the other attachments titles as a guide. You may have a different error and should modify the database accordingly.
10. Once the entry has been corrected, create the XML backup again.
11. Import the backup into the new version.
12. If the import succeeds, revert the changes made in your [SQL logging](#) to re-enable disable batched updates and turn off log SQL queries and log SQL queries with parameters.
13. Restart Confluence.

Troubleshooting "Duplicate Entry" for key "cp\_" or "cps\_"

If you are encountering an error message such as:

```

com.atlassian.confluence.importexport.ImportExportException: Unable
to complete import because the data does not match the constraints in
the Confluence schema. Cause:
MySQLIntegrityConstraintViolationException: Duplicate entry
'1475804-Edit' for key 'cps_unique_type'

```

This indicates that the XML export came from a version of Confluence with a corrupt permissions database, caused by some 3rd party plugin. This is an issue that was fixed when [CONF-22123](#) was implemented in Confluence 3.5.2. The simplest workaround is to export the space again after upgrading the instance to 3.5.2 or above. If that is not an option, then either the export will need to be edited manually to remove the duplicate permission entries or the source instance will need to have the offending entries removed. The following SQL queries can be used to look for such entries:



```
SELECT * FROM CONTENT_PERM WHERE USERNAME IS NULL AND GROUPNAME IS
NULL;

SELECT cp.ID, cp.CP_TYPE, cp.USERNAME, cp.GROUPNAME, cp.CPS_ID,
cp.CREATOR,
cp.CREATIONDATE, cp.LASTMODIFIER, cp.LASTMODDATE
FROM CONTENT_PERM cp
WHERE cp.USERNAME IS NOT NULL AND cp.GROUPNAME IS NOT NULL;

SELECT cps1.ID, cps1.CONTENT_ID, cps1.CONT_PERM_TYPE FROM
CONTENT_PERM_SET cps1, CONTENT_PERM_SET cps2
WHERE cps1.ID <> cps2.ID AND
cps1.CONTENT_ID = cps2.CONTENT_ID AND
cps1.CONT_PERM_TYPE = cps2.CONT_PERM_TYPE
ORDER BY cps1.CONTENT_ID, cps1.CONT_PERM_TYPE, cps1.CREATIONDATE ASC;

SELECT cp.ID, cp.CP_TYPE, cps.CONTENT_ID,
(SELECT scps.ID FROM CONTENT_PERM_SET scps WHERE scps.CONTENT_ID =
cps.CONTENT_ID AND scps.CONT_PERM_TYPE = cp.CP_TYPE) AS
suggested_cps_id
FROM CONTENT_PERM cp, CONTENT_PERM_SET cps
WHERE cp.CPS_ID = cps.ID AND
cp.CP_TYPE <> cps.CONT_PERM_TYPE;

SELECT DISTINCT cp1.ID, cp1.CP_TYPE, cp1.USERNAME, cp1.GROUPNAME,
cp1.CPS_ID,
cp1.CREATOR, cp1.CREATIONDATE, cp1.LASTMODIFIER, cp1.LASTMODDATE
FROM CONTENT_PERM cp1, CONTENT_PERM_SET cps1, CONTENT_PERM cp2,
CONTENT_PERM_SET cps2
WHERE
cp1.CPS_ID = cps1.ID AND
cp2.CPS_ID = cps2.ID AND
cp1.ID <> cp2.ID AND
cps1.CONTENT_ID = cps2.CONTENT_ID AND
cp1.CP_TYPE = cp2.CP_TYPE AND
cp1.USERNAME = cp2.USERNAME
ORDER BY cp1.CPS_ID, cp1.CP_TYPE, cp1.USERNAME, cp1.CREATIONDATE;

SELECT DISTINCT cp1.ID, cp1.CP_TYPE, cp1.USERNAME, cp1.GROUPNAME,
cp1.CPS_ID,
cp1.CREATOR, cp1.CREATIONDATE, cp1.LASTMODIFIER, cp1.LASTMODDATE
FROM CONTENT_PERM cp1, CONTENT_PERM_SET cps1, CONTENT_PERM cp2,
CONTENT_PERM_SET cps2
WHERE
cp1.CPS_ID = cps1.ID AND
cp2.CPS_ID = cps2.ID AND
cp1.ID <> cp2.ID AND
cps1.CONTENT_ID = cps2.CONTENT_ID AND
cp1.CP_TYPE = cp2.CP_TYPE AND
cp1.GROUPNAME = cp2.GROUPNAME
ORDER BY cp1.CPS_ID, cp1.CP_TYPE, cp1.GROUPNAME, cp1.CREATIONDATE;

SELECT * FROM CONTENT_PERM_SET
WHERE ID NOT IN (SELECT DISTINCT CPS_ID FROM CONTENT_PERM);
```

Remove all matching entries and perform the export again.

#### Troubleshooting "Duplicate Key" related problems

If you are encountering an error message such as:

```
could not insert:
[bucket.user.propertyset.BucketPropertysetItem#bucket.user.propertyse
t.BucketPropertysetItem@a70067d3]; SQL []; Violation of PRIMARY KEY
constraint 'PK_OS_PROPERTYENTRY314D4EA8'. Cannot insert duplicate key
in object 'OS_PROPERTYENTRY'.; nested exception is
java.sql.SQLException: Violation of PRIMARY KEY constraint
'PKOS_PROPERTYENTRY_314D4EA8'. Cannot insert duplicate key in object
'OS_PROPERTYENTRY'.
```

This indicates that the Primary Key constraint 'PK\_OS\_PROPERTYENTRY\_314D4EA8' has duplicate entries in table 'OS\_PROPERTYENTRY'.

You can locate the constraint key referring to 'PK\_OS\_PROPERTYENTRY\_314D4EA8' in your table 'OS\_PROPERTYENTRY' and locate any duplicate values in it and remove them, to ensure the "PRIMARY KEY" remains unique. An example query to list duplicate entries in the 'OS\_PROPERTYENTRY' table is:

```
SELECT ENTITY_NAME, ENTITY_ID, ENTITY_KEY, COUNT(*) FROM
OS_PROPERTYENTRY GROUP BY ENTITY_NAME, ENTITY_ID, ENTITY_KEY HAVING
COUNT(*) > 1
```

#### Troubleshooting "net.sf.hibernate.PropertyValueException: not-null" related problems

If you're receiving a message like:

```
ERROR [Importing data task]
[confluence.importexport.impl.ReverseDatabinder] endElement
net.sf.hibernate.PropertyValueException: not-null property references
a null or transient value:
com.atlassian.user.impl.hibernate.DefaultHibernateUser.name
```

This means there's an unexpected null value in a table. In the above example, the error is in the name column in the USERS table. We've also seen them in the ATTACHMENTS table.

Remove the row with the null value, redo the xml export, and reimport.

#### To Help Prevent this Issue from Recurring


1. If you are using the embedded database, be aware that it is bundled for evaluation purposes and does not offer full transactional integrity in the event of sudden power loss, which is why an external database is recommended for production use. You should [migrate to an external database](#).
2. If you are using an older version of Confluence than [the latest](#), you should consider [upgrading](#) at this point.

The problem with different settings for case sensitivity varies between databases. The case sensitivity of the database is usually set through the collation that it uses. Please vote on the existing [issue](#)

## Attachment Storage Configuration

By default Confluence stores attachments in the home directory (e.g. in a file system).

To configure Confluence attachment storage:

- Choose the **cog icon**  , then choose **General Configuration** under Confluence Administration
- Choose **Attachment Storage**.

#### On this page:

- [Attachment Storage Options](#)
  - [Local File System](#)
  - [Database \(deprecated\)](#)
  - [WebDav \(deprecated\)](#)
- [Migrating to a supported attachment storage option](#)

#### Related pages:

- [Working with Confluence Logs](#)

## Attachment Storage Options

Earlier Confluence versions allowed attachments to be stored in WebDav or the Confluence database. This is not an option for new installations.

### Local File System

By default, Confluence stores attachments in the `attachments` directory within the configured Confluence home folder.

### Database (deprecated)

Confluence 5.4 and earlier gives administrators the option to store attachments in the database that Confluence is configured to use.

While storing attachments in the database can offer some advantages (such as ease of backup, and avoiding issues with some characters in attachment filenames), please be aware that the amount of space used by the database will increase because of greater storage requirements.

### WebDav (deprecated)

WebDav is no longer available as an attachment storage option.

This has no impact on your ability to [configuring a WebDAV client](#) to access spaces, pages or attachments in your Confluence site.


## Migrating to a supported attachment storage option

If you are storing attachments in WebDav or your database, you can migrate to storing attachments in the file system. When migrating attachments from your database to a filesystem, the attachments are removed from the database after migration.

When the migration occurs, all other users will be locked out of the Confluence instance. This is to prevent modification of attachments while the migration occurs. Access will be restored as soon as the migration is complete.

To improve logging during the migration, add the package `com.atlassian.confluence.pages.persistence.dao` with level `DEBUG`. See [Configuring Logging](#) for more information.

To migrate, follow the steps below:

1. Go to  > **General Configuration** > **Attachment storage**.
2. Click **Edit** to modify the configuration.
3. Select **Locally in Confluence home directory**.

4. Click **Save** to save the changes.
5. A screen will appear, asking you to confirm your changes. Clicking 'Migrate' will take you to a screen that displays the progress of the migration.

*Screenshot: migration warning*

## Attachment Migration

**WARNING:**

Changing your attachment storage location from the current setting will result in a migration occurring. This may take time (depending on the amount of attachments).

During the migration process, users will not be able to access the system.

**Migration Notes:**


Prior to migration, all records in the Attachment data database table will be removed.  
Are you sure you want to perform this migration?

The following external website provides further information on migrating attachments from database to file system storage that you might find helpful - <https://www.scandio.de/blog/de/2013/05/confluence-attachment-migration-the-safe-way-2>.

## Configuring Attachment Size

You can limit the size of files that can be uploaded and attached in Confluence.

**To configure the maximum file size that can be uploaded:**

1. Go to  **> General Configuration.**
2. Choose **Edit**.
3. Enter the maximum size next to **Attachment Maximum Size**.  
The default is 100 MB.
4. Choose **Save**.

### Related pages:

- [Recognized System Properties](#)
- [Files](#)

### *How attachments are indexed*

When a file is uploaded, Confluence will attempt to extract and index its text. This allows people to search for the content of a file, not just the filename. This process is quite memory intensive and can cause out of memory errors when very large files are uploaded. Confluence has a number of safeguards to prevent this happening:

- If the uploaded file is larger than 100 MB, Confluence will not attempt to extract text or index the file contents. Only the filename will be searchable.
- If the uploaded file is one of the following types, Confluence will only extract up to:
  - 1 MB of text from Excel (.xlsx)
  - 8 MB of text from PDF (.pdf)
  - 10 MB of text from other text files (including .txt, .xml, .html, .rtf etc)
  - 16 MB of text from Word (.docx)
- If the text extracted from the file was greater than 1 MB, it will be searchable, but Confluence will not show this text as an excerpt with the search result.

If Confluence stops extracting text, only a portion of the file's content will be searchable.

Confluence will only attempt to extract and index the file once. If it fails, it will not try again.

Some of the values above are configurable via [system properties](#). If you experience out of memory errors when people upload large files, you may want to reduce these limits further, using the following properties:

- `atlassian.indexing.attachment.maxsize`
- `officeconnector.excel.extractor.maxlength`
- `officeconnector.textextract.word.docxmaxsize`
- `atlassian.indexing.contentbody.maxsize`

## Hierarchical File System Attachment Storage

The way attachments are stored changed significantly in Confluence 3.0. If you are upgrading from Confluence 2.10 or earlier see [Upgrading Confluence](#) for recommended upgrade paths, and read the version of the [Hierarchical File System Attachment Storage](#) page in our Confluence 3.0 documentation which provides more detail about migrating to the new file system structure.

Confluence stores attachments, such as files and images, in a file system. Confluence's attachment storage layout is designed to:

1. Limit the number of entries at any single level in a directory structure (as some file systems have a limit on the number of files that can be stored in a directory).
2. Partition attachments per space making it possible for a system admin to selectively back up attachments from particular spaces.

Attachments in Confluence have a number of identifying attributes: *content id of the file itself*, the *space id* and *content id of the page the file is attached to*. This means the file logically belongs to a piece of content which logically belongs in a space (not all content belongs to a space). For files within a space in Confluence, the directory structure is typically 8 levels, with the name of each directory level based on the following algorithm:

level	Derived From
1 (top)	Always 'ver003' indicating the Confluence version 3 storage format
2	The least significant 3 digits of the <i>space id</i> , modulo 250
3	The next 3 least significant digits of the <i>space id</i> , modulo 250
4	The full <i>space id</i>
5	The least significant 3 digits of the <i>content id</i> of the page the file is attached to, modulo 250
6	The next 3 least significant digits of the <i>content id</i> of the page the file is attached to, modulo 250
7	The full <i>content id</i> of the page the file is attached to
8	The full <i>content id</i> of the attached file
9	These are the files, named with the version number of the file, e.g. 1, 2, 6.

The [modulo](#) calculation is used to find the remainder after division, for example  $800 \text{ modulo } 250 = 50$ .

An example:

**Attached files**

<b>A</b> file content id: 74544 space id: 800432 page content id: 632780	<b>B</b> file content id: 782234 space id: 800432 page content id: 620002	<b>C</b> file content id: 771250 space id: 810032 page content id: 603101	<b>D</b> file content id: 701002 space id: global logo page content id: 511242
---	--	--	---

**Directory structure**

To find the directory where attachments for a particular space are stored, go to `<confluence url>/admin/findspaceattachments.jsp` and enter a space key. It will return the directory on the file system where attachments for that space are stored.

File D in the above diagram is stored in a slightly different structure. Files that are not conceptually within a space replace the level 2 - 4 directories with a single directory called 'nonspaced'. Examples of such files are the global site logo and attachments on unsaved content.

**Extracted text files**

When a text based file is uploaded in Confluence (for example Word, PowerPoint, etc), its text is extracted and indexed so that people can search for the content of a file, not just the filename. We store the extracted text so that when that file needs to be reindexed, we don't need to re-extract the content of the file.

The extracted text file will be named with the version number, for example `2.extracted_text`, and stored alongside the file versions themselves (within level 8 in the explanation above). We only keep the extracted text

for the latest version, not earlier versions of a file.

## Confluence Data Model

This document provides a diagram of the Confluence schema and a conceptual overview of the data model.

### Notes:

- The Hibernate mapping files are the authoritative reference for the Confluence data model. These are the \*.hbm.xml files which you will find in the main Confluence JAR file (<CONFLUENCE-INSTALLATION>\confluence\WEB-INF\lib\confluence-5.1.1.jar).
- The tables, columns and other attributes are likely to change with each major release of Confluence. To find the exact DDL of your Confluence site, please run a query after installation.

### On this page:

- [Database diagrams](#)
- [Database tables and references](#)
- [Authentication](#)
- [Content](#)
- [Clustering](#)
- [System information](#)
- [Spaces](#)
- [Appearance](#)
- [Miscellaneous](#)

## Database diagrams

### Detailed diagrams

The following SVG images (Scalable Vector Graphics) include all the tables in the Confluence database. Click the links below to open the images in your browser, or download the SVG files for later use. You can use the browser's zoom (Ctrl++ or Cmd++) to see more detail in the diagrams:

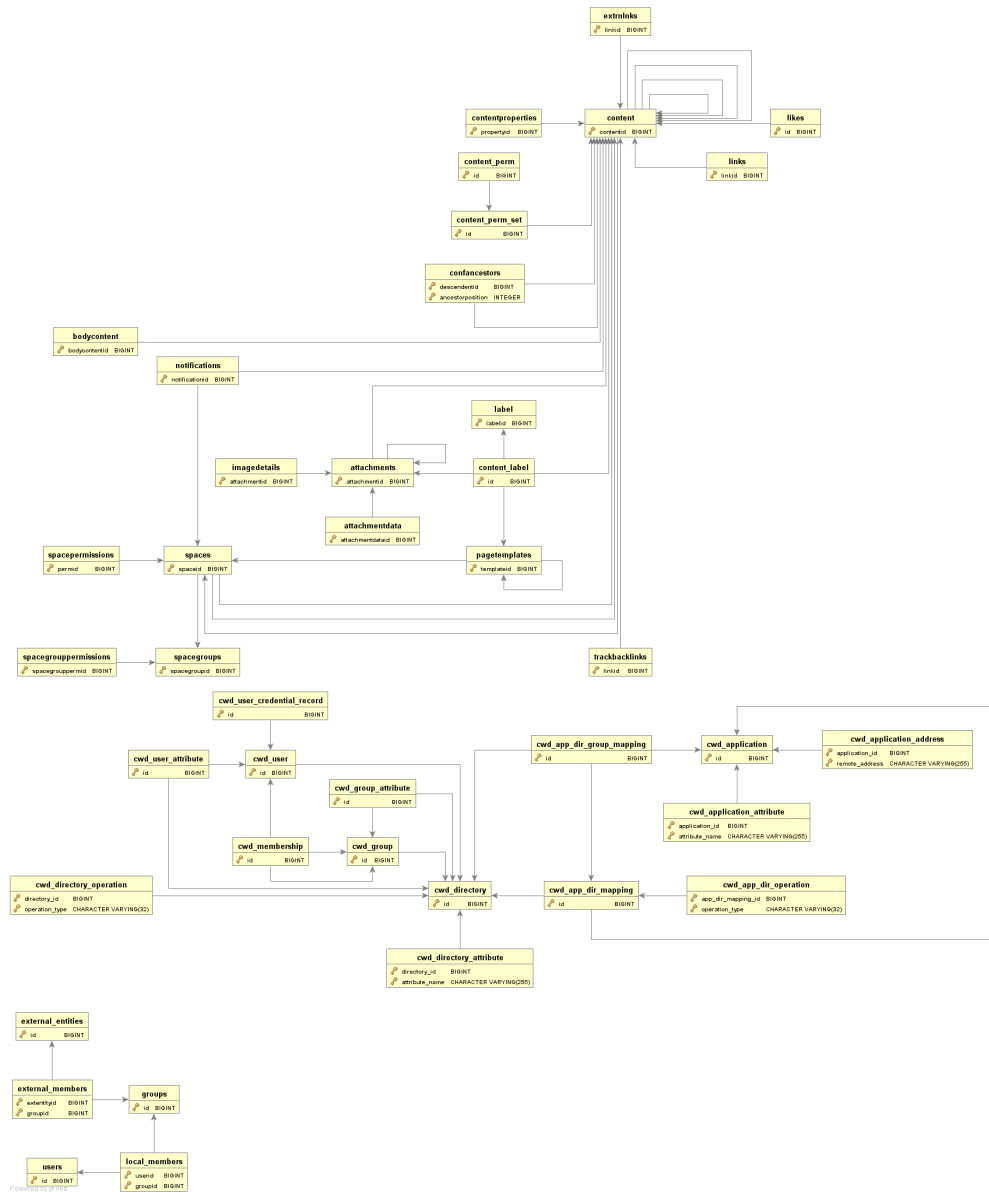
- [ConfluenceTables-KeysOnly.svg](#) – Shows all tables, with primary keys only for each table.
- [ConfluenceTables-AllColumns.svg](#) – Shows all tables, and all columns for each table.

### Overview diagram

This image shows the core tables. Note that the image is very large. You may need to download it (right-click on the image) and view it in an image viewer. Alternatively, use the SVG images linked in the previous section.

▼ [Click here to show/hide the image...](#)





## Database tables and references

Expand the link below to see a table of the primary and foreign keys for each table.

▼ [Click here to show/hide the table...](#)

Primary key table name	Primary key column name	Foreign key table name	Foreign key column name	Foreign
AO_9412A1_AOUSER	ID	AO_9412A1_USER_APP_LINK	USER_ID	fk_ao_94
attachments	attachmentid	attachmenttdata	attachmentid	fk9dc3e3
attachments	attachmentid	attachments	prevver	fk54475f
attachments	attachmentid	content_label	attachmentid	fkf0e743
attachments	attachmentid	imagedetails	attachmentid	fka7680d
content	contentid	attachments	pageid	fk54475f
content	contentid	bodycontent	contentid	fka898da
content	contentid	confancestors	ancestorid	fk9494e2

content	contentid	confancestors	descendentid	fk9494e2
content	contentid	content	prevver	fk6382c0
content	contentid	content	parentid	fk6382c0
content	contentid	content	parentcommentid	fk6382c0
content	contentid	content	pageid	fk6382c0
content	contentid	content_label	contentid	fkf0e743
content	contentid	content_perm_set	content_id	fkbf45a7
content	contentid	contentproperties	contentid	fk984c5e
content	contentid	extrnlInks	contentid	fk97c10f
content	contentid	likes	contentid	fk4514b5
content	contentid	links	contentid	fk451575
content	contentid	notifications	pageid	fk594acc
content	contentid	spaces	homepage	fk922824
content	contentid	spaces	spacedescid	fk922824
content	contentid	trackbacklinks	contentid	fkf6977a
content_perm_set	id	content_perm	cps_id	fkbd74b3
cwd_app_dir_mapping	id	cwd_app_dir_group_mapping	app_dir_mapping_id	fk_app_c
cwd_app_dir_mapping	id	cwd_app_dir_operation	app_dir_mapping_id	fk_app_c
cwd_application	id	cwd_app_dir_group_mapping	application_id	fk_app_c
cwd_application	id	cwd_app_dir_mapping	application_id	fk52050e
cwd_application	id	cwd_application_address	application_id	fk_applic
cwd_application	id	cwd_application_attribute	application_id	fk_applic
cwd_directory	id	cwd_app_dir_group_mapping	directory_id	fk_app_c
cwd_directory	id	cwd_app_dir_mapping	directory_id	fk_app_c
cwd_directory	id	cwd_directory_attribute	directory_id	fk_direct
cwd_directory	id	cwd_directory_operation	directory_id	fk_direct
cwd_directory	id	cwd_group	directory_id	fk_direct
cwd_directory	id	cwd_group_attribute	directory_id	fk_group
cwd_directory	id	cwd_user	directory_id	fk_user_
cwd_directory	id	cwd_user_attribute	directory_id	fk_user_
cwd_group	id	cwd_group_attribute	group_id	fk_group
cwd_group	id	cwd_membership	parent_id	fk_paren
cwd_group	id	cwd_membership	child_group_id	fk_child_
cwd_user	id	cwd_membership	child_user_id	fk_child_

cwd_user	id	cwd_user_attribute	user_id	fk_user_
cwd_user	id	cwd_user_credential_record	user_id	fk76f874
external_entities	id	external_members	extentityid	fk d8c8d8
groups	id	external_members	groupid	fk d8c8d8
groups	id	local_members	groupid	fk6b8fb4
keystore	keyid	trustedapp	public_key_id	fkddb119
label	labelid	content_label	labelid	fkf0e743
os_group	id	os_user_group	group_id	fk932472
os_user	id	os_user_group	user_id	fk932472
pagetemplates	templateid	content_label	pagetemplateid	fkf0e743
pagetemplates	templateid	pagetemplates	prevver	fkbc7ce9
spacegroups	spacegroupid	spacegrouppermissions	spacegroupid	fk487d9f
spacegroups	spacegroupid	spaces	spacegroupid	fk922824
spaces	spaceid	content	spaceid	fk6382cc
spaces	spaceid	notifications	spaceid	fk594acc
spaces	spaceid	pagetemplates	spaceid	fkbc7ce9
spaces	spaceid	spacepermissions	spaceid	fk d33f23
trustedapp	trustedappid	trustedapprestriction	trustedappid	fke8496t
users	id	local_members	userid	fk6b8fb4

The following sections describe the principal tables involved in each logical area of Confluence – authentication, content, system information, and so on.

## Authentication

This section describes the tables involved in user authentication, which is implemented via the Atlassian Crowd framework embedded in Confluence.

Table	Description
cwd_user	Information for each user in Confluence.
cwd_group	The groups to which users can belong.
cwd_membership	Mapping the membership of users to groups.
cwd_directory	The user directories in your Confluence site. Examples of directories are the Confluence internal directory, or an LDAP directory.
cwd_application	The applications (Jira, Confluence, and so on) defined in the authentication framework.

## Content

This section describes the tables involved in storing content. Content is the information that Confluence users are storing and sharing.

Table	Description
attachmentdata	The binary data for attached files. This table is only used when Confluence is configured to store attachments in the database. Otherwise, attachments are stored in the local file system.
attachments	Metadata for the files attached to Confluence pages.
bodycontent	The content of Confluence pages. No version information or other metadata is stored here. That is all in the <code>content</code> table.
content	A persistence table for the <code>ContentEntityObject</code> class of objects. The subclass is indicated by the <code>contenttype</code> column.
content_label	Arbitrary text labels for content.
label	The other half of the <code>content_label</code> system.
content_perm	Content-level permissions objects.
content_perm_set	A one-to-many mapping for content items and their permissions, with added metadata.
pagetemplates	The back end of the templates feature.
likes	The pages and other content liked by a particular user.
follow_connections	A mapping of users who are following other users.

## Clustering

The following table contains information about clustered Confluence sites.

Table	Description
clustersafety	Normally, this table only contains one row. The value of the <code>safetynumber</code> is what Confluence uses to find out whether another Confluence site is sharing its database without being part of the cluster.

## System information

These tables store data related to the status and configuration of the Confluence site.

Table	Description
confversion	Used by the upgrade system to determine what to expect from the database, so as to negotiate upgrades.
plugindata	A record of the plugins that have been installed, and when. data is a blob of the actual plugin JAR file. This is principally cluster-related.

## Spaces

This table is related to the management of spaces.

Table	Description
spaces	Information about the spaces themselves: key, human-friendly name and numeric ID.

## Appearance

The following table contains information about the look and feel of your Confluence site.

Table	Description
decorator	The custom display templates used to customize Velocity layouts.

## Miscellaneous

This section includes other tables worth commenting on.

Table	Description
os_propertyentry	Arbitrary association of entities and properties.
bandana	A catch-all persistence layer. This table contains things like user settings and space- and global-level configuration data, and is used as storage by plugins such as the Dynamic Task List plugin. Essentially, for storing arbitrary data that doesn't fit anywhere else.
extrnlinks	Referral links.
hibernate_unique_key	Used by the high/low ID generator – the subsystem which generates our primary keys.  If you interfere with this table, you may not be able to create objects in Confluence.
indexqueueentries	Manages full-content indexing across the system. The table generally contains the last 12 hours (approximately) of updates, to allow re-syncing of cluster nodes after restarts.
keystore	Used by the trusted apps framework to store the server's private key, and other servers' public keys.
links	Tracks links within the server (that is, across and within spaces).
notifications	Stores page- and space-level watches.
trackbacklinks	Trackback links.
confancestors	Used to speed up permissions checks, by allowing quick lookup of all a page's ancestors.

## Finding Unused Spaces

Sometimes, you want to know what is *not* being used. It's great to know what's getting most attention, but what about stagnant pages, or even entire spaces that are no longer active?

While [viewing space activity](#) can provide hints, it doesn't always provide enough detail. It is possible to find out this information directly from the database.

The following query identifies the last date on which content was modified in each space within a single Confluence instance:

```
SELECT spaces.spacename, MAX(content.lastmoddate)
FROM content, spaces
WHERE content.spaceid = spaces.spaceid
GROUP BY spaces.spacename;
```

It returns a list of space names, and the last date and time at which any content was added or changed.

Alternatively, this query identifies spaces where the content hasn't changed since a specified date:

```
SELECT spaces.spacename
FROM content, spaces
WHERE content.spaceid = spaces.spaceid
GROUP BY spaces.spacename
HAVING MAX(content.lastmoddate) < '2006-10-10';
```

The result is a simple list of space names.

## Data Import and Export

Confluence administrators and users can import data into Confluence from a number of sources. The permissions required differ, depending on the scope of the import. See [Import Content Into Confluence](#).

You can also export Confluence content to various formats. See [Export Content to Word, PDF, HTML and XML](#).

### Related pages:

- [Managing Confluence Data](#)
- [Confluence Administrator's Guide](#)

## Import a Text File

Confluence allows you to import text files from a directory on the Confluence server, and convert them into Confluence pages. Each file is imported as a separate Confluence page with the same name as the file.

- The text file may contain plain text, HTML or Confluence storage format
- You need to be part of the `confluence-administrators` group or a System Administrator to import text files
- You can import pages from disk into site spaces, but not into personal spaces  
Please see [Spaces](#) for information about differences between site spaces and personal spaces.

### Related pages:

- [Import Content Into Confluence](#)
- [Site Backup and Restore](#)

To make sure Confluence maintains the formatting of the text document, add `<pre>` to the beginning and `</pre>` to the end. This will let Confluence know that it should treat the text as pre-formatted.

If you're working in a Unix-like environment, you can add the opening and closing tags to all files in a particular directory by following these steps:

1. Go to the directory containing the files
2. Run the following command in the terminal:

```
for i in $(ls); do echo "<pre>" >> m$i; cat $i >> m$i; echo
"</pre>" >> m$i; mv m$i $i; done
```

**To import text files:**

1. Go to the space and choose **Space tools > Content Tools** from the bottom of the sidebar
2. Choose **Import**.
3. Type the directory path into the **Import directory** box.
4. Select **Trim file extensions** to remove file extensions from the page titles when converting the files to Confluence pages  
The Confluence pages will take their titles from the files' names (including their extensions). To avoid having page titles with a suffix like '.txt' check this box.
5. Select **Overwrite existing pages** if you want to replace existing Confluence pages with the same title with the one you're importing.
6. Choose **Import**.

Screenshot: Importing text files

You can use this action to import text files from a directory on the Confluence server.

These text files become pages in Confluence, with the following features:

- The page title is taken from the filename
- The content is the entire page body

Import directory

Trim file extensions ☐

Overwrite existing pages ☐

## Audit log

The audit log allows administrators to look back at changes that have been made in your site. This is useful when you need to troubleshoot a problem or if you need to keep a record of important events, such as changes to global permissions. You'll need Confluence Administrator permissions to view the audit log.

To view the audit log



> **General Configuration > Audit log.**

You can then filter the log by keyword and time to narrow down the results. Here's how it looks.

1

Filter by keyword

Filter by Time: All

Export Settings

2

Prev 1 2 3 Next

Time	User	Event type	Change	Item affected	Actions
13 May, 2016 15:41:17	Administrator	Global Administration	Global settings changed		Show more
13 May, 2016 15:41:17	Administrator	Global Administration	Color scheme modified		Show more
13 May, 2016 15:41:17	Administrator	Global Administration	Site logo changed		Show more
13 May, 2016 15:39:16	Ewan User	Users and groups	User added to group	Group: developers	Show more
13 May, 2016 15:38:59	Ewan User	Users and groups	Group created	Group: developers	Show more
13 May, 2016 15:38:59	Ewan User	Users and groups	Group created	Group: developers	Show more
13 May, 2016 15:38:13	Administrator	Spaces	Space created	Space: Audit log space	Show more

3

1. **Filter it:** dig into the log by keyword or by time.



2. **More control:** export the whole log or change how long to keep events
3. **Get detailed:** see the details of each change.

The audit log records information about the following events. This is not an exhaustive list, but gives you an idea of what to expect in the log.

### Spaces

- Create and delete a space.
- Edit space details, theme, color scheme or stylesheet.
- Change space permission, including changing anonymous access.
- Export and import a space.
- Empty trash.

### Users, groups and permissions

- Add, delete, deactivate or reactivate a user.
- Edit user details.
- Change group membership.
- Add or delete a group.
- Modify permissions for a user or group.
- Change global anonymous access.

### Global administration

- Modify global settings such as base URL, mail server, license, user directory, application links and more.
- Modify global look and feel such as color scheme theme, site logo, favicon, custom HTML and more.
- Install, uninstall, enable or disable add-ons or add-on modules.

The audit log **doesn't** record information directly relating to pages such as page edits (you can see these in the page history) location, or changes to page restrictions.

By default, events are removed from the log after 3 years. You can choose how long to keep events in the log settings (up to 10 years).

You can also export the log to CSV format if you'd like to explore it in more detail, or if you need to maintain a longer term record.

## Configuring a Confluence Environment

This section describes the external setup of your Confluence installation. It includes information on configuring the web server, application server, directories and files – everything to do with the environment that Confluence runs in. For guidelines on modifying settings inside the application, see [Configuring Confluence](#) instead.

Confluence is a J2EE web application. On the client side, users access Confluence primarily via a web browser.

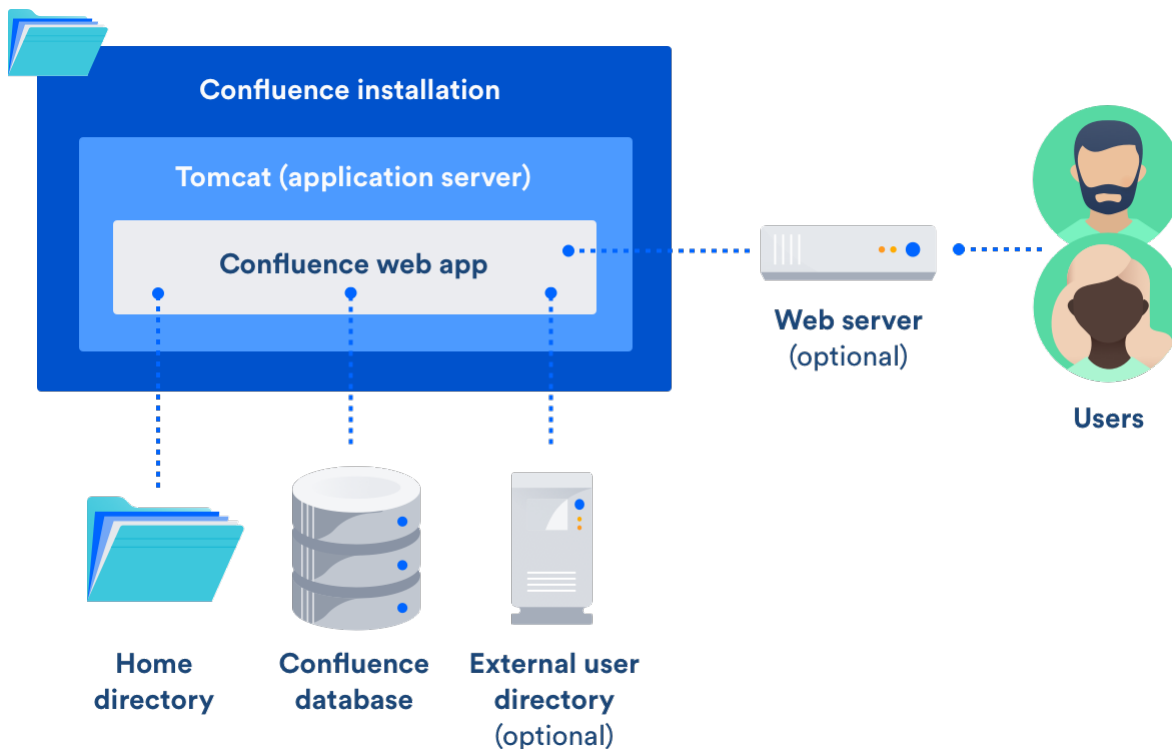
This section contains the following guidelines:

- [Confluence Home and other important directories](#)
- [Application Server Configuration](#)
- [Web Server Configuration](#)
- [Starting Confluence Automatically on System Startup](#)

*Diagram: A Confluence installation*

#### Related pages:

- [Getting Started as Confluence Administrator](#)
- [Supported Platforms](#)



## Confluence Home and other important directories

### Confluence installation directory

The 'Confluence Installation directory' is the directory where Confluence was installed. This directory is also sometimes called the 'Confluence Install directory'.

Important files in the installation directory:

- `bin/setenv.bat` or `bin/setenv.sh`  
This file is used to edit `CATALINA_OPTS` memory and garbage collection settings and define system properties.
- `confluence/WEB-INF/classes/confluence-init.properties`  
This file contains the location of the Confluence Home directory.

### On this page:

- [Confluence installation directory](#)
- [Confluence home directory](#)
- [Changing the location of the home directory](#)
- [Database](#)
- [Temp directory \(installation directory\)](#)

### Confluence home directory

The Confluence Home directory is the folder where Confluence stores its configuration information, search indexes and page attachments. Another term for 'Home directory' would be 'data directory'.

## Finding the home directory

The location of the Confluence home directory is defined when you install Confluence. This location is stored in the `confluence-init.properties` file, which is located in the `confluence/WEB-INF/classes` directory of your Confluence Installation directory.

When Confluence is running you can find the location of the home directory in



> **General Configuration** > **System Information** > **Confluence Information - Confluence Home.**

If your Confluence instance is clustered, you will also have a shared home directory which will contain some data (such as attachments and backups) that would otherwise reside in the home directory.

### Contents of the home directory

The Confluence home directory contains some of the configuration data used by Confluence. This section outlines the purpose of the files and directories in the Confluence home directory.

File or directory	Purpose
<code>confluence.cfg.xml</code>	<p>This file contains all of the information necessary for Confluence to start up, such as:</p> <ul style="list-style-type: none"> <li>• Product license</li> <li>• Context path</li> <li>• Database details, such as location and connection pool settings</li> <li>• Paths to important directories</li> </ul>
<code>attachments/</code>	<p>This directory contains every version of each attachment stored in Confluence.</p> <p>You can specify an alternative directory for attachment storage by setting the <code>attachments.dir</code> property in <code>confluence.cfg.xml</code>.</p>
<code>backups/</code>	<p>Confluence will place its daily backup archives in this directory, as well as any manually generated backups. Backup files in this directory take the following form <code>daily-backup-YYYY_MM_DD.zip</code></p> <p>You can specify an alternative directory for backups by setting the <code>daily.backup.dir</code> property in <code>confluence.cfg.xml</code>.</p>
<code>bundled-plugins/</code>	<p>Confluence includes a set of <i>bundled</i> plugins. The <code>bundled-plugins</code> directory is where Confluence will unpack its bundled plugins when it starts up. This directory is refreshed on every restart, so removing a plugin from this directory will not uninstall the plugin, as it will be replaced the next time Confluence starts up.</p>
<code>database/</code>	<p>This is where Confluence stores its database when configured to run with the <a href="#">Embedded H2 Database</a>. In such cases this directory contains all Confluence runtime data. Installations configured to run using an external database such as MySQL will not use this directory.</p> <p>The H2 database is provided for evaluating Confluence and is not supported as a production database.</p>
<code>index/</code>	<p>The Confluence index is heavily used by the application for content searching and recently updated lists and is critical for a running Confluence instance. If data in this directory is lost or corrupted, it can be restored by running a full reindex from within Confluence. This process can take a long time depending on how much data is stored Confluence's database.</p> <p>An alternative directory may be specified for the index by setting the <code>lucene.index.dir</code> property in <code>confluence.cfg.xml</code>.</p>
<code>journal/</code>	<p>Entries are added to the journal when changes occur (such as a comment, like, new page). Journal entries are then processed and the entries added to the index (about every 5 seconds). In a cluster, the journal keeps the indexes on each node in sync.</p>
<code>logs/</code>	<p>Confluence's application logs are stored in this directory.</p>

<code>plugin-cache/</code>	All Confluence plugins are stored in the database. To allow for quicker access to classes contained within the plugin JARs, Confluence will cache these plugins in the <code>plugin-cache</code> directory. This directory is updated as plugins are installed and uninstalled from the system and is completely repopulated from the database every time Confluence is restarted. Removing plugins from this directory does not uninstall them.
<code>resources/</code>	The <code>resources</code> directory stores any space logos used in your Confluence instance. Space logos are stored in directories named with the spacekey.
<code>temp/</code>	<p>The <code>temp</code> directory is used for runtime functions such as exporting, importing, file upload and indexing. Files in this directory are temporary and can be safely removed when Confluence is offline. A daily job within Confluence deletes files that are no longer needed.</p> <p>You can specify a different temp directory location, if necessary. Edit <code>&lt;confluence-home&gt;/confluence.cfg.xml</code> and set the new location in the <code>webwork.multipart.saveDir</code> property.</p>
<code>thumbnails/</code>	Stores temporary files for image thumbnails. This directory is essentially a thumbnail cache, and files deleted from this directory will be regenerated the next time the image is accessed.

## Changing the location of the home directory

When Confluence first starts up, it reads the `confluence-init.properties` file to determine where to look for the Home directory.

To change the location of the home directory edit the `confluence.home` property in the `confluence-init.properties` file as follows:

- **Windows**

In Windows, the path `C:\confluence\data` would be written as:

```
confluence.home=C:/confluence/data
```

Note that all backslashes (\) are written as forward slashes (/)

- **Linux / Solaris**

On any Linux-based system, the property is defined using the normal directory syntax:

```
confluence.home=/var/confluence/
```

## Symbolic links

There can be no symbolic links within the Confluence home directory. You must define an absolute path. If disk space is an issue, place the entire `confluence.home` directory on a disk partition where there is enough space. The absolute path of generated files (such as exports) is compared with the absolute path of the `confluence.home` directory when constructing URLs. When a sub-directory has a different path, the URL will be incorrect, and you may receive "Page not found" errors. These measures are in place to prevent "directory traversal" attacks.

## Fixing the Confluence Configuration

The Confluence configuration file: `confluence-cfg.xml` inside the home directory may contain references to the original location of your Confluence home. You will need to edit this file to update these references to also point to the new location. The two properties in this file that need to change are:

- `daily.backup.dir` if you have not configured your backups to be placed elsewhere already
- `hibernate.connection.url` if you are using the embedded HSQL database.

## Database

All other data, including page content, is kept in the database. If you installed Confluence as a trial, or chose to use the [embedded HSQL database](#) during setup, the database will store its files under `database/` in the Confluence Home Directory. Otherwise, the database management system you are connecting to is responsible for where and how your remaining data is stored.


### Temp directory (installation directory)

The temp directory is configured in the Java runtime and some Confluence components write temporary files or lockfiles into this directory.

The temp directory is located in the installation directory as `/temp`.

To change the location of this directory, start the Java Virtual Machine in which confluence is running with the argument:

```
-Djava.io.tmpdir=/path/to/your/own/temp/directory.
```

 **Note:** this is not the same as the temp directory in Confluence Home where exports, for example, are saved. See the table above to find out how to change the location of the `<confluence-home>/temp` directory.

## Application Server Configuration

The following pages contain information about configuring your application server for Confluence:

- [Managing Application Server Memory Settings](#)
- [Java Policy Settings for Enterprise or Webhosting Environments](#)

### Managing Application Server Memory Settings

The minimum and maximum JVM heap space allocated to the application server affects performance. Confluence administrators may wish to modify this value from the defaults [depending on their server load](#). This document only provides guidelines rather than rules, so administrators optimizing for performance should use this document as a starting point only.

For a comprehensive overview of memory management, and memory tuning in Confluence under Sun JRE, please read [Garbage Collector Performance Issues](#)

### Testing For Optimum Memory Settings

In the general case, both Jira & Confluence users will benefit from setting the minimum and maximum values identical. In larger installations, there is benefit to memory tuning, if there is a perceived performance issue. If you are experiencing Out of Memory Heap errors, try increasing the `-Xmx` and `-Xms` values for your installation to see if this resolves or helps resolve your issue. It's best to increase in small increments (eg 512mb at a time), to avoid having too large a heap, which can cause different problems. If increasing the memory does not help, please lodge a support ticket as there may be other factors contributing.

Memory usage is most likely to be maximized under peak load, and when [creating a site XML backup](#). In many cases, the backup can be the cause of the OOM, so increase `-Xmx` values and verify if a backup was occurring at the time of OOM. A quick rule of thumb for gauging the success of a memory adjustment is using simple anecdotal evidence from users. Is it snappier? The same? How does it handle while a backup is occurring?

Atlassian recommends in normal use, to disable the XML backup and use a [Production Backup Strategy](#).

- If you normally perform manual XML site backups on your server, test your maximum memory requirements by performing a site XML backup while the server is under maximum load
- If you do not create manual XML site backups, simply monitor the server while under maximum load

### Applying Memory Settings

See [How to fix out of memory errors by increasing available memory](#).

### Related Topics

- [Garbage Collector Performance Issues](#)
- [How to fix out of memory errors by increasing available memory](#)
- [Server Hardware Requirements Guide](#)
- [Performance Tuning](#)
- [Troubleshooting Slow Performance Using Page Request Profiling](#)
- [Tomcat JVM options and Modify the Default JVM Settings](#)

### Java Policy Settings for Enterprise or Webhosting Environments

Confluence relies on a number of Java libraries. Some of these libraries make use of features of the Java language that may be restricted by Java security policies.

This does not normally cause any problems. The default security configuration of most application servers will happily run Confluence. However, in some shared-hosting or enterprise environments, security settings may be such that Confluence cannot function.

#### Related pages:

- [Application Server Configuration](#)
- [Confluence Administrator's Guide](#)

When you attempt to run Confluence, you may get the following error:

```
java.security.AccessControlException: access denied
(java.lang.RuntimePermission accessDeclaredMembers)
    at
    java.security.AccessControlContext.checkPermission(AccessControlContext.
    java(Compiled Code))
        at
        java.security.AccessController.checkPermission(AccessController.java(Com
        piled Code))
            at
            java.lang.SecurityManager.checkPermission(SecurityManager.java(Compiled
            Code))
```

The permissions required by Confluence to run are detailed in the sample policy file below. You may need to give this information to your systems administrator so that they can be deployed with the Confluence application.

```
grant codeBase "file:${catalina.home}/webapps/confluence/-" {
    permission java.security.AllPermission;
};

grant {
    permission java.lang.RuntimePermission "accessDeclaredMembers";
    permission java.lang.reflect.ReflectPermission "suppressAccessChecks";
    permission java.lang.RuntimePermission "defineCGLIBCClassInJavaPackage";
};
```

### Web Server Configuration

- [Configuring Web Proxy Support for Confluence](#)
- [Running Confluence behind Apache](#)
  - [General Apache Configuration Notes](#)
  - [Using Apache with mod\\_proxy](#)
  - [Using Apache with virtual hosts and mod\\_proxy](#)
  - [Using Apache with mod\\_jk](#)
  - [Using mod\\_rewrite to Modify Confluence URLs](#)
  - [Configuring Apache to Cache Static Content via mod\\_disk\\_cache](#)

## Configuring Web Proxy Support for Confluence

The content on this page relates to platforms which are not supported. Consequently, Atlassian Support **cannot guarantee providing any support for it**. Please be aware that this material is provided for your information only and using it is done so at your own risk.

Some of Confluence's macros, such as {rss} and {jiraissues} need to make web requests to remote servers in order to retrieve data. If Confluence is deployed within a data centre or DMZ, it may not be able to access the Internet directly to make these requests. If you find that the {rss} macro does not work, ask your network administrator if Confluence needs to access the Internet through a web proxy.

### Configuring an outbound HTTP proxy in Confluence

Proxy support is configured by passing certain [system properties](#) to the Java Virtual Machine on startup.

- `http.proxyHost`
- `http.proxyPort` (default: 80)
- `http.nonProxyHosts` (default: <none>)
- `https.proxyHost`
- `https.proxyPort`

At a minimum, you need to define `http.proxyHost` to configure an HTTP proxy, and `https.proxyHost` to configure an HTTPS proxy. System property configuration is described in the [Configuring System Properties](#).

Properties `http.proxyHost` and `http.proxyPort` indicate the proxy server and port that the http protocol handler will use, and `https.proxyHost` and `https.proxyPort` indicate the same for the https protocol handler.

```
-Dhttp.proxyHost=proxy.example.org -Dhttp.proxyPort=8080  
-Dhttps.proxyHost=proxy.example.org -Dhttps.proxyPort=8080
```

Property `http.nonProxyHosts` indicates the hosts which should be connected to directly and not through the proxy server. The value can be a list of hosts, each separated by a pipe character | . In addition, a wildcard character (asterisk) \* can be used for matching. For example:

```
-Dhttp.nonProxyHosts=*.foo.com|localhost
```

If you're using Confluence 6.0 or later with Synchrony, you'll need to pass the following to ensure Confluence can connect directly to Synchrony. Replace `localhost|127.0.0.1` with your Synchrony IP if you have used the `synchrony.host` [system property](#) to change the IP Synchrony uses.

```
-Dhttp.nonProxyHosts=localhost|127.0.0.1  
-Dhttps.nonProxyHosts=localhost|127.0.0.1
```

Note: You may need to escape the pipe character | in some command-line environments.

If the `http.nonProxyHosts` property is not configured, all web requests will be sent to the proxy.

Please note that any command line parameters set are visible from the process list, and thus anyone who has the appropriate access to view the process list will see the proxy information in the clear. To avoid this, you can set these properties in the `catalina.properties` file, located in `confluence-install/conf/`. Add this to the end of the file:



```
http.proxyHost=yourProxyURL
http.proxyPort=yourProxyPort
http.proxyUser=yourUserName
http.proxyPassword=yourPassword
https.proxyHost=yourProxyURL
https.proxyPort=yourProxyPort
https.proxyUser=yourUserName
https.proxyPassword=yourPassword
```

### Configuring HTTP proxy authentication

Proxy authentication is also configured by providing [system properties](#) to Java in your application server's configuration file. Specifically, the following two properties:

- `http.proxyUser` – username
- `http.proxyPassword` – secret

### HTTP proxy (Microsoft ISA) NTLM authentication

Confluence supports NTLM authentication for outbound HTTP proxies when Confluence is running on a Windows server.

This means that the `{rss}` and `{jiraissues}` macro will be able to contact external websites if requests have to go through a proxy that requires Windows authentication. This support is not related to logging in Confluence users automatically with NTLM, for which there is a user-contributed authenticator available.

To configure NTLM authentication for your HTTP proxy, you need to define a domain [system property](#), `http.auth.ntlm.domain`, in addition to the properties for host, port and username mentioned above:

```
-Dhttp.auth.ntlm.domain=MYDOMAIN
```

### Configuring authentication order

Sometimes multiple authentication mechanisms are provided by an HTTP proxy. If you have proxy authentication failure messages, you should first check your username and password, then you can check for this problem by examining the HTTP headers in the proxy failure with a packet sniffer on the Confluence server. (Describing this is outside the scope of this document.)

To set the order for multiple authentication methods, you can set the [system property](#) `http.proxyAuth` to a comma-separated list of authentication methods. The available methods are: `ntlm`, `digest` and `basic`; this is also the default order for these methods.

For example, to attempt Basic authentication before NTLM authentication, and avoid Digest authentication entirely, you can set the `http.proxyAuth` property to this value:

```
-Dhttp.proxyAuth=basic,ntlm -Dhttps.proxyAuth=basic,ntlm
```

### Troubleshooting

1. There's a diagnostic jsp file in [CONF-9719](#) for assessing the connection parameters.
2. **'Status Code [407]'** errors are described in [APR-160](#).
3. Autoproxies are not supported. See [CONF-16941](#).

### Running Confluence behind Apache

Error rendering macro 'viewport-redirect' : null

## General Apache Configuration Notes

### Prefer Apache `mod_deflate` to Confluence's built-in gzip implementation

1. Disable gzip in confluence. See [Compressing an HTTP Response within Confluence](#).
2. Enable gzip compression in Apache. For RedHat distributions this can be achieved by adding the following lines:

```
AddOutputFilterByType DEFLATE text/html text/plain text/xml
text/css application/x-javascript

# ensure sensible defaults
DeflateBufferSize 8192
DeflateCompressionLevel 4
DeflateMemLevel 9
DeflateWindowSize 15
```

### Ensure `keepalive` is enabled

```
KeepAlive On
```

### Enable `keepalive` for recent MSIE user agents

The standard Apache SSL configuration is very conservative when it comes to MSIE and SSL. By default all keepalives are disabled when using HTTPS with MSIE. While MSIE will always be *special*, the issues with SSL and MSIE have been solved since [Service Pack 2 for Windows XP](#), released over 4 years go. For anyone using an XP machine SP2 or above, it is safe to allow keepalive for MSIE 6 and above.

Remove the following lines:

```
SetEnvIf User-Agent ".*MSIE.*" \
    nokeepalive ssl-unclean-shutdown \
    downgrade-1.0 force-response-1.0
```

Add these in their place:

```
BrowserMatch "MSIE [1-5]" nokeepalive ssl-unclean-shutdown downgrade-1.0
force-response-1.0
BrowserMatch "MSIE [6-9]" ssl-unclean-shutdown
```

## Using Apache with `mod_proxy`

Atlassian applications allow the use of reverse-proxies, however Atlassian Support does not provide assistance for configuring them. Consequently, Atlassian **can not guarantee providing any support for them**.

If assistance with configuration is required, please raise a question on [Atlassian Answers](#).

This page describes one possible way to use Apache HTTP Server 2.4 to proxy requests for Confluence running in a standard Tomcat container. You can find additional documentation that explains how to use [NGINX](#) for the same purpose.

You might use this configuration when:

- You have an existing Apache website, and want to add Confluence (for example, **http://www.example.com/confluence**).
- You have two or more Java applications, each running in their own application server on different ports, for example, **http://example:8090/confluence** and **http://example:8080/jira** and want to make them both available on the regular HTTP port (80) (for example, at **http://www.example.com/confluence** and **http://www.example.com/jira**). Each application can be restarted, managed and debugged separately.

**Note:** This page documents a configuration of Apache, rather than of Confluence itself. Atlassian will support Confluence with this configuration, but we cannot guarantee to help you debug problems with Apache. Please be aware that this material is provided for your information only, and that you use it at your own risk.

#### On this page:

- Base configuration
  - 1 Set the context path
  - 2 Set the URL for redirection
  - 3 Configure mod\_proxy
  - 4 Restart Apache
  - 5 Disable HTTP Compression
  - 6 Change the Confluence Base URL
- Adding SSL
- This guide for integrating Apache and SSL is now obsolete
- More information

### Base configuration

In these examples, we use the following:

**http://www.example.com/confluence** - your intended URL

**http://example:8090** - the hostname and port Confluence is currently installed to

**http://example:8091** - the hostname and port Synchrony, the service that powers collaborative editing, defaults to

**/confluence** - the intended context path for Confluence (the part after hostname and port)

**/synchrony** - the context path for Synchrony, the process that powers collaborative editing

You'll need to replace these URLs with your own URLs.

#### 1 Set the context path

 If you want to access Confluence without a context path, such as **www.example.com**, skip this step.

Set your Confluence application path (the part after hostname and port) in Tomcat. In this example the context path will be `/confluence`.

Edit `<installation-directory>conf/server.xml`, locate the "Context" definition:

```
<Context path="" docBase="../../confluence" debug="0" reloadable="true">
```

and change it to:

```
<Context path="/confluence" docBase="../../confluence" debug="0"
reloadable="true">
```

Restart Confluence, and check you can access it at **http://example:8090/confluence**.

## 2 Set the URL for redirection

Next, set the URL for redirection. In the same `<installation-directory>conf/server.xml` file, locate this code segment:

```
<Connector port="8090" connectionTimeout="20000" redirectPort="8443"
           maxThreads="48" minSpareThreads="10"
           enableLookups="false" acceptCount="10" debug="0"
           URIEncoding="UTF-8"
           protocol="org.apache.coyote.http11.Http11NioProtocol"
/>
```

And add **proxyName**, **proxyPort** and **scheme** as shown in the last line below:

```
<Connector port="8090" connectionTimeout="20000" redirectPort="8443"
           maxThreads="48" minSpareThreads="10"
           enableLookups="false" acceptCount="10" debug="0"
           URIEncoding="UTF-8"
           protocol="org.apache.coyote.http11.Http11NioProtocol"

           proxyName="www.example.com" proxyPort="80"
           scheme="http" />
```

If you're using SSL, the scheme will be **"https"**.

## 3 Configure mod\_proxy

Use one of the examples below to edit your Apache `http.conf` file to proxy requests to the application server.

 You will need to enable the following required Apache modules if they are not already enabled:

- `mod_proxy`
- `mod_proxy_http`
- `proxy_wstunnel`
- `mod_rewrite`


(`proxy_wstunnel` and `mod_rewrite` are new requirements in Confluence 6.0)

The format of the `http.conf` file, and location of the modules may differ on your operating system. We recommend Windows users specify the absolute path to the module files.

### Example 1: Configuration with context path

Use this example if you set a context path in step 1, and will access Confluence with a context path like this **http://www.example.com/confluence**.

In this example, users will connect to Synchrony, which is required for collaborative editing, directly via WebSockets.

 The order of directives in the config is important.

#### Apache HTTP server 2.4

```
# Put this after the other LoadModule directives
LoadModule proxy_module /usr/lib/apache2/modules/mod_proxy.so
LoadModule proxy_http_module
/usr/lib/apache2/modules/mod_proxy_http.so
LoadModule proxy_wstunnel_module
/usr/lib/apache2/modules/mod_proxy_wstunnel.so
LoadModule rewrite_module /usr/lib/apache2/modules/mod_rewrite.so

# Put this in the main section of your configuration (or virtual
host, if using Apache virtual hosts)
ProxyRequests Off
ProxyPreserveHost On

<Proxy *>
    Require all granted
</Proxy>

ProxyPass /synchrony http://localhost:8091/synchrony
<Location /synchrony>
    Require all granted
    RewriteEngine on
    RewriteCond %{HTTP:UPGRADE} ^WebSocket$ [NC]
    RewriteCond %{HTTP:CONNECTION} Upgrade$ [NC]
    RewriteRule .* ws://localhost:8091%{REQUEST_URI} [P]
</Location>

ProxyPass /confluence http://<domain>:8090/confluence
ProxyPassReverse /confluence http://<domain>:8090/confluence


<Location /confluence>
    Require all granted
</Location>
```

**Note:** It's not possible to use Apache HTTP Server 2.2 with Confluence 6.0 or later. If you plan to use SSL, you will need version 2.4.10 or later.

#### Example 2: Configuration without context path

Use this example if you skipped step 1, and will access Confluence without a context path like this **http://www.example.com**.

As in the previous example, users will connect to Synchrony, which is required for collaborative editing, directly via WebSockets.

 The order of directives in the config is important.

### Apache HTTP server 2.4

```
# Put this after the other LoadModule directives
LoadModule proxy_module /usr/lib/apache2/modules/mod_proxy.so
LoadModule proxy_http_module
/usr/lib/apache2/modules/mod_proxy_http.so
LoadModule proxy_wstunnel_module
/usr/lib/apache2/modules/mod_proxy_wstunnel.so
LoadModule rewrite_module /usr/lib/apache2/modules/mod_rewrite.so

# Put this in the main section of your configuration (or virtual
host, if using Apache virtual hosts)

ProxyRequests Off
ProxyPreserveHost On

RewriteEngine On
RewriteCond %{REQUEST_URI} !^/synchrony
RewriteRule ^/(.*) http://<domain>:8090/$1 [P]

<Proxy *>
    Require all granted
</Proxy>

ProxyPass /synchrony http://<domain>:8091/synchrony

<Location /synchrony>
    Require all granted
    RewriteEngine on
    RewriteCond %{HTTP:UPGRADE} ^WebSocket$ [NC]
    RewriteCond %{HTTP:CONNECTION} Upgrade$ [NC]
    RewriteRule .* ws://<domain>:8091%{REQUEST_URI} [P]
</Location>

ProxyPass / http://<domain>:8090
ProxyPassReverse / http://<domain>:8090

<Location />
    Require all granted
</Location>
```

**Note:** It's not possible to use Apache HTTP Server 2.2 with Confluence 6.0 or later. If you plan to use SSL, you will need version 2.4.10 or later.

#### 4 Restart Apache

This is needed to pick up on the new configuration. To restart Apache, run the following command:

```
sudo apachectl graceful
```

#### 5 Disable HTTP Compression

Having compression run on both the proxy and Tomcat can cause problems integrating with other Atlassian applications, such as Jira. Please disable HTTP compression as per our [Compressing an HTTP Response within Confluence](#) docs.

## 6 Change the Confluence Base URL

The last stage is to set the [Base URL](#) to the address you're using within the proxy, for example <http://www.example.com/confluence>.

### Adding SSL

***This guide for integrating Apache and SSL is now obsolete***

We've created a much better guide for [Securing your Atlassian applications with Apache using SSL](#).

You may also be interested in our other Reverse Proxy Setup Guides:

- [Proxying Atlassian server applications with Apache HTTP Server \(mod\\_proxy\\_http\)](#)
- [Proxying Atlassian server applications with Apache HTTP Server \(mod\\_proxy\\_ajp\)](#)
- [Reverse Proxy and Application Link Troubleshooting Guide](#)

### More information

- The [mod\\_proxy\\_html](#) site has documentation and examples on the use of this module in the complex configuration.
- [Apache Week has a tutorial](#) that deals with a complex situation involving two applications and ProxyHTMLURLMap.

## Using Apache with virtual hosts and mod\_proxy

Error rendering macro 'viewport-redirect' : null

## Using Apache with mod\_jk

It's not possible to use only mod\_jk to proxy Confluence 6.0 or later. This is because Synchrony, which is required for collaborative editing, cannot accept AJP connections. The preferred configuration is [Using Apache with mod\\_proxy](#).

If you are unable to switch to mod\_proxy, see [How to configure Apache mod\\_jk to proxy Confluence 6.x or later](#) for a workaround.

## Using mod\_rewrite to Modify Confluence URLs

**Note:** This page documents a configuration of Apache, rather than of Confluence itself. Atlassian will support Confluence with this configuration, but we cannot guarantee to help you debug problems with Apache. Please be aware that this material is provided for your information only, and that you use it at your own risk.

Confluence requires URL rewriting for proper functionality, if Confluence is accessible via different domain names. If Confluence is configured for multiple domains *without* URL rewriting, you will experience an array of problems. See [Various Issues Caused when Server Base URL Does Not Match the URL Used to Access Confluence](#).

An example of why you may want to access Confluence from different domains:

- From an internal network:  
<http://wiki>
- The externally visible domain:  
<http://wiki.domain.com>

### Using URL rewriting to access Confluence over multiple domains

#### To configure Confluence over multiple domains:

1. Add a DNS entry mapping <http://wiki> to the externally visible IP address of the Confluence server.
2. Set Confluence's [server base URL](#) to <http://wiki.domain.com>.
3. Add Apache HTTP proxy, using the instructions from [Running Confluence behind Apache](#).
4. Add the [mod\\_rewrite](#) module to change the URL.



### Further information

You may be interested in the [UrlRewriteFilter](#) that is Java web filter that works in a similar way of the **Apache's mod\_rewrite**.

### Configuring Apache to Cache Static Content via mod\_disk\_cache

#### Redirection Notice

This page will redirect to [KB:Proxying Atlassian Server applications](#).

To improve performance of a large Confluence site, we recommend that you move the caching of static content from the JVM into Apache. This will prevent the JVM from having a number of long running threads serving up static content.

Static content in Confluence includes most JavaScript, CSS and image files which are included with the application or an installed plugin. This content will be cached by Apache in this configuration. User-provided content like space logos, attachments or embedded images are not considered static content and will not be cached.

**Note:** This page documents a configuration of Apache, rather than of Confluence itself. Atlassian will support Confluence with this configuration, but we cannot guarantee to help you debug problems with Apache. Please be aware that this material is provided for your information only, and that you use it at your own risk.

### Configuring Apache mod\_disk\_cache

#### To configure Apache to cache static Confluence content:

1. Add a `mod_disk_cache` stanza to the virtual host configuration:

```
<IfModule mod_disk_cache.c>
  # "/s" is where Confluence serves "static" stuff. Instruct Apache
  to cache it:
  CacheEnable disk /s
  CacheIgnoreHeaders Set-Cookie
  CacheRoot "/var/cache/mod_proxy"
</IfModule>
```

2. Configure Apache to load `mod_disk_cache`. For example, in our server configuration this is done in `/etc/httpd/conf/httpd.conf`:

```
LoadModule disk_cache_module modules/mod_disk_cache.so
```

3. Restart Apache after both modifications are complete.

### Notes

- Please refer to the Apache documentation for [mod\\_disk\\_cache](#).
- If you encounter problems where users are served stale content, you may need to purge the Apache cache directory (`/var/cache/mod_proxy` in the above configuration) after a Confluence or plugin upgrade. This is a simple 3 step process:
  - Shut down Apache.
  - Clear the cache directory. For example: `sudo rm -r /var/cache/mod_proxy/*`
  - Restart Apache.
- Ensure that you are running the `htcacheclean` daemon in order to prevent excessive use of disk space. In our situation we ran it like this:

```
sudo htcacheclean -d30 -n -t -p /var/cache/mod_proxy -l 512M
```

This will purge content once the cache reaches 512M every 30 minutes. See the Apache documentation for [htcacheclean](#) for details of the options.

## Starting Confluence Automatically on System Startup

You can configure Confluence to start automatically on system startup, allowing it to recover automatically after a reboot.

- [Start Confluence Automatically on Linux](#)
- [Start Confluence Automatically on Windows as a Service](#)

### Start Confluence Automatically on Linux

On Linux/Solaris, the best practice is to install, configure and run each service (including Confluence) as a dedicated user with only the permissions they require.

To install, configure and run Confluence automatically on Linux/Solaris:

1. Create a `confluence` user for instance, using the following command:


```
sudo useradd --create-home -c "Confluence role account" confluence
```

2. Create a directory to install Confluence into. In this example we're using `/usr/local/confluence`.

```
sudo mkdir /usr/local/confluence
sudo chown confluence: /usr/local/confluence
```

3. Log in as the `confluence` user to install Confluence:

```
sudo su - confluence
cd /usr/local/confluence/
tar zxvf /tmp/confluence-5.6.4.tar.gz
ln -s confluence-5.6.4/ current
```

4. Edit `<<CONFLUENCE_INSTALL_DIRECTORY>>/confluence/WEB-INF/classes/confluence-init.properties` file, and set `confluence.home=/usr/local/confluence/<Confluence_Data_Home>` (ensure you have removed the comment '#')
5. Then back as root, create the file `/etc/init.d/confluence` (code shown below), which will be responsible for starting up Confluence after a reboot (or when manually invoked).  
 If you are running Ubuntu Jaunty (or later) do not perform this step. Please use the [instructions](#) further down this page.

```
#!/bin/sh -e
# Confluence startup script
#chkconfig: 2345 80 05
#description: Confluence

# Define some variables
# Name of app ( JIRA, Confluence, etc )
APP=confluence
# Name of the user to run as
USER=confluence
# Location of Confluence install directory
CATALINA_HOME=/usr/local/confluence/current
# Location of Java JDK
export JAVA_HOME=/usr/lib/jvm/java-7-oracle

case "$1" in
    # Start command
    start)
        echo "Starting $APP"
        /bin/su -m $USER -c "$CATALINA_HOME/bin/start-confluence.sh &>
/dev/null"
        ;;
    # Stop command
    stop)
        echo "Stopping $APP"
        /bin/su -m $USER -c "$CATALINA_HOME/bin/stop-confluence.sh &>
/dev/null"
        echo "$APP stopped successfully"
        ;;
    # Restart command
    restart)
        $0 stop
        sleep 5
        $0 start
        ;;
    *)
        echo "Usage: /etc/init.d/$APP {start|restart|stop}"
        exit 1
        ;;
esac

exit 0
```


6. Make this file executable:

```
sudo chmod +x /etc/init.d/confluence
```

7. Set this file to run at the appropriate runlevel. For example, use `sudo chkconfig --add confluence` on Redhat-based systems, `sudo update-rc.d confluence defaults` or `rcconf` on Debian-based systems.
8. You should now be able to start Confluence with the init script. A successful startup output typically looks like this:

```
$ sudo /etc/init.d/confluence start
Starting Confluence:
If you encounter issues starting up Confluence, please see the
Installation guide at
http://confluence.atlassian.com/display/DOC/Confluence+Installation
+Guide
Using CATALINA_BASE:   /usr/local/confluence/current
Using CATALINA_HOME:   /usr/local/confluence/current
Using CATALINA_TMPDIR: /usr/local/confluence/current/temp
Using JRE_HOME:        /usr/lib/jvm/java-1.7.0-oracle
done.
```

You should then see this running at <http://<server>:8090/>

 The port for this will be whatever is defined in your Confluence `server.xml` file.

#### Adding Confluence as a service for Ubuntu Jaunty (or later)

To continue configuring Confluence to start automatically as a service on Ubuntu Jaunty (or later):

1. After **logging in** as the confluence user to install Confluence, create start and stop scripts in `/usr/local/confluence`:

Example startscript:

```
#!/bin/bash
export JAVA_HOME=/usr/lib/jvm/java-7-oracle-1.7.0.71/
export JDK_HOME=/usr/lib/jvm/java-7-oracle-1.7.0.71/
cd /usr/local/confluence/current/bin
./startup.sh
```

Example stopscript:

```
#!/bin/bash
export JAVA_HOME=/usr/lib/jvm/java-7-oracle-1.7.0.71/
export JDK_HOME=/usr/lib/jvm/java-7-oracle-1.6.0.71/
cd /usr/local/confluence/current/bin
./shutdown.sh
```

2. Make both of these scripts executable. For example, by issuing the command: `sudo chmod a+x /usr/local/confluence/start /usr/local/confluence/stop`.
3. Karmic and later: Create two text files in `/etc/init/` called `confluence-up.conf` and `confluence-down.conf`:

`confluence-up:`

```
start on runlevel [2345]

script

date >> /tmp/confluence-startup.out
exec sudo -u confluence /usr/local/confluence/start >>
/tmp/confluence-startup.out 2>&1

end script
```

confluence-down:

```
start on runlevel [16]

expect fork
respawn

exec sudo -u confluence /usr/local/confluence/stop >>
/tmp/confluence-shutdown.out 2>&1
```

... and make them readable to all users:

```
sudo chmod a+r /etc/init/confluence-up.conf /etc/init/confluence-down.conf
```

1. Jaunty, Intrepid: Create two text files in `/etc/event.d/` called `confluence-up` and `confluence-down`:

confluence-up:

```
start on runlevel 2
start on runlevel 3
start on runlevel 4
start on runlevel 5

exec sudo -u confluence /usr/local/confluence/start >>
/tmp/confluence-startup.out 2>&1
```

confluence-down:

```
start on runlevel 1
start on runlevel 6

exec sudo -u confluence /usr/local/confluence/stop >>
/tmp/confluence-shutdown.out 2>&1
```

... and make them readable to all users:

```
sudo chmod a+r /etc/event.d/confluence-up /etc/event.d/confluence-down
```

## RELATED TOPICS

### Starting Confluence Automatically on System Startup

#### Start Confluence Automatically on Windows as a Service

For long-term use, we recommend that you configure Confluence to start automatically when the operating system restarts. For Windows servers, this means configuring Confluence to run as a Windows service.

There are two ways to install the Confluence distribution as a service: using the [Confluence installer](#) or manually as described below.

#### On this page:

- [Reasons for Starting Confluence as a Service](#)
- [Changing the User Running the Service](#)
- [Manually Installing the Confluence Distribution as a Service](#)
- [Managing Confluence as a Service](#)
- [Upgrading Confluence](#)
- [Troubleshooting Confluence while Running as a Windows Service](#)
- [Requesting Support](#)

#### Problem with 64-bit Windows

If you are running 64-bit Windows, please note that you may encounter problems with Apache Tomcat running as a Windows service if you are using a 64-bit JDK. Refer to our [knowledge base article](#) for more information.

#### Reasons for Starting Confluence as a Service

Installation as a Windows service offers these advantages:

- Reduced risk of shutting down Confluence by accident (If you start Confluence manually, a console window opens and there is a risk of someone accidentally shutting down Confluence by closing the window).
- Automated Confluence recovery after server restart.
- Improved troubleshooting through logging server output to file.

You can read more about Windows services in the [Microsoft Developer Network](#).

#### Changing the User Running the Service

If you wish to run the service as a non-administrator user for security, or if you are using network drives for backups, attachments or indexes, you can run the service as another user. To change users, open the Apache Tomcat Confluence properties, go to the 'Log On' tab and enter the required username and password. Go to your Windows Control Panel -> User Accounts and confirm that the user has write permissions for the <CONFLUENCE-INSTALL> and <CONFLUENCE-HOME> directories, and all subfolders. Note that any network drives must be specified by UNC and not letter mappings (eg. \\backupserver\confluence not z:\confluence).

For more detail, see [Creating a Dedicated User Account on the Operating System to Run Confluence](#).

#### Manually Installing the Confluence Distribution as a Service

In Windows:

1. Open a command prompt and change directory to the <CONFLUENCE-INSTALL>/bin directory. You'll need to run the command prompt using 'Run as administrator' so that you can complete some of these steps.
2. Confirm that the JAVA\_HOME variable is set to the JDK base directory with the command:

```
echo %JAVA_HOME%
```

If you installed the Java Runtime Environment (JRE) or used the Confluence installer, replace `JAVA_HOME` with `JRE_HOME`. See [Setting the JAVA\\_HOME Variable in Windows](#) for more info.

Note that any directory in the path with spaces (eg. `C:\Program Files`) must be converted to its eight-character equivalent (e.g. `C:\Progra~1`).

3. Use the following command to install the service with default settings:

```
service.bat install Confluence
```

The service will be called **Atlassian Confluence** and will be configured to start automatically by default, but will not automatically start up until the next server reboot.

4. If you have a large Confluence installation, you can increase the maximum memory Confluence can use (the default is 1024MB). For example, you can set the maximum memory to 2048MB using:

```
tomcat8 //US//Confluence --JvmMx 2048
```

5. If you don't have any JVM parameters that you pass to your distribution of Confluence, you can skip this step. If you do, add them to the service using:

```
tomcat8 //US//Confluence ++JvmOptions="-Djust.an.example=True"
```

Alternatively you can use the following command to launch the service properties dialog then navigate to the Java tab to add more JVM parameters.

```
tomcat8w //ES//Confluence
```

For further configuration options, please refer to the [Tomcat Windows Service How-To](#) guide.

6. Go to **Control Panel > Administrative Tools > Services > Atlassian Confluence** and right-click **Properties** to verify the settings are correct. Start the Confluence service with the command:
7. Finally, start the Confluence service. From now on this will happen automatically after the a server reboot.

```
net start Confluence
```

### Managing Confluence as a Service

You can manage the Confluence service from the command prompt.

- Stop Confluence with:

```
net stop Confluence
```

- Uninstall the Confluence service with:

```
service.bat remove Confluence
```



## Upgrading Confluence

After upgrading Confluence, you can either uninstall and reinstall the Windows service or change the StartPath parameter to your new folder. Refer to the [Tomcat documentation](#) for help.

## Troubleshooting Confluence while Running as a Windows Service

- Check the Knowledge Base articles:
  - [Getting 'The image file tomcat6.exe is valid, but is for a machine type other than the current machine'](#)
  - [Confluence Does Not Start Due to Windows Firewall](#)
  - [Unable to start Confluence Windows service after allocating JVM memory](#)
  - [Unable to Configure Confluence to Run as a Service on Tomcat 5](#)
  - [Unable to Install Service on Windows Vista](#)
- If none of the above solves your problem, please refer to the complete [list of known issues](#) in our Knowledge Base.
- When investigating memory issues or bugs, it may be useful to view information from Confluence's garbage collection. To turn on the verbose garbage collection see [How to Enable Garbage Collection \(GC\) Logging](#).
- You can use a [Sysinternals tool](#) called **Procmon.exe** from the The Microsoft Windows Sysinternals Team, to check that the error occurred at the specific time when the Confluence service started. You need to match the time when Tomcat failed, as captured by this tool, against the time in the Windows Event Viewer.

### Note

We do not recommend that you run this tool for too long as it may disrupt other Atlassian applications. Once you have captured the required information you will need to press **Ctrl + E** to stop capturing.

## Requesting Support

If, after following the troubleshooting guide above, you still cannot make Confluence run as a Windows Service or if there is an error when setting the JVM configuration for the service, you can [create a support request](#).

Please provide the following information when creating your support request, because we will need it to assist you:

- Give us the result of running **java -version** from Windows command line console.
- A screen shot of your Windows Registry setting for Tomcat.
- If you have modified **service.bat**, please give us a copy of this file for review.
- Your [atlassian-confluence.log](#) file.

## Configuring Confluence

This section focuses on settings and configurations within the Confluence application.

For guidelines on external configuration, see [Configuring a Confluence Environment](#).

- [Viewing System Information](#)
- [Configuring the Server Base URL](#)
- [Configuring the Confluence Search and Index](#)
- [Configuring Mail](#)
- [Configuring Character Encoding](#)
- [Other Settings](#)
- [Configuring System Properties](#)
- [Working with Confluence Logs](#)
- [Configuring Confluence Security](#)

### Related pages:

- [Customizing your Confluence Site](#)
- [Confluence administrator's guide](#)

- [Scheduled Jobs](#)
- [Configuring the Whitelist](#)
- [Configuring the Time Interval at which Drafts are Saved](#)

## Viewing System Information

The System Information screen provides information about Confluence's configuration, which plugins are in use, and the environment in which Confluence has been deployed.

To view your system information go to



> **General Configuration** > **System Information**.

### Notes:

- The handy **memory graph** helps you keep track of Confluence's memory usage.
- Your system configuration information is helpful to Atlassian Support when diagnosing errors you may face using Confluence. When logging a **support request** or **bug report**, please provide as much detail as possible about your installation and environment.

### Related pages:

- [Cache Statistics](#)
- [Live Monitoring Using the JMX Interface](#)
- [Tracking Customizations Made to your Confluence Installation](#)

## Live Monitoring Using the JMX Interface

JMX ([Java Management Extensions](#) API) allows you to monitor the status of your Confluence instance in real time. JMX uses objects called MBeans (Managed Beans) to expose data and resources from your application, providing useful data such as the resource usage of your instance and its database latency, allowing you to diagnose problems or performance issues.

In this page we'll guide you through how to use [JConsole](#) to monitor Confluence locally and remotely. JConsole is included in the Java Development Kit (JDK), but you can use any JMX client.

This guide provides a basic introduction to the JMX interface and is provided as is. Our support team can help you troubleshoot a specific Confluence problem, but aren't able to help you set up your monitoring system or interpret the results.

### Monitor Confluence locally using JConsole

If you are troubleshooting a particular issue, or only need to monitor Confluence for a short time, you can use local monitoring. Local monitoring can have a performance impact on your server, so its not recommended for long term monitoring of your production system.

To monitor locally:

1. Start JConsole (you'll find it in the `bin` directory of the JDK installation directory)
2. Select **Local Process**.
3. Select the Confluence process. It will be called something like `org.apache.catalina.startup.Bootstrap start`

See [Using JConsole](#) for more information on local monitoring.

### Monitor Confluence remotely using JConsole

Remote monitoring is recommended for production systems, as it does not consume resources on your Confluence server.

To monitor remotely:

1. Add the following properties to your `setenv.sh` / `setenv.bat` file. The port can be any port that is not in use.

```
set CATALINA_OPTS=-Dcom.sun.management.jmxremote %CATALINA_OPTS%
set CATALINA_OPTS=-Dcom.sun.management.jmxremote.port=8099
%CATALINA_OPTS%
```

2. Decide how you will secure your remote connection. See [Remote Monitoring and Management](#) for more information.  
Although it is possible to disable authentication, we do not recommend doing this on a production system.
3. Start JConsole (you'll find it in the `bin` directory of the JDK installation directory).
4. Select **Remote Process**.
5. Enter your hostname and port (this is the port you specified earlier, not the Confluence port).
6. Click **Connect**.

See [Using JConsole](#) for more information on remote monitoring.

### Confluence MBeans

You can use the following Confluence MBeans to see live information about your Confluence instance.

#### CacheStatistics

This MBean shows information about Confluence caches. This info can also be found on the [Cache Statistics](#) page.

#### IndexingStatistics

This MBean shows information related to search indexing. Here's some useful attributes.

Property name	Function	Values
Flushing	Indicate whether the cache is currently flushing	True/False
LastElapsedMilliseconds	Time taken during last indexing	Milliseconds
TaskQueueLength	Shows number of tasks in the queue	Integer
ReIndexing	Indicates whether Confluence is currently reindexing	True/False

#### SystemInformation

This MBean shows information such as the Confluence version and uptime. This info can also be found on the [System Information](#) page.

Property name	Function	Values
DatabaseExampleLatency	Shows the latency of an example query performed against the database	Milliseconds

#### RequestMetrics

This MBean shows information related to system load and error pages served.

Property name	Function	Values
AverageExecutionTimeForLastTenRequests	Average execution time for the last ten requests.	Milliseconds
CurrentNumberOfRequestsBeingServed	Number of requests being served at this instant.	Integer

ErrorCount	Number of times the Confluence error page was served.	Integer
NumberOfRequestsInLastTenSeconds	The number of requests in the last ten seconds.	Integer

**MailServer-SMTPServer**

This MBean shows information related to email dispatch attempts and failures. There will be an MBean for every SMTP Mailserver that has been configured in the Confluence instance.

Property name	Function	Values
EmailsAttempted	The number of email messages Confluence has tried to send.	Integer
EmailsSent	The number of email messages sent successfully.	Integer

**MailTaskQueue**

This MBean shows information related to the email workload.

Property name	Function	Values
ErrorQueueSize	Number of errors in the queue.	Integer
Flushing	Shows state (i.e. flushing, or not)	True/False
FlushStarted	Time that operation began.	Time
RetryCount	The number of retries that were performed.	Integer
TaskSize	Number of email messages queued for dispatch.	Integer

**SchedulingStatistics**

This MBean shows information related to current jobs, scheduled tasks and the time that they were last run.

Property name	Function	Values
AllJobNames	Shows information on current scheduled jobs including the time they were last run	String
CurrentlyRunningJobNames	Lists the scheduled jobs that are currently running	List

**Additional MBeans**

To also monitor Hibernate and Hazelcast (Confluence Data Center only) you will need to add the following properties to your `setenv.sh` / `setenv.bat` file first.

```
set CATALINA_OPTS=-Dconfluence.hazelcast.jmx.enable=true %CATALINA_OPTS%
set CATALINA_OPTS=-Dconfluence.hibernate.jmx.enable=true %CATALINA_OPTS%
```

This will make the Hibernate and Hazelcast MBeans available in your JMX client.

**Monitoring high CPU consuming threads**

The [Top Threads Plugin](#) for JConsole is useful for monitoring whether the CPU is spiking. Use the following command to start JConsole with this plugin:

```
JConsole -pluginpath /pathto/topthreads.jar
```

## Tracking Customizations Made to your Confluence Installation

The **'Modification'** section of the Confluence **'System Information'** screen lists the files that have been changed since your Confluence application was installed. You will find this information particularly useful when upgrading Confluence to a new version, because you will need to re-apply all customizations after the upgrade.

To see the modifications made to files in your Confluence installation:

1. Choose the **cog icon**



, then choose **General Configuration** under Confluence Administration

2. Select **'System Information'** in the 'Administration' section of the left-hand panel.
3. Scroll down to the section titled **'Modification'**.

*Screenshot: Modifications tracker on the Confluence System Information screen*

Modification	
Modified	decorators/main.vmd, pages/page-breadcrumbs.vm, template/includes/macros.vm, decorators/mail.vmd, decorators/space.vmd, template/includes/personal-sidebar.vm
Removed	No files removed

### Notes

- The modification tracker does not detect changes to class files from the `confluence.jar` or other JAR files. If you modify classes, the Confluence modification detection does not report the modification.

### View Space Activity

Space activity information is **disabled by default**, and the 'Activity' tab won't be visible unless the Confluence Usage Stats plugin is enabled. See notes [below](#).

If enabled, the space activity screen displays statistics on the activity in each space. These include:

- How many pages and blog posts have been viewed, added or updated over a given period.
- Which content is the most popular (most frequently viewed).
- Which content is the most active (most frequently edited).
- Which people are the most active contributors/editors of content.

#### To view the activity in a space:

1. Go to the space and choose **Space Tools** at the bottom of the sidebar
2. Choose **Activity**

#### Related pages:

- [Page History and Page Comparison Views](#)
- [Watch Pages, Spaces and Blogs](#)
- [How do I get more statistics from Confluence?](#)

You'll see a graphic display of the number of pages and blog posts that have been viewed, added, and edited, showing trends over a period of time.

*Screenshot: The Space Activity tab*

## Space Activity

[Overview](#)
[Permissions](#)
[Content Tools](#)
[Look and Feel](#)
[Integrations](#)
[Activity](#)

Activity

### Activity for week starting 10 February 2013

Period: [month](#) | **[week](#)** | [day](#)    Week: << [Previous](#) | [Now](#) | [Next](#) >>

**See also:** [Global Confluence activity](#)

In addition to the graphical representation of Views and Edits, the top ten most popular and most active pages and/or blog posts will be listed, with a link to each.

*Screenshot: Popular content, active content, and active contributors.*

Most popular content (Views)	Most active content (Edits)	Most active contributors (Edits)
1. <a href="#">Angry Nerds Home</a> (6)	1. <a href="#">Ideas for Angry Nerds 2 - revenge of the...</a> (2)	1. <a href="#">Josh User</a> (5)
2. <a href="#">Which nerd are you?</a> (3)	2. <a href="#">Why I loved Angry Nerds</a> (1)	2. <a href="#">Ewan User</a> (3)
3. <a href="#">Step 1 - download the game</a> (2)	3. <a href="#">Which nerd are you?</a> (1)	3. <a href="#">Rach Admin</a> (1)
4. <a href="#">Why I loved Angry Nerds</a> (2)	4. <a href="#">Step 2 - Play</a> (1)	
5. <a href="#">Step 2 - Play</a> (2)	5. <a href="#">Status update</a> (1)	
6. <a href="#">Ideas for Angry Nerds 2 - revenge of the...</a> (2)	6. <a href="#">Games as a communication medium</a> (1)	
7. <a href="#">Status update</a> (1)		
8. <a href="#">Games as a communication medium</a> (1)		

#### Notes

- To view Space Activity the **Confluence Usage Stats** system plugin must be enabled. This plugin is known to cause performance problems on large installations and in Confluence Cloud, and is **disabled by default**. System administrators can enable this plugin (go to **add-ons**, select **System add-ons** and search for 'Confluence Usage Stats').
- The plugin collects data only when it's activated.
- If you're using [Confluence Data Center](#), space activity information isn't available.
- Page hits aren't unique - the graph on the Space Activity screen includes all page hits, including multiple visits by the same user.

#### Viewing Site Statistics

Note that the site activity information is **disabled by default**. See notes [below](#).

If enabled, the global activity screen displays statistics on the activity in your Confluence site. These include:

- How many pages and blog posts have been viewed, added or updated over a given period.
- Which spaces are the most popular (most frequently viewed).
- Which spaces are the most active (most frequently edited).

#### Related pages:

- [How do I get more statistics from Confluence?](#)
- [Cache Statistics](#)
- [View Space Activity](#)
- [Live Monitoring Using the JMX Interface](#)

- Which people are the most active contributors/editors of content.

**To view the activity on your site:**

1. Choose the **cog icon**



, then choose **General Configuration** under Confluence Administration

2. Choose '**Global Activity**' in the 'Administration' section of the left-hand panel (only appears if enabled - see [below](#)).

*Screenshot: Global Activity*

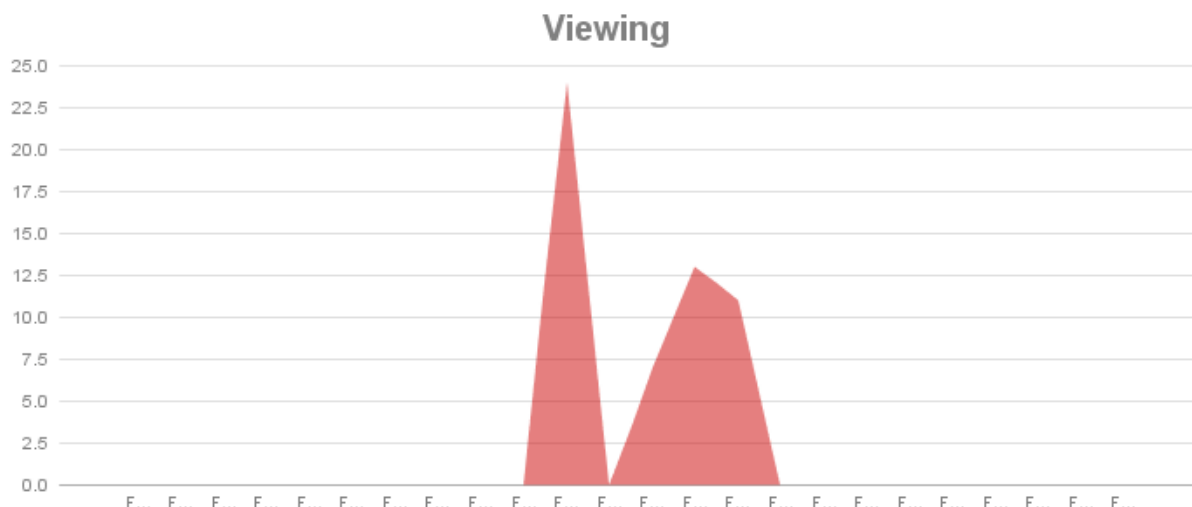


## Global Activity

Activity for 15 February 2013

Period: [month](#) | [week](#) | [day](#)

Day: [<< Previous](#) | [Now](#) | [Next >>](#)



This graph shows how many times pages and blog posts have been viewed over the current time period.



This graph shows how many pages, blog posts and comments have been created or updated over the current time period.

#### Most popular spaces (Views)

1. Angry Nerds (39)
2. Documentation (8)
3. Sample Space (6)
4. Stars (1)
5. Josh User (1)

#### Most active spaces (Edits)

1. Angry Nerds (16)
2. Documentation (4)
3. Sample Space (2)


#### Most active contributors (Edits)

1. Rach Admin (8)
2. Josh User (7)
3. Sophie Staunton (4)
4. Ewan User (3)

The top ten most popular and most active pages and/or blog posts will be listed, with a link to each.

#### Notes

- The [Confluence Usage Stats plugin](#), which provides the 'Global Activity' screen, is known to cause performance problems on large installations. This plugin is **disabled by default**. A status report on the progress of the performance issues with this plugin is available in this issue:

 **USGTRK-15** - [Authenticate](#) to see issue details .

- Your Confluence system administrator can enable the plugin, but please be aware of the possible impact upon your site's performance.
- The plugin is sometimes called 'Confluence Usage Tracking'.
- If your Confluence site is clustered, the global activity information will not be available.

## Viewing System Properties

After adding memory, setting a proxy, or changing other Java options, it can be difficult to diagnose whether the system has picked them up. This page tells you how to view the system properties that your Confluence site is using.

You can see the expanded system properties on the 'System Information' screen of the Confluence Administration Console. You do not need to restart Confluence before viewing the information.

To see the system properties recognized by your Confluence installation:

1. Choose the **cog icon**



, then choose **General Configuration** under Confluence Administration

2. Choose **System Information** in the left-hand panel.
3. Scroll down to the section titled **System Properties**.

## Configuring the Server Base URL

The **Server Base URL** is the URL via which users access Confluence. The base URL **must** be set to the same URL by which browsers will be viewing your Confluence site.

Confluence will automatically detect the base URL during setup, but you may need to set it manually if your site's URL changes or if you set up Confluence from a different URL to the one that will be used to access it publicly.

You need to have [System Administrator](#) permissions in order to perform this function.

### To configure the Server Base URL:

1. Choose the **cog icon**



, then choose **General Configuration** under Confluence Administration

2. Choose **General Configuration** in the left-hand panel
3. Choose **Edit**
4. Enter the new URL in the **Server Base URL** text box
5. Choose **Save**

## Example

If Confluence is installed to run in a non-root context path (that is, it has a context path), then the server base URL should include this context path. For example, if Confluence is running at:

```
http://www.foobar.com/confluence
```

then the server base URL should be:

```
http://www.foobar.com/confluence
```

## Notes

- **Using different URLs.** If you configure a different base URL or if visitors use some other URL to access Confluence, it is possible that you may encounter errors while viewing some pages.
- **Changing the context path.** If you change the context path of your base URL, you also need to make these changes:
  1. Stop Confluence.
  2. Go to the Confluence installation directory and edit `<installation-directory>\conf\server.xml`.
  3. Change the value of the `path` attribute in the `Context` element to reflect the context path. For example, if Confluence is running at `http://www.foobar.com/confluence`, then your `path` attribute should look like this:

```
<context path="/confluence" docBase="../confluence" debug="0"
reloadable="false" useHttpOnly="true">
```

4. Save the file.
5. Go to the Confluence home directory and edit `<confluence-home>\confluence.cfg.xml`

Change the value of the `confluence.webapp.context.path` to reflect the new context path. For example if Confluence is running at `http://www.foobar.com/confluence` your property would look like this:

```
<property
name="confluence.webapp.context.path">/confluence</property>
```

6. Save the file.
  7. Restart Confluence.
- **Proxies.** If you are running behind a proxy, ensure that the proxy name matches the base URL. For example: `proxyName="foobar.com" proxyPort="443" scheme="https"`. This will make sure we are passing the information correctly.
  - This information needs to be added in the `Connector` element at `{CONFLUENCE_INSTALLATION}\conf\server.xml`.

## Configuring the Confluence Search and Index

Confluence administrators can adjust the behavior of the Confluence search, and manage the index used by the search.

- [Configuring Indexing Language](#)
- [Configuring Quick Navigation](#)
- [Content Index Administration](#)
- [Enabling OpenSearch](#)
- [Rebuilding the Ancestor Table](#)
- [Setting Up Confluence to Index External Sites](#)
- [Setting Up an External Search Tool to Index Confluence](#)

### Related pages:

- [Search](#)
- [Confluence Administrator's Guide](#)


## Configuring Indexing Language

Changing the indexing language defined in Confluence may improve the accuracy of Confluence search results, if the majority of the content of your site is in some language other than English. Confluence supports content indexing in English (default), German, Russian, Chinese, CJK, Custom Japanese, French, Portuguese, Czech and Greek.

### Related pages:

- [Choosing a Default Language](#)
- [Installing a Language Pack](#)
- [Content Index Administration](#)
- [How to Rebuild the Content Indexes From Scratch on Confluence Server](#)

**To configure the indexing language:**


1. Choose the **cog icon**  , then choose **General Configuration** under Confluence Administration
2. Choose **General Configuration** in the left-hand panel.
3. Choose **Edit**.
4. Select the **Indexing Language** from the dropdown list in the **Formatting and International Settings** section.
5. Choose **Save**.

**Configuring Quick Navigation**

When a user is searching Confluence (see [Searching Confluence](#)) the quick navigation aid automatically offers a dropdown list of pages and other items, matched by title to the search query. By default, this feature is enabled, with the maximum number of simultaneous quick navigation requests set to 40. These options can be modified as described below.

The maximum number of simultaneous quick navigation requests defines the maximum number of individuals who can use this feature simultaneously on the same Confluence server. If your Confluence server serves a large number of individuals who use this feature regularly, some of whom are being denied access to it, you may wish to increase this value.

To configure quick navigation:

1. Choose the **cog icon**  , then choose **General Configuration** under Confluence Administration
2. Choose **Further Configuration** in the left-hand panel.
3. Choose **Edit**.
4. To disable Quick Navigation, deselect the **Quick Navigation** checkbox.
5. To modify the maximum number of simultaneous quick navigation requests, enter the appropriate number in the field beside **Max Simultaneous Requests**.
6. Choose **Save**.

**Related pages:**

- [Search](#)

**Content Index Administration**

The content index, also called the search index, supports Confluence's search functionality. It is also used for a number of related functions such as building email threads in the mail archive, the [space activity](#) feature, and lists of recently-updated content. The [Gliffy plugin](#) also uses the index for some of its functionality.

For reasons of efficiency, Confluence does not immediately add content to the index. New and modified Confluence content is first placed in a queue and the queue is processed once every five seconds (by default).

[Viewing the content index summary](#)

**To see information about your Confluence site's content indexing:**

1. Choose the **cog icon**

**On this page:**

- [Viewing the content index summary](#)
- [Rebuilding the search index](#)
- [The 'Did You Mean' index is no longer relevant](#)
- [Slow reindexing](#)
- [Viewing the index browser](#)
- [More hints and tips](#)

**Related pages:**

- [Scheduled Jobs](#)
- [Search](#)
- [Configuring the Confluence Search and Index](#)



- , then choose **General Configuration** under Confluence Administration
2. Choose '**Content Indexing**' under the heading '**Administration**' in the left-hand panel.

Screenshot: Index summary

## Search Index

The search index allows searching of Confluence content. If you are having troubles with search, you may need to rebuild the search index. Please note, rebuilding the search index can severely affect the performance of your instance - it can take hours for some large instances.

**BUILT**

100%

Rebuild

## Did You Mean Index

You will need to build this index to make "Did You Mean" work. After this has finished, "Did You Mean" will be automatically turned on. **Please note, this feature only provides suggestions for the English language.**

**NOT BUILT**


0%

Build

### Rebuilding the search index

The search index is maintained automatically, but you may need to rebuild it manually if your searching and mail threading are malfunctioning, or if directed to in the upgrade notes for a new version.

#### To rebuild the search index:

1. Choose the **cog icon**  
  
, then choose **General Configuration** under Confluence Administration
2. Choose '**Content Indexing**' under the heading '**Administration**' in the left-hand panel.
3. Choose the '**Rebuild**' button in either the 'Search Index' section.  
(If the indexes have never been built, its button will indicate 'Build' instead of 'Rebuild.')

Screenshot: Content indexing

## Search Index

The search index allows searching of Confluence content. If you are having troubles with search, you may need to rebuild the search index. Please note, rebuilding the search index can severely affect the performance of your instance - it can take hours for some large instances.

IN PROGRESS...

0% (Elapsed Time: 00:00:00)

Rebuild

## Did You Mean Index

You will need to build this index to make "Did You Mean" work. After this has finished, "Did You Mean" will be automatically turned on. Please note, this feature only provides suggestions for the English language

**'Did You Mean' index build temporarily disabled while Search Index build is in progress.**

NOT BUILT

0%

### The 'Did You Mean' index is no longer relevant

The 'Did You Mean' feature is no longer available in Confluence. This index is therefore redundant, and will be removed at some time in the future.

### Slow reindexing

Does the reindexing take a long time to complete? The length of time depends on the following factors:

- Number of pages in your Confluence instance.
- Number, type and size of attachments.
- Amount of memory allocated to Confluence.
- Disk throughput.

It may help to increase the heap memory allocation of Confluence by following the instructions here [Increasing Jira application memory](#). The process is basically the same for Confluence or Jira applications.

If you are running an older version of Confluence and find that the index rebuild is not progressing, you may need to shut down Confluence, and restart it with the following *Java system property* set: `bucket.indexing.threads.fixed=1`. This will cause the re-indexing to happen in a single thread and be much more stable (but slower).


### Viewing the index browser

Confluence uses a search engine called Lucene. If you need to see more details of the indexed pages in your Confluence site, you can download and run [Luke](#). Luke is a development and diagnostic tool that accesses existing Lucene indexes and allows you to display and modify their content in several ways.

Start Luke and use it to open the `index` directory, located in your [Confluence Home directory](#). For example: `c:\confluence\data\confluence-home\index`.

**Note:** Confluence 5.2 (and later) use Lucene 4.3 (or later). If the [Luke](#) library has not been updated to support the latest version of Lucene, you can compile Luke yourself, from the [fork on Github](#) – please read the warnings and notes in the README file of that repository.

### More hints and tips

- If you are still experiencing problems after performing the above rebuild, the next step might be to [remove the index and rebuild it from scratch](#).
-  The [space activity](#) feature uses the index to store data. If you remove the index file, the existing activity data will disappear.
- A tip for the development community: If you have the Confluence source, you can look for references to the SmartListManager to find the screens and lists that rely on the content index.


## Enabling OpenSearch

With OpenSearch autodiscovery, you can add Confluence search to your Firefox or IE7 search box (see [Searching Confluence from your Browser's Search Box](#)). By default, OpenSearch autodiscovery is enabled. This feature can be enabled or disabled as described below.

### Related pages:

- [Search](#)
- [Confluence Administrator's Guide](#)

### To enable or disable OpenSearch autodiscovery:


1. Choose the **cog icon** , then choose **General Configuration** under Confluence Administration
2. Choose **Further Configuration** in the left-hand panel.
3. Choose **Edit**.
4. Select the **Open Search** checkbox to enable this feature (deselect to disable).
5. Choose **Save**.

## Rebuilding the Ancestor Table

The `ancestor` table records the parent and descendant (child) relationship between pages. It is also used when determining whether a page will inherit view restrictions from a parent page.

Occasionally records in the ancestor table can become corrupted. When this happens you will need to rebuild the ancestor table.

To rebuild the ancestor table:

1. Back up your database.
2. Use the following URL to access the **Page Level Permissions** page  
`<your-site>/admin/permissions/pagepermsadmin.action`
3. Choose **Rebuild ancestor table**.
4. Go to  **> General Configuration > Cache Management**.
5. Flush the **Inherited Content Permissions** cache.

You may also need to [rebuild the content index](#) so that the permissions take effect in search results.

This process takes about ten minutes for an average size site, and you may not be able to save new content during this time. **We recommend you take a full backup of your database and complete this process during a maintenance window.**

## Setting Up Confluence to Index External Sites

Confluence cannot easily index external sites, due to the way [Lucene](#) search works in Confluence, but there are two alternatives:

1. [Embed External Pages Into Confluence](#)
2. [Replace Confluence Search](#)

### Related pages:

- [Setting Up an External Search Tool to Index Confluence](#)
- [Configuring the Confluence Search and Index](#)

### [Embedding external pages into Confluence](#)

If you only have a small number of external sites to index, you may prefer to enable the [HTML-include Macro](#) and use it to embed the external content inside normal Confluence pages.



### Replacing the Confluence search

Use your own programmer resources to replace Confluence's internal search with a crawler that indexes both Confluence and external sites. This advanced option is easier than modifying the internal search engine. It requires removing Confluence internal search from all pages and replacing the internal results page with your own crawler front-end.

1. Setup a replacement federated search engine to index the Confluence site, as well as your other sites, and provide the results that way. You would need to host a web crawler, such as these [open-source crawlers](#). Note that you can perform a search in Confluence via the [Confluence API](#).
2. Replace references to the internal search by [modifying the site layout](#) so that it links to your search front-end
3. Host another site containing the search front-end. You may wish to insert it into a suitable context path in your application server so that it appears to be from a path under Confluence. Tomcat sets Confluence's paths from the Confluence install\confluence\WEBINF\web.xml file.

### Setting Up an External Search Tool to Index Confluence

Any web crawler can be configured to index Confluence content. If a login is required to view content that will be indexed, you should create a Confluence user specifically for the search crawler to use. Grant this user view rights to all content you wish to index, but deny that user all delete and administration rights. This ensures that an aggressive crawler will not be able to perform actions that could modify the site.

External applications can also use the search function in the [Confluence APIs](#).

#### Related pages:

- [Setting Up Confluence to Index External Sites](#)
- [Configuring the Confluence Search and Index](#)

### Configuring Mail

- [Configuring a Server for Outgoing Mail](#)
- [Setting Up a Mail Session for the Confluence Distribution](#)
- [Configuring the Recommended Updates Email Notification](#)
- [The Mail Queue](#)
- [Customizing Email Templates](#)

#### Configuring a Server for Outgoing Mail

Configuring your Confluence server to send email messages allows your Confluence users to:


- [Receive emailed notifications and daily reports of updates.](#)
- [Send a page via email.](#)

You can personalize email notifications by configuring the 'From' field to include the name and email address of the Confluence user who made the change.

You need [System Administrator](#) permissions in order to configure Confluence's email server settings.

#### Configuring Confluence to send email messages

To configure Confluence to send outgoing mail:

1. Go to  **> General Configuration > Mail Servers**. This will list all currently configured SMTP servers.
2. Click **Add New SMTP Server** (or **edit** an existing server).

#### On this page:

- [Configuring Confluence to send email messages](#)
- [Testing the email settings](#)

#### Related pages:

- [The Mail Queue](#)
- [Setting Up a Mail Session for the Confluence Distribution](#)

## 3. Edit the following fields as required:

- **Name:** By default, this is simply 'SMTP Server'.
- **From Address:** Enter the email address that will be displayed in the 'from' field for email messages originating from this server.  
This field is mandatory. This must be an ordinary email address, you can't enter variables in this field.
- **From Name:** Enter the name that will be displayed in the 'from' field for email messages originating from this server. This is the text which appears before the user's registered email address (in square brackets).  
This field accepts the following variables, which reference specific details defined in the relevant Confluence user's profile:

Variable	Description
<code>\${fullname}</code>	The user's full name.
<code>\${email}</code>	The user's email address.
<code>\${email.hostname}</code>	The domain/host name component of the user's email address.

The default is `'${fullname} (Confluence)'`.

Hence, if Joe Bloggs made a change to a page he was watching and the Confluence site's 'From Address' was set to `confluence-administrator@example-company.com`, then the 'From' field in his email notification would be: Joe Bloggs (Confluence)  
`<confluence-administrator@example-company.com>`.

- **Subject Prefix:** Enter some text to appear at the beginning of the subject line.

4. Enter your **Hostname**, **Port**, **User name** and **Password** details.

If your SMTP host uses the Transport Layer Security (TLS) protocol select **Use TLS**.

**OR**

Specify the **JNDI location** of a mail session configured in your application server. For more information on how to set up a JNDI mail session, see [Setting Up a Mail Session for the Confluence Distribution](#).

### Testing the email settings

A Confluence administrator can test the email server as follows:

1. Set up a mail server as described above.
2. Click **Send Test Email** to check that the server is working. Check that you get the test email in your inbox.
3. You can flush the email queue to send the email message immediately. Go to **Mail Queue**, and click **Flush Mail Queue**. See [The Mail Queue](#).

A user can test that notifications are working as follows:

1. Go to your user profile (using the **Settings** link) and edit your email preferences. See [Email Notifications](#).
2. Enable **Notify On My Actions**. (By default, Confluence does not send you notifications for your own changes.)
3. Go to a page you wish to get notifications about.
4. Choose **Watch** at the top-right of the page. See [Watch Pages, Spaces and Blogs](#).
5. Edit the page, make a change, and save the page.
6. Check your email inbox. You may need to wait a while for the email message to arrive.

### Setting Up a Mail Session for the Confluence Distribution


The simplest way to set up a mail server through the Confluence Administration console. See [Configuring a Server for Outgoing Mail](#).

If you want to add different options or parameters you can also set up a mail session for the Confluence distribution. In the example below we'll set up Gmail.

To set up a mail session for the Confluence distribution:

1. Stop Confluence.
2. Move (don't copy) mail-x.x.x.jar from <confluence-install>\confluence\WEB-INF\lib to <confluence-install>\lib (x.x.x. represents the version numbers on the jar files in your installation).  
Don't leave a renamed backup of the jar files in \confluence\WEB-INF\lib. Even with a different file name, the files will still be loaded as long as it remains in the directory.
3. Edit the <confluence-install>\conf\server.xml file and add the following at the end of the Confluence <context> tag, just before </Context>.  
Note: you're editing the <context> tag that contains the *Confluence* context path, not the one that contains the *Synchrony* context path.

```
<Resource name="mail/GmailSMTPServer"
  auth="Container"
  type="javax.mail.Session"
  mail.smtp.host="smtp.gmail.com"
  mail.smtp.port="465"
  mail.smtp.auth="true"
  mail.smtp.user="yourEmailAddress@gmail.com"
  password="yourPassword"
  mail.smtp.starttls.enable="true"
  mail.transport.protocol="smtps"
  mail.smtp.socketFactory.class="javax.net.ssl.SSLSocketFactory"
/>
```

4. Restart Confluence.
5. Go to  **> General Configuration > Mail Servers.**
6. Choose either **Edit an existing configuration**, or **Add a new SMTP mail server**.
7. Edit the server settings as necessary, and set the **JNDI Location** as:

```
java:comp/env/mail/GmailSMTPServer
```

Note that the JNDI Location is case sensitive and must match the resource name specified in server.xml.

8. Save your changes and send a test email.

## Configuring the Recommended Updates Email Notification

Confluence sends a regular email report to subscribers, containing the top content that is relevant to the person receiving the message, from spaces they have permission to view. This is called the 'Recommended Updates' notification.

If you have Confluence Administrator or System Administrator [permissions](#), you can configure the default settings that determine how often the Recommended Updates notification is sent. When new users are added to Confluence, the default settings will be applied to their user profiles.

Confluence users can choose their personal settings, which will override the defaults. See [Email Notifications](#).

### Initial settings of the defaults

When you install Confluence, the initial values of the default settings are as follows:

- The default frequency is weekly.

- If your Confluence site has public signup enabled, the Recommended Updates notification is disabled by default. If public signup is not enabled, the notification is enabled by default.

You can change the above settings, specifying a different default value for the site.

#### Notes:

- The Recommended Updates notification is sent only to people who have a user profile in Confluence. If your Confluence site uses external user management, such as LDAP, then people will receive the report only after they have logged in for the first time. (The first login creates their user profile.)
- The daily email message is sent at 1 p.m. in the user's configured time zone.
- The weekly email message is sent at 1 p.m. on Thursdays in the user's configured time zone.

#### On this page:

- [Initial settings of the defaults](#)
- [Configuring the Recommended Updates notification](#)
- [Disabling the Recommended Updates notification for the entire site](#)

#### Related pages:

- [Email Notifications](#)

## Configuring the Recommended Updates notification

You can set the default send option (send / do not send) and the default schedule (daily or weekly).

### To configure the Recommended Updates email notification:

1. Choose the **cog icon**



, then choose **General Configuration** under Confluence Administration

2. Click **Recommended Updates Email** in the left-hand panel.

### Disabling the Recommended Updates notification for the entire site

You can also turn off the **recommended updates** notification for the entire site, by disabling the 'Confluence daily summary email' plugin. See [Disabling and enabling add-ons](#).

## The Mail Queue

Email messages waiting to be sent are queued in a mail queue and periodically flushed from Confluence once a minute. A Confluence administrator can also manually flush messages from the mail queue.

If there is an error sending messages, the failed email messages are sent to an error queue from which you can either try to resend them or delete them.

### To view the mail queue:

1. Choose the **cog icon**




, then choose **General Configuration** under Confluence Administration

2. Choose **Mail Queue** in the left-hand panel. This will display the email messages currently in the queue.
3. Choose **Flush Mail Queue** to send all email messages immediately.
4. Choose **Error Queue** to view failed email messages. You can try to **Resend** the messages, which will flush the mails back to the mail queue, or you can **Delete** them from here.

**Related pages:**

- [Configuring a Server for Outgoing Mail](#)
- [Setting Up a Mail Session for the Confluence Distribution](#)

 *The information on this page does not apply to Confluence Cloud.*

## Configuring Character Encoding

Confluence and your database must be configured to use the same character encoding. To avoid problems with character encoding **always set all character encodings to UTF-8** (or the equivalent for your database, for example, AL32UTF8 for Oracle databases).

**On this page:**

- [Configuring Confluence character encoding](#)
- [Database character encoding](#)
- [Problems with character encodings](#)

**Related pages:**


- [Configuring Database Character Encoding](#)

### Configuring Confluence character encoding

By default, Confluence uses UTF-8 character encoding. Confluence has a number of checks in place to make sure your database is also using UTF-8 (or equivalent for your database).

While it is possible to change the character encoding, it is **not recommended**. Changing the Confluence character encoding will change your HTTP request and response encoding and your filesystem encoding as used by exports and Velocity templates. You may also be prevented from restarting or upgrading Confluence, depending on your database.

To change the Confluence character encoding (not recommended):

1. Go to  > **General Configuration** and choose **Edit**
2. Enter the new character encoding of your choice in the text box next to **Encoding** then **Save**.

### Database character encoding

Your database, and the JDBC or datasource connection to it, must be configured to use UTF-8 (or the equivalent for your database, for example, AL32UTF8 for Oracle databases). There are a number of checks in place to warn you if your database character encoding is incorrect.

See [Configuring Database Character Encoding](#) for more information.

### Problems with character encodings

See [Troubleshooting Character Encodings](#) to find out how to test your character encoding.

## Troubleshooting Character Encodings

If character encoding is not configured correctly in your Confluence site, you may experience problems like:

- Non-ASCII characters appearing as question marks (?)
- Page links with non-ASCII characters not working
- Single characters being displayed as two characters
- Garbled text appearing

To diagnose the problem, follow these steps.

### 1. Run the encoding test

Confluence includes an encoding test that can reveal problems with your configuration. You'll need to be a Confluence admin to do this.

1. Head to **<your-confluence-url>/admin/encodingtest.action**
2. Follow the prompts to paste a line of text and start the test. You can also paste text in a specific language, for example Japanese, if you're experiencing a particular problem with that language.

If the text displayed in the encoding test is different to what you entered, then there are problems with your character encoding settings. Here's what a successful test looks like.

### Character Encoding Test Results

The encoding test has now been run. Below, you can compare the raw text delivered from Confluence against the text returned by your browser in web forms, and the text as it appears after a round-trip through the database. All the test results should appear identical.

**Intërnätiónälizætïön** This image is how the sample text below *should* appear. If it does not, please file a support request at <http://support.atlassian.com>, including a screenshot of this page, and all of your [System Information](#).

**Test 1: Raw text**

This is the test string generated in Confluence

Intërnätiónälizætïön

**Test 2: Form submission**

This is the test string pasted by you into the web form and submitted back to Confluence

Intërnätiónälizætïön

**Test 3: Database round-trip (select as lower-case)**

This is the string from Test 2 after being stored in the database and then retrieved as lower-case

intërnätiónälizætïön

Expected result (converting Java string to lowercase)

intërnätiónälizætïön

**Test 4: Database round-trip (select as upper-case)**

This is the string from Test 2 after being stored in the database and then retrieved as upper-case

Intërnätiónälizætïön

Expected result (converting Java string to uppercase)

Intërnätiónälizætïön

**Test 5: International file name support**

Try to write a file to the confluence home directory with the test string as the file name

✓ File was written successfully

**Test 6: Detect international file name mangling**

Detect whether the file system is mangling the file name when it is saved

✓ The file name has been preserved

### 2. Use the same encoding for your database

Your database and Confluence must use the same character encoding. See [Configuring Database Character Encoding](#) for more information.

### 3. Get help

If you're still having problems with character encoding, [create a support request](#), and our support team will help you solve the problem.

Include the following details to help us identify your problem:

- screenshots of the problem occurring
- results of the encoding test
- information about your database (including version)
- A copy of the information on your [System Information](#) page.

#### "€" Euro character not displaying properly

The € (euro) symbol is a three byte character, with byte values in file (UTF-8) of 0xE2, 0x82, 0xAC.

Sometimes, if the character encoding is not set consistently among all participating entities of the system, Confluence, server and the database, one may experience strange behavior.

...

I write a page with a Euro sign in it (€). All is well, the Euro sign shows up in the wiki markup text-box, and the preview, and the display of the saved page.

One day later, the Euro sign has changed into a question mark upside down!



...

What is going on? Why does the Euro sign mysteriously change? How do I prevent it?

Interestingly enough the character encoding test passes with no problems, demonstrating that Confluence and the connected Database both recognize the € symbol.

There are two potential reasons for this behavior:

*Database and Confluence is using utf-8 encoding. The connection is not.*

When data transferred to it via the connection which does not use utf-8 encoding gets encoded incorrectly. Hence, updating the connection encoding may resolve this problem from now on, yet it probably would not affect already existing data.

*Database is not using utf-8. Confluence and your connection are.*

If your Database encoding is not set to UTF-8, yet is using some other encoding such as *latin1*, it could be one of the potential reasons why you lose the "€" characters at some stage. It could be occurring due to **caching**. When Confluence saves data to the database, it may also keep a local cached copy. If the database encoding is set incorrectly, the Euro character may not be correctly recorded in the database, but Confluence will continue to use its cached copy of that data (which is encoded correctly). The encoding error will only be noticed when the cache expires, and the incorrectly encoded data is fetched from the database.

For instance the *latin1* encoding would store and display all 2-byte UTF8 characters correctly except for the euro character which is replaced by '?' before being stored. As Confluence's encoding was set to UTF-8, the 2-byte UTF-8 characters were stored in *latin1* database assuming that they were two *latin1* different characters, instead of one utf8 character. Nevertheless, this is not the case for 3-byte utf8 characters, such as the Euro symbol.

Please ensure that you set the character encoding to UTF-8 for all the entities of your system as advised in this [guide](#).

### MySQL 3.x Character Encoding Problems

MySQL 3.x is known to have some problems upper- and lower-casing certain (non-ASCII) characters.

#### Diagnosing the problem

1. Follow the instructions for [Troubleshooting Character Encodings](#).
2. If the upper- and lower-cased strings displayed on the Encoding Test are different, then your database is probably affected.

An example (faulty) output of the Encoding Test is shown below:

*Screenshot: Encoding Test Output (excerpt)*

**Test 4: Database round-trip (select as upper-case)**

**This is the string from Test 2 after being stored in the database and then retrieved as upper-case**

**INtERNAtIÖNÄLIZæTIOÑ ←**

**Expected result (converting Java string to uppercase)**

**INtERNAtIÖNÄLIZæTIOÑ**

#### Solution

Upgrade to a newer version of MySQL. (4.1 is confirmed to work.)

#### Other Settings

- [Configuring a WebDAV client for Confluence](#)
- [Configuring HTTP Timeout Settings](#)
- [Configuring Number Formats](#)
- [Configuring Shortcut Links](#)
- [Configuring Time and Date Formats](#)
- [Enabling the Remote API](#)



- [Enabling Threaded Comments](#)
- [Installing a Language Pack](#)
- [Installing Patched Class Files](#)

## Configuring a WebDAV client for Confluence

WebDAV allows users to access Confluence content via a WebDAV client, such as 'My Network Places' in Microsoft Windows. Provided that the user has permission, they will be able to read and write to spaces, pages and attachments in Confluence. Users will be asked to log in and the standard Confluence content access permissions will apply to the equivalent content available through the WebDAV client.

Mapping a Confluence WebDAV network drive requires a set of specific criteria to be met. For specific information, please see [Windows Network Drive Requirements](#).

### Introduction to Confluence's WebDAV Client Integration

By default, all WebDAV clients have permission to write to Confluence. Write permissions include the ability for a WebDAV client to create, edit, move or delete content associated with spaces, pages and attachments in a Confluence installation.

On the '**WebDAV Configuration**' screen in the Confluence Administration Console, you can:

- [Deny a WebDAV client write permissions to a Confluence installation](#) using a regular expression (regex)
- [Disable or enable strict path checking](#)
- [Enable or disable access to specific virtual files/folders](#)

#### Note:

- The 'WebDav Configuration' page is only available if the WebDAV plugin has been enabled. This plugin is bundled with Confluence, and can be enabled or disabled by the System Administrator.
- The settings on the 'WebDav Configuration' page **do not apply** to external attachment storage configuration.

### Using a WebDAV Client to Work with Pages

The following sections tell you how to set up a WebDAV client natively for a range of different operating systems. WebDAV clients typically appear as drives in your operating system's file browser application, such as Windows Explorer in Microsoft Windows, or Konqueror in Linux.

#### Accessing Confluence in Finder on Mac OSX

You can successfully connect but you can't see content when using HTTPS, so this technique won't work for Confluence Cloud. Use a third-party WebDAV client instead.

To use Finder to view and manage Confluence content:

1. In Finder choose **Go > Connect to Server**
2. Enter your Confluence URL in this format:

#### On this page:

- [Introduction to Confluence's WebDAV Client Integration](#)
- [Using a WebDAV Client to Work with Pages](#)
- [Restricting WebDAV Client Write Access to Confluence](#)
- [Disabling Strict Path Checking](#)
- [Virtual Files and Folders](#)

#### Related pages:

- [Global Permissions Overview](#)
- [Disabling and enabling add-ons](#)
- [Disabling or Enabling Confluence Add-ons](#)
- [Attachment Storage Configuration](#)

```
http://<confluenceURL>/plugins/servlet/confluence/default
```

For example if your Confluence URL is <http://ourconfluence.atlassian.net/wiki> you would enter:

```
http://ourconfluence.atlassian.net/wiki/plugins/servlet/confluence/default
```

3. Enter your **Confluence** username and password and click **Connect**

Use your username (jsmith), not your email address, unless your email address is your username.

Confluence will appear as a shared drive in Finder. You can use the same URL to connect using a third party WebDAV client, like CyberDuck.

#### *Accessing Confluence in Explorer in Microsoft Windows*

This section covers the two methods for configuring a WebDAV client natively in Microsoft Windows:

- As a network drive
- As a web folder

If possible, use the network drive method as this will enable more comprehensive WebDAV client interaction with Confluence than that provided by a web folder. However, your Confluence instance must meet several environmental constraints if you use this method. If you cannot configure your instance to meet these requirements, then use the web folder method or third-party WebDAV client software.

If you're using SSL you may need to add @SSL to the end of your server URL, for example:

```
http://<confluence server url>@SSL/confluence/plugins/servlet/confluence/default
```

If you run into any problems with the procedures in this section, please refer to the [WebDAV Troubleshooting](#) page.

#### **Windows Network Drive**

To map a Confluence WebDAV client network drive, your Confluence instance must be configured so that *all* of the following criteria is met:

- Has no context root
- There's an issue that can prevent Network Drives from being mapped. Please use the Network Folders steps below as a workaround.

The reason for these restrictions results from limitations in Microsoft's Mini-Redirector component. For more information, please refer to Microsoft's [server discovery issue](#).

#### **To map a Confluence WebDAV client network drive in Microsoft Windows:**

1. In Windows XP, go to **My Computer**→**Tools menu**→**Map Network Drive**  
In Windows Vista, go to **Computer**→**Map Network Drive**
2. Specify the following input to map the WebDAV client as a network drive:
  - **Drive:**<Any drive letter> (for example, Z:)
  - **Folder:**\\<hostname>\webdav (for example, \\localhost\webdav)
3. Click **Finish**

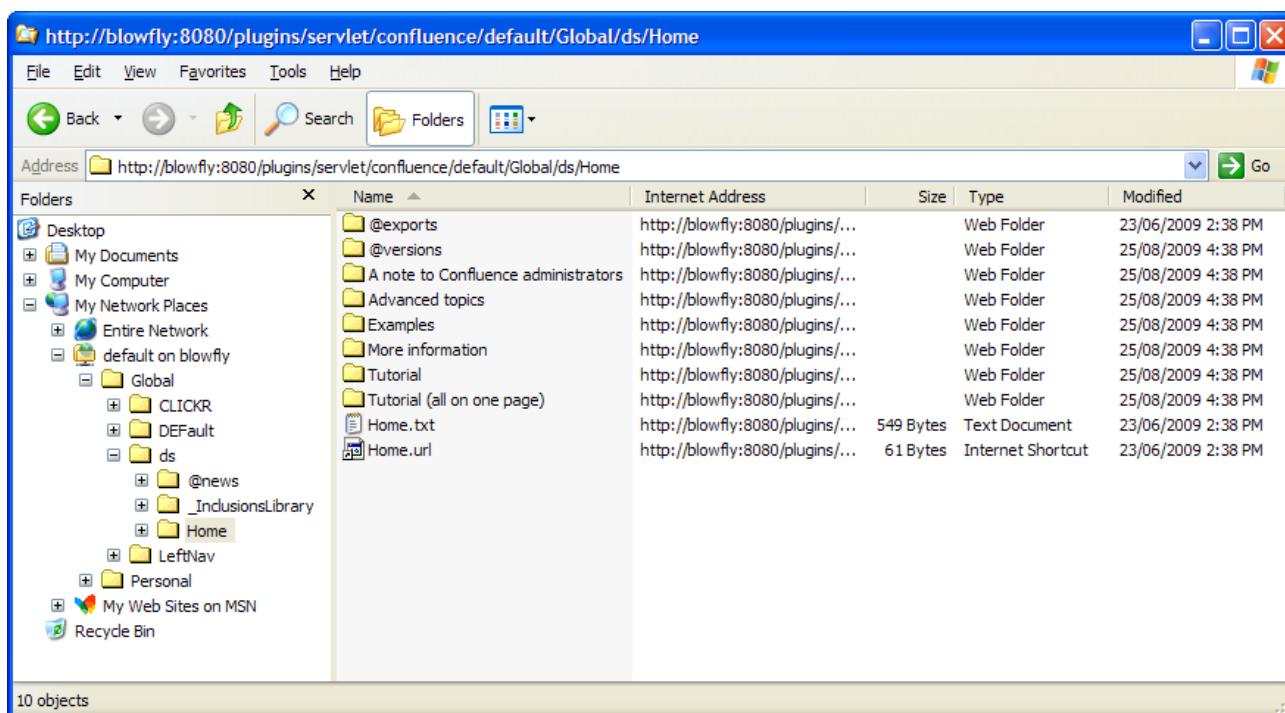
When prompted for login credentials, specify your Confluence username and password.

#### Windows Web Folder

#### To map a Confluence WebDAV client web folder in Windows XP:

1. Go to **My Network Places** and choose **Add a network place** and click **Next**
2. Ensure that **Choose another network location** is selected and click **Next** again
3. In the 'Internet or network address' field, enter the URL for the Confluence WebDAV location (for example, `http://<confluence server url>/confluence/plugins/servlet/confluence/default` or `http://<confluence server url>/plugins/servlet/confluence/default`) and click **Next**
4. Enter your Confluence username and password
5. Provide a meaningful name for your web folder and proceed with the wizard
6. Click **Finish**

*Screenshot: A Confluence WebDAV Client Web Folder in Windows XP*



#### To map a Confluence WebDAV client web folder in Windows Vista:

This procedure is very similar to the one for Windows XP. However, the following procedure includes the slight interface differences that are specific to Windows Vista.

1. Open the 'Map Network Drive' dialog box (refer to first step of the procedure above for mapping a network drive) and choose **'Connect to a Web site that you can use to store your documents and pictures'**
2. Click **'Next'**
3. Ensure that **Choose a custom network location** is selected and click **Next** again
4. In the 'Internet or network address' field, enter the URL for the Confluence WebDAV location (for example, `http://<confluence server url>/confluence/plugins/servlet/confluence/default` or `http://<confluence server url>/plugins/servlet/confluence/default`) and then click **Next**
5. Enter your Confluence username and password
6. Provide a meaningful name for your network location/web folder and proceed with the wizard
7. Click **Finish**

#### Setting up a WebDAV client in Linux or Solaris

There are many tools and mechanisms available for configuring WebDAV clients in these operating systems.

Therefore, we have chosen to demonstrate this using the file manager [Konqueror](#), which is part of the Linux [K Desktop Environment](#).

### To set up a Confluence WebDAV client in Konqueror:

1. Open Konqueror
2. In the 'Location' field, enter the URL for the Confluence WebDAV location using the 'protocol' webdav s (for example, webdavs://<confluence server url>/confluence/plugins/servlet/confluence/default or webdavs://<confluence server url>/plugins/servlet/confluence/default) and press Enter.
3. Enter your Confluence username and password if prompted

You should be able to click to load many, but not all files. In practice, you would normally save a modified file locally, then drag it to the Konqueror window to upload it to Confluence.

### Restricting WebDAV Client Write Access to Confluence

In earlier versions of the WebDAV plugin, separate options for restricting a WebDAV client's write permissions (that is, create/move, edit and delete actions), were available. However, in the current version of this plugin, they have been simplified and combined into a general write permission restriction that covers all of these actions.


WebDAV clients are now denied write permission to your Confluence installation by setting a regex that matches specific content within the WebDAV client's user agent header. Upon setting a regex, it will be added to a list of restricted WebDAV clients. Any WebDAV clients whose user agent header matches a regex in this list will be denied write permission to your Confluence installation.

*Example: A PROPFIND method header generated by a Microsoft Web Folder WebDAV client, showing the user agent header field:*

```
PROPFIND /plugins/servlet/confluence/default HTTP/1.1
Content-Language: en-us
Accept-Language: en-us
Content-Type: text/xml
Translate: f
Depth: 1
Content-Length: 489
User-Agent: Microsoft Data Access Internet Publishing Provider DAV
Host: 127.0.0.1:8082
Connection: Keep-Alive
```

Unlike earlier versions of the WebDAV plugin, which could only restrict write permissions for **all** WebDAV clients, the current version of this plugin allows you to restrict write permissions to specific WebDAV clients.

### To restrict a WebDAV client's write access permissions to your Confluence installation:

1. Choose the **cog icon**  , then choose **General Configuration** under Confluence Administration
2. Choose '**WebDav Configuration**' in the left panel
3. Enter a regex that matches a specific component of the user agent header sent by the WebDAV client you want to restrict.
4. Click the '**Add new regex**' button  
Repeat steps 3 and 4 to add a regex for each additional WebDAV client you want to restrict.

### 5. Hit **Save**

**To restore one or more restricted WebDAV client's write access permissions to your Confluence installation:**

1. Choose the **cog icon**



, then choose **General Configuration** under Confluence Administration

2. Click **WebDav Configuration** under 'Configuration' in the left panel
3. Select the regex(es) from the list that match(es) the user agent header sent by the restricted WebDAV client(s) you want to restore
4. Click the **Remove selected regexes** button
5. Hit **Save**

*Screenshot: WebDAV configuration*

## WebDAV Configuration

### Denying Modifications From WebDAV Clients

You can deny certain WebDAV clients from writing to Confluence. To do that, please add a regular expression matching the clients [user agent](#) headers. For instance, "Microsoft.\*" will deny write operations by Microsoft WebDAV clients.

### Disable Strict Path Checking

Strict path checking is enabled by default to respect the file system heirarchy that the plugin exposes. Unfortunately, that can cause problems like [WBDV-175](#). The problem is related to corrupt page ancestor data and we recommend that users affected by the problem fix it by [rebuilding the ancestor table](#). If that does not fix the problem or if the approach can't be taken for any reason, users can disable the strict path checking here.

**Please note that disabling strict path checking may cause other problems with certain WebDAV clients.** This is a highly experimental workaround.

Disable strict path check : ☐

### Disabling Strict Path Checking

If you observe any idiosyncrasies with your WebDAV client, such as a folder that does exist on your Confluence site but is missing from the client, you can disable the WebDAV plugin's strict path checking option, which may minimize these problems.

**To disable the WebDAV plugin's strict path checking option:**

1. Choose the **cog icon**



, then choose **General Configuration** under Confluence Administration

2. Click **WebDav Configuration** under 'Configuration' in the left panel
3. Clear the 'Disable strict path check' check box
4. Hit **Save**

### Virtual Files and Folders

In the unlikely event that you have problems with the WebDAV client's performance or stability, you can enable access to automatically generated (that is, virtual) files and folders.

**Note:**

By default, these options are hidden on the 'WebDAV Configuration' page. To make them visible, append the parameter `?hiddenOptionsEnabled=true` to the end of your URL and reload the page. For example:

```
<Confluence base
URL>/admin/plugins/webdav/config.action?hiddenOptionsEnabled=true
```

*Screenshot: The Hidden Virtual Files and Folders Option*

.url	@exports	@versions
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Save

**To enable or disable access to virtual files and folders:**

1. Choose the **cog icon**



, then choose **General Configuration** under Confluence Administration

2. Click **WebDav Configuration** under 'Configuration' in the left panel
3. Amend your URL as described in the note above and reload the 'WebDav Configuration' page
4. Select or clear the check box options in the 'Virtual Files and Folders' section as required
5. Hit **Save**

## Configuring HTTP Timeout Settings

When macros such as the [RSS Macro](#) make HTTP requests to servers which are down, a long timeout value is used. You can set this timeout value through a system parameter to avoid this.

**To configure the HTTP Timeout Settings:**

1. Choose the **cog icon**



, then choose **General Configuration** under Confluence Administration

2. Select '**General Configuration**' under the 'Configuration' heading in the left-hand panel.
3. Find the '**Connection Timeouts**' section in the lower portion of the screen.
4. Click '**Edit**' to adjust the settings:
  - **Adjust External connections enabled:** This setting allows system administrators to disable external connections so macros like the [RSS Macro](#) won't be allowed to make connections to an external server. It provides protection against external servers providing insecure HTML, timing out or causing performance problems. The default setting is 'true'.
  - **Connection Timeout (milliseconds):** Sets the maximum time for a connection to be established. A value of zero means the timeout is not used. The default setting is ten seconds (10000).
  - **Socket Timeout (milliseconds):** Sets the default socket timeout ([SO\\_TIMEOUT](#)) in milliseconds, which is the maximum time Confluence will wait for data. A timeout value of zero is interpreted as an infinite timeout. The default setting is ten seconds (10000).

## Configuring Number Formats


There are two number format settings in Confluence:

- Long number format. For example: #####
- Decimal number format. For example: #####.#####



Confluence uses the guidelines in this Java document from Oracle: [Class NumberFormat](#).

### To change the number formats in Confluence:

1. Choose  **> General Configuration**
2. Choose **Edit**
3. Update the **Long Number Format** and **Decimal Number Format** to suit your requirements
4. Choose **Save**

### Configuring Shortcut Links

Shortcut links provide a quick way of linking to resources that are frequently referenced from Confluence. When you create a shortcut link, you assign a key to an URL so that, when editing, a user can type just the key instead of the complete URL.

#### Example: Creating a shortcut to Google

Most Google searches look like this: <http://www.google.com/search?q=>. If you create a shortcut for this search with the key 'google', every time a user needs to use <http://www.google.com/search?q=searchterms>, they can just type [ **search terms**@google ] instead.


Here is a screenshot showing the shortcuts currently defined on <http://confluence.atlassian.com>:

Key	Expanded Value	Default Alias	Operations
cache	<a href="http://www.google.com/search?q=cache:">http://www.google.com/search?q=cache:</a>		<a href="#">Remove</a>
imdb	<a href="http://us.imdb.com/Title?">http://us.imdb.com/Title?</a>		<a href="#">Remove</a>
jira	<a href="http://jira.atlassian.com/secure/QuickSearch.jspa?searchString=">http://jira.atlassian.com/secure/QuickSearch.jspa?searchString=</a>	JIRA Issue %s	<a href="#">Remove</a>
googlegroups	<a href="http://groups.google.com/groups?q=">http://groups.google.com/groups?q=</a>		<a href="#">Remove</a>
google	<a href="http://www.google.com/search?q=">http://www.google.com/search?q=</a>		<a href="#">Remove</a>
dictionary	<a href="http://www.dict.org/bin/Dict?Database=*&amp;Form=Dict1&amp;Strategy=*&amp;Query=">http://www.dict.org/bin/Dict?Database=*&amp;Form=Dict1&amp;Strategy=*&amp;Query=</a>		<a href="#">Remove</a>

Shortcut links are added and maintained by Confluence administrators from the **Administration Console**.

### Creating shortcut links

#### To create a shortcut link:

1. Choose the **cog icon** , then choose **General Configuration** under Confluence Administration
2. Choose **Shortcut Links** in the left-hand panel.
3. Enter a **Key** for your shortcut. This is the shortcut name a user will use to reference the URL.
4. Enter the **Expanded Value**. This is the URL for the link. You can use '%s' in the URL to specify where the user's input is inserted. If there is no '%s' in the URL, the user's input will be put at the end.
5. Enter a **Default Alias**. This is the text of the link which will be displayed on the page where the shortcut is used, with the user's text being substituted for '%s'.
6. Choose **Submit**.

### Using shortcut links

Enter a shortcut link on the **Advanced** tab of the Insert Link dialog. See [Links](#) for details.

Specify in the link what should be appended to the end of the shortcut URL, followed by an at-sign (@) and the key of the shortcut. Shortcut names are case-insensitive. So, for example, using the keys shown in the above screenshot:

#### On this page:

- [Creating shortcut links](#)
- [Using shortcut links](#)
- [Deleting shortcut links](#)

#### Related pages:

- [Links](#)
- [Confluence administrator's guide](#)

To link to...	Type this	Resulting URL
a issue	CONF-1000@JIRA	<a href="http://jira.atlassian.com/secure/QuickSearch.jsps?searchString=CONF-1000">http://jira.atlassian.com/secure/QuickSearch.jsps?searchString=CONF-1000</a>
a Google search	Atlassian Confluence@Google	<a href="http://www.google.com/search?q=Atlassian+Confluence">http://www.google.com/search?q=Atlassian+Confluence</a>

### Deleting shortcut links

Shortcut links are listed on the **Shortcut Links** tab of the Administration Console. Click **Remove** to delete the shortcut.

## Configuring Time and Date Formats

You can localize the formats that Confluence uses to display dates and times within the web interface.

The settings use the syntax of Java's `SimpleDateFormat` class, as described in this document: [Java SimpleDateFormat](#).

There are three time and date format settings:

- **Time format:** Used when displaying only the time of day. For example, when a blog post is published. Example of configuration: `h:mm a`
- **Date time format:** Used when displaying both the date and the time of day. For example, in historical versions of pages. Example of configuration: `MMM dd, yyyy HH:mm`
- **Date format:** Used when displaying only the date. For example, the creation and most recent modification dates of pages. Example of configuration: `MMM dd, yyyy`

### Related pages:

- [Choosing a Default Language](#)
- [Installing a Language Pack](#)
- [Confluence administrator's guide](#)

### To change the time and date formats:

1. Choose the **cog icon**



, then choose **General Configuration** under Confluence Administration

2. Choose **General Configuration** in the left-hand panel.
3. Choose **Edit**.
4. Enter the values for **Time Format**, **Date Time Format** and **Date Format**, to suit your requirements.
5. Choose **Save**.

## Enabling the Remote API

XML-RPC and SOAP remote APIs were deprecated in Confluence 5.5. We recommend using the fully supported [Confluence Server REST API](#) wherever possible.

To use the XML-RPC and SOAP remote APIs you need to enable the APIs from the **Administration Console**. You'll need [System Administrator](#) permissions to do this.

### To enable the remote API:

1. Choose the **cog icon**



, then choose **General Configuration** under Confluence Administration

2. Click **Further Configuration** in the left-hand panel.



3. Click **Edit**.
4. Click the check box next to **Remote API (XML-RPC & SOAP)**.
5. Click **Save**.

### Enabling Threaded Comments

Comments on pages or blog posts are displayed in one of two views:

- **Threaded:** Shows the comments in a hierarchy of responses. Each reply to a comment is indented to indicate the relationships between the comments.
- **Flat:** Displays all the comments in one single list and does not indicate the relationships between comments.

By default, comments are displayed in **threaded** mode. A Confluence Administrator (see [Global Permissions Overview](#)) can enable or disable the threaded view for the entire Confluence site.

#### To enable or disable the threaded view:

1. Choose the **cog icon**



, then choose **General Configuration** under Confluence Administration

2. Select **Further Configuration** in the left-hand panel
3. Choose **Edit**
4. Select or unselect the **Threaded Comments** checkbox to enable or disable threaded mode
5. Choose **Save**

#### Related pages:

- [Comment on pages and blog posts](#)
- [Confluence administrator's guide](#)

### Installing a Language Pack

Confluence ships with a number of bundled language packs. These languages appear as options on the 'Language Configuration' screen in the Administration Console when [choosing a default language](#) and as 'Language' options for users in their [user settings](#).

Confluence is available in these languages right out of the box:

- eština (eská republika | Czech Republic)
- Deutsch (Deutschland | Germany)
- Eesti (Eesti | Estonia)
- English (UK)
- English (US)
- Español (España | Spain)
- Français (France)
- Íslenska (Ísland | Iceland)
- Italiano (Italia | Italy)
- Magyar (Magyarország | Hungary)
- Nederlands (Nederland | The Netherlands)
- Norsk (Norge | Norway)
- Polski (Polska | Poland)
- Português (Brasil | Brazil)
- Român (România | Romania)
- Slovenina (Slovenská republika | Slovak Republic)
- Suomi (Suomi | Finland)
- Svenska (Sverige | Sweden)
- ( | Russia)
- ( | China)
- ( | Japan)
- ( | Republic of Korea)

You can make additional languages available by installing language pack add-ons. You'll need to be a Confluence administrator to install a language pack.

#### Related pages:

- [Choosing a Default Language](#)
- [Configuring Indexing Language](#)
- [Installing add-ons](#)

### Installing a language pack add-on

To install a language pack using the Universal Plugin Manager:

1. Choose the **cog icon**



, then choose **General Configuration** under Confluence Administration

2. Choose **Find New Add-ons** in the left-hand panel.
3. Find the language pack on the Atlassian Marketplace.
4. Choose **Install** to install the language pack.

### Installing a language pack manually

To install a language pack manually, you will need to upload the language pack plugin as described below. The language pack plugin will be enabled by default once you have installed it.

Plugins are distributed as JAR or OBR (OSGi Bundle Repository) files. To install a plugin:

1. Choose the **cog icon**



, then choose **General Configuration** under Confluence Administration

2. Choose **Manage Add-ons**.
3. Choose **Upload Plugin**.
4. Choose **Browse** to find the plugin file you wish to install from your hard drive and select it, or enter a network location by URL.
5. Choose **Upload**.  
The plugin will be uploaded to Confluence and will be automatically installed.
6. Check the list of user-installed plugins to ensure that the add-on is available.
7. Enable the plugin if necessary. (Some plugins will be enabled by default when they are installed. Others will have to be manually enabled from the 'Manage Add-ons' page.)

### Finding more Language Packs

- You can download official language packs from the [Atlassian Marketplace](https://atlassian.com/marketplace). You can also download language packs developed by the Confluence user community from <https://translations.atlassian.com>.

### Showing User Interface Key Names for Translation

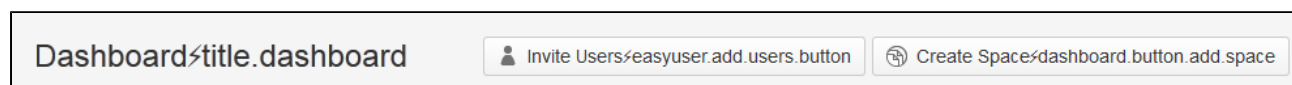
This feature is useful if you are working on creating translations of the Confluence user interface. After opening the Confluence dashboard, you can add the following action to the end of your Confluence URL:

```
?i18ntranslate=on
```

For example `http://myconfluencesite.com?i18ntranslate=on`

This will cause each element of the user interface to display its special **key name**. This makes it easier to find the context for each key within the user interface. You can then search for the key on <http://translations.atlassian.com> where you can enter an appropriate translation for your custom language pack.

The key names are displayed with a 'lightning bolt' graphic. For example:



To turn off the translation view, add the following to the end of the Confluence URL:

```
?i18ntranslate=off
```

## Installing Patched Class Files

Atlassian support or the Atlassian bug-fixing team may occasionally provide patches for critical issues that have been resolved but have not yet made it into a release. Those patches will be class files which are attached to the relevant issue in our [Jira bug-tracking system](#).

### Installation Instructions for the Confluence Distribution

Follow these steps to install a patched class file:

1. Shut down your confluence instance.
2. Copy the supplied class files to `<installation-directory>/confluence/WEB-INF/classes/<subdirectories>`, where:
  - `<installation-directory>` must be replaced with your Confluence Installation directory. (If you need more information, read about the [Confluence Installation Directory](#).)
  - `<subdirectories>` must be replaced by the value specified in the relevant Jira issue. This value will be different for different issues. In some cases, the subdirectories will not exist and you will need to create them before copying the class files. Some issues will contain the patch in the form of a ZIP file which will contain the desired directory structure.
3. Restart your Confluence instance for the changes to become effective.

**i** Class files in the `/WEB-INF/classes` directory of a web application will be loaded before classes located in JAR files in the `/WEB-INF/lib` directory. Therefore, classes in the first directory will effectively replace classes of the same name and package which would otherwise be loaded from the JAR files.

### Reverting the patch

To revert the patch, simply remove the class files from the `<installation-directory>/confluence/WEB-INF/classes/` folder (taking care to only remove those that apply to the patch you wish to revert), then restart the instance.

Once the issue that the patch relates to is resolved, you should upgrade to the version of Confluence that contains the fix, and revert the patch. Patches are often naive and untested and may not solve the problem in the most efficient way. As such, an official fix should be preferred in all cases.

## Configuring System Properties

This page describes how to set Java properties and options on startup for Confluence.

See [How to fix out of memory errors by increasing available memory](#) for specific instructions for OutOfMemory Errors.

**On this page:**

- Linux
- Windows (starting from .bat file)
- Windows service
- Confluence Data Center deployed in AWS
- Verifying your settings
- Recognized system properties


**Related pages:**

- Recognized System Properties
- How to fix out of memory errors by increasing available memory

## Linux

### To configure System Properties in Linux installations:


1. Edit the <installation-directory>/bin/setenv.sh file.
2. Find the section **CATALINA\_OPTS=** (this is JAVA\_OPTS= in Confluence 5.5 and earlier)
3. Refer to the list of parameters in [Recognized System Properties](#).

 Add all parameters in a space-separated list, inside the quotations.

## Windows (starting from .bat file)

### To Configure System Properties in Windows Installations When Starting from the .bat File:

1. Edit the <installation-directory>/bin/setenv.bat file.
2. Find the section **set CATALINA\_OPTS=%CATALINA\_OPTS%** (this is JAVA\_OPTS=%JAVA\_OPTS% in Confluence 5.5 and earlier)
3. Refer to the list of parameters in [Recognized System Properties](#).

 Add all parameters in a space-separated list. Make sure to keep the string %CATALINA\_OPTS% in place.

## Windows service

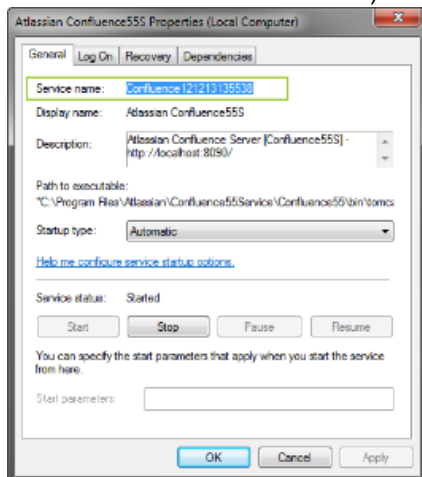
There are two ways to configure system properties when you [Start Confluence Automatically on Windows](#) as

a Service, either via [command line](#) or in the Windows Registry

### Setting properties for Windows services via command line

To set properties for Windows services via a command line:

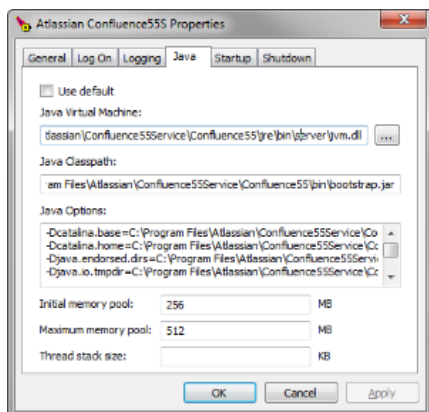
1. Identify the name of the service that Confluence is installed as in Windows (Go to **Control Panel > Administrative Tools > Services**):



- i In the above example, the service name is *Confluence121213135538*.
2. Open the command window (Choose **Start > cmd.exe**)
3. `cd` to the `bin` directory of your Confluence instance and run the following command:

```
tomcat8w //ES//<SERVICENAME>
```

- i In the above example, it would be `tomcat8w //ES//Confluence121213135538`  
The Tomcat version number may be different if you are using an earlier version of Confluence.
4. Click on the Java tab to see the list of current start-up options:

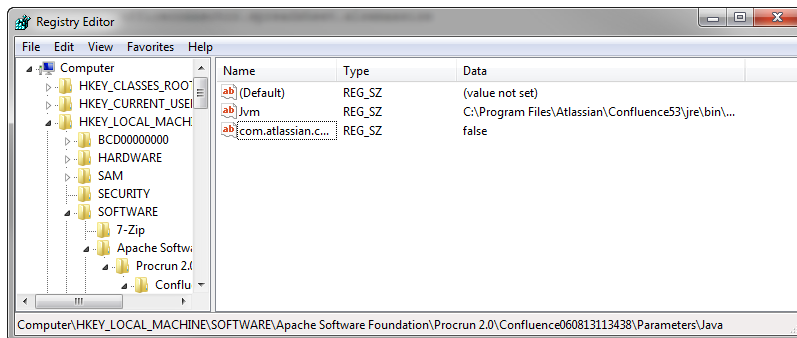


5. Append any new option on its own new line by adding to the end of the existing Java Options. Refer to the list of parameters in [Recognized System Properties](#).

### Setting properties for Windows services via the Windows registry

In some versions of Windows, there is no option to add Java variables to the service. In these cases, you must add the properties by viewing the option list in the registry.

1. Go to the Registry Editor (**Start > regedit.exe**).
2. Find the Services entry:  
`HKEY_LOCAL_MACHINE >> SOFTWARE >> Apache Software Foundation >> Procrun 2.0 >> Confluence service name`



3. To change existing properties double-click the appropriate value.
4. To change additional properties, double-click options.
5. Refer to the list of parameters in [Recognized System Properties](#). Enter each on a separate line.

## Confluence Data Center deployed in AWS

If you've used the Quick Start or CloudFormation template to deploy Confluence Data Center in AWS, you will pass system properties via the Cloud Formation Template, and not using the methods described above.

1. In the AWS Console, choose **Update Stack**
2. Under **Advanced**, enter system properties in the Catalina Properties field as follows:

```
-Xms1024m -Xmx1024m -Dsystemproperty=value
```

3. Changes are applied when a new nodes are provisioned.

## Verifying your settings

To see what Confluence is using, check [Viewing System Properties](#).

## Recognized system properties

See [Recognized System Properties](#) for the full list of system properties available to your Confluence version.

### Recognized System Properties

Confluence supports some configuration and debugging settings that can be enabled through Java system properties. System properties are usually set by passing the `-D` flag to the Java virtual machine in which Confluence is running. See the full instructions: [Configuring System Properties](#).

Since	Default Value	Module...	Effect
<b><i>atlassian.forceSchemaUpdate</i></b>			
1.0	false	atlassian-config	By default, Confluence will only run its database schema update when it detects that it has been upgraded. This flag will force Confluence to perform the schema update on system startup.
<b><i>confluence.home</i></b>			

1.0	Any filesystem path	Confluence and atlassian-config	If this system property is set, Confluence will ignore the contents of the <code>confluence-init.properties</code> file, and use this property as the setting for the Confluence Home directory.
<b><code>confluence.dev.mode</code></b>			
1.0	false	Confluence	Enables additional debugging options that may be of use to Confluence developers (additionally it changes spring bean creation to use lazy initialization by default to decrease startup time). Do not enable this flag on a production system.
<b><code>confluence.disable.mailpolling</code></b>			
2.4	false	Confluence	If set to "true", will prevent Confluence from retrieving mail for archiving within spaces. Manually triggering "check for new mail" via the web UI will still work. This property has no effect on outgoing mail
<b><code>confluence.i18n.reloadbundles</code></b>			
1.0	true	Confluence	Setting this property will cause Confluence to reload its i18n resource bundles every time an internationalized string is looked up. This can be useful when testing translations, but will make Confluence run <i>insanely slowly</i> .
<b><code>confluence.ignore.debug.logging</code></b>			

1.0	true	Confluence	Confluence will normally log a severe error message if it detects that DEBUG level logging is enabled (as DEBUG logging generally causes a significant degradation in system performance). Setting this property will suppress the error message.
<b><i>confluence.jmx.disabled</i></b>			
3.0	false	Confluence	If set to "true", will disable Confluence's JMX monitoring. This has the same effect as setting the "enabled" property to false in <code>WEB-INF/classes/jmxContext.xml</code>
<b><i>confluence.optimize.index.modulo</i></b>			
2.2	20	Confluence	Number of index queue flushes before the index is optimized.
<b><i>confluence.plugins.bundled.disable</i></b>			
2.9	false	Confluence	Starts confluence without bundled plugins. May be useful in a development environment to make Confluence start quicker, but since bundled plugins are necessary for some of Confluence's core functionality, this property should not be set on a production system.
<b><i>atlassian.indexing.contentbody.maxsize</i></b>			



3.0	1048576	atlassian	<p>When a file is uploaded, its text is extracted and indexed. This allows people to search for the content of a file, not just the filename.</p> <p>If the amount of content extracted from the file exceeds the limit set by this property (default is 1MB, in bytes), the file's contents will still be indexed and searchable, but will not appear when the file is returned in search results. Increasing this limit may make displaying search results slower. See <a href="#">Configuring Attachment Size</a> for more info.</p>
<b><i>atlassian.mail.fetchdisabled</i></b>			
3.5	false	Confluence	Disables mail fetching services for IMAP and POP
<b><i>atlassian.mail.sendsdisabled</i></b>			
3.5	false	Confluence and atlassian-mail	Disables sending of mail
<b><i>atlassian.disable.caches</i></b>			
2.4	true	atlassian-plugins, atlassian-cache-servlet	<p>Setting this property will disable conditional get and expires: headers on some web resources. This will significantly slow down the user experience, but is useful in development if you are frequently changing static resources and don't want to continually flush your browser cache.</p>
<b><i>confluence.html.encode.automatic</i></b>			

2.9		Confluence	Setting this property forces the antixss encoding on or off, overriding the behavior dictated by settings. The default behavior differs between Confluence versions.
<b>org.osgi.framework.bootdelegation</b>			
2.10	empty	atlassian-plugins	Comma-separated list of package names to provide from application for OSGi plugins. Typically required when profiling Confluence. For example: "com.jprofiler., <b>com.yourkit.</b> ".
<b>confluence.diff.pool.size</b>			
3.1	20	Confluence	Maximum number of concurrent diffs. When that number is exceeded, additional attempts by RSS feeds to create diffs are ignored and logged. (The RSS requests succeed, they are just missing diffs).
<b>confluence.diff.timeout</b>			
3.1	1000	Confluence	Number of milliseconds to wait for a diff operation (comparing two page versions) to complete before aborting with an error message.
<b>confluence.html.diff.timeout</b>			
4.0	10000	Confluence	Number of milliseconds to wait for a diff operation (comparing two page versions) to complete before aborting with an error message.
<b>atlassian.user.experimentalMapping</b>			

2.10	false	Confluence	Setting this property changes the relationship between local users and local groups to reduce performance degradation when adding a local user to a local group with a large number of users. Please note, setting this property can slow down other user management functions. We recommend that you set it only if you are experiencing performance problems when adding local users to large local groups. Please refer to <a href="#">CONF-12319</a> , fixed in Confluence 3.1.1.
<b><i>confluence.import.use-experimental-importer</i></b>			
3.2	false	Confluence	Setting this property changes Confluence to use the Experimental XML Importer. It is designed to be a more stable implementation but, at the time of the release of 3.2, the importer is largely untested and thus not supported.
<b><i>atlassian.webresource.disable.minification</i></b>			
3.3	false	atlassian-plugins	Disables automatic minification of JavaScript and CSS resources served by Confluence.
<b><i>index.queue.thread.count</i></b>			

3.3	See "Effect"	Confluence	<p>Sets the number of threads to be used for the reindex job. The value has to be in the range of 1 to 50 (inclusive), i.e. at least one thread but no more than 50 threads will be used. There is no default value, i.e.</p> <ul style="list-style-type: none"><li>• If you don't set <code>index.queue.thread.count</code>, the number of threads to be used are calculated based on the number of objects that need to be reindexed and the number of processors available (a maximum of 50 threads will be used).</li><li>• If you set <code>index.queue.thread.count=2</code>, then two threads will be used to reindex the content (regardless of the number of objects to be reindexed or the number of processors available)</li><li>• If you set <code>index.queue.thread.count=200</code>, then ten threads (the maximum allowed) will be used to reindex the content.</li></ul> <p>Note: For Confluence versions from 3.3 to 5.6 the maximum threads is 10.</p>
<i>index.queue.batch.size</i>			

3.3	1500	Confluence	Size of batches used by the indexer. Reducing this value will reduce the load that the indexer puts on the system, but indexing takes longer. Increasing this value will cause indexing to be completed faster, but puts a higher load on the system. Normally this setting does not need tuning.
<b><i>password.confirmation.disabled</i></b>			
3.4	false	Confluence	This property disables the password confirmation functionality that Confluence uses as an additional security measure. With this property set, Confluence will <i>not</i> require password confirmation for the following actions: <a href="#">administrative actions</a> , change of email address and <a href="#">Captcha for failed logins</a> . Disabling password confirmations is useful if you are using a custom authenticator.
<b><i>confluence.browser.language.enabled</i></b>			
3.5	true	Confluence	Setting this property to "false" disables the detection of browser language headers, effectively restoring Confluence behavior to that of earlier releases. Setting this property to "true" enables the detection of the language headers sent by the browser. Confluence will change the UI language based on the browser headers. See documentation on how users can <a href="#">choose a language preference</a> .
<b><i>upm.pac.disable</i></b>			

Universal Plugin Manager 1.5	false	Universal Plugin Manager (UPM)	When this property is set to true, then UPM will not try to access the <a href="#">The Atlassian Marketplace</a> . This is useful for application servers that do not have access to the Internet. See the <a href="#">UPM documentation</a> .
<b>confluence.reindex.documents.to.pop</b>			
3.5.9	20	Confluence	Indicates how many objects each indexing thread should process at a time during a full re-index. Please note that this number does not include attachments
<b>confluence.reindex.attachments.to.pop</b>			
3.5.9	10	Confluence	Indicates how many attachments each indexing thread should process at a time during a full re-index.
<b>confluence.upgrade.active.directory</b>			
3.5.11	false	Confluence	Forces Confluence to treat any LDAP directories it migrates as Active Directory, rather than relying on looking for sAMAccountName in the username attribute. This is necessary if you are upgrading from before Confluence 3.5, and need to use an attribute other than sAMAccountName to identify your users and are seeing LDAP: error code 4 - Sizelimit Exceeded exceptions in your logs. For more details, see <a href="#">Unable to Log In with Confluence 3.5 or Later Due to 'LDAP error code 4 - Sizelimit Exceeded'</a>
<b>confluence.context.batching.disable</b>			

4.0	false	Confluence	Disables batching for web resources in contexts (e.g. editor, main, admin). Useful for diagnosing the source of javascript or CSS errors.
<b><i>com.atlassian.logout.disable.session.invalidation</i></b>			
4.0	false	Confluence	Disables the session invalidation on log out. As of 4.0 the default behavior is to invalidate the JSession assigned to a client when they log out. If this is set to true the session is kept active (but the user logged out). This may be valuable when using external authentication systems, but should generally not be needed.
<b><i>officeconnector.spreadsheet.xlsxmaxsize</i></b>			
4.0.5	2097152	Office Connector	Indicates the maximum size in bytes of an Excel file that can be viewed using the <code>viewxls</code> macro. If empty, the maximum size defaults to 2Mb. See <a href="#">CONF-21043</a> for more details.
<b><i>com.atlassian.confluence.extra.calendar3.display.events.calendar.maxpercalendar</i></b>			
	200	Team Calendars	Specifies the maximum number of events per calendar. This property is effective only if the <a href="#">Team Calendars</a> plugin is installed on your Confluence site.
<b><i>com.atlassian.confluence.allow.downgrade</i></b>			



4.3.2, 5.0-OD-10	false	Confluence	Allows Confluence to start up against the home directory of a newer version of Confluence. Note that running Confluence like that is unsupported. You should only turn this on if you know what you are doing. See <a href="#">After Downgrading, Confluence Will No Longer Run</a> for details.
<b>confluence.skip.reindex</b>			
	false		When true, allows Confluence to skip rebuilding the search index when Confluence is upgraded. This can be useful if you have a very large site and wish to delay rebuilding the index until a time after the upgrade is complete.
<b>reindex.thread.count</b>			
5.2		Confluence	Sets the number of threads to be used for a one-off reindex job. The value has to be in the range of 1 to 50 (inclusive), i.e. at least one thread but no more than 50 threads will be used. There is no default value. This system property does not affect the incremental indexing that Confluence does.
<b>reindex.attachments.thread.count</b>			
5.2	4	Confluence	Sets the number of threads to be used for reindexing attachments specifically, and allows you to reduce the concurrency for these more memory intensive index items.
<b>confluence.mbox.directory</b>			

5.4.1		Confluence	Setting this property defines the directory on your Confluence Server where mailboxes can be imported from (for use with the Confluence Mail Archiving add-on). Mailboxes are not able to be imported from any other location. We recommend administrators create a directory in the Confluence Home directory specifically for this purpose. Mail cannot be imported from the server until this system property is set.
<b><i>confluence.search.max.results</i></b>			
5.5	1000	Confluence	Setting this property changes the maximum number of items Confluence Search will return.
<b><i>confluence.upgrade.recovery.file.enabled</i></b>			
5.5	true	Confluence	By default, Confluence creates an upgrade recovery file before and after an upgrade. The operation can take long time on large databases and can be safely turned off if there is a process to back up database and verify the backup before performing an upgrade. Setting this property to false will disable upgrade recovery file creation.
<b><i>confluence.junit.report.directory</i></b>			

5.5		Confluence	Setting this property defines the directory on your Confluence Server where JUnit Reports can be imported from (for use in the JUnit Report Macro). No other locations are permitted. We recommend administrators create a directory in the Confluence Home directory specifically for this purpose. JUnit Test result files cannot be imported from the server until this system property is set.
<b><i>officeconnector.textextract.word.docxmaxsize</i></b>			
5.5.3	16777216	Confluence	<p>When a file is uploaded, its text is extracted and indexed. This allows people to search for the content of a file, not just the filename.</p> <p>Confluence will only extract content from a Word document up to the limit set by this property (defaults to 16MB, in bytes), before proceeding to index it. This will mean that only part of file's contents are searchable. See <a href="#">Configuring Attachment Size</a> for more info.</p>
<b><i>cluster.login.rememberme.enabled</i></b>			
5.6	False		<p>In a cluster, setting this property to <code>True</code> will enable the 'Remember Me' checkbox on the login page. This is not recommended in a cluster, and is disabled by default (i.e. 'Remember me' is always on and users can move seamlessly between nodes).</p> <p>This system property has no effect in standalone Confluence.</p>

<b>confluence.cluster.hazelcast.listenPort</b>			
5.6	5801		In a cluster, this property can be used to override the default port that Hazelcast will bind to, for example, if the port is unavailable, or you need to run more than one node on the same host (not recommended). It defaults to 5801.
<b>confluence.document.conversion.threads</b>			
5.7		Confluence	The number of threads allocated to the file conversion service is calculated dynamically based on the amount of memory assigned to the instance and the number of CPU cores (usually 4 to 6 threads). This property can be used to change the number of threads. Decrease threads to resolve OOME issues, increase threads to resolve problems with documents spending too long in the queue.
<b>confluence.document.conversion.threads.wait</b>			
5.7	1000	Confluence	Set this property to change the maximum number of items that can be queued for conversion. Any file conversion requests that are made when this maximum limit has been reached are aborted.
<b>confluence.cluster.node.name</b>			
5.7		Confluence	Set this property to give each node in your Data Center cluster a human readable name (displayed in email notifications and in the footer). If left unset, Confluence will assign a node identifier to each node.

<b><i>confluence.document.conversion.fontpath</i></b>			
5.8.7		Confluence	<p>Set this property to define a directory where you can add additional fonts to be used when rendering files (in previews and thumbnails).</p> <p>This is useful if you need to support previewing files with specific fonts, or fonts with multibyte characters (such as Japanese).</p>
<b><i>confluence.document.conversion.words.defaultfontname</i></b>			
5.8.7		Confluence	<p>Set this property to change the default font for rendering Word (.doc and .docx) files in Confluence.</p> <p>Specify just the name of the font (not the path).</p>
<b><i>confluence.document.conversion.slides.defaultfontname.regular</i></b>			
5.8.7		Confluence	<p>Set this property to change the default font for rendering regular fonts in Powerpoint (.ppt and .pptx) files in Confluence.</p> <p>Specify just the name of the font (not the path).</p>
<b><i>confluence.document.conversion.slides.defaultfontname.asian</i></b>			
5.8.7	TakaoPGothic	Confluence	<p>Set this property to change the default font for rendering asian fonts in Powerpoint (.ppt and .pptx) files in Confluence.</p> <p>Specify just the name of the font (not the path).</p>
<b><i>confluence.document.conversion.slides.defaultfontname.symbol</i></b>			

5.8.7		Confluence	<p>Set this property to change the default font for rendering symbols in Powerpoint (.ppt and .pptx) files in Confluence.</p> <p>This is the font that will be used for bullets and other symbols when the font <code>Symbol</code> is not found.</p> <p>Specify just the name of the font (not the path).</p>
<b><code>confluence.clickjacking.protection.disable</code></b>			
5.8.15	false	Confluence	<p>Security features prevent Confluence from being embedded in an <code>&lt;iframe&gt;</code>. To disable this protection, set this property to <code>true</code> which will allow Confluence to be embedded in an <code>&lt;iframe&gt;</code>.</p>
<b><code>confluence.cluster.index.recovery.query.timeout</code></b>			
5.9.1	10		<p>In Confluence Data Center, the amount of time, in seconds, that a confluence node needing index recovery will wait for another node to offer an index snapshot, before it gives up and stops attempting to recover the index.</p>
<b><code>confluence.cluster.index.recovery.generation.timeout</code></b>			
5.9.1	120		<p>In Confluence Data Center, the amount of time, in seconds, that a confluence node needing index recovery will wait for an index snapshot to be created by another node, before it gives up and stops attempting to recover the index.</p>
<b><code>confluence.cluster.index.recovery.num.attempts</code></b>			

5.9.1	1		In Confluence Data Center, the number of times that a node needing index recovery will attempt to recover its index. Set this property to 0 to disable index recovery on that node (for example, when you want to force a node to automatically rebuild its own index on startup).
<b><code>com.atlassian.confluence.officeconnector.canary.memory_value</code></b>			
5.9.1	1024	Confluence	Sets the memory (in megabytes) available to the Office Connector Canary process, which is a workaround for a known issue with the Import from Word option. See <a href="#">JVM crashes during Import from Word in Confluence</a> for more information.
<b><code>com.atlassian.confluence.officeconnector.canary.timeout</code></b>			
5.9.1	120000	Confluence	Sets the maximum timeout (in milliseconds) for the Office Connector Canary process, which is a workaround for a known issue with the Import from Word option. See <a href="#">JVM crashes during Import from Word in Confluence</a> for more information.
<b><code>atlassian.plugins.enable.wait</code></b>			
5.9.5	300		Set this property to increase the default time to wait for plugins to start up. This is useful if you have problems with plugins not starting up in time, causing Confluence to fail to start.
<b><code>confluence.cluster.hazelcast.max.no.heartbeat.seconds</code></b>			



5.9.7	30	Confluence	In Confluence Data Center, this sets how long (in seconds) a node can be out of communication with the cluster before it's removed from the cluster. See <a href="#">balancing uptime and data integrity</a> for more info on when you may want to change this setting.
<b>confluence.startup.remigration.disable</b>			
5.10.8	False		Set this property to true if you repeatedly experience issues with Confluence creating a new page version as it attempts to migrate pages containing unmigrated wiki-markup macros each time a plugin is install or updated. See <a href="#">CONFSERVER-37710</a> <b>RESOLVED</b> for more details.
<b>cluster.safety.time.to.live.split.ms</b>			
6.0.0	60000		In Confluence Data Center, this is the amount of time (in milliseconds) that the cluster safety job will wait to allow the nodes to rejoin after a split brain is detected. If the node still can't find the cluster safety number in the cache after this time, the node will panic.
<b>confluence.cph.max.entries</b>			
6.0.0	2000	Confluence	This is the maximum number of pages that can be copied when you copy a page and its child pages. Increase this if you need to copy a page with more than the default number of child pages.

<b>confluence.cph.batch.size</b>			
6.0.0	10	Confluence	This is the number of pages copied in each batch when you copy a page and its children. Increase or reduce this number if you experience problems copying a page with many child pages.
<b>synchrony.port (formerly known as reza.port)</b>			
6.0.0	8091		This is the port that Synchrony, the service that powers collaborative editing, runs on. You should only need to change this if port 8091 is not available. For Confluence Data Center system properties see <a href="#">Configuring Synchrony for Data Center</a> . From 6.0.4, Confluence Server will accept either <code>reza.port</code> or <code>synchrony.port</code> .
<b>synchrony.memory.max (formerly reza.memory.max)</b>			
6.0.0	1g		This is the maximum heap size (Xmx) allocated to Synchrony, the service that powers collaborative editing. Change this value if you need to increase or decrease the heap size. For Confluence Data Center system properties see <a href="#">Configuring Synchrony for Data Center</a> . From 6.0.4, Confluence Server will accept either <code>reza.memory.max</code> or <code>synchrony.memory.max</code> .
<b>synchrony.stack.space</b>			

6.0.0	2048k		This sets the stack size (Xss) of the Synchrony JVM. Increase if you experience stack overflow errors, or decrease if you experience out of memory errors from Synchrony.
<b><i>synchrony.enable.xhr.fallback</i></b>			
6.0.0	True		XML HTTP Request (XHR) fallback allows a user, who cannot connect to Synchrony via a WebSocket, to use the Confluence Editor. From Confluence 6.1 this is enabled by default, and only used when a WebSocket connection is not available. You should not need to disable this, unless directed by our support team.
<b><i>synchrony.database.test.connection.on.checkin</i></b>			
6.0.0	True		Verifies the connection to the database is valid at every connection checkin. Atlassian Support may suggest you set this property to False if you experience performance issues in sites that have very frequent page edits.
<b><i>synchrony.proxy.enabled</i></b>			

6.0.0	True		<p>By default, Confluence uses an internal proxy to communicate between the Confluence JVM and Synchrony JVM. See <a href="#">Administering Collaborative Editing</a> for more information.</p> <p>In Confluence 6.0, set this property to <code>true</code> to manually enable the internal proxy (useful if you have configured a reverse proxy and want to also use the internal Synchrony proxy).</p> <p>In Confluence 6.1 or later it should <b>not be necessary</b> to use this system property, as Confluence intelligently determines when to use the proxy.</p> <p>This property has no effect in Confluence Data Center.</p>
<i>synchrony.bind (formerly known as reza.bind)</i>			
6.0.0	0.0.0.0		<p>This is the specific network interface that Synchrony listens on. It is unlikely that you will need to change this in Confluence Server. In Confluence Data Center this should be set to the same value as <code>synchrony.cluster.bind</code>. From 6.0.4, Confluence Server will accept either <code>reza.bind</code> or <code>synchrony.bind</code>.</p>
<i>synchrony.context.path</i>			
6.0.0	/synchrony		<p>This is the context path for Synchrony. There should be no need to change this in Confluence Server.</p>
<i>confluence.flyingpdf.default.characters.per.line</i>			

6.0.3	80		If the total characters in a table column heading exceeds the value of this property, Confluence will automatically adjust the width of the other table columns so that all columns will fit within one page when the page is exported to PDF.
<b><i>synchrony.host</i></b>			
6.0.4	127.0.0.1		This is the IP that Confluence uses to connect to Synchrony. It defaults to localhost. Change this if you need to allow Confluence to contact Synchrony via a custom hostname or IP address.
<b><i>synchrony.proxy.healthcheck.disabled</i></b>			
6.1.0	false		The Synchrony proxy health check is used to check whether the Synchrony proxy is running and responding to requests. It requires a http connection. If a http connector is not present in your <code>server.xml</code> (for example you're using a https or AJP connector) the health check will fail even if the Synchrony proxy is operational. You can use this system property to disable the health check if necessary.
<b><i>page.index.macro.max.pages</i></b>			

6.1.4	5000		Sets the maximum number of pages that the Page Index macro can display. The Page Index macro can significantly slow down your Confluence instance and cause out of memory errors when used in a space with a large number of pages. If the number of pages in the space exceeds this limit, the Page Index macro will show a page count, and a message that there are too many pages to display.
<b><code>atlassian.indexing.attachment.maxsize</code></b>			
6.2.2	104857600		<p>When a file is uploaded, its text is extracted and indexed. This allows people to search for the content of a file, not just the filename.</p> <p>If the uploaded file is larger than the limit set by this property (default is 100MB, in bytes), text extraction and indexing will be skipped. See <a href="#">Configuring Attachment Size</a> for more info.</p>
<b><code>officeconnector.excel.extractor.maxlength</code></b>			
6.2.2	1048576		<p>When a file is uploaded, its text is extracted and indexed. This allows people to search for the content of a file, not just the filename.</p> <p>Confluence will only extract content from an Excel spreadsheet up to the limit set by this property (default is 1MB, in bytes), before proceeding to index it. This will mean that only part of file's contents are searchable. See <a href="#">Configuring Attachment Size</a> for more info.</p>

<b>confluence.collab.edit.user.limit</b>			
6.3.0	12		When collaborative editing is enabled, this sets the maximum number of users that can simultaneously edit a page. Reduce this number if you experience degraded performance when many people are editing.
<b>jobs.limit.per.purge</b>			
6.4.3	2000		<p>The <b>Purge Old Job Run Details</b> scheduled job deletes details of old scheduled jobs from the database in batches.</p> <p>Set this property to change the number of records to remove in each batch.</p>
<b>all.jobs.ttl.hours</b>			
6.4.3	2160		<p>By default, the <b>Purge Old Job Run Details</b> scheduled job deletes details of successful scheduled jobs older than 90 days (or 2160 hours).</p> <p>Set this property, to change number of hours to keep details of successful jobs in the database.</p>
<b>unsuccessful.jobs.ttl.hours</b>			
6.4.3	168		<p>By default, the <b>Purge Old Job Run Details</b> scheduled job deletes details of unsuccessful (failed or aborted) scheduled jobs older than 7 days (or 168 hours).</p> <p>Set this property, to change number of hours to keep details of unsuccessful jobs in the database.</p>

<code>atlassian.recovery.password</code>			
5.6.1			<p>Allows an administrator to start Confluence in recovery mode and specify a temporary administrator password. This is useful if the administrator is locked out of the instance after a site import, or cannot reset their password by other methods. See <a href="#">Restore Passwords To Recover Admin User Rights</a> for more information.</p> <p>This system property must be removed immediately after the admin account has been recovered or a new admin account created.</p>

## Working with Confluence Logs

Confluence uses Apache's [log4j](#) logging service. This allows administrators to control the logging behavior and the log output file by editing a configuration file. There are six [log4j logging levels](#).

If you request help from Atlassian Support, we will almost always ask for the Confluence application logs. The easiest way to get these logs is to go to



> **General Configuration > Troubleshooting and support tools** and follow the prompts to create a **Support Zip**.

### On this page:

- [Finding the Confluence log files](#)
- [Finding the log configuration file](#)
- [Changing the destination of the log files](#)
- [Changing the size and number of log files](#)
- [Changing the logging levels](#)
- [Specific Confluence logging options](#)
- [Scanning log files for known problems](#)

### Related pages:

- [Enabling Detailed SQL Logging](#)
- [Enabling user access logging](#)
- [Generating a Thread Dump](#)
- [Enabling Page Request Profiling](#)

## Finding the Confluence log files

This section describes Confluence's default logging behavior, and assumes that you have not changed the destination of the logs. In order to unify logging across different application servers, Confluence uses the `atlassian-confluence.log` as its primary log, not the application server log.

- When you start Confluence, log entries will be sent to the application server logs until Confluence has completed its initial bootstrap. Any log entries written to the console will be repeated into the log in the Confluence home directory as described below.
- Once the initial startup sequence is complete, all logging will be to `<confluence-home>/logs/atlassian-confluence.log`. For example: `c:/confluence/data/logs/atlassian-confluence.log`.



e.log.

Note that the default location is the Confluence **home directory**, not the application server's log file. The home directory is specified in `<confluence-installation>/confluence/WEB-INF/classes/confluence-init.properties`.

## Finding the log configuration file

The logging behavior for Confluence and Synchrony is defined in the following properties file:  
`<CONFLUENCE-INSTALL>/confluence/WEB-INF/classes/log4j.properties`

This file is a standard log4j configuration file, as described in the [Apache log4j documentation](#).

## Changing the destination of the log files

In log4j, an output destination is called an 'appender'. To change the destination of the log files, you need to stop Confluence and then change the settings in the '**Logging Location and Appender**' section of the `log4j.properties` file. The location of this file is described [above](#).

In the standard properties file, you will find entries for two appenders:

- `com.atlassian.confluence.logging.ConfluenceHomeLogAppender` – This is a custom appender which controls the default logging destination described [above](#). This appender allows the following settings:
  - `MaxFileSize`
  - `MaxBackupIndex`
- `org.apache.log4j.RollingFileAppender` – If you want to log to a different location, uncomment the `RollingFileAppender` line and change the destination file in the line below it. Comment out the previous lines referring to the `ConfluenceHomeLogAppender`.

The Synchrony log destination can also be changed in the same way in file.

Confluence ships with the full suite of appenders offered by log4j. Read more about appenders in the [log4j documentation](#).

## Changing the size and number of log files

By default, Confluence keeps 5 log files, which are overwritten as they reach 20 MB.

You can change the default log size and the number of log files to keep by editing the following values in `<CONFLUENCE-INSTALL>/confluence/WEB-INF/classes/log4j.properties` file.

```
log4j.appender.confluencelog.MaxFileSize=20480KB
log4j.appender.confluencelog.MaxBackupIndex=5
```

## Changing the logging levels

See [Configuring Logging](#) for instructions on how to change the logging configuration of Confluence.

## Specific Confluence logging options

Here's some specific log configurations you may need when troubleshooting.

### Log the details of SQL requests made to the database

You may want to increase Confluence's logging so that it records individual SQL requests sent to the database. This is useful for troubleshooting specific problems.

You can enable detailed SQL logging in two ways:

- At runtime – see [instructions above](#).
- Via the logging properties file – see the [detailed instructions](#).

### Log the details of users viewing/accessing each Confluence page

You can configure the log to show which users are accessing which pages in Confluence. This can only be done via the logging properties file – see the [detailed instructions](#).

## Scanning log files for known problems

Atlassian Troubleshooting and support tools includes a log analyzer that can check for your Confluence logs for errors and match them against known problems in our knowledge base and issue tracker.

See [Troubleshooting Problems and Requesting Technical Support](#) to find out how to set up a periodic scan of your log files.

## Configuring Logging

We recommend that you configure Confluence's logging to your own requirements. You can change the log settings in two ways:

- Configure logging in Confluence Administration – Your changes will be in effect only until you next restart Confluence.
- Edit the properties file – Your changes will take effect next time you start Confluence, and for all subsequent sessions.

Both methods are described below. In some rare circumstances you may *also* need to configure the [logging.properties](#) file.

**Terminology:** In log4j, a 'logger' is a named entity. Logger names are case-sensitive and they follow a hierarchical naming standard. For example, the logger named `com.foo` is a parent of the logger named `com.foo.Bar`.

### Configure logging in Confluence Administration

You can change some of Confluence's logging behavior via the **Administration Console** while Confluence is running. Any changes made in this way will apply only to the currently-running Confluence lifetime. The changes are not written to the `log4j.properties` file and are therefore discarded when you next stop Confluence.

Not all logging behavior can be changed via the Administration Console. For logging configuration not mentioned below, you will need to stop Confluence and then [edit the logging properties file](#) instead.

The '**Logging and Profiling**' screen shows a list of all currently defined loggers. On this screen you can:

- Turn [page profiling](#) on or off.
- Turn detailed SQL logging on or off.
- Add a new logger for a class/package name.
- Remove a logger for a class/package name.
- Set the logging level (INFO, WARN, FATAL, ERROR or DEBUG) for each class or package name.
- Reset all logging levels to a predefined profile.

Changing the logging configuration

1. Choose the **cog icon**



, then choose **General Configuration** under Confluence Administration

2. Select '**Logging and Profiling**' in the '**Administration**' section of the left-hand panel.



You need to have [System Administrator](#) permissions in order to perform this function.

3. The '**Logging and Profiling**' screen appears, as shown below. Use the following guidelines to change the logging behavior while Confluence is running:
  - '**Performance Profiling**' — See [Page Request Profiling](#).
  - '**SQL Logging**' — Click the '**Enable SQL Logging**' button to log the details of SQL requests made to the database.
    - ❗ If you need to enable logging of SQL parameter values, you will need to change the setting in the [properties file](#). This option is not available via the Administration Console.
  - '**Log4j Logging**' — Click one of the profile buttons to reset all your loggers to the predefined profiles:
    - The '**Production**' profile is a fairly standard profile, recommended for normal production conditions.
    - The '**Diagnostic**' profile gives more information, useful for troubleshooting and debugging. It results in slower performance and fills the log files more quickly.
  - '**Add New Entry**' — Type a class or package name into the text box and click the '**Add Entry**' button. The new logger will appear in the list of '**Existing Levels**' in the lower part of the screen.
  - '**Existing Levels**' - These are the loggers currently in action for your Confluence instance.
    - You can change the logging level by selecting a value from the '**New Level**' dropdown list. Read the [Apache documentation](#) for a definition of each level.
    - Click the '**Remove**' link to stop logging for the selected class/package name.
4. Click the '**Save**' button to save any changes you have made in the '**Existing Levels**' section.

Screenshot: Changing Log Levels and Profiling

## Logging and Profiling

**Performance Profiling**  
 Profiling is currently OFF.

---

**SQL Logging**

---

**Log4j Logging**  
 loglevel.profileDesc

OR:

Customise specific logging settings

**Add New Entry**

Class/Package Name

New Level

INFO ▼

**Existing Levels**

Class/Package Name	Current Level	New Level	
atlassian.plugin	INFO	INFO ▼	<a href="#">Remove</a>
com.atlassian.confluence.admin.actions	INFO	INFO ▼	<a href="#">Remove</a>

## Editing the Properties File

To configure the logging levels and other settings on a permanent basis, you need to stop Confluence and then change the settings in the `log4j.properties` file, described [above](#).

The properties file contains a number of entries for different loggers that can be uncommented if you are interested in logging from particular components. Read more in the [Apache log4j documentation](#).

See [Working with Confluence Logs](#) for some guidelines on specific configuration options you may find useful.

#### Configuring Levels for java.util.logging in logging.properties

A few libraries used by Confluence use java.util.logging rather than log4j or slf4j. These libraries include:

- com.sun.jersey
- org.apache.shindig
- net.sf.ehcache

Confluence's logging.properties file is set to redirect java.util.logging at specific levels to log4j via slf4j.

To increase logging levels for these libraries you must first configure the logging.properties file in <CONFLUENCE-INSTALL>/confluence/WEB-INF/classes/. The logging levels are different from log4j and are listed [here](#).

For example, to increase logging for shindig change the following line in the logging.properties file:

```
org.apache.shindig.level = INFO
```

to

```
org.apache.shindig.level = FINE
```

And then use one of the methods above **as well** to configure the log4j level.

### log4j Logging Levels

#### Logging Levels

- **DEBUG** - designates fine-grained informational events that are most useful to debug an application (*what is going on*)
- **INFO** - announcements about the normal operation of the system - scheduled jobs running, services starting and stopping, user-triggered processes and actions
- **WARN** - any condition that, while not an error in itself, may indicate that the system is running sub-optimally
- **ERROR** - a condition that indicates something has gone wrong with the system
- **FATAL** - a condition that indicates something has gone wrong so badly that the system can not recover
- **TRACE** - n/a within confluence

There are two ways to modify the logging levels, as described in [Working with Confluence Logs](#).

1. Modifying the runtime log levels via the **Administration Console** (changes made here will not persist across restarts).
2. Manually modifying the <Confluence-Install>\confluence\WEB-INF\classes\log4j.properties file.

#### Default Log Level

The standard Confluence log level **WARN** is a way for Confluence to communicate with the server administrator. Logging at WARN level and higher should be reserved for situations that require some kind of attention from the server administrator, and for which corrective action is possible.

See [log4j manual](#) for more information.

### Troubleshooting SQL Exceptions

If you get an exception similar to those shown below, it is a good idea to increase the logging levels of your Confluence instance. If you request [Atlassian support](#), this additional logging will help us work out the cause of the error.

Increased logging levels will enable us to diagnose errors like these:

```
org.springframework.dao.DataIntegrityViolationException:
(HibernateTemplate): data integrity violated by SQL ''; nested exception
is java.sql.BatchUpdateException: Duplicate entry '1234' for key 1
    at
org.springframework.jdbc.support.SQLStateSQLExceptionTranslator.translate
(SQLStateSQLExceptionTranslator.java:88)
    caused by: java.sql.BatchUpdateException: Duplicate entry '1234' for key
1
    at
com.mysql.jdbc.ServerPreparedStatement.executeBatch(ServerPreparedStatement
ent.java:647)
```

or

```
(HibernateTemplate): data integrity violated by SQL ''; nested exception
is java.sql.BatchUpdateException: ORA-00001: unique constraint
(CONFLUENCE.SYS_C0012345) violated
```

This document outlines the steps to take to increasing logging on your system.


### Changing the logging levels via the Administration Console

With Confluence 2.7 and later, you can adjust logging levels at runtime via the Administration Console — read the [instructions](#). Below we tell you how to edit the log4j files directly.

1. Open `confluence/WEB-INF/classes/log4j.properties` and uncomment the following lines. The double `##` lines are comments, leave them intact.

```
## log hibernate prepared statements/SQL queries (equivalent to
setting 'hibernate.show_sql' to 'true')
#log4j.logger.net.sf.hibernate.SQL=DEBUG

## log hibernate prepared statement parameter values
#log4j.logger.net.sf.hibernate.type=DEBUG
```

1.  If you can not locate these lines in your `log4j.properties` file, please add them to the end of it.
2. Restart Confluence.
3. Redo the steps that led to the error.
4. Zip up your logs directory and attach it your support ticket.
5. If you are using Oracle and received a **constraint error**, please ask your database administrator which *table* and *column* the constraint (that is, `CONFLUENCE.SYS_C0012345`) refers to and add that information to your support ticket.
6. Open `confluence/WEB-INF/classes/log4j.properties` again and remove the 4 lines you added in step 1. (The additional logging will impact performance and should be disabled once you have completed this procedure.)

#### RELATED TOPICS

[Enabling Detailed SQL Logging](#)  
[Working with Confluence Logs](#)  
[Troubleshooting failed XML site backups](#)

## Configuring Confluence Security

This section gives guidelines on configuring the security of your Confluence site:

- [Confluence Security Overview and Advisories](#)
- [Confluence Cookies](#)
- [Configuring Secure Administrator Sessions](#)
- [Using Fail2Ban to limit login attempts](#)
- [Securing Confluence with Apache](#)
- [Trackback and External Referrers](#)
- [Best Practices for Configuring Confluence Security](#)
- [Hiding the People Directory](#)
- [Configuring Captcha for Spam Prevention](#)
- [Hiding External Links From Search Engines](#)
- [Configuring Captcha for Failed Logins](#)
- [Configuring XSRF Protection](#)
- [User Email Visibility](#)
- [Anonymous Access to Remote API](#)
- [Running Confluence Over SSL or HTTPS](#)
- [Connecting to LDAP or Jira applications or Other Services via SSL](#)
- [Configuring RSS Feeds](#)
- [Preventing and Cleaning Up Spam](#)
- [Running Confluence behind NGINX with SSL](#)

### Related pages:

- [Permissions and restrictions](#)
- [Configuring a Confluence Environment](#)
- [Confluence administrator's guide](#)

## Confluence Security Overview and Advisories

This document is for system administrators who want to evaluate the security of the Confluence web application. The page addresses overall application security and lists the security advisories issued for Confluence. As a public-facing web application, Confluence's application-level security is important. This document answers a number of questions that commonly arise when customers ask us about the security of our product.

Other topics that you may be looking for:

- For information about user management, groups and permissions, please refer to the [internal security overview](#).
- For guidelines on configuring the security of your Confluence site, see the [administrator's guide to configuring Confluence security](#).

## Application Security Overview

### Password Storage

When Confluence's internal user management is used, since version 3.5 of Confluence passwords are hashed through the salted [PKCS5S2 implementation provided by Embedded Crowd](#) before being stored in the database. There is no mechanism within Confluence to retrieve a user's password – when password recovery is performed, a reset password link is generated and mailed to the user's registered address.

When external user management is enabled, password storage is delegated to the external system.

### On this page:

- [Application Security Overview](#)
- [Finding and Reporting a Security Vulnerability](#)
- [Publication of Confluence Security Advisories](#)
- [Severity Levels](#)
- [Our Security Bugfix Policy](#)
- [Published Security Advisories](#)

#### Buffer Overflows

Confluence is a 100% pure Java application with no native components. As such it is highly resistant to buffer overflow vulnerabilities – possible buffer overruns are limited to those that are bugs in the Java Runtime Environment itself.

#### SQL Injection

Confluence interacts with the database through the Hibernate Object-Relational mapper. Database queries are generated using standard APIs for parameter replacement rather than string concatenation. As such, Confluence is highly resistant to SQL injection attacks.

#### Script Injection

Confluence is a self-contained Java application and does not launch external processes. As such, it is highly resistant to script injection attacks.

#### Cross-Site Scripting

As a content-management system that allows user-generated content to be posted on the web, precautions have been taken within the application to prevent cross-site scripting attacks:

- The wiki markup language in Confluence does not support dangerous HTML markup
- Macros allowing the insertion of raw HTML are disabled by default
- HTML uploaded as a file attachment is served with a content-type requesting the file be downloaded, rather than being displayed inline
- Only system administrators can make HTML-level customizations of the application

When cross-site scripting vulnerabilities are found in the Confluence web application, we endeavor to fix them as quickly as possible.

#### Transport Layer Security

Confluence does not directly support SSL/TLS. Administrators who are concerned about transport-layer security should set up SSL/TLS at the level of the Java web application server, or the HTTP proxy in front of the Confluence application.

For more information on configuring Confluence for SSL, see: [Running Confluence Over SSL or HTTPS](#)

#### Session Management

Confluence delegates session management to the Java application server in which it is deployed. We are not aware of any viable session-hijacking attacks against the Tomcat application server shipped with Confluence. If you are deploying Confluence in some other application server, you should ensure that it is not vulnerable to session hijacking.

#### Plugin Security

Administrators install third party plugins **at their own risk**. Plugins run in the same virtual machine as the Confluence server, and have access to the Java runtime environment, and the Confluence server API.

Administrators should always be aware of the source of the plugins they are installing, and whether they trust those plugins.

#### Administrator Trust Model

Confluence is written under the assumption that anyone given [System Administrator privileges](#) is trusted. System administrators are able, either directly or by installing plugins, to perform any operation that the Confluence application is capable of.

As with any application, you should not run Confluence as the root/Administrator user. If you want Confluence to listen on a privileged network port, you should set up port forwarding or proxying rather than run Confluence with additional privileges. The extra-careful may consider running Confluence inside a `chroot` jail.

#### Stack Traces

To help when debugging a problem, Confluence provides stack traces through the web interface when an error occurs. These stack traces include information about what Confluence was doing at the time, and some



information about your deployment server.

Only non-personal information is supplied such as operating system and version and Java version. With proper network security, this is not enough information to be considered dangerous. No usernames or passwords are included.

### Finding and Reporting a Security Vulnerability

Atlassian's approach to reporting security vulnerabilities is detailed in [How to Report a Security Issue](#).

### Publication of Confluence Security Advisories

Atlassian's approach to releasing security advisories is detailed in [Security Advisory Publishing Policy](#).

### Severity Levels

Atlassian's approach to ranking security issues is detailed in [Severity Levels for Security Issues](#).

### Our Security Bugfix Policy

Our approach to releasing patches for security issues is detailed in our [Security Bugfix Policy](#).

### Published Security Advisories

## Confluence Cookies

This page lists cookies stored in Confluence users' browsers which are generated by Confluence itself. This page does not list cookies that may originate from 3rd-party Confluence plugins.

### Authentication cookies

Confluence uses [Seraph](#), an open source framework, for HTTP cookie authentication. Confluence uses two types of cookies for user authentication:

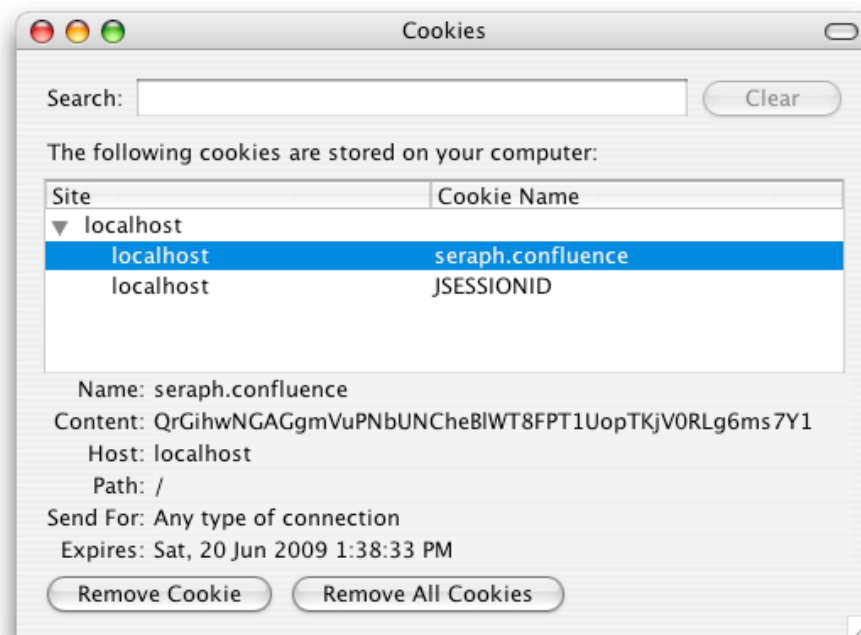
- The JSESSIONID cookie is created by the application server and used for session tracking purposes. This cookie contains a random string and the cookie expires at the end of every session or when the browser is closed.
- The 'remember me' cookie, `seraph.confluence`, is generated by Confluence when the user selects the **Remember me** check box on the login page.

 You can read about cookies on the [Wikipedia page about HTTP cookies](#).

#### On this page:

- [Authentication cookies](#)
- [Other Confluence cookies](#)
- [Notes](#)





#### The 'remember me' cookie

The 'remember me' cookie, `seraph.confluence`, is a long-lived HTTP cookie. This cookie can be used to authenticate an unauthenticated session. Confluence generates this cookie when the user selects the **Remember me** check box on the login page.

#### Cookie key and contents

By default, the cookie key is `seraph.confluence`, which is defined by the `login.cookie.key` parameter in the `CONFLUENCE-INSTALLATION/confluence/WEB-INF/classes/seraph-config.xml` file.

The cookie contains a unique identifier plus a securely-generated random string (i.e. token). This token is generated by Confluence and is also stored for the user in the Confluence database.

#### Use of cookie for authentication

When a user requests a web page, if the request is not already authenticated via session-based authentication or otherwise, Confluence will match the 'remember me' cookie (if present) against the token (also if present), which is stored for the user in the Confluence database.

If the token in the cookie matches the token stored in the database and the cookie has not expired, the user is authenticated.

#### Life of 'remember me' cookies

You can configure the maximum age of the cookie. To do that you will need to modify the `CONFLUENCE-INSTALLATION/confluence/WEB-INF/classes/seraph-config.xml` file and insert the following lines below the other `init-param` elements:

```
<init-param>
  <param-name>autologin.cookie.age</param-name>
  <param-value>2592000</param-value><!-- 30 days in seconds -->
</init-param>
```

#### Automatic cleanup of 'remember me' tokens

Every cookie issued by Confluence has a corresponding record in the database. A scheduled job runs on the 20th of every month to clean up expired tokens. The name of the trigger is `clearExpiredRememberMeTokensTrigger`.

**Note:** The only purpose of this job is to prevent the database table from growing too big. For authentication

purposes, Confluence will ignore expired tokens even if they still exist in the database.

*Is it possible to disable the 'remember me' feature?*

Confluence does not offer an option for disabling the 'Remember Me' feature. See the [workaround](#).

#### Other Confluence cookies

There are several cookies that Confluence uses to store basic 'product presentation' states. Confluence users' authentication details are not stored by these cookies.

Cookie Key	Purpose	Cookie Contents	Expiry
<b>confluence.list.pages.cookie</b>	Remembers the user's last chosen tab in the "list pages" section.	The name of the last selected tab. For example, list-content-tree	One year from the date it was set or was last updated.
<b>confluence.browse.space.cookie</b>	Remembers the user's last chosen tab in the "browse space" section	The name of the last selected tab. For example, space-pages	One year from the date it was set or was last updated.
<b>confluence-language</b>	Remembers the user's language chosen on the login page. This cookie relates to a feature that allows a user to change Confluence's language from (and including) the login page, when the language presented to the user prior to logging in is not appropriate.	A locale relating to the chosen language. For example, de_DE	360 days from the date it was set or was last updated.
<b>AJS.conglomerate.cookie</b>	Tracks which general tabs were last used or expansion elements were last opened or closed.	One or more key-value strings which indicate the states of your last general tab views or expansion elements.	One year from the date it is set or was last updated.

#### Notes

- The *autocomplete* feature in browser text fields (which are typically noticeable when a user logs in to Confluence) is a browser-specific feature, not a Confluence one. Confluence cannot enable or disable this autocompletion, which is typically set through a browser's settings.

### Configuring Secure Administrator Sessions

Confluence protects access to its administrative functions by requiring a secure administration session to use the [Confluence administration console](#) or administer a space. When a Confluence administrator (who is logged into Confluence) attempts to access an administration function, they are prompted to log in again. This logs the

administrator into a temporary secure session that grants access to the Confluence/space administration console.

The temporary secure session has a rolling timeout (defaulted to 10 minutes). If there is no activity by the administrator in the Confluence/space administration console for a period of time that exceeds the timeout, then the administrator will be logged out of the secure administrator session (note, they will remain logged into Confluence). If the administrator does click an administration function, the timeout will reset.

To configure secure administrator sessions:

1. Choose the **cog icon**




, then choose **General Configuration** under Confluence Administration

2. Choose **Security Configuration** in the left-hand panel.
3. Choose **Edit**.
4. Configure the setting as follows:
  - To disable secure administrator sessions, uncheck the **Enable** check box next to **Secure administrator sessions**. When this setting is disabled, administrators will no longer be required to log into a secure session to access the administration console.
  - To change the timeout for secure administrator sessions, update the value next to **minutes before invalidation**. The default timeout for a secure administration session is 10 minutes.
5. Choose **Save**.

#### Notes

- **Disabling password confirmation.** Confluence installations that use a custom authentication mechanism may run into problems with the Confluence security measure that requires password confirmation. If necessary, you can set the `password.confirmation.disabled` system property to disable the password confirmation functionality. See [Recognized System Properties](#). See issue [CONF-20958](#) "Confluence features that require password confirmation (websudo, captcha) do not work with custom authentication".
- **WebSudo.** The feature that provides secure administrator sessions is also called 'WebSudo'.
- **Manually ending a secure session.** An administrator can choose to manually end their secure session by clicking the '**drop access**' link in the banner displayed at the top of their screen. For example:


 You have temporary access to administrative functions. [Drop access](#) if you no longer require it. For more information, refer to [the documentation](#).

- **Note for developers.** Secure administrator sessions can cause exceptions when developing against Confluence or deploying a plugin. Please read this FAQ: [How do I develop against Confluence with Secure Administrator Sessions?](#) Note: The Confluence XML-RPC and REST APIs are not affected by secure administration sessions.

## Using Fail2Ban to limit login attempts

### What is Fail2Ban?

We need a means of defending sites against brute-force login attempts. [Fail2Ban](#) is a Python application which trails logfiles, looks for [regular expressions](#) and works with Shorewall (or directly with iptables) to apply temporary blacklists against addresses that match a pattern too often. This can be used to limit the rate at which a given machine hits login URLs for Confluence.

 The information on this page *does not apply* to Confluence Cloud.

### Prerequisites

- Requires [Python](#) 2.4 or higher to be installed
- Needs a specific file to follow, which means your Apache instance needs to log your Confluence access to a known logfile. You **should adjust the configuration below** appropriately.

### How to set it up

*This list is a skeletal version of the instructions*

- There's an RPM available for RHEL on the [download page](#), but you can also download the source and set it up manually
- Its configuration files go into `/etc/fail2ban`
- The generic, default configuration goes into `.conf` files (`fail2ban.conf` and `jail.conf`). Don't change these, as it makes upgrading difficult.
- Overrides to the generic configuration go into `.local` files corresponding to the `.conf` files. These only need to contain the specific settings you want overridden, which helps maintainability.
- Filters go into `filter.d` — this is where you define regexps, each going into its own file
- Actions go into `action.d` — you probably won't need to add one, but it's handy to know what's available
- "jails" are a configuration unit that specify one regexp to check, and one or more actions to trigger when the threshold is reached, plus the threshold settings (e.g. more than 3 matches in 60 seconds causes that address to be blocked for 600 seconds)
- Jails are defined in `jail.conf` and `jail.local`. Don't forget the `enabled` setting for each one — it can be as bad to have the wrong ones enabled as to have the right ones disabled.

### **Running Fail2Ban**

- Use `/etc/init.d/fail2ban {start|stop|status}` for the obvious operations
- Use `fail2ban-client -d` to get it to dump its current configuration to STDOUT. Very useful for troubleshooting.
- Mind the CPU usage; it can soak up resources pretty quickly on a busy site, even with simple regexp
- It can log either to syslog or a file, whichever suits your needs better

### **Common Configuration**

#### **jail.local**

```
# The DEFAULT allows a global definition of the options. They can be
# override
# in each jail afterwards.

[DEFAULT]

# "ignoreip" can be an IP address, a CIDR mask or a DNS host. Fail2ban
# will not
# ban a host which matches an address in this list. Several addresses
# can be
# defined using space separator.
# ignoreip = <space-separated list of IPs>

# "bantime" is the number of seconds that a host is banned.
bantime = 600

# A host is banned if it has generated "maxretry" during the last
# "findtime"
# seconds.
findtime = 60

# "maxretry" is the number of failures before a host get banned.
maxretry = 3

[ssh-iptables]

enabled = false

[apache-shorewall]

enabled = true
filter = cac-login
action = shorewall
logpath = /var/log/httpd/confluence-access.log
bantime = 600
maxretry = 3
findtime = 60
backend = polling
```

### Configuring for Confluence

The following is an example only, and you should adjust it for your site.

#### filter.d/confluence-login.conf

```
[Definition]

failregex = <HOST>.*"GET /login.action

ignoreregex =
```

## Securing Confluence with Apache

The following outlines some basic techniques to secure a Confluence instance using Apache. These instructions are basic to-do lists and should not be considered comprehensive. For more advanced security topics see the "Further Information" section below.

- [Using Apache to limit access to the Confluence administration interface](#)
- [Using Fail2Ban to limit login attempts](#)

### Further Information

#### Running Confluence behind Apache

#### Using Apache to limit access to the Confluence administration interface

##### Limiting administration to specific IP addresses

The Confluence administration interface is a critical part of the application; anyone with access to it can potentially compromise not only the Confluence instance but the entire machine. As well as limiting access to users who really need it, and using strong passwords, you should consider limiting access to it to certain machines on the network or internet. If you are using an [Apache web server](#), this can be done with Apache's **Location** functionality as follows:

##### 1. Create a file that defines permission settings

This file can be in the Apache configuration directory or in a system-wide directory. For this example we'll call it "sysadmin\_ips\_only.conf". The file should contain the following:

```
Order Deny,Allow
Deny from All

# Mark the Sysadmin's workstation
Allow from 192.168.12.42
```

##### 2. Add the file to your Virtual Host

In your Apache Virtual Host, add the following lines to restrict the administration actions to the Systems Administrator:

This configuration assumes you've installed Confluence under '/confluence'. If you have installed under '/' or elsewhere, adjust the paths accordingly.

```
<Location /confluence/admin>
  Include sysadmin_ips_only.conf
</Location>
<Location /confluence/plugins/servlet/oauth/consumers/list>
  Include sysadmin_ips_only.conf
</Location>
<Location /confluence/plugins/servlet/oauth/view-consumer-info>
  Include sysadmin_ips_only.conf
</Location>
<Location /confluence/plugins/servlet/oauth/service-providers/list>
  Include sysadmin_ips_only.conf
</Location>
<Location /confluence/plugins/servlet/oauth/service-providers/add>
  Include sysadmin_ips_only.conf
</Location>
<Location /confluence/plugins/servlet/oauth/consumers/add>
  Include sysadmin_ips_only.conf
```

```
</Location>
<Location /confluence/plugins/servlet/oauth/consumers/add-manually>
  Include sysadmin_ips_only.conf
</Location>
<Location /confluence/plugins/servlet/oauth/update-consumer-info>
  Include sysadmin_ips_only.conf
</Location>
<Location /confluence/pages/templates/listpagetemplates.action>
  Include sysadmin_ips_only.conf
</Location>
<Location /confluence/pages/templates/createpagetemplate.action>
  Include sysadmin_ips_only.conf
</Location>
<Location /confluence/spaces/spacepermissions.action>
  Include sysadmin_ips_only.conf
</Location>
<Location /confluence/pages/listpermissionpages.action>
  Include sysadmin_ips_only.conf
</Location>
<Location /confluence/spaces/removespace.action>
  Include sysadmin_ips_only.conf
</Location>
<Location /confluence/spaces/importtmbbox.action>
  Include sysadmin_ips_only.conf
</Location>
<Location /confluence/spaces/viewmailaccounts.action>
  Include sysadmin_ips_only.conf
</Location>
<Location /confluence/spaces/addmailaccount.action?>
  Include sysadmin_ips_only.conf
</Location>
<Location /confluence/spaces/importpages.action>
  Include sysadmin_ips_only.conf
</Location>
<Location /confluence/spaces/flyingpdf/flyingpdf.action>
  Include sysadmin_ips_only.conf
</Location>
<Location /confluence/spaces/exportspacehtml.action>
  Include sysadmin_ips_only.conf
</Location>
<Location /confluence/spaces/exportspacexml.action>
  Include sysadmin_ips_only.conf
</Location>
<Location /confluence/plugins/servlet/embedded-crowd>
  Include sysadmin_ips_only.conf
</Location>
```

```
<Location /confluence/plugins/servlet/upm>  
  Include sysadmin_ips_only.conf  
</Location>
```


## Trackback and External Referrers

### Trackback

When Trackback is enabled, any time you link to an external webpage that supports Trackback Autodiscovery, Confluence will send a trackback ping to that page to inform it that it has been linked to.

Confluence pages also support Trackback Autodiscovery and when Trackback is enabled, can receive trackback pings from other sites.

To enable trackback:

1. Go to  **General Configuration**  
    > **Further Configuration**
2. Choose **Edit**
3. Select the **Trackback** checkbox then **Save**

### On this page:

- [Trackback](#)
- [External referrers](#)
  - [Excluding external referrers](#)
  - [Hiding external referrers](#)
  - [Ignoring external referrers](#)

### External referrers

An external referrer is any site that links to your Confluence instance. Each time someone clicks on the external link, your Confluence site can record the click as a referral.

By default, external referrers for a page are listed under '**Hot Referrers**' on the '**Info**' screen of the page. Confluence shows a maximum of 10 referrers. If there are more than 10, confluence shows the 10 with the highest number of hits.

Note that you do *not* need to enable trackback in order to have external referrers enabled.

*Screenshot: hot referrers on the page information screen.*



## Page Information

Title:	The new logo
Author:	<a href="#">Sophie Staunton</a> Feb 15, 2013
Last Changed by:	<a href="#">Sophie Staunton</a> Feb 15, 2013
Tiny Link: (useful for email)	<a href="http://localhost:8090/x/HwA8">http://localhost:8090/x/HwA8</a>
Export As:	Word · PDF
Operations:	Copy

### Labels

There are no labels assigned to this page.

### Hot Referrers

(2)	<a href="https://mail.google.com/mail/u/1/">https://mail.google.com/mail/u/1/</a>	[ban]
(1)	<a href="https://atlassian.hipchat.com/chat">https://atlassian.hipchat.com/chat</a>	[ban]

### Excluding external referrers

Confluence Administrators can exclude external referrers to prevent them from being recorded or displayed anywhere on your site. Once you have specified your list of blocked URLs, any incoming links from URLs that match the list will no longer be recorded.

Referrer URLs are blocked if they start with any of the URLs in the exclusion list. So <http://evilspamsite.blogspot.com> will also match <http://evilspamsite.blogspot.com/nastypage.html>

You might want to do this if:

1. **You're running a Confluence installation that is open to public**

In a site that is open to public, one unfortunate problem is that malicious sites can spam the display of a page's incoming links statistics. This is usually done to get the site's URL to appear in the sidebar. By adding these sites to the 'excluded referrers' list, you can prevent them from being listed on your site.

2. **Confluence is installed on a server with multiple domain names or IP addresses**

Confluence will consider any URL originating from the domain name where Confluence is installed as an internal link. However, if Confluence is installed on a server with multiple domain names or IP addresses, you will need to add the other domain name prefixes to this list to let Confluence know that any links from these domains should not be considered external links.

To add a URL to the excluded referrers list:

1. Go to



> **General Configuration**  
> **Manage Referrers**

2. Enter the URL in the **Referrer URL Prefix** field (you must include `http://`)
3. Choose **Add**

You can add multiple URLs to the list.

### Exclude External Referrers

Referrer URL Prefix

Add a URL Prefix that will no longer be recorded in the External Referrers. All URLs that start with this prefix will be excluded.


### Excluded Referrer URL Prefixes

URL Prefix	Operations
	<a href="#">Purge All</a>
<a href="http://evilspamsite.blogspot.com">http://evilspamsite.blogspot.com</a>	<a href="#">Delete</a> · <a href="#">Purge</a>

#### Hiding external referrers

By default, Confluence lists the external referrers as '**Hot Referrers**' on the page information screen for a page. If you turn this option off, external referrers will not be listed on the page.

To hide external referrers:

1. Go to 
  - > **General Configuration**
  - > **Manage Referrers.**
2. Deselect **Show Referrers in Page Info**.

Screenshot: Managing external referrers

### External Referrer Settings

Record External Referrers ☒

Allow Confluence to record the external URLs that link to Confluence pages.  
[More about External Referrers](#)

Show Referrers in Page Info ☐

Show the top 10 external links pointing to that page on the 'Info' screen.

[Cancel](#)

#### Ignoring external referrers

An external referrer is any site that links to your Confluence instance. Each time someone clicks on the external link, your Confluence site can record the click as a referral. By default, Confluence records the number of hits made to a page from any link on an external site. If you turn this option off, Confluence will not record the hits.

To ignore external referrers:

1. Go to 
  - > **General Configuration**
  - > **Manage Referrers**
2. Deselect **Record External Referrers**

Screenshot: Managing external referrers

## External Referrer Settings

Record External Referrers

☐

Allow Confluence to record the external URLs that link to Confluence pages.  
[More about External Referrers](#)

Show Referrers in Page Info

☐

Show the top 10 external links pointing to that page on the 'Info' screen.

Submit

Cancel

## Best Practices for Configuring Confluence Security

The best way to harden a system is to look at each of the involved systems individually. Contact your company's security officer or department to find out what security policies you should be using. There are many things to consider, such as the configuration of your underlying operating systems, application servers, database servers, network, firewall, routers, etc. It would be impossible to outline all of them here.

This page contains guidelines on good security practices, to the best of our knowledge.

### Configuring the Web Server

Please refer to the following guides for system administrators:

- How to configure Apache to lock down the administration interface to those people who really need it: [Using Apache to limit access to the Confluence administration interface](#).
- How to reduce the risk of brute force attacks: [Using Fail2Ban to limit login attempts](#).

### Configuring the Application Server

See the following system administrator guide for general hints on the application server level:

- [Tomcat security best practices](#)

### Configuring the Application

The way you set up Confluence roles, permissions and processes makes a big difference in the security of your Confluence site.

Below are some more Confluence-specific items to consider. None of these provides 100% security. They are measures to reduce impact and to slow down an intruder in case your system does become compromised.

- Keep the number of Confluence administrators extremely low. For example, 3 system administrator accounts should be the maximum.
- Similarly, restrict the number of users with powerful roles or group memberships. If only one department should have access to particularly sensitive data, then do restrict access to the data to those users. Do not let convenience over-rule security. Do not give all staff access to sensitive data when there is no need.
- The administrators should have separate Confluence accounts for their administrative roles and for their day to day roles. If John Doe is an administrator, he should have a regular user account without administrator access to do his day to day work (such as writing pages in the wiki). This could be a 'john.doe' account. In addition, he should have an entirely separate account (that cannot be guessed by an outsider and that does not even use his proper name) for administrative work. This account could be 'jane smith' – using a username that is so obscure or fake that no outsider could guess it. This way, even if an attacker singles out the actual person John Doe and gets hold of his password, the stolen account would most likely be John's regular user account, and the attacker cannot perform administrative actions with that account.

- Lock down administrative actions as much as you can. If there is no need for your administrators to perform administrative actions from outside the office, then lock down access to those actions to known IP addresses, for example. See [Using Apache to limit access to the Confluence administration interface](#).
- Put documented procedures in place for the case of employees leaving the company.
- Perform security audits regularly. Know who can help in case a security breach occurs. Perform 'what if' planning exercises. ('What is the worst thing that could happen if a privileged user's password were stolen while he's on vacation? What can we do to minimize damage?').
- Make sure the Confluence database user (and all datasource database users) only has the amount of database privileges it really needs.
- Monitor your binaries. If an attacker compromises an account on your system, he will usually try to gain access to more accounts. This is sometimes done by adding malicious code, such as by modifying files on the system. Run routine scripts that regularly verify that no malicious change has been made.

As another precaution:

- Regularly monitor the above requirements. There are many things that could start out well, but deteriorate over time:
  - A system may start out with just 3 administrators, but over the course of a year this could grow to 30 administrators if no one prevents expansion.
  - Apache administration restrictions may be in place at the start of the year, but when the application server is migrated after a few months, people may forget to apply the rules to the new system.

Again, keep in mind that the above steps may only be a fraction of what could apply to you, depending on your security requirements. Also, keep in mind that none of the above rules can guarantee anything. They just make it harder for an intruder to move quickly.

### Hiding the People Directory

The [People Directory](#) provides a list of all users in your Confluence system.

If you need to disable the People Directory [set the following system properties](#) on your application server command line:

- **To disable the People Directory for anonymous users:**

```
-Dconfluence.disable.peopledirectory.anonymous=true
```

- **To disable the People Directory entirely:**

```
-Dconfluence.disable.peopledirectory.all=true
```

This workaround will prevent the People directory from appearing on the dashboard, but if you navigate to the profile of a user, and then click on the "People" in the breadcrumb link (Dashboard >> **People** >> FullName >> Profile) or you go to the URL directly `<CONFLUENCE_INSTALL>/browsepeople.action`, you will be able to access the people directory.

To workaround this, set up your Apache webserver in front of Confluence and redirect requests to this URL.

### Configuring Captcha for Spam Prevention

If your Confluence site is open to the public (you allow anonymous users to add comments, create pages etc) you may find that automated spam is being added, in the form of comments or new pages.

You can configure Confluence to deter automated spam by asking users to prove that they are human before they are allowed to:

- Sign up for an account.
- Add a comment.
- Create a page.

#### Related pages:

- [Configuring Confluence Security](#)

- Edit a page.
- Send a request to the Confluence administrators.

Captcha is a test that can distinguish a human being from an automated agent such as a web spider or robot. When Captcha is switched on, users will see a distorted picture of a word, and must enter it in a text field before they can proceed.

*Screenshot: Example of a Captcha test*



By default, Captcha is disabled. When enabled, the default is that only anonymous users will have to perform the Captcha test when creating comments or editing pages. You can also choose to enforce Captcha for all users or members of particular groups.

You need System Administrator permissions to configure Captcha for spam prevention in Confluence.

#### To enable Captcha for spam prevention in Confluence:

1. Choose the **cog icon**



, then choose **General Configuration** under Confluence Administration

2. Choose **Spam Prevention** in the left-hand panel
3. Choose **ON** to turn on Captcha
4. If you want to disable Captcha for certain groups:
  - Select **No one** if you want everyone to see Captchas.
  - Select **Signed in users** if you want only anonymous users to see Captchas.
  - If you want everyone to see Captchas except members of specific groups, select **Members of the following groups** and enter the group names in the text box.  
You can click the magnifying-glass icon to search for groups. Search for all or part of a group name and click the **Select Groups** button to add one or more groups to the list.
  - To remove a group from the list, delete the group name
5. Choose **Save**

#### Hiding External Links From Search Engines

Hiding external links from search engines helps to discourage spammers from posting links on your site. If you turn this option on, any URLs inserted in pages and comments will be given the 'nofollow' attribute, which prevents search engines from following them.

**i** Shortcut links (e.g. CONF-2622@JIRA) and internal links to other pages within Confluence are not tagged.

To hide external links from search engines:

1. Choose the **cog icon**



, then choose **General Configuration** under Confluence Administration

2. Click **'Security Configuration'** in the left panel.
3. This will display the **'Security Configuration'** screen. Click **'Edit'**.
4. Check the **'Hide External Links From Search Engines'** checkbox.
5. Click the **'Save'** button.

#### Background to the nofollow attribute

As part of the effort to combat the spamming of wikis and blogs (Confluence being both), Google came up with [some markup](#) which instructs search engines not to follow links. By removing the main benefit of wiki-spamming it's hoped that the practice will stop being cost-effective and eventually die out.

## Configuring Captcha for Failed Logins

If you have Confluence administrator permissions, you can configure Confluence to impose a maximum number of repeated login attempts. After a given number of failed login attempts (the default is three) Confluence will display a Captcha form asking the user to enter a given word when attempting to log in again. This will prevent brute force attacks on the Confluence login screen.

Similarly, after three failed login attempts via the XML-RPC or SOAP API, an error message will be returned instructing the user to log in via the web interface. Captcha will automatically be activated when they attempt this login.

'Captcha' is a test that can distinguish a human being from an automated agent such as a web spider or robot. When Captcha is activated, users will need to recognize a distorted picture of a word, and must type the word into a text field. This is easy for humans to do, but very difficult for computers.

*Screenshot: example of a Captcha test*



### On this page:

- [Enabling, Disabling and Configuring Captcha for Failed Logins](#)
- [Notes](#)

## Enabling, Disabling and Configuring Captcha for Failed Logins

By default, Captcha for failed logins is enabled and the number of failed login attempts is set to three.

**To enable, disable and configure Captcha for failed logins:**

1. Choose the **cog icon**



, then choose **General Configuration** under Confluence Administration

2. Choose '**Security Configuration**' from the left menu.
3. Choose '**Edit**'.
4. To enable Captcha:
  - Select the '**Enable**' checkbox next to '**CAPTCHA on login**'.
  - Set the maximum number of failed logins next to '**Maximum Authentication Attempts Allowed**'. You must enter a number greater than zero.
5. To **disable** Captcha, deselect the '**Enable**' checkbox.
6. Choose '**Save**'.

*Screenshot: Configuring Captcha for failed logins*

## Security and Privacy

Settings for user management, site security and user privacy.

☐ External user management

Delegate user management to JIRA. [More about User Management](#)

☒ Append wildcards to user and group searches

☒ Hide External Links From Search Engines

This helps discourage spammers from posting malicious links by preventing search engines to follow the site. [More about External Links](#)

☐ Anonymous Access to Remote API

Enabling this will allow 'anonymous' to access Confluence remotely.

☐ Custom Stylesheets for Spaces

☐ Show system information on the 500 page

User email visibility

Maximum RSS Items

Limit the maximum number of items an RSS Feed can request.

RSS timeout  seconds

The time in seconds allowed to create each RSS Feed. Any items rendered within the timeout will still be returned.

Page timeout  seconds

The time in seconds allowed to render the content of each wiki Page. Pages taking longer to render will display a timeout error to the user. The default is 120 seconds.

CAPTCHA on login ☒ Enable

maximum authentication attempts allowed

Secure administrator sessions ☒ Enable

minutes before automatic invalidation

Requires Confluence Administrator login to access administration functions. [More about Secure Administrator Sessions](#)

### Notes

- **Disabling all password confirmation requests, including Captcha on login.** Confluence installations that use a custom authentication mechanism may run into problems with the Confluence security measure that requires password confirmation. If necessary, you can set the `password.confirmation.disabled` system property to disable the password confirmation functionality on [administrative actions](#), change of email address and Captcha for failed logins. See [Recognized System Properties](#).

### Configuring XSRF Protection

Confluence requires an XSRF token to be present on comment creation, to prevent users being tricked into unintentionally submitting malicious data. All the themes bundled with Confluence have been designed to use this feature. However, if you are using a custom theme that does not support this security feature, you can disable it.

**⚠ Please carefully consider the security risks before you disable XSRF protection for comments in your Confluence installation.**



Read more about [XSRF \(Cross Site Request Forgery\)](http://cgisecurity.com) at [cgisecurity.com](http://cgisecurity.com).

#### To configure XSRF protection for comments:

1. Choose the **cog icon**  , then choose **General Configuration** under Confluence Administration
2. Choose **Security Configuration** in the left-hand panel.
3. Choose **Edit**.
4. Uncheck the **Adding Comments** checkbox in the **XSRF Protection** section, to disable XSRF protection.
5. Choose **Save**.

##### Related pages:


- [Configuring Confluence Security](#)
- [Confluence Administrator's Guide](#)
- [Developer documentation on XSRF protection in Confluence](#)

#### User Email Visibility

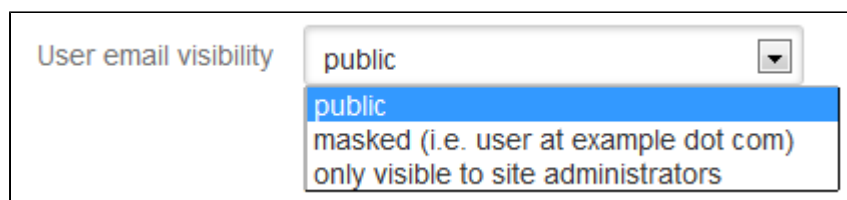
Confluence provides three options for email address privacy which can be configured by a Confluence administrator from the **Administration Console**:

- **Public**: email addresses are displayed publicly.
- **Masked**: email addresses are still displayed publicly, but masked in such a way to make it harder for spam-bots to harvest them.
- **Only visible to site administrators**: only [Confluence administrators](#) can see the email addresses. Note that, if you select this option, email addresses will not be available in the 'User Search' popup (e.g. when setting [Page Restrictions](#)).

#### To configure user email visibility:

1. Choose the **cog icon**  , then choose **General Configuration** under Confluence Administration
2. Choose '**Security Configuration**'.
3. Choose '**Edit**'. The fields on the '**Security Configuration**' screen will be editable.
4. Select one of the options from the '**User email visibility**' dropdown: **public**, **masked**, or **only visible to site administrators**.
5. Choose '**Save**'.

*Screenshot: Email Visibility*



User email visibility

public

public

masked (i.e. user at example dot com)

only visible to site administrators

#### Anonymous Access to Remote API

Administrators may wish to disable anonymous access to the Confluence remote API, to make it harder for malicious users to write 'bots' that perform bulk changes to the site.

#### To disable anonymous access to the remote API:



1. Choose the **cog icon**



, then choose **General Configuration** under Confluence Administration

2. Choose **Security Configuration** in the left-hand panel. The **Security Configuration** screen will appear.
3. Choose **Edit**.
4. Uncheck the **Anonymous Access to API** check box.
5. Choose **Save**.

#### Notes

This page is about access to the remote API. If you are looking for information about preventing anonymous users from accessing Confluence, see [Global Permissions Overview](#).

#### Running Confluence Over SSL or HTTPS

Atlassian applications allow the use of SSL within our products, however Atlassian Support does not provide assistance for configuring it. Consequently, Atlassian **cannot guarantee providing any support for it**.

- If assistance with conversions of certificates is required, please consult with the vendor who provided the certificate.
- If assistance with configuration is required, please raise a question on [Atlassian Answers](#).

This document tells you how to configure Confluence to enable access via HTTPS (HTTP over SSL), so that your Confluence logins and data are encrypted during transport to and from Confluence. SSL encryption is a good way to safeguard your Confluence data and user logins from being intercepted and read by outsiders.

These instructions apply to the following platforms:

- **Confluence** - Apache Tomcat is the application server shipped with Confluence, and is the only supported application server. If you are using Apache HTTP Server (httpd) or NGINX, see [Apache with mod\\_proxy](#) or [Running Confluence behind NGINX with SSL](#) for instructions on how to terminate an SSL connection at the external web server.
- **Java 8** - JDK 1.8 is the [supported](#) Java version for Confluence. Note that you need the JDK, since it includes the `keytool` utility used in the instructions below. The JRE is not enough.

**i** The default connector port for Confluence is 8090.

#### On this page:

- [Step 1. Create or Request a New SSL Certificate](#)
- [Step 2. Modify the Server Configuration File in your Confluence Installation](#)
- [Step 3. Specify the Location of your Certificate](#)
- [Step 4. Change your Confluence Base URL to HTTPS](#)
- [Step 5. Add a Security Constraint to Redirect All URLs to HTTPS](#)
- [Notes](#)
- [Troubleshooting](#)

#### Related Topics

- [SSL Configuration HOW-TO in the Apache Tomcat 8.0 documentation](#)
- [keytool - Key and Certificate Management Tool in the Java SE documentation](#)
- [Connecting to LDAP or Jira applications or Other Services via SSL](#)

#### Step 1. Create or Request a New SSL Certificate

You will need a valid SSL certificate before you can enable HTTPS. If you already have a certificate prepared, skip to step 2 [below](#).

You can choose to create a self-signed certificate or to use a certificate issued by a certificate authority (CA, sometimes also called a 'certification authority'). We described both options below.

If you're not comfortable using command line utilities [KeyStore Explorer](#) is a useful GUI replacement for the Java Keytool command line.

### Certificate Option 1 – Create a Self-Signed Certificate

Self-signed certificates are useful if you require encryption but do not need to verify the identity of the requesting website. In general, you might use a self-signed certificate on a test environment and on internal corporate networks (intranets).

Because the certificate is not signed by a certificate authority (CA), users may receive a message that the site is not trusted and may have to perform several steps to accept the certificate before they can access the site. This usually will only occur the first time they access the site.

Follow the steps below to generate a certificate using Java's `keytool` utility. This tool is included in the JDK.

1. Use Java's `keytool` utility to generate the certificate:

Many SSL issuers (including but not limited to GoDaddy and RapidSSL) are now requiring a 2048-bit key size. To generate a key with 2048-bit encryption, add '-keysize 2048' to these queries.

- On Windows, run the following command at the command prompt:

```
"%JAVA_HOME%\bin\keytool" -genkeypair -keysize 2048 -alias tomcat -keyalg RSA -sigalg SHA256withRSA
```

- On OS X or UNIX-based systems, run the following command at the command prompt:

```
$JAVA_HOME/bin/keytool -genkeypair -keysize 2048 -alias tomcat -keyalg RSA -sigalg SHA256withRSA
```

2. When asked for a **password**:

- Specify the password you want to use for the certificate (private key). Note that the password text will not appear as you type it.
- Make a note of the password you choose, because you will need it in the next step when editing the configuration file.
- The default password is 'changeit'.

Tomcat has a known issue with passwords containing special characters. You should use a password that only contains alphanumeric characters.

3. Follow the prompts to specify your name, organization and location. This information is used to construct the X.500 Distinguished Name (DN) of the entity. The CN ("What is your first and last name?") must match the fully-qualified hostname of the server running Confluence, otherwise Tomcat will not be able to use the certificate for SSL. For example for a Confluence running on a server named "confluence.example.com":  
CN=confluence.example.com, OU=Java Software Division, O=Sun Microsystems Inc, C=US
4. Enter 'y' to confirm the details.
5. When asked for the **password** for 'tomcat' (the alias you entered in the keytool command above), press the 'Enter' key. This specifies that your keystore entry will have the **same password** as your private key. You **MUST** use the same password here as was used for the keystore password itself. This is a restriction of the Tomcat implementation.
6. Your certificate is now ready. Go to step 2 [below](#).

### Certificate Option 2 – Use a Certificate Issued by a Certificate Authority

When running Confluence in a production environment, you will need a certificate issued by a certificate authority (CA, sometimes also called a 'certification authority') such as [VeriSign](#), [Thawte](#) or [digicert](#). The instructions below are adapted from the [Tomcat documentation](#).

First you will generate a local certificate and create a 'certificate signing request' (CSR) based on that certificate. You will submit the CSR to your chosen certificate authority. The CA will use that CSR to generate a certificate for you.

1. Use Java's `keytool` utility to generate a local certificate, as described in the previous section.
2. Use the `keytool` utility to generate a CSR, replacing the text `<MY_KEYSTORE_FILENAME>` with the path to and file name of the `.keystorefile` generated for your local certificate:

```
keytool -certreq -keyalg RSA -alias tomcat -file certreq.csr  
-keystore <MY_KEYSTORE_FILENAME>
```

3. Submit the generated file called `certreq.csr` to your chosen certificate authority. **Refer to the documentation on the CA's website to find out how to do this.**
4. The CA will send you a certificate.
5. Import the new certificate into your local keystore:

```
keytool -importcert -alias tomcat -keystore  
<MY_KEYSTORE_FILENAME> -file <MY_CERTIFICATE_FILENAME>
```

**Please note that some CAs require you to install an intermediate certificate before importing your certificate. Please refer to your CA documentation to successfully install your certificate.**

If you receive an error, and you use Verisign or GoDaddy, you may need to export the certificate to PKCS12 format along with the private key.

1. First, remove the certificate added above from the keystore:

```
keytool -delete -alias tomcat -keystore  
<MY_KEYSTORE_FILENAME>
```

2. Then export to PKCS12 format:

```
openssl pkcs12 -export -in <MY_CERTIFICATE_NAME> -inkey  
<MY_PRIVATEKEY_NAME> -out <MY_PKC12_KEYSTORE_NAME> -name  
tomcat -CAfile  
<MY_ROOTCERTIFICATE_NAME-alsoCalledBundleCertificateInGoDa  
ddy> -caname root
```

3. Then import from PKCS12 to jks:


```
keytool -importkeystore -deststorepass  
<MY_DESTINATIONSTORE_PASSWORD> -destkeypass  
<MY_DESTINATIONKEY_PASSWORD> -destkeystore  
<MY_KEYSTORE_FILENAME> -srckeystore  
<MY_PKC12_KEYSTORE_NAME> -srcstoretype PKCS12  
-srcstorepass <MY_PKC12_KEYSTORE_PASSWORD> -alias tomcat
```

## Step 2. Modify the Server Configuration File in your Confluence Installation

1. Edit the server configuration file at this location: <CONFLUENCE\_INSTALLATION>/conf/server.xml
2. Uncomment the following lines:

```
<Connector port="8443" maxHttpHeaderSize="8192"
    maxThreads="150" minSpareThreads="25"
    protocol="org.apache.coyote.http11.Http11NioProtocol"
    enableLookups="false" disableUploadTimeout="true"
    acceptCount="100" scheme="https" secure="true"
    clientAuth="false" sslProtocol="TLSv1.2"
    sslEnabledProtocols="TLSv1.2" SSLEnabled="true"
    URIEncoding="UTF-8"
    keystorePass="<MY_CERTIFICATE_PASSWORD>" />
```

3. Replace the text <MY\_CERTIFICATE\_PASSWORD> with the password you specified for your certificate.
4. Make sure that the attribute-value pair SSLEnabled="true" is part of the Connector element, as shown above. If this attribute is not present, attempts to access Confluence will time out.
5. Save the server configuration file.

 Avoid removing the http connector, as the Synchrony proxy health check, still requires HTTP. If you do not want to include the http connector, you can use the synchrony.proxy.healthcheck.disabled system property to disable the health check.

You should also **not** disable the internal Synchrony proxy (by setting the synchrony.proxy.enabled system property to false) as this is known to cause problems when you're terminating SSL at Tomcat.

## Step 3. Specify the Location of your Certificate

By default, Tomcat expects the keystore file to be named .keystore and to be located in the user home directory under which Tomcat is running (which may or may not be the same as your own home directory). This means that, by default, Tomcat will look for your SSL certificates in the following location:

- On Windows: C:\users\#CURRENT\_USER#\keystore
- On OS X and UNIX-based systems: ~/keystore

Don't store your keystore file in your Confluence installation directory as the contents of that directory are removed when you upgrade Confluence.

You may decide to move the certificate to a custom location. If your certificate is not in the default location, you will need to update your server configuration file as outlined below, so that Tomcat can find the certificate.

1. Edit the server configuration file at this location: <CONFLUENCE\_INSTALLATION>/conf/server.xml
2. Add the attribute keystoreFile="<MY\_CERTIFICATE\_LOCATION>" to the Connector element, so that the element looks like this:

```
<Connector port="8443" maxHttpHeaderSize="8192"
           maxThreads="150" minSpareThreads="25"
maxSpareThreads="75"
           enableLookups="false"
disableUploadTimeout="true"
           acceptCount="100" scheme="https"
secure="true"
           clientAuth="false" sslProtocol="TLS"
SSLEnabled="true"
           URIEncoding="UTF-8"
keystorePass="<MY_CERTIFICATE_PASSWORD>"
           keystoreFile="<MY_CERTIFICATE_LOCATION>" />
```

3. Replace the text `<MY_CERTIFICATE_LOCATION>` with the path to your certificate, including the path and the name of the `.keystore` file.
4. Save the server configuration file.

#### Step 4. Change your Confluence Base URL to HTTPS

1. In your browser, go to the Confluence Administration Console.
2. Change the Server Base URL to HTTPS. See the documentation on [configuring the server base URL](#).
3. Restart Confluence and access Confluence on `https://<MY_BASE_URL>:8443/`.

#### Step 5. Add a Security Constraint to Redirect All URLs to HTTPS

Although HTTPS is now activated and available, the old HTTP URLs (`http://localhost:8090`) are still available. Now you need to redirect the URLs to their HTTPS equivalent. You will do this by adding a security constraint in `web.xml`. This will cause Tomcat to redirect requests that come in on a non-SSL port.

1. Check whether your Confluence site uses the **RSS macro**. If your site has the RSS macro enabled, you may need to configure the URL redirection with a firewall rule, rather than by editing the `web.xml` file. Skip the steps below and follow the steps on the [RSS Feed Macro](#) page instead.
2. Otherwise, Edit the file at `<CONFLUENCE_INSTALLATION>/confluence/WEB-INF/web.xml`.
3. Add the following declaration to the end of the file, **before** the `</web-app>` tag:

```
<security-constraint>
  <web-resource-collection>
    <web-resource-name>Restricted URLs</web-resource-name>
    <url-pattern>/</url-pattern>
  </web-resource-collection>
  <user-data-constraint>
    <transport-guarantee>CONFIDENTIAL</transport-guarantee>
  </user-data-constraint>
</security-constraint>
```

4. Restart Confluence and access `http://localhost:8090`. You should be redirected to `https://localhost:8443/login.action`.

**i** Confluence has two `web.xml` files. The other one is at `<CONFLUENCE_INSTALLATION>/conf/web.xml`. Please only add the security constraints to `<CONFLUENCE_INSTALLATION>/confluence/WEB-INF/web.xml`, as described above.

#### Notes

- **Background information on generating a certificate:** The 'keytool -genkeypair' command generates a key pair consisting of a public key and the associated private key, and stores them in a keystore. The command packages the public key into an X.509 v3 self-signed certificate, which is stored as a single-element certificate chain. This certificate chain and the private key are stored in a new keystore entry, identified by the `alias` that you specify in the command. The [Java SE documentation](#) has a good overview of the utility.
- **Custom SSL port:** If you have changed the port that the SSL connector is running on from the default value of 8443, you must update the `redirectPort` attribute of the standard HTTP connector to reflect the new SSL port. Tomcat needs this information to know which port to redirect to when an incoming request needs to be secure.
- **Multiple instances on the same host:** When running more than one instance on the same host, it is important to specify the `address` attribute in the `<CONFLUENCE_INSTALLATION>/conf/server.xml` file because by default the connector will listen on **all available network interfaces**, so specifying the address will prevent conflicts with connectors running on the same default port. See the Tomcat Connector documentation for more about setting the address attribute: <https://tomcat.apache.org/tomcat-8.0-doc/config/http.html>

```
<Connector port="8443" address="your.confluence.url.com"
maxHeaderSize="8192"
                maxThreads="150" minSpareThreads="25"
maxSpareThreads="75"
                enableLookups="false"
disableUploadTimeout="true"
                acceptCount="100" scheme="https"
secure="true"
                clientAuth="false" sslProtocol="TLS"
SSLEnabled="true"
                URIEncoding="UTF-8"
keystorePass="<MY_CERTIFICATE_PASSWORD>"
                keystoreFile="<MY_CERTIFICATE_LOCATION>" />
```

- **Protection for logins only or for individual spaces:** As of Confluence 3.0, Atlassian does not support HTTPS for logins only or for specific pages. We support only site-wide HTTPS. To see the reasoning behind this decision, please see [CONF-18120](#) and [CONF-4116](#).

## Troubleshooting

- Check the Confluence knowledge base articles on [troubleshooting SSL](#)
- Problems with **Internet Explorer being unable to download attachments:** Applying SSL site wide can prevent IE from downloading attachments correctly. To fix this problem, edit `<CONFLUENCE_INSTALLATION>/conf/server.xml` and add the following line within the `<Context ... />` element:

```
<Valve
className="org.apache.catalina.authenticator.NonLoginAuthenticator"
                disableProxyCaching="true" securePagesWithPragma="false"
/>
```

## Connecting to LDAP or Jira applications or Other Services via SSL

This page documents configuration of SSL, rather than of Confluence itself. Atlassian will support Confluence with this configuration, but we cannot guarantee to



help you debug problems with SSL. Please be aware that this material is provided for your information only, and that you use it at your own risk.

**Related pages:**

- [Configuring an SSL Connection to Active Directory](#)
- [Configuring Web Proxy Support for Confluence](#)
- [Running Confluence Over SSL or HTTPS](#)

This page describes how to get Confluence connecting to external servers over SSL, via the various SSL-wrapped protocols.

Here are some examples of when you may need to connect to an external server over SSL/HTTPS:

- You need to connect to an LDAP server, such as Active Directory, if the LDAP server is running over SSL.  
**For specific instructions for Active Directory, see [Configuring an SSL Connection to Active Directory](#).**
- You want to set up your Jira application as a trusted application in Confluence, when Jira is running over SSL.
- You want to refer to an https://... URL in a Confluence macro.

If you want to run Confluence itself over SSL, see [Running Confluence Over SSL or HTTPS](#).

There's a [Confluence SSL plugin](#) that facilitates this process.

### Importing SSL Certificates

For more information on these commands, see the [Keytool documentation](#).

1. Add the root certificate to your default Java keystore with the following command. This is the certificate that was used to authorize the LDAP server's certificate. It will be either the one that was used for signing it, or will come from further up in the trust chain, possibly the root certificate. This is often a self-signed certificate, when both ends of the SSL connection are within the same network. Again, the exact alias is not important.

```
keytool -importcert -alias serverCert -file RootCert.crt
-keystore %JAVA_HOME%/jre/lib/security/cacerts (Windows)
keytool -importcert -alias serverCert -file RootCert.crt
-keystore $JAVA_HOME/jre/lib/security/cacerts (Linux/Unix/Mac)
```

2. Import your LDAP or Jira server's public certificate into the JVM Keystore. This is the certificate that the LDAP server will use to set up the SSL encryption. You can use any alias of your choosing in place of "JIRAorLDAPServer.crt".

```
keytool -importcert -alias ldapCert -file JIRAorLDAPServer.crt
-keystore %JAVA_HOME%/jre/lib/security/cacerts (Windows)
keytool -importcert -alias ldapCert -file JIRAorLDAPServer.crt
-keystore $JAVA_HOME/jre/lib/security/cacerts (Linux/Unix/Mac)
```

3. Verify that the certificate has been added successfully by entering the following command:

```
keytool -list -keystore %JAVA_HOME%/jre/lib/security/cacerts
(Windows)
keytool -list -keystore $JAVA_HOME/jre/lib/security/cacerts
(Unix/Linux)
keytool -list -keystore /Library/Java/Home/lib/security/cacerts
(Mac)
```

4. Ensure that you have updated CATALINA\_OPTS to specify the path to the keystore, as specified in [Connecting to SSL services](#) before restarting Confluence.  
There is no need to specify an alias for Confluence to use. On connecting to the LDAP server, it will search through the keystore to find a certificate to match the key being presented by the server.

### Troubleshooting

Check the following knowledge base articles:

- [Unable to Connect to SSL Services due to PKIX Path Building Failed](#)
- [SSL troubleshooting articles](#)


### Configuring RSS Feeds

A Confluence System Administrator can configure the following aspects of RSS feeds:

- The maximum number of items that Confluence returns to an RSS feed request.
- The maximum time period that Confluence allows to respond to an RSS feed request.

Both of these are set in the 'Edit Security Configuration' screen.

#### To configure RSS feeds:

1. Choose the **cog icon** , then choose **General Configuration** under Confluence Administration
2. Choose **Security Configuration**.
3. Choose **Edit**.
4. Enter a value for **Maximum RSS Items**. The default value is 200.
5. Enter a value for **RSS timeout**.
6. Choose **Save**.

*Screenshot: Configuring RSS feeds*

Maximum RSS Items	<input type="text" value="200"/>
Limit the maximum number of items an RSS Feed can request.	
RSS timeout	<input type="text" value="60"/> seconds
The time in seconds allowed to create each RSS Feed. Any items rendered within the timeout will still be returned.	

### Notes

- When using the RSS [Feed Builder](#), a user could potentially enter such a large value for the number of



- feed items returned that Confluence would eventually run out of memory.
- When using the [Feed Builder](#), if a users a value greater than this setting (or less than 0) they will get a validation error.
- If any pre-existing feeds are set to request more than the configured maximum, they will be supplied with only the configured maximum number of items. This is done silently - there is no logging and no message is returned to the RSS reader.
- If Confluence times out when responding to an RSS feed request, any items already rendered are returned.

## Preventing and Cleaning Up Spam

If your Confluence site is public-facing you may be affected by spammers.

### Stopping Spammers

#### To prevent spammers:

1. Enable Captcha. See [Configuring Captcha for Spam Prevention](#).
2. Run Confluence behind an [Apache webserver](#) and create rules to block the spammer's IP address.

### Blocking Spam at Apache or System Level

If a spam bot is attacking your Confluence site, they are probably coming from one IP address or a small range of IP addresses. To find the attacker's IP address, follow the [Apache access logs](#) in real time and filter for a page that they are attacking.

For example, if the spammers are creating users, you can look for `signup.action`:

```
$ tail -f confluence.atlassian.com.log | grep signup.action
1.2.3.4 - - [13/Jan/2010:00:14:51 -0600] "GET /signup.action HTTP/1.1"
200 9956 "-" "Mozilla/4.0 (compatible; MSIE 6.0; Windows NT 5.1; SV1)"
37750
```

Compare the actual spam users being created with the log entries to make sure you do not block legitimate users. By default, Apache logs the client's IP address in the first field of the log line.

Once you have the offender's IP address or IP range, you can add it to your firewall's blacklist. For example, using the popular [Shorewall](#) firewall for Linux you can simply do this:

```
# echo "1.2.3.4" >> /etc/shorewall/blacklist
# /etc/init.d/shorewall reload
```

To block an IP address at the Apache level, add this line to your Apache vhost config:

```
Deny from 1.2.3.4
```

You can restart Apache with a "graceful" command which will apply the changes without dropping any current sessions.

If this still does not stop the spam, then consider turning off [public signup](#).

### Deleting Spam

#### Profile Spam

By 'profile spam', we mean spammers who create accounts on Confluence and post links to their profile page.

If you have had many such spam profiles created, the easiest way to delete them is via SQL.

**To delete a spam profile:**

1. Shut down Confluence and back up your database.  
**Note:** This step is essential before you run any SQL commands on your database.
2. Find the last real profile:

```
SELECT bodycontentid,body FROM bodycontent WHERE contentid IN
(SELECT contentid FROM content WHERE contenttype='USERINFO')
ORDER BY bodycontentid DESC;
```

3. Look through the bodies of the profile pages until you find where the spammer starts. You may have to identify an number of ranges.
4. Find the killset:

```
CREATE TEMP TABLE killset AS SELECT
bc.bodycontentid,c.contentid,c.username FROM
  bodycontent bc JOIN content c ON bc.contentid=c.contentid WHERE
  bodycontentid >= BOTTOM_OF_SPAM_RANGE AND bodycontentid <=
TOP_OF_SPAM_RANGE
  AND c.contenttype='USERINFO';

DELETE FROM bodycontent WHERE bodycontentid IN (SELECT
bodycontentid FROM killset);

DELETE FROM links WHERE contentid IN (SELECT contentid FROM
killset);

DELETE FROM content WHERE prevver IN (SELECT contentid FROM
killset);

DELETE FROM content WHERE pageid IN (SELECT contentid FROM
killset);

DELETE FROM content WHERE contentid IN (SELECT contentid FROM
killset);

DELETE FROM os_user_group WHERE user_id IN (SELECT id FROM killset
k JOIN os_user o ON o.username=k.username);

DELETE FROM os_user WHERE username IN (SELECT username FROM
killset);
```

If you're using Confluence 5.6 or earlier use the SQL commands below:

▼ [For Confluence 5.6 and earlier...](#)

```

CREATE TEMP TABLE killset AS SELECT
bc.bodycontentid,c.contentid,c.username FROM
  bodycontent bc JOIN content c ON bc.contentid=c.contentid
WHERE
  bodycontentid >= BOTTOM_OF_SPAM_RANGE AND bodycontentid <=
TOP_OF_SPAM_RANGE
  AND c.contenttype='USERINFO';

DELETE FROM bodycontent WHERE bodycontentid IN (SELECT
bodycontentid FROM killset);

DELETE FROM links WHERE contentid IN (SELECT contentid FROM
killset);

DELETE FROM content WHERE prevver IN (SELECT contentid FROM
killset);

DELETE FROM attachments WHERE pageid IN (SELECT contentid FROM
killset);

DELETE FROM content WHERE contentid IN (SELECT contentid FROM
killset);

DELETE FROM os_user_group WHERE user_id IN (SELECT id FROM
killset k JOIN os_user o ON o.username=k.username);

DELETE FROM os_user WHERE username IN (SELECT username FROM
killset);

```

5. Once the spam has been deleted, restart Confluence and [rebuild the index](#). This will remove any references to the spam from the search index.

### Running Confluence behind NGINX with SSL

This page describes how to set up NGINX as a [reverse proxy](#) for Confluence.

The configuration described on this page results in a scenario where:

- External client connections with NGINX are secured using SSL. Connections between NGINX and Confluence Server are unsecured.
- Confluence Server and NGINX run on the same machine.


#### On this page

- [Step 1: Set the context path](#)
- [Step 2: Configure the Tomcat connector](#)
- [Step 3: Configure NGINX](#)
- [Step 4: Restart Confluence and NGINX](#)

We assume that you already have a running instance of NGINX. If not, refer to the [NGINX documentation](#) for instructions on downloading and installing NGINX. SSL certificates must be installed on the server machine. You'll need an NGINX version that supports WebSockets (1.3 or later).

Note that the [Atlassian Support](#) does not cover NGINX integration. Assistance with NGINX may be obtained through the Atlassian community from [answers.atlassian.com](#) or from an [Atlassian Expert](#).

#### Step 1: Set the context path

 If you want to access Confluence without a context path (www.example.com), or via a sub-domain (confluence.example.com) skip this step.

Set your Confluence application path (the part after hostname and port) in Tomcat. Edit <installation-d

irectory>/conf/server.xml, locate the "Context" definition:

```
<Context path="" docBase="../../confluence" debug="0"
reloadable="false">
```

and change it to:

```
<Context path="/confluence" docBase="../../confluence" debug="0"
reloadable="false">
```

Restart Confluence, and check you can access it at **http://example:8090/confluence**

### Step 2: Configure the Tomcat connector

Next, in the same <installation-directory>/conf/server.xml file, locate this code segment:

```
<Connector port="8090" connectionTimeout="20000" redirectPort="8443"
          maxThreads="48" minSpareThreads="10"
          enableLookups="false" acceptCount="10" debug="0"
URIEncoding="UTF-8"

protocol="org.apache.coyote.http11.Http11NioProtocol"/>
```

And add the last line as follows:

```
<Connector port="8090" connectionTimeout="20000" redirectPort="8443"
          maxThreads="48" minSpareThreads="10"
          enableLookups="false" acceptCount="10" debug="0"
URIEncoding="UTF-8"
          protocol="org.apache.coyote.http11.Http11NioProtocol"

          proxyName="www.example.com" proxyPort="443"
scheme="https"/>
```

Note: don't include `secure="true"` in this connector. Make sure you've included correct values for `protocol` and `proxyName`.

### Step 3: Configure NGINX

You will need to specify a listening server in NGINX, as in the example below. Add the following to your NGINX configuration.

Replace your server name and the location of your SSL certificate and key.

In this example, users will connect to Synchrony, which is required for collaborative editing, directly.

```
server {
    listen www.example.com:80;
    server_name www.example.com;

    listen 443 default ssl;
    ssl_certificate      /usr/local/etc/nginx/ssl/nginx.crt;
    ssl_certificate_key  /usr/local/etc/nginx/ssl/nginx.key;

    ssl_session_timeout 5m;

    ssl_protocols SSLv2 SSLv3 TLSv1 TLSv1.1 TLSv1.2;
    ssl_ciphers HIGH:!aNULL:!MD5;
    ssl_prefer_server_ciphers on;

    location /confluence {
        client_max_body_size 100m;
        proxy_set_header X-Forwarded-Host $host;
        proxy_set_header X-Forwarded-Server $host;
        proxy_set_header X-Forwarded-For $proxy_add_x_forwarded_for;
        proxy_pass http://localhost:8090/confluence;
    }
    location /synchrony {
        proxy_set_header X-Forwarded-Host $host;
        proxy_set_header X-Forwarded-Server $host;
        proxy_set_header X-Forwarded-For $proxy_add_x_forwarded_for;
        proxy_pass http://localhost:8091/synchrony;
        proxy_http_version 1.1;
        proxy_set_header Upgrade $http_upgrade;
        proxy_set_header Connection "Upgrade";
    }
}
```

See [http://nginx.org/en/docs/http/nginx\\_http\\_proxy\\_module.html](http://nginx.org/en/docs/http/nginx_http_proxy_module.html) for more information.

Note: do not include `ssl on;` if you are configuring SSL and Confluence on the same server as in this example.

If you experience 413 Request Entity Too Large errors, make sure that the `client_max_body_size` in the `/confluence` location block matches Confluence's [maximum attachment size](#). You may also need to increase the `client_max_body_size` in the `/synchrony` location block if you experience errors when editing large pages.

▼ [If you're accessing Confluence via a sub-domain...](#)

If you're accessing Confluence via a sub-domain, your config will look like this:

```
server {
    listen confluence.example.com:80;
    server_name confluence.example.com;

    listen 443 default ssl;
    ssl_certificate      /usr/local/etc/nginx/ssl/nginx.crt;
    ssl_certificate_key  /usr/local/etc/nginx/ssl/nginx.key;

    ssl_session_timeout 5m;

    ssl_protocols SSLv2 SSLv3 TLSv1 TLSv1.1 TLSv1.2;
    ssl_ciphers HIGH:!aNULL:!MD5;
    ssl_prefer_server_ciphers on;

    location / {
        client_max_body_size 100m;
        proxy_set_header X-Forwarded-Host $host;
        proxy_set_header X-Forwarded-Server $host;
        proxy_set_header X-Forwarded-For
$proxy_add_x_forwarded_for;
        proxy_pass http://localhost:8090;
    }
    location /synchrony {
        proxy_set_header X-Forwarded-Host $host;
        proxy_set_header X-Forwarded-Server $host;
        proxy_set_header X-Forwarded-For
$proxy_add_x_forwarded_for;
        proxy_pass http://localhost:8091/synchrony;
        proxy_http_version 1.1;
        proxy_set_header Upgrade $http_upgrade;
        proxy_set_header Connection "Upgrade";
    }
}
```

#### Step 4: Restart Confluence and NGINX

1. Restart Confluence and NGINX for all the changes to take affect.
2. Update Confluence's base URL to include the context path you set earlier - see [Configuring the Server Base URL](#).

## Scheduled Jobs

The administration console allows you to schedule various administrative jobs in Confluence, so that they are executed at regular time intervals. The types of jobs which can be scheduled cover:

- Confluence site backups
- Storage optimization jobs to clear Confluence's temporary files and caches
- Index optimization jobs to ensure Confluence's search index is up to date
- Mail queue optimization jobs to ensure Confluence's mail queue is maintained and notifications have been sent.

**i** You'll need [System Administrator](#) permissions in order to edit and manually run jobs.

#### On this page:

- [Accessing Confluence's scheduled jobs configuration](#)
- [Running a job manually](#)
- [Changing a job's schedule](#)
- [Disabling or re-enabling a job](#)
- [Viewing a job's execution history](#)
- [Types of jobs](#)
- [Cron expressions](#)

#### Related pages:

- [Trigger Module](#)
- [Configuring Backups](#)

## Accessing Confluence's scheduled jobs configuration

To access Confluence's Scheduled Jobs configuration page:

1. Go to



> **General Configuration** > **Scheduled Jobs**

2. All scheduled jobs are listed with:

- **Status** - the job's status, which is either 'Scheduled' (it is currently enabled) or 'Disabled'.
- **Last Execution** - the date and time when the job was last executed. This field will be empty if the job was never executed.
- **Next Execution** - the date and time when the job is next scheduled to be executed. This field will contain dash symbol ('-') if the job is disabled.
- **Avg. Duration** - the length of time (in milliseconds) that it took to complete the job (the last time it ran).
- **Actions** - Options to edit the job's schedule, run it manually, view the history or disable the job.

*Screenshot: Scheduled Jobs*

Scheduled Jobs					
Job	Status	Last Execution	Next Execution	Avg. Duration	Actions
Back Up Confluence	Scheduled	Nov 20, 2016 02:00	Nov 19, 2016 02:00	592755	<a href="#">History</a>
Check Cluster Safety	Scheduled	Nov 21, 2016 01:56	Nov 21, 2016 01:57	3	<a href="#">History</a>
Clean Journal Entries	Scheduled	Nov 20, 2016 02:00	Nov 19, 2016 02:00	82	<a href="#">History</a>
Clean Old Audit Records	Scheduled	Nov 21, 2016 00:00	Nov 22, 2016 00:00	24	<a href="#">History</a>
Clean Temporary Directory	Scheduled	Nov 20, 2016 04:00	Nov 19, 2016 04:00	199	<a href="#">History</a>
Clear Expired Mail Errors	Scheduled	Nov 20, 2016 03:00	Nov 19, 2016 03:00	43	<a href="#">History</a>
Clear Expired Remember Me Tokens	Scheduled	Nov 20, 2016 00:00	Nov 20, 2016 00:00	72	<a href="#">History</a>

## Running a job manually

To run a job manually head to the Scheduled Jobs list and choose **Run** next to the job. It will run immediately.

Not all jobs can be run manually.

## Changing a job's schedule

To change a job's schedule:

1. Choose **Edit** next to the job you want to change.
2. Enter the new day or time to run the job as a cron expression - there's more info about cron expressions [below](#).
3. **Save** your changes to the job's schedule, or **Revert** back to the default setting.

Not all jobs' schedules are configurable.

*Screenshot: Configuring a Job Schedule*

Future Schedules:	
20-Feb-2013	02:00:00
21-Feb-2013	02:00:00
22-Feb-2013	02:00:00
23-Feb-2013	02:00:00
24-Feb-2013	02:00:00
25-Feb-2013	02:00:00
26-Feb-2013	02:00:00
27-Feb-2013	02:00:00
28-Feb-2013	02:00:00
01-Mar-2013	02:00:00

### Disabling or re-enabling a job

By default, all jobs in Confluence are enabled.

Use the **Disable** / **Enable** links in the action column to disable and re-enable each job.

Not all jobs in Confluence can be disabled.

### Viewing a job's execution history

To see when a job was last run, and how long the job took to run, click the **History** link beside the job.

If a job has not run at least once the History link won't appear.

*Screenshot: Job Execution History*



History for Clean Temporary Directory		
Started	Ended	Duration (ms)
19-Feb-2013 04:00:00	19-Feb-2013 04:00:01	1901
18-Feb-2013 04:00:00	18-Feb-2013 04:00:00	42
17-Feb-2013 04:00:00	17-Feb-2013 04:00:00	334

⚠ Execution history is not available in Confluence Data Center.

## Types of jobs

Here's a summary of some of the scheduled jobs that you may want to adjust.

Job Name	Description	Execution Behavior	Default Schedule
Back Up Confluence	Performs a <a href="#">backup</a> of your entire Confluence site.	Per cluster	At 2am every day
Check Cluster Safety	For clustered Confluence installations, this job ensures that only one Confluence instance in the cluster writes to the database at a time. For standard (non-clustered) editions of Confluence, this job is useful for alerting customers who have accidentally connected a second Confluence instance to a Confluence database which is already in use.	Per cluster	Every 30 seconds
Clean Journal Entries	Periodically clears journal entries that have already been processed to ensure that its size does not grow indefinitely.	Per node	At 2am every day
Clean Temporary Directory	Cleans up temporary files generated in the <code>&lt;confluence-home&gt;/temp</code> directory. This temp directory is created by exports etc. This doesn't include the temp directory located in the confluence install directory.	Per node	At 4am every day
Clear Expired Mail Errors	Clears notification errors in the <a href="#">mail error queue</a> . A notification error is sent to the mail error queue whenever the notification fails to be sent due to an error.	Per cluster	At 3am every day
Clear Expired Remember Me Tokens	Clears all expired 'Remember Me' tokens from the Confluence site. Remember Me tokens expire after two weeks.	Per cluster	On the 20th of each month
Email Daily Reports	Emails a daily summary report of all Confluence changes to <a href="#">all subscribers</a> . Since each email report only records changes from the last 24-hour period, it is recommended that you only change the time of this job while keeping the job's frequency to 24 hours.	Per cluster	At 12am every day
Flush Edge Index Queue	Flushes the Edge Index Queue so Confluence's search results stay up to date.	Per node	Every 30 seconds
Flush Local Task Queue	Flushes the local task queue. (These are internal Confluence tasks that are typically flushed at a high frequency.)	Per node	Every minute

Flush Mail Queue	Sends notifications that have been queued up in the <a href="#">mail queue</a> . This doesn't include batched notifications. Edit the <b>Send batched notifications</b> job if you also want to change how often notifications are sent for changes to a page or blog post.	Per cluster	Every minute
Send batched notifications	Sends email notifications containing all changes to a page or blog post since the last time the job ran. Increase the time for fewer emails or reduce the time if more immediate notifications are important in your site.	Per cluster	Every 10 minutes
Flush Task Queue	Flushes the task queue. (These are internal Confluence tasks that are typically flushed at a high frequency.)	Per node	Every minute
Send Recommended Updates Email	Triggers sending recommended update emails to users. The job runs hourly, but users will receive the notification weekly or daily, depending on the setting in their profile, at a time that matches their timezone.	Per cluster	Hourly
Purge Old Job Run Details	Confluence stores the details of each scheduled job that is run in the <code>scheduler_run_details</code> table in your database. In order to keep this table small for troubleshooting and debugging, the <b>Purge Old Job Run Details</b> job regularly removes the details of: <ul style="list-style-type: none"> <li>successful jobs run more than 90 days ago</li> <li>unsuccessful jobs run more than 7 days ago</li> </ul> You can override these settings using the following <a href="#">system properties</a> : <code>jobs.limit.per.purge</code> , <code>all.jobs.ttl.hours</code> and <code>unsuccessful.jobs.ttl.hours</code> .	Per cluster	at 11pm every day

## Cron expressions

A cron expression is a string of 6-7 'time interval' fields that defines the frequency with which a job is executed. Each of these fields can be expressed as either a numerical value or a special character and each field is separated by at least one space or tab character.

The table below shows the order of time interval fields in a cron expression and each field's permitted numerical values.

You can specify a special character instead of a numerical value for any field in the cron expression to provide flexibility in defining a job's frequency. Common special characters include:

- '\*' — a 'wild card' that indicates 'all permitted values'.
- '?' — indicates 'ignore this time interval' in the cron expression. That is, the cron expression will not be bound by the time interval (such as 'Month', 'Day of week' or 'Year') to which this character is specified.

For more information about cron expressions, please refer to the [Cron Trigger tutorial on the Quartz website](#).

Order in cron expression	Time interval field	Permitted values*	Required?
1	Seconds	0-59	Yes
2	Minutes	0-59	Yes
3	Hours	0-23	Yes

4	Day of month	1-31	Yes
5	Month	1-12 or JAN-DEC	Yes
6	Day of week	1-7 or SUN-SAT	Yes
7	Year	1970-2099	No

\* Excluding special characters.

## Configuring the Whitelist

Confluence administrators can choose to allow incoming and outgoing connections and content from specified sources for use in the RSS macro, HTML Include macro and gadgets, by adding URLs to the whitelist.


Confluence will display an error if content has been added that is not from an allowed source, and prompt the user to add the URL to the whitelist.

[Application links](#) are automatically added to the whitelist. You don't need to manually add them.

Note: The [HTML Include macro](#) is disabled by default.

### Add allowed URLs to the whitelist

To add a URL to the whitelist:

1. Go to  **> General Configuration > Whitelist.**
2. Enter the URL or expression you want to allow.
3. Choose the **Type** of expression (see [below](#) for examples of the types available).
4. Choose **Allow Incoming** if you need to allow CORS requests (see [below](#)).
5. Choose **Add**.

Your URL or expression appears in the whitelist.

To test that your whitelisted URL is working as expected you can enter a URL in the **Test a URL** field. Icons will indicate whether incoming and / or outgoing traffic is allowed for that URL.

## Expression Types

When adding a URL to the whitelist, you can choose from a number of expression types.

Type	Description	Example
Domain name	Allows all URLs from the specified domain.	<code>http://www.example.com</code>
Exact match	Allows only the specified URL.	<code>http://www.example.com/th ispage</code>
Wildcard Expression	Allows all matching URLs. Use the wildcard * character to replace one or more characters.	<code>http://*example.com</code>
Regular Expression	Allows all URLs matching the regular expression.	<code>http(s)?://www\..example\. com</code>

## Allow Incoming

**Allow Incoming** enables [CORS](#) requests from the specified origin. The URL must match the format `scheme:/`

/host[:port], with no trailing slashes (:port is optional). So `http://example.com/` would not allow CORS requests from the domain `example.com`.

### Disabling the whitelist

The whitelist is enabled by default. You can choose to disable the whitelist however this will allow all URLs, including malicious content, and is not recommended.

To disable the whitelist:

1. Choose the **cog icon**



, then choose **General Configuration** under Confluence Administration

2. Choose **Whitelist**.
3. Choose **Turn off whitelist**.
4. Choose **Confirm**.

All URLs will now be allowed. We strongly recommend **not** disabling the whitelist.

### Configuring the Time Interval at which Drafts are Saved

This setting only applies to Confluence 6.0 or later if you've chosen to **disable collaborative editing**.

When collaborative editing is enabled we're saving all the time!

#### Related pages:

- [Drafts](#)

When collaborative editing is disabled, Confluence saves a draft of your page once every thirty seconds by default. Confluence administrators can configure how often drafts are saved.

As a Confluence administrator, you can set the time interval at which drafts are saved as follows:

1. Choose the **cog icon**



, then choose **General Configuration** under Confluence Administration

2. Click **Further Configuration** in the left-hand panel.
3. Edit the setting for **Draft Save Interval**.

## Performance Tuning

This document describes tuning your application for improved performance. It is not a guide to troubleshooting Confluence outages. Check [Trouble shooting Confluence hanging or crashing](#) for help if Confluence is crashing.

Like any server application, Confluence may require some tuning as it is put under heavier use. We do our best to make sure Confluence performs well under a wide variety of circumstances, but there's no single configuration that is best for everyone's environment and usage patterns.

If you are having problems with the performance of Confluence and need our help resolving them, you should read [Requesting Performance Support](#).

### Use the latest version of your tools

Use the latest versions of your application servers

and Java runtime environments. Newer versions are usually better optimized for performance.

**On this page:**

- [Use the latest version of your tools](#)
- [Avoid swapping due to not enough RAM](#)
- [Being aware of other systems using the same infrastructure](#)
- [Choice of database](#)
- [Database connection pool](#)
- [Database in general](#)
- [Database statistics and query analyzers](#)
- [Cache tuning in Confluence and Apache](#)
- [Antivirus software](#)
- [Enabling HTTP compression](#)
- [Performance testing](#)
- [Access logs](#)
- [Built-in profiler](#)
- [Application server memory settings](#)
- [Web server configuration](#)
- [Troubleshooting possible memory leaks](#)

## Avoid swapping due to not enough RAM

Always watch the swapping activity of your server. If there is not enough RAM available, your server may start swapping out some of Confluence's heap data to your hard disk. This will slow down the JVM's garbage collection considerably and affect Confluence's performance. In clustered installations, swapping can lead to a [Cluster Panic due to Performance Problems](#). This is because swapping causes the JVM to pause during [Garbage Collection](#), which in turn can break the inter-node communication required to keep the clustered nodes in sync.

## Being aware of other systems using the same infrastructure

It may sound tempting: Just have one powerful server hosting your database and/or application server, and run **all** your crucial programs on that server. **If** the system is set up perfectly, then you might be fine. Chances are however that you are missing something, and then one application's bug might start affecting other applications. So if Confluence is slow every day around noon, then maybe this is because another application is using the shared database to generate complicated reports at that time? Either make sure applications can't harm each other despite sharing the same infrastructure, or get these systems untangled, for example by moving them to separate instances that can be controlled better.

## Choice of database

The **embedded H2 database** is provided for evaluating Confluence, not for production Confluence sites. After the evaluation finishes, you must switch to a [supported external database](#). We recommend using what you are familiar with, because your ability to maintain the database will probably make far more difference to what you get out of it than the choice of database itself.

## Database connection pool

If load on Confluence is high, you may need more simultaneous connections to the database.

- If you are using JNDI data-sources, you will do this in your application server's configuration files.
- If you have configured Confluence to access the database directly, you will need to manually edit the `hibernate.c3p0.max_size` property in the `confluence.cfg.xml` file in your `confluence.home` directory. After you have changed the URL in this file, restart Confluence.

To assess whether you need to tune your database connection pool, take [thread dumps](#) during different times (including peak usage). Inspect how many threads have concurrent database connections.

## Database in general

If Confluence is running slowly, one of the most likely cause is that there is some kind of bottleneck in (or around) the database.

The first item you should check is the "**Database Latency**" field in the System Information tab in the admin console.

Database Connection	Transaction Isolation	Read committed
Database Latency		0
Confluence Usage		

The latency is calculated by sending a trivial request to the database, querying a table which is known to have only one column and one row. ("select \* from CLUSTERSAFETY"). Obviously this query should be blazing fast, and return within 1 or 2 milliseconds. If the value displayed is between 3 and 5 milliseconds, you might already have an issue. If the value is above 10ms, then you **definitely** need to investigate and improve something! A few milliseconds may not sound so bad, but consider that Confluence sends quite a few database queries per page request, and those queries are a lot more complex too! High latency might stem from all sorts of problems (slow network, slow database, connection-pool contention, etc), so it's up to you to investigate. Don't stop improving until latency is below 2ms on average.

Obviously, latency is just the very first thing to look at. You may get zero latency and still have massive database problems, e.g. if your tables are poorly indexed. **So don't let a low latency fool you either.**

## Database statistics and query analyzers

Modern databases have query optimizers based on collecting statistics on the current data. Using the SQL EXPLAIN statement will provide you information on how well the query optimizer is performing. If the cost estimate is wildly inaccurate then you will need to run statistics collection on the database. The exact command will depend on your database and version. In most cases you can run statistics collection while Confluence is running, but due to the increased load on the database it's best to do this after normal hours or on a week-end.

## Cache tuning in Confluence and Apache

To reduce the load on the database, and speed up many operations, Confluence keeps its own cache of data. Tuning the size of this cache may speed up Confluence (if the caches are too small), or reduce memory (if the caches are too big).

Please have a look at our documentation on [Cache Performance Tuning](#) for information on how to tune Confluence caches.

To improve performance of a large Confluence site, we recommend that you move the caching of static content from the JVM into Apache. This will prevent the JVM from having a number of long running threads serving up static content. See [Configuring Apache to Cache Static Content via mod\\_disk\\_cache](#).

## Antivirus software

Antivirus software greatly decreases the performance of Confluence. Antivirus software that intercepts access to the hard disk is particularly detrimental, and may even cause errors with Confluence. You should configure your antivirus software to ignore the Confluence home directory, its index directory and any database-related directories.

## Enabling HTTP compression

If bandwidth is responsible for bottlenecking in your Confluence installation, you should consider [enabling HTTP compression](#). This may also be useful when running an external facing instance to reduce your

bandwidth costs.

Take note of the [known issues with HTTP compression](#) in versions of Confluence prior to 2.8, which may result in high memory consumption.

## Performance testing

You should try out all configuration changes on a demo system. Ideally, you should run and customize loadtests that simulate user behavior.

## Access logs

You can find out which pages are slow and which users are accessing them by [enabling Confluence's built-in access logging](#).

## Built-in profiler

You can identify the cause of page delays using Confluence's built-in profiler according to [Troubleshooting Slow Performance Using Page Request Profiling](#).

## Application server memory settings

See [How to fix out of memory errors by increasing available memory](#).

## Web server configuration

For high-load environments, performance can be improved by using a web server such as Apache in front of the application server. There is a configuration guide to [Running Confluence behind Apache](#).

When configuring your new web server, make sure you configure sufficient threads/processes to handle the load. This applies to both the web server and the application server connector, which are typically configured separately. If possible, you should enable connection pooling in your web server connections to the application server.

## Troubleshooting possible memory leaks

Some external plugins, usually ones that have been written a long time ago and that are not actively maintained anymore, have been reported to consume memory and never return it. Ultimately this can lead to a crash, but first this manifests as reduced performance. The [Troubleshooting Confluence hanging or crashing](#) guide is a good place to start. Some of the known causes listed there could result in performance issues short of a crash or hang.

## Cache Performance Tuning

Confluence performance can be significantly affected by the performance of its caches. It is essential for the administrator of a large production installation of Confluence to tune the caches to suit its environment.

There are several configurable parameters for each of the cache regions, most notably cache size, cache expiry delay and eviction policy. In most cases, cache size is the parameter you would want to change.

To change the size of a cache:

1. Go to



> **General Configuration > Cache Management.**

### On this page:

- [Cache tuning example](#)
- [Finding the configuration file](#)
- [Cache key mappings](#)
- [Caching in Confluence Data Center](#)
- [Important caches](#)
- [Monitoring the contents of a cache](#)



2. Choose **Show Advanced View**.
3. Choose **Adjust Size** next to the cache you want to change.

To modify other parameters you can modify the cache configuration files manually.

### Cache tuning example

As an example of how to tune Confluence's caches, let's have a look at the following table:

Caches	% Used	% Effectiveness	Objects/Size	Hit/Miss/Expiry
Attachments	87%	29%	874/1000	78226/189715/187530
Content Attachments	29%	9%	292/1000	4289/41012/20569
Content Bodies	98%	81%	987/1000	28717/6671/5522
Content Label Mappings	29%	20%	294/1000	4693/18185/9150
Database Queries	96%	54%	968/1000	105949/86889/83334
Object Properties	27%	18%	279/1000	5746/25386/8102
Page Comments	26%	11%	261/1000	2304/17178/8606
Users	98%	5%	982/1000	6561/115330/114279


The maximum size of the caches above is 1000 (meaning that it can contain up to 1000 objects). You can tell when a cache size needs to be increased because the cache has both:

- a high usage percentage (above 75%)
- a low effectiveness percentage.

Check the 'effectiveness' versus the 'percent used'. A cache with a low percent used need not have its size lowered; it does not use more memory until the cache is filled.

Based on this, the sizes of the "Attachments", "Database Queries", and "Users" caches should be increased to improve their effectiveness.

As the stored information gets older or unused it will expire and be eliminated from the cache. Cache expiry may be based on time or on frequency of use.

 There is not much that you can do with a cache that has both a low percentage of usage and effectiveness. Over time, as the cache is populated with more objects and repeat requests for them are made, the cache's effectiveness will increase.

### Finding the configuration file

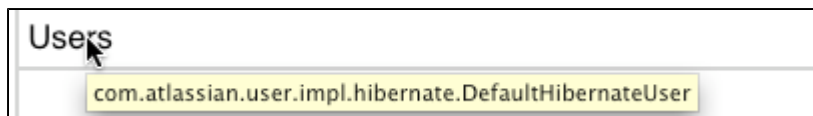
Cache configurations are stored in `<confluence-home>/shared-home/config/cache-settings-overrides.properties`

For Confluence Data Center (clustered) it can be found in `<confluence-shared-home>/config/cache-settings-overrides.properties` (in the shared home directory for the cluster).

### Cache key mappings

The cache configuration file configures caches by their keys. To find out a cache key hover your mouse over the cache name in the **Cache Management** screen.





## Caching in Confluence Data Center

In Confluence Data Center (clustered) you have a distributed cache and a cluster node-local cache. The Cluster Management page will indicate cluster distributed cache and cluster node-local cache.

The cache configuration file is stored in the shared home directory for the cluster.

## Important caches

The following suggestions are general guidelines. In cases of large databases, 20-30% of the size of the table may be unnecessarily large. Check the effectiveness and percent used categories in the cache for more specific assessments.

- **Content Objects cache** (`com.atlassian.confluence.core.ContentEntityObject`) should be set to at least 20-30% of the number of content entity objects (pages, comments, emails, news items) in your system. To find the number of content entity objects, use the query `select count(*) from CONTENT where prevver is null`.
- **Content Body Mappings cache** (`com.atlassian.confluence.core.ContentEntityObject.bodyContents`) should be set to at least 20% of the number of content entity objects (pages, comments, emails, news items) in your system. To find the number of content entity objects, use the query `select count(*) from CONTENT where prevver is null`.
- **Embedded Crowd Internal User cache** (`com.atlassian.crowd.model.user.InternalUser`) should be set to the number of users you have in the internal directory. You can discover this number by using the following SQL:

```
SELECT
    COUNT(*)
FROM
    cwd_user u
JOIN
    cwd_directory d
ON
    u.directory_id = d.id
AND d.directory_name = 'Confluence Internal Directory';
```

- **Embedded Crowd Users cache** (`com.atlassian.confluence.user.crowd.CachedCrowdUserDao.USER_CACHE`) should be set to the number of rows in the `cwd_user` table.

```
SELECT
    COUNT(*)
FROM
    cwd_user u;
```

- **Space permissions by ID cache** (`com.atlassian.confluence.security.SpacePermission`) should be set to the number of space permissions in your deployment (a good rule of thumb is 20

times the number of spaces). You can find the number of space permissions using the query `select count(*) from SPACEPERMISSIONS`.

## Monitoring the contents of a cache

To monitor what is in a cache:

1. In your browser go to `<confluence-URL>/admin/cachecontents.jsp`  
All caches that contain items will appear.
2. Select a cache from the list.

## Cache Statistics

Confluence provides statistics about its internal caches that allow you to track the size and hit ratio of each cache and tune it for better performance (if necessary). See [Performance Tuning](#) for more information.

### Configurable Caches

System administrators can change the sizes of Confluence's internal caches through the Administration Console and these changes will take effect without the need to first shut down and then restart Confluence. The maximum number of units for any of the defined cache regions can be adjusted individually.

Note that larger cache sizes will require more memory at runtime, so you should review the memory allocation of the Confluence Java process and the physical memory available on your server.

### Viewing Cache Statistics and Modifying Cache Sizes

To view the cache statistics:

1. Go to  **> General Configuration > Cache Management.**
2. Choose **Show Advanced View.**

Here is an example for one of the most frequently used caches, the 'Content Object' cache.

Cache Statistics							
This page displays statistics about Confluence's internal caches. You may wish to tune cache sizes and expiration policies to improve memory usage or performance.							
Cache Name	Capacity Utilisation	Effectiveness	Current / Max Entries	Current Heap Size (MB)	Hit / Miss / Evicted	Adjust Max Entries	Flush Entries
Content Objects	36%	73%	3653 / 10000	Unknown	307748 / 112538 / 37051	Adjust Size	Flush

About the generated numbers:

<b>Capacity Utilization</b>	$= (\text{Objects}) / (\text{Size})$ <p>For example Percent Used = <math>4023 / 5000 = 80\%</math></p>
<b>Effectiveness:</b>	$= (\text{Hits}) / (\text{Hits} + \text{Misses})$ <p>For example Effectiveness = <math>374550 / (374550 + 140460) = 73\%</math></p>
<b>Current / Max Entries</b>	The number of entries in the cache / the number of total possible entries allowed (this is the size of the cache).
<b>Current Heap Size</b>	Heap memory (in MB) allocated to this cache (if applicable)

<b>Hit / Miss / Evicted</b>	The number of reads accessing cache where required content was found / the number of reads accessing cache where required content was not found / the number of objects evicted from the cache.
<b>Adjust Size</b>	Use this option to specify a different maximum cache size.
<b>Flush</b>	Flushes the cache.

Changes to cache size configurations are saved in the `shared-home/config/cache-settings-override.s.properties` file in your home directory (in a Confluence Data Center cluster this is in the shared home directory, not local home).

If you need to reset all the values back to the default, you can simply delete the file and restart Confluence.

## Memory Usage and Requirements

Managing Confluence's performance and memory usage really depends on what resources are available. Confluence will run faster if you give it lots of memory for its caches, but it should still be able to run quite well in low-memory environments, with the right tuning. Below are some tips on getting the most out of your Confluence site.

### Increasing the amount of memory available to Confluence

See [Increasing JIRA Memory](#) for details on how to increase the memory available to web application servers typically used to run Confluence.

### Embedded database

The embedded HSQL database that comes with Confluence essentially holds all your data in memory while the Confluence server is running. If you are running out of memory, you should consider [migrating Confluence to an external database](#).

### Caching

By default, Confluence keeps large in-memory caches of data to improve its responsiveness and the user experience. The trade off is an increase in memory requirements to support the cache. Administrators of larger Confluence sites may need to configure the size of their caches to improve performance.

To customize Confluence's cache to meet your needs, see [cache tuning](#).

To increase the amount of memory available to Confluence, see [How to fix out of memory errors by increasing available memory](#).

### Mail error queue

Confluence keeps a copy of all emails that it failed to send within an internal error queue. In the event of intermittent failures such as network connectivity issues, the emails in this queue can be manually resent when the problem is fixed. Under certain circumstances, the mail queue can fill up with large objects. The queue is regularly flushed, but if you get a *lot* of mail errors, you might get a spike in memory usage.

#### On this page:

- [Increasing the amount of memory available to Confluence](#)
- [Embedded database](#)
- [Caching](#)
- [Mail error queue](#)
- [Attachments](#)
- [System backup and restore](#)
- [Known issues that we do not have control over](#)
- [Confluence is taking long periods of time to respond to some actions](#)

#### Related pages:

- [Performance Tuning](#)
- [Requesting Performance Support](#)

## Attachments

The indexing of large attachments requires that the attachment be loaded into memory. In the case of large attachments, this can cause a temporary strain on the systems resources, and may result in indexing failing because the attachment could not be fully loaded into memory.

## System backup and restore

The Confluence backup and restore process scales linearly with the size of data. This can have a significant impact on large Confluence instances where the amount of data exceeds the amount of available memory. If you are experiencing an `OutOfMemoryError` during either a backup or restore processes, then we strongly recommend that you choose and [Production Backup Strategy](#).

If you encounter an `OutOfMemoryError` while restoring a backup and wish to overcome this issue by increasing memory, how much more will you need to make this process work? A good rule of thumb is to have a look at the size of the `entities.xml` file in your backup. This file contains all of the data Confluence will be loading, so at least that much is required. Add another 64-128Mb to ensure that Confluence has enough memory to load and function and that should be enough. To increase the amount of memory available to Confluence, see [How to fix out of memory errors by increasing available memory](#).

## Known issues that we do not have control over

There are also some memory issues we don't have any control over. For example,

- There's a memory leak in the Oracle 10g JDBC drivers. Not much we can do about that.
- One customer found a rather nasty memory leak that appeared to originate inside Tomcat 5, but only using the IBM JDK on PowerPC.

If you are having problems that appear to result from a memory leak, log an issue on <http://support.atlassian.com>. Our memory profiler of choice is [YourKit](#). It would be helpful to us if you can provide us with a memory dump from that tool showing the leak.

## Confluence is taking long periods of time to respond to some actions

A common cause of random pauses in Confluence is the JVM running garbage collection. To determine if this is what is happening, enable verbose garbage collection and look at how long Java is taking to free up memory. If the random pauses match when Java is running its garbage collection, garbage collection is the cause of the pause.

Verbose garbage collection will generate log statements that indicate when Java is collecting garbage, how long it takes, and how much memory has been freed.

To enable gc (garbage collection) logging, start Confluence with the option `-XX:+PrintGCDetails -XX:+PrintGCTimeStamps -verbose:gc -Xloggc:gc.log`. Replace `gc.log` with an absolute path to a `gc.log` file.

For example, with a Windows service, run:

```
tomcat5 //US//Confluence ++JvmOptions="-XX:+PrintGCDetails
-XX:+PrintGCTimeStamps -verbose:gc -Xloggc:c:\confluence\logs\gc.log"
```

or in `bin/setenv.sh`, set:

```
export CATALINA_OPTS="$CATALINA_OPTS -XX:+PrintGCDetails
-XX:+PrintGCTimeStamps -verbose:gc
-Xloggc:${CATALINA_BASE}/logs/gc.log"
```

If you modify `bin/setenv.sh`, you will need to restart Confluence for the changes to take effect.

What can you do to minimize the time taken to handle the garbage collection? See <http://java.sun.com/docs/hotspot/gc1.4.2/> for details on tuning the JVM to minimize the impact that garbage collection has on the running application.

## Requesting Performance Support

### Basic performance troubleshooting steps

Begin with the following procedures:

1. Go through the [Troubleshooting Confluence hanging or crashing](#) page to identify the major known performance problems.
2. Proceed with the [Performance Tuning](#) tips to help optimize performance.

### Requesting basic performance support

If the above tips don't help or you're not sure where to start, open a [support ticket](#) starting with at least the basic information:

1. The [atlassian-confluence.log](#)
2. The `catalina.out` log (or your application server log), with a series of three [thread dumps](#) separated by 10 seconds
3. A description with as much detail as possible regarding:
  - a. What changes have been made to the system?
  - b. When did performance problems begin?
  - c. When in the day do performance issues occur?
  - d. What pages or operations experience performance issues?
  - e. Is there a pattern?

Continue with as much of the advanced performance troubleshooting information as you can.

### Advanced performance troubleshooting

Please gather **all** of the information listed below and include it in your support request, even if you think you have a good idea what's causing the problem. That way we don't have to ask for it later.

#### System information

##### Confluence server

- Take a screenshot of Confluence's Administration System Information (or save the page as HTML)
- Take a screenshot of Confluence's Administration Cache Statistics (or save the page as HTML)
- Find out the exact hardware Confluence is running on
  - How many CPUs? What make and model? What MHz?
  - How much memory is installed on the machine?
  - How much memory is assigned to Confluence's JVM? (i.e. what are the `-Xmx` and `-Xms` settings for the JVM?)
  - What other applications are being hosted on the same box?

##### Confluence content

- How many *users* are registered in Confluence?
- On average, to how many *groups* does each user belong?
- How many *spaces* (global and personal) are there in your Confluence server?
- How many of those spaces would be viewable by the average user?
- Approximately how many *pages*? (Connect to your database and perform `'select count(*) from content where prevver is null and contenttype = 'PAGE''`)

#### On this page:

- [Basic performance troubleshooting steps](#)
- [Requesting basic performance support](#)
- [Advanced performance troubleshooting](#)

#### Related pages:

- [Memory Usage and Requirements](#)
- [Confluence for Enterprise](#)

- How much data is being stored in Bandana (where plugins usually store data)? (Connect to your database and perform `'select count(*), sum(length(bandanavalue)) from bandana'`)

### The database

- What is the exact version number of Confluence's database server?
- What is the exact version number of the JDBC drivers being used to access it? (For some databases, the full filename of the driver JAR file will suffice)
- Is the database being hosted on the same server as Confluence?
- If it is on a different server, what is the network latency between Confluence and the database?
- What are the database connection details? How big is the connection pool? If you are using the standard configuration this information will be in your `confluence_cfg.xml` file. Collect this file. If you are using a Data source this information will be stored in your application server's configuration file, collect this data.

### User management

- Are you using external user management or authentication? (i.e. Jira or LDAP user delegation, or single sign-on)
- If you are using external Jira user management, what is the latency between Confluence and Jira's database server?
- If you are using LDAP user management:
  - What version of which LDAP server are you using?
  - What is the latency between Confluence and the LDAP server?

## Diagnostics

### Observed problems

- Which pages are slow to load?
  - If it is a specific wiki page, attach the wiki source-code for that page
- Are they always slow to load, or is the slowness intermittent?

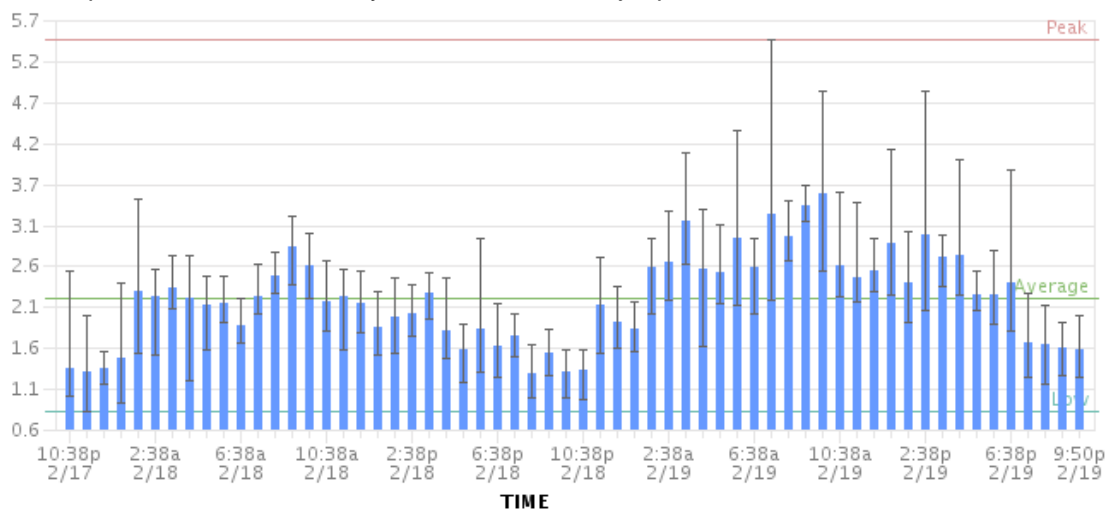
### Monitoring data

Before drilling down into individual problems, helps a lot to understand the nature of the performance problem. Do we deal with sudden spikes of load, or is it a slowly growing load, or maybe a load that follows a certain pattern (daily, weekly, maybe even monthly) that only on certain occasions exceeds critical thresholds? It helps a lot to have access to continuous monitoring data available to get a rough overview.

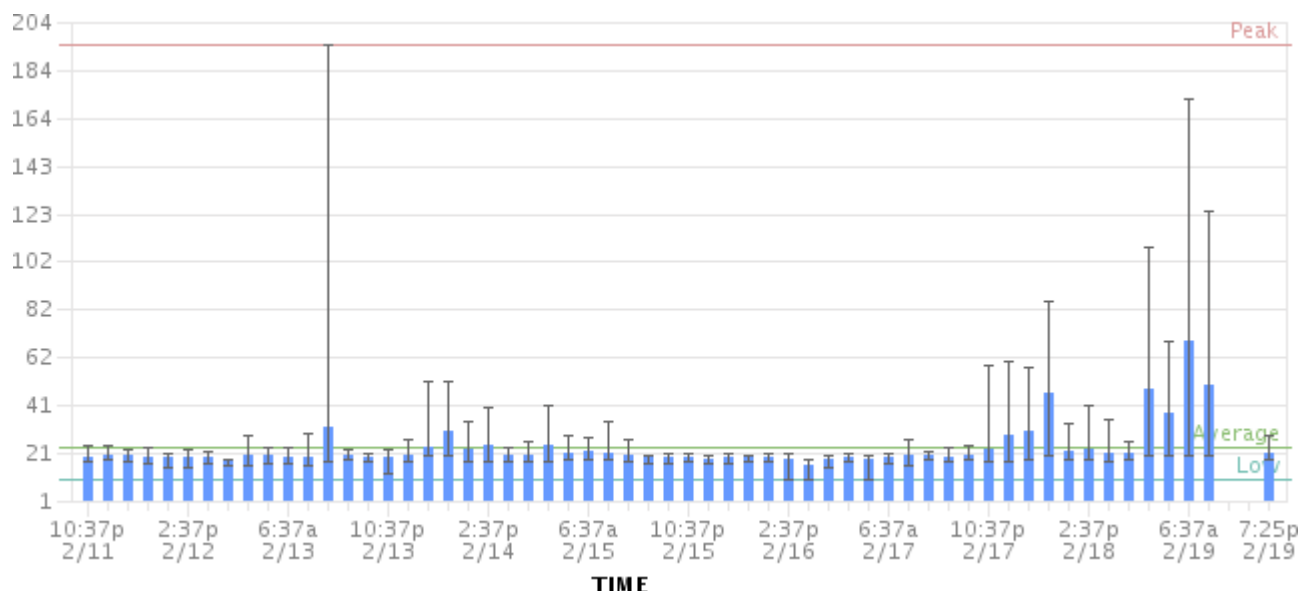
Here are sample graphs from the `confluence.atlassian.com` system, showing

### Load

This graph shows the load for two consecutive days. The obvious pattern is that the machine is under decent load, which corresponds to the user activity, and there is no major problem.

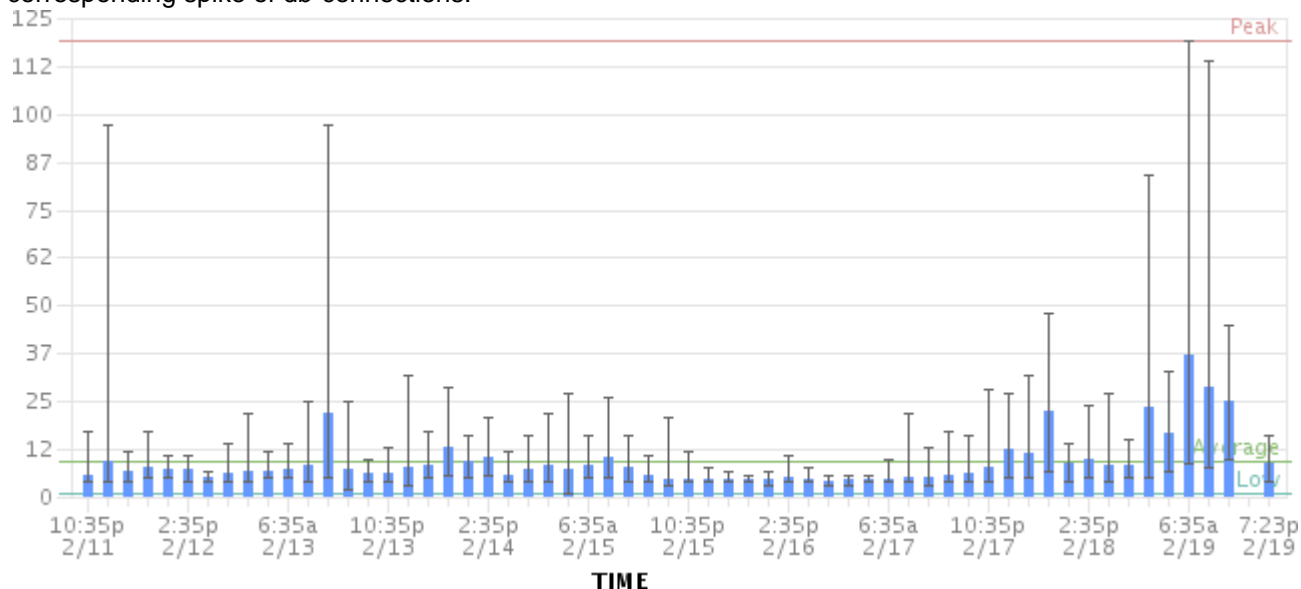


### Resin threads and database connections



#### Active number of Java Threads

These two charts show the active threads in the application server (first chart) and the size database connection pool (second chart). As you can see, there was a sudden spike of server threads and a corresponding spike of db-connections.



#### The database connection pool size

The database connection pool size peaked over 112, which happened to be more than the maximum number of connections the database was configured for (100). So it was no surprise that some requests to Confluence failed and many users thought it had crashed, since many requests could not obtain the crucial database connections.

We were able to identify this configuration problem quite easily just by looking at those charts. The next spikes were uncritical because more database connections were enabled.

The bottom line being: it helps a lot to monitor your Confluence systems continuously (we use Hyperic, for example), and it helps even more if you are able to send us graphs when you encounter problems.

#### Access logs

- [How to Enable User Access Logging](#), including redirecting the logs to a separate file
  - You can run this file through a log file analyzer such as [AWSStats](#), or manually look through for pages which are slow to load.

#### Profiling and logs

- Enable Confluence's built-in profiling for long enough to demonstrate the performance problem using T



#### troubleshooting Slow Performance Using Page Request Profiling.

- If a single page is reliably slow, you should make several requests to that page
- If the performance problem is intermittent, or is just a general slowness, leave profiling enabled for thirty minutes to an hour to get a good sample of profiling times
- Find Confluence's standard output logs (which will include the profiling data above). Take a zip of the entire logs directory.
- [Take a thread dump](#) during times of poor performance

#### CPU load

- If you are experiencing high CPU load, please [install the YourKit profile](#) and attach two profiler dumps taken during a CPU spike. If the CPU spikes are long enough, please take the profiles 30-60 seconds apart. The most common cause for CPU spikes is a virtual machine operating system.
- If the CPU is spiking to 100%, try [Live Monitoring Using the JMX Interface](#), in particular with the [Top threads plugin](#).

#### Site metrics and scripts

- It is essential to understand the user access and usage of your instance. Please use the [access log scripts](#) and [sql scripts](#) to generate Usage statistics for your instance.

#### Next step

Open a ticket on <https://support.atlassian.com> and attach all the data you have collected. This should give us the information we need to track down the source of your performance problems and suggest a solution. Please follow the progress of your enquiry on the support ticket you have created.

### Access Log Scripts

The access log scripts are [attached to this page](#). To use the scripts:

1. Unzip the 7z file.
2. Copy all the daily access logs to a folder called logs.
3. Run `Atlassian-processDailyLog.rb`. This will generate a csv file called `summary.csv` and several directories which contain the access logs of each defined user action.
4. Run the appropriate script `Atlassian-processDailyLog-hourly.rb` `<admin/comment/create/edit/search/rss>`. Each script will generate a different csv file. For example, `Atlassian-processDailyLog-hourly.rb admin` will process the admin logs extracted in step 3.
5. Import the csv files to `www-log-Analysis.xls` (`summary.csv` to 'raw stats - daily' sheet and `admin.csv` to 'admin -hours' sheet, etc) to generate the load profiles and graphs. You may need to modify the number of rows in each sheet depending on the number of logs.

#### Note

All scripts are written in Ruby and assume the log file name contains the string 'confluence.atlassian.com-access.log'. Scripts need to be changed if another name is used. Modify the line: `filenameRegexp = Regexp.new('confluence.atlassian.com-access.log')`

### Compressing an HTTP Response within Confluence

Confluence supports HTTP GZip transfer encoding. This means that Confluence will compress the data it sends to the user, which can speed up Confluence over slow or congested Internet links, and reduce the amount of bandwidth consumed by a Confluence server.

Turn on Confluence's GZip encoding if:

- Users are accessing Confluence over the Internet, or a WAN connection with limited bandwidth.
- You wish to reduce the amount of data transfer between the Confluence server and client.

If you are accessing Confluence over a Local Area Network or over a particularly fast WAN, you may wish to leave GZip encoding disabled. If the network is fast enough that transferring data from Confluence to the user isn't a limiting factor, the additional CPU load caused by compressing each HTTP response may slow



Confluence down.

## Enabling HTTP Compression

1. Choose the **cog icon**



, then choose **General Configuration** under Confluence Administration

2. Select '**General Configuration**' in the left-hand panel.
3. Enable '**Compress HTTP Responses**'.

It is possible to configure which types of content are compressed within Confluence. By default, the following mime types will be compressed:

- text/htmltext
- javascript
- text/css
- text/plain
- application/x-javascript
- application/javascript

If you wish to change the types of content to be compressed, add a replacement `urlrewrite-gzip-default.xml` file within the `WEB-INF/classes/com/atlassian/gzipfilter/` directory in your Confluence Installation Directory. A sample file is provided as an [attachment](#). It is unlikely that you will need to alter this file.

## Garbage Collector Performance Issues

This document relates broadly to memory management with Oracle's Hotspot JVM. These recommendations are based on Support's successful experiences with customers with large Confluence instances.

Please **do not** use the Concurrent Mark Sweep (CMS) Collector with Confluence, unless otherwise advised by Atlassian Support. It requires extensive manual tuning and testing, and is likely to result in degraded performance.

### Use a small heap

Keep your heap as small as possible, without the instance experiencing OutOfMemory errors. If you experience OutOfMemory errors and need to increase this, we recommend you do it in 512mb or 1gb allotments, and monitor the instance. If you continue to receive OutOfMemory errors, increase the heap by another 512mb or 1gb, and continue this process until you are operating stably with no OutOfMemory errors. Do not increase the heap further than required, as this will result in longer garbage collections.

### Remove any old tuning parameters

On every full GC, the JVM will resize the allocations of Eden, Survivor etc based on the throughput it is actually seeing. It will tune itself based on the real world data of the objects that are being created and collected. Most of the time simply allowing JVM to tune itself will give you better performance.

If you have added JVM parameters in the past and are experiencing difficulties with GC now, we'd recommend you remove all GC related parameters, unless you added them to solve a specific problem, and they did in fact solve that problem. You should also consider re-benchmarking now to ensure that they are still solving that problem, and are not causing you any other issues.

### Check your VM resources

If you run Confluence on a VM, check that it is not using the swap file. If it does, when the JVM garbage collects it has to load the objects from the swap file into memory to clean them, and this can cause significantly longer GC pauses. Instead of using swapping, ballooning and bursting, allocate adequate memory to the VM.

## Manual Tuning

If you find you are still experiencing difficulties with GC after following these recommendations and you would like to see if you can tune the JVM better to improve performance, we recommend following the instructions in our [Garbage Collection \(GC\) Tuning Guide](#). This document will take you through the process of choosing performance goals (throughput/footprint/latency), and how to tune for those goals.

### Viewing your GC logs

[How to Enable Garbage Collection \(GC\) Logging](#), and use a tool like [Chewiebug's GCViewer](#) to view the resulting logs.

## Troubleshooting Slow Performance Using Page Request Profiling

This page tells you how to enable page-request profiling. With profiling turned on, you will see a record of the time it takes (in milliseconds) to complete each action made on any Confluence page. If Confluence is responding slowly, an internal timing trace of the slow page request can help to identify the cause of the delay.

You will need access to the Confluence server to view a profile.

### On this page:

- [Enabling Page-Request Profiling](#)
- [Profiling an Activity](#)
- [Example of a Profile](#)
- [Start Confluence with Profiling Enabled](#)

### Related pages:

- [Requesting Performance Support](#)
- [Working with Confluence Logs](#)

### Enabling Page-Request Profiling

To see just the slow performing macros, see [Identifying Slow Performing Macros](#).

**i** You need to have [System Administrator](#) permissions in order to enable or disable profiling.

To enable page profiling:

1. Choose the **cog icon**



, then choose **General Configuration** under Confluence Administration

2. Choose '**Logging and Profiling**' in the left-hand panel.
3. The '**Logging and Profiling**' screen appears. Choose '**Enable Profiling**'.



If profiling is already enabled, the button will be labeled 'Disable Profiling'.

To disable page profiling:

1. Choose the **cog icon**



, then choose **General Configuration** under Confluence Administration

2. Choose '**Logging and Profiling**' in the left-hand panel.
3. The '**Logging and Profiling**' screen appears. Choose '**Disable Profiling**'.



If profiling is already disabled, the button will be labeled 'Enable Profiling'.

*Screenshot: Changing Log Levels and Profiling*

## Logging and Profiling

Performance Profiling  
Profiling is currently OFF.

[Enable Profiling](#)

---

SQL Logging

[Enable SQL Logging](#)

---

Log4j Logging

loglevel.profileDesc

[Production](#) [Diagnostic](#)

**OR:**

Customise specific logging settings

**Add New Entry**

Class/Package Name	New Level	
<input type="text"/>	INFO ▼	<a href="#">Add entry</a>

**Existing Levels**

Class/Package Name	Current Level	New Level	
atlassian.plugin	INFO	INFO ▼	<a href="#">Remove</a>
com.atlassian.confluence.admin.actions	INFO	INFO ▼	<a href="#">Remove</a>

### Profiling an Activity

1. Enable profiling, using either of the methods described [above](#).  
Profiles for every page hit, for all users, will now be logged to your application server's default logs until Confluence is restarted. Note that each time a user visits a link, a single profile is printed.
2. Confirm that profiles are being written to the Confluence log file — see [Working with Confluence Logs](#) for location of the log files and other details.
3. Perform the activity that is resulting in unusually slow response time.
4. Copy the profile for that action. When deciding which profiles to copy, look for the links that took a long time to respond. If a single page is slow, only that profile is necessary. If Confluence is generally or intermittently slow, copy all profiles logged during the slowdown until a reasonable sample has been collected.
5. If you were instructed to profile your instance by Atlassian technical support, attach all relevant profiles to your support ticket.
6. Turn profiling off again, using either of the methods described [above](#).
7. Confirm that profiles are no longer being printed to the Confluence log file.

### Example of a Profile

Below are the first few lines of a normal profile for accessing a page called Confluence Overview.

```
[344ms] - /display/ds/Confluence+Overview
  [313ms] - SiteMesh: parsePage:
http://localhost:8080/display/ds/Confluence+Overview
  [313ms] - XW Interceptor: Before defaultStack:
/pages/viewpage.action (ViewPageAction.execute())
    [0ms] - SpaceAwareInterceptor.intercept()
    [16ms] - PageAwareInterceptor.intercept()
      [0ms] - AOP: PageManager.getPage()
      [16ms] - AOP: PermissionManager.hasPermission()
        [0ms] - AOP: SpacePermissionManager.hasPermission()
        [16ms] - AOP: SpacePermissionManager.hasPermission()
        [0ms] - AOP: SpacePermissionManager.hasPermission()
        [0ms] - AOP: SpacePermissionManager.hasPermission()
      [281ms] - XW Interceptor: After defaultStack:
/pages/viewpage.action (ViewPageAction.execute())
    [281ms] - XW Interceptor: After validatingStack:
/pages/viewpage.action (ViewPageAction.execute())
    ...
```

**i** Notice that each indented line is a recursive call that rolls up into the parent line. In the example above, the Confluence Overview page takes 344ms. Part of that, 313ms, is spent in sitemesh.

### Start Confluence with Profiling Enabled

There may be some situations where you may wish to have Confluence profiling enabled during startup. This may be useful if you restart often and may forget to enable profiling for Support/Trouble-shooting purposes.

Edit the file `CONFLUENCE_HOME\confluence\WEB-INF\web.xml`. You should see a section similar to the one below. Set the parameter value for **autostart** to **true**:

```
<filter>
  <filter-name>profiling</filter-name>

  <filter-class>com.atlassian.confluence.util.profiling.ConfluenceProfi
lingFilter</filter-class>
  <init-param>
    <!-- specify the which HTTP parameter to use to turn the
filter on or off -->
    <!-- if not specified - defaults to "profile.filter" -->
    <param-name>activate.param</param-name>
    <param-value>profile</param-value>
  </init-param>
  <init-param>
    <!-- specify the whether to start the filter
automatically -->
    <!-- if not specified - defaults to "true" -->
    <param-name>autostart</param-name>
    <param-value>true</param-value>
  </init-param>
</filter>
```

Remember to turn it back to **false** or your logs will grow very large.

### Identifying Slow Performing Macros

[Page Profiling](#) gives good detail on what operations are slow in a page load. In addition, you can add debug level logging:

#### Version 3.1 and Later

Set the package name `com.atlassian.renderer.v2.components.MacroRendererComponent` to **DEBUG** in Administration >> [Logging and Profiling](#).

#### Prior to version 3.1

Download `WikiMarkupParser.class`, available from the [attachments to this page](#). This will result in logs like:

```
2009-04-23 10:27:54,789 DEBUG [http-8080-1]
[atlassian.renderer.v2.WikiMarkupParser] parse Entering macro rendering.
Processed text: {spaces}
2009-04-23 10:27:55,768 DEBUG [http-8080-1]
[atlassian.renderer.v2.WikiMarkupParser] parse Exiting macro text
rendering. Total time: 979ms
2009-04-23 10:27:55,785 DEBUG [http-8080-1]
[atlassian.renderer.v2.WikiMarkupParser] parse Entering macro rendering.
Processed text: {create-space-button}
2009-04-23 10:27:55,857 DEBUG [http-8080-1]
[atlassian.renderer.v2.WikiMarkupParser] parse Exiting macro text
rendering. Total time: 72ms
2009-04-23 10:27:55,862 DEBUG [http-8080-1]
[atlassian.renderer.v2.WikiMarkupParser] parse Entering macro rendering.
Processed text:
{recently-updated-dashboard:dashboard|showProfilePic=true}
2009-04-23 10:27:56,704 DEBUG [http-8080-1]
[atlassian.renderer.v2.WikiMarkupParser] parse Exiting macro text
rendering. Total time: 842ms
2009-04-23 10:27:56,707 DEBUG [http-8080-1]
[atlassian.renderer.v2.WikiMarkupParser] parse Entering macro rendering.
Processed text: {favpages:maxResults=10}
2009-04-23 10:27:56,889 DEBUG [http-8080-1]
[atlassian.renderer.v2.WikiMarkupParser] parse Exiting macro text
rendering. Total time: 182ms
```

To add the class:

1. Add this line to the file `<confluence-install>/confluence/WEB-INF/classes/log4j.properties`:  
`log4j.logger.com.atlassian.renderer=DEBUG`
2. Add the appropriate [WikiMarkupParser.class](#) to `/confluence/WEB-INF/classes/com/atlassian/renderer/v2`.  
You'll have to make the `renderer` and `v2` folders.

In combination with page profiling, this should give good specifics on the amount of time various plugins take. You can also use this utility to [Search Confluence for Uses of a Macro](#).

#### Resolution

Experiment with the tips from the [performance tuning](#) page, or open an enhancement request about the specific macro. In some instances there is no resolution - you'll just be aware of the overhead of various macros.

## Data Collection Policy

### Why does Confluence collect usage data?

We're proud that Confluence is one of the most versatile collaboration tools on the planet, and we will continue to deliver innovative new features as quickly as we can. In order to prioritize the features we deliver, we need to understand how our customers use Confluence, what's important, what's not, and what doesn't work well. The collection of usage data allows us to measure the user experience across many thousands of users and deliver features that matter.

### What data is collected?

The type of data we collect is covered in our [Privacy Policy](#). Please read it - we've tried to avoid legal jargon and made it as straightforward as possible.

To view a sample of data that might be collected from your specific installation, go to



> **General Configuration** > **Analytics**.

Data is always collected in Confluence Cloud.

### How is data collected from Confluence?

Older versions of Confluence (prior to Confluence 5.6 or Confluence Questions 1.0.618) didn't collect usage data. Analytics are collected using the Atlassian Analytics add-on. The add-on collects analytics events in a log file which is located in `<confluence-home>/analytics-logs`. The logs are periodically uploaded using an encrypted session and then deleted. If Confluence is unable to connect to the Internet, no logs are ever uploaded.

### Enabling/disabling data collection in Confluence

You can turn off analytics collection at any time. Go to



> **General Configuration** > **Analytics**.

## Administering Collaborative Editing

Collaborative editing takes teamwork to the next level. This page covers everything you need to know about administering collaborative editing.

Head to [Collaborative editing](#) to find out how your team can work together in real time on software requirements, meeting notes, retros, and any other Confluence page you can think of.

### About Synchrony

Collaborative editing is powered by Synchrony which synchronizes data in real time. Synchrony is executed as a separate process by Confluence and managed by Confluence automatically. Under normal circumstances it should not need to be managed manually by an administrator.

To check if Synchrony is running, go to



> **General Configuration** > **Collaborative editing**.

Here you can check your Synchrony status and current configuration, including current port, database driver and maximum heap size allocated to Synchrony. This information can be useful if you need to troubleshoot Synchrony problems.

Synchrony runs on port 8091 by default, and an

#### On this page:

- [About Synchrony](#)
- [Change the editing mode](#)
- [Maximum editor limit](#)
- [Auditing considerations](#)
  - [No version history in unpublished drafts](#)
  - [Visibility of edits made by anonymous users](#)
- [Change your Synchrony configuration](#)
- [Proxy and SSL considerations](#)
  - [SSL](#)
  - [Proxies](#)
    - [No reverse proxy](#)
    - [With a reverse proxy](#)
    - [Direct to Synchrony with a reverse proxy](#)
  - [XHR fallback](#)

#### Related pages:

- [Troubleshooting Collaborative Editing](#)

internal Synchrony proxy means that you shouldn't need to open this additional port.

## Collaborative editing

Collaborative editing gets your team working together in real time. It's powered by Synchrony, a service that runs outside of Confluence. You can monitor Synchrony performance or change your editing mode below. [Learn more](#)

### Editing mode

Collaborative editing **ON**

This mode allows your team to edit a shared draft of a page at the same time. [Learn more](#)

Change mode

### Synchrony monitoring and configuration

#### Status

Synchrony **RUNNING**

The Synchrony service is running.

Restart Synchrony

[Troubleshooting](#)

#### Configuration

Synchrony port 8091

Maximum heap size 1GB


Custom database driver org.postgresql.Driver

[Learn more](#)

## Change the editing mode

The editing mode determines the editing experience for all users in your site. This is how you turn collaborative editing on or off.

To change the editing mode:

1. Go to  > **General Configuration** > **Collaborative editing**.
2. Choose **Change mode**.
3. Select a mode and choose **Change**.

Changing the editing mode is not trivial, and some changes can result in the loss of your users' drafts, so it is good to understand the implications of each mode.

The following modes are available:

Mode	Implications
<b>On</b>	<p>This mode allows your team to edit a shared draft of a page at the same time, and see each others' changes in real time.</p> <p>This the recommended editing mode.</p>



<b>Limited</b>	<p>This mode protects your users' shared drafts if you need to troubleshoot Synchrony. You would only switch to this mode if your users are experiencing problems editing and publishing.</p> <p>The editing experience will be very limited for your users:</p> <ul style="list-style-type: none"> <li>• Only one person can edit a shared draft at one time.</li> <li>• You can't revert to an earlier version of the page in the page history.</li> <li>• You can't move pages.</li> <li>• You can't make inline comments on pages.</li> </ul> <p>As soon as Synchrony is running again, we recommend turning collaborative editing back on.</p>
<b>Off</b>	<p>This mode means that your team can only edit their own personal draft of a page. Confluence will attempt to merge any conflicts on save. This mode replicates the Confluence 5 editing experience.</p> <p>This mode is useful if you are unable to run Synchrony successfully in your environment, or if you have decided that collaborative editing is not for you (for example if you have auditing requirements that would prohibit using collaborative editing just yet).</p> <p>You should make sure your users have published any work they want to keep before you turn collaborative editing off.</p>

### Maximum editor limit

A maximum of 12 people can edit a page at the same time. This means that people can't enter the editor if there are already 12 other people editing the page, and will need to wait until someone leaves.

Administrators can increase or decrease this limit using a [system property](#). If you experience performance issues when many people are editing, you might want to decrease this limit.

### Auditing considerations

We know that auditing is a major consideration for some customers. We don't yet have very granular auditing capabilities with collaborative editing. All page changes are currently attributed to the person that publishes the page, rather than the people who made each specific change.

If this is going to be a problem in your site, we recommend turning collaborative editing off in your site for now.

### No version history in unpublished drafts

We're saving all the time in collaborative editing, but we don't save versions of unpublished changes. When restoring an earlier page version, you can only roll back to an existing published version. Any unpublished changes will be lost when you restore a previous version.

### Visibility of edits made by anonymous users

There are some additional things to be aware of if you have granted the **Add** page permission (and **Can use** global permission) to anonymous users.

You won't be alerted, when closing the editor or publishing a page, if the only unpublished changes on the page were made by anonymous users. This means a logged in user may inadvertently publish changes they were not aware had been made to the page.

The changes themselves are visible in the page, but the usual warning dialog will not appear if the only people to have made changes were not logged in.

If there are unpublished changes from both logged in users and anonymous users, the warning dialog will appear, but only the logged in users will be listed in the dialog. Changes made by all users (including anonymous) will be included if you view the changes from that dialog.



## Change your Synchrony configuration

You can't change your Synchrony configuration through the Confluence UI. Configuration changes are made via system properties. In most cases you will not need to make changes to the default configuration.

### ▼ Change the port Synchrony runs on...

Synchrony runs on port 8091 by default. If this port is already in use by another application on your server you can use the `synchrony.port` system property to change it to an available port.

If you're Confluence 6.0.3 or earlier you'll need to use `reza.port` instead of `synchrony.port`.

See [Configuring System Properties](#) to find out how to change this.

For Confluence Data Center the way you run Synchrony is a little different. See [Configuring Synchrony for Data Center](#) for more information.

### ▼ To change the maximum heap for Synchrony

Synchrony has a maximum heap size of 1 GB by default.

If you experience out of memory errors related to Synchrony, you can change the heap size allocated to Synchrony using the `synchrony.memory.max` system property.

If you're Confluence 6.0.3 or earlier you'll need to use `reza.memory.max` instead of `synchrony.memory.max`.

See [Configuring System Properties](#) to find out how to change this.

For Confluence Data Center the way you run Synchrony is a little different. See [Configuring Synchrony for Data Center](#) for more information.

See [Recognized System Properties](#) for the full list of Synchrony system properties.

If you need to pass additional arguments to Synchrony's JVM directly, create a file called `synchrony-args.properties` in the Confluence home directory and include the arguments you want to pass to Synchrony, one per line, as follows.

```
property1=value1  
property2=value2
```

This will add `-Dproperty1=value1 -Dproperty2=value2` to the Synchrony command. This is only available in Confluence 6.0.2 and later.

You can't use this method for passing any value that is already handled by a system property, such port, Xmx or Xss etc. See [Configuring System Properties](#) for a full list of system properties.

## Proxy and SSL considerations

How you connect to Synchrony will depend on your environment. We know that most Confluence sites run behind a reverse proxy, often with SSL. Here's some information to help you identify the right configuration for your environment, and any changes you might need to make to your environment to use collaborative editing in your site.

### SSL

Synchrony runs in a separate JVM, and does not support direct HTTPS connections. If you are not using a reverse proxy, SSL should be terminated at Tomcat. If you are using a reverse proxy or load balancer, SSL should be terminated at your reverse proxy or load balancer.

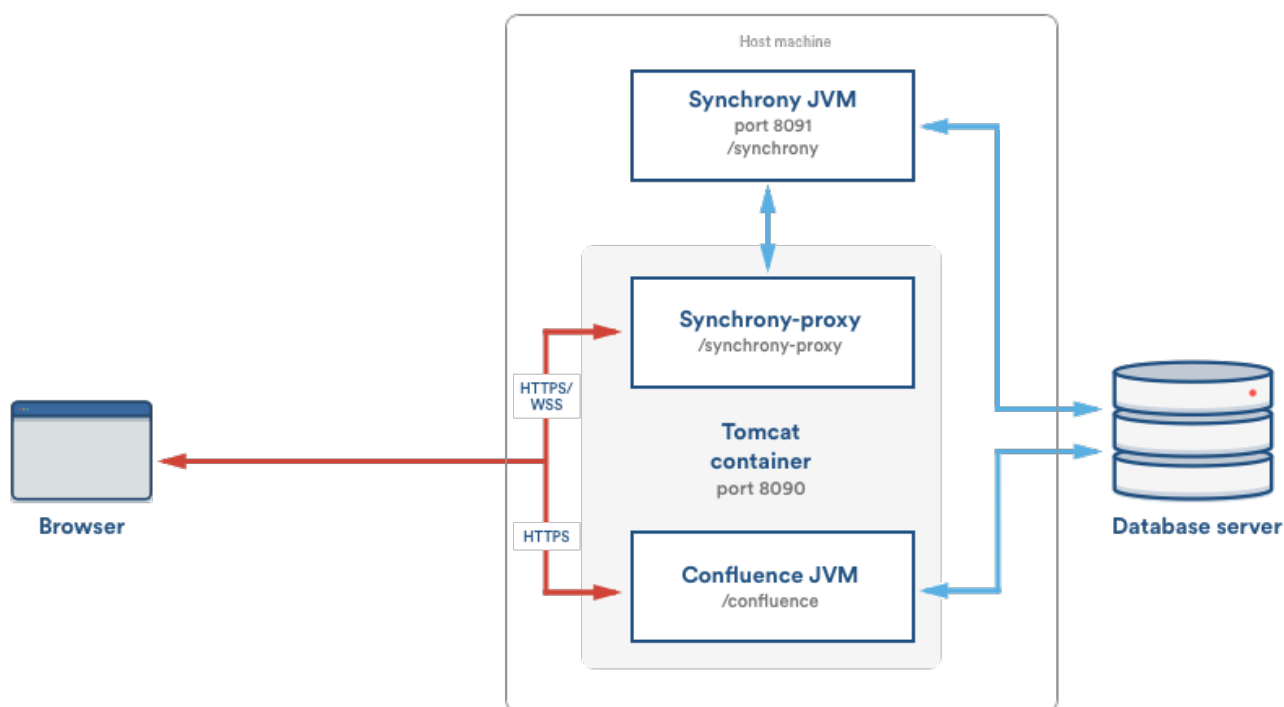
### Proxies

In the diagrams below we've used a common implementation where Confluence is running under the /confluence context path (e.g. [www.mysite.com/confluence](http://www.mysite.com/confluence)). The concepts are the same if you use Confluence without a context path (e.g. [www.myconfluence.com](http://www.myconfluence.com)).

The following info is specific to Confluence Server. If you're using Data Center, see [Configuring Synchrony for Data Center](#).

#### No reverse proxy

If you don't run Confluence behind a reverse proxy, you'll connect to Synchrony via Confluence's internal Synchrony proxy. SSL, if used, is terminated at Tomcat. This is the default configuration, and you shouldn't need to make any additional changes to use collaborative editing.

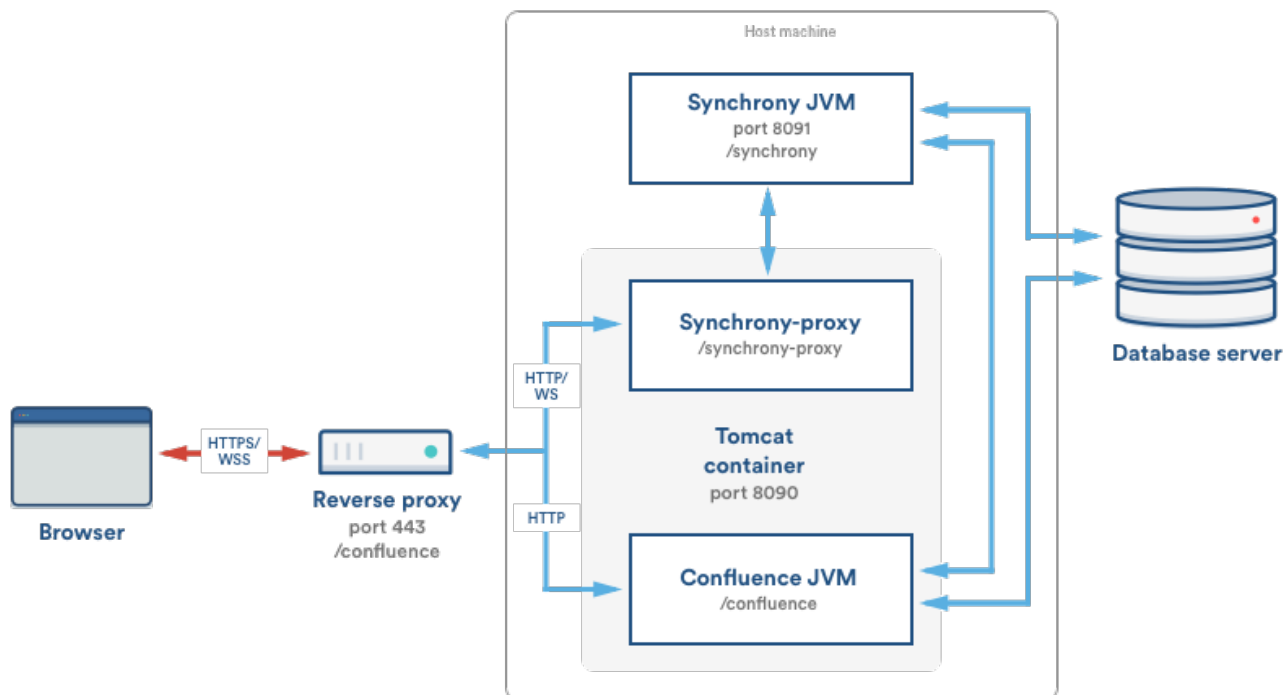


#### With a reverse proxy

If you run Confluence behind a reverse proxy, you will connect to Synchrony via Confluence's internal Synchrony proxy. This is the default configuration with a reverse proxy, and a good choice if you do not want to open port 8091. SSL should be terminated at your reverse proxy.

You do not need to make any additional changes to your reverse proxy configuration for Synchrony, but for best results your reverse proxy must support WebSocket connections (you may need to manually enable this in your proxy).

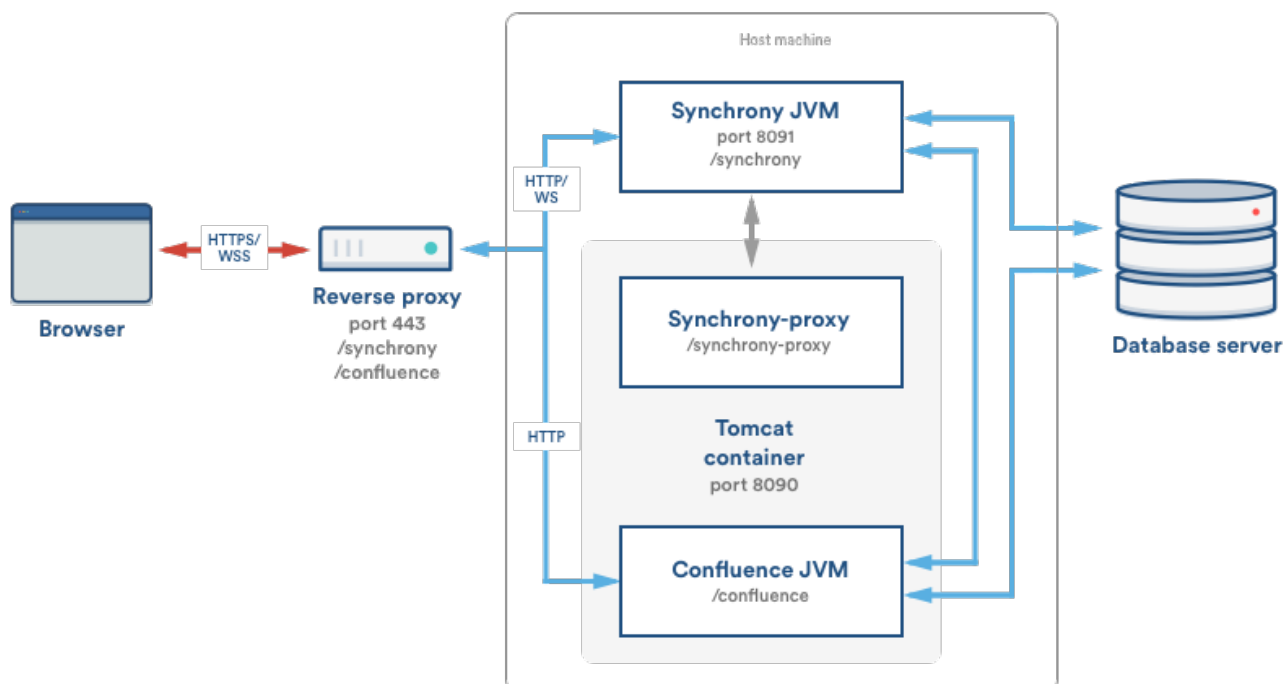
To tell Confluence that you want to use the internal proxy, set the `synchrony.proxy.enabled` [system property](#) to `true`. (This is optional, but will prevent Confluence from trying to reach Synchrony via /synchrony first, before retrying via the internal proxy).



If Synchrony can't be reached via /synchrony-proxy we'll automatically try /confluence/synchrony-proxy (where /confluence is your Confluence context path).

#### Direct to Synchrony with a reverse proxy

If you run Confluence behind a reverse proxy, and experience latency or other issues connecting to Synchrony via Confluence's internal Synchrony proxy, you can choose to connect direct to Synchrony. This is the optimal setup, but does require some changes to your environment. You will need to open port 8091 and add /synchrony to your reverse proxy configuration. SSL will still be terminated at your reverse proxy, as Synchrony does not accept direct HTTPS connections.



If Synchrony can't be reached via /synchrony we'll automatically try the internal Synchrony proxy via /confluence/synchrony-proxy (where /confluence is your Confluence context path).

See the following guides for example reverse proxy configurations. The order of directives is important, so

check our examples.

- [Using Apache with mod\\_proxy](#)
- [Running Confluence behind NGINX with SSL](#)
- [Proxying Atlassian server applications with Apache HTTP Server \(mod\\_proxy\\_http\)](#)
- [Proxying Atlassian server applications with Microsoft Internet Information Services \(IIS\)](#)
- [How to configure Amazon Web Service Elastic Load Balancer with Confluence 6.0](#)

## XHR fallback

When a user cannot connect to Confluence via a WebSocket, we'll fall back to a XML HTTP Request (XHR), allowing them to edit pages successfully. For the best editing experience, we strongly recommend that your environment allows WebSocket connections however.

XHR fallback is enabled by default, but can be disabled using a [system property](#) if necessary. You shouldn't need to change this.

## Troubleshooting Collaborative Editing

Collaborative editing is powered by Synchrony which synchronizes data in real time. Under normal circumstances it should not need to be managed manually by an administrator.

This page will help you troubleshoot problems with Synchrony in your instance.

### First steps

#### *Check Synchrony is running*

To check if Synchrony is running, go to



- > **General Configuration**
- > **Collaborative editing.**

Note: if you're running Confluence Data Center, this page will only be able to tell you if the current Confluence node is connected to your Synchrony cluster. You may want to use a third party monitoring tool to help you monitor your Synchrony cluster.

#### *Check you can edit a page*

If you see an error when you edit a page, but Synchrony is running, something is preventing your browser from connecting to Synchrony.

The most common issue is a misconfigured reverse proxy. See our proxy troubleshooting tips later in this page or head to [Administering Collaborative Editing](#) to find out more about possible proxy and SSL configurations.

#### *Check the logs*

You can find the Confluence application logs at `<home-directory>/logs/atlassian-confluence.log` and Synchrony specific logs at `<home-directory>/logs/atlassian-synchrony.log`.

#### *Restart Synchrony*

Go to

### On this page:

- [First steps](#)
  - [Check Synchrony is running](#)
  - [Check you can edit a page](#)
  - [Check the logs](#)
  - [Restart Synchrony](#)
- [Check port 8091 is available](#)
- [Reverse proxy issues](#)
- [Forward proxy issues](#)
- [Websocket issues](#)
- [SSL issues](#)
- [Memory issues](#)
- [Multiple Synchrony processes](#)
- [Incompatible browser extensions](#)
- [Firewall or anti-virus interference](#)
- [Too many people in the editor](#)

### Related pages:

- [Administering Collaborative Editing](#)



## > General Configuration

> **Collaborative editing** and choose **Restart Synchrony**.

### Check port 8091 is available

Synchrony runs on port 8091 by default. If this port is already in use by another application on your server you can use the `synchrony.port` system property to change it to an available port.

(If you're using Confluence 6.0.3 or earlier you'll need to use `reza.port` instead of `synchrony.port`.)

See [Configuring System Properties](#) to find out how to change this.

For Confluence Data Center the way you run Synchrony is a little different. See [Configuring Synchrony for Data Center](#) for more information.

### Reverse proxy issues

If you have configured your reverse proxy, but can't edit pages, here's some things to check in your configuration:

- Go to `installation-directory>/conf/server.xml` and check the Connector directive. Make sure that you have correct values for `<protocol>` and `<proxyName>`. See the examples in the guides below for more information.
- The `http` connector always needs to be present in the `<installation-directory>/conf/server.xml` file, even if you're configuring SSL or using the AJP connector. The Synchrony health check uses HTTP and will fail if this connector is not present. Alternatively, if you do not want to include the `http` connector, you can use the `synchrony.proxy.healthcheck.disabled` system property to disable the health check.
- If you're using Apache, make sure you're using Apache 2.4 (with WebSockets support) and all required modules have been enabled (`mod-proxy`, `mod_rewrite`, `proxy_wstunnel`).
- If you're using Apache and want to connect directly to Synchrony, in your proxy config file, make sure you've included `/synchrony` and that the order of the Confluence and Synchrony directives and location blocks is correct. See the examples in the guides below for more information.

See [Administering Collaborative Editing](#) to find out more about possible proxy and SSL configurations then check out the following guides for more information on how to include Synchrony in your reverse proxy config, if you want to connect direct to Synchrony:

- [Using Apache with mod\\_proxy](#)
- [Running Confluence behind NGINX with SSL](#)
- [Proxying Atlassian server applications with Apache HTTP Server \(mod\\_proxy\\_http\)](#)
- [Proxying Atlassian server applications with Microsoft Internet Information Services \(IIS\)](#)
- [How to configure Amazon Web Service Elastic Load Balancer with Confluence 6.0](#)

### Forward proxy issues

If you're using a forward or outbound proxy, you will need to add the IP that Synchrony listens on to your config to ensure it is bypassed. See [Configuring Web Proxy Support for Confluence](#) for more info.

By default, the IP is 127.0.0.1, or it will be the value of the `synchrony.host` system property, if you've customized the hostname or IP that Confluence uses to connect to Synchrony.

### Websocket issues

Collaborative editing works best with a WebSocket connection. If one can't be established due to a timeout, or a proxy server or firewall that doesn't allow WebSocket connections, the editor will attempt to connect via an XML HTTP Request (XHR).

You can use <http://websocket.org/echo.html> to perform a quick HTML5 WebSocket test against an echo server.

### SSL issues

Synchrony cannot accept direct HTTPS connections, so you will need to terminate SSL at your reverse proxy or load balancer, or at Tomcat if you are not using a reverse proxy.

### Memory issues

If you experience out of memory errors related to Synchrony, you can change the heap size allocated to Synchrony using the `synchrony.memory.max` system property.

If you're Confluence 6.0.3 or earlier you'll need to use `reza.memory.max` instead of `synchrony.memory.max`.

See [Configuring System Properties](#) to find out how to change this.

For Confluence Data Center the way you run Synchrony is a little different. See [Configuring Synchrony for Data Center](#) for more information.

### Multiple Synchrony processes

If you see an error immediately in the editor, but Confluence reports that Synchrony is running, check to make sure that you only have one Synchrony process running.

If you do have multiple Synchrony processes running, stop Confluence, kill the additional Synchrony processes and then restart Confluence.

You can avoid this problem by always using `stop-confluence.sh` / `stop-confluence.bat` to stop Confluence, rather than simply closing the Tomcat window.

### Incompatible browser extensions

Some third party browser extensions that interact with the editor, such as Grammarly, may not function correctly with collaborative editing. See [Confluence Collaborative Editing blocks Grammarly Extension](#) to find out how to disable Grammarly for just your Confluence site.

### Firewall or anti-virus interference

We've had a few reports of firewalls or anti-virus software blocking some requests to the server, resulting in unexpected behavior in the editor. You may need to add Confluence to your whitelist / trusted URLs if you experience issues. See [Weird Page or Editor Behaviors with Kaspersky Internet Security](#) for more information.

### Too many people in the editor

We don't enforce a maximum number of people who can edit together, but we recommend you keep it to no more than 12 people editing the same page at the same time. We may enforce a limit to the number people who can enter the editor in a later release if necessary.

## Migrate from Confluence Cloud to Server

This page is for people who are currently using Confluence Cloud, and wish to move to Confluence Server (a Confluence installation hosted on your own servers).

For migrating from Confluence Server to Confluence Cloud, see [Importing wiki data](#).

#### On this page:

- [Migration steps](#)
- [Support, limitations, and recommendations](#)
  - [Add-ons](#)
  - [Database considerations](#)
  - [Confluence license](#)

You can migrate from your Confluence Cloud to **Confluence Server 6.0 or later** only. You can't import Cloud data (whole site or individual space exports) into any earlier versions of Confluence. We recommend

installing the latest version.

Confluence Cloud is typically ahead of Confluence Server, which means that some features may not be available after you've moved to Confluence Server.

## Migration steps

### To migrate from Confluence Cloud to Confluence Server:

1. Export the data from your Confluence Cloud site, using the Confluence backup manager.
  - For detailed instructions, see [Exporting wiki data](#).
  - You now have an XML export of your Confluence data.
2. Download the [latest Confluence Server release](#).  
You will only be able to import your Cloud backup into Confluence 6.0 or later. We recommend always installing the latest release.
3. Follow the [Confluence Installation Guide](#) for your platform to install Confluence.
4. Import the data from your backup file (XML export) into your new Confluence installation - see [Restoring a Site](#).
5. Follow the steps on [Restore Passwords To Recover Admin User Rights](#) to start Confluence in recovery mode, and log in using the temporary account.
6. Create a new user account, and make it a member of the confluence-administrators group. This will be your system administrator account.
7. Stop Confluence, remove the recovery mode system property, then restart Confluence.

## Support, limitations, and recommendations

Please note the following about your new Confluence Server site.

- If you're unable to remove the Jira cloud application link from your Confluence after the import, you'll need to remove those references directly from the Confluence database as per [this guide](#).
- The User Management section might be missing due to

**CONFSERVER-35177** - User and Group Links Missing from Admin Console After Migrating From Cloud to Server [OPEN](#)

Follow the workaround notes on the issue to enable the feature again.

- If your Confluence Cloud instance has macros that depend on the Application Links back to a Jira Cloud instance, and you are migrating Jira as well, these references will need to be updated to work properly as per

**APL-1144** - Allow relocation of application links even if the target application is still accessible.  
[TRIAGE](#)

You can address that by either editing the XML prior to import, or by bulk editing those references in Confluence database as per [this guide](#).

- If you experience problems loading pages after the import, head to



> **General Configuration** to check your base URL as the port may have changed.

- If you find that some of your users' favorites (pages saved for later) are missing due to

**CONFSERVER-36348** - Favourites missing after importing  
[OPEN](#)

. See [How to restore missing favorites after import from XML](#) for more information.

- Confluence spaces are not automatically created when you create a new Jira projects.
- If you are unable to create or edit pages after migrating from Cloud to Confluence 5.10, follow the workaround in this issue to disable the specified dark features

**CONFSERVER-44335** - Edit/Create pages is not working when migrate from Cloud to Server  
[RESOLVED](#)

. This issue doesn't affect Confluence 6.x versions.

## Add-ons



After migrating your data you will need to install any compatible add-ons, such as Questions and Team Calendars.

Some third party add-ons are only available for Cloud, and will no longer be available after you migrate. You can check whether your essential add-ons are available for Confluence Server, Cloud or both on Atlassian Marketplace.

### Database considerations

If you are uncertain about which database to choose for your new Confluence installation, we recommend PostgreSQL - see [Database Setup for PostgreSQL](#). The Confluence Cloud site runs on PostgreSQL, so there should be no compatibility issues.

If you choose another [supported database](#), Contact [Support](#) if you encounter any compatibility issues with other [supported databases](#).

### Confluence license

You will need a new license to migrate to Confluence Server. Your existing Cloud license cannot be used. You can get a new license at <https://my.atlassian.com>. You may also need new licenses for any paid add-ons.

## Confluence installation and upgrade guide

### About the installation and upgrade guide

This guide covers how to install and upgrade Confluence.

Information on the features and changes in specific Confluence releases can be found in the [Confluence Release Notes](#).

For information on using and administering Confluence refer to the [Confluence Documentation](#).

- [System Requirements](#)
  - [Server Hardware Requirements Guide](#)
  - [Example Size and Hardware Specifications From Customer Survey](#)
  - [Running Confluence in a Virtualized Environment](#)
- [Confluence Installation Guide](#)
  - [Installing Confluence](#)
  - [Installing Confluence Data Center](#)
  - [Installing Java for Confluence](#)
  - [Creating a Dedicated User Account on the Operating System to Run Confluence](#)
- [Confluence Setup Guide](#)
  - [Configuring Jira Integration in the Setup Wizard](#)
- [Upgrading Confluence](#)
  - [Upgrading Beyond Current Licensed Period](#)
  - [Confluence Post-Upgrade Checks](#)
  - [Migration from Wiki Markup to XHTML-Based Storage Format](#)
  - [Migration of Templates from Wiki Markup to XHTML-Based Storage Format](#)
  - [Upgrading Confluence Manually](#)
  - [Create a staging environment for upgrading Confluence](#)
- [Supported Platforms](#)

### Downloads



Download the Confluence documentation in PDF format.

### Other resources

[Confluence Release Notes](#)

[Confluence administrator's guide](#)

[Confluence Knowledge Base](#)

[Atlassian Answers](#)



- [End of Support Announcements for Confluence](#)
- [Supported Platforms FAQ](#)
- [Migrating Confluence Between Servers](#)
  - [From Confluence Evaluation through to Production Installation](#)

## System Requirements

Confluence can run on a wide range of operating systems and databases, on physical or virtualized servers.

See [Supported Platforms](#) for the full list of platforms that we support in this version of Confluence or [Supported Platforms FAQ](#) for details on our support handling procedures.

### Software requirements

#### Operating systems

Atlassian supports the operating systems listed on the [Supported Platforms](#) page.

If you would like to run Confluence on virtualized hardware, please read our [Running Confluence in a Virtualized Environment](#) document first.

#### Application server

We only support running Confluence on the version of Apache Tomcat that is bundled with the Confluence distribution.

#### Databases

You'll need an external database to run Confluence. See the [Supported Platforms](#) page for a list of all the databases we support.

When evaluating Confluence, you can use the embedded H2 database included in the Confluence installation, but you will need to migrate to a supported external database once you're ready to roll Confluence out to your team.

#### Java

The Java Runtime Environment (JRE) is packed up and ready to go when you install Confluence using the Windows or Linux installer. You don't need to install Java yourself.

If you choose to install Confluence from an archive file, you'll need a [supported](#) JRE or JDK, and your JAVA\_HOME variable set correctly. See [Installing Java for Confluence](#) for more information.

#### Antivirus considerations

Antivirus software on the operating system running Confluence can greatly decrease the performance of Confluence. Antivirus software that intercepts access to the hard disk is particularly detrimental and may even cause errors in Confluence. This is particularly important if you are running Confluence on Windows. No

#### On this page:

- [Software requirements](#)
  - [Operating systems](#)
  - [Application server](#)
  - [Databases](#)
  - [Java](#)
  - [Antivirus considerations](#)
- [Hardware requirements](#)
- [Hosted solutions – Confluence Cloud](#)

matter how fast your hardware is, antivirus software will almost always have a negative impact on Confluence's performance.

You should configure your antivirus software to ignore the following directories:

- Confluence [home directory](#)
- Confluence's index directory
- All database-related directories

## Hardware requirements

Please be aware that while some of our customers run Confluence on SPARC-based hardware, Atlassian only officially supports Confluence running on x86 hardware and 64-bit derivatives of x86 hardware.

See [Server Hardware Requirements Guide](#) for more information.

You may also like to check out our tips on [reducing out of memory errors](#), in particular the section on [Permanent Generation Size](#).

## Hosted solutions – Confluence Cloud

If you do not have the resources to set up and maintain a Confluence installation locally, consider trying Confluence Cloud. Atlassian can run and maintain your installation of Confluence, handling all the testing, monitoring and upgrading processes for you.


## Server Hardware Requirements Guide

Server administrators can use this guide in combination with the free Confluence trial period to evaluate their server hardware requirements. Because server load is difficult to predict, live testing is the best way to determine what hardware a Confluence instance will require in production.

Peak visitors are the maximum number of browsers simultaneously making requests to access or update pages in Confluence. Visitors are counted from their first page request until the connection is closed and if public access is enabled, this includes internet visitors as well as logged in users. Storage requirements will vary depending on how many pages and attachments you wish to store inside Confluence.

### Minimum hardware requirements

The values below refer to the minimum available hardware required to run Confluence only; for example, the minimum heap size to allocate to Confluence is 1 GB and 1 GB for Synchrony (which is required for collaborative editing). You'll need additional physical hardware, of at least the minimum amount required by your Operating System and any other applications that run on the server.

 On small instances, server load is primarily driven by peak visitors, so minimum system requirements are difficult to judge. We provide these figures as a guide to the absolute minimum required to run Confluence, and your configuration will likely require better hardware.

Here is our minimum hardware recommendation:

- **CPU:** Quad core 2GHz+ CPU
- **RAM:** 6GB
- **Minimum database space:** 10GB

**On this page:**

- [Minimum hardware requirements](#)
- [Example hardware specifications](#)
- [Server load and scalability](#)
- [Maximum reported usages](#)
- [Hard disk requirements](#)
- [Professional assistance](#)
- [Example site](#)

**Related pages:**

- [Confluence Installation Guide](#)
- [Managing Application Server Memory Settings](#)
- [Running Confluence in a Virtualized Environment](#)

**Note:** Please be aware that while some of our customers run Confluence on SPARC-based hardware, we only officially support Confluence running on x86 hardware and 64-bit derivatives of x86 hardware. Confluence typically will not perform well in a tightly constrained, shared environment - examples include an AWS micro.t1 instance. Please be careful to ensure that your choice of hosting platform is capable of supplying sustained processing and memory capacity for the server, particularly the processing-intense startup process.

**Example hardware specifications**

These are example hardware specifications for non-clustered Confluence instances. It is not recorded whether the amount of RAM refers to either the total server memory or memory allocated to the JVM, while blank settings indicate that the information was not provided.

Accounts	Spaces	Pages	CPUs	CPU (GHz)	RAM (MB)	Notes
150	30	1,000	1	2.6	1,024	
350	100	15,000	2	2.8	1,536	

5,000	500		4	3	2,048	
10,000	350	16,000	2	3.8	2,048	
10,000	60	3,500	2	3.6	4,096	
21,000	950		2	3.6	4,096	
85,000	100	12,500	4	2.6	4,096	3 machines total: application server, database server, Apache HTTPD + LDAP tunnel server.

### Server load and scalability

When planning server hardware requirements for your Confluence deployment, you will need to estimate the server scalability based on peak visitors, the editor to viewer ratio and total content.

- The editor to viewer ratio is how many visitors are performing updates versus those only viewing content
- Total content is best estimated by a count of total spaces

Confluence scales best with a steady flow of visitors rather than defined peak visitor times, few editors and few spaces. Users should also take into account:

- Total pages is not a major consideration for performance. For example, instances hosting 80K of pages can consume under 512MB of memory
- Always [use an external database](#), and check out the [performance tuning guides](#).

### Maximum reported usages

These values are largest customer instances reported to Atlassian or used for performance testing. Clustering, database tuning and other performance tuning is recommended for instances exceeding these values.

Most Spaces	1700
Most Internal Users	15K
Most LDAP Users	100K
Most Pages	80K

### Hard disk requirements

All page content is stored in the database, while attachments are stored in the file system. The more attachments you have, the more disk space you will require.

### Private and public comparison

Private instances manage their users either internally or through a user repository such as LDAP, while online instances have public signup enabled and must handle the additional load of anonymous internet visitors. Please keep in mind that these are examples only, not recommendations:

Use Case	Spaces	User Accounts	Editors	Editor To Viewer Ratio	Pages	Page Revisions	Attachments	Comment
Online Documentation	140	11,500	1,000	9%	8,800	65,000	7,300	11,500

Private Intranet	130	180	140	78%	8,000	84,000	3,800	500
Company-Wide Collaboration	100	85,000	1,000+	1%+	12,500	120,000	15,000	

### Professional assistance

For large instances, it may be worthwhile contacting an [Atlassian Solution Partner](#) for expertise on hardware sizing, testing and performance tuning.

### Example site

Here is a breakdown of the disk usage and memory requirements a large documentation site as at April 2013:

<b>Database size</b>	2827 MB
<b>Home directory size</b>	116 GB
<b>Average memory in use</b>	1.9 GB

### Size of selected database tables

Data	Relevant Table	Rows	Size
Attachment metadata	attachments	193903	60 MB
Content and user properties	os_propertyentry (?)	639737	255 MB
Content bodies (incl. all versions of blogs, pages and comments)	bodycontent	517520	1354 MB
Content metadata (incl. title, author)	content	623155	459 MB
Labels	label (5982, 1264 kB), content_label (134151, 46 MB)	140133	47.2 MB
Users	users	38766	6200 kB

Note: not all database tables or indexes are shown, and average row size may vary between instances.

### Size of selected home directory components

Data	Files	Size
Attachments (incl. all versions)	207659	105 GB
Did-you-mean search index	10	14 MB
Office Connector cache	3506	456 MB
Plugin files	1851	669 MB
Search index	448	3.9 GB
Temporary files	14232	5 GB

Thumbnails	86516	1.7 GB
Usage index (now disabled)	239	2.6 GB

Note: not all files are shown, and average file size may vary between instances.

## Example Size and Hardware Specifications From Customer Survey

Below are the results of a survey conducted by Atlassian in July 2007, showing some capacity statistics for Confluence users. The figures are broken down by industry and number of users.

Num Users	Length of time in production	Database	Application Server	Num CPUs/Cores	Physical Memory/RAM	Operating System	Satisfaction with Confluence Performance
<b>Banking/Finance</b>							
26 - 50	3-6 Months Ago	Microsoft SQL Server	Confluence distribution/ Apache Tomcat	2	2G	Windows	Neutral
26 - 50	2 Years Ago	Sybase ASE	Weblogic	>8	>16G	Unix	Satisfied
51 - 250	3-6 Months Ago	Oracle	Confluence distribution/ Apache Tomcat	2	4G	Unix	Neutral
501 - 1,000	3-6 Months Ago	Microsoft SQL Server	Websphere	2	2G	AIX	Satisfied
1,001 - 5,000	3-6 Months Ago	Oracle	Confluence distribution/ Apache Tomcat	2	4G	Windows	Satisfied
1,001 - 5,000	2 Years Ago	Oracle	Websphere	4	>16G	Solaris	Extremely Satisfied
5,001 - 10,000	10-12 Months Ago	Microsoft SQL Server	Confluence distribution/ Apache Tomcat	4	16G	Linux	Satisfied
<b>Education</b>							
1-25	2 Years Ago	DB2	Confluence distribution/ Apache Tomcat	2	2G	Linux	Satisfied
26 - 50	10-12 Months Ago	MySQL	Confluence distribution/ Apache Tomcat	2	2G	Linux	Extremely Satisfied

51 - 250	<3 Months Ago	Oracle	Confluence distribution/ Apache Tomcat		1G	Windows	Unsatisfied
51 - 250	10-12 Months Ago	Oracle	Confluence distribution/ Apache Tomcat	1	2G	Unix	Extremely Satisfied
<b>Engineering/Aerospace</b>							
251 - 500	7-9 Months Ago	Oracle	Confluence distribution/ Apache Tomcat	1	1G	Mac OS X	Satisfied
1,001 - 5,000	7-9 Months Ago	Microsoft SQL Server	JBoss	2	4G	Linux	Satisfied
<b>Entertainment</b>							
1,001 - 5,000	10-12 Months Ago	PostgreSQL	Confluence distribution/ Apache Tomcat	2	8G	Linux	Extremely Satisfied
<b>Government</b>							
51 - 250	2 Years Ago	MySQL	Confluence distribution/ Apache Tomcat	2	2G	Mac OS X	Extremely Satisfied
<b>Technology</b>							
501 - 1,000	7-9 Months Ago	MySQL	Confluence distribution/ Apache Tomcat	1	2G	Linux	Satisfied
<b>Telecommunications &amp; Media</b>							
1-25	3-6 Months Ago	Confluence distribution/ HSQL	Confluence distribution/ Apache Tomcat	1		Linux	Satisfied
1-25	7-9 Months Ago	MySQL	Confluence distribution/ Apache Tomcat	1	2G	Linux	Satisfied
26 - 50	10-12 Months Ago	MySQL	Confluence distribution/ Apache Tomcat	2	2G	Linux	Satisfied

## Running Confluence in a Virtualized Environment

This page provides pointers for things to look at when running Confluence on virtualized hardware.

### Summary

Running Confluence in a virtual machine (VM) requires specialized skills to set up and manage the virtualized environment. In particular, the performance of Confluence can be affected by the activity of other VMs running on the same infrastructure, as well as how you configure the Confluence VM itself.

Atlassian supports running Confluence and Confluence Data Center in a virtualized environment, but we cannot offer support for problems which are related to the environment itself.

### Recommendations

The following recommendations come from our experience in running and testing Confluence in virtualized environments like VMWare and KVM, and our experience in working with customers running on these platforms.

- **Know your platform.** Consult the documentation for your operating system and your chosen virtualization technology, for details on setting up a reliable VM (virtual machine) image.
- **Allocate enough memory.** As a Java web application, Confluence requires a relatively large memory allocation, compared to some other web technologies. Ensure that your VM images have enough physical memory allocated to run Confluence without swapping.
- **Handle high I/O.** Under normal usage, Confluence requires a significant number of input/output (I/O) operations to the database and home directory for each web request. Ensure that you use the correct drivers and consider how you make storage available to your VMs to optimize this access.
- **Handle peak CPU and memory usage.** For certain operations (including PDF export, Office document processing, and displaying large pages) Confluence requires a significant amount of CPU and memory. Ensure that your virtualization infrastructure has the flexibility and capacity to deal with peak load, not just idle load.
- **Synchronize time correctly.** Some customers have had problems with time synchronization between the VM and the host system. This causes problems in Confluence due to irregularities in the execution of scheduled tasks. We strongly recommend checking your VM time sync if you have issues with scheduled tasks in a virtualized environment.

### Further help

For further assistance in setting up a virtualized environment for running Confluence, you may want to consult an [Atlassian Expert](#). Several experts have experience with installation and performance tuning, and can help you with your Confluence configuration.

## Confluence Installation Guide

### Before you start

Before installing Confluence, please check that you meet the [minimum system requirements](#) and [Supported Platforms](#).

If you're planning to run Confluence in a virtualized environment see [Running Confluence in a Virtualized Environment](#).

### Choose your installation method

#### On this page:

- [Summary](#)
- [Recommendations](#)
- [Further help](#)

#### Related pages:

- [Server Hardware Requirements Guide](#)
- [Confluence Installation Guide](#)
- [Confluence Data Center](#)
- [AWS Quick Start \(Data Center only\)](#)



There are a number of ways to install Confluence. Choose the method that is best for your environment.

Install method	Is this right for you?
<b>Install a Confluence trial</b> <ul style="list-style-type: none"> <li>Windows, Linux or OS X</li> </ul>	<p>This is the fastest way to get a Confluence site up and running. If you're evaluating Confluence, use this option or try <a href="#">Confluence Cloud</a> free.</p> <p>You don't need an external database to install a Confluence trial.</p>
<b>Install Confluence using an installer</b> <ul style="list-style-type: none"> <li>Windows</li> <li>Linux</li> </ul>	<p>This option uses an installer, and is the most straightforward way to get your production site up and running on a Windows or Linux server.</p>
<b>Install Confluence from a zip or archive file</b> <ul style="list-style-type: none"> <li>Windows</li> <li>Linux</li> </ul>	<p>This option requires you to manually install files and configure some system properties. It gives you the most control over the install process. Use this option if there isn't an installer for your operating system.</p>
<b>Run Confluence in a Docker container</b> <ul style="list-style-type: none"> <li>Docker</li> </ul>	<p>This option gets Confluence Server up and running in no time using a pre-configured Docker image. Head to <a href="https://docs.docker.com/">https://docs.docker.com/</a> to find out more about Docker.</p> <p>Atlassian supports running Confluence in a Docker container, but we cannot offer support for problems which are related to the environment itself.</p>
<b>Install Confluence in a cluster</b> <ul style="list-style-type: none"> <li>Windows or Linux</li> <li>AWS Quick Start</li> <li>Azure</li> </ul>	<p>Confluence Data Center is a clustered solution for large enterprises. It can be hosted on your own infrastructure or deployed to AWS or Azure for a private cloud solution.</p> <p>Read the <a href="#">Confluence Data Center Technical Overview</a> to find out if Confluence Data Center is right for your organization.</p>

**Note:** we do not support installing Confluence as a production system on OS X. An OS X download is available for the purposes of evaluating Confluence only. There are no limitations to using Confluence on a mac with any one of the [supported browsers](#).

The EAR/WAR distribution is [no longer available](#), you'll need to install Confluence from a zip or archive file if you previously deployed Confluence into an existing application server.

## Installing Confluence

There are a number of ways to install Confluence. Choose the method that is best for your environment.

Install method	Is this right for you?
<b>Install a Confluence trial</b> <ul style="list-style-type: none"> <li>Windows, Linux or OS X</li> </ul>	<p>This is the fastest way to get a Confluence site up and running. If you're evaluating Confluence, use this option or try <a href="#">Confluence Cloud</a> free.</p> <p>You don't need an external database to install a Confluence trial.</p>
<b>Install Confluence using an installer</b> <ul style="list-style-type: none"> <li>Windows</li> <li>Linux</li> </ul>	<p>This option uses an installer, and is the most straightforward way to get your production site up and running on a Windows or Linux server.</p>

<b>Install Confluence from a zip or archive file</b> <ul style="list-style-type: none"> <li>• <a href="#">Windows</a></li> <li>• <a href="#">Linux</a></li> </ul>	This option requires you to manually install files and configure some system properties. It gives you the most control over the install process. Use this option if there isn't an installer for your operating system.
<b>Run Confluence in a Docker container</b> <ul style="list-style-type: none"> <li>• <a href="#">Docker</a></li> </ul>	<p>This option gets Confluence Server up and running in no time using a pre-configured Docker image. Head to <a href="https://docs.docker.com/">https://docs.docker.com/</a> to find out more about Docker.</p> <p>Atlassian supports running Confluence in a Docker container, but we cannot offer support for problems which are related to the environment itself.</p>
<b>Install Confluence in a cluster</b> <ul style="list-style-type: none"> <li>• <a href="#">Windows or Linux</a></li> <li>• <a href="#">AWS Quick Start</a></li> <li>• <a href="#">Azure</a></li> </ul>	<p>Confluence Data Center is a clustered solution for large enterprises. It can be hosted on your own infrastructure or deployed to AWS or Azure for a private cloud solution.</p> <p>Read the <a href="#">Confluence Data Center Technical Overview</a> to find out if Confluence Data Center is right for your organization.</p>

## Installing a Confluence trial

Want to get up and running with Confluence ASAP? This page will guide you through three simple steps to install and set up an evaluation Confluence site.

### On this page:

[Before you begin](#)

1. [Download the installer](#)

2. [Install Confluence](#)

3. [Set up Confluence](#)

If you're ready to set up a production Confluence site or you want more control, check out our [full installation guides](#).

### Before you begin

Our installers come with all the bits and pieces you need to run the application, but there's a few things you'll need to get up and running:

- A computer or laptop with a supported operating system - you'll be installing Confluence so you'll need admin rights.

#### ▼ [Supported operating systems...](#)

You can install Confluence on a Windows or Linux operating system.

Apple Mac isn't supported for production sites, but if you're comfortable setting up applications on your Mac from scratch, you can download the `tar.gz` file and follow the instructions for [Installing Confluence on Linux from Archive File](#) as the process is similar.

- A supported web browser - you'll need this to access Confluence, we support the latest versions of Chrome and Mozilla Firefox, Internet Explorer 11, and Microsoft Edge.
- A valid email address - you'll need this to generate your evaluation license and create an account.

Ready to get going? Let's start with grabbing the installer.

### 1. Download the installer

Head to [www.atlassian.com/software/confluence/download](http://www.atlassian.com/software/confluence/download) and download the installer for your operating system.

### 2. Install Confluence

The installer allows you to choose Express or Custom installations.

The Custom installation allows you to pick some specific options for Confluence, but for this guide we'll use the Express installation.

#### ▼ For Windows

1. Run the installer - we recommend running with a Windows administrator account.  
If prompted, make sure you allow the installer to make changes to your computer. This will allow you to install Confluence as a service.
2. Choose **Express Install**, then click **Next**.
3. Once installation is complete, it will ask you if you want to open Confluence in your browser. Make sure this option is selected then click **Done**.
4. Confluence will open in your default browser, and you're ready to start the set up wizard.

#### ▼ For Linux

1. Change to the directory where you downloaded Confluence then execute this command to make it executable:

```
$ chmod a+x atlassian-confluence-X.X.X-x64.bin
```

Where `X.X.X` is the Confluence version you downloaded.

2. Run the installer - we recommend using `sudo` to run the installer as this will create a dedicated account to run Confluence and allow you to run Confluence as a service.

```
$ sudo ./atlassian-confluence-X.X.X-x64.bin
```

3. When prompted, choose **Express Install** (option 1).
4. Once installation is complete head to `http://localhost:8090/` in your browser to begin the setup process.

### 3. Set up Confluence

The set up wizard is the last step in getting Confluence up and running. You'll need your email address to generate your evaluation license.

1. Select **Trial**, and click **Next**.  
This will allow Confluence to set up everything it needs to run, including an H2 database.
2. Select **Get an evaluation license** then follow the prompts to generate your license.
3. If you want to try some Confluence add-ons to give you more functionality, select the ones you want and click **Next**.  
It will take a few minutes to get everything connected and operational.
4. Select **Manage users with Confluence**, and click **Next**.
5. Enter and confirm the details you want to use for your administrator account, and click **Done**.

That's it! You're ready to team up with some colleagues and start using Confluence!



## Installing Confluence on Windows

In this guide we'll run you through installing Confluence in a production environment, with an external database, using the Windows installer.

This is the most straightforward way to get your production site up and running on a Windows server.

### Other ways to install Confluence:

- [Evaluation](#) - get your free trial up and running in no time.
- [Zip](#) – install Confluence manually from a zip file.
- [Linux](#) – install Confluence on a Linux operating system

### On this page:

[Before you begin](#)

[Install Confluence](#)

1. [Download Confluence](#)

2. [Run the installer](#)

[Set up Confluence](#)

3. [Choose installation type](#)

4. [Enter your license](#)

5. [Connect to your database](#)

6. [Populate your new site with content](#)

7. [Choose where to manage users](#)

8. [Create your administrator account](#)

9. [Start using Confluence](#)

[Troubleshooting](#)

### Before you begin

Before you install Confluence, there's a few questions you need to answer.

<p>Are you using a supported operating system?</p>	<p><a href="#">Tell me more...</a></p> <p>Check the <a href="#">Supported Platforms</a> page for the version of Confluence you are installing. This will give you info on supported operating systems, databases and browsers.</p> <p><b>Good to know:</b></p> <ul style="list-style-type: none"> <li>• We don't support installing Confluence on OSX.</li> <li>• The Confluence installer includes Java (JRE) and Tomcat, so you don't need to install these separately.</li> </ul>
--	--

Do you want to run Confluence as a Windows Service?	<p>▼ <a href="#">Tell me more...</a></p> <p>Running Confluence as a service in Windows means that Confluence will automatically start up when Windows is started.</p> <p><b>If you choose to run Confluence as a service:</b></p> <ul style="list-style-type: none"> <li>You must run the installer as administrator to be able to install Confluence as a service.</li> <li>The Confluence service will be run as the Windows 'SYSTEM' user account. To change this user account see <a href="#">Changing the Windows user that the Confluence service uses</a>.</li> <li>We strongly recommend creating a dedicated user account (e.g. with username 'confluence') for running Confluence. See <a href="#">Creating a Dedicated User Account on the Operating System to Run Confluence</a> to find out what directories this user will need to be able to read and write to.</li> </ul> <p><b>If you choose not to run Confluence as a service:</b></p> <ul style="list-style-type: none"> <li>You will start and stop Confluence by running the <code>start-confluence.bat</code> file in your Confluence installation directory.</li> <li>Confluence will be run as the Windows user account that was used to install Confluence, or you can choose to run as a dedicated user.</li> <li>Confluence will need to be restarted manually if your server is restarted.</li> </ul>
Are ports 8090 and 8091 available?	<p><a href="#">Tell me more...</a></p> <p>Confluence runs on port 8090 by default. If this port is already in use, the installer will prompt you to choose a different port.</p> <p>Synchrony, which is required for collaborative editing, runs on port 8091 by default. If this port is already in use, you will need to change the port that Synchrony runs on after your Confluence installation is complete. See <a href="#">Administering Collaborative Editing</a> to find out how to change the port Synchrony runs on. You won't be able to edit pages until Synchrony has an available port.</p>
Is your database set up and ready to use?	<p><a href="#">Tell me more...</a></p> <p>To run Confluence in production you'll need an external database. Check the <a href="#">Supported Platforms</a> page for the version you're installing for the list of databases we currently support. If you don't already have a database, PostgreSQL is free and easy to set up.</p> <p><b>Good to know:</b></p> <ul style="list-style-type: none"> <li>Set up your database before you begin. Step-by-step guides are available for <a href="#">PostgreSQL</a>, <a href="#">Oracle</a>, <a href="#">MySQL</a>, and <a href="#">SQL Server</a>.</li> <li>If you're using Oracle or MySQL you'll need to <a href="#">download the driver</a> for your database.</li> <li>To use a datasource see <a href="#">Configuring a datasource connection</a> as there are some steps you need to perform before running the setup wizard.</li> <li>The embedded H2 database can be used for evaluating Confluence, but you'll need to migrate to another database before running in production. You may find it easier to use external database from the start.</li> </ul>

Do you have a Confluence license?	<p>▼ <a href="#">Tell me more...</a></p> <p>You'll need a valid Confluence Server license to use Confluence.</p> <p><b>Good to know:</b></p> <ul style="list-style-type: none"> <li>• If you have not yet purchased a Confluence license you'll be able to create an evaluation license during setup.</li> <li>• If you already have a license key you'll be prompted to log in to <a href="https://my.atlassian.com">my.atlassian.com</a> to retrieve it, or you can enter the key manually during setup.</li> <li>• If you're migrating from Confluence Cloud, you'll need a new license.</li> </ul>
-----------------------------------	--

## Install Confluence

### 1. Download Confluence

Download the installer for your operating system - <https://www.atlassian.com/software/confluence/download>

### 2. Run the installer

1. Run the installer. We recommend using a Windows administrator account.
2. Follow the prompts to install Confluence. You'll be asked for the following info:
  - a. **Destination directory** – this is where Confluence will be installed.
  - b. **Home directory** – this is where Confluence data like logs, search indexes and files will be stored.
  - c. **TCP ports** – these are the HTTP connector port and control port Confluence will run on. Stick with the default unless you're running another application on the same port.
  - d. **Install as service** – this option is only available if you ran the installer as administrator.
3. Confluence will start up in your browser once installation is complete.

## Set up Confluence

### 3. Choose installation type

1. Choose **Production installation**.
2. Choose any **add-ons** you'd also like to install.

### 4. Enter your license

Follow the prompts to log in to [my.atlassian.com](https://my.atlassian.com) to retrieve your license, or enter a license key.

### 5. Connect to your database

1. If you've not already done so, it's time to create your database. See the 'Before you begin' section of this page for details and connection options.
2. Choose **My own database** then select your particular database from the **Database type** dropdown menu.
3. For MySQL and Oracle, follow the prompts to download and install the [required driver](#).
4. Enter your database details. Use **test connection** to check your database is set up correctly.
 

▼ [Advanced setup options...](#)

If you want to specify particular parameters, you can choose to connect **By connection string**. You'll be prompted to enter:

  - **Database URL** – the JDBC URL for your database. If you're not sure, check the documentation for your database.

- **Username and Password** – A valid username and password that Confluence can use to access your database.

## 6. Populate your new site with content

Choose whether you'd like Confluence to populate your site with content:

### ▼ [Demonstration space...](#)

This option will create a space that you and your users can use to get to know Confluence. You can delete this space at any time.

### ▼ [Import data from an existing site...](#)

Use this option if you have a [full site export](#) of an existing Confluence site. This is useful when you're migrating to another database or setting up a test site.

#### Good to know:

- You can only import sites from the **same** or **earlier** Confluence version.
- The system administrator account and all other user data and content will be imported from your previous installation.

#### In the setup wizard:

- **Upload a backup file** – use this option if your site export file is small (25mb or less).
- **Restore a backup file from the file system** – use this option if your backup file is large. Drop the file into your `<confluence-home>/restore` directory then follow the prompts to restore the backup.
- **Build Index** – we'll need to build an index before your imported content is searchable. This can take a long time for large sites, so deselect this option if you would rather build the index later. Your content won't be searchable until the index is built.

## 7. Choose where to manage users

Choose to manage Confluence's users and groups inside Confluence or in a Jira application, such as Jira Software or Jira Service Desk:

### ▼ [Manage users and groups in Confluence...](#)

Choose this option if you're happy to manage users in Confluence, or don't have a Jira application installed.

#### Good to know:

- If you do plan to manage users in a Jira application, but have not yet installed it, we recommend installing Jira first, and then returning to the Confluence setup.
- You can add external user management (for example LDAP, Crowd or Jira) later if you choose.

### ▼ [Connect to Jira...](#)

Choose this option if you have a Jira application installed and want to manage users across both applications.

#### Good to know:

- This is a quick way of setting up your Jira integration with the most common options.
- It will configure a Jira user directory for Confluence, and set up application links between Jira and Confluence for easy sharing of data.
- You'll be able to specify exactly which groups in your Jira app should also be allowed to log in to Confluence. Your license tiers do not need to be the same for each application.
- You'll need either Jira 4.3 or later, Jira Core 7.0 or later, Jira Software 7.0 or later, or Jira Service Desk 3.0 or later.

#### In the setup wizard:

- **Jira Base URL** – the address of your Jira server, such as `http://www.example.com:8080/jira/` or `http://jira.example.com/`
- **Jira Administrator Login** – this is the username and password of a user account that has the Jira System Administrator global permission in your Jira application. Confluence will also use this



username and password to create a local administrator account which will let you access Confluence if Jira is unavailable. Note that this single account is stored in Confluence's internal user directory, so if you change the password in Jira, it will not automatically update in Confluence.

- **Confluence Base URL** – this is the URL Jira will use to access your Confluence server. The URL you give here overrides the base URL specified in Confluence, for the purposes of connecting to the Jira application.
- **User Groups** – these are the Jira groups whose members should be allowed to use Confluence. Members of these groups will get the 'Can use' permission for Confluence, and will be counted in your Confluence license. The default user group name differs depending on your Jira version:
  - Jira 6.4 and earlier: `jira-users`.
  - Jira Software 7.x and later: `jira-software-users`
  - Jira Core 7.x and later: `jira-core-users`
  - Jira Service Desk 3.x and later: `jira-servicedesk-users`
- **Admin Groups** – provide one or more Jira groups whose members should have administrative access to Confluence. The default group is `jira-administrators`. These groups will get the system administrator and Confluence administrator global permissions in Confluence.

### 8. Create your administrator account

Enter details for the administrator account.

Skip this step if you chose to manage users in a Jira application or you imported data from an existing site.

### 9. Start using Confluence

That's it! Your Confluence site is accessible from a URL like this:

`http://<computer_name_or_IP_address>:<port>`

If you plan to run Confluence behind a reverse proxy, check out [Proxy and SSL considerations](#) before you go any further.

Here's a few things that will help you get your team up and running:

- [Set the server base URL](#) – this is the URL people will use to access Confluence.
- [Set up a mail server](#) – this allows Confluence to send people notification about content.
- [Add and invite users](#) – get your team on board!
- [Start and stop Confluence](#) – find out how to start and stop Confluence.



### Troubleshooting

#### ▼ [Running into problems installing Confluence?](#)

- Some anti-virus or other Internet security tools may interfere with the Confluence installation process and prevent the process from completing successfully. If you experience or anticipate experiencing such an issue with your anti-virus/Internet security tool, disable this tool first before proceeding with the Confluence installation.
- Can't start Confluence? See [Confluence does not start due to Spring Application context has not been set](#).
- Collaborative editing errors? See [Troubleshooting Collaborative Editing](#).

Head to [Installation Troubleshooting](#) in our Knowledge Base for more help.



## Installing Confluence on Windows from Zip File

In this guide we'll run you through installing Confluence in a production environment, with an external database, manually using a zip file.

This method gives you the most control of the installation process.

### Other ways to install Confluence:

- [Evaluation](#) - get your free trial up and running in no time.
- [Installer](#) – install Confluence using the Windows installer.
- [Linux](#) – install Confluence on a Linux operating system.

### On this page:

#### Before you begin

##### Install Confluence

1. Download Confluence
2. Create the installation directory
3. Create the home directory
4. Check the ports
5. Start Confluence

##### Set up Confluence

6. Choose installation type
7. Enter your license
8. Connect to your database
9. Populate your new site with content
10. Choose where to manage users
11. Create your administrator account
12. Start using Confluence

#### Troubleshooting

### Before you begin

Before you install Confluence, there's a few questions you need to answer.

Are you using a supported operating system and Java version?	<p><a href="#">Tell me more about this...</a></p> <p>Check the <a href="#">Supported Platforms</a> page for the version of Confluence you are installing. This will give you info on supported operating systems, databases and browsers.</p> <p><b>Good to know:</b></p> <ul style="list-style-type: none"> <li>• We don't support installing Confluence on OSX.</li> <li>• We don't support OpenJDK. You'll need to install the Oracle Java JRE or JDK.</li> <li>• You can use either the JDK (Java Development Kit) or JRE (Java Runtime Environment).</li> <li>• We only support the version of Apache Tomcat that is bundled with Confluence.</li> </ul>
Do you want to run Confluence as a Windows Service?	<p><a href="#">Tell me more about this...</a></p> <p>Running Confluence as a service in Windows means that Confluence will automatically start up when Windows is started.</p> <p>You should use the <a href="#">Windows installer</a> if you want to run Confluence as a Service.</p> <p><b>If you choose not to run Confluence as a service:</b></p> <ul style="list-style-type: none"> <li>• You will start and stop Confluence by running the <code>start-confluence.bat</code> file in your Confluence installation directory.</li> <li>• Confluence will be run as the Windows user account that was used to install Confluence, or you can choose to run as a dedicated user (this user must have full read and write access to the installation directory and home directory).</li> <li>• Confluence will need to be restarted manually if your server is restarted.</li> </ul>

Are ports 8090 and 8091 available?	<p>▼ <a href="#">Tell me more...</a></p> <p>Confluence runs on port 8090 by default. If this port is already in use, the installer will prompt you to choose a different port.</p> <p>Synchrony, which is required for collaborative editing, runs on port 8091 by default. If this port is already in use, you will need to change the port that Synchrony runs on after your Confluence installation is complete. See <a href="#">Administering Collaborative Editing</a> to find out how to change the port Synchrony runs on. You won't be able to edit pages until Synchrony has an available port.</p>
What database do you plan to use?	<p><a href="#">Tell me more about this...</a></p> <p>To run Confluence in production you'll need an external database. Check the <a href="#">Supported Platforms</a> page for the version you're installing for the list of databases we currently support. If you don't already have a database, PostgreSQL is free and easy to set up.</p> <p><b>Good to know:</b></p> <ul style="list-style-type: none"> <li>• Set up your database before you begin. Step-by-step guides are available for <a href="#">PostgreSQL</a>, <a href="#">Oracle</a>, <a href="#">MySQL</a>, and <a href="#">SQL Server</a>.</li> <li>• If you're using Oracle or MySQL you'll need to <a href="#">download the driver</a> for your database.</li> <li>• To use a datasource see <a href="#">Configuring a datasource connection</a> as there are some steps you need to perform before running the setup wizard.</li> <li>• The embedded H2 database can be used for evaluating Confluence, but you'll need to migrate to another database before running in production. You may find it easier to use external database from the start.</li> </ul>
Do you have a Confluence license?	<p><a href="#">Tell me more about this...</a></p> <p>You'll need a valid Confluence Server license to use Confluence.</p> <p><b>Good to know:</b></p> <ul style="list-style-type: none"> <li>• If you have not yet purchased a Confluence license you'll be able to create an evaluation license during setup.</li> <li>• If you already have a license key you'll be prompted to log in to <a href="#">my.atlassian.com</a> to retrieve it, or you can enter the key manually during setup.</li> <li>• If you're migrating from Confluence Cloud, you'll need a new license.</li> </ul>
Is your JAVA_HOME variable set correctly?	<p><a href="#">Tell me more about this...</a></p> <p>Before you install Confluence, check that you're running a supported Java version and that the <code>JAVA_HOME</code> environment variable is set correctly.</p> <p><b>To check the <code>JAVA_HOME</code> variable:</b></p> <p>Open a command prompt and type <code>echo %JAVA_HOME%</code> and hit Enter.</p> <ul style="list-style-type: none"> <li>• If you see a path to your Java installation directory, the <code>JAVA_HOME</code> environment variable has been set correctly.</li> <li>• If nothing is displayed, or only <code>%JAVA_HOME%</code> is returned, you'll need to set the <code>JAVA_HOME</code> environment variable manually. See <a href="#">Setting the <code>JAVA_HOME</code> Variable in Windows</a> for a step by step guide.</li> </ul>

## Install Confluence

### 1. Download Confluence

Download the zip file for your operating system – <https://www.atlassian.com/software/confluence/download>.

## 2. Create the installation directory

1. Create your installation directory (with full control permission) – this is where Confluence will be installed. Avoid using spaces or special characters in the path. We'll refer to this directory as your <installation-directory>.
2. Extract the Confluence zip file to your <installation-directory>. We recommend using [7zip](#) or [Winzip](#).

## 3. Create the home directory

1. Create your home directory (with full control permission) – this is where Confluence data like logs, search indexes and files will be stored. This should be separate to your installation directory. We'll refer to this directory as your <home-directory>.
2. Edit <installation-directory>\confluence\WEB-INF\classes\confluence-init.properties.
3. At the bottom of the file, enter the path to your <home directory>.

### ▼ Show me how to do this...

You can edit the confluence-init.properties file in Notepad or any other text editor.

- a. Scroll to the bottom of the text and find this line:

```
# confluence.home=c:/confluence/data
```

- b. Remove the '#' and the space at the beginning of this line (so Confluence doesn't regard the line as a comment)

```
confluence.home=c:/data/confluence-home
```

- c. If you decide to use a different directory as the home directory you should:
  - Avoid spaces in the directory path or file name.
  - Use forward slashes '/' to define the path in this file.

## 4. Check the ports

By default Confluence listens on port 8090. If you have another application running on your server that uses the same ports, you'll need to tell Confluence to use a different port.

### ▼ Show me how to do this...

To change the ports:

1. Edit <installation-directory>\conf\server.xml
2. Change the **Server** port (8000) and the **Connector** port (8090) to free ports on your server.

In the example below we've changed the **Server** port to 5000 and the **Connector** port to 5050.

```
Server port="5000" shutdown="SHUTDOWN" debug="0">
  <Service name="Tomcat-Standalone">
    <Connector port="5050" connectionTimeout="20000"
      redirectPort="8443"
      maxThreads="48" minSpareThreads="10"
      enableLookups="false" acceptCount="10" debug="0"
      URIEncoding="UTF-8"
      protocol="org.apache.coyote.http11.Http11NioProtocol"
    />
```

## 5. Start Confluence

1. Run `<installation-directory>/startup.bat` to start the install process.

A command prompt will open. Closing this window will stop Confluence.

2. Go to `http://localhost:8090/` to launch Confluence in your browser (change the port if you've updated the Connector port).

### ▼ Troubleshooting Confluence?

- If the command prompt window closes immediately, your `JAVA_HOME` variable may not be set correctly. See [Setting the JAVA\\_HOME Variable in Windows](#).
- If you see an error, see [Confluence does not start due to Spring Application context has not been set](#) for troubleshooting options.

## Set up Confluence

### 6. Choose installation type

1. Choose **Production installation**.
2. Choose any **add-ons** you'd also like to install.

### 7. Enter your license

Follow the prompts to log in to [my.atlassian.com](https://my.atlassian.com) to retrieve your license, or enter a license key.

### 8. Connect to your database

1. If you've not already done so, it's time to create your database. See the 'Before you begin' section of this page for details and connection options.
2. Choose **My own database** then select your particular database from the **Database type** dropdown menu.
3. For MySQL and Oracle, follow the prompts to download and install the [required driver](#).
4. Enter your database details. Use **test connection** to check your database is set up correctly.

#### ▼ Advanced setup options...

If you want to specify particular parameters, you can choose to connect **By connection string**. You'll be prompted to enter:

- **Database URL** – the JDBC URL for your database. If you're not sure, check the documentation for your database.
- **Username and Password** – A valid username and password that Confluence can use to access your database.

### 9. Populate your new site with content

Choose whether you'd like Confluence to populate your site with content:

#### ▼ Demonstration space...

This option will create a space that you and your users can use to get to know Confluence. You can delete this space at any time.

#### ▼ Import data from an existing site...

Use this option if you have a [full site export](#) of an existing Confluence site. This is useful when you're migrating to another database or setting up a test site.

### Good to know:

- You can only import sites from the **same** or **earlier** Confluence version.
- The system administrator account and all other user data and content will be imported from your previous installation.

#### In the setup wizard:

- **Upload a backup file** – use this option if your site export file is small (25mb or less).
- **Restore a backup file from the file system** – use this option if your backup file is large. Drop the file into your `<confluence-home>/restore` directory then follow the prompts to restore the backup.
- **Build Index** – we'll need to build an index before your imported content is searchable. This can take a long time for large sites, so deselect this option if you would rather build the index later. Your content won't be searchable until the index is built.

#### 10. Choose where to manage users

Choose to manage Confluence's users and groups inside Confluence or in a Jira application, such as Jira Software or Jira Service Desk:

##### ▼ [Manage users and groups in Confluence...](#)

Choose this option if you're happy to manage users in Confluence, or don't have a Jira application installed.

#### Good to know:

- If you do plan to manage users in a Jira application, but have not yet installed it, we recommend installing Jira first, and then returning to the Confluence setup.
- You can add external user management (for example LDAP, Crowd or Jira) later if you choose.

##### ▼ [Connect to Jira...](#)

Choose this option if you have a Jira application installed and want to manage users across both applications.

#### Good to know:

- This is a quick way of setting up your Jira integration with the most common options.
- It will configure a Jira user directory for Confluence, and set up application links between Jira and Confluence for easy sharing of data.
- You'll be able to specify exactly which groups in your Jira app should also be allowed to log in to Confluence. Your license tiers do not need to be the same for each application.
- You'll need either Jira 4.3 or later, Jira Core 7.0 or later, Jira Software 7.0 or later, or Jira Service Desk 3.0 or later.

#### In the setup wizard:

- **Jira Base URL** – the address of your Jira server, such as `http://www.example.com:8080/jira/` or `http://jira.example.com/`
- **Jira Administrator Login** – this is the username and password of a user account that has the Jira System Administrator global permission in your Jira application. Confluence will also use this username and password to create a local administrator account which will let you access Confluence if Jira is unavailable. Note that this single account is stored in Confluence's internal user directory, so if you change the password in Jira, it will not automatically update in Confluence.
- **Confluence Base URL** – this is the URL Jira will use to access your Confluence server. The URL you give here overrides the base URL specified in Confluence, for the purposes of connecting to the Jira application.
- **User Groups** – these are the Jira groups whose members should be allowed to use Confluence. Members of these groups will get the 'Can use' permission for Confluence, and will be counted in your Confluence license. The default user group name differs depending on your Jira version:
  - Jira 6.4 and earlier: `jira-users`.
  - Jira Software 7.x and later: `jira-software-users`
  - Jira Core 7.x and later: `jira-core-users`
  - Jira Service Desk 3.x and later: `jira-servicedesk-users`
- **Admin Groups** – provide one or more Jira groups whose members should have administrative access to Confluence. The default group is `jira-administrators`. These groups will get the system administrator and Confluence administrator global permissions in Confluence.

### 11. Create your administrator account

Enter details for the administrator account.

Skip this step if you chose to manage users in a Jira application or you imported data from an existing site.

### 12. Start using Confluence

That's it! Your Confluence site is accessible from a URL like this:

`http://<computer_name_or_IP_address>:<port>`

If you plan to run Confluence behind a reverse proxy, check out [Proxy and SSL considerations](#) before you go any further.

Here's a few things that will help you get your team up and running:

- [Set the server base URL](#) – this is the URL people will use to access Confluence.
- [Set up a mail server](#) – this allows Confluence to send people notification about content.
- [Add and invite users](#) – get your team on board!
- [Start and stop Confluence](#) – find out how to start and stop Confluence.



## Troubleshooting

### ▼ Running into problems installing Confluence?

- If your web browser window shows an error the first time you try to access Confluence, wait for 30 seconds or so and then refresh the page.
- If the command prompt window closes immediately, your JAVA\_HOME variable may not be set correctly. See [Setting the JAVA\\_HOME Variable in Windows](#).
- If you see an error, see [Confluence does not start due to Spring Application context has not been set for troubleshooting options](#).
- Collaborative editing errors? See [Troubleshooting Collaborative Editing](#).

Head to [Installation Troubleshooting](#) in our Knowledge Base for more help.

## Uninstalling Confluence from Windows

This page describes the procedure for uninstalling an instance of Confluence which has been installed using the [Windows Installer](#).

### To uninstall Confluence from Windows:

1. Log in to Windows as the same user that was used to install Confluence with the [Windows Installer](#).
2. Start the uninstaller by doing either of the following:
  - Click the Windows **Start Menu** > **All Programs** > **Confluence** > **Uninstall Confluence**  
**OR**
  - Open the Windows Control Panel, choose **Add or Remove Programs** (on Windows XP) or **Programs and Features** on (Windows 7, Vista) and then select **Confluence X.Y** from the list of applications and click **Uninstall/Change**.  
**OR**

- Open the Windows command prompt and do the following:
  - a. Change directory to your Confluence installation directory
  - b. Run the `uninstall.exe` file
- 3. Follow the prompts to uninstall Confluence from your computer.

**i** Please note:

- The uninstaller will not delete the Confluence Home Directory.
- All log files that were generated while Confluence was running will not be deleted.
- All files within the Confluence Installation Directory will be deleted (with the exception of the Tomcat log folder located in the Confluence Installation Directory).
- The uninstaller can be made to operate in unattended mode by specifying the `-q` option at the Windows command prompt — i.e. `uninstall -q`
- If you wish to re-install Confluence in 'unattended mode', do not uninstall your previous installation of Confluence just yet. See [Using the Silent Installation Feature](#) for more information.

## Installing Confluence on Linux

In this guide we'll run you through installing Confluence in a production environment, with an external database, using the Linux installer.

This is the most straightforward way to get your production site up and running on a Linux server.

### Other ways to install Confluence:

- [Evaluation](#) - get your free trial up and running in no time.
- [TAR.GZ](#) – install Confluence manually from an archive file.
- [Windows](#) – install Confluence on a Windows server.

### On this page:

#### Before you begin

##### Install Confluence

1. Download Confluence
2. Run the installer

##### Set up Confluence

3. Choose installation type
4. Enter your license
5. Connect to your database
6. Populate your new site with content
7. Choose where to manage users
8. Create your administrator account
9. Start using Confluence

#### Troubleshooting

### Before you begin

Before you install Confluence, there are a few questions you need to answer.

<p>Are you using a supported operating system?</p>	<p><a href="#">Tell me more...</a></p> <p>Check the <a href="#">Supported Platforms</a> page for the version of Confluence you are installing. This will give you info on supported operating systems, databases and browsers.</p> <p><b>Good to know:</b></p> <ul style="list-style-type: none"> <li>• We don't support installing Confluence on OSX for production sites.</li> <li>• The Confluence installer includes Java (JRE) and Tomcat, so you don't need to install these separately.</li> <li>• Confluence can't run on OpenJDK.</li> </ul>
--	---



<p>Do you want to run Confluence as a service?</p>	<p>▼ <a href="#">Tell me more...</a></p> <p>Running Confluence as a service means that Confluence will automatically start up when Linux is started.</p> <p><b>If you choose to run Confluence as a service:</b></p> <ul style="list-style-type: none"> <li>You must use <code>sudo</code> to run the installer to be able to install Confluence as a service.</li> <li>The installer will create a dedicated user account, <code>confluence</code>, that will run the service.</li> </ul> <p><b>If you choose not to run Confluence as a service:</b></p> <ul style="list-style-type: none"> <li>You will start and stop Confluence by running the <code>start-confluence.sh</code> file in your Confluence installation directory.</li> <li>Confluence will be run as the user account that was used to install Confluence, or you can choose to run as a dedicated user.</li> <li>Confluence will need to be restarted manually if your server is restarted.</li> </ul>
<p>Are ports 8090 and 8091 available?</p>	<p><a href="#">Tell me more...</a></p> <p>Confluence runs on port 8090 by default. If this port is already in use, the installer will prompt you to choose a different port.</p> <p>Synchrony, which is required for collaborative editing, runs on port 8091 by default. If this port is already in use, you will need to change the port that Synchrony runs on after your Confluence installation is complete. See <a href="#">Administering Collaborative Editing</a> to find out how to change the port Synchrony runs on. You won't be able to edit pages until Synchrony has an available port.</p>
<p>Is your database set up and ready to use?</p>	<p><a href="#">Tell me more...</a></p> <p>To run Confluence in production you'll need an external database. Check the <a href="#">Supported Platforms</a> page for the version you're installing for the list of databases we currently support. If you don't already have a database, PostgreSQL is free and easy to set up.</p> <p><b>Good to know:</b></p> <ul style="list-style-type: none"> <li>Set up your database before you begin. Step-by-step guides are available for <a href="#">PostgreSQL</a>, <a href="#">Oracle</a>, <a href="#">MySQL</a>, and <a href="#">SQL Server</a>.</li> <li>If you're using Oracle or MySQL you'll need to <a href="#">download the driver</a> for your database.</li> <li>To use a datasource see <a href="#">Configuring a datasource connection</a> as there are some steps you need to perform before running the setup wizard.</li> <li>The embedded H2 database can be used for evaluating Confluence, but you'll need to migrate to another database before running in production. You may find it easier to use external database from the start.</li> </ul>
<p>Do you have a Confluence license?</p>	<p><a href="#">Tell me more...</a></p> <p>You'll need a valid Confluence Server license to use Confluence.</p> <p><b>Good to know:</b></p> <ul style="list-style-type: none"> <li>If you have not yet purchased a Confluence license you'll be able to create an evaluation license during setup.</li> <li>If you already have a license key you'll be prompted to log in to <a href="#">my.atlassian.com</a> to retrieve it, or you can enter the key manually during setup.</li> <li>If you're migrating from Confluence Cloud, you'll need a new license.</li> </ul>



## Install Confluence

### 1. Download Confluence

Download the installer for your operating system – <https://www.atlassian.com/software/confluence/download>

### 2. Run the installer

1. Make the installer executable.

#### ▼ Show me how to do this...

Change to the directory where you downloaded Confluence then execute this command:

```
$ chmod a+x atlassian-confluence-X.X.X-x64.bin
```

Where x.x.x is the Confluence version you downloaded.

2. Run the installer – we recommend using `sudo` to run the installer as this will create a dedicated account to run Confluence and allow you to run Confluence as a service.

#### ▼ Show me how to do this...

To use `sudo` to run the installer execute this command:

```
$ sudo ./atlassian-confluence-X.X.X-x64.bin
```

Where x.x.x is the Confluence version you downloaded.

You can also choose to run the installer as with root user privileges.

3. Follow the prompts to install Confluence. You'll be asked for the following info:

- **Install type** – choose option 2 (custom) for the most control.
- **Destination directory** – this is where Confluence will be installed.
- **Home directory** – this is where Confluence data like logs, search indexes and files will be stored.
- **TCP ports** – these are the HTTP connector port and control port Confluence will run on. Stick with the default unless you're running another application on the same port.
- **Install as service** – this option is only available if you ran the installer as `sudo`.

4. Once installation is complete head to <http://localhost:8090/> in your browser to begin the setup process.

(Replace 8090 if you chose a different port during installation).

#### ▼ Trouble starting Confluence?

If you're installing Confluence on a fresh Linux installation see [Confluence generates Confluence is vacant error on install](#) for troubleshooting options.

## Set up Confluence

### 3. Choose installation type

1. Choose **Production installation**.
2. Choose any **add-ons** you'd also like to install.

### 4. Enter your license

Follow the prompts to log in to [my.atlassian.com](https://my.atlassian.com) to retrieve your license, or enter a license key.

### 5. Connect to your database

1. If you've not already done so, it's time to create your database. See the 'Before you begin' section of this page for details and connection options.
2. Choose **My own database** then select your particular database from the **Database type** dropdown menu.
3. For MySQL and Oracle, follow the prompts to download and install the [required driver](#).
4. Enter your database details. Use **test connection** to check your database is set up correctly.
  - ▼ [Advanced setup options...](#)

If you want to specify particular parameters, you can choose to connect **By connection string**. You'll be prompted to enter:

    - **Database URL** – the JDBC URL for your database. If you're not sure, check the documentation for your database.
    - **Username and Password** – A valid username and password that Confluence can use to access your database.

## 6. Populate your new site with content

Choose whether you'd like Confluence to populate your site with content:

### ▼ [Demonstration space...](#)

This option will create a space that you and your users can use to get to know Confluence. You can delete this space at any time.

### ▼ [Import data from an existing site...](#)

Use this option if you have a [full site export](#) of an existing Confluence site. This is useful when you're migrating to another database or setting up a test site.

#### Good to know:

- You can only import sites from the **same** or **earlier** Confluence version.
- The system administrator account and all other user data and content will be imported from your previous installation.

#### In the setup wizard:

- **Upload a backup file** – use this option if your site export file is small (25mb or less).
- **Restore a backup file from the file system** – use this option if your backup file is large. Drop the file into your `<confluence-home>/restore` directory then follow the prompts to restore the backup.
- **Build Index** – we'll need to build an index before your imported content is searchable. This can take a long time for large sites, so deselect this option if you would rather build the index later. Your content won't be searchable until the index is built.

## 7. Choose where to manage users

Choose to manage Confluence's users and groups inside Confluence or in a Jira application, such as Jira Software or Jira Service Desk:

### ▼ [Manage users and groups in Confluence...](#)

Choose this option if you're happy to manage users in Confluence, or don't have a Jira application installed.

#### Good to know:

- If you do plan to manage users in a Jira application, but have not yet installed it, we recommend installing Jira first, and then returning to the Confluence setup.
- You can add external user management (for example LDAP, Crowd or Jira) later if you choose.

### ▼ [Connect to Jira...](#)

Choose this option if you have a Jira application installed and want to manage users across both applications.

**Good to know:**

- This is a quick way of setting up your Jira integration with the most common options.
- It will configure a Jira user directory for Confluence, and set up application links between Jira and Confluence for easy sharing of data.
- You'll be able to specify exactly which groups in your Jira app should also be allowed to log in to Confluence. Your license tiers do not need to be the same for each application.
- You'll need either Jira 4.3 or later, Jira Core 7.0 or later, Jira Software 7.0 or later, or Jira Service Desk 3.0 or later.

**In the setup wizard:**

- **Jira Base URL** – the address of your Jira server, such as `http://www.example.com:8080/jira/` or `http://jira.example.com/`
- **Jira Administrator Login** – this is the username and password of a user account that has the Jira System Administrator global permission in your Jira application. Confluence will also use this username and password to create a local administrator account which will let you access Confluence if Jira is unavailable. Note that this single account is stored in Confluence's internal user directory, so if you change the password in Jira, it will not automatically update in Confluence.
- **Confluence Base URL** – this is the URL Jira will use to access your Confluence server. The URL you give here overrides the base URL specified in Confluence, for the purposes of connecting to the Jira application.
- **User Groups** – these are the Jira groups whose members should be allowed to use Confluence. Members of these groups will get the 'Can use' permission for Confluence, and will be counted in your Confluence license. The default user group name differs depending on your Jira version:
  - Jira 6.4 and earlier: `jira-users`.
  - Jira Software 7.x and later: `jira-software-users`
  - Jira Core 7.x and later: `jira-core-users`
  - Jira Service Desk 3.x and later: `jira-servicedesk-users`
- **Admin Groups** – provide one or more Jira groups whose members should have administrative access to Confluence. The default group is `jira-administrators`. These groups will get the system administrator and Confluence administrator global permissions in Confluence.

**8. Create your administrator account**

Enter details for the administrator account.

Skip this step if you chose to manage users in a Jira application or you imported data from an existing site.

**9. Start using Confluence**

That's it! Your Confluence site is accessible from a URL like this:  
`http://<computer_name_or_IP_address>:<port>`

If you plan to run Confluence behind a reverse proxy, check out [Proxy and SSL considerations](#) before you go any further.

Here's a few things that will help you get your team up and running:

- [Set the server base URL](#) – this is the URL people will use to access Confluence.
- [Set up a mail server](#) – this allows Confluence to send people notification about content.
- [Add and invite users](#) – get your team on board!
- [Start and stop Confluence](#) – find out how to start and stop Confluence.



## Troubleshooting

### ▼ Running into problems installing Confluence?

- Some anti-virus or other Internet security tools may interfere with the Confluence installation process and prevent the process from completing successfully. If you experience or anticipate experiencing such an issue with your anti-virus/Internet security tool, disable this tool first before proceeding with the Confluence installation.
- The [Linux OOM Killer](#) can sometimes kill Confluence processes when memory on the server becomes too low. See [How to Configure the Linux Out-of-Memory Killer](#).
- Collaborative editing errors? See [Troubleshooting Collaborative Editing](#).

Head to [Installation Troubleshooting](#) in our Knowledge Base for more help.

## Installing Confluence on Linux from Archive File

In this guide we'll run you through installing Confluence in a production environment, with an external database, manually using a zip file.

This method gives you the most control over the installation process.

### Other ways to install Confluence:

- [Evaluation](#) - get your free trial up and running in no time.
- [Installer](#) – install Confluence using the Linux installer.
- [Windows](#) – install Confluence on a Windows server.

### On this page:

#### Before you begin Install Confluence

1. Download Confluence
2. Create the installation directory
3. Create the home directory
4. Check the ports
5. Start Confluence

#### Set up Confluence

6. Choose installation type
7. Enter your license
8. Connect to your database
9. Populate your new site with content
10. Choose where to manage users
11. Create your administrator account
12. Start using Confluence

#### Troubleshooting

### Before you begin

Before you install Confluence, there are a few questions you need to answer.

<p>Are you using a supported operating system and Java version?</p>	<p>▼ <a href="#">Tell me more...</a></p> <p>Check the <a href="#">Supported Platforms</a> page for the version of Confluence you are installing. This will give you info on supported operating systems, databases and browsers.</p> <p><b>Good to know:</b></p> <ul style="list-style-type: none"> <li>• We don't support installing Confluence on OS X or mac OS for production environments.</li> <li>• <b>Confluence can't run on OpenJDK.</b> You'll need to install Oracle Java.</li> <li>• You can use either the JDK (Java Development Kit) or JRE (Java Runtime Environment).</li> <li>• We only support the version of Apache Tomcat that is bundled with Confluence.</li> </ul>
<p>Do you want to run Confluence as a service?</p>	<p><a href="#">Tell me more...</a></p> <p>Running Confluence as a service means that Confluence will automatically start up when your Linux server is started.</p> <p>You should use the <a href="#">Linux installer</a> if you want to run Confluence as a service.</p> <p><b>If you choose not to run Confluence as a service:</b></p> <ul style="list-style-type: none"> <li>• You will start Confluence by running the <code>start-confluence.sh</code> file in your Confluence installation directory.</li> <li>• We recommend creating a dedicated user to run Confluence. This user must have full read, write and execute access to the installation directory and home directory.</li> <li>• Confluence will need to be restarted manually if your server is restarted.</li> </ul>
<p>Are ports 8090 and 8091 available?</p>	<p><a href="#">Tell me more...</a></p> <p>Confluence runs on port 8090 by default. If this port is already in use, the installer will prompt you to choose a different port.</p> <p>Synchrony, which is required for collaborative editing, runs on port 8091 by default. If this port is already in use, you will need to change the port that Synchrony runs on after your Confluence installation is complete. See <a href="#">Administering Collaborative Editing</a> to find out how to change the port Synchrony runs on. You won't be able to edit pages until Synchrony has an available port.</p>
<p>What database do you plan to use?</p>	<p><a href="#">Tell me more...</a></p> <p>To run Confluence in production you'll need an external database. Check the <a href="#">Supported Platforms</a> page for the version you're installing for the list of databases we currently support. If you don't already have a database, PostgreSQL is free and easy to set up.</p> <p><b>Good to know:</b></p> <ul style="list-style-type: none"> <li>• Set up your database before you begin. Step-by-step guides are available for <a href="#">PostgreSQL</a>, <a href="#">Oracle</a>, <a href="#">MySQL</a>, and <a href="#">SQL Server</a>.</li> <li>• If you're using Oracle or MySQL you'll need to <a href="#">download the driver</a> for your database.</li> <li>• To use a datasource see <a href="#">Configuring a datasource connection</a> as there are some steps you need to perform before running the setup wizard.</li> <li>• The embedded H2 database can be used for evaluating Confluence, but you'll need to migrate to another database before running in production. You may find it easier to use external database from the start.</li> </ul>

Do you have a Confluence license?	<p>▼ <a href="#">Tell me more...</a></p> <p>You'll need a valid Confluence Server license to use Confluence.</p> <p><b>Good to know:</b></p> <ul style="list-style-type: none"> <li>• If you have not yet purchased a Confluence license you'll be able to create an evaluation license during setup.</li> <li>• If you already have a license key you'll be prompted to log in to <a href="https://my.atlassian.com">my.atlassian.com</a> to retrieve it, or you can enter the key manually during setup.</li> <li>• If you're migrating from Confluence Cloud, you'll need a new license.</li> </ul>
Is your JAVA_HOME variable set correctly?	<p><a href="#">Tell me more...</a></p> <p>Before you install Confluence, check that you're running a supported Java version and that the JAVA_HOME environment variable is set correctly.</p> <p><b>Confluence can only run with Oracle JDK or JRE.</b></p> <p>To check your Java version:</p> <pre>\$ java -version</pre> <p>To check your JAVA_HOME variable is set correctly:</p> <pre>\$ echo \$JAVA_HOME</pre> <p>If you see a path to your Java installation directory, the JAVA_HOME environment variable has been set correctly. If a path is not returned you'll need to set your JAVA_HOME environment variable manually before installing Confluence.</p>
Have you created a dedicated user to run Confluence?	<p><a href="#">Tell me more...</a></p> <p>We strongly recommend running Confluence as a dedicated user.</p> <p>You should create this user before you begin, so that when creating the installation and home directories, you can give this user appropriate read and write permissions.</p> <p>In this example, we'll create a user called <code>confluence</code>:</p> <pre>\$ sudo /usr/sbin/useradd --create-home --comment "Account for running Confluence" --shell /bin/bash confluence</pre> <p>See <a href="#">Creating a Dedicated User Account on the Operating System to Run Confluence</a> for more information.</p>

## Install Confluence

### 1. Download Confluence

Download the `tar.gz` file for your operating system - <https://www.atlassian.com/software/confluence/download>.

### 2. Create the installation directory

1. Create your installation directory – this is where Confluence will be installed. Avoid using spaces or special characters in the path. We'll refer to this directory as your `<installation-directory>`.

▼ [Show me how to do this...](#)

In this example we'll call our installation directory `confluence`:

```
$ mkdir confluence
```

2. Extract the Confluence `tar.gz` file to your `<installation-directory>`. We recommend using a GNU version of the archive utility, especially on Solaris.

▼ [Show me how to do this...](#)

Change to the directory where you downloaded Confluence then execute these commands:

```
$ tar -xzf atlassian-confluence-X.X.X.tar.gz -C  
<installation-directory>  
$ cd <installation-directory>  
$ tar -xf atlassian-confluence-X.X.X.tar
```

Replace `x.x.x` with your Confluence version and `<installation-directory>` with the full path to the directory you created in the last step.

3. Give your dedicated Confluence user read, write and execute permission to your `<installation-directory>`.

▼ [Show me how to do this...](#)

In this example we're changing ownership of the installation directory and giving the user `confluence` read, write and execute permissions.

```
$ chown -R confluence <installation-directory>  
$ chmod -R u=rwx,go-rwx <installation-directory>
```

### 3. Create the home directory

1. Create your home directory – this is where Confluence application data like logs, search indexes and files will be stored. This should be separate to your installation directory, with no spaces or special characters in the path. We'll refer to this directory as your `<home-directory>`.

▼ [Show me how to do this...](#)

In this example we'll call our home directory `confluence-home`:

```
$ mkdir confluence-home
```

2. Give your dedicated Confluence user read, write and execute permissions to the `<home-directory>`.

▼ [Show me how to do this...](#)

In this example we're changing ownership of the home directory and giving the user `confluence` read, write and execute permissions.

```
$ chown -R confluence <home-directory>  
$ chmod -R u=rwx,go-rwx <home-directory>
```

3. Edit `<installation-directory>\confluence\WEB-INF\classes\confluence-init.pro`



perties.

4. At the bottom of the file, enter the absolute path to your <home-directory>. This tells Confluence where to find your <home-directory> when it starts up.

▼ Show me how to do this...

You can edit the `confluence.init.properties` file any text editor.

- a. Scroll to the bottom of the text and find this line:

```
# confluence.home=c:/confluence/data
```

- b. Remove the # and the space at the beginning of this line (so Confluence doesn't read the line as a comment) and add the absolute path to your home directory (not a symlink). For example:

```
confluence.home=/var/confluence-home
```

#### 4. Check the ports

By default Confluence listens on port 8090. If you have another application running on your server that uses the same ports, you'll need to tell Confluence to use a different port.

▼ Show me how to do this...

To change the ports:

1. Edit <installation-directory>\conf\server.xml
2. Change the **Server** port (8000) and the **Connector** port (8090) to free ports on your server.

In the example below we've changed the **Server** port to 5000 and the **Connector** port to 5050.

```
Server port="5000" shutdown="SHUTDOWN" debug="0">
  <Service name="Tomcat-Standalone">
    <Connector port="5050" connectionTimeout="20000"
      redirectPort="8443"
      maxThreads="48" minSpareThreads="10"
      enableLookups="false" acceptCount="10" debug="0"
      URIEncoding="UTF-8"
      protocol="org.apache.coyote.http11.Http11NioProtocol"
    />
```

Linux won't allow you to bind to ports less than 1024. If you want to run Confluence on port 80, for example, you could use a reverse proxy to redirect traffic from port 80. See [Using Apache with mod\\_proxy](#).

#### 5. Start Confluence

1. Run <installation-directory>/bin/start-confluence.sh to start the setup process.

▼ Show me how to do this...

We recommend running Confluence as your dedicated user.

```
$ su -u <user>
$ ./start-confluence.sh
```



If you're using Ubuntu the command is a little different:

```
$ sudo su <user>
$ ./start-confluence.sh
```

2. Go to <http://localhost:8090/> to launch Confluence in your browser (change the port if you've updated the Connector port).

#### ▼ [Trouble starting Confluence?](#)

- Check your `JAVA_HOME` variable is set correctly.
- If you see an error, see [Confluence does not start due to Spring Application context has not been set](#) for troubleshooting options.

### Set up Confluence

#### 6. Choose installation type

1. Choose **Production installation**.
2. Choose any **add-ons** you'd also like to install.

#### 7. Enter your license

Follow the prompts to log in to [my.atlassian.com](https://my.atlassian.com) to retrieve your license, or enter a license key.

#### 8. Connect to your database

1. If you've not already done so, it's time to create your database. See the 'Before you begin' section of this page for details and connection options.
2. Choose **My own database** then select your particular database from the **Database type** dropdown menu.
3. For MySQL and Oracle, follow the prompts to download and install the [required driver](#).
4. Enter your database details. Use **test connection** to check your database is set up correctly.

##### ▼ [Advanced setup options...](#)

If you want to specify particular parameters, you can choose to connect **By connection string**. You'll be prompted to enter:

- **Database URL** – the JDBC URL for your database. If you're not sure, check the documentation for your database.
- **Username and Password** – A valid username and password that Confluence can use to access your database.

#### 9. Populate your new site with content

Choose whether you'd like Confluence to populate your site with content:

##### ▼ [Demonstration space...](#)

This option will create a space that you and your users can use to get to know Confluence. You can delete this space at any time.

##### ▼ [Import data from an existing site...](#)

Use this option if you have a [full site export](#) of an existing Confluence site. This is useful when you're migrating to another database or setting up a test site.

#### Good to know:

- You can only import sites from the **same** or **earlier** Confluence version.
- The system administrator account and all other user data and content will be imported from your previous installation.

**In the setup wizard:**

- **Upload a backup file** – use this option if your site export file is small (25mb or less).
- **Restore a backup file from the file system** – use this option if your backup file is large. Drop the file into your `<confluence-home>/restore` directory then follow the prompts to restore the backup.
- **Build Index** – we'll need to build an index before your imported content is searchable. This can take a long time for large sites, so deselect this option if you would rather build the index later. Your content won't be searchable until the index is built.

**10. Choose where to manage users**

Choose to manage Confluence's users and groups inside Confluence or in a Jira application, such as Jira Software or Jira Service Desk:

▼ **Manage users and groups in Confluence...**

Choose this option if you're happy to manage users in Confluence, or don't have a Jira application installed.

**Good to know:**

- If you do plan to manage users in a Jira application, but have not yet installed it, we recommend installing Jira first, and then returning to the Confluence setup.
- You can add external user management (for example LDAP, Crowd or Jira) later if you choose.

▼ **Connect to Jira...**

Choose this option if you have a Jira application installed and want to manage users across both applications.

**Good to know:**

- This is a quick way of setting up your Jira integration with the most common options.
- It will configure a Jira user directory for Confluence, and set up application links between Jira and Confluence for easy sharing of data.
- You'll be able to specify exactly which groups in your Jira app should also be allowed to log in to Confluence. Your license tiers do not need to be the same for each application.
- You'll need either Jira 4.3 or later, Jira Core 7.0 or later, Jira Software 7.0 or later, or Jira Service Desk 3.0 or later.

**In the setup wizard:**

- **Jira Base URL** – the address of your Jira server, such as `http://www.example.com:8080/jira/` or `http://jira.example.com/`
- **Jira Administrator Login** – this is the username and password of a user account that has the Jira System Administrator global permission in your Jira application. Confluence will also use this username and password to create a local administrator account which will let you access Confluence if Jira is unavailable. Note that this single account is stored in Confluence's internal user directory, so if you change the password in Jira, it will not automatically update in Confluence.
- **Confluence Base URL** – this is the URL Jira will use to access your Confluence server. The URL you give here overrides the base URL specified in Confluence, for the purposes of connecting to the Jira application.
- **User Groups** – these are the Jira groups whose members should be allowed to use Confluence. Members of these groups will get the 'Can use' permission for Confluence, and will be counted in your Confluence license. The default user group name differs depending on your Jira version:
  - Jira 6.4 and earlier: `jira-users`.
  - Jira Software 7.x and later: `jira-software-users`
  - Jira Core 7.x and later: `jira-core-users`
  - Jira Service Desk 3.x and later: `jira-servicedesk-users`
- **Admin Groups** – provide one or more Jira groups whose members should have administrative access to Confluence. The default group is `jira-administrators`. These groups will get the system administrator and Confluence administrator global permissions in Confluence.

**11. Create your administrator account**

Enter details for the administrator account.

Skip this step if you chose to manage users in a Jira application or you imported data from an existing site.

## 12. Start using Confluence

That's it! Your Confluence site is accessible from a URL like this:

`http://<computer_name_or_IP_address>:<port>`

If you plan to run Confluence behind a reverse proxy, check out [Proxy and SSL considerations](#) before you go any further.

Here's a few things that will help you get your team up and running:

- [Set the server base URL](#) – this is the URL people will use to access Confluence.
- [Set up a mail server](#) – this allows Confluence to send people notification about content.
- [Add and invite users](#) – get your team on board!
- [Start and stop Confluence](#) – find out how to start and stop Confluence.



## Troubleshooting

### ▼ [Running into problems installing Confluence?](#)

- Check your `JAVA_HOME` is set correctly.
- If you see an error, see [Confluence does not start due to Spring Application context has not been set](#) for troubleshooting options.
- Use a [GNU](#) version of the `unzip` utility. There are known issues extracting the `tar.gz` file on Solaris and AIX. See ['extractBundledPlugins Couldn't find atlassian-bundled-plugins.zip on classpath' Due to Solaris TAR Utility](#).
- Collaborative editing errors? See [Troubleshooting Collaborative Editing](#).

Head to [Installation Troubleshooting](#) in our Knowledge Base for more help.

## Uninstalling Confluence from Linux

This page describes the procedure for uninstalling Confluence, which had been installed using the [Linux Installer](#).

### To uninstall Confluence from Linux:

1. Open a Linux console.
2. Change directory (`cd`) to your Confluence installation directory.
3. Execute the command `uninstall`. This command must be executed as the same user account that was used to install Confluence with the [Linux Installer](#).
4. Follow the prompts to uninstall Confluence from your computer.

### Please note:

- The uninstaller will not delete the Confluence Home Directory.
- All log files that were generated while Confluence was running will not be deleted.
- All files within the Confluence Installation Directory will be deleted (with the exception of the Tomcat `log` folder located in the Confluence Installation Directory).
- The uninstaller can be made to operate in unattended mode by specifying the `-q` option — i.e. `uninstall -q`

1 -q

- If you wish to re-install Confluence in 'unattended mode', do not uninstall your previous installation of Confluence just yet. See [Using the Silent Installation Feature](#) for more information.

### Unattended installation

If you've previously installed Confluence using the Windows or Linux installer, you can use a configuration file from your existing Confluence installation (`response.varfile`) to re-install Confluence in unattended mode, no user input required.



This can be useful when you have installed Confluence on a test server and are ready to install on your production server with the same configuration.

#### Good to know

- The `response.varfile` file contains the options specified during the installation wizard steps of your previous Confluence installation. Don't uninstall your previous Confluence installation until after you've copied this file to your new install location.
- If you decide to modify the `response.varfile` file, make sure all directory paths specified are absolute, for example, `sys.installationDir=C:\\Program Files\\Atlassian\\Confluence` (Windows) or `sys.installationDir=/opt/atlassian/confluence` (Linux).

Unattended installations will fail if the file contains relative directory paths.

#### Install Confluence in unattended mode

1. [Download](#) the appropriate installer for your operating system.
2. Copy `<installation-directory>/install4j/response.varfile` from your existing Confluence installation to where you downloaded the installer.
3. In command prompt or terminal change directory (`cd`) to where you downloaded the installer.
4. Run the following command to install Confluence:

##### Windows

```
> atlassian-confluence-X.X.X-x64.exe -q -varfile  
response.varfile
```

##### Linux

```
$ atlassian-confluence-X.X.X-x64.bin -q -varfile  
response.varfile
```

Where `x.x.x` is the Confluence version you downloaded.

`-q` instructs the installer to run in unattended mode (quietly). `-varfile` specifies the location and name of the configuration file containing the options used by the installer.

5. Confluence will start automatically once the silent installation finishes.

Finally, head to `http://localhost:<port>` to finish setting up Confluence.

See the **Set up Confluence** section on [Installing Confluence on Windows](#) or [Installing Confluence on Linux](#) for more info.

## Change listen port for Confluence

### Problem

This page tells you what to do if you get errors like the following when starting Confluence, when you can't access Confluence on port **8090**.

If you see this error:

```
java.net.BindException: Address already in use: JVM_Bind:8090
```

This means you are running other software on Confluence's default port of **8090**. This may be another other process running on the same port. It may also be a previous instance of Confluence that hasn't been shut down cleanly.

To find out what process is listening on that port, load a command prompt and type: **netstat -an**

```
-a : Displays all active TCP connections and the TCP and UDP ports on
which the computer is listening.
-n : Displays active TCP connections, however, addresses and port
numbers are expressed numerically and no attempt is made to determine
names.
```

There is also [Process Explorer tool](#) available to determine what is binding port **8090**.


### Solution: Change the Ports which Confluence Listens On

To change the ports for Confluence, open the file `conf/server.xml` under your Confluence Installation directory. The first four lines of the file look like this:

#### Default conf/server.xml

```
<Server port="8000" shutdown="SHUTDOWN" debug="0">
  <Service name="Tomcat-Standalone">
    <Connector className="org.apache.coyote.tomcat4.CoyoteConnector"
port="8090" minProcessors="5" maxProcessors="75"
      enableLookups="true" redirectPort="8443" acceptCount="10"
debug="0" connectionTimeout="20000" useURValidationHack="false"/>
    ...
```

You need to modify both the **server** port (default is 8000) and the **connector** port (default is 8090) to ports that are free on your machine. The server port is required by Tomcat but is not user facing in any way. The connector port is what your users will use to access Confluence, eg in the snippet above, the URL would be `http://example.com:8090`.

 **Hint:** You can use netstat to identify free ports on your machine. See more information on using netstat on Windows or on Linux.

For example, here are the first four lines of a modified `server.xml` file, using ports '8020' and '8099':

**Modified conf/server.xml using ports 8020 and 8099**

```
<Server debug="0" shutdown="SHUTDOWN" port="8020">
  <Service name="Tomcat-Standalone">
    <Connector className="org.apache.coyote.tomcat4.CoyoteConnector"
port="8099" minProcessors="5" maxProcessors="75"
      enableLookups="true" redirectPort="8443" acceptCount="10"
debug="0" connectionTimeout="20000" useURValidationHack="false"/>
    ...
```

To access Confluence in this configuration, point your web browser to `http://localhost:8099/`.

**Final Configuration**

- If this is the URL your users will use to access Confluence, [update your Base URL](#) to point to the new URL.
- You should also ensure at this point that if you are using a firewall, it is configured to allow http/https traffic over the port you have chosen.

**NOTES**

- [1] For more information on netstat, see [using netstat on Windows](#), or [netstat man page](#) (Linux).
- [2] The Jira distribution runs on port **8080** by default. If you're looking to change the port of your Jira application's distribution, see [Changing JIRA application TCP ports](#).
- [3] You will need to restart Confluence after editing `server.xml` for the changes to take effect.

**Start and Stop Confluence**

How you start and stop Confluence depends on whether you are running Confluence as a Service.

To check whether Confluence is already running you can go to `http://<base-url>/status`.

**Windows**

▼ [When installed as a service...](#)

If you installed Confluence as a service, you can **Start Confluence Server** and **Stop Confluence Server** from the Windows Start menu.

You can't start or stop Confluence manually using the `start-confluence.bat` and `stop-confluence.bat` file.

▼ [When not installed as a service...](#)

If you didn't install Confluence as a service you'll need to start and stop Confluence manually.

- To start Confluence run `<installation-directory>\bin\start-confluence.bat`
- To stop Confluence run `<installation-directory>\bin\stop-confluence.bat`

We recommend running Confluence with a dedicated user account. To do this, use the `runas` command to execute `start-confluence.bat`.

```
> runas /env /user:<DOMAIN>\<confluence> start-confluence.bat
```

Where `<DOMAIN>` is your Windows domain or computer name and `<confluence>` is the name of your dedicated user.

▼ [With add-ons disabled \(for troubleshooting\)...](#)

It is possible to start Confluence Server with user installed add-ons temporarily disabled. This is useful if you need to troubleshoot problems with your site, particularly if an add-on may be preventing Confluence from starting up successfully.

To start Confluence with all user installed add-ons temporarily disabled:

```
> cd <installation-directory>/bin
> start-confluence.bat /disablealladdons
```

To start Confluence with a particular add-on temporarily disabled:

```
> cd <installation-directory>/bin
> start-confluence.bat /disableaddon=com.atlassian.test.plugin
```

where `com.atlassian.test.plugin` is the add-on key. To disable multiple add-ons, use a colon separated list. Regex/wildcards are not permitted, the full key of the plugin must be provided.

These parameters are applied at startup only, they do not persist. If you want to permanently disable an add-on, go to



#### > Add-ons

to do this via UPM.

#### Notes

- If the add-on key contains a space, disabling the add-on using this method will not work, you need to [manually deal with that add-on](#).
- This feature does **not** work for Confluence Data Center.

## Linux

### ▼ When installed as a service...

If you installed Confluence as a service, use one of the following commands to **start**, **stop** or **restart** Confluence.

```
$ sudo /etc/init.d/confluence start
$ sudo /etc/init.d/confluence stop
$ sudo /etc/init.d/confluence restart
```

You can't start or stop Confluence manually using the `start-confluence.sh` and `stop-confluence.sh` files.

### ▼ When not installed as a service...

If you didn't install Confluence as a service you'll need to start and stop Confluence manually.

- To start Confluence run `<installation-directory>\bin\start-confluence.sh`
- To stop Confluence run `<installation-directory>\bin\stop-confluence.sh`

We recommend running Confluence with a dedicated user account:

```
$ su -u <user>
$ ./start-confluence.sh
```

Where `<user>` is the name of your dedicated user.

If you're using Ubuntu the command is a little different:



```
$ sudo su <user>
$ ./start-confluence.sh
```

#### ▼ With add-ons disabled (for troubleshooting)...

It is possible to start Confluence with user installed add-ons temporarily disabled. This is useful if you need to troubleshoot problems with your site, particularly if an add-on may be preventing Confluence from starting up successfully.

To start Confluence with **all** user installed add-ons temporarily disabled:

```
$ cd <installation-directory>/bin
$ ./start-confluence.sh --disable-all-addons
```

To start Confluence with a particular add-on temporarily disabled:

```
$ cd <installation-directory>/bin
$ ./start-confluence.sh --disable-addons=com.atlassian.test.plugin
```

where `com.atlassian.test.plugin` is the add-on key.

To disable multiple add-ons, use a colon separated list, for example, `com.atlassian.test.plugin:com.atlassian.another.plugin`. Regex/wildcards are not permitted, the full key of the plugin must be provided.

These parameters are applied at startup only, they do not persist. If you want to permanently disable an add-on, go to



#### > Add-ons

to do this via UPM.

#### Notes

- If the add-on key contains a space, disabling the add-on using this method will not work, you need to [manually deal with that add-on](#).
- This feature does **not** work for Confluence Data Center.

## Installing Confluence Data Center

In this guide we'll run you through installing Confluence Data Center, which is a clustered solution, in a Windows or Linux Environment.

This guide covers installing for the first time, with no existing data. If you already have a Confluence Server instance, see [Moving to Confluence Data Center](#).



#### Other ways to install Confluence Data Center:

- [AWS Quick Start](#) - hassle free deployment in AWS
- [Move to Data Center](#) - for existing Confluence Server sites



**On this page:**[Before you begin](#)[Clustering requirements](#)[Supported platforms](#)[Terminology](#)[Install and set up Confluence](#)[1. Install Confluence on the first node](#)[Set up Synchrony](#)[2. Set up your Synchrony cluster](#)[3. Start Confluence on Node 1](#)[Add more Confluence nodes](#)[4. Copy Confluence to second node](#)[5. Configure load balancer](#)[6. Start Confluence one node at a time](#)[7. Test your Confluence cluster](#)[Security](#)[Troubleshooting](#)[Upgrading a cluster](#)

## Before you begin

### Clustering requirements

To run Confluence in a cluster you must:

- Have a Data Center license (you can [purchase a Data Center license](#) or create an evaluation license at [my.atlassian.com](#))
- Use a [supported](#) external database, operating system and Java version
- Use a load balancer with session affinity and WebSockets support in front of the cluster
- Have a shared directory accessible to all cluster nodes in the same path (this will be your shared home directory)
- Use OAuth authentication if you have [application links](#) to other Atlassian products (such as Jira)

### Supported platforms

See our [Supported Platforms](#) page for information on the database, Java, and operating systems you'll be able to use. These requirements are the same for Server and Data Center deployments. See [Confluence Data Center Technical Overview](#) for important hardware and infrastructure considerations.

We also have specific guides and deployment templates to help you running Confluence Data Center in [AWS](#) or [Azure](#). Check them out to find out what's required.

### Terminology

In this guide we'll use the following terminology:

- Installation directory – The directory where you installed Confluence on a node.
- Local home directory – The home or data directory on each node (in non-clustered Confluence this is simply known as the home directory).
- Shared home directory – The directory you created that is accessible to all nodes in the cluster via the same path.
- Synchrony home directory - The directory where you configure and run Synchrony from (this may be on a confluence node, or on its own node)

At the end of the installation process, you'll have an installation and *local* home directory on each node, and a single *shared* home directory (a total of 5 directories in a two node cluster) for Confluence plus directories for Synchrony.

## Install and set up Confluence

### 1. Install Confluence on the first node

#### 1. Install Confluence on node 1

See [Installing Confluence on Windows from Zip File](#) or [Installing Confluence on Linux from Archive File](#) for more information.

#### 2. Start Confluence on Node 1

#### 3. The setup wizard will prompt you to complete the migration, by entering:

- A name for your cluster
- The path to the shared home directory you created earlier
- The network interface Confluence will use to communicate between nodes
- A multicast address (automatically generated or enter your own) or the IP addresses of each cluster node
- How you want Confluence to discover cluster nodes:
  - Multicast - enter your own multicast address or automatically generate one.
  - TCP/IP - enter the IP address of each cluster node
  - AWS - enter your IAM Role or secret key, and region.

#### ▼ [AWS node discovery...](#)

We recommend using our [Quick Start](#) or Cloud Formation Template to deploy Confluence Data Center in AWS, as it will automatically provision, configure and connect everything you need.

If you do decide to do your own custom deployment, you can provide the following information to allow Confluence to auto-discover cluster nodes:

Field	Description
<b>IAM Role or Secret Key</b>	This is your authentication method. You can choose to authenticate by IAM Role or Secret Key.
<b>Region</b>	This is the region your cluster nodes (EC2 instances) will be running in.
<b>Host header</b>	Optional. This is the AWS endpoint for Confluence to use (the address where the EC2 API can be found, for example ' <a href="#">ec2.amazonaws.com</a> '). Leave blank to use the default endpoint.
<b>Security group name</b>	Optional. Use to narrow the members of your cluster to only resources in a particular security group (specified in the EC2 console).
<b>Tag key and Tag value</b>	Optional. Use to narrow the members of your cluster to only resources with particular tags (specified in the EC2 console).

#### 4. Stop Confluence on Node 1

## Set up Synchrony

If you don't plan to use collaborative editing, you can skip the steps in this section and jump straight to adding your second Confluence node.

### 2. Set up your Synchrony cluster

In this example, we assume you'll run Synchrony in its own cluster.

1. Grab the `<install-directory>/bin/synchrony` directory from your first Confluence node and move it to your Synchrony node. We'll call this your `<synchrony-home>` directory.
2. Copy `synchrony-standalone.jar` from your Confluence local home directory to your `<synchrony-home>` directory.
3. Copy your database driver from your Confluence `<install-directory>/confluence/web-inf/lib` to your `<synchrony-home>` directory or other appropriate location on your Synchrony node.
4. Edit the `<synchrony-home>/start-synchrony.sh` or `start-synchrony.bat` file and enter details for the parameters listed under **Configure parameters**. See [Configuring Synchrony for Data Center](#) for more information on the required parameters and some and optional properties that you can also choose to specify.
5. Run `start-synchrony.sh` or `start-synchrony.bat` then head to `http://<SERVER_IP>:<SYNCHRONY_PORT>/synchrony/heartbeat` to check that Synchrony is available
6. Copy your `<synchrony-home>` directory to each Synchrony node. As each node joins you'll see something like this in your console.

```
Members [2] {
  Member [172.22.52.12]:5801
  Member [172.22.49.34]:5801
}
```

7. Configure your load balancer for Synchrony. Your load balancer must support WebSockets (for example NGINX 1.3 or later, Apache httpd 2.4, IIS 8.0 or later) and session affinity. SSL connections must be terminated at your load balancer so that Synchrony can accept XHR requests from the web browser.

### 3. Start Confluence on Node 1

1. Start Confluence on node 1 and pass the following system property to Confluence to tell Confluence where to find your Synchrony cluster.

```
-Dsynchrony.service.url=http://<LOAD_BALANCER_URL>:<PORT>/synchrony/v1
```

For example `http://yoursite.com:8091/synchrony/v1`. You must include `/v1` on the end of the URL.

You may want to add this system property to your `<install-directory>/bin/setenv.sh` or `setenv.bat` so it is automatically passed every time you start Confluence. See [Configuring System Properties](#) for more information on how to do this in your environment.

2. Head to



> **General Configuration** > **Collaborative editing** to check that this Confluence node can connect to Synchrony.

Note: to test creating content you'll need to access Confluence via your load balancer. You can't create or edit pages when accessing a node directly.

### Add more Confluence nodes

#### 4. Copy Confluence to second node

To copy Confluence to the second node:

1. Shut down Confluence on node 1
  2. Shut down your application server on node 2, or stop it automatically loading web applications
  3. Copy the installation directory from node 1 to node 2
  4. Copy the local home directory from node 1 to node 2
- If the file path of the local home directory is not the same on nodes 1 and 2 you'll need to update the `< installation directory>/confluence/WEB-INF/classes/confluence-init.properties` file on node 2 to point to the correct location.

Copying the local home directory ensures the Confluence search index, the database and cluster configuration, and any other settings are copied to node 2.

## 5. Configure load balancer

Configure your load balancer for Confluence. You can use the load balancer of your choice, but it needs to support session affinity and WebSockets.

SSL connections must be terminated at your load balancer so that Synchrony can accept XHR requests from the web browser.

You can verify that your load balancer is sending requests correctly to your existing Confluence server by accessing Confluence through the load balancer and creating a page, then checking that this page can be viewed/edited by another machine through the load balancer.

## 6. Start Confluence one node at a time

You must only start Confluence **one node at a time**. The first node must be up and available before starting the next one.

1. Start Confluence on node 1
2. Wait for Confluence to become available on node 1
3. Start Confluence on node 2
4. Wait for Confluence to become available on node 2.

The Cluster monitoring console (



> **General Configuration > Clustering**) shows information about the active cluster.

When the cluster is running properly, this page displays the details of each node, including system usage and uptime. Use the



menu to see more information about each node in the cluster.

	Node ID	Cluster address	Hostname	System Usage	Heap Usage	Uptime	More
	d7062d1x	123.45.678.90	node450.stg.atlassian.com	0.38%	17.3%	125 hours and 25 seconds	...
	d7062d5y	123.45.678.91	172.24.248.91	0.25%	66.66%	125 hours and 26 seconds	...
	d7062d3z	123.45.678.92	node470.stg.atlassian.com	0%	51.7%	125 hours and 26 seconds	...

## 7. Test your Confluence cluster

Remember, to test creating content you'll need to access Confluence via your load balancer. You can't create or edit pages when accessing a node directly.

A simple process to ensure your cluster is working correctly is:

1. Access a node via your load balancer, and create a new document on this node
2. Ensure the new document is visible by accessing it directly on a different node
3. Search for the new document on the original node, and ensure it appears
4. Search for the new document on another node, and ensure it appears

If Confluence detects more than one instance accessing the database, but not in a working cluster, it will shut itself down in a *cluster panic*. This can be fixed by [troubleshooting the network connectivity of the cluster](#).

## Security

Ensure that only permitted cluster nodes are allowed to connect to a Confluence Data Center instance's [Hazelcast](#) port (which defaults to 5801) or Synchrony's Hazelcast port (which defaults to 5701) through the use of a firewall and or network segregation.

## Troubleshooting

If you have problems with the above procedure, please see our [Cluster Troubleshooting guide](#).

If you're testing Confluence Data Center by running the cluster on a single machine, please refer to our developer instructions on [Starting a Confluence cluster on a single machine](#).

## Upgrading a cluster

It's important that upgrades follow the procedure for [Upgrading Confluence Data Center](#).

## Moving to Confluence Data Center

This page outlines the process for migrating an existing Confluence Server (non-clustered) site to Confluence Data Center (clustered).

If you're installing Confluence for the first time (you don't have any existing Confluence data to migrate), see [Installing Confluence Data Center](#).

If you're wanting to switch back to a non-clustered solution, see [Moving from Data Center to Server](#).

Your Confluence license determines the type of Confluence you have: Server or Data Center. Confluence will auto-detect the license type when you enter your license key, and automatically prompt you to begin the migration.

### On this page:

- Before you begin
  - [Clustering requirements](#)
  - [Supported platforms](#)
  - [Terminology](#)
- Set up Data Center
  - [1. Upgrade Confluence Server](#)
  - [2. Apply Data Center license](#)
  - [3. Create a shared home directory](#)
  - [4. Start Confluence](#)
- Set up Synchrony
  - [5. Set up a Synchrony cluster](#)
  - [6. Start Confluence on Node 1](#)
- Add more Confluence nodes
  - [7. Copy Confluence to second node](#)
  - [8. Configure load balancer](#)
  - [9. Start Confluence one node at a time](#)
  - [10. Test your Confluence cluster](#)
- [Security](#)
- [Troubleshooting](#)

## Before you begin

### Clustering requirements

To run Confluence in a cluster you must:

- Have a Data Center license (you can [purchase a Data Center license](#) or create an evaluation license at [my.atlassian.com](#))
- Use a [supported](#) external database, operating system and Java version
- Use a load balancer with session affinity and WebSockets support in front of the cluster
- Have a shared directory accessible to all cluster nodes in the same path (this will be your shared home directory)
- Use OAuth authentication if you have [application links](#) to other Atlassian products (such as Jira)

### Supported platforms

See our [Supported Platforms](#) page for information on the database, Java, and operating systems you'll be able to use. These requirements are the same for Server and Data Center deployments. See [Confluence Data Center Technical Overview](#) for important hardware and infrastructure considerations.

We also have specific guides and deployment templates to help you running Confluence Data Center in [AWS](#) or [Azure](#). Check them out to find out what's required.

### Terminology

In this guide we'll use the following terminology:

- Installation directory – The directory where you installed Confluence on a node.
- Local home directory – The home or data directory on each node (in non-clustered Confluence this is simply known as the home directory).
- Shared home directory – The directory you created that is accessible to all nodes in the cluster via the same path.
- Synchrony home directory - The directory where you configure and run Synchrony from (this may be on a confluence node, or on its own node)

At the end of the installation process, you'll have an installation and *local* home directory on each node, and a single *shared* home directory (a total of 5 directories in a two node cluster) for Confluence plus directories for Synchrony.

## Set up Data Center

### 1. Upgrade Confluence Server

If you plan to upgrade Confluence as part of your migration to Data Center, you should upgrade your existing Confluence Server site as the first step.

### 2. Apply Data Center license

1. Go to



> **General Configuration > License Details**

2. Enter your new Confluence Data Center license key.
3. You'll be prompted to stop Confluence to begin the migration.

At this stage your home directory (configured in `confluence\WEB-INF\classes\confluence-init.properties`) should still be pointing to your existing (local) home directory.

### 3. Create a shared home directory

1. Create a directory that's accessible to all cluster nodes via the same path. This will be your **shared home** directory.

2. In your existing Confluence home directory, move the contents of `<confluence home>/shared-home` to the new shared home directory you just created.

To prevent confusion, we recommend deleting the empty `<confluence home>/shared-home` directory once you've moved its contents.

3. Move your attachments directory to the new shared home directory (skip this step if you currently store attachments in the database).

#### 4. Start Confluence

The setup wizard will prompt you to complete the migration, by entering:

- A name for your cluster
- The path to the shared home directory you created earlier
- The network interface Confluence will use to communicate between nodes
- A multicast address (automatically generated or enter your own) or the IP addresses of each cluster node
- How you want Confluence to discover cluster nodes:
  - Multicast - enter your own multicast address or automatically generate one.
  - TCP/IP - enter the IP address of each cluster node
  - AWS - enter your IAM Role or secret key, and region.

##### ▼ [AWS node discovery...](#)

We recommend using our [Quick Start](#) or Cloud Formation Template to deploy Confluence Data Center in AWS, as it will automatically provision, configure and connect everything you need.

If you do decide to do your own custom deployment, you can provide the following information to allow Confluence to auto-discover cluster nodes:

Field	Description
<b>IAM Role or Secret Key</b>	This is your authentication method. You can choose to authenticate by IAM Role or Secret Key.
<b>Region</b>	This is the region your cluster nodes (EC2 instances) will be running in.
<b>Host header</b>	Optional. This is the AWS endpoint for Confluence to use (the address where the EC2 API can be found, for example ' <a href="#">ec2.amazonaws.com</a> '). Leave blank to use the default endpoint.
<b>Security group name</b>	Optional. Use to narrow the members of your cluster to only resources in a particular security group (specified in the EC2 console).
<b>Tag key and Tag value</b>	Optional. Use to narrow the members of your cluster to only resources with particular tags (specified in the EC2 console).

Once you've confirmed that Confluence is running, stop Confluence so you can set up Synchrony (required if you want to continue to use collaborative editing).

#### Set up Synchrony

##### 5. Set up a Synchrony cluster

In this example, we assume you'll run Synchrony in its own cluster.

1. Grab the `<install-directory>/bin/synchrony` directory from your first Confluence node and move it to your Synchrony node. We'll call this your `<synchrony-home>` directory.



2. Copy `synchrony-standalone.jar` from your Confluence local home directory to your `<synchrony-home>` directory.
3. Copy your database driver from your Confluence `<install-directory>/confluence/web-inf/lib` to your `<synchrony-home>` directory or other appropriate location on your Synchrony node.
4. Edit the `<synchrony-home>/start-synchrony.sh` or `start-synchrony.bat` file and enter details for the parameters listed under **Configure parameters**.  
See [Configuring Synchrony for Data Center](#) for more information on the required parameters and some and optional properties that you can also choose to specify.
5. Run `start-synchrony.sh` or `start-synchrony.bat` then head to `http://<SERVER_IP>:<SYNCHRONY_PORT>/synchrony/heartbeat` to check that Synchrony is available
6. Copy your `<synchrony-home>` directory to each Synchrony node. As each node joins you'll see something like this in your console.

```
Members [2] {
  Member [172.22.52.12]:5801
  Member [172.22.49.34]:5801
}
```

7. Configure your load balancer for Synchrony.  
Your load balancer must support WebSockets (for example NGINX 1.3 or later, Apache httpd 2.4, IIS 8.0 or later) and session affinity. SSL connections must be terminated at your load balancer so that Synchrony can accept XHR requests from the web browser.

## 6. Start Confluence on Node 1

1. Start Confluence on node 1 and pass the following system property to Confluence to tell Confluence where to find your Synchrony cluster.

```
-Dsynchrony.service.url=http://<LOAD_BALANCER_URL>:<PORT>/synchrony/v1
```

For example `http://yoursite.com:8091/synchrony/v1`. You must include `/v1` on the end of the URL.

You may want to add this system property to your `<install-directory>/bin/setenv.sh` or `setenv.bat` so it is automatically passed every time you start Confluence. See [Configuring System Properties](#) for more information on how to do this in your environment.

2. Head to



> **General Configuration** > **Collaborative editing** to check that this Confluence node can connect to Synchrony.

Note: to test creating content you'll need to access Confluence via your load balancer. You can't create or edit pages when accessing a node directly.

## Add more Confluence nodes

### 7. Copy Confluence to second node

To copy Confluence to the second node:

1. Shut down Confluence on node 1
2. Shut down your application server on node 2, or stop it automatically loading web applications
3. Copy the installation directory from node 1 to node 2
4. Copy the local home directory from node 1 to node 2  
If the file path of the local home directory is not the same on nodes 1 and 2 you'll need to update the <



```
installation
directory>/confluence/WEB-INF/classes/confluence-init.properties file on node 2
to point to the correct location.
```

Copying the local home directory ensures the Confluence search index, the database and cluster configuration, and any other settings are copied to node 2.

### 8. Configure load balancer

Configure your load balancer for Confluence. You can use the load balancer of your choice, but it needs to support session affinity and WebSockets.

SSL connections must be terminated at your load balancer so that Synchrony can accept XHR requests from the web browser.

You can verify that your load balancer is sending requests correctly to your existing Confluence server by accessing Confluence through the load balancer and creating a page, then checking that this page can be viewed/edited by another machine through the load balancer.

### 9. Start Confluence one node at a time

You must only start Confluence **one node at a time**. The first node must be up and available before starting the next one.

1. Start Confluence on node 1
2. Wait for Confluence to become available on node 1
3. Start Confluence on node 2
4. Wait for Confluence to become available on node 2.

The Cluster monitoring console (



> **General Configuration > Clustering**) shows information about the active cluster.

When the cluster is running properly, this page displays the details of each node, including system usage and uptime. Use the



menu to see more information about each node in the cluster.

	Node ID	Cluster address	Hostname	System Usage	Heap Usage	Uptime	More
	d7062d1x	123.45.678.90	node450.stg.atlassian.com	0.38%	17.3%	125 hours and 25 seconds	...
	d7062d5y	123.45.678.91	172.24.248.91	0.25%	66.66%	125 hours and 26 seconds	...
	d7062d3z	123.45.678.92	node470.stg.atlassian.com	0%	51.7%	125 hours and 26 seconds	...

### 10. Test your Confluence cluster

Remember, to test creating content you'll need to access Confluence via your load balancer. You can't create or edit pages when accessing a node directly.

A simple process to ensure your cluster is working correctly is:

1. Access a node via your load balancer, and create a new document on this node
2. Ensure the new document is visible by accessing it directly on a different node
3. Search for the new document on the original node, and ensure it appears
4. Search for the new document on another node, and ensure it appears

If Confluence detects more than one instance accessing the database, but not in a working cluster, it will shut itself down in a *cluster panic*. This can be fixed by [troubleshooting the network connectivity of the cluster](#).

## Security

Ensure that only permitted cluster nodes are allowed to connect to a Confluence Data Center instance's [Hazelcast](#) port (which defaults to 5801) or Synchrony's Hazelcast port (which defaults to 5701) through the use of a firewall and / or network segregation.

## Troubleshooting

If you have problems with the above procedure, please see our [Cluster Troubleshooting guide](#).

If you're testing Confluence Data Center by running the cluster on a single machine, please refer to our developer instructions on [Starting a Confluence cluster on a single machine](#).

## Upgrading Confluence Data Center

This page contains instructions for **upgrading an existing Confluence cluster**.

If you are not yet running a clustered instance of Confluence, see [Moving to Confluence Data Center](#).

In this guide we'll use the following terminology:

- installation directory - this is the directory where you installed Confluence on each node.
- local home directory - this is the home or data directory on each node (in non-clustered Confluence this is simply known as the home directory).
- shared home directory - this is a directory that is accessible to all nodes in the cluster via the same path. If you're upgrading from Confluence 5.4 or earlier you'll create this directory as part of the upgrade.
- Synchrony directory - this is the directory where you downloaded Synchrony (this can be on a confluence node, or on its own node)

### On this page:

- 1. Back up
- 2. Stop the cluster
- 3. Upgrade the first node
- 4. Set up or upgrade Synchrony
- 5. Start Confluence on Node 1
- 6. Copy Confluence to remaining nodes
- 7. Start Confluence and check cluster connectivity

### 1. Back up

We strongly recommend that you backup your Confluence home and install directories and your database before proceeding.

More information on specific files and directories to backup can be found in [Upgrading Confluence](#).

### 2. Stop the cluster

You must stop all the nodes in the cluster before upgrading.

We recommend configuring your load balancer to redirect traffic away from Confluence until the upgrade is complete on all nodes.

### 3. Upgrade the first node

To upgrade the first node:

1. Extract (unzip) the files to a directory (this will be your new installation directory, and must be different to your existing installation directory)
2. Update the following line in the `<Installation-Directory>\confluence\WEB-INF\classes\`

- `confluence-init.properties` file to point to the **existing local home** directory on that node.
3. Copy the jdbc driver jar file from your existing Confluence installation directory to `confluence/WEB-INF/lib` in your new installation directory.  
The jdbc driver will be located in either the `<Install-Directory>/common/lib` or `<Installation-Directory>/confluence/WEB-INF/lib` directories.
  4. Copy any other immediately required customizations from the old version to the new one (for example if you are not running Confluence on the default ports or if you manage users externally, you'll need to update / copy the relevant files - find out more in [Upgrading Confluence Manually](#))
  5. Start Confluence, and confirm that you can log in and view pages before continuing to the next step. Don't try to edit pages at this point.

You should now reapply any additional customizations from the old version to the new version, before upgrading the remaining nodes.

#### 4. Set up or upgrade Synchrony

The first time you upgrade from Confluence 5.x to **Confluence 6.x** you will need to set up your Synchrony nodes, as follows.

##### ▼ Set up your Synchrony cluster...

In this example, we assume you'll run Synchrony in its own cluster.

1. Grab the `<install-directory>/bin/synchrony` directory from your first Confluence node and move it to your Synchrony node. We'll call this your `<synchrony-home>` directory.
2. Copy `synchrony-standalone.jar` from your Confluence local home directory to your `<synchrony-home>` directory.
3. Copy your database driver from your Confluence `<install-directory>/confluence/web-inf/lib` to your `<synchrony-home>` directory or other appropriate location on your Synchrony node.
4. Edit the `<synchrony-home>/start-synchrony.sh` or `start-synchrony.bat` file and enter details for the parameters listed under **Configure parameters**.  
See [Configuring Synchrony for Data Center](#) for more information on the required parameters and some and optional properties that you can also choose to specify.
5. Run `start-synchrony.sh` or `start-synchrony.bat` then head to `http://<SERVER_IP>:<SYNCHRONY_PORT>/synchrony/heartbeat` to check that Synchrony is available
6. Copy your `<synchrony-home>` directory to each Synchrony node. As each node joins you'll see something like this in your console.

```
Members [2] {
  Member [172.22.52.12]:5801
  Member [172.22.49.34]:5801
}
```

7. Configure your load balancer for Synchrony.  
Your load balancer must support WebSockets (for example NGINX 1.3 or later, Apache httpd 2.4, IIS 8.0 or later) and session affinity. SSL connections must be terminated at your load balancer so that Synchrony can accept XHR requests from the web browser.

If you're already running Confluence 6.x, you should upgrade your Synchrony nodes:

1. Grab the new `synchrony-standalone.jar` from the `<local-home>` directory on your upgraded Confluence node.
2. Copy the new `synchrony-standalone.jar` to each of your Synchrony nodes, and start Synchrony as normal.

#### 5. Start Confluence on Node 1

1. Start Confluence on node 1 and pass the following system property to Confluence to tell Confluence

where to find your Synchrony cluster.

```
-Dsynchrony.service.url=http://<LOAD_BALANCER_URL>:<PORT>/synchrony/v1
```

For example <http://yoursite.com:8091/synchrony/v1>. You must include `/v1` on the end of the URL.

You may want to add this system property to your `<install-directory>/bin/setenv.sh` or `setenv.bat` so it is automatically passed every time you start Confluence. See [Configuring System Properties](#) for more information on how to do this in your environment.

2. Head to



> **General Configuration** > **Collaborative editing** to check that this Confluence node can connect to Synchrony.

Note: to test creating content you'll need to access Confluence via your load balancer. You can't create or edit pages when accessing a node directly.

## 6. Copy Confluence to remaining nodes

The next step is to replicate your upgraded Confluence directories to other nodes in the cluster.

1. Stop Confluence on the first node.
2. Copy the installation directory and local home directory from the first node to the next node.  
If the path to the local home directory is different on this node, edit the `confluence-init.properties` to point to the correct location.
3. Start Confluence, and confirm that you can log in and view pages on this node.
4. Stop Confluence on this node before continuing with the next node.

Repeat this process for each remaining node.

## 7. Start Confluence and check cluster connectivity

Once all nodes have been upgraded you can start Confluence Data Center on each node, **one at a time** (starting up multiple nodes simultaneously can lead to serious failures).

The Cluster monitoring console (



> **General Configuration** > **Clustering**) includes information about the active cluster nodes. When the cluster is running properly, you should be able to see the details of each node.

## Adding and Removing Data Center Nodes

Your Data Center license is based on the number of users in your cluster, rather than the number of nodes. This means you can add and remove nodes from your Data Center cluster at any time.

If you deployed Confluence Data Center on AWS using the [Quick Start](#), your Confluence and Synchrony nodes will be in [auto-scaling groups](#). You will add and remove nodes in the AWS console either by changing the minimum and maximum size of each group or using a scaling plan.

### Adding a node

To add a node:

1. Copy the installation directory and local home directory from the stopped node to your new node.
2. Start Confluence on your new node.  
During the startup process Confluence will recover indexes from a running node to bring the new node up to date.
3. Go to



> **General Configuration** > **Clustering** and check that the new node is visible.

You should only start one node at a time. Starting up multiple nodes simultaneously can cause serious failures.

#### *Removing a node*

To remove a node, stop Confluence on that node. You can then remove the installation and local home directory as required.

To see the number of nodes remaining go to



> **General Configuration** > **Clustering**.

#### *Changing the node identifier*

Confluence generates an identifier for each node in your cluster. You can use the `confluence.cluster.node.name` system property to set the node identifier on each node so that it's easier for your users and administrators to read.

See [Configuring System Properties](#) for more information on how to set the system property.

#### **Change Node Discovery from Multicast to TCP/IP**

If you're setting up Confluence Data Center for the first time, it'll step you through the process of choosing your discovery mode and adding cluster nodes. If you're switching from a multicast configuration to TCP/IP (unicast), however, you'll need to edit the `confluence.cfg.xml` file in the local home directory of each cluster node.

- Before you make any changes, shut down all nodes in your cluster
- Make sure the discovery configuration is exactly the same for each node (make the same changes to the `confluence.cfg.xml` file in each local home directory)

The changes you need to make may differ slightly, depending on whether you've upgraded from an older version of Confluence Data Center or if you've started with version 5.9. We've detailed both methods, below.

#### *To change from multicast to TCP/IP*

Look for the following two lines in the `confluence.cfg.xml` file:

```
<property name="confluence.cluster.address">[multicast IP]</property>
<property name="confluence.cluster.join.type">multicast</property>
```

If both lines exist in the file, change them to the lines below; where the `confluence.cluster.address` property exists, but there's no reference to the `confluence.cluster.join.type` property, update the first line and add the second line as shown below.

```
<property name="confluence.cluster.peers">[node 1 IP],[node 2 IP],[node
3 IP]</property> <!-- A comma-separated list of node IP addresses,
without spaces -->
<property name="confluence.cluster.join.type">tcp_ip</property> <!--
accepted values are multicast or tcp_ip -->
```

Enter the address of each node, and separate each address with a comma.

You can now restart your cluster nodes.

#### *To change from TCP/IP to multicast*

To switch from TCP/IP to multicast, just perform the reverse of the changes outlined above.

**Reference of properties in the `confluence.cfg.xml` file**

key	valid values	notes
<code>confluence.cluster.join.type</code>	'multicast' or 'tcp_ip'	Pre-5.9 Data Center installations won't have this key. By default, if the key is missing, Confluence will choose multicast
<code>confluence.cluster.addresses</code>	a single multicast IP address	This key is only used by confluence if <code>confluence.cluster.join.type</code> is set to multicast
<code>confluence.cluster.peers</code>	a comma-separated string of IP addresses (no spaces)	There must be at least one address here. The addresses are the IP address of each node in the cluster. This key is only used by confluence if <code>confluence.cluster.join.type</code> is set to <code>tcp_ip</code>

**Running Confluence Data Center in AWS**

Confluence Data Center is an excellent fit for the Amazon Web Services (AWS) environment. Not only does AWS allow you to scale your deployment elastically by resizing and quickly launching additional nodes, it also provides a number of managed services that work out of the box with Confluence Data Center instances and handle all their configuration and maintenance automatically.

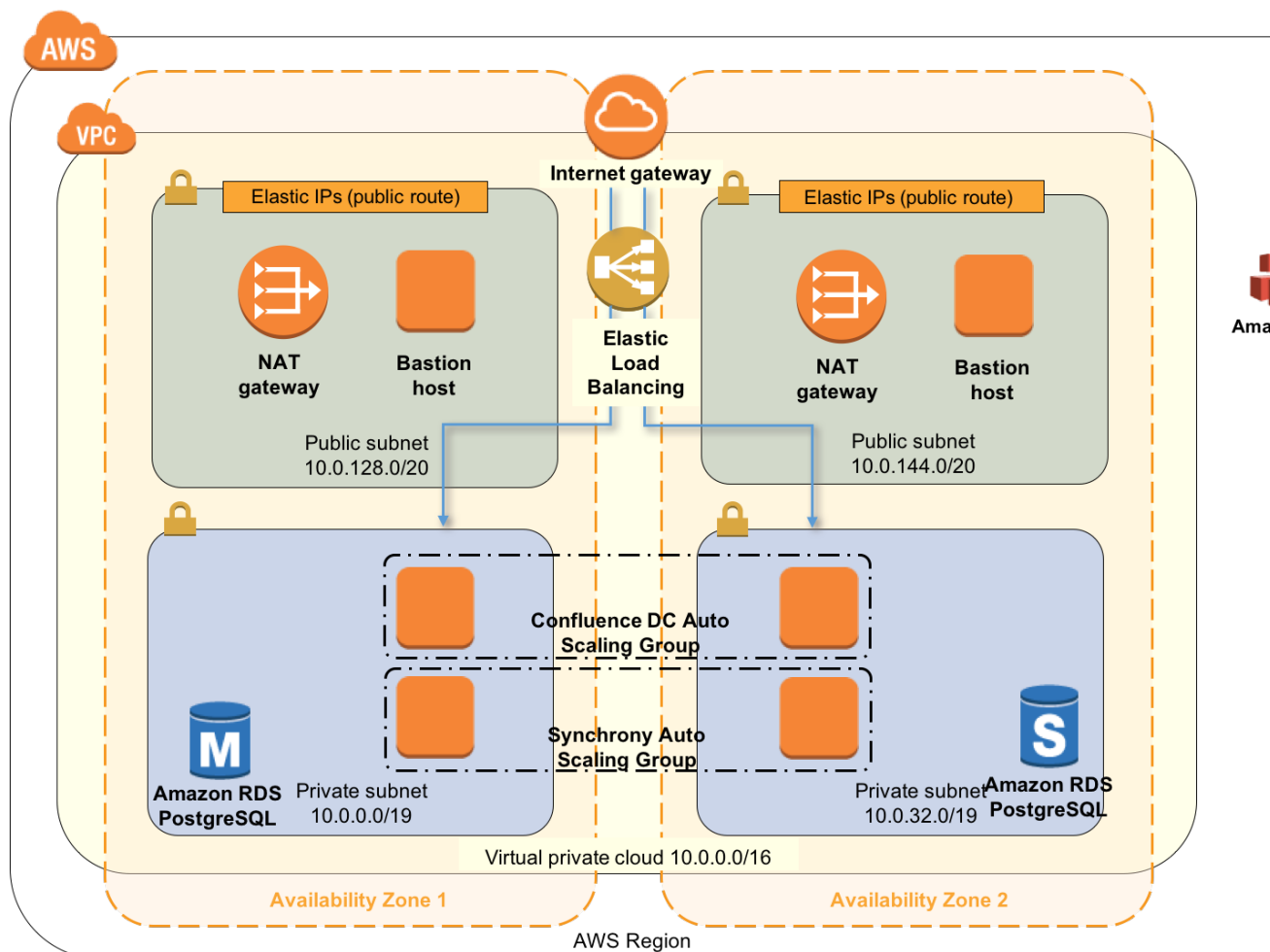
**On this page:**

- [Deploying Confluence Data Center using the AWS Quick Start](#)
- [EC2 sizing recommendations](#)
- [Supported AWS regions](#)
- [Setting up an internal facing site with your own DNS server](#)
- [Scaling up and down](#)
- [Connecting to your nodes over SSH](#)
- [Upgrading](#)
- [Backing up](#)
- [Migrating your existing Confluence site to AWS](#)

**Deploying Confluence Data Center using the AWS Quick Start**

The simplest way to deploy your entire Data Center cluster in AWS is by using the [Quick Start](#). The Quick Start launches, configures, and runs the AWS compute, network, storage, and other services required to deploy a specific workload on AWS, using AWS best practices for security and availability.

Here's an overview of the architecture for the Confluence Data Center Quick Start:



The deployment consists of the following components:

- One or more Amazon Elastic Compute Cloud (EC2) instances as cluster nodes, running Confluence, in an auto scaling group.
- One or more Amazon Elastic Compute Cloud (EC2) instances as cluster nodes, running Synchrony (which is required for collaborative editing), in an auto scaling group.
- An Amazon Application Load Balancer (ALB), both as load balancer and SSL-terminating reverse proxy.
- Amazon Elastic File System (EFS) server for the shared home directory which contains attachments and other files accessible to all Confluence nodes.
- An Amazon Relational Database (RDS) PostgreSQL instance as the shared database.

For more information on the architecture, components and deployment process, see our [Quick Start Guide](#).

#### EC2 sizing recommendations

The Quick Start uses c3.xlarge instances by default for Confluence and Synchrony nodes. The instance type is up to you, but it must meet Confluence's [system requirements](#). Smaller instance types (micro, small, medium) are generally not adequate for running Confluence.

#### Supported AWS regions

Not all regions offer the services required to run Confluence. You'll need to choose a region that supports Amazon Elastic File System (EFS). You can currently deploy Confluence using the Quick Start in the following regions:

- Asia Pacific (Sydney)
- EU (Frankfurt)
- EU (Ireland)
- US East (North Virginia)
- US West (Oregon)



The services offered in each region change from time to time, so check the [Regional Product Services](#) table in the AWS documentation to see if your preferred region is supported yet.

▼ [If you are deploying Confluence 6.3.1 or earlier....](#)


There is an additional dependency for Confluence versions earlier than 6.3.2. Synchrony (which is required for collaborative editing) uses a third party library to interact with the Amazon API, and the correct endpoints are not available in all regions. This means you can't run Synchrony in the following regions:

- US East (Ohio)
- EU (London)<sup>1</sup>
- Asia Pacific (Mumbai)<sup>1</sup>
- Asia Pacific (Seoul)<sup>1</sup>
- Canada (Central)<sup>1</sup>

<sup>1</sup> At the time of writing, these regions did not yet support EFS, so also can't be used to run Confluence.

### Setting up an internal facing site with your own DNS server

If you want to deploy an internal facing Confluence site, using your own DNS server, you can use [Amazon Route 53](#) to create a link between the public DNS and internal DNS.

1. In Route 53, create a hosted zone. The domain name is your preferred domain.
2. If you've already set up Confluence, go to **Services > CloudFormation** in the AWS console, select the stack, and click **Update Stack**. (If you're setting up Confluence for the first time, follow the Quick Start template as below).
3. Under **Other Parameters**, enter the **domain name** of your hosted zone in the **Route 53 Hosted Zone** field.
4. Enter your preferred **sub-domain** or leave the **Sub-domain for Hosted Zone** field blank and we'll use your stack name as the sub-domain.
5. Follow the prompts to update the stack. We'll then generate the load balancer and EFS url, and create a record in Route 53 for each.
6. In Confluence go to  **> General Configuration** and update the Confluence base URL to your Route 53 domain.
7. Finally, terminate and re-provision each Confluence and Synchrony node to pick up the changes.

### Scaling up and down

To increase or decrease the number of Confluence or Synchrony cluster nodes:

1. Go to **Services > CloudFormation** in the AWS console, select the stack, and click **Update Stack**.
2. Change the **Minimum number of cluster nodes** and **Maximum number of cluster nodes** parameters as desired.

It may take several minutes for the Auto Scaling Group to detect and apply changes to these parameters.

Unless you specify the same number for **Minimum** and **Maximum number of cluster nodes**, the Auto Scaling Group will launch new cluster nodes and terminate existing ones automatically to achieve the optimal desired number of nodes between these two limits. By default, this target number is determined by the following CloudWatch metrics:

- If the average CPU utilization across the Auto Scaling Group exceeds 60% for 5 minutes, the target number of nodes increases by one (up to the Maximum).
- If the average CPU utilization across the Auto Scaling Group is lower than 40% for 30 minutes, the target number of nodes decreases by one (down to the Minimum).

A default "cooldown" period of 10 minutes between scaling events is also applied. See [Scaling Based on Metrics](#) for more information.



**Note:** Adding new cluster nodes, especially automatically in response to load spikes, is a great way to increase capacity of a cluster temporarily. Beyond a certain point, adding large numbers of cluster nodes will bring diminishing returns. In general, increasing the size of each node (i.e., "vertical" scaling) will be able to handle a greater sustained capacity than increasing the number of nodes (i.e., "horizontal" scaling), especially if the nodes themselves are small.

See the [AWS documentation](#) for more information on auto scaling groups.

### Connecting to your nodes over SSH

It is possible to SSH to your cluster nodes and file server to perform configuration or maintenance tasks. Note that you must keep your SSH private key file (the PEM file you downloaded from Amazon and specified as the **Key Name** parameter) in a safe place. This is the key to all the nodes in your instance, and if you lose it you may find yourself locked out.

**Note:** the **ConfluenceDataCenter.template** deploys all EC2 instances in the Subnets specified by the **Internal subnets** parameter. If you have specified **Internal subnets** that are completely unreachable from outside, then you may need to launch an EC2 instance with SSH running and accessible in one of the the **External subnets**, and use this as a "jump box" to SSH to any instances in your **Internal subnets**. That is, you SSH first to your "jump box", and from there to any instance deployed in the **Internal subnets**.

When connecting to your instance over SSH, use `ec2-user` as the user name, for example:

```
ssh -i keyfile.pem ec2-user@ec2-xx-xxx-xxx-xxx.compute-1.amazonaws.com
```

The `ec2-user` has `sudo` access. SSH access by `root` is not allowed.

### Upgrading

To upgrade a Confluence Data Center instance launched from **ConfluenceDataCenter.template**:

1. In the AWS console, **Update Stack**
2. Change the size of the Confluence and Synchrony auto scaling groups (maximum and minimum) to 0. This will terminate all running nodes.
3. Once the update is complete, check that all EC2 nodes have been terminated.
4. In the AWS console, **Update Stack**.
5. Change the **Confluence Version** to the version you want to upgrade to.
6. Change the size of the Confluence and Synchrony auto scaling groups (maximum and minimum) to 1. Do not add more than one node until after the upgrade is complete.
7. Access Confluence in your browser. Any upgrade tasks will run at this point.
8. Confirm that Confluence and Synchrony are both running successfully, and that you are running the new version (check the footer).
9. In the AWS console, **Update Stack**.
10. Change the maximum Confluence nodes and Maximum Synchrony nodes to your usual auto scaling group size.
11. Confirm that your new nodes have joined the cluster.

Confluence Data Center in AWS currently doesn't allow upgrading an instance without some downtime in between the last cluster node of the old version shutting down and the first cluster node on the new version starting up.

You must make sure all existing nodes are terminated before launching new nodes on the new version.

### Backing up

We recommend you use the AWS native backup facility, which utilizes snap-shots to back up your Confluence Data Center.

### Migrating your existing Confluence site to AWS

To migrate an existing Confluence instance to AWS:

1. Upgrade your existing site to the version you have deployed to AWS (Confluence 6.1 or later).
2. Migrate your database to PostgreSQL (if you're not already using Postgres). See [Migrating to Another Database](#).
3. Back up your PostgreSQL database and your existing `<shared-home>/attachments` directory.
4. Copy your backup files to `/media/atl/confluence/shared-home` in your EC2 instance.
5. Restore your PostgreSQL database dump to your RDS instance with `pg_restore`.  
See [Importing Data into PostgreSQL on Amazon RDS](#) in Amazon documentation for more information on how to do this.

**Notes:**

- When you create a cluster using the CloudFormation template, the database name is `confluence`. You **must maintain this database name** when you restore, or there will be problems when new nodes are provisioned. You will need to drop the new database and replace it with your backup.
- You don't need to copy indexes or anything from your existing local home or installation directories, just the attachments from your existing shared home directory.
- If you've modified the `<shared-home>/config/cache-settings-overrides.properties` file you may want to reapply your changes in your new environment.
- The `_copy` method described in this AWS page, [Importing Data into PostgreSQL on Amazon RDS](#), is not suitable for migrating Confluence.

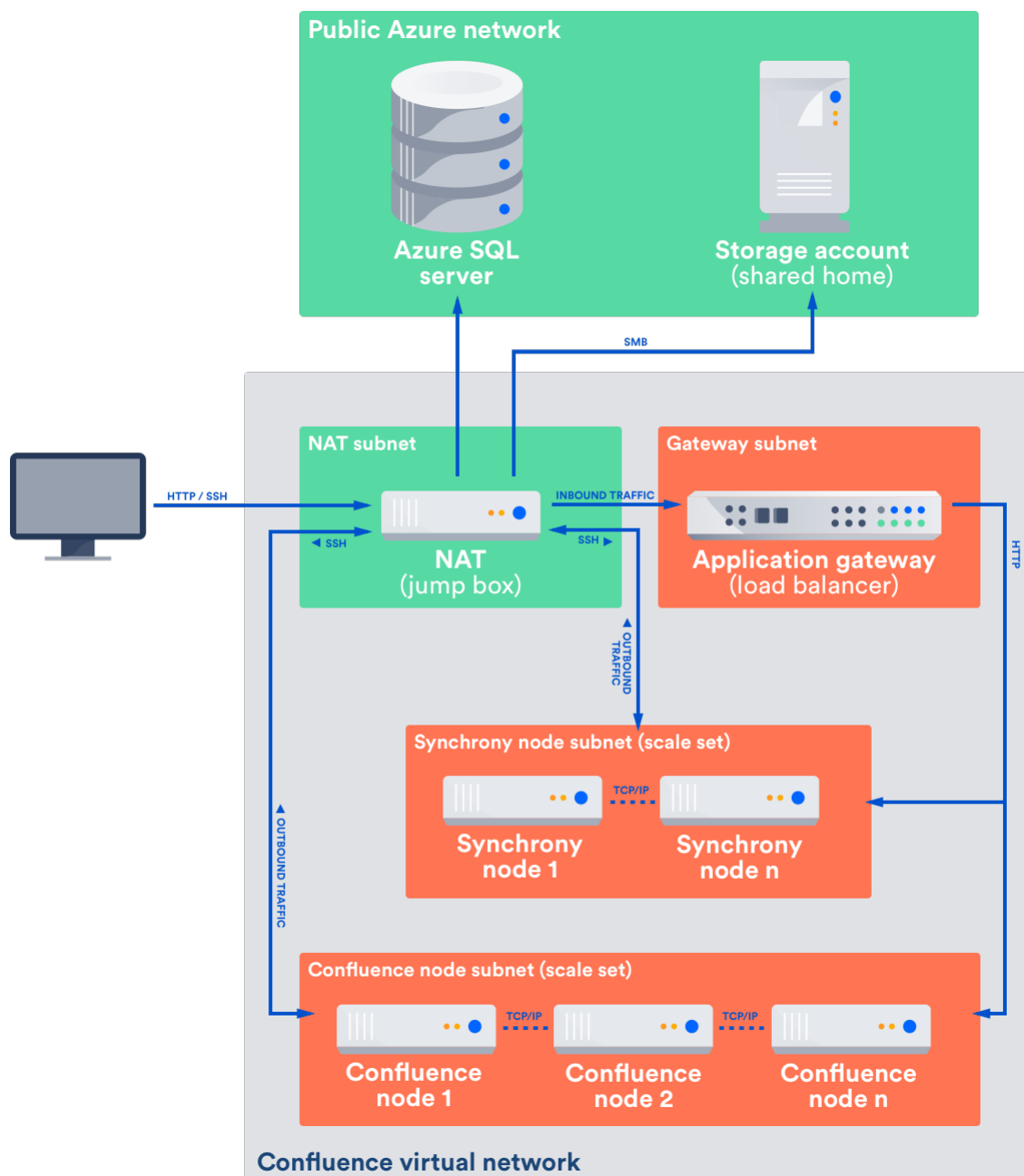
### Getting started with Confluence Data Center on Azure

Confluence Data Center is an excellent fit for the Microsoft Azure environment. We provide a reference template that lets you deploy Confluence Data Center in Microsoft Azure, and you can then configure it depending on your organization's Azure best practices. It's the fastest way to get everything you need to run Confluence Data Center up and running in Azure.

We strongly recommend you set up user management, central logging storage, a backup strategy, and monitoring, just as you would for a Confluence Data Center installation running on your own hardware.

#### How it works

Here's an architectural overview of what you'll get when deploying Confluence Data Center using the template:



The deployment consists of the following components:

- One or more Azure standard Linux VM instances as cluster nodes, running Confluence, in a scale set
- One or more Azure standard Linux VM instances as cluster nodes, running Synchrony (required for collaborative editing), in a scale set
- Azure SQL server database
- a storage account for the shared home directory which contains attachments and other files accessible to all Confluence nodes
- a NAT box (or jumpbox)
- an application gateway

Azure SQL instances can't be created in a virtual private network/subnet. To ensure security, the SQL Server firewall has been configured to only allow traffic from the private network that the cluster nodes reside in. The SQL Server firewall rules require a public IP address upfront during deployment, and as the application gateway's public IP address isn't known at this stage of the deployment, we use the public IP address of NAT box (jumpbox). This network topology means that all traffic from the cluster to the SQL Server is routed through the NAT box, and all public traffic to the cluster is also routed through the NAT box, including all SSH traffic and L4 traffic to the application gateway.

The application gateway also acts as a load balancer for your scale set of Confluence and Synchrony nodes.

We use a storage account for Confluence's shared home directory. As with the Azure SQL Server, this service

exists outside the virtual network. It's mounted on each Confluence node, and it's treated as any other file would be.

### Limitations

There are some limitations you should be aware of before deciding to deploy to Azure:

- Autoscaling is not yet available, due to a problem with Hazelcast, which Confluence uses to discover nodes.
- We don't provide any backup solutions beyond the default site backup (XML export)
- We don't provide any additional node monitoring. Azure provides some basic monitoring, including CPU usage and network / disk rates.
- No log aggregation. Logs are only stored in the local home directory on the VMs provisioned during set up. If a VM is lost its logs will also be lost.
- You can't use the deployment template to upgrade an existing Confluence deployment, or to provision new nodes running a different version to the rest of your cluster
- SSL is not enabled. You'll need to manually configure your application gateway. See [Additional steps for SSL](#) below for more information.
- If a node is deleted manually, it can't be redeployed without first removing the cluster. The existing database, and the existing shared home directory won't be removed when redeploying.
- Due to the network topology of the different resources required, the NAT virtual machine will have a relatively high network load. This may become a bottleneck if there is a lot of traffic. If you increase the size of your cluster, you'll need to also increase the NAT virtual machine to make sure the larger cluster handles traffic effectively. This limitation will be rectified once [Virtual Network integration for Azure Storage and Azure SQL](#) is available.

### Deploying Confluence Data Center to Azure via Azure marketplace

This method uses the Azure Marketplace to deploy Confluence Data Center using our deployment templates as a reference.

To deploy Confluence Data Center to Azure using our Marketplace app:

1. Log in to [Azure Portal](#)
2. Choose **New** to start a new deployment
3. Search for **Atlassian** then select **Confluence Data Center** from the list of Marketplace apps
4. Choose **Create** to start configuring the deployment
5. Follow the prompts in the wizard to configure your deployment. Refer to the parameters table below for more information.
6. Confirm all the details are correct then click **Create** to purchase the subscription. Deployment will take about 30 minutes.
7. Once deployment is complete, go to the Confluence URL listed in the deployment outputs to complete onboarding and start using Confluence.

### Parameters

Parameters	Description
CNAME	This is the <a href="#">Canonical Name record</a> (CNAME) for your organization. If you don't provide one, Azure will generate a random sub domain for your instance.
Subscription	Your Microsoft Azure subscription type.
Resource group	If you have an existing resource group, you can use it, or create a new one.
Location	This is the region where Azure will house your deployment.

Confluence admin credentials	Provide a name and password for the initial Confluence administrator on your instance.
Number and size of nodes	Specify the initial number of nodes, and the size of each node. This can be reconfigured at a later date.
Synchrony cluster size	Choose <b>automatic</b> for the number of Synchrony nodes to be determined by the number of Confluence nodes (using the ratio of one Synchrony node to every three Confluence nodes, with a minimum of 2 nodes).  Alternatively, choose <b>manual</b> to specify the number and size of nodes.
Database credentials	Provide a username and password for the database admin user.
Database size	Choose <b>automatic</b> for the database tier to be determined by the number of Confluence nodes.  Alternatively, choose <b>manual</b> to specify a specific database tier and edition.
Jumpbox credentials	Provide a username and SSH public key for the jumpbox.
Confluence and Synchrony node credentials	Provide a username and password for your nodes. These credentials are used across all Confluence and Synchrony nodes.

### Deploying Confluence Data Center to Azure using the CLI

This method uses the Azure command line interface to deploy Confluence Data Center using our deployment templates as a reference. You'll need to [install the Azure CLI](#) to do this.

To deploy Confluence Data Center to Azure using the command line interface:

1. Download the `azuredeploy.json` **template file** and `azuredeploy.parameters.json` **parameters file** from the Confluence directory on <https://bitbucket.org/atlassian/atlassian-azure-deployment>.
2. Edit the `azuredeploy.parameters.json` **parameters file**, and insert values for the following required parameters:
  - Cluster size
  - SSH key (used for the NAT box)
  - SSH password (for the cluster nodes)
  - Database password
  - Full name, username and password for the Confluence administrator account
  - Your confluence license
  - Confluence version (6.4.0 and later)

See the [table below](#) for more information on each of these required values.

The template applies sensible defaults for a number of other parameters, including the size of your VMs and database instance. You can choose to override these defaults if you want to specify particular values.

3. [Log in](#) to Azure via the command line interface.
4. Create a resource group. This will be the container for the Confluence resources you deploy.

```
az group create --name ConfluenceDataCenter --location "Central US"
```

5. Create a new deployment, and specify the Confluence data center template file and parameters file.

```
az group deployment create \  
  --name ConfluenceDataCenterDeployment \  
  --resource-group ConfluenceDataCenter \  
  --template-file azuredeploy.json \  
  --parameters azuredeploy.parameters.json
```

6. Log in to the [Azure Portal](#) to see the deployment outputs. The **Application URL** is the URL for your new Confluence site.
7. Go to the Application URL in your browser to complete onboarding and start using Confluence.

#### Required parameters

The deployment template requires a number of values to be provided in order to deploy your Confluence Data Center instance.

Parameter	Description
clusterSize	<p>This is the number of Confluence nodes in your cluster.</p> <p>The number of Synchrony nodes will be automatically determined by the number of Confluence nodes using the ratio of one Synchrony node to every three Confluence nodes (with a minimum of 2 nodes).</p>
jumpboxSshKey	This is the SSH Key you'll use to access the NAT box (jumpbox).
nodeSshPassword	This is the SSH password you'll use to access your Confluence and Synchrony nodes.
dbPassword	<p>This the password for your dedicated database user.</p> <p>The password must meet a strong password requirement (imposed by AzureSQL Server): it must be between 16 and 41 characters long, and must contain at least one uppercase letter, one lowercase letter, one number (0-9), and one non-alphanumeric character (., !, \$, #, %, etc). See <a href="#">the Azure SQL password documentation</a> for details.</p>
userName	This is the username for your Confluence administrator's account.
userFullName	This is the full name of your Confluence administrator user.
userEmail	This is the email address of your Confluence administrator user.
userCredential	This is the password for your Confluence administrator's account.

confluenceLicense	<p>This is your Confluence Data Center license key. If you already have a license, you can retrieve it from <a href="https://my.atlassian.com">my.atlassian.com</a>. You can't use this deployment template to deploy Confluence Server.</p> <p>If you do not yet have a license you can generate one at <a href="https://my.atlassian.com">my.atlassian.com</a> or omit this parameter and your site will be provisioned with a time-limited evaluation license.</p>
-------------------	---

### Optional parameters

The following parameters are optional. If you don't provide a value in the parameter file, we'll use sensible default values.

Parameter	Default value	Description
cname	<i>empty</i>	<p>Leave empty/unset to use the Fully Qualified Domain Name (FQDN) provided by Azure automatically. However, if you own a custom domain name, you can use this parameter to set the base URL of your Confluence site to the custom domain.</p> <p>If you do use a custom domain, you must also create an appropriate <a href="#">cname record</a> to point to the FQDN of the Confluence instance (printed as part of the output of the <code>az</code> command when deploying this reference template). Consult your domain registry's documentation on how to configure cname records.</p>
confluenceVmSize	Standard_DS2_v2	This is the size of the virtual machines that will be your Confluence and Synchrony cluster nodes. Specify your own value if you want to provision larger VMs.
natVmSize	Standard_DS3_v2	<p>This is the size of the NAT box (jumpbox). Specify your own value if you want to provision a larger VM.</p> <p>Note that the NAT box VM type <b>must</b> have at least 3 network cards (NIC). The smallest VMs which only have two network cards cannot be used for the jumpbox. See the <a href="#">Azure VM size documentation</a> for details.</p>
jumpboxSshUser	confluenceadmin	This is the SSH user you'll use to access the NAT box (jumpbox).



nodeSshUser	confluenceadmin	This is the SSH username you'll use to access the Confluence and Synchrony nodes.
confluenceVersion	6.4.0	<p>This is the version of Confluence you want to install on your cluster nodes. Enter the Confluence version number in full, for example "6.4.0". Azure deployment is compatible only for versions 6.4.0 or later.</p> <p>WARNING: Once deployed, this version must continue to be used if you update the deployment (for example, to add more nodes). Changing this value in a subsequent deployment may corrupt your Confluence instance. You can't use the <code>confluenceVersion</code> parameter to upgrade an existing deployment to a newer version of Confluence.</p>
applicationTitle	Atlassian Confluence	This is the name of your Confluence site.
applicationGatewaySize	Standard_Medium	<p>This is the size of your application gateway.</p> <p>Specify your own value if you want to provision a particular application gateway size.</p>

### VM and database sizing considerations

The deployment template uses a number of sensible defaults for the VM size, database tier and application gateway size, which are automatically calculated depending on the number of Confluence nodes you provision.

For example, if you chose to deploy a cluster with 6 Confluence nodes we would:

- provision **3** Synchrony nodes (for collaborative editing)
- set the database tier to `PRS4`
- set the application gateway capacity to 3

It is possible to manually control the Database tier, and the Synchrony cluster size by setting some of these parameters in the `azuredeploy.parameters.json`. However, we don't recommend attempting to deploy Confluence Data Center on anything less than the automatically chosen defaults, as it may not meet required performance characteristics (such as not enough database DTUs).

To override the database tier, set the parameter `dbTierOption` to 'manual' in the parameters file. Then set these parameters:

- `dbTier` to one of the available database tiers, e.g., `PRS1` (see [the Azure documentation on the resource limits](#)).
- `dbEdition` to one of the available database editions (`Standard`, `Premium`, and `PremiumRS`).

To override the Synchrony cluster sizes, set the parameter `synchronyVmOption` to 'manual'. Then set these parameters:

- `synchronyVmSize` to the desired vm type (see the parameter `confluenceVmSize`)
- `synchronyClusterSize` to the desired number of Synchrony nodes.



### Additional steps required for SSL

As noted in limitations above, you'll need to manually configure your application gateway. See [Overview of end to end SSL with Application Gateway](#) in the Microsoft Azure documentation for more information.

There's currently a bug which stops SSL from being used in the templates unless the administrator performs the following steps manually.

On every Confluence node:

1. Edit the `${confluence_install_dir}/conf/server.xml` file.
2. In the `<connector>` element, change the `scheme` attribute to `https`.
3. Edit the `${confluence_install_dir}/bin/setenv.sh` file.
4. Change the Synchrony service URL (`synchrony.service.url` system property) scheme from `http` to `https`.
5. Repeat these steps on each Confluence node.

On every Synchrony node:

1. Edit the `${confluence_install_dir}/bin/start-synchrony.sh` file
2. Change the Synchrony service URL (`synchrony.service.url` system property) scheme from `http` to `https`.
3. Repeat these steps on each Synchrony node.

### Administering Confluence Data Center on Azure

Once you've deployed Confluence Data Center to Azure using the deployment template, administering the application is similar to managing an application on your own hardware, with the exception that you'll need to go via the jumpbox to access your nodes.

To access your jumpbox and nodes you'll need:

- the SSH credentials you provided during setup,
- the Confluence / Synchrony node credentials you provided during setup
- the public DNS name or IP address of your jumpbox (you can obtain this through the Azure portal via **Menu > Resource groups > <your resource group> > confluencenat**), and
- the node IP addresses, listed against the `confluencecluster (instance n)` row in **Connected devices**. (You can obtain this through the Azure portal via **Menu > Resource groups > <your resource group> > confluencevnet**).

### Connecting to your Azure jumpbox over SSH

You can SSH into your Confluence cluster nodes, Synchrony nodes and shared home directory to perform configuration or maintenance tasks. Note that you must keep your SSH public key file in a safe place. This is the key to your jumpbox, and therefore all the nodes in your instance.

Access the jumpbox via a terminal or command line using:

```
$ ssh JUMPBOX_USERNAME@DNS_NAME_OR_IP_ADDRESS
```

Once you've accessed the jumpbox, we can jump to any of the nodes in the cluster, using:

```
$ ssh NODE_USERNAME@NODE_IP_ADDRESS
```

You'll then be asked for your node password - after providing this, you should be connected to the node.

### Accessing your configuration files

For your Azure deployment, you may need to make changes to some configuration files, just as you would for a deployment on your own hardware:

- your `server.xml` lives in `/opt/atlassian/confluence/conf`

- your `setenv.sh` lives in `/opt/atlassian/confluence/bin`
- your local home `confluence.cfg.xml` lives in `/var/atlassian/application-data/confluence`
- your shared home `confluence.cfg.xml` lives in `/media/atl/confluence/shared`

These files are only accessible from the existing nodes. The *shared home* is mounted (think of it as a network hard disk) on each node under `/media/atl/confluence/shared`. So from an existing node (when you're logged in through SSH), you can go to `/media/atl/confluence/shared`.

If modifications to these files are made manually, new nodes will not pick up those modifications. You can either repeat the modifications on each node, or change the templates in the `/media/atl/confluence/shared` directory from which those files are derived. The mappings are:

- the `server.xml` file is derived from `/media/atl/confluence/shared/server.xml`
- the `setenv.sh` file is derived from `/media/atl/confluence/shared/setenv.sh`
- the local home `confluence.cfg.xml` is derived from `/media/atl/confluence/shared/home-confluence.cfg.xml`
- the shared home `confluence.cfg.xml` is derived from `/media/atl/confluence/shared/shared-confluence.cfg.xml`

These template files contain placeholders for values that are injected via the deployment script. Removing or changing them may cause breakages with the deployment. In most cases, these files should not be modified, as a lot of these settings are produced from the Azure Resource Manager templates automatically.

### **Backing up**

We recommend you use the Azure native backup facility, which utilizes snapshots to back up your Confluence Data Center instance.

### **Migrating your existing content into Azure**

To migrate content from an existing site into your Confluence Data Center site on Azure you will need to take a full site export, and then import it into your new Confluence site.

See [Manually Backing Up the Site](#) for information on how to export your site, and [Restoring a Site](#) for information on how to import it into your new site on Azure.

Make sure you have the Administrator account credentials for your existing site, as the administrator account you created during Azure deployment process will be overwritten by the export, and you may be locked out of your site.

### **Upgrading Confluence in Azure**

The process of upgrading Confluence is the same as if you were running the cluster on your own hardware. You will stop Confluence on all nodes, upgrade one node, stop that node then copy the installation directory across to each remaining node in the cluster, before restarting each node, one at a time.

See [Upgrading Confluence Data Center](#) for more details.

You can't use the `confluenceVersion` parameter in the deployment template to upgrade an existing Confluence deployment, or to provision new nodes running a different version to the rest of your cluster.

### **Moving from Data Center to Server**

This page outlines how to switch from Confluence Data Center (clustered) to Confluence Server (non-clustered). In these instructions we'll assume that you'll use one of your existing cluster nodes as your new, non-clustered installation.

You'll need a Confluence Server license to switch back to Server.

#### **Before you complete this process**

As a precaution, we recommend shutting down all nodes except one, and running Confluence on a single node.

### 1. Enter your Confluence server license

Your home directory (configured in `confluence\WEB-INF\classes\confluence-init.properties`) should point to your local home directory.

1. Go to



> **General Configuration**

2. Choose **License Details** from the sidebar under the **Administration** heading
3. Enter your Confluence Server license key

### 2. Shut down Confluence

Stop any cluster nodes that are still running before proceeding. We also recommend configuring your load balancer to redirect traffic away from Confluence.

### 3. Move items in the cluster shared home back to local home

1. Create a directory called `/shared-home` in the `<local home>` directory on one node (if you removed this directory when installing Data Center)
2. Move the entire `config` directory from your `<shared home>` directory to the `<local home>/shared-home` directory
3. Move the remaining contents of your `<shared home>` directory to the root of your `<local home>` directory

Your cluster's shared home directory should now be empty.

### 4. Start Confluence

The setup wizard will guide you through the migration process.

To confirm you're now running the non-clustered edition, go to



> **General Configuration**. The 'Cluster Configuration' page **should not** appear. Instead you'll see information about Confluence Data Center.

## Installing Java for Confluence

This page contains instructions for installing the Java Development Kit (JDK). This is a manual step that's only required if you're installing Confluence from a zip or archive file. If you're using the Confluence [installer](#), you do not need to install Java manually.

Check the [Supported Platforms](#) page to find out which Java versions are supported for Confluence.

### Installing Java

The JDK (Java Development Kit) needs to be installed on the same server that will have Confluence installed. We support running Confluence with the JDK or JRE (Java Runtime Environment). These instructions will just cover installing the JDK.

▼ [For Windows: \(click to expand\)](#)

#### *Installing the JDK on Windows*

Before you start, go to **Control Panel > Programs and Features** to check whether a JDK is already installed.

To install the JDK on Windows:

1. Download the appropriate [JDK version](#).  
Check the [Supported Platforms](#) page to find out which JDK / JRE versions are supported for your version of Confluence.
2. Run the Java installer. Make a note of the installation directory, as you'll need this later.
3. Once the Java installation is complete, check that the `JAVA_HOME` environment variable has been set correctly.  
Open a command prompt and type `echo %JAVA_HOME%` and hit Enter.
  - If you see a path to your Java installation directory, the `JAVA_HOME` environment variable has been set correctly.
  - If nothing is displayed, or only `%JAVA_HOME%` is returned, you'll need to set the `JAVA_HOME` environment variable manually. See [Setting the JAVA\\_HOME Variable in Windows](#) for a step by step guide.

▼ [For Linux: \(click to expand\)](#)

### Installing the JDK on Linux

Before you start, check whether a JDK is already installed. Open a shell console and type `echo $JAVA_HOME` and hit Enter.

- If it returns something like `/opt/JDK7` or `/usr/lib/jvm/java-7`, then your JDK is installed and properly configured.
- If nothing is displayed, you'll need to install the JDK or set the `$JAVA_HOME` environment variable. You can set this environment variable in your user account's 'profile' file. Alternatively, you can set this after installing Confluence, by defining this path in your Confluence installation's `setenv.sh` file, usually located in the Confluence `bin` directory.
- If you have installed [an unsupported JDK](#) and you want to use SSL then you need to install the [Sun JSSE package](#).

To install the JDK on Linux:

1. Download the appropriate [JDK version](#).  
Check the [Supported Platforms](#) page to find out which JDK / JRE versions are supported for your version of Confluence.
2. Run the Java installer. Detailed installation instructions are provided on [Oracle's website](#).
3. Open a shell console and type `echo $JAVA_HOME` and hit Enter to check that it has installed correctly (see notes above).

**Note:** Any Java or JDK version numbers on this page are **examples only**. Please refer to the [Supported Platforms](#) page for supported versions of Java.

### Setting the JAVA\_HOME Variable in Windows

After you've [installed Java](#) in Windows, you must set the `JAVA_HOME` environment variable to point to the Java installation directory.

This information is only relevant if you're installing Confluence manually on a Windows server. If you're using the installer, you don't need to do this.

If you installed the Java Development Kit (JDK) you'll be setting the `JAVA_HOME` environment variable. If you installed the Java Runtime Environment (JRE) you will follow the same steps but set the `JRE_HOME` environment variable instead.

#### Set the JAVA\_HOME Variable

To set the `JAVA_HOME` variable:

1. Locate your Java installation directory

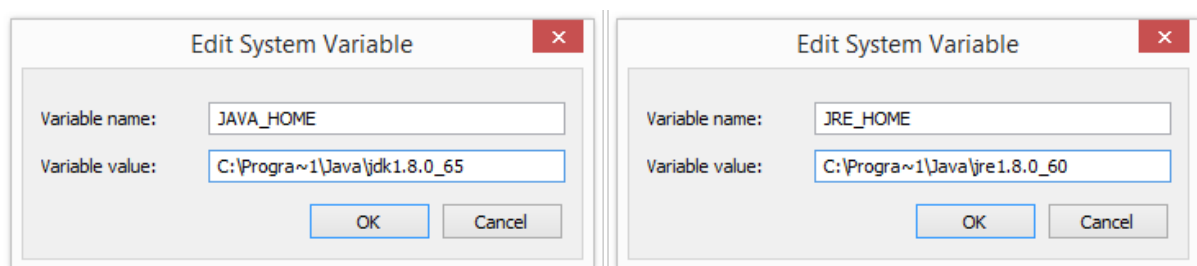
If you didn't change the path during installation, it'll be something like `C:\Program Files\Java\jdk1.8.0_65`

#### Related pages

- [Starting Tomcat as a Windows Service](#)
- [Installing Confluence in Linux](#)

2. Do one of the following:  
**Windows 7** – Right click **My Computer** and select **Properties > Advanced**  
**Windows 8** – Go to **Control Panel > System > Advanced System Settings**  
**Windows 10** – Search for **Environment Variables** then select **Edit the system environment variables**
3. Click the **Environment Variables** button.
4. Under **System Variables**, click **New**.
5. In the **Variable Name** field, enter either:
  - `JAVA_HOME` if you installed the JDK (Java Development Kit)  
or
  - `JRE_HOME` if you installed the JRE (Java Runtime Environment)
6. In the **Variable Value** field, enter your JDK or JRE installation path .

If the path contains spaces, use the shortened path name. For example, `C:\Progra~1\Java\jdk1.8.0_65`



**Note for Windows users on 64-bit systems**

Progra~1 = 'Program Files'

Progra~2 = 'Program Files(x86)'

7. Click **OK** and **Apply Changes** as prompted

You'll need to close and re-open any command windows that were open before you made these changes, as there's no way to reload environment variables from an active command prompt. If the changes don't take effect after reopening the command window, restart Windows.

**Set the `JAVA_HOME` variable via the command line**

If you would prefer to set the `JAVA_HOME` (or `JRE_HOME`) variable via the command line:

1. Open Command Prompt (make sure you Run as administrator so you're able to add a system environment variable).
2. Set the value of the environment variable to your JDK (or JRE) installation path as follows:

```
setx -m JAVA_HOME "C:\Progra~1\Java\jdk1.8.0_XX"
```

If the path contains spaces, use the shortened path name.

3. Restart Command Prompt to reload the environment variables then use the following command to check the it's been added correctly.

```
echo %JAVA_HOME%
```

You should see the path to your JDK (or JRE) installation.

## Creating a Dedicated User Account on the Operating System to Run Confluence


**i** This step is optional if you are evaluating Confluence, but should be mandatory for Confluence installations used in production. If you have used the Confluence installer on Linux, this user will be created automatically.

A dedicated user should be created to run Confluence, because Confluence runs as the user it is invoked under and therefore can potentially be abused. For example:

- If your operating system is \*nix-based (for example, Linux or Solaris), type the following in a console:  

```
$ sudo /usr/sbin/useradd --create-home --comment "Account for running Confluence" --shell /bin/bash confluence
```
- If your operating system is Windows:
  1. Create the dedicated user account by either:
    - Typing the following at the Windows command line:  

```
> net user confluence mypassword /add /comment:"Account for running Confluence"
```

 (This creates a user account with user name 'confluence' and password 'mypassword'. You should choose your own password.)
    - Opening the Windows 'Computer Management' console to add your 'confluence' user with its own password.
  2. (Optional) Use the Windows 'Computer Management' console to remove the 'confluence' user's membership of all unnecessary Windows groups, such as the default 'Users' group.
-  If Windows is operating under Microsoft Active Directory, ask your Active Directory administrator to create your 'confluence' account (with no prior privileges).

Ensure that the following directories can be read and written to by this dedicated user account (e.g. 'confluence'):

- The [Confluence Installation Directory](#), particularly these sub-directories:
  - logs
  - temp
  - work
- Your [Confluence Home directory](#).

See also [Best Practices for Configuring Confluence Security](#).

## Confluence Setup Guide

Before running the Confluence Setup Wizard, as described below, you should have already completed [installing Confluence](#).

When you access Confluence in your web browser for the first time, you will see the **Confluence Setup Wizard**. This is a series of screens which will prompt you to supply some default values for your Confluence site. It will also offer some more advanced options for setting up data connections and restoring data from a previous installation.

### 1. Start the setup wizard

1. Start Confluence (if it is not already running)  
 For Windows, go to **Start > Programs > Confluence > Start Confluence Server**.  
 Or, run the start-up script found in the bin folder of your installation directory:
  - start-confluence.bat for Windows.
  - start-confluence.sh for Linux-based systems.
2. Go <http://localhost:8090/> in your browser  
 If you chose a different port during

#### On this page:

- [1. Start the setup wizard](#)
- [2. Choose your installation type and add-ons](#)
- [3. Enter your license key](#)
- [4. Production installation: database configuration](#)
- [5. Production installation: external database](#)
- [6. Production installation: load content](#)
- [7. Production Installation: restore data from backup](#)
- [8. Set up user management](#)
- [9. Connect to your Jira application](#)
- [10. Set up system administrator account](#)
- [11. Setup is Complete](#)

installation, change '8090' to the port you specified  
If you see an error, check you are using the port you specified during installation.

## 2. Choose your installation type and add-ons

In this step, you'll choose whether you want a trial or a production installation.

- **Trial installation**

Set up Confluence with the embedded [H2 database](#), default settings and sample content to get you started.

You'll need to migrate to a supported external database before using Confluence as a production system. This option is recommended if you're just taking Confluence for a test drive.

- **Production installation**

Set up Confluence with your own external database. This option is recommended for setting up Confluence in a production environment.

If you've purchased a license bundle that includes Questions or Team Calendars for Confluence (or if you're keen to try these add-ons) you can get the setup wizard to install these add-ons automatically - choose the add-ons you want to automatically install.

## 3. Enter your license key

Follow the prompts to generate an evaluation license, or enter an existing license key. To retrieve an existing license key head to [my.atlassian.com](https://my.atlassian.com), or to purchase a new commercial license go to [my.atlassian.com/purchase](https://my.atlassian.com/purchase).

If you selected a **Trial installation** in the previous step, Confluence will generate your license and then create the embedded database. This will take a few minutes. Once complete, go to [step 8 below](#).

If you selected a **Production installation**, go to the next step to set up your external database.

## 4. Production installation: database configuration

Next it's time to set up your database. Some things to consider:

- Check the [supported platforms](#) list to confirm that your chosen database and version is supported.
- See [database configuration](#) for information on setting up your database, including UTF-8 character encoding requirements.
- If you are using Confluence as a production system you **must** use an external database.
- The embedded [H2 database](#) option is available for evaluating or demonstrating Confluence, but should not be used for production use. If you choose this option, you'll need to migrate to an external database later on.

*Screenshot: Database configuration*



## Choose a Database Configuration

Choose where Confluence should store its data.

### External Database

If you wish to store your Confluence data in an external database, choose it from the list of supported databases. This is **recommended for production systems**.

Confluence supports a number of databases, and does not strongly recommend any one database. Atlassian provides only limited support for maintaining and tuning databases, so if you already have an established, supported database of choice within your organisation it is advisable to use this database. The benefit of having an expert to diagnose operational and performance issues far outweighs any differences between the databases themselves.

If you have no established database and do not have a strong preference for any of our supported databases, we recommend the latest supported version of [PostgreSQL](#), which is free and thoroughly tested against. Please check the latest supported version in our [documentation](#).

If your database is not listed in the menu, you may configure an "Unsupported Database", but be aware that Confluence may not be fully tested against this database.

PostgreSQL

External Database

### Embedded Database

The embedded database will allow Confluence to operate without an external database.

We **strongly recommend against** using this on a **production** server. This is **recommended for evaluating and demonstrating Confluence only**. Production systems should consider an external database for improved scalability and reliability. A guide on how to migrate your data can be found [here](#).

Embedded Database

## 5. Production installation: external database

### Before you Start

- **Character encoding:**
  - We strongly recommend that character encoding is consistent across your database, application server and web application, and that you use **UTF-8** encoding.
  - Before setting up your database, please read about [configuring character encoding](#).
- **Database name:** When creating a new external database, give it the name '**confluence**'.

Choose how you want Confluence to connect to your database either via a direct JDBC connection or via a server-managed datasource connection.

*Screenshot: Connection options*



## Configure Database

Choose how you wish Confluence to connect to your database.

### Direct JDBC Connection

Connect directly to the database

Direct JDBC

### Connect via a Datasource

Connect to the database via a datasource configured in the application server

Datasource

## Direct JDBC

This uses a standard JDBC database connection. Connection pooling is handled within Confluence.

- **Driver Class Name** – The Java class name for the appropriate database driver. This will depend on the JDBC driver, and will be found in the documentation for your database. Note that Confluence bundles some database drivers, but you'll need to install the driver yourself if it is not bundled. See [Database JDBC Drivers](#) for details.
- **Database URL** – The JDBC URL for the database you will be connecting to. This will depend on the JDBC driver, and will be found in the documentation for your database.
- **User Name** and **Password** – A valid username and password that Confluence can use to access your database.

You will also need to know:

- The size of the connection pool Confluence should maintain. If in doubt, just go with the default provided.
- What kind of database you're connecting to, so you can tell Confluence which dialect it needs to use.

## Datasource

This asks your application server (Tomcat) for a database connection. You will need to have configured a datasource in your application server. For information about configuring an external database, see [Database Configuration](#).

- **Datasource Name** - The JNDI name of the datasource, as configured in the application server.  
Note: Some servers will have JNDI names like `jdbc/datasourcename`; others will be like `java:comp/env/jdbc/datasourcename`. Check your application server documentation.

You will also need to know:

- What kind of database you're connecting to, so you can tell Confluence which dialect it needs to use.

## 6. Production installation: load content

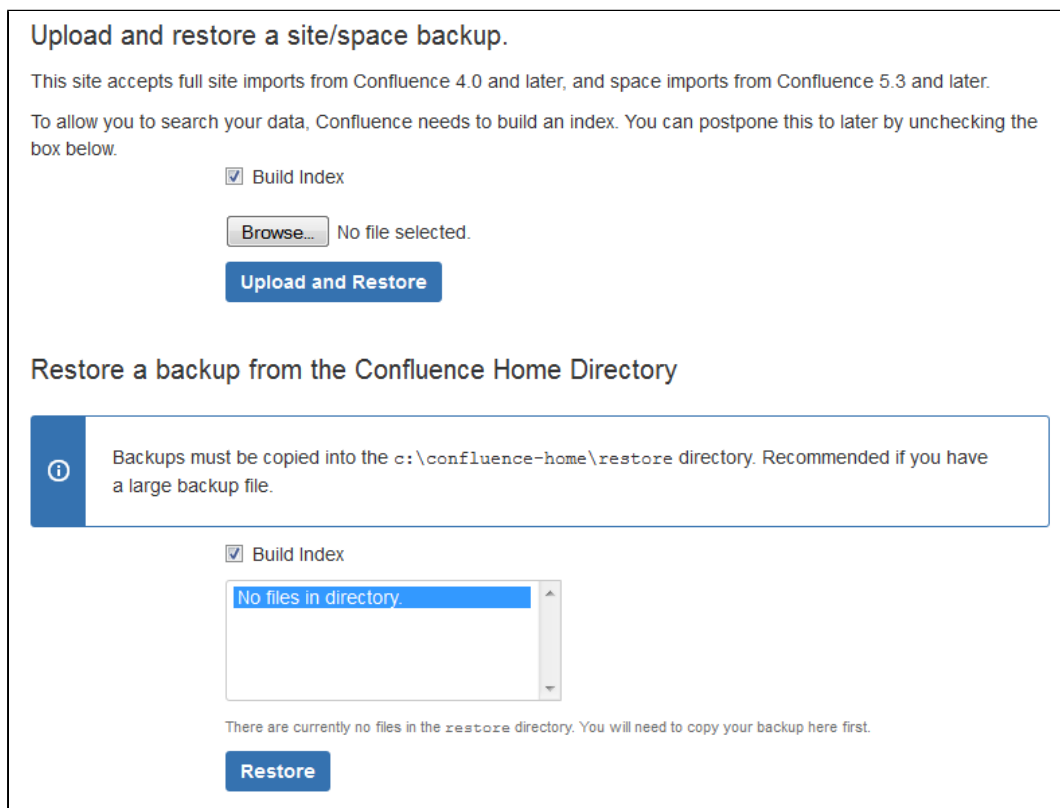
We can help you get your new Confluence site started with some demonstration content (which you can remove once you're up and running), or you can choose to proceed with an empty site. You'll need to create a space in your new site before you can start adding content.

If you're migrating from another Confluence installation choose **Restore from backup** to import your existing Confluence data.

## 7. Production Installation: restore data from backup

This option allows you to import data from an existing Confluence installation as part of the setup process. You'll need a [manual backup](#) file from your existing Confluence installation to do this (go to **Backup and Restore** in the administration console of your existing Confluence site).

*Screenshot: restore data options*



**Upload and restore a site/space backup.**

This site accepts full site imports from Confluence 4.0 and later, and space imports from Confluence 5.3 and later.

To allow you to search your data, Confluence needs to build an index. You can postpone this to later by unchecking the box below.

☒ Build Index

No file selected.

**Restore a backup from the Confluence Home Directory**

**i** Backups must be copied into the `c:\confluence-home\restore` directory. Recommended if you have a large backup file.

☒ Build Index

No files in directory.

There are currently no files in the `restore` directory. You will need to copy your backup here first.

There are two ways to restore your data - upload the file, or restore from a location on your file system.

- **Upload a backup file**

This option will load the data from a zipped backup file. If your backup file is very large, restoring from the file system is a better option. Follow the prompts to browse for your backup file. Ensure select **Build Index** is selected so the search index is generated.

- **Restore a backup file from the file system**

This option is recommended if your backup file is very large (100mb or more), or your backup file is already on the same server.

Copy your XML backup file into the `<confluence-home>/restore` directory. Your backup file will appear in the list. Follow the prompts to restore the backup. Ensure select **Build Index** is selected so the search index is generated.

When the restore process has you'll be ready to log in to Confluence. The system administrator account and all other user data and content has been imported from your previous installation.

## 8. Set up user management

You can choose to manage Confluence's users and groups inside Confluence or in a Jira application, such as Jira Software or Jira Service Desk.

- If you do not have a Jira application installed, or if you would prefer to set up external user management later, choose **Manage users and groups within Confluence**.
- If you have a Jira application installed, the setup wizard gives you the opportunity to configure the Jira connection automatically. This is a quick way of setting up your Jira integration with the most common options. It will configure a Jira user directory for Confluence, and set up application links between Jira and Confluence for easy sharing of data. Choose **Connect to Jira**.

## 9. Connect to your Jira application

### Connect to JIRA

Fill in the details of the JIRA server you wish to retrieve user and group information from. You will need a valid administrator account on that JIRA server. [Learn more about configuring JIRA integration.](#)

#### JIRA Server Location

JIRA Base URL \*

For example: <http://jira.mycompany.com> or <http://mycompany.com/jira>

#### JIRA Administrator Login

Confluence will need to log in to JIRA with administrative privileges to retrieve user information.

Username \*

This username must have system administrator rights on your JIRA server.

Password \*

#### Advanced Options

Confluence Base URL \*

JIRA will use this URL to access your Confluence server. If Confluence is behind a proxy, you may need to change the URL given here.

User Groups \*

Users in these groups will have access to Confluence. Comma-separated.

Admin Groups \*

Users in these groups will have administrator access to Confluence. Comma-separated.

[Return to User Management Selection](#) [Next](#)

Enter the following information:

- **Jira Base URL** - the address of your Jira server, such as `http://www.example.com:8080/jira/` or `http://jira.example.com`
- **Jira Administrator Login** - this is the username and password of a user account that has the Jira System Administrator global permission in your Jira application.

Confluence will also use this username and password to create a local administrator account which will let you access Confluence if Jira is unavailable. Note that this single account is stored in Confluence's internal user directory, so if you change the password in Jira, it will not automatically update in Confluence.

- **Confluence Base URL** - this is the URL Jira will use to access your Confluence server. The URL you give here overrides the base URL specified in Confluence, for the purposes of connecting to the Jira application.
- **User Groups** - these are the Jira groups whose members should be allowed to use Confluence. Members of these groups will get the 'Can use' permission for Confluence, and will be counted in your Confluence license. The default user group name differs depending on your Jira version:
  - Jira 6.4 and earlier: `jira-users`.
  - Jira Software 7.x and later: `jira-software-users`
  - Jira Core 7.x and later: `jira-core-users`
  - Jira Service Desk 3.x and later: `jira-servicedesk-users`
- **Admin Groups** - Specify one or more Jira groups whose members should have administrative access to Confluence. The default group is `jira-administrators`. These groups will get the system administrator and Confluence administrator global permissions in Confluence.

For full details and a troubleshooting guide, see [Configuring Jira Integration in the Setup Wizard](#).

## 10. Set up system administrator account

The system administrator has full administrative power over your Confluence instance. This person will be able to add more users, create spaces, and set further Confluence options. Please refer to the [overview of global permissions](#) for more information.

Hint: If you are evaluating Confluence, set yourself as the administrator.

If you've delegated user management to a Jira application, we'll use the Jira system administrator account you specified as Confluence's system administrator account.

## 11. Setup is Complete

That's it, Confluence is ready to go. Click **Start** to jump straight in to Confluence.

Choose **Further Configuration** if you want to go directly to the Administration Console and complete administrator's tasks including configuring a mail server, adding users, changing the base URL and more.

## Configuring Jira Integration in the Setup Wizard

This page describes the **Connect to Jira** step in the Confluence setup wizard.

If you are already using a Jira application, you can choose to delegate user management to Jira, instead of separately maintaining your users in Confluence.

You'll be able to specify exactly which groups in your Jira app should also be allowed to log in to Confluence. Your license tiers do not need to be the same for each application.

It's possible to connect Confluence to Jira after completing the setup process, but it's much quicker and easier to set it up at this stage.

You can delegate Confluence's user management to:

- Jira 4.3 or later
- Jira Core 7.0 or later
- Jira Software 7.0 or later
- Jira Service Desk 3.0 or later.

### On this page:

- [Connecting to a Jira application in the Setup Wizard](#)
- [Troubleshooting](#)

### Related pages:

- [User Management Limitations and Recommendations](#)
- [Connecting to Crowd or Jira for User Management](#)
- [Confluence Setup Guide](#)

## Connecting to a Jira application in the Setup Wizard

## Connect to JIRA

Fill in the details of the JIRA server you wish to retrieve user and group information from. You will need a valid administrator account on that JIRA server. [Learn more about configuring JIRA integration.](#)

### JIRA Server Location

JIRA Base URL \*

For example: <http://jira.mycompany.com> or <http://mycompany.com/jira>

### JIRA Administrator Login

Confluence will need to log in to JIRA with administrative privileges to retrieve user information.

Username \*

This username must have system administrator rights on your JIRA server.

Password \*

### Advanced Options

Confluence Base URL \*

URL

JIRA will use this URL to access your Confluence server. If Confluence is behind a proxy, you may need to change the URL given here.

User Groups \*

Users in these groups will have access to Confluence. Comma-separated.

Admin Groups \*

Users in these groups will have administrator access to Confluence. Comma-separated.

[Return to User Management Selection](#) [Next](#)

Enter the following information:

- **Jira Base URL** - the address of your Jira server, such as <http://www.example.com:8080/jira/> or <http://jira.example.com>
- **Jira Administrator Login** - this is the username and password of a user account that has the Jira System Administrator global permission in your Jira application.

Confluence will also use this username and password to create a local administrator account which will let you access Confluence if Jira is unavailable. Note that this single account is stored in Confluence's internal user directory, so if you change the password in Jira, it will not automatically update in Confluence.

- **Confluence Base URL** - this is the URL Jira will use to access your Confluence server. The URL you give here overrides the base URL specified in Confluence, for the purposes of connecting to the Jira application.
- **User Groups** - these are the Jira groups whose members should be allowed to use Confluence. Members of these groups will get the 'Can use' permission for Confluence, and will be counted in your Confluence license. The default user group name differs depending on your Jira version:
  - Jira 6.4 and earlier: `jira-users`.
  - Jira Software 7.x and later: `jira-software-users`
  - Jira Core 7.x and later: `jira-core-users`
  - Jira Service Desk 3.x and later: `jira-servicedesk-users`
- **Admin Groups** - Specify one or more Jira groups whose members should have administrative access to Confluence. The default group is `jira-administrators`. These groups will get the system administrator and Confluence administrator global permissions in Confluence.

## Troubleshooting

If you have trouble connecting Confluence to Jira, the following troubleshooting information should help you get up and running.

If no users can log in to Confluence after you've completed the setup process, check that the people are members of the Jira groups you specified. Only members of these groups will get the 'Can Use' Confluence permission.

Error in the setup wizard	Cause	Solution
Failed to create application link, or Failed to authenticate application link	The setup wizard failed to complete registration of the peer-to-peer application link with Jira. Jira integration is only partially configured.	Follow the steps below to <a href="#">remove the partial configuration</a> then try the Connect to Jira step again.
Failed to register Confluence configuration in Jira for shared user management	The setup wizard failed to complete registration of the client-server link with Jira for user management. The peer-to-peer link was successfully created, but integration is only partially configured.	Follow the steps below to <a href="#">remove the partial configuration</a> then try the Connect to Jira step again.
Error setting Crowd authentication	The setup wizard successfully established the peer-to-peer link with Jira, but could not persist the client-server link for user management in your <code>config.xml</code> file. This may be caused by a problem in your environment, such as a full disk.	Fix the problem that prevented the application from saving the configuration file to disk then follow the steps below to <a href="#">remove the partial configuration</a> before trying the Connect to Jira step again.
Error reloading Crowd authentication	The setup wizard has completed the integration of your application with Jira, but is unable to start synchronizing the Jira users with your application.	Restart Confluence. You should be able to continue with the setup wizard. If this does not work, contact <a href="#">Atlassian Support</a> for help.
<code>java.lang.IllegalStateException: Could not create the application in Jira/Crowd (code: 500)</code>	The setup wizard has not completed the integration of your application with Jira. The links are only partially configured. The problem occurred because there is already a user management configuration in Jira for this <application> URL.	Follow the steps below to <a href="#">remove the partial configuration</a> and resolve any conflict with existing links then try the Connect to Jira step again.

### Removing a partial configuration

If you hit a roadblock, you'll need to log in to Jira and remove the partial integration before you can try again. The specific steps will differ depending on your Jira application and version, but the essentials are the same for all versions:

- Log in to Jira as a user with system administrator permissions.
- In the Administrator screens, go to **Application Links**.
- Remove the application link that matches the base URL of your Confluence server.
- In the User Management screens, go to **Jira User Server**.
- Remove the link that matches the name and base URL of your Confluence server from the list of applications that can use Jira for user management.
  - ▼ [If you have multiple servers running on the same host...](#)  
If you're unable to tell which link matches your Confluence server because you have multiple servers of the same type running on the same host you can check the application ID, which is

listed beside each server.

To find out the application ID of your new Confluence site, go to `<baseUrl>/rest/applinks/1.0/manifest` (where `<baseUrl>` is the base URL of your Confluence site). The application ID will be listed in the `<ID>` element.

- Return to the Confluence setup wizard and try the **Connect to Jira** step again.

If you're still unable to connect Jira and Confluence using the setup wizard, you may need to skip this step and set up the links between Jira and Confluence manually once you've completed the Confluence setup process. See [Connecting to Crowd or Jira for User Management](#).

## Upgrading Confluence

In this guide we'll run you through using the installer to upgrade your Confluence site to the latest Confluence version on Windows or Linux.

Upgrading to any later version is free if you have current software maintenance. See our [Licensing FAQ](#) to find out more.



### Other ways to upgrade Confluence:

- [Manually](#) – upgrade without using the installer.
- [Data Center](#) – upgrade your Data Center cluster.

XML backups should **not** be used to upgrade Confluence.

### Before you begin

Before you upgrade Confluence, there's a few questions you need to answer.

<p>Is installer the right upgrade method for you?</p>	<p><a href="#">Tell me more...</a></p> <p>You can choose to upgrade using the installer, or manually using a zip or tar.gz file. In most cases the installer is the easiest way to upgrade your Confluence instance.</p> <p>You will need to <a href="#">upgrade manually</a> if:</p> <ul style="list-style-type: none"> <li>• you are moving to another operating system or file location as part of this upgrade.</li> <li>• you are upgrading from <b>Confluence 3.5 or earlier</b></li> <li>• you are upgrading from <b>Confluence 5.6</b> or earlier and previously used the <b>E AR/WAR distribution</b> to deploy Confluence into an existing application server.</li> </ul>
---	---

### On this page:

[Before you begin](#)

[Plan your upgrade](#)

1. Determine your upgrade path
2. Complete the pre-upgrade checks
3. Upgrade Confluence in a test environment

[Upgrade Confluence](#)

4. Back up
5. Download Confluence
6. Run the installer

[After the upgrade](#)

7. Copy your database driver
8. Re-apply any modifications
9. Update your reverse proxy and check you can access Confluence

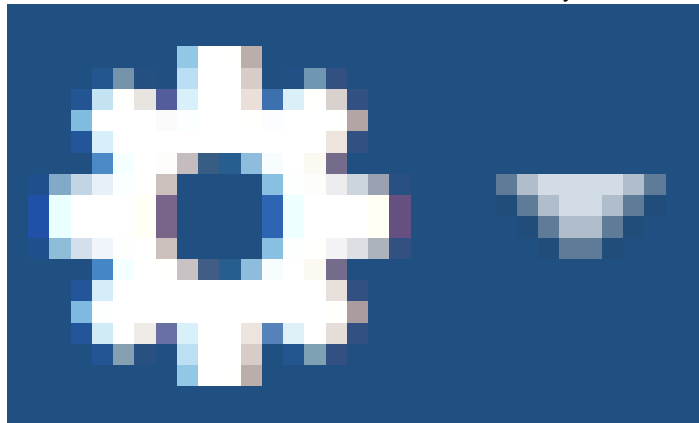
[Troubleshooting](#)



Are you eligible to upgrade?

▼ [Tell me more...](#)

To check if software maintenance is current for your license, go to



> **General Configuration > Troubleshooting and support tools** and make sure the license support period has not expired.

#### License Details

Here are your current license details.

To update your Confluence license, enter your new license key below.

Organisation	Atlassian
Date purchased	Dec 06, 2016
License type	Sample license
Licensed users	500 (4 signed up currently) <a href="#">Learn more</a>
	<input type="button" value="Refresh"/>
Support period	Your commercial Confluence support and updates are available until Dec 06, 2017. <a href="#">Learn more</a>
Support Entitlement Number	SEN-500
Server ID	BE8C-MMO5-V88S-6MWC (Atlassian sales or support may ask you to provide this ID)

**Software maintenance**  
Upgrade at any time during this period

If your support period has expired, follow the prompts to renew your license and reapply it before upgrading.

Have our supported platforms changed?

[Tell me more...](#)

Check the [Supported Platforms](#) page for the version of Confluence you are upgrading to. This will give you info on supported operating systems, databases and browsers.

#### Good to know:

- The Confluence installer includes Java (JRE) and Tomcat, so you won't need to upgrade these separately.
- If you need to upgrade your database, be sure to read the upgrade notes for the Confluence version you plan to upgrade to (and any in-between) to check for any database configuration changes that you may need to make.

Do you need to make changes to your environment?	<p>▼ <a href="#">Tell me more...</a></p> <p>Newer Confluence versions sometimes require changes to your environment, such as providing more memory or adjusting your reverse proxy settings.</p> <p><b>Good to know:</b></p> <p>We use <a href="#">Upgrade Notes</a> to communicate changes that will impact you, such as:</p> <ul style="list-style-type: none"> <li>• Changes to supported databases, memory requirements or other changes that will impact your environment.</li> <li>• Features that have significantly changed or been removed in this release.</li> <li>• Actions you may need to take in your instance or environment immediately after the upgrade.</li> </ul> <p>It's important to read the notes for the version you're upgrading to and those in-between. For example, if you are upgrading from 5.8 to 5.10 you should read the upgrade notes for 5.9 and 5.10.</p>
--	---

## Plan your upgrade

### 1. Determine your upgrade path

Use the table below to determine the most efficient upgrade path from your current version to the latest versions of Confluence.

Your Version	Recommended upgrade path to Confluence 6
2.7 or earlier	Upgrade to <b>2.7.4</b> then upgrade to <b>3.5.17</b> , and follow paths below.
2.8 to 3.4	Upgrade to <b>3.5.17</b> , and follow paths below.
3.5	Upgrade to <b>5.0.3</b> then upgrade to the latest version of <a href="#">Confluence 6</a> .
4.0 to 4.3	Upgrade to <b>5.10.x</b> then upgrade to the latest version of <a href="#">Confluence 6</a> .
5.0 to 6.x	Upgrade directly to the latest version of <a href="#">Confluence 6</a> .

### Confluence 6 is a major upgrade

Be sure to read the [Confluence 6.0 Upgrade Notes](#), take a full backup, and test your upgrade in a non-production environment before upgrading your production site.

### 2. Complete the pre-upgrade checks

1. Check the [Upgrade Notes](#) for the version you plan to upgrade to (and any in between).

2. Go to



> **General Configuration** > **Troubleshooting and support tools** to run the health check (available in Confluence 5.5 or later).

▼ [License expired?](#)

If the software maintenance period included in your license has expired you can keep using Confluence, but you'll need to renew before you can upgrade.

Go to



> **General Configuration** > **License Details** and follow the prompts to renew your license.

▼ **Still using the embedded database?**

If you are using the **embedded (trial) database** you should [migrate to a different database](#) before upgrading.

This database is supplied for evaluation purposes only and is not recommended for production environments. See [Embedded H2 Database](#) for more information.

▼ **Database character encoding incorrect?**

Database character encoding must be set to UTF+8 (or AL32UTF8 for Oracle databases). You will not be able to upgrade to current Confluence versions unless you have the correct character encoding.

3. Go to



> **Add-ons** and scroll down to the **Confluence Update Check** to check the compatibility of your add-ons.

4. Choose the version you plan to upgrade to then hit **Check**.

▼ **If you have incompatible add-ons...**

If your users rely on particular add-ons, you may want to wait until they are compatible before upgrading Confluence. Add-on vendors generally update their add-ons very soon after a major release.

**Good to know:**

- You can disable an add-on temporarily while you upgrade if it is not yet compatible.
- Compatibility information for Atlassian Labs and other free add-ons is often not available immediately after a new release. In many cases the add-on will still work, so give it a try in a test site before upgrading your production site.

### 3. Upgrade Confluence in a test environment

1. Create a staging copy of your current production environment.  
See [Create a staging environment for upgrading Confluence](#) for help creating an environment to test your upgrade in.
2. Follow the steps below to upgrade your test environment.
3. Test any unsupported add-ons, customizations (such as custom theme or layouts) and proxy configuration (if possible) before upgrading your production environment.

## Upgrade Confluence

### 4. Back up

1. Back up your **database** and confirm the backup was created properly.  
If your database does not support online backups you'll need to stop Confluence first.
2. Back up your **installation directory**  
The installer will completely replace this directory, so any files you've added (such as a keystore or SSL certificate) won't be retained. The installation wizard will back up this directory before starting the upgrade, but you should also back it up manually first.
3. Back up your **home directory**.  
The installation wizard gives you the option to also back up your home directory as part of the installation process, but you should also back up this directory manually before starting the upgrade.

▼ [Where is my home directory?](#)

You can find the location of your home directory in the `<installation-directory>/confluence/WEB-INF/classes/confluence-init.properties` file.

This is where your search indexes and attachments are stored. If you store attachments outside the Confluence Home directory, you should also backup your attachments directory.

## 5. Download Confluence

Download the installer for your operating system.

- Latest version <https://www.atlassian.com/software/confluence/download>
- Older versions <https://www.atlassian.com/software/confluence/download-archives>

## 6. Run the installer

### 1. Run the installer.

▼ [Show me how to do this in Windows...](#)

Run the .exe file. We recommend using a Windows administrator account.

If prompted to allow the upgrade wizard to make changes to your computer, choose '**Yes**'. If you do not, the installation wizard will have restricted access to your operating system and any subsequent installation options will be limited.

▼ [Show me how to do this in Linux...](#)

Change to the directory where you downloaded Confluence then execute this command to make the installer executable:

```
$ chmod a+x atlassian-confluence-X.X.X-x64.bin
```

Where `X.X.X` is the Confluence version you downloaded.

Next, run the installer – we recommend using `sudo` to run the installer:

```
$ sudo ./atlassian-confluence-X.X.X-x64.bin
```

You can also choose to run the installer with root user privileges.

### 2. Follow the prompts to upgrade Confluence:

- a. When prompted choose **Upgrade an existing Confluence installation** (for Linux users this is option 3).
- b. Make sure the **Existing Confluence installation directory** suggested by the wizard is correct (especially important if you have multiple Confluence installations on the same machine).
- c. **Back up Confluence home** is strongly recommended. This will create a .zip backup of the Confluence home and installation directories.
- d. The installation wizard notifies you of customizations in the Confluence Installation directory. Make a note of these as you'll need to reapply them later.

▼ [There are some limitations...](#)

The installation wizard's ability to notify you about customizations will depend on how your existing Confluence instance was installed:

- If your current Confluence instance was installed using the installer, the wizard will

- check the entire Confluence Installation directory.
- If your current Confluence instance was installed manually it will only check the `confluence` subdirectory of the Confluence Installation directory. The installation wizard will **not** notify you of modifications in any other directory, for example modifications to start-up scripts under the `bin` directory or modifications to the `server.xml` file (such as an SSL configuration).

You won't be notified about files you've added to the installation directory, so be sure to back them up first.

3. The wizard will shut down your Confluence instance and proceed with the upgrade. Once complete, it will restart Confluence and you can then launch Confluence in your browser to confirm the upgrade was successful.

Depending on the size of your instance and the number of upgrade tasks to be run, this step may take a few minutes or several hours.

## After the upgrade

### 7. Copy your database driver

If you're using an Oracle or MySQL database, you'll need to copy the jdbc driver jar file from your existing Confluence installation directory to `confluence/WEB-INF/lib` in your new installation directory.

Microsoft SQL and Postgres users can skip this step.

### 8. Re-apply any modifications

During the upgrade the wizard migrated the following from your existing Confluence installation:

- TCP port values in your `<install-directory>/conf/server.xml` file.
- Location of your Confluence home directory in `<install-directory>/confluence/WEB-INF/classes/confluence-init.properties`.

All other customizations, including `CATALINA_OPTS` parameters in your `<install-directory>/bin/setenv.sh / setenv.bat` files, need to be reapplied manually.

#### ▼ Show me how to do this...

Any other configurations, customizations (including any other modifications in the `<install-directory>/conf/server.xml` file), or additional files added to the installation directory are **not migrated** during the upgrade and need to be reapplied manually.

1. Stop your upgraded Confluence instance.
2. Edit each file, and reapply the customizations in your upgraded Confluence Installation directory.
3. Copy over any additional files (such as keystore or SSL certificate)
4. Restart the upgraded Confluence instance.

We **strongly recommend** you test your customizations in a test instance prior to upgrading your production instance as changes may have been made to Confluence that make your customizations unusable.

### 9. Update your reverse proxy and check you can access Confluence

If you are upgrading from **Confluence 5.x to Confluence 6.x** you will need to modify your reverse proxy (if used) to add Synchrony, which is required for collaborative editing. See [Proxy and SSL considerations](#) for more information on the changes you'll need to make to your proxy config.

Once your upgrade is complete, you should access Confluence (via your reverse proxy, not directly) and:

- Head to



- > **General Configuration** > **Collaborative editing** and check the Synchrony status is **running**.
- Edit any page to check that your browser can connect to Synchrony.

See [Troubleshooting Collaborative Editing](#) for suggested next steps if Synchrony is not running or you see an error in the editor, as you may have a misconfigured reverse proxy.

## Troubleshooting

### Did something go wrong?

If you need to retry the upgrade, **you must restore your pre-upgrade backups first**. Do not attempt to run an upgrade again, or start the older version of Confluence again after an upgrade has failed.

#### Some common issues while upgrading...

- **Can't proceed with upgrade because license has expired**  
If your license has expired and was not renewed and reapplied before upgrading you will receive errors during the upgrade process. See [upgrading beyond current license period](#) for information on how to resolve this problem.
- **Can't proceed with upgrade because of a conflict with anti virus**  
Some anti-virus or other Internet security tools may interfere with the Confluence upgrade process and prevent the process from completing successfully, particularly if you run Confluence as a Windows service. If you experience or anticipate experiencing such an issue with your anti-virus / Internet security tool, disable this tool first before proceeding with the Confluence upgrade.
- **Database does not support online backups**  
The upgrade wizard will prompt you to backup your database using your database's backup utilities. If your database does not support online backups, stop the upgrade process, shut down Confluence, perform your database backup and then run the installer again to continue with the upgrade.
- **Upgrade is taking a very long time**  
If you have a very large database (i.e. database backups take a very long time to complete), setting the `confluence.upgrade.recovery.file.enabled` [system property](#) to false will speed up the upgrade process. It should be used only when there is a process to back up database and verify the backup before performing an upgrade.
- **Confluence doesn't start**  
Incompatible add-ons can occasionally prevent Confluence from starting successfully. You can troubleshoot the problem by starting Confluence with all user installed add-ons temporarily disabled. See [Start and Stop Confluence](#) for more info.
- **Collaborative editing errors**  
If Synchrony is not running or you see an error, head to [Troubleshooting Collaborative Editing](#) for info on how to get collaborative editing up and running in your environment. The most common problems are a misconfigured reverse proxy or port 8091 not being available for Synchrony.

You can also refer to the [Upgrade Troubleshooting](#) guide in the Confluence Knowledge Base, or check for answers from the community at [Atlassian Answers](#).

## Upgrading Beyond Current Licensed Period

This page covers what to do if you have upgraded Confluence to a version beyond your current license entitlement.

### Related pages:


- [Upgrading Confluence](#)
- [Working with Confluence Logs](#)


### License warnings

During the upgrade you will see an error similar to the following in your application [log file](#).

```
ERROR [confluence.upgrade.impl.DefaultUpgradeManager]
runUpgradePrerequisites
Current license is not valid: SUPPORT_EXPIRED
```

When you try to access Confluence in your browser, you'll see this warning:





### Confluence had problems starting up


This page is for Confluence administrators. If you're seeing this page, your Confluence administrator is probably working to restore the service.

Description	Time	Level	Exception
Confluence support and upgrades for your current license have expired.  Please access <a href="#">My Atlassian</a> as the license contact and purchase a license renewal for Confluence. If you have a new license, please enter it on <a href="#">this page</a> and <b>restart</b> .  Alternatively, you can continue using Confluence by rolling back to a previous version. To do this you must perform a clean installation of Confluence of the version that needs to be restored then restore the confluence home directory to its pre-upgrade state. No database restorations need to be made.	2017-10-30 15:29:09	error	

If you're unable to fix the problems and need to contact support, we can respond faster if you provide [the logs](#) of your instance.

## Updating the Confluence license

1. Head to [my.atlassian.com](https://my.atlassian.com) to renew your license or purchase a new license.
2. Follow the prompts on the warning screen to enter your new license key.

 **Update Confluence License**

You do not have a license installed for this Confluence installation.

You can enter your license key below, or obtain an [evaluation key online](#).

License

Save

3. Restart Confluence to pick up the license change. You should now be able to log in to Confluence as normal.

## Confluence Post-Upgrade Checks

This article provides a list of items for Confluence Administrators to check after a [Confluence upgrade](#) to ensure that it has completed successfully. This list is not exhaustive, but it does cover common upgrade mistakes.



## Before You Begin

After you have completed an upgrade, you should see the following message in the `atlassian-confluence.log` file:

```
2010-03-08 08:03:58,899 INFO [main]
[atlassian.confluence.upgrade.AbstractUpgradeManager] entireupgradeFinished Upgrade
completed successfully
```

If you do not see the line in your log similar to the one above, this means that your upgrade may not have completed successfully. Please check our [Upgrade Troubleshooting](#) documentation to check for a suitable recommendation or fix.

## Upgrade Checklist

Here's a recommended list of things to check after completing an upgrade

### 1. The editor

Edit a page to check your browser can connect to Synchrony, which is required for collaborative editing. See [Troubleshooting Collaborative Editing](#) if you are not able to edit a page.

### 2. Layout and Menu

Visit the [Confluence dashboard](#) and check that it is accessible and displays as expected. Test the different Internet browsers that you have in use in your environment. In addition, confirm that the [layout](#) appears as expected and that the menus are clickable and functioning.

### 3. Search

Try [searching for content](#), for example pages, attachments or user names. Check that the expected results are returned.

### 4. Permissions

Confirm that you can visit a page that has [view restrictions](#), but you have permission to view. Confirm that you can edit a page that has edit restrictions but you have permission to edit. Make sure that the permissions of child pages are functioning as well. Involve as many space administrators as possible to confirm they are working. Confirm that anonymous or forbidden users cannot access or modify restricted pages.

### 5. Attachments

Confirm that [attachments](#) are accessible and searchable.

### 6. Add-ons

Outdated third-party [add-ons](#) can cause upgrade failure. Quite often, they will just be incompatible and simply do not work anymore. If you discover that your add-on is no longer working, please check for the latest version for your add-on in the [The Atlassian Marketplace](#) or check for compatibility in the [Universal Plugin Manager](#).

## Migration from Wiki Markup to XHTML-Based Storage Format

If you are upgrading **to Confluence 4.0 or later** from an older version (From Confluence 3.5.x or earlier) then as part of the upgrade an automatic migration of your content will take place. This is a non-destructive process. Your existing content is not overwritten. Instead, the migration process will create a new version of each wiki markup page. The new version will use the new XHTML-based storage format, so that you can edit the page in the Confluence rich text editor.

In addition, if you are **upgrading to Confluence 4.3 or later** from an older version then as part of the upgrade an automatic migration of your page templates will take place. See [Migration of Templates from Wiki Markup to XHTML-Based Storage Format](#).

**Note:** Even though the process is non-destructive, you must be sure to perform a backup of your database and home directory prior to starting the new version of Confluence, as we recommend for any [Confluence upgrade](#).

## Migration process

Depending on the size of your Confluence installation, the migration from wiki markup to the new XHTML-based storage format could prove time consuming. The duration of the migration is difficult to estimate; this is due to a number of site specific factors. As a rough guide, a test dataset we migrated was 130,000 pages, totalling approximately 700Mb, which took six minutes.

### On this page:

- [Migration process](#)
- [Watching the migration logs during the upgrade](#)
- [Re-running the migration – for content that completely failed the migration](#)
- [Re-attempting the migration – for content in 'unmigrated-wiki-markup' macro](#)
- [Notes](#)

### Related pages:

- [Migration of Templates from Wiki Markup to XHTML-Based Storage Format](#)
- [Upgrading Confluence](#)

The following properties that can be modified to allow finer control over the migration process:

Property	Purpose	Default
confluence.wiki.migration.threads	The number of concurrent worker threads migrating content	4
confluence.wiki.migration.batch.size	The number of items migrated in each batch of work	500
confluence.wiki.migration.version comment	The comment associated with the newly migrated version of each piece of content	"Migrated to Confluence 4.0"

(For instructions on setting Confluence system properties see [this document](#).)

Again, due to the large variability in Confluence installations it is hard to give specific recommendations for the above settings. One point to note though that both increasing batch size and the number of threads (or both) will increase the peak memory required for migration. If memory is an issue then as you increase one of these settings consider decreasing the other.

Another factor to be aware of if modifying these defaults is that of the cache settings employed in your site. The migration will quickly populate certain Confluence caches so be sure that if you have customized caches as [described here](#) that there is enough memory on the server for these caches should they reach maximum capacity.

## Watching the migration logs during the upgrade

To monitor the progress of a site migration you should watch the output in the [application log](#).

Typical logging progress will be shown by multiple log entries at the INFO level of the following format:

```
WikiToXhtmlMigrationThread-n - Migrated 2500 of 158432 pages, this batch
migrated 500/500 without error
```

There may be a wide array of messages logged from each individual page but any errors are also collected for display in a single migration report once all content has been processed. Here is a typical example of such a report:

```
Wiki to XHTML Exception Report:
Summary:
  0 settings values failed.
  0 PageTemplates failed.
  2 ContentEntityObjects failed.
Content Exceptions:
  1) Type: page, Id: 332, Title: Release Notes 1.0b3, Space: DOC -
Confluence 4.0 Beta. Cause:
com.atlassian.confluence.content.render.xhtml.migration.exceptions.Unkno
wnMacroMigrationException: The macro link is unknown.. Message: The
macro link is unknown.
  2) Type: comment, Id: 6919, Title: null, Global Scope. Cause:
com.atlassian.confluence.content.render.xhtml.migration.exceptions.Unkno
wnMacroMigrationException: The macro mymacro is unknown.. Message: The
macro mymacro is unknown.
```

Each entry in the report will identify the content that caused migration exceptions as well as displaying the exceptions themselves.

In almost all cases any content reported as errored will have been migrated to the new XHTML-based storage format, but will actually consist of wiki markup content wrapped within an XML 'unmigrated-wiki-markup' macro. This content will still be viewable in Confluence and editable within the new Confluence Editor.

However, in some cases a batch of content may actually have completely failed to migrate. This is most typically due to an unhandled exception causing a database transaction rollback. This would be reported in the log with a message like this:

```
Unable to start up Confluence. Fatal error during startup sequence:
confluence.lifecycle.core:pluginframeworkdependentupgrades (Run all the
upgrades that require the plugin framework to be available) -
com.atlassian.confluence.content.render.xhtml.migration.exceptions.Migra
tionException: java.util.concurrent.ExecutionException:
org.springframework.transaction.UnexpectedRollbackException: Transaction
rolled back because it has been marked as rollback-only
```

Confluence provides no further report about this scenario and will also allow Confluence to restart as normal without retrying a migration. If a user tries to view any such unmigrated content they will see an exception similar to this:

```
java.lang.UnsupportedOperationException: The body of this
ContentEntityObject ('Page Title') was 'WIKI' but was expected to be
'XHTML'
```

The solution is to ensure you manually re-run the site migration after the restart.

### Re-running the migration – for content that completely failed the migration

A Confluence Administrator can restart the site migration if there was any content that failed migration (see previous section). Only the content that is still formatted in wiki markup will be migrated, so typically a re-migration will take less time than the original migration.

To manually re-run migration:

1. Open this URL in your browser: <Confluence Address>/admin/force-upgrade.action
2. Select **wikiToXhtmlIMigrationUpgradeTask** in the **Upgrade task to run** dropdown list.

### 3. Choose **Force Upgrade**.

## Force Upgrade

This will run the selected upgrade task. You should only run any of these tasks if you were directed here by support documentation.

Upgrade task to run wikiToXhtmlMigrationUpgradeTask ▼

Migrate all wiki formatted content in this Confluence instance to XHTML

Force Upgrade Cancel

### Re-attempting the migration – for content in 'unmigrated-wiki-markup' macro

The previous section was about dealing with the exceptional circumstance where certain content was left completely unmigrated. The most common migration problem is that the content was migrated but remains formatted as wiki markup on the page, within the body of an 'unmigrated-wiki-markup' macro. Any content which is referenced in the migration report will be found in this state. This content is still viewable and editable but since it is wiki markup it cannot be edited using the full feature set of the rich text editor.

The most common reason for content to be in this state is that the page contains an unknown macro, or a macro that is not compatible with Confluence 4.x.

There are two possible fixes for this situation:

1. Install a version of the macro that is compatible with Confluence 4.x. See [Plugin Development Upgrade FAQ for 4.0](#).
2. Edit the page and remove the problematic macro.

Regardless of the solution you choose, you can then force a re-migration of all the content (including content in templates) that was left wrapped in an 'unmigrated-wiki-markup' macro. This feature is found at `<Confluence Address>/admin/unmigratedcontent.action`

## Update content with incompatible macros

Confluence has detected that there are **0 pages** with macros that are not yet Confluence 4+ compatible. To ensure backwards compatibility, these macros are still being rendered as wiki markup when editing your pages.

If you have recently updated plugins, you should update your content to ensure that any macros that are not Confluence 4 compatible become compatible. You may have to run the update several times as you update incompatible macros.

### Update Check

#### Update not required

You have not installed any new plugins since your last content upgrade. You do not need to run this upgrade unless you have been advised to by Atlassian Support staff.

**Note:** Once an upgrade has commenced you will not be able to pause or undo the upgrade. An update can severely affect the performance of your instance, we recommend you conduct this update during a quiet time. Users editing a page as it is updated may receive notice of a conflicting edit.

[Update Content](#)

## Notes

We refer to the Confluence storage format as 'XHTML-based'. To be correct, we should call it XML, because the Confluence storage format does not comply with the XHTML definition. In particular, Confluence includes custom elements for macros and more. We're using the term 'XHTML-based' to indicate that there is a large proportion of HTML in the storage format.

## Migration of Templates from Wiki Markup to XHTML-Based Storage Format

If you are **upgrading to Confluence 4.3 or later from an older version** (from Confluence 4.2.x or earlier) then as part of the upgrade an automatic migration of your page templates will take place. This is a non-destructive process. Your existing content is not overwritten. Instead, the migration process will create a new version of each space template and each global template on your Confluence site. The new version will use the new XHTML-based storage format, so that you can edit the template in the Confluence rich text editor.

**Note:** Nevertheless, you must be sure to perform a backup of your database and home directory prior to starting the new version of Confluence, as we recommend for any [Confluence upgrade](#).

## Watching the migration logs during the upgrade

To monitor the progress of a site migration you should watch the output in the [application log](#).

A typical logging progress will be shown by multiple log entries at the INFO level of the following format:

```
WikiToXhtmlMigrationThread-n - Migrated 22 of 29 PageTemplates.
```

### On this page:

- [Watching the migration logs during the upgrade](#)
- [Re-running the migration](#)
- [Notes](#)

### Related pages:

- [Migration from Wiki Markup to XHTML-Based Storage Format](#)
- [Page Templates](#)
- [Upgrading Confluence](#)

There may be a wide array of messages logged from each individual template, but any errors are also collected for display in a single migration report once all content has been processed. Here is a typical example of such a report:

```
Wiki to XHTML Exception Report:
Summary:
  0 settings values failed.
  2 PageTemplates failed.
  0 ContentEntityObjects failed.
Content Exceptions:
  1) Type: page, Id: 332, Title: Release Notes 1.0b3, Space: DOC -
Confluence 4.0 Beta. Cause:
com.atlassian.confluence.content.render.xhtml.migration.exceptions.Unkno
wnMacroMigrationException: The macro link is unknown.. Message: The
macro link is unknown.
  2) Type: comment, Id: 6919, Title: null, Global Scope. Cause:
com.atlassian.confluence.content.render.xhtml.migration.exceptions.Unkno
wnMacroMigrationException: The macro mymacro is unknown.. Message: The
macro mymacro is unknown.
```

Each entry in the report will identify the content that caused migration exceptions as well as displaying the

exceptions themselves.

In almost all cases any content reported as errored will have been migrated to the new XHTML-based storage format, but will actually consist of wiki markup content wrapped within an XML 'unmigrated-wiki-markup' macro. This content will still be viewable in Confluence and editable within the Confluence rich text editor.

However, in some cases a batch of content may actually have completely failed to migrate. This is most typically due to an unhandled exception causing a database transaction rollback. This would be reported in the log with a message like this:

```
Unable to start up Confluence. Fatal error during startup sequence:  
confluence.lifecycle.core:pluginframeworkdependentupgrades (Run all the  
upgrades that require the plugin framework to be available) -  
com.atlassian.confluence.content.render.xhtml.migration.exceptions.Migra  
tionException: java.util.concurrent.ExecutionException:  
org.springframework.transaction.UnexpectedRollbackException: Transaction  
rolled back because it has been marked as rollback-only
```

Confluence provides no further report about this scenario and will also allow Confluence to restart as normal without retrying a migration. If a user tries to view or edit an unmigrated template, the wiki template editor will be used.

The solution is to manually re-run the site migration after the restart, as described below.

### Re-running the migration

A Confluence administrator can restart the template migration if any templates have failed the migration (see previous section). Only the templates that are still formatted in wiki markup will be migrated again. Typically, a re-migration will take less time than the original migration.

#### To manually re-run the migration:

1. Open this URL in your browser: <Confluence Address>/admin/force-upgrade.action
2. Select **pageTemplateWikiToXhtmlMigrationUpgradeTask** in the **Upgrade task to run** dropdown list.
3. Choose **Force Upgrade**.

*Screenshot: The 'Force Upgrade' screen in the Confluence administration console*

**Force Upgrade**

This will run the selected upgrade task. You should only run any of these tasks if you were directed here by support documentation.

Upgrade task to run **pageTemplateWikiToXhtmlMigration**

Migrate all wiki formatted page templates in this Confluence instance to XHTML

**Force Upgrade** Cancel

### Notes

We refer to the Confluence storage format as 'XHTML-based'. To be correct, we should call it XML, because the Confluence storage format does not comply with the XHTML definition. In particular, Confluence includes custom elements for macros and more. We're using the term 'XHTML-based' to indicate that there is a large proportion of HTML in the storage format.

## Upgrading Confluence Manually

In this guide we'll run you through upgrading your Confluence site to the latest Confluence version on Windows or Linux using the zip / tar.gz file.

Upgrading to any later version is free if you have current software maintenance. See our [Licensing FAQ](#) to find out more.



### Other ways to upgrade Confluence:

- [Installer](#) – the simplest way to upgrade Confluence.
- [Data Center](#) – upgrade your Data Center cluster.

XML backups should **not** be used to upgrade Confluence.

### Before you begin

Before you upgrade Confluence, there's a few questions you need to answer.

<p>Is manual the right upgrade method for you?</p>	<p><a href="#">Tell me more...</a></p> <p>You can choose to upgrade using the installer, or manually using a zip or tar.gz file. In most cases the installer is the easiest way to upgrade your Confluence instance.</p> <p>You will need to <a href="#">upgrade manually</a> if:</p> <ul style="list-style-type: none"> <li>• you are moving to another operating system or file location as part of this upgrade.</li> <li>• you are upgrading from <b>Confluence 3.5 or earlier</b></li> <li>• you are upgrading from <b>Confluence 5.6</b> or earlier and previously used the <b>EAR/WAR distribution</b> to deploy Confluence into an existing application server.</li> </ul>
--	--

### On this page:

[Before you begin](#)

[Plan your upgrade](#)

1. Determine your upgrade path
2. Complete the pre-upgrade checks
3. Upgrade Confluence in a test environment

[Upgrade Confluence](#)

4. Back up
5. Download Confluence
6. Extract the file and upgrade Confluence

[After the upgrade](#)

7. Re-apply any modifications
8. Update your reverse proxy and check you can access Confluence

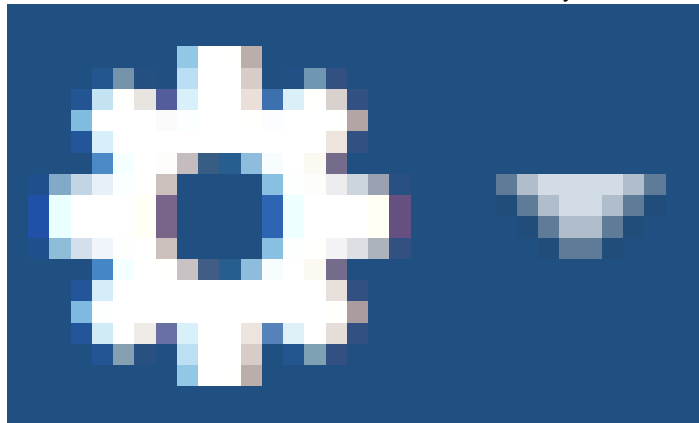
[Troubleshooting](#)



Are you eligible to upgrade?

[Tell me more...](#)

To check if software maintenance is current for your license, go to



> **General Configuration > Troubleshooting and support tools** and make sure the license support period has not expired.

#### License Details

Here are your current license details.

To update your Confluence license, enter your new license key below.

Organisation	Atlassian
Date purchased	Dec 06, 2016
License type	Sample license
Licensed users	500 (4 signed up currently) <a href="#">Learn more</a>
	<input type="button" value="Refresh"/>
Support period	Your commercial Confluence support and updates are available until Dec 06, 2017. <a href="#">Learn more</a>
Support Entitlement Number	SEN-500
Server ID	BE8C-MMO5-V88S-6MWC (Atlassian sales or support may ask you to provide this ID)

**Software maintenance**  
Upgrade at any time during this period

If your support period has expired, follow the prompts to renew your license and reapply it before upgrading.

Have our supported platforms changed?

[Tell me more...](#)

Check the [Supported Platforms](#) page for the version of Confluence you are upgrading to. This will give you info on supported operating systems, databases and browsers.

#### Good to know:

- If you need to upgrade Java, remember to update your JAVA\_HOME variable to the new version.
- The Confluence installer includes Tomcat, so you won't need to upgrade it separately.
- If you need to upgrade your database, be sure to read the upgrade notes for the Confluence version you plan to upgrade to (and any in-between) to check for any database configuration changes that you may need to make.

Do you need to make changes to your environment?	<p>▼ <a href="#">Tell me more...</a></p> <p>Newer Confluence versions sometimes require changes to your environment, such as providing more memory or adjusting your reverse proxy settings.</p> <p><b>Good to know:</b></p> <p>We use <a href="#">Upgrade Notes</a> to communicate changes that will impact you, such as:</p> <ul style="list-style-type: none"> <li>• Changes to supported databases, memory requirements or other changes that will impact your environment.</li> <li>• Features that have significantly changed or been removed in this release.</li> <li>• Actions you may need to take in your instance or environment immediately after the upgrade.</li> </ul> <p>It's important to read the notes for the version you're upgrading to and those in-between. For example, if you are upgrading from 5.8 to 5.10 you should read the upgrade notes for 5.9 and 5.10.</p>
--	---

## Plan your upgrade

### 1. Determine your upgrade path

Use the table below to determine the most efficient upgrade path from your current version to the latest versions of Confluence.

Your Version	Recommended upgrade path to Confluence 6
2.7 or earlier	Upgrade to <b>2.7.4</b> then upgrade to <b>3.5.17</b> , and follow paths below.
2.8 to 3.4	Upgrade to <b>3.5.17</b> , and follow paths below.
3.5	Upgrade to <b>5.0.3</b> then upgrade to the latest version of <a href="#">Confluence 6</a> .
4.0 to 4.3	Upgrade to <b>5.10.x</b> then upgrade to the latest version of <a href="#">Confluence 6</a> .
5.0 to 6.x	Upgrade directly to the latest version of <a href="#">Confluence 6</a> .

### Confluence 6 is a major upgrade

Be sure to read the [Confluence 6.0 Upgrade Notes](#), take a full backup, and test your upgrade in a non-production environment before upgrading your production site.

### 2. Complete the pre-upgrade checks

1. Check the [Upgrade Notes](#) for the version you plan to upgrade to (and any in between).

2. Go to



> **General Configuration > Troubleshooting and support tools** to run the health check (available in Confluence 5.5 or later).

#### ▼ [License expired?](#)

If the software maintenance period included in your license has expired you can keep using Confluence, but you'll need to renew before you can upgrade.

Go to



> **General Configuration > License Details** and follow the prompts to renew your license.

▼ [Still using the embedded database?](#)

If you are using the **embedded (trial) database** you should [migrate to a different database](#) before upgrading.

This database is supplied for evaluation purposes only and is not recommended for production environments. See [Embedded H2 Database](#) for more information.

▼ [Database character encoding incorrect?](#)

Database character encoding must be set to UTF+8 (or AL32UTF8 for Oracle databases). You will not be able to upgrade to current Confluence versions unless you have the correct character encoding.

3. Go to



> **Add-ons** and scroll down to the **Confluence Update Check** to check the compatibility of your add-ons.

4. Choose the version you plan to upgrade to then hit **Check**.

▼ [If you have incompatible add-ons...](#)

If your users rely on particular add-ons, you may want to wait until they are compatible before upgrading Confluence. Add-on vendors generally update their add-ons very soon after a major release.

**Good to know:**

- You can disable an add-on temporarily while you upgrade if it is not yet compatible.
- Compatibility information for Atlassian Labs and other free add-ons is often not available immediately after a new release. In many cases the add-on will still work, so give it a try in a test site before upgrading your production site.

### 3. Upgrade Confluence in a test environment

1. Create a staging copy of your current production environment.  
See [Create a staging environment for upgrading Confluence](#) for help creating an environment to test your upgrade in.
2. Follow the steps below to upgrade your test environment.
3. Test any unsupported add-ons, customizations (such as custom theme or layouts) and proxy configuration (if possible) before upgrading your production environment.

## Upgrade Confluence

### 4. Back up

1. Back up your database and confirm the backup was created properly.  
If your database does not support online backups you'll need to stop Confluence first.
2. Back up your **installation directory** and **home directory**.

▼ [Where is my home directory?](#)

You can find the location of your home directory in the `<installation-directory>/confluence/WEB-INF/classes/confluence-init.properties` file.

This is where your search indexes and attachments are stored. If you store attachments outside the Confluence Home directory, you should also backup your attachments directory.

### 5. Download Confluence

Download the appropriate file for your operating system - <https://www.atlassian.com/software/confluence/download>

## 6. Extract the file and upgrade Confluence

1. Stop Confluence.
2. Extract (unzip) the files to a directory (this is your new installation directory, and must be different to your existing installation directory)  
Note: There are some known issues with unzipping the archive on Windows. We recommend using 7Zip or Winzip.
3. Edit `<Installation-Directory>\confluence\WEB-INF\classes\confluence-init.properties` file to point to your **existing** Confluence home directory.
4. Copy your jdbc driver jar file from your existing Confluence installation directory to `confluence/WEB-INF/lib` in your **new installation directory**.

5. There are some additional steps you may need to take if:

- you are running Confluence as a **Windows Service**

▼ [Click here to expand...](#)

If you are running Confluence as a Windows service, go to the command prompt and type:

```
<Installation-Directory>\bin\service.bat remove
Confluence
```

It is vital that you stop and remove the existing service *prior to uninstalling* the old instance of Confluence. For more information on running Confluence as Windows service, please refer to [Start Confluence Automatically on Windows as a Service](#).

⚠ To remove the service installed by the Confluence installer, you'll need to run `<confluence auto installer installation folder>\UninstallService.bat`.

- you use a **Jira** application or **LDAP** for user management

▼ [Click here to expand...](#)

If you use Jira or LDAP for user management, copy the following files from your existing installation directory to your new installation directory:

- `<Installation-Directory>/confluence/WEB-INF/classes/osuser.xml`
- `<Installation-Directory>/confluence/WEB-INF/classes/atlassian-user.xml`

- you use **Crowd** for user management

▼ [Click here to expand...](#)

If you are using Crowd for user management, copy the following files from your existing installation directory to your new installation directory:

- `<Installation-Directory>/confluence/WEB-INF/classes/osuser.xml`
- `<Installation-Directory>/confluence/WEB-INF/classes/atlassian-user.xml` (if you are upgrading from Confluence 2.2 or later).
- `<Installation-Directory>/confluence/WEB-INF/classes/crowd.properties`

- You are running Confluence on a different port (not the default 8090)

▼ [Click here to expand...](#)

If you are not running Confluence on port 8090 update `<Installation-Directory>\conf\server.xml` file to include your ports.

6. Start your new Confluence. You should not see the setup wizard.

## After the upgrade

### 7. Re-apply any modifications

If you have customized Confluence (such as an SSL configuration in the `server.xml` file, or `CATALINA_OPTS` or `JAVA_OPTS` parameters in your `confluence-init.properties` file), you'll need to perform the following steps after the upgrade is complete:


1. Stop your upgraded Confluence instance.
2. Reapply the customizations to the relevant files in the newly upgraded Confluence Installation directory.
3. Restart the upgraded Confluence instance.

We **strongly recommend** you test your customizations in a test instance prior to upgrading your production instance as changes may have been made to Confluence that make your customizations unusable.

### 8. Update your reverse proxy and check you can access Confluence

If you are upgrading from **Confluence 5.x to Confluence 6.x** you will need to modify your reverse proxy (if used) to add Synchrony, which is required for collaborative editing. See [Proxy and SSL considerations](#) for more information on the changes you'll need to make to your proxy config.

Once your upgrade is complete, you should access Confluence (via your reverse proxy, not directly) and:

- Head to  > **General Configuration** > **Collaborative editing** and check the Synchrony status is **running**.
- Edit any page to check that your browser can connect to Synchrony.

See [Troubleshooting Collaborative Editing](#) for suggested next steps if Synchrony is not running or you see an error in the editor, as you may have a misconfigured reverse proxy.

## Troubleshooting

### Did something go wrong?

If you need to retry the upgrade, **you must restore your pre-upgrade backups first**. Do not attempt to run an upgrade again, or start the older version of Confluence again after an upgrade has failed.

#### ▼ Some common issues while upgrading...

- **Can't proceed with upgrade because license has expired**  
If your license has expired and was not renewed and reapplied before upgrading you will receive errors during the upgrade process. See [upgrading beyond current license period](#) for information on how to resolve this problem.
- **Collaborative editing errors**  
If Synchrony is not running or you see an error, head to [Troubleshooting Collaborative Editing](#) for info on how to get collaborative editing up and running in your environment. The most common problems are a misconfigured reverse proxy or port 8091 not being available for Synchrony.

You can also refer to the [Upgrade Troubleshooting](#) guide in the Confluence Knowledge Base, or check for answers from the community at [Atlassian Answers](#).

## Create a staging environment for upgrading Confluence

When you upgrade Confluence we strongly recommend performing the upgrade in a test

### On this page:

- [Create a staging environment](#)
- [Upgrade your staging environment](#)

environment before upgrading your production site. In this guide we'll refer to this test environment as *staging*.

Most Confluence licenses include a free developer license for use in a staging environment. See [How to get a Confluence Developer license](#) to find out how to access your license.

## Create a staging environment

### 1 Replicate your environment

Your staging environment should closely replicate your real-live environment (production), including any reverse proxies, SSL configuration, or load balancer (for Data Center). You may decide to use a different physical server or a virtualized solution. The main thing is to make sure it is an appropriate replica of your production environment.

For the purposes of these instructions, we assume your staging environment is physically separate from your production environment, and has the same operating system (and Java version if you've installed Confluence manually).

### 2 Replicate your database

To replicate your database:

1. Back up your production database. Refer to the documentation for your database for more info on the best way to do this.
2. Install your database on the staging server and restore the backup.

The steps for restoring your database backup will differ depending on your chosen database and backup tool. Make sure:

- Your new staging database has a **different** name from your production database.
- Your staging database user account has the **same** username and password as your production database user account.
- Character encoding and other configurations are the same as your production database (for example character encoding should be Unicode UTF-8 (or AL32UTF8 for Oracle databases)).

### 3 Replicate Confluence

To replicate Confluence, make a copy of your Confluence installation and point it to your staging database. These instructions are for Confluence Server (for Data Center there are some [additional steps](#) before you start Confluence).

1. Copy your entire **production installation directory** to your staging server.
2. Copy your entire **production home directory** to your staging server.
3. Edit `<installation-directory>/confluence/WEB-INF/classes/confluence-init.properties` to point to your staging home directory.
4. Edit `<home-directory>/confluence.cfg.xml` or `<installation-directory>/server.xml` to point to your staging database.

▼ If you're using a direct JDBC connection, the line you need to update in `confluence.cfg.xml` will look something like this...

```
<property
name="hibernate.connection.url">jdbc:postgresql://localhost:54
32/confluencestaging</property>
```

▼ If you're using a datasource connection, the lines you need to update in `server.xml` will look something like this...

```
<Resource name="jdbc/confluence" auth="Container"
type="javax.sql.DataSource"
  username="postgres"
  password="postgres"
  driverClassName="org.postgresql.Driver"
  url="jdbc:postgresql://localhost:5432/confluencestaging"
  maxTotal="60"
  maxIdle="20"
  validationQuery="select 1" />
```

5. Start Confluence with the following [System Properties](#) to make sure your staging site does not send notifications to real users.

```
-Datlassian.notifications.disabled=true
-Datlassian.mail.senddisabled=true
```

6. Head to `http://localhost:<port>` and log in to Confluence on your staging server.

7. Go to



> **General Configuration**

and change the **base URL** of your staging site (for example `mysite.staging.com`)

8. Go to



> **General Configuration**

> **License Details** and apply your development license.

9. Go to



> **General Configuration**

> **System Information** and check that Confluence is correctly pointing to your staging database, and staging home directory.

It's essential to check that you are not still connected to your production database.

#### **Additional steps for Data Center**

If you have Confluence Data Center, the process is much the same as for Confluence Server described above. You will copy each local home and installation directory to each staging node, and then:

1. Copy the **production shared home directory** to the staging server.
2. Edit `<local-home-directory>/confluence.cfg.xml` to point to your staging shared home directory. This change **must** be made on every staging node.

Changes to the `<installation-directory>/confluence/WEB-INF/classes/confluence-init.properties` and `<home-directory>/confluence.cfg.xml` must be made on **every** staging node.

When it comes time to start Confluence, start one node at a time, as usual.

#### **4 Replicate external user management (optional)**

If you're managing users in Jira, Crowd, or in an external LDAP directory you can:

- replicate Jira, Crowd, or your external directory in your staging environment and point your Confluence staging site to your staging external directory (recommended).



- provide your staging server with network or local access to the same hosts as your production server.

### 5 Modify application links (optional)

If you have application links between Confluence and other Atlassian applications you should change the server ID on each staging application. See [How to change the server ID of Confluence](#) and [Changing Server ID for Test Installations](#) for Jira.

If you don't change the server ID and update your application links there is a chance that when you create a new application link in production it will point to your staging server instead.

### Upgrade your staging environment


Once you have created your staging environment, you can upgrade it in the same way you would your production environment.

Make a note of how long the upgrade takes, as this information will help you plan your production system outage and communicate with your users.




You can also use your staging environment to test any customizations or essential add-ons in your site.

## Supported Platforms

This page describes the additional software and infrastructure you'll need to run Confluence. Please review this info before installing Confluence. The information on this page applies to **Confluence 6.6**.

- You should only use Confluence with a supported platform. Any platforms and versions not listed on this page are unsupported, which means we don't test, fix bugs or provide assistance.
- See [End of Support Announcements for Confluence](#) for upcoming changes to supported platforms.
- Go to  **> General Configuration > Troubleshooting and support tools** to check your instance health. It looks at things like your license validity, Tomcat version, basic database setup and more.

#### Definitions:

-  **Supported** - you can use **Confluence 6.6** with this platform.
-  **Limited** - you can evaluate Confluence on this platform, but you can't use it to run a production Confluence site.
-  **Deprecated** - support for this platform will end in an upcoming release.

#### On this page:






- [Browsers](#)
- [Operating systems](#)
- [Databases](#)
- [Java](#)
- [Infrastructure](#)

#### Related pages:

- [Confluence Installation Guide](#)
- [Confluence Setup Guide](#)
- [Server Hardware Requirements Guide](#)
- [Supported Platforms FAQ](#)

### Browsers

#### Desktop browsers:

-  Internet Explorer 11
-  Microsoft Edge
-  Chrome
-  Firefox
-  Safari (Mac only)

#### Known issues:

- Chrome does not support WEBDAV, this means features such as [Edit in Word](#) for files won't work in Chrome.
- The WebDAV plugin required to edit Office documents can't be used with Firefox 57 (Quantum) or later.

#### Good to know:

- We test Confluence in Internet Explorer 11 using standards-compliant rendering mode, not compatibility mode. You may experience

**Mobile browsers:**

- ✓ Chrome
- ✓ Firefox
- ✓ Safari (iOS only)
- ✓ Android 4.4 (KitKat) or later

**Operating systems****Operating systems:**

- ✓ Microsoft Windows
- ✓ Linux (most distributions)
- i MacOS / OSX (evaluation only)

problems in compatibility mode.

- The Confluence setup wizard requires Javascript to be enabled while installing Confluence. [Learn more](#)
- The native mobile app is only available for Confluence Cloud sites. You can't create and edit pages in the Confluence Server mobile web view.
- Parts of Confluence won't display correctly if your browser window size is less than 1024x768.

**Known issues:**

- The following operating system variants can't be used with Confluence:
  - Windows Nano
  - Alpine Linux - see [CONFSERVER-52400](#)

**Good to know:**

- You can run Confluence on 32bit or 64bit operating systems, but we only provide installers for 64bit operating systems.
- You can evaluate Confluence on MacOS / OSX, but you can't install and run your production Confluence site on a Mac.

**Databases****PostgreSQL:**

- ✓ PostgreSQL 9.2
- ✓ PostgreSQL 9.3
- ✓ PostgreSQL 9.4
- ✓ PostgreSQL 9.5
- ✓ PostgreSQL 9.6

**MySQL:**

- ✓ MySQL 5.6
- ✓ MySQL 5.7

**Oracle:**

- ✓ Oracle 12c (Release 1)

**Microsoft SQL Server:**

- ✓ SQL Server 2012
- ✓ SQL Server 2014

**Embedded database:**

- i H2 (evaluation only)

**Java****Oracle JRE / JDK:**

- ✓ Java 1.8

**Known issues:**

- Confluence will not work on MySQL 5.6 versions earlier than 5.6.16. See [MySQL bug 69005](#).
- Confluence will not work on MySQL variants such as:
  - MariaDB - see [CONFSERVER-29060](#)
  - Percona Server - see [CONFSERVER-36471](#)

**Good to know:**

- You must use the InnoDB storage engine in MySQL.
- The embedded H2 database is for evaluation only. For production sites, you'll need to use one of the supported external databases listed on this page.

**Known issues:**

- Some Java versions have bugs that impact Confluence. You can't run Confluence on Java 1.8.0\_25 and 1.8.0\_31 (see [JDK-8059299](#)) or Java 1.8.0\_45 (see [JDK-8068400](#)).
- Confluence will not work with OpenJDK. If you're installing Java yourself, you must use Oracle Java.

**Good to know:**

- You don't need to install Java if you plan to use the installer to install Confluence, as the JRE is bundled with Confluence.

## Infrastructure

### Hardware:

- You can't run Confluence on SPARC based hardware. You'll need to use x86 hardware or 64bit derivatives of x86 hardware.
- You can't use an NFS mount for your installation or home directory due to Lucene requirements. If you're installing Confluence Data Center, an NFS mount is fine for the shared home directory, but not for the local home directories.

### Virtualization:

- Our support team can assist you with problems running Confluence in a Docker container, but can't offer support for problems related to the environment itself.
- Our support team can assist you with deploying Confluence Data Center in AWS using the Cloud Formation Template or Quick Start. We won't be able to assist you if you have customised the Cloud Formation Template.

### Application server:

- We only support the Tomcat version that is bundled with your Confluence version. You can't run Confluence in your own application server.

For more information see our [Server Hardware Requirements Guide](#) and [System Requirements](#).

## End of Support Announcements for Confluence

This page is where we announce end of support for various platforms, browsers, and information on features that will be discontinued in Confluence Server.

The table below summarizes the end of support announcements for **upcoming** Confluence releases. If a platform (or version) has already reached its end of support date, it is **not** listed in the table.

Platform	Confluence end of support
JUnit Report macro	With the release of Confluence 6.6 ( <a href="#">announcement</a> )
jTDS driver for SQL Server	With the release of Confluence 6.6 ( <a href="#">announcement</a> )

▼ [See the full list of announcements...](#)

### Most recent announcements first:

- [Deprecated macro for Confluence \(31 October 2017\)](#)
- [Deprecated driver for Microsoft SQL Server](#)
- [Deprecated operating system for Confluence \(15 May 2017\)](#)
- [Deprecated mobile browser for Confluence \(3 November 2016\)](#)
- [Changes to Confluence distributions \(8 June 2016\)](#)
- [Deprecated browsers for Confluence \(8 June 2016\)](#)
- [Deprecated databases for Confluence \(8 June 2016\)](#)
- [Deprecated macros for Confluence \(13 November 2015\)](#)
- [Discontinued features for Confluence \(10 July 2015\)](#)
- [Deprecated databases for Confluence \(19 May 2015\)](#)
- [Deprecated Tomcat platform for Confluence \(1 May 2015\)](#)
- [Deprecated Web Browsers for Confluence \(20 April 2015\)](#)
- [Deprecated Java platform for Confluence \(27 January 2015\)](#)
- [Deprecated distribution for Confluence \(2 September 2014\)](#)
- [Deprecated databases for Confluence \(12 June 2014\)](#)
- [Deprecated Tomcat platform for Confluence \(22 April 2014\)](#)
- [Deprecated Databases for Confluence \(2 December 2013\)](#)
- [Deprecated Web Browsers for Confluence \(24 September 2013\)](#)
- [Deprecated Databases for Confluence \(13 August 2013\)](#)
- [Deprecated Tomcat platform for Confluence \(29 August 2012\)](#)

- [Deprecated Java platform for Confluence \(6 August 2012\)](#)
- [Deprecated Databases for Confluence \(1 May 2012\)](#)
- [Deprecated Databases for Confluence \(13 March 2012\)](#)
- [Deprecated Operating Systems for Confluence \(21 July 2011\)](#)
- [Deprecated Databases for Confluence \(7 January 2011\)](#)
- [Deprecated Web Browsers for Confluence \(7 January 2011\)](#)
- [Deprecated Databases for Confluence \(12 October 2010\)](#)
- [Deprecated Web Browsers for Confluence \(12 October 2010\)](#)
- [Deprecated Databases for Confluence \(6 July 2010\)](#)
- [Deprecated Web Browsers for Confluence \(6 July 2010\)](#)
- [Deprecated Databases for Confluence \(24 March 2010\)](#)
- [Deprecated Application Servers for Confluence \(27 January 2010\)](#)
- [Deprecated Java Platforms for Confluence \(27 January 2010\)](#)
- [Deprecated Web Browsers for Confluence \(14 December 2009\)](#)

### Deprecated macro for Confluence (31 October 2017)

We will end support for the **JUnit Report macro** with the release of Confluence 6.6. This macro is used to display the results of JUnit tests on a Confluence page and, based on our research, is rarely used.

End of support means that Atlassian will not fix bugs related to this macro past the support end date for your version of Confluence. We will remove this macro entirely in a future Confluence release, and will provide more information at that time.

To check whether this macro is used in your site, go to



> **General Configuration** > **Macro Usage**. The JUnit Report macro will be listed under **Advanced Macros** if it's used.

If you have questions or concerns, please comment on this issue

**CONFSERVER-53942** - Plans to remove JUnit macro

NEEDS VERIFICATION

### Deprecated driver for Microsoft SQL Server

We are replacing the open source jTDS driver for SQL Server with the official Microsoft JDBC Driver for SQL Server. This new driver is bundled with Confluence 6.4 and later.

Atlassian will end support for the jTDS driver in Confluence 6.6. End of support means that Atlassian will not offer support for, or fix bugs related to, installing and running Confluence 6.6 or later with this driver.

- Confluence 6.5.x will be the last major release to bundle the jTDS driver.
- Confluence 6.5.x and earlier versions will continue to be supported with the jTDS driver, until their support end date.
- Confluence 6.6.x will not bundle or support the jTDS driver. We'll provide plenty of information on how to migrate to the new driver at that time.

If you have questions or concerns regarding this announcement, please email [eol-announcement@atlassian.com](mailto:eol-announcement@atlassian.com).

### Deprecated operating system for Confluence (15 May 2017)

Atlassian will end support for the Oracle Solaris operating system in Confluence 6.3. End of support means that Atlassian will not offer support for, or fix bugs related to, installing and running Confluence 6.3 or later on this operating system.

- Confluence 6.2.x will be the last major release that can be installed on Solaris.
- Confluence 6.2.x and earlier versions will continue to be supported on Solaris, until their support end date.

Check out the [Supported Platforms](#) page for the full list of supported operating systems.

If you have questions or concerns regarding this announcement, please email [eol-announcement@atlassian.com](mailto:eol-announcement@atlassian.com).

### Deprecated mobile browser for Confluence (3 November 2016)

Atlassian will end support for the default browser provided with Android 4.0.3 (Ice Cream Sandwich) in Confluence 6.0. End of support means that Atlassian will not fix bugs related to this browser past the support end date, except for security related issues. This means:

- Confluence 5.10 will be the last major release that supports the default browser provided with Android 4.0.3 (Ice Cream Sandwich).
- Confluence 5.10.x and earlier versions will continue to work on the default browser provided with Android 4.0.3 (Ice Cream Sandwich).

With the release of Confluence 6.0 we have added support for the default browser provided with current Android versions from 4.4 (KitKat) and later. Check out the [Supported Platforms](#) page for the full list of supported browsers.

If you have questions or concerns regarding this announcement, please email [eol-announcement@atlassian.com](mailto:eol-announcement@atlassian.com).

### Changes to Confluence distributions (8 June 2016)

To help us bring you new Confluence Server releases faster, we are considering only providing 64-bit installers. Confluence 5.10 would be the last Confluence release to provide a 32-bit installer.

#### Q: Can I upgrade using the 64-bit installer?

Yes. If you installed Confluence using the 32-bit installer on a 64-bit operating system, you will be able to upgrade using the 64-bit installer.

#### Q: What if I am not able to use the 64-bit installer?

We'd love to hear from you to better understand how this change would impact you. Comment on this issue

**CONFSERVER-42817** - Planned deprecation of 32-bit installers

**RESOLVED**

or contact us directly at [eol-announcement@atlassian.com](mailto:eol-announcement@atlassian.com).

ement at [atlassian dot com](mailto:eol-announcement@atlassian.com).

### Deprecated browsers for Confluence (8 June 2016)

Atlassian will end support for Internet Explorer 10 in Confluence 6.0. End of support means that Atlassian will not fix bugs related to Internet Explorer 10 past the support end date, except for security related issues.

This change allows us to use more modern browser technologies to give you the best user experience in Confluence. Check out the [Supported Platforms](#) page for the full list of supported browsers.

If you have questions or concerns regarding this announcement, please email [eol-announcement@atlassian.com](mailto:eol-announcement@atlassian.com).

#### Internet Explorer 10 (IE10) end of support notes

- Confluence 5.10 will be the last major release that supports Internet Explorer 10.
- Confluence 5.10.x and earlier versions will continue to work on Internet Explorer 10.
- No Confluence releases after 5.10.x will be tested with Internet Explorer 10.

### Deprecated databases for Confluence (8 June 2016)

This section announces the end of Atlassian support for certain databases for Confluence. End of support means that Atlassian will not fix bugs related to the specified database past the support end date for your

version of Confluence.

The details are below. Please refer to the list of [supported platforms](#) for details of platform support for Confluence. If you have questions or concerns regarding this announcement, please email [eol-announcement@atlassian.com](mailto:eol-announcement@atlassian.com).

#### **End of life announcement for database support**

Database	Support End Date
MySQL 5.5	After Confluence 5.10.x

#### **Notes:**

- Confluence 5.10 is the last version that will support MySQL 5.5.
- Confluence 5.10 and previously-released versions will continue to work with the database version listed above, however we will not fix bugs affecting these databases after the [end-of-life date](#) for your version of Confluence.
- No Confluence releases after 5.10.x will be tested with the database listed above.

#### **Deprecated macros for Confluence (13 November 2015)**

With the release of Confluence **5.9** we will be ending support for the following macros, known collectively as the 'View File' macros:

- Office Excel
- Office Word
- Office PowerPoint
- PDF

End of support means that Atlassian will not fix bugs related to these macros past the support end date for your version of Confluence. We plan to remove these macros in a future Confluence release, and will provide plenty of information to help you make the transition when the time comes.

The View File macros will still be available in future Confluence releases (including Confluence 5.9, 5.10 and later), but we recommend inserting Office and PDF files as a thumbnail or link, and using the preview to view the file in full, as it provides a much better way to display Office and PDF files on your pages. See [Display Files and Images](#) for more info.

If you have any questions or concerns, please comment on this issue

**CONFSERVER-39829** - Plans to remove the view file macros

VERIFIED

#### **Discontinued features for Confluence (10 July 2015)**

##### **Status updates**

As part of our work to make Confluence simpler and easier to use we've decided to remove the Status Updates feature in **Confluence 5.9**. This includes the ability to:

- update your status
- see other people's status via their profile or the User Status List macro.

Our research tells us that this feature isn't widely used, and we believe that [HipChat](#) gives your team much better ways to share their status.

We'll provide more information at the time of the Confluence 5.9 release. If you have questions or concerns,

please comment on this issue

**CONFSERVER-38253** - Plans to remove status updates

RESOLVED

##### **Documentation theme**

In order to better focus our development efforts on a single theme, we plan to remove the Documentation theme



in **Confluence 6.0**.

We know that many customers use the Documentation theme because they like to have a page tree in their space sidebar. This has been available in the default theme for some time now, plus other great features like sidebar shortcuts, JIRA links, and sticky table headers.

To help you switch to the more modern default theme, we've added some of your favorite documentation theme features, including the ability to add:

- a header and footer
- custom content to the sidebar.

These new additions to the default theme are available in Confluence 5.9. As these fields will continue to use wiki markup, you will be able to drop your existing wiki markup straight from the Documentation theme into the default theme.

To help you switch themes we've put together a [step-by-step guide](#) which covers everything from how to turn on the default theme, find out which spaces are using the theme, and what to do if the Documentation theme is the global theme for your whole site.

If you have any questions or concerns please comment on this issue

**CONFSERVER-38256** - Plans to remove the documentation theme

**RESOLVED**

### Deprecated databases for Confluence (19 May 2015)

This section announces the end of Atlassian support for certain databases for Confluence. End of support means that Atlassian will not fix bugs related to the specified database past the support end date for your version of Confluence.

The details are below. Please refer to the list of [supported platforms](#) for details of platform support for Confluence. If you have questions or concerns regarding this announcement, please email [eol-announcement@atlassian.com](mailto:eol-announcement@atlassian.com).

#### End of Life Announcement for Database Support

Database	Support End Date
Microsoft SQL 2008	After Confluence 5.8.x
Oracle 11.1	
Oracle 11.2	

#### Notes:

- Confluence 5.8 is the last version that will support the database versions listed above.
- Confluence 5.8 and previously-released versions will continue to work with the database versions listed above, however we will not fix bugs affecting these databases after the [end-of-life date](#) for your version of Confluence.
- No Confluence releases after 5.8.x will be tested with the databases listed above.

### Deprecated Tomcat platform for Confluence (1 May 2015)

This section announces the end of Atlassian support for Tomcat 7.0.x for Confluence. As [previously announced](#), we now only support the version of Tomcat that is bundled with your version of Confluence.

End of support means that Atlassian will not fix bugs related to the specified version of Tomcat, past the support end date for your version of Confluence. If you have questions or concerns regarding this announcement, please email [eol-announcement@atlassian.com](mailto:eol-announcement@atlassian.com).



### End of Life Announcement for Tomcat 7.0.x Support

Platform	Support End Date
Tomcat 7.0.x	When Confluence 5.8 is released

#### Tomcat 7.0.x notes:

- Confluence 5.7 is the last major version that will support Tomcat 7.0.x. The Confluence 5.7.x bug-fix releases will also continue to support Tomcat 7.0.x.
- Confluence 5.7.x and previously-released versions will continue to work with Tomcat 7.0.x. However, we will not fix bugs affecting Tomcat 7.0.x after the [end-of-life date](#) for your version of Confluence.
- Confluence 5.8 will not be tested with Tomcat 7.0.x.

### Deprecated Web Browsers for Confluence (20 April 2015)

Atlassian will end support for Internet Explorer 9 in the next major release after Confluence 5.8.x. End of support means that Atlassian will not fix bugs related to Internet Explorer 9 past the support end date, except for security related issues.

This change allows us to use more modern browser technologies to give you the best user experience in Confluence. Check out the [Supported Platforms](#) page for the full list of supported browsers.

If you have questions or concerns regarding this announcement, please email [eol-announcement@atlassian.com](mailto:eol-announcement@atlassian.com).

#### Internet Explorer 9 (IE9) End of Support Notes

- Confluence 5.8 will be the last major release that supports Internet Explorer 9
- Confluence 5.8.x and earlier versions will continue to work on Internet Explorer 9
- No Confluence releases after 5.8.x will be tested with Internet Explorer 9

### Deprecated Java platform for Confluence (27 January 2015)

This section announces the end of Atlassian support for Java 7 for Confluence. Please note that Oracle is planning to stop providing public updates for JRE 7 in [April 2015](#).

End of support means that Atlassian will not fix bugs related to the specified version of Java, past the support end date for your version of Confluence. The details are below. Please refer to the list of [supported platforms](#) for details of platform support for Confluence. If you have questions or concerns regarding this announcement, please email [eol-announcement@atlassian.com](mailto:eol-announcement@atlassian.com).

#### End of Life Announcement for Java 7 Support

Platform	Support End Date
Java 7 (JRE and JDK 1.7)	When Confluence 5.8 is released

#### Java 7 notes:

- Confluence 5.7 is the last major version that will support Java 7. The Confluence 5.7.x bug-fix releases will also continue to support Java 7.
- Java 7 (JRE and JDK 1.7) will still be supported in Confluence 5.7.
- Confluence 5.7.x and previously-released versions will continue to work with Java 7, but we will not fix bugs affecting Java 7 after the [end-of-life date](#) for your version of Confluence.
- Confluence 5.8 will not be tested with Java 7.

### Deprecated distribution for Confluence (2 September 2014)

To help us to make Confluence a more robust and scalable application, we have decided to stop providing an

EAR/WAR distribution. This means that the only supported application server will be the version of Tomcat that is bundled with each release.

Confluence 5.6 will be the last Confluence release to provide an EAR/WAR edition.

**Q: Do I need to use the installer?**

No, the removal of the EAR/WAR distribution does not force you to use the installer. You can still use the standalone distribution, which doesn't have an install script - it's just a copy of Tomcat with Confluence configured inside it. Essentially it's a directory that you unpack and then run yourself.

**Q: What if a security problem is found in the bundled version of Tomcat?**

Our security team monitors vulnerabilities in all our dependencies, including Tomcat, and fixes continue to follow our [Security Bugfix Policy](#). If at any time you become aware of a vulnerability we've missed, please report it as described in [How to report a security issue](#).

If you have more questions or concerns regarding this announcement, please contact us at [eol-announcement at atlassian dot com](mailto:eol-announcement@atlassian.com).

### Deprecated databases for Confluence (12 June 2014)

This section announces the end of Atlassian support for certain databases for Confluence. End of support means that Atlassian will not fix bugs related to the specified database past the support end date for your version of Confluence.

The details are below. Please refer to the list of [supported platforms](#) for details of platform support for Confluence. If you have questions or concerns regarding this announcement, please email [eol-announcement at atlassian dot com](mailto:eol-announcement@atlassian.com).

#### End of Life Announcement for Database Support

Database	Support End Date
PostgreSQL 8.4	With the release of Confluence 5.7
PostgreSQL 9.0	
PostgreSQL 9.1	
MySQL 5.1	

**Notes:**

- Confluence 5.6 is the last version that will support the database versions listed above.
- Confluence 5.6 and previously-released versions will continue to work with the database versions listed above, however we will not fix bugs affecting these databases after the [end-of-life date](#) for your version of Confluence.
- Confluence 5.7 has not been tested with the databases listed above.

### Deprecated Tomcat platform for Confluence (22 April 2014)

This section announces the end of Atlassian support for Tomcat 6.0.x for Confluence.

End of support means that Atlassian will not fix bugs related to the specified version of Tomcat, past the support end date for your version of Confluence. The details are below. Please refer to the list of [supported platforms](#) for details of platform support for Confluence. If you have questions or concerns regarding this announcement, please email [eol-announcement at atlassian dot com](mailto:eol-announcement@atlassian.com).

#### End of Life Announcement for Tomcat 6.0.x Support

Platform	Support End Date
----------	------------------

<b>Tomcat 6.0.x</b>	When Confluence 5.6 is released, due in mid 2014
---------------------	--

**Tomcat 6.0.x notes:**

- Confluence 5.5 is the last major version that will support Tomcat 6.0.x. The Confluence 5.5.x bug-fix releases will also continue to support Tomcat 6.0.x.
- Confluence 5.5.x and previously-released versions will continue to work with Tomcat 6.0.x. However, we will not fix bugs affecting Tomcat 6.0.x after the [end-of-life date](#) for your version of Confluence.
- Confluence 5.6 will not be tested with Tomcat 6.0.x.

**Deprecated Databases for Confluence (2 December 2013)**

This section announces the end of Atlassian support for certain databases for Confluence. End of support means that Atlassian will not fix bugs related to the specified database past the support end date for your version of Confluence.

The details are below. Please refer to the list of [supported platforms](#) for details of platform support for Confluence. If you have questions or concerns regarding this announcement, please email [eol-announcement@atlassian.com](mailto:eol-announcement@atlassian.com).

**End of Life Announcement for Database Support**

Database	Support End Date
<b>PostgreSQL 8.3</b>	When Confluence 5.5 is released, due in early 2014

**PostgreSQL 8.3 notes:**

- Confluence 5.4 is the last version that will support PostgreSQL 8.3.
- Confluence 5.4 and previously-released versions will continue to work with PostgreSQL 8.3. However, we will not fix bugs affecting PostgreSQL 8.3 after the [end-of-life date](#) for your version of Confluence.
- Confluence 5.5 will not be tested with PostgreSQL 8.3.

**Deprecated Web Browsers for Confluence (24 September 2013)**

To allow us to dedicate resources to providing the best experience on modern browsers, Confluence 5.5 will be the **last release that supports Internet Explorer 8 (IE8)**. The reasons behind this decision are to enable us to provide the best user experience to our customers, accelerate our pace of innovation and give us the ability to utilize modern browser technologies.

*End of support* means that Atlassian will not perform any maintenance on Confluence related to IE8 after the final release of Confluence 5.5.x, except for security related issues. In order to minimize the impact on you and the way your company uses Confluence, we have provided this announcement as early as possible, and hope that the subsequent 6 month period will give you adequate time to prepare for this change without disruption.

Atlassian will continue to support Internet Explorer 9 (IE9) and Internet Explorer 10 (IE10) as well as the latest versions of Chrome, Firefox and Safari. For further information, please refer to the [Supported Platforms](#) page. If you have questions or concerns regarding this announcement, please email [eol-announcement@atlassian.com](mailto:eol-announcement@atlassian.com).

**Deprecated Databases for Confluence (13 August 2013)**

This section announces the end of Atlassian support for certain databases for Confluence. End of support means that Atlassian will not fix bugs related to the specified database past the support end date for your version of Confluence.

The details are below. Please refer to the list of [supported platforms](#) for details of platform support for Confluence. If you have questions or concerns regarding this announcement, please email [eol-announcement@atlassian.com](mailto:eol-announcement@atlassian.com).

t at atlassian dot com.

#### *End of Life Announcement for Database Support*

Database	Support End Date
<b>MS SQL 2005</b>	When Confluence 5.3 is released, due in late 2013

#### **MS SQL 2005 notes:**

- Confluence 5.2 is the last version that will support MS SQL 2005.
- Confluence 5.2 and previously-released versions will continue to work with MS SQL 2005. However, we will not fix bugs affecting MS SQL 2005 after the [end-of-life date](#) for your version of Confluence.
- Confluence 5.3 will not be tested with MS SQL 2005.

#### **Deprecated Tomcat platform for Confluence (29 August 2012)**

This section announces the end of Atlassian support for Tomcat 5.5.x for Confluence. Please note: Apache have announced that support for Apache Tomcat 5.5.x will end on 30 September 2012: [End of life for Apache Tomcat 5.5.x](#).

End of support means that Atlassian will not fix bugs related to the specified version of Tomcat, past the support end date for your version of Confluence. The details are below. Please refer to the list of [supported platforms](#) for details of platform support for Confluence. If you have questions or concerns regarding this announcement, please email [eol-announcement at atlassian dot com](mailto:eol-announcement@atlassian.com).

#### *End of Life Announcement for Tomcat 5.5.x Support*

Platform	Support End Date
<b>Tomcat 5.5.x</b>	When Confluence 5.0 is released, due in early 2013

#### **Tomcat 5.5.x notes:**

- Confluence 4.3 is the last major version that will support Tomcat 5.5.x. The Confluence 4.3.x bug-fix releases will also continue to support Tomcat 5.5.x.
- Tomcat 6.0.x will still be supported in Confluence 5.0.
- Confluence 4.3.x and previously-released versions will continue to work with Tomcat 5.5.x. However, we will not fix bugs affecting Tomcat 5.5.x after the [end-of-life date](#) for your version of Confluence.
- Confluence 5.0 will not be tested with Tomcat 5.5.x.

#### **Deprecated Java platform for Confluence (6 August 2012)**

This section announces the end of Atlassian support for Java 6 for Confluence. Please note that Oracle has announced the end of public updates for Java 6: [Java SE 6 End of Public Updates Notice](#).

End of support means that Atlassian will not fix bugs related to the specified version of Java, past the support end date for your version of Confluence. The details are below. Please refer to the list of [supported platforms](#) for details of platform support for Confluence. If you have questions or concerns regarding this announcement, please email [eol-announcement at atlassian dot com](mailto:eol-announcement@atlassian.com).

#### *End of Life Announcement for Java 6 Support*

Platform	Support End Date
<b>Java 6 (JRE and JDK 1.6)</b>	When Confluence 5.0 is released, due in early 2013

#### **Java 6 notes:**

- Confluence 4.3 is the last major version that will support Java 6. The Confluence 4.3.x bug-fix releases will also continue to support Java 6.
- Java 7 (JRE and JDK 1.7) will still be supported in Confluence 5.0.
- Confluence 4.3.x and previously-released versions will continue to work with Java 6. However, we will not fix bugs affecting Java 6 after the [end-of-life date](#) for your version of Confluence.
- Confluence 5.0 will not be tested with Java 6.

### Deprecated Databases for Confluence (1 May 2012)

This section announces the end of Atlassian support for certain databases for Confluence. End of support means that Atlassian will not fix bugs related to the specified database past the support end date for your version of Confluence.

The details are below. Please refer to the list of [supported platforms](#) for details of platform support for Confluence. If you have questions or concerns regarding this announcement, please email [eol-announcement@atlassian.com](mailto:eol-announcement@atlassian.com).

#### End of Life Announcement for Database Support

Database	Support End Date
PostgreSQL 8.2	When Confluence 4.3 is released, due in mid 2012

#### PostgreSQL 8.2 notes:

- Confluence 4.2 is the last version that will support version 8.2 of PostgreSQL.
- Versions 8.3, 8.4 and 9.0 will still be supported in Confluence 4.3.
- Confluence 4.2 and previously-released versions will continue to work with PostgreSQL 8.2. However, we will not fix bugs affecting PostgreSQL 8.2 after the [end-of-life date](#) for your version of Confluence.
- Confluence 4.3 will not be tested with PostgreSQL 8.2.

### Deprecated Databases for Confluence (13 March 2012)

This section announces the end of Atlassian support for certain databases for Confluence. End of support means that Atlassian will not fix bugs related to the specified database past the support end date for your version of Confluence.

The details are below. Please refer to the list of [supported platforms](#) for details of platform support for Confluence. If you have questions or concerns regarding this announcement, please email [eol-announcement@atlassian.com](mailto:eol-announcement@atlassian.com).

#### End of Life Announcement for Database Support

Database	Support End Date
DB2	When Confluence 4.3 is released, due in mid 2012

#### DB2 notes:

- Confluence 4.2 is the last version that will support DB2.
- From Confluence 4.3, no versions of DB2 will be supported.
- Confluence 4.2 and previously-released versions will continue to work with DB2. However, we will not fix bugs affecting DB2 after the [end-of-life date](#) for your version of Confluence.
- Confluence 4.3 will not be tested with DB2.
- For help with moving from DB2 to a supported database, please refer to the list of [supported databases](#) and the guide to [migrating to another database](#).

## Deprecated Operating Systems for Confluence (21 July 2011)

This section announces the end of Atlassian support for certain operating systems for Confluence. End of support means that Atlassian will not fix bugs related to running Confluence server on that operating system past the support end date.

We will stop supporting the following operating systems from Confluence 4.0, due in late 2011:

- Mac OS X (as a Confluence server platform).

The details are below. Please refer to the list of [supported platforms](#) for details of platform support for Confluence. If you have questions or concerns regarding this announcement, please email [eol-announcement@atlassian.com](mailto:eol-announcement@atlassian.com).

### End of Life Announcement for Operating System Support

Operating System	Support End Date
Mac OS X (as a Confluence server platform)	When Confluence 4.0 releases, due in late 2011

#### • Mac OS X Notes:

- Atlassian intends to end support for Mac OS X (as a server platform) in Confluence 4.0 (due for release in late 2011). Confluence 3.5 is the last version that will support Mac OS X.
- The Sun/Oracle JDK/JRE 1.6 is the only JDK platform officially supported by Atlassian. This means that Apple Mac OS X is not a supported operating system for the Confluence server, as the Sun/Oracle JDK does not run on Mac OS X.
- Accessing Confluence as a user from Mac OS X via a compatible web browser will still be supported for the foreseeable future.

## Deprecated Databases for Confluence (7 January 2011)

This section announces the end of Atlassian support for certain database versions for Confluence. End of support means that Atlassian will not fix bugs related to certain database versions past the support end date.

We will **stop supporting the following database versions** from Confluence 4.0, due in late 2011:

- MySQL 5.0.

The details are below. Please refer to the list of [supported platforms](#) for details of platform support for Confluence. If you have questions or concerns regarding this announcement, please email [eol-announcement@atlassian.com](mailto:eol-announcement@atlassian.com).

### End of Life Announcement for Database Support

Database	Support End Date
MySQL (version 5.0 only)	When Confluence 4.0 releases, due in late 2011

#### • MySQL Notes:

- Atlassian intends to end support for MySQL 5.0 in Confluence 4.0 (due for release in the middle of 2011). Confluence 3.5 is the last version that will support MySQL 5.0.
- MySQL 5.1 will still be supported.
- 'Support End Date' means that Confluence 3.5 and previously released versions will continue to work with MySQL 5.0. However, we will not fix bugs affecting MySQL 5.0 past the support end date.
- Confluence 4.0 will not be tested with MySQL 5.0.



## Deprecated Web Browsers for Confluence (7 January 2011)

This section announces the end of Atlassian support for certain web browser versions for Confluence. End of support means that Atlassian will not fix bugs related to certain web browser versions past the support end date.

We will **stop supporting the following web browser versions** from Confluence 4.0, late middle of 2011:

- Microsoft Internet Explorer 7 (IE7).
- Safari 4.
- Firefox 3.5.

The details are below. Please refer to the list of [supported platforms](#) for details of platform support for Confluence. If you have questions or concerns regarding this announcement, please email [eol-announcement@atlassian.com](mailto:eol-announcement@atlassian.com).

### End of Life Announcement for Web Browser Support

Web Browser	Support End Date
<b>Microsoft Internet Explorer (version 7 only)</b>	When Confluence 4.0 releases, late the middle of 2011
<b>Safari (version 4 only)</b>	When Confluence 4.0 releases, due in late of 2011
<b>Firefox (version 3.5 only)</b>	When Confluence 4.0 releases, due in late of 2011

- **Internet Explorer Notes:**
  - Atlassian intends to end support for IE7 in Confluence 4.0 (due for release in the middle of 2011). Confluence 3.5 is the last version that will support IE7.
  - IE8 will still be supported.
  - 'Support End Date' means that Confluence 3.5 and previously released versions will continue to work with IE7. However, we will not fix bugs affecting IE7 past the support end date.
  - Confluence 4.0 will not be tested with IE7.
- **Safari Notes:**
  - Atlassian will introduce support for Safari 5 in Confluence 3.5.
  - We intend to end support for Safari 4 in Confluence 4.0 (due for release in the middle of 2011). Confluence 3.5 is the last version that will support Safari 4.
  - 'Support End Date' means that Confluence 3.5 and previously released versions will continue to work with Safari 4. However, we will not fix bugs affecting Safari 4 past the support end date.
  - Confluence 4.0 will not be tested with Safari 4.
- **Firefox Notes:**
  - Atlassian will end support for Firefox 3.0 in Confluence 3.5, as [previously announced](#).
  - We intend to end support for Firefox 3.5 in Confluence 4.0 (due for release in the middle of 2011). Confluence 3.5 is the last version that will support Firefox 3.5.
  - Firefox 3.6 will still be supported.
  - 'Support End Date' means that Confluence 3.5 and previously released versions will continue to work with Firefox 3.5. However, we will not fix bugs affecting Firefox 3.5 past the support end date.
  - Confluence 4.0 will not be tested with Firefox 3.5.

## Deprecated Databases for Confluence (12 October 2010)

This section announces the end of Atlassian support for certain database versions for Confluence. End of support means that Atlassian will not fix bugs related to certain database versions past the support end date.

We will **stop supporting the following database versions**:

- From Confluence 3.5, due in the first half of 2011, Confluence will no longer support PostgreSQL 8.1. *Note, PostgreSQL 8.2 and PostgreSQL 8.4 will still be supported.*



The details are below. Please refer to the [Supported Platforms](#) for more details regarding platform support for Confluence. If you have questions or concerns regarding this announcement, please email [eol-announcement@atlassian.com](mailto:eol-announcement@atlassian.com).

#### End of Life Announcement for Database Support

Database	Support End Date
<b>PostgreSQL (version 8.1 only)</b>	When Confluence 3.5 releases, due in the first half of 2011

- **PostgreSQL (version 8.1 only) End of Support Notes:**
  - Atlassian intends to end support for PostgreSQL 8.1 in Confluence 3.5 (due to release in the first half of 2011), with the final support for these platforms in Confluence 3.4. PostgreSQL 8.2 and PostgreSQL 8.4 will still be supported.
  - 'Support End Date' means that Confluence 3.4 and previous released versions will continue to work with the PostgreSQL 8.1. However, we will not fix bugs affecting PostgreSQL 8.1 past the support end date.
  - Confluence 3.5 (due to release in the first half of 2011) will not be tested with PostgreSQL 8.1.

#### Deprecated Web Browsers for Confluence (12 October 2010)

This section announces the end of Atlassian support for certain web browser versions for Confluence. End of support means that Atlassian will not fix bugs related to certain web browser versions past the support end date.

We will **stop supporting the following web browser versions:**

- From Confluence 3.5, due in the first half of 2011, Confluence will no longer support Firefox 3.0.  
*Note, Firefox 3.5 and Firefox 3.6 will still be supported.*

The details are below. Please refer to the [Supported Platforms](#) for more details regarding platform support for Confluence. If you have questions or concerns regarding this announcement, please email [eol-announcement@atlassian.com](mailto:eol-announcement@atlassian.com).

#### End of Life Announcement for Web Browser Support

Web Browser	Support End Date
<b>Firefox (version 3.0 only)</b>	When Confluence 3.5 releases, due in the first half of 2011

- **Firefox (version 3.0 only) End of Support Notes:**
  - Atlassian intends to end support for Firefox 3.0 in Confluence 3.5 (due to release in the first half of 2011), with the final support for these platforms in Confluence 3.4. Firefox 3.5 and Firefox 3.6 will still be supported.
  - 'Support End Date' means that Confluence 3.4 and previous released versions will continue to work with Firefox 3.0. However, we will not fix bugs affecting Firefox 3.0 past the support end date.
  - Confluence 3.5 (due to release in the first half of 2011) will not be tested with Firefox 3.0.

#### Deprecated Databases for Confluence (6 July 2010)

This section announces the end of Atlassian support for certain database versions for Confluence. End of support means that Atlassian will not fix bugs related to certain database versions past the support end date.

We will **stop supporting the following database versions:**

- From Confluence 3.4, due in the second half of 2010, Confluence will no longer support Oracle 10g (i.e. Oracle 10.1 and Oracle 10.2).


*Note, Oracle 11g (i.e. Oracle 11.1 and Oracle 11.2) will still be supported.*

We have made these decisions in line with Oracle's decision to stop support for Oracle 10g, as per the "Oracle Database (RDBMS) Releases Support Status Summary [ID 161818.1]" article on the [Oracle Support site](#) (note, you will need an Oracle Support account to find and view the article). This also will reduce the testing time required for each release and help us speed up our ability to deliver market-driven features. We are committed to helping our customers understand this decision and assist them in upgrading to Oracle 11g if needed.

The details are below. Please refer to the [Supported Platforms](#) for more details regarding platform support for Confluence. If you have questions or concerns regarding this announcement, please email [eol-announcement@atlassian.com](mailto:eol-announcement@atlassian.com).

#### **End of Life Announcement for Database Support**

Database	Support End Date
<b>Oracle (version 10.1 and 10.2 only)</b>	When Confluence 3.4 releases, due in the second half of 2010

- **Oracle (version 10.1 and 10.2 only) End of Support Notes:**
  - Atlassian intends to end support for Oracle 10.1 and Oracle 10.2 in Confluence 3.4 (due to release in the second half of 2010), with the final support for these platforms in Confluence 3.3 . Oracle 11.1 and Oracle 11.2 will still be supported.
  - 'Support End Date' means that Confluence 3.3 and previous released versions will continue to work with the Oracle 10.1 and Oracle 10.2. However, we will not fix bugs affecting Oracle 10.1 or Oracle 10.2 past the support end date.
  - Confluence 3.4 (due to release in the second half of 2010) will not be tested with Oracle 10.1 and Oracle 10.2.

#### **Deprecated Web Browsers for Confluence (6 July 2010)**

This section announces the end of Atlassian support for certain web browser versions for Confluence. End of support means that Atlassian will not fix bugs related to certain web browser versions past the support end date.

We will **stop supporting the following web browser versions:**

- From Confluence 3.4, due in the second half of 2010, Confluence will no longer support Safari 3 or Safari 3.1.  
*Note, Safari 4 will still be supported.*

The details are below. Please refer to the [Supported Platforms](#) for more details regarding platform support for Confluence. If you have questions or concerns regarding this announcement, please email [eol-announcement@atlassian.com](mailto:eol-announcement@atlassian.com).

#### **End of Life Announcement for Web Browser Support**

Web Browser	Support End Date
<b>Safari (version 3 and 3.1 only)</b>	When Confluence 3.4 releases, due in the second half of 2010

- **Safari (version 3 and 3.1 only) End of Support Notes:**
  - Atlassian intends to end support for Safari 3 and Safari 3.1 in Confluence 3.4 (due to release in the second half of 2010), with the final support for these platforms in Confluence 3.3. Safari 4 will still be supported.
  - 'Support End Date' means that Confluence 3.3 and previous released versions will continue to work with the Safari 3 and Safari 3.1. However, we will not fix bugs affecting Safari 3 and Safari 3.1 past the support end date.
  - Confluence 3.4 (due to release in the second half of 2010) will not be tested with Safari 3 and Safari 3.1.

## Deprecated Databases for Confluence (24 March 2010)

This section announces the end of Atlassian support for certain database versions for Confluence. End of support means that Atlassian will not fix bugs related to certain database versions past the support end date.

We will **stop supporting the following database versions**:

- From Confluence 3.3, due in Q3 2010, Confluence will no longer support DB2 8.2.  
*Note, DB2 9.7 will still be supported.*

We are reducing our database support to reduce the amount of testing time and help us speed up our ability to deliver market-driven features. We are committed to helping our customers understand this decision and assist them in upgrading to DB2 9.7 if needed.

The details are below. Please refer to the [Supported Platforms](#) for more details regarding platform support for Confluence. If you have questions or concerns regarding this announcement, please email [eol-announcement@atlassian.com](mailto:eol-announcement@atlassian.com).

### End of Life Announcement for Database Support

Database	Support End Date
<b>DB2 (version 8.2 only)</b>	When Confluence 3.3 releases, due Q3 2010

- DB2 (version 8.2 only) End of Support Notes:**
  - Atlassian intends to end support for DB2 8.2 in Q3 2010, with the final support for these platforms in Confluence 3.2. DB2 9.7 will still be supported.
  - 'Support End Date' means that Confluence 3.2 and previous released versions will continue to work with the DB2 8.2. However, we will not fix bugs affecting DB2 8.2 past the support end date.
  - Confluence 3.3 (due to release in Q3 2010) will not be tested with DB2 8.2.

## Deprecated Application Servers for Confluence (27 January 2010)

This section announces the end of Atlassian support for certain application servers for Confluence. End of support means that Atlassian will not fix bugs related to certain application servers past the support end date.

We will **stop supporting the following application servers**:

- From Confluence 3.2, due late Q1 2010, Confluence will no longer support JBoss application servers.
- From Confluence 3.3, due in Q3 2010, Confluence will no longer support Oracle WebLogic, IBM WebSphere or Caucho Resin.

We are reducing our application server platform support to reduce the amount of testing time and help us speed up our ability to deliver market-driven features. We are committed to helping our customers understand this decision and assist them in migrating to Tomcat, our supported application server.

The details are below. Please refer to the [Supported Platforms](#) for more details regarding platform support for Confluence. If you have questions or concerns regarding this announcement, please email [eol-announcement@atlassian.com](mailto:eol-announcement@atlassian.com).

### End of Life Announcement for Application Server Support

Application Servers	Support End Date
<b>JBoss 4.2.2</b>	When Confluence 3.2 releases, due late Q1 2010
<b>Oracle WebLogic 9.2</b>	When Confluence 3.3 releases, due Q3 2010
<b>IBM WebSphere 6.1</b>	When Confluence 3.3 releases, due Q3 2010
<b>Caucho Resin 3.0, 3.1.6, 3.1.7</b>	When Confluence 3.3 releases, due Q3 2010

- **JBoss End of Support Notes:**
  - 'Support End Date' means that Confluence 3.1 and previous released versions will continue to work with stated application servers. However, we will not fix bugs affecting JBoss application servers.
  - Confluence 3.2 will not support JBoss application servers.
- **WebLogic, WebSphere and Resin End of Support Notes:**
  - Atlassian intends to end support for Oracle WebLogic, IBM WebSphere, and Caucho Resin in Q3 2010, with the final support for these platforms in Confluence 3.2.
  - 'Support End Date' means that Confluence 3.2 and previous released versions will continue to work with the stated application servers. However, we will not fix bugs affecting Oracle WebLogic, IBM WebSphere, and Caucho Resin application servers past the support end date.
  - Confluence 3.3 (due to release in Q3 2010) will only be tested with and support Tomcat 5.5.20+ and 6.0.
  - If you have concerns with this end of support announcement, please email [eol-announcement at atlassian dot com](mailto:eol-announcement@atlassian.com).

#### *Why is Atlassian doing this?*

We have chosen to standardize on Tomcat, because it is the most widely used application server in our user population. It is fast, robust, secure, well-documented, easy to operate, open source, and has a huge community driving improvements. It is the de facto industry standard, with several companies available that specialize in providing enterprise grade support contracts for it, ranging from customizations to 24/7 support.

### Deprecated Java Platforms for Confluence (27 January 2010)

This section announces the end of Atlassian support for certain Java Platforms for Confluence.

We will **stop supporting the following Java Platforms:**

- From Confluence 3.3, due Q3 2010, support for Java Platform 5 (JDK/JRE 1.5) will end.

We are ending support for Java Platform 5, in line with the [Java SE Support Roadmap](#) (i.e. "End of Service Life" for Java Platform 5 dated October 30, 2009). We are committed to helping our customers understand this decision and assist them in updating to Java Platform 6, our supported Java Platform.

The details are below. Please refer to the [Supported Platforms](#) for more details regarding platform support for Confluence. If you have questions or concerns regarding this announcement, please email [eol-announcement at atlassian dot com](mailto:eol-announcement@atlassian.com).

#### *End of Life Announcement for Java Platform Support*

Java Platform	Support End Date
<b>Java Platform 5 (JDK/JRE 1.5)</b>	When Confluence 3.3 releases, due Q3 2010

- **Java Platform 5 End of Support Notes:**
  - Atlassian intends to end support for Java Platform 5 in Q3 2010.
  - 'Support End Date' means that Confluence 3.2.x and previous released versions will continue to work with Java Platform 5 (JDK/JRE 1.5), however we will not fix bugs related to Java Platform 5 past the support end date.
  - Confluence 3.3 will only be tested with and support Java Platform 6 (JDK/JRE 1.6).
  - If you have concerns with this end of support announcement, please email [eol-announcement at atlassian dot com](mailto:eol-announcement@atlassian.com).

### Deprecated Web Browsers for Confluence (14 December 2009)

This section announces the end of Atlassian support for certain web browsers for Confluence.

We will **stop supporting older versions of web browsers** as follows:

- From Confluence 3.2, due late Q1 2010, support for Firefox 2 and Safari 2 will end.
- From 13 July 2010, in line with Microsoft's Support Lifecycle policy, support for IE6 will end.

The details are below. Please refer to the [Supported Platforms](#) for more details regarding platform support for Confluence. If you have questions or concerns regarding this announcement, please email [eol-announcement@atlassian.com](mailto:eol-announcement@atlassian.com).

#### End of Life Announcement for Web Browser Support

Web Browsers	Support End Date
Firefox 2	When Confluence 3.2 releases, late Q1 2010
Safari 2	When Confluence 3.2 releases, late Q1 2010
Internet Explorer 6	When Confluence 3.3 releases (target Q3 2010) or 13 July 2010, whichever is sooner

- **Firefox 2 and Safari 2 Notes:**

- Confluence 3.1 is the last version to officially support Firefox 2 and Safari 2.
- You may be able to use these older browser for the most common use cases like viewing and editing content, but official support for these browsers will end once you upgrade to Confluence 3.2.
- Confluence 3.2 is currently targeted to release late Q1 2010 and will not be tested with Firefox 2 and Safari 2. After the Confluence 3.2 release, Atlassian will not provide fixes in older versions of Confluence for bugs affecting Firefox 2 and Safari 2.

- **Internet Explorer 6 Notes:**

- Confluence 3.2 (due late Q1 2010) will be the last version to officially support Internet Explorer 6.
- Confluence 3.3 is currently targeted to release Q3 2010 and will **not** support IE6.
- Atlassian will support IE6 in Confluence until the 13th of July 2010, in line with Microsoft's [Support Lifecycle policy](#). Beyond that date, released versions of Confluence will continue working with IE6 just as they did before, but we will not fix bugs affecting Internet Explorer 6.
- You may be able to use Internet Explorer 6 for the most common use cases like viewing and editing content, but official support for this browser will end once you upgrade to Confluence 3.3.

## Supported Platforms FAQ

### Q: How does Atlassian choose which JRE versions, application servers and databases to support?

For application servers and databases, we try to pick a good cross-section of open source options and popular commercial platforms. We then choose which JRE versions to support based on the recommended environments for these servers.

### Q: What is a supported platform?

A supported platform is one that:

- Confluence is regularly tested on during the development cycle
- One that is available within Atlassian for support technicians and developers to reproduce problems
- Bugs raised against it will be given a high priority

Supporting a platform means we know how to get Confluence running in that environment and can troubleshoot Confluence issues within it. It does not mean we have any particular expertise beyond that. As such, we may not be able to provide assistance with customizing or tuning that application server or database. (Atlassian support is not a substitute for a good database administrator.)

### Q: Can I get assistance with running Confluence on a platform that is *not* supported?

If you are running Confluence on an unsupported platform, then we can not guarantee providing any support for it. Furthermore, we will recommend that you switch to a platform which is supported.

### Q: If you write your application to standards like J2EE, JDBC and SQL, doesn't that mean it should run on any compliant server?

Confluence is a complicated application and we commonly encounter interesting edge-cases where different servers have interpreted the specifications differently. Then again, each server has its own different collection of

bugs.

### Q: How can I get Atlassian to support Confluence on a new platform?

Supporting a new platform involves a significant investment of time by Atlassian, both up-front costs to set up new testing environments and fix any issues we might encounter and the ongoing costs involved in maintaining the application against this new environment in the future. As such, supporting a new platform is not something we will do unless we know there is significant demand for it.

Please be aware that your interest alone will not be enough for us to add support for your application server or database. We would need to see a significant number of votes on the issue raised in our public Jira site or a significant level of interest in our forums, before considering supporting that platform.

### Q: My organization has standardized on an operating environment that Confluence does not support. What can I do?

In this situation, you have the following two options:

1. Run Confluence in the unsupported environment, with the caveats mentioned above.
2. Make an exception to your standardized operating environment and set up Confluence based on its supported platforms.

## Migrating Confluence Between Servers

This page describes how to move Confluence between physical servers using the same or a different operating system.

It doesn't cover [database migration](#) or [upgrading](#) your Confluence version. We suggest you do each of these steps separately.

### On this page:

- [Transferring Confluence to another server](#)

### Transferring Confluence to another server

To transfer Confluence to another server you will copy the home and install folders straight into an identical external database and user management setup. If your new server is using a different operating system there may be some additional changes at step 4.

1. Run the Confluence installer on your new server
2. Shut down Confluence on both your old and new servers
3. If you're using Oracle or MySQL, copy [the drivers](#) from your old server to the new one
4. Delete the contents of the home directory on your new Confluence server, then copy in the contents of the home directory from your old Confluence server.
5. Make any additional changes required for your environment.

#### ▼ [If you're changing the location of the home directory...](#)

If the path to your home directory is different on the new server open the `Confluence_install_directory/confluence/WEB-INF/classes` directory and edit `confluence-init.properties` by changing the line starting with `'confluence.home='`.

#### ▼ [If you're moving your database...](#)

If you have also moved your database from one server to another you can change the JDBC URL in `<confluence.home>/confluence.cfg.xml` if you are using a direct JDBC connection or in the definition of your datasource (if you are connecting via a datasource).

#### ▼ [If your new server has a different operating system...](#)

If you're migrating from **Windows to Linux**, you'll need to replace the backslashes with forward slashes in the following lines in `confluence.cfg.xml`:



```
<property
name="attachments.dir">${confluenceHome}/attachments</property
>
<property
name="lucene.index.dir">${localHome}/index</property>
<property
name="webwork.multipart.saveDir">${localHome}/temp</property>
```

If you're migrating from **Linux to Windows**, you'll need to replace the forward slashes with backslashes in the following lines in `confluence.cfg.xml`:

```
<property
name="attachments.dir">${confluenceHome}\attachments</property
>
<property
name="lucene.index.dir">${localHome}\index</property>
<property
name="webwork.multipart.saveDir">${localHome}\temp</property>
```

6. Copy the `<confluence-install>/conf/server.xml` file from your old server to the same location on your new server
7. If you use a data source, ensure the data source points to the new database. See [Configuring a datasource connection](#).
8. Start Confluence, then head to **General configuration > License Details** to add your license key

We strongly recommend you perform a [rebuild of your content indices](#) after performing a migration, to ensure Confluence search works as expected.

## From Confluence Evaluation through to Production Installation

So, you want to try Confluence on an evaluation installation, then move to a production installation when you are ready? This page gives an overview of the steps to follow.

Assumptions:

- This page starts with telling you how to install an evaluation Confluence site. If you have already finished evaluating Confluence, you can safely skip steps 1 to 3.
- Your production installation will be an installed version of Confluence, **not** a Confluence Cloud site.
- You will evaluate Confluence on an installed version too, not a Confluence Cloud site.

If you are using Confluence Cloud to evaluate Confluence, please refer to the following guide when you want to move to an installed version: [Migrate from Confluence Cloud to Server](#).

### Step 1. Set up your evaluation Confluence site

If you have already set up an evaluation Confluence site, you can skip this step.

#### On this page:

- [Step 1. Set up your evaluation Confluence site](#)
- [Step 2. Add users and content to your evaluation site](#)
- [Step 3. Look for interesting add-ons as part of your evaluation](#)
- [Step 4. Set up your production Confluence site](#)

#### Related pages:

- [Supported Platforms](#)
- [Add and Invite Users](#)
- [Getting Started as Confluence Administrator](#)
- [Confluence installation and upgrade guide](#)



Below is a summary of the installation and setup procedure, focusing on the choice of database.

#### To install Confluence:

1. Download the installer from the [Confluence download site](#).  
Note: If you are using a Mac or another unsupported platform for your evaluation, you will need to install from a zip file. Details are in the full installation guide.
2. Run the installer and choose the express or custom installation. If you are not sure, choose **Express Install**.
  - The **express** option will install Confluence with default settings.
  - The **custom** option allows you to choose the Confluence installation directory, home (data) directory, ports and other options.
3. When prompted, choose the option to **open Confluence in your browser**, where you can complete the setup.

#### To set up Confluence, including the database:

1. Follow the prompts in the browser-based setup wizard, to get your Confluence license.
2. Choose the **Trial** or **Production** installation type. If you are not sure, choose **Trial Installation**.
  - The **Trial** option will install Confluence with default settings, including the embedded database which is automatically set up for you. You'll need to migrate to an external database before running Confluence in a production environment (more info below).

### Step 2. Add users and content to your evaluation site

If you have finished evaluating Confluence, you can skip this step.

Depending on your choices during the Confluence setup, your evaluation site may include sample content. The example pages, blog posts and attachments are in the 'Demonstration space'. This space is present if:

- You chose the 'Trial Installation' during setup.
- Or you chose the 'Production Installation', then chose to include the 'Example Site'.

You can update the sample content, and create more of your own. You can also invite people to join you on the site.

When you move to a production site, you can choose to copy the content and users to the new site.

#### To create content in your evaluation site:

- Choose **Spaces > Create Space** to add a space, which is like a library of pages.
- Choose **Create** to add pages and blog posts.

**To add users:** Choose the **cog** icon



then choose **User Management**.


### Step 3. Look for interesting add-ons as part of your evaluation

If you have finished evaluating Confluence, you can skip this step.

Add-ons, also called plugins, provide additional features that you can install into your Confluence site. Some of them are provided free of charge. Many of the commercial add-ons are available free for an evaluation period.

You can browse and download add-ons on the [Atlassian Marketplace](#). You can also find add-ons via the Confluence user interface, which interacts with the Atlassian Marketplace for you.

#### To find useful add-ons via the Confluence user interface:

1. Choose the **cog** icon  
  
then choose **Add-ons**.
2. Choose **Find new add-ons**.

## Step 4. Set up your production Confluence site

When you are ready to move from an evaluation site to a production site, you need to migrate to a production-ready database. This involves installing a new Confluence site with a new database, and instructing Confluence to copy the data from your evaluation site to the new site. You will also need to check some important configuration settings, and define your backup strategy. The instructions below lead you through all the steps required.

### Migrating your data to a production database:

1. Choose a database carefully, with a focus on reliability and backups. See our [list of supported databases](#). If you are unsure which one to choose, we recommend PostgreSQL.
2. Install a new database and a new Confluence site, by following our guide to [migrating to another database](#). The guide will lead you through the following steps:
  - Setting up your database server.
  - Adding a Confluence database (schema) to your database server.
  - Installing a new, production-ready Confluence site.
  - Copying your Confluence data from your evaluation site to your new production site.

### Setting important configuration options on your production site:

- Set the base URL. See [Configuring the Server Base URL](#).
- Make sure you have configured an email server. See [Configuring a Server for Outgoing Mail](#).
- Decide on proxy setup and other settings that determine where Confluence fits into your network. See [Web Server Configuration](#).
- Consider setting up a secure connection via SSL. See [Running Confluence Over SSL or HTTPS](#).
- Read our guidelines on security. See [Best Practices for Configuring Confluence Security](#).
- Decide whether you will manage your users in Confluence or connect to an external LDAP directory. See [Configuring User Directories](#).
- Decide whether you want to allow public (anonymous) access to your site. See [Setting Up Public Access](#).
- Set up your permission scheme. See [Permissions and restrictions](#).
- Connect Confluence to Jira applications such as Jira Software or Jira Service Desk or other applications. See [Linking to Another Application](#).

### Defining your backup strategy:

By default, Confluence will create daily XML backups of your content and user data. This is suitable when you are evaluating Confluence. When you move to a production site, you need more robust backup procedures and technologies. See [Production Backup Strategy](#).

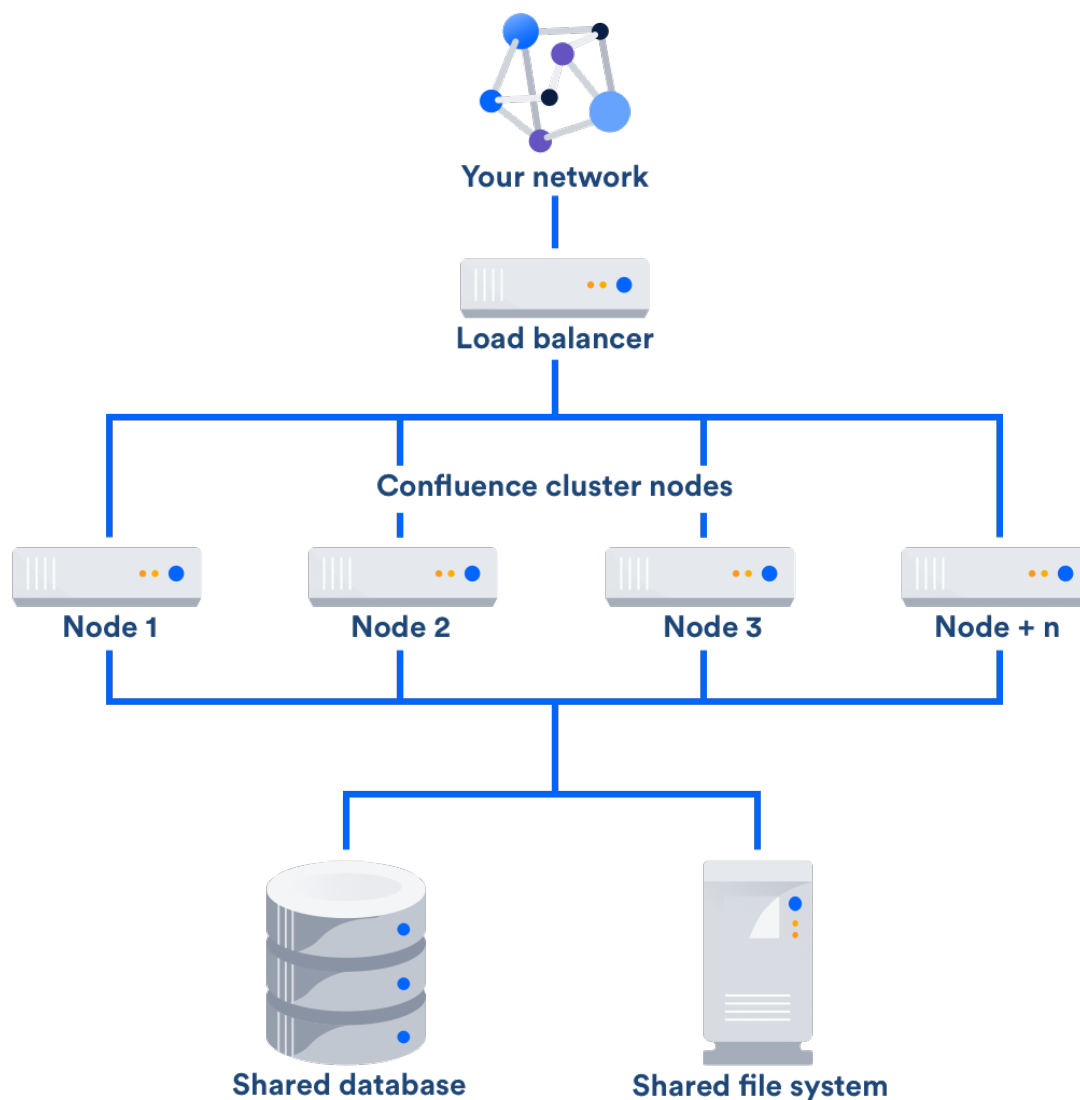
## Confluence Data Center

Confluence Data Center is designed to support the unique, and complex requirements of enterprise organizations. It is a clustered solution that can provide performance at scale and high availability. This page provides an overview of options and considerations for large enterprises using Confluence. If you want to find out how to make sure Confluence can scale with your organization, this information is for you.

- **Performance at scale:** If your Confluence instance has a very heavy load (you have a lot of users accessing Confluence at the same time) a clustered installation will spread the load evenly between cluster nodes, enabling you to serve more requests.
- **High availability and failover:** If one cluster node goes down, then the remaining cluster nodes can continue servicing requests so that users see little or no loss of availability.
- **Instant scalability:** You can rapidly provision extra capacity with no downtime. Licensing is based on users, not the number of nodes in your cluster. This means you can join additional nodes to your cluster at any time, making it very easy to adapt as your usage grows.

### A look at the architecture

Confluence Data Center enables you to configure a cluster similar to the one pictured here:



### Load balancer

The load balancer distributes requests from your users to the cluster nodes. If a cluster node goes down, the load balancer immediately detects the failure and automatically directs requests to the other nodes within seconds. You can use any load balancer that supports session affinity.

### Application nodes

The cluster of Data Center nodes share the workload of incoming requests. Failure of a cluster node causes virtually no loss of availability for users, because requests are immediately directed to other nodes. All nodes are active and process requests.

### Shared database and storage

Data Center supports the [same databases](#) that are supported for Confluence Server. It also supports any shared file system, which stores: import/export files, plugins, Logos directory, shared caches, and any data directory which includes attachments, avatars and icons.

## Get started with Confluence Data Center

[Contact us](#) to speak with an Atlassian or [get going with Data Center](#) straight away.

For a detailed overview of Confluence's clustering solution see [Confluence Data Center Technical Overview](#). For help with installation, take a look at [Installing Confluence Data Center](#), or for quick and easy set up, check out [Running Confluence Data Center in AWS](#).

## Confluence Data Center Technical Overview

This page provides information on Confluence Data Center, which is a clustered solution that can provide performance at scale and high availability. This is

essential if your Confluence instance is mission critical or has very high load.

## How it works

### On this page

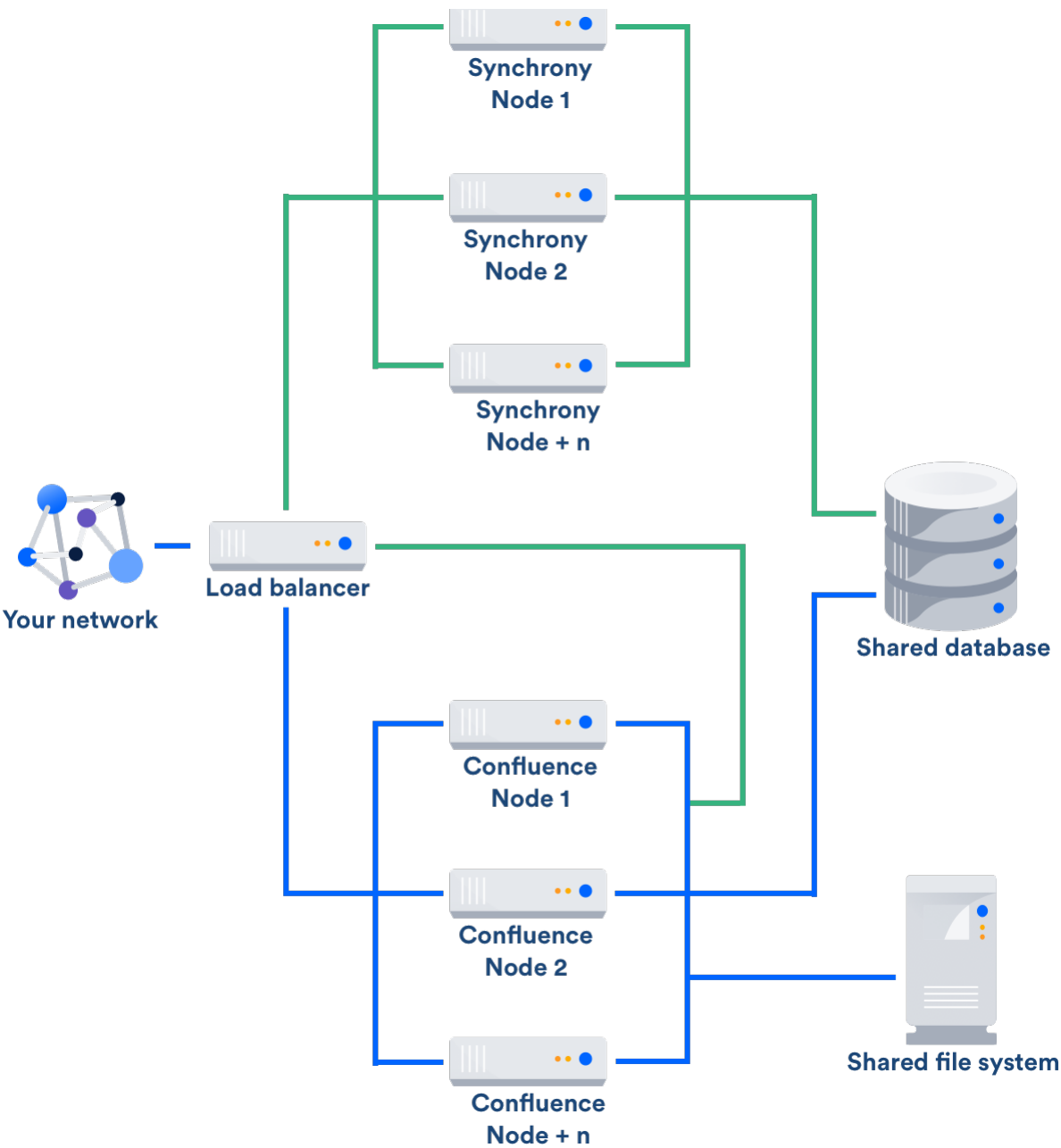
- [How it works](#)
- [Infrastructure and hardware requirements](#)
- [User management](#)
- [Plugins and add-ons](#)

## The basics

Confluence Data Center enables you to configure a cluster similar to the one pictured below with:

- Multiple server nodes for Confluence that store:
  - logs
  - caches
  - Lucene indexes
  - configuration files
  - plugins
- Multiple server nodes to run Synchrony, which is required for collaborative editing.
- A shared file system that stores:
  - attachments
  - avatars / profile pictures
  - icons
  - export files
  - import files
  - plugins
- A database that all nodes read and write to.
- A load balancer to evenly direct requests to each node.

All Confluence nodes are active and process requests. A user will access the same Confluence node for all requests until their session times out, they log out, or a node is removed from the cluster.



Licensing

Your Data Center license is based on the number of users in your cluster, rather than the number of nodes. You can monitor the available license seats in the License page.

If you wanted to automate this process (for example to send alerts when you are nearing full allocation) you can use the REST API.

▼ REST API...

The following GET requests require an authenticated user with system administrator permissions. The requests return JSON.

<code>&lt;confluenceurl&gt;/rest/license/1.0/license/userCount</code>	Number of active users
<code>&lt;confluenceurl&gt;/rest/license/1.0/license/remainingSeats</code>	Number of users you can add before reaching your license limit

<code>&lt;confluenceurl&gt;/rest/license/1.0/license/maxUsers</code>	Maximum number of users allowed by your license
--	---

## Home directories

Confluence has a concept of a local home and shared home. Each Confluence node has a local home that contains logs, caches, Lucene indexes and configuration files. Everything else is stored in the shared home, which is accessible to each Confluence node in the cluster. Attachments, icons and avatars are stored in the shared home as are export and import files.

Add-ons can choose whether to store data in the local or shared home, depending on the needs of the add-on.

If you are currently storing attachments in your database you can continue to do so, but this is not available for new installations.

## Caching

Confluence uses a distributed cache that is managed using Hazelcast. Data is evenly partitioned across all the Confluence nodes in a cluster, instead of being replicated on each node. This allows for better horizontal scalability, and requires less storage and processing power than a fully replicated cache.

Because of this caching solution, to minimize latency, your nodes should be located in the same physical location.

## Indexes

A full copy of the Confluence indexes are stored on each Confluence node individually. A journal service keeps each index in synch.

When you first set up your cluster, you will copy the local home directory, including the indexes, from the first node to each new node.

When adding a new Confluence node to an existing cluster, you will copy the local home directory of an existing node to the new node. When you start the new node, Confluence will check if the index is current, and if not, request a recovery snapshot of the index from either the shared home directory, or a running node (with a matching build number) and extract it into the index directory before continuing the start up process. If the snapshot can't be generated or is not received by the new node in time, existing index files will be removed, and Confluence will perform a full re-index.

If a Confluence node is disconnected from the cluster for a short amount of time (hours), it will be able to use the journal service to bring its copy of the index up-to-date when it rejoins the cluster. If a node is down for a significant amount of time (days) its Lucene index will have become stale, and it will request a recovery snapshot from an existing node as part of the node startup process.

If you suspect there is a problem with the index on all nodes, you can temporarily disable index recovery on one node, rebuild the index on that node, then copy the new index over to each remaining node.

## Cluster safety mechanism

The ClusterSafetyJob scheduled task runs every 30 seconds in Confluence. In a cluster, this job is run on one Confluence node only. The scheduled task operates on a safety number – a randomly generated number that is stored both in the database and in the distributed cache used across the cluster. The ClusterSafetyJob compares the value in the database with the one in the cache, and if the value differs, Confluence will shut the node down - this is known as cluster split-brain. This safety mechanism is used to ensure your cluster nodes cannot get into an inconsistent state.

If cluster split-brain does occur, you need to ensure proper network connectivity between the clustered nodes. Most likely multicast traffic is being blocked or not routed correctly.

This mechanism also exists in standalone Confluence.

## Balancing uptime and data integrity

By changing how often the cluster safety scheduled job runs and the duration of the Hazelcast heartbeat (which controls how long a node can be out of communication before it's removed from the cluster) you can fine tune the balance between uptime and data integrity in your cluster. In most cases the default values will be appropriate, but there are some circumstances where you may decide to trade off data integrity for increased uptime for example.

▼ [Here's some examples...](#)

### Uptime over data integrity

Cluster safety job	Hazelcast heartbeat	Effect
1 minute	1 minute	You could have network interruptions or garbage collection pauses of up to 1 minute without triggering a cluster panic. However, if two nodes are no longer communicating, conflicting data could be being written to the database for up to 1 minute, affecting your data integrity.
10 minutes	30 seconds	You could have network interruptions or garbage collection pauses of up to 30 seconds without nodes being evicted from the cluster. Evicted nodes then have up to 10 minutes to rejoin the cluster before the Cluster Safety Job kicks in and shuts down the problem node. Although this may result in higher uptime for your site, conflicting data could be being written to the database for up to 10 minutes, affecting your data integrity.

### Data integrity over uptime

Cluster safety job	Hazelcast heartbeat	Effect
15 seconds	15 seconds	Network interruptions or garbage collection pauses longer than 15 seconds will trigger a cluster panic. Although this may result in higher downtime for your site, nodes can only write to the database while out of communication with each other for a maximum of 15 seconds, ensuring greater data integrity.
15 seconds	1 minute	You could have network interruption or garbage collection pauses up to 1 minute without nodes being evicted from the cluster. Once a node is evicted, it can only write to the database for a maximum of 15 seconds, minimizing the impact on your data integrity.

To find out how to change the cluster safety scheduled job, see [Scheduled Jobs](#).

You can change the Hazelcast heartbeat default via the `confluence.cluster.hazelcast.max.no.heartbeat.seconds` system property. See [Configuring System Properties](#).

## Cluster locks and event handling

Where an action must only run on one node, for example a scheduled job or sending daily email notifications, Confluence uses a cluster lock to ensure the action is only performed on one node.

Similarly, some actions need to be performed on one node, and then published to others. Event handling ensures that Confluence only publishes cluster events when the current transaction is committed and complete. This is to ensure that any data stored in the database will be available to other instances in the cluster when the event is received and processed. Event broadcasting is done only for certain events, like enabling or disabling an add-on.



## Cluster node discovery

When configuring your cluster nodes you can either supply the IP address of each cluster node, or a multicast address.

### If you're using multicast:

Confluence will broadcast a join request on the multicast network address. Confluence must be able to open a UDP port on this multicast address, or it won't be able to find the other cluster nodes. Once the nodes are discovered, each responds with a unicast (normal) IP address and port where it can be contacted for cache updates. Confluence must be able to open a UDP port for regular communication with the other nodes.

A multicast address can be auto-generated from the cluster name, or you can enter your own, during the set-up of the first node.

## Infrastructure and hardware requirements

The choice of hardware and infrastructure is up to you. Below are some areas to think about when planning your hardware and infrastructure requirements.

### AWS Quick Start deployment option

If you plan to run Confluence Data Center on AWS, a [Quick Start](#) is available to help you deploy Confluence Data Center in a new or existing Virtual Private Cloud (VPC). You'll get your Confluence and Synchrony nodes, Amazon RDS PostgreSQL database and application load balancer all configured and ready to use in minutes. If you're new to AWS, the step-by-step Quick Start Guide will assist you through the whole process.

Confluence can only be deployed in a region that supports Amazon Elastic File System (EFS). See [Running Confluence Data Center in AWS](#) for more information.

## Servers

We recommend your servers have at least 4GB of physical RAM. A high number of concurrent users means that a lot of RAM will be consumed. You usually don't need to assign more than 4GB per JVM process, but can fine tune the settings as required.

You should also not run any additional applications (other than core operating system services) on the same servers as Confluence. Running Confluence, Jira and Bamboo on a dedicated Atlassian software server works well for small installations but is discouraged when running at scale.


Confluence Data Center can be run successfully on virtual machines. If you're using multicast, you can't run Confluence Data Center in Amazon Web Services (AWS) environments as AWS doesn't currently support multicast traffic.

## Cluster nodes

Your Data Center license does not restrict the number of nodes in your cluster. We have tested the performance and stability with up to 4 nodes.

Each node does not need to be identical, but for consistent performance we recommend they are as close as possible. All cluster nodes must:

- be located in the same data center
- run the same Confluence version (for Confluence nodes) or the same Synchrony version (for Synchrony nodes)
- have the same OS, Java and application server version
- have the same memory configuration (both the JVM and the physical memory) (recommended)
- be configured with the same time zone (and keep the current time synchronized). Using `ntpd` or a similar service is a good way to ensure this.

 You must ensure the clocks on your nodes don't diverge, as it can result in a range of problems with your cluster.

## Database

The most important requirement for the cluster database is that it have sufficient connections available to support the number of nodes.

For example, if:

- each Confluence node has a maximum pool size of 20 connections
- each Synchrony node has a maximum pool size of 15 connections (the default)
- you plan to run 3 Confluence nodes and 3 Synchrony nodes

your database server must allow at least 105 connections to the Confluence database. In practice, you may require more than the minimum for debugging or administrative purposes.

You should also ensure your intended database is listed in the current [Supported Platforms](#). The load on an average cluster solution is higher than on a standalone installation, so it is crucial to use the a supported database.

You must also use a supported database driver. Collaborative editing will fail with an error if you're using an unsupported or custom JDBC driver (or `driverClassName` in the case of a JNDI datasource connection). See [Database JDBC Drivers](#) for the list of drivers we support.

## Shared home directory and storage requirements

All Confluence cluster nodes must have access to a shared directory in the same path. NFS and SMB/CIFS shares are supported as the locations of the shared directory. As this directory will contain large amount of data (including attachments and backups) it should be generously sized, and you should have a plan for how to increase the available disk space when required.

## Load balancers

We suggest using the load balancer you are most familiar with. The load balancer needs to support 'session affinity' and WebSockets. This is required for both Confluence and Synchrony. If you're deploying on AWS you'll need to use an Application Load Balancer (ALB).

Here are some recommendations when configuring your load balancer:

- Queue requests at the load balancer. By making sure the maximum number requests served to a node does not exceed the total number of http threads that Tomcat can accept, you can avoid overwhelming a node with more requests than it can handle. You can check the `maxThreads` in `<install-directory>/conf/server.xml`.
- Don't replay failed idempotent requests on other nodes, as this can propagate problems across all your nodes very quickly.
- Using *least connections* as the load balancing method, rather than *round robin*, can better balance the load when a node joins the cluster or rejoins after being removed.

Many load balancers require a URL to constantly check the health of their backends in order to automatically remove them from the pool. It's important to use a stable and fast URL for this, but lightweight enough to not consume unnecessary resources. The following URL returns Confluence's status and can be used for this purpose.

URL	Expected content	Expected HTTP Status
<code>http://&lt;confluenceurl&gt;/status</code>	<code>{ "state": "RUNNING" }</code>	200 OK

▼ [See all status codes and responses...](#)

HTTP Status Code	Response entity	Description
------------------	-----------------	-------------

200	<pre>{ "state": "RUNNING" }</pre>	Running normally
500	<pre>{ "state": "ERROR" }</pre>	An error state
503	<pre>{ "state": "STARTING" }</pre>	Application is starting
503	<pre>{ "state": "STOPPING" }</pre>	Application is stopping
200	<pre>{ "state": "FIRST_RUN" }</pre>	Application is running for the first time and has not yet been configured
404		Application failed to start up in an unexpected way (the web application failed to deploy)

Here are some recommendations, when setting up monitoring, that can help a node survive small problems, such as a long GC pause:

- Wait for two consecutive failures before removing a node.
- Allow existing connections to the node to finish, for say 30 seconds, before the node is removed from the pool.

## Network adapters

Use separate network adapters for communication between servers. Cluster nodes should have a separate physical network (i.e. separate NICs) for inter-server communication. This is the best way to get the cluster to run fast and reliably. Performance problems are likely to occur if you connect cluster nodes via a network that has lots of other data streaming through it.

## Additional requirements for collaborative editing

Collaborative editing in Confluence 6.0 and later is powered by Synchrony, which runs as a separate process. You can deploy Synchrony on the same nodes as Confluence, or in its own cluster with as many nodes as you need.

If you chose to run Synchrony on the same nodes as Confluence, you will need at least 2 GB of additional memory (the default maximum heap size for Synchrony is 1 GB).

Your load balancer (and any other proxies) must support WebSocket connections and session affinity.

## Additional requirements for high availability

Confluence Data Center removes the application server as a single point of failure. You can further minimize single points of failure by ensuring your load balancer, database and shared file system are also highly available.

## User management

You can manage users in Confluence's internal directory, in an [external LDAP directory](#), or in [Atlassian Crowd or JIRA](#).

You can also connect Confluence Data Center to a [SAML 2.0 identity provider](#) for authentication and single sign-on (only available to Confluence Data Center).

## Plugins and add-ons

The process for installing add-ons in Confluence Data Center is the same as for a standalone instance of Confluence. You will not need to stop the cluster, or bring down any nodes to install or update an add-on.

The Atlassian Marketplace indicates add-ons that are compatible with Confluence Data Center.

Add-on licenses for Data Center are sold at the single server rate, but must match or exceed your Confluence Data Center license tier. For example, if you are looking to have 3,000 people using Confluence Data Center, then you would buy any add-ons at the 2-001-10,000 user tier.

If you have developed your own plugins for Confluence you should refer to our developer documentation on [How do I ensure my add-on works properly in a cluster?](#) to find out how you can confirm your plugin is cluster compatible.

## Ready to get started?

[Contact us](#) to speak with an Atlassian or [get going with Data Center](#) straight away.

For help with installation, take a look at [Installing Confluence Data Center](#).

## Administer your Data Center search index

### Location of search indexes

A full copy of the Confluence indexes are stored on each Confluence node individually. A journal service keeps each index in sync.

Confluence Data Center also stores a snapshot of the search index in the shared home directory, which can be useful in a disaster recovery scenario. These snapshots are created as part of the Clean Journal Entries scheduled job which, by default, runs once per day.

### Index recovery

When you start a Confluence node it will check whether its index is current, and if not, it will request a recovery snapshot from the shared home directory. If a snapshot is not available, it will generate a snapshot from a running node (with a matching build number). Once the recovery snapshot is extracted into the index directory, Confluence will continue the startup process.

If the snapshot can't be generated, or is not received in time, existing index files will be removed and Confluence will perform a reindex on that node. If your index is very large or your file system slow, you may need to increase the time Confluence waits for the snapshot to be generated using the `confluence.cluster.index.recovery.generation.timeout` system property.

Index recovery only happens on node startup, so if you suspect a problem with a particular cluster node's index, restart that node to trigger index recovery.

### Rebuilding the search index

If you suspect there's a problem with the index on all nodes, you'll need to rebuild the index on just one node first, then copy it to the other nodes. We recommend backing up the local home directory and your shared home directory before you begin.

In this example we'll rebuild the index on node 1. You may wish to use your load balancer to direct traffic away from node 1 while the index is being rebuilt. This will prevent users from hitting a Confluence node with an

incomplete index.

1. Stop Confluence on node 1.
2. Set the `confluence.cluster.index.recovery.num.attempts` system property to 0.  
This disables index recovery on node 1, so that when this node is restarted, it does not attempt to recover the bad index from the remaining nodes.
3. Back up then delete the following index directories on node 1.
  - `<local-home>/index`
  - `<local-home>/journal`
4. Back up then delete the following index directory from your shared home directory.
  - `<shared-home>/index-snapshots`
5. Start Confluence on Node 1. Confluence will automatically begin building the index.
6. Once the reindex is complete stop Confluence on both node 1 and node 2.
7. Back up then delete the following index directories on node 2.
  - `<local-home>/index`
  - `<local-home>/journal`
8. Copy the `<node1-local-home>/index` directory to node 2 local home.
9. Start Confluence on node 2.
10. Repeat this process for any remaining nodes.  
To avoid problems, both the node you are copying *from* and the node you are copying *to* should be stopped while copying.
11. Finally, stop Confluence on Node 1.
12. Set the `confluence.cluster.index.recovery.num.attempts` system property back to 1.  
This re-enables index recovery on node 1.

All nodes are now running the rebuilt index.

## Configuring Synchrony for Data Center

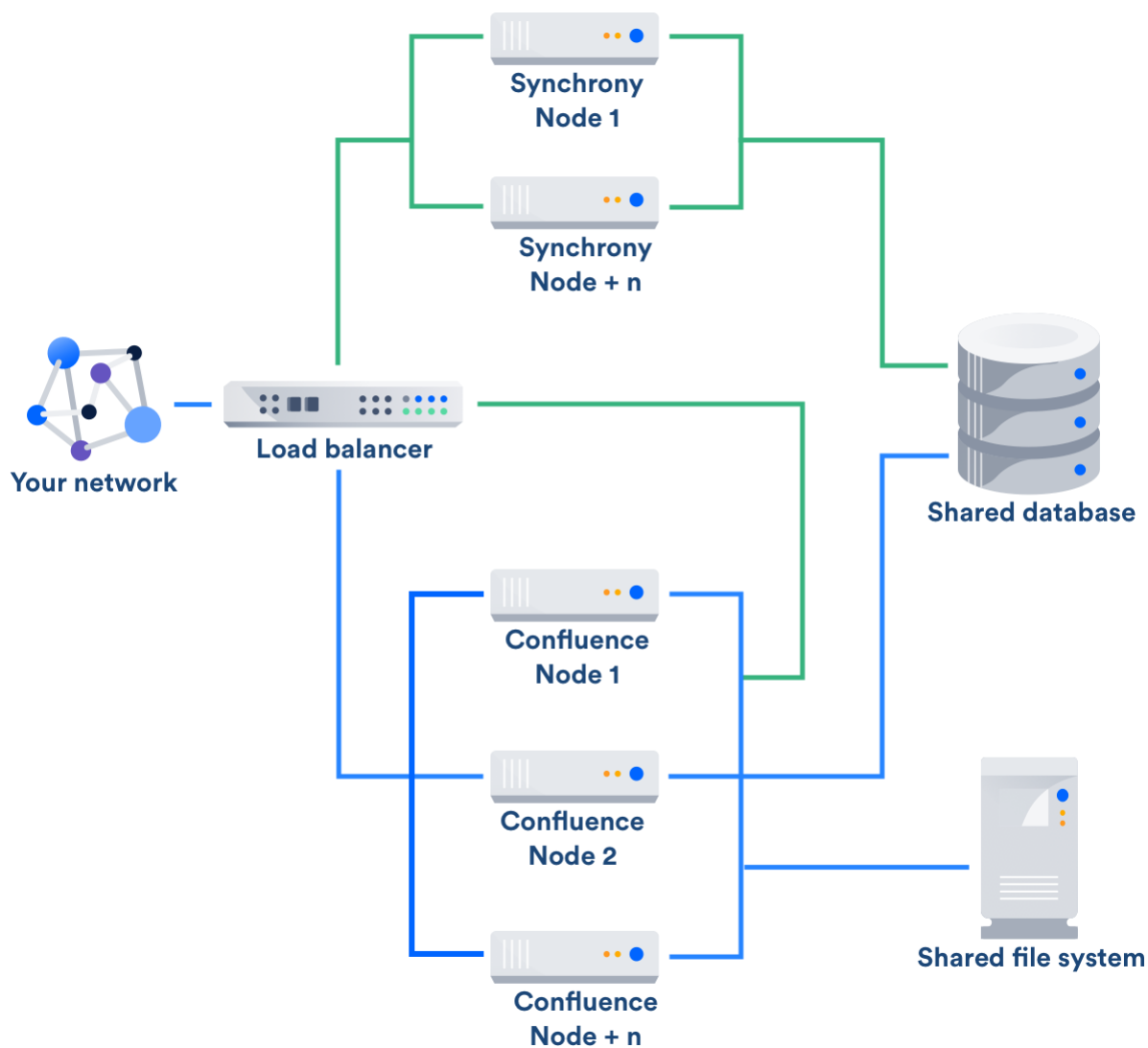
When you install Confluence Server, Synchrony is automatically configured to run as a separate process on your server.

For Confluence Data Center, we give you full control by allowing you to set Synchrony up yourself. This gives you the flexibility to deploy Synchrony standalone on the same nodes as Confluence, or in its own cluster with as many nodes as you need.

### On this page:

- [Start and stop Synchrony](#)
- [Run Synchrony as a service](#)
- [Accessing Synchrony logs](#)
- [Notes](#)

Here's an example architecture, with a 2 node Synchrony cluster to support a three node Confluence cluster.



To set up Synchrony in Data Center you'll need to:

- Copy the following files and directories from one of your Confluence nodes to wherever you plan to run Synchrony:
  - `<install-directory>/bin/synchrony`
  - `<local-home>/synchrony-standalone.jar`
  - your database driver from `<install-directory>/confluence/WEB-INF/lib`
- Edit the `start-synchrony.sh` or `start-synchrony.bat` file and follow the instructions in the script itself to insert the required parameters listed below.
- Add any additional system properties in the **Optional Overrides** section.

See [Installing Confluence Data Center](#) for a step by step guide to setting up Synchrony for Data Center.

#### Required Synchrony properties (Data Center only)

Before you can run Synchrony, you need to edit the `start-synchrony` script to provide the following values.

Property name	Description
<code>SERVER_IP</code>	Public IP address or hostname of this Synchrony node. It could also be a private IP address - it should be configured to the address where Synchrony is reachable by the other nodes.

DATABASE_URL	This is the URL for your Confluence database. For example <code>jdbc:postgresql://yourserver:5432/confluence</code> . You can find this URL in <code>&lt;local-home&gt;/confluence.cfg.xml</code> .
DATABASE_USER	This is the username of your Confluence database user.
DATABASE_PASSWORD	(Optional) This is the password for your Confluence database user.  Rather than hardcoding your password, we recommend setting your password with the environment variable <code>SYNCHRONY_DATABASE_PASSWORD</code> . Any dots (".") in variable names (identifiers) will need to be replaced with underscores ("_").
CLUSTER_JOIN_PROPERTIES	This determines how Synchrony should discover nodes. You'll be prompted to uncomment a set of parameters for either: <ul style="list-style-type: none"> <li>• TCP/IP</li> <li>• Multicast</li> <li>• AWS</li> </ul> Follow the prompts in the script for the values you need to enter for each of these.
DATABASE_DRIVER_PATH	This is the path to your database driver file. If you're running Synchrony on its own node, you'll need to copy your database driver to an appropriate location then provide the path to this location.
SYNCHRONY_JAR_PATH	This is the path to the <code>synchrony-standalone.jar</code> file you copied to this node.
SYNCHRONY_URL	This is the URL that the browser uses to contact Synchrony. Generally this will be the full URL of the load balancer Synchrony will run behind plus the Synchrony context path, for example <code>http://yoursite.com:8091/synchrony</code> .  Note that it <i>does not</i> end with <code>/v1</code> , unlike the <code>synchrony.service.url</code> system property passed to Confluence. If this URL doesn't match the URL coming from a users' browser, Synchrony will fail.
OPTIONAL_OVERRIDES	You can choose to specify additional system properties. See the table below for recognised Synchrony system properties.

### Optional Synchrony system properties (Data Center only)

When you start Synchrony, we pass default values for the properties listed below. You can choose to override these values by specifying any of these properties when you start Synchrony.

Property name	Default	Description
<code>cluster.listen.port</code>	5701	<p>This is Synchrony's <a href="#">Hazelcast</a> port. Specify this property if you do not want to use port 5701 or if it is not available.</p> <p>As with the Confluence Hazelcast port (5801) you should ensure that only permitted cluster nodes are allowed to connect to Synchrony's Hazelcast port, through the use of a firewall and or network segregation.</p>



<code>synchrony.cluster.base.port</code>	25500	This is the Aleph binding port. Synchrony uses Aleph to communicate between nodes. Specify this property if you don't want to use the default.
<code>cluster.join.multicast.group</code>	224.2.2.3	If the cluster join type is multicast, you can specify an IP address for the multicast group if you don't want to use the default.
<code>cluster.join.multicast.port</code>	54327	If the cluster join type is multicast, you can specify a multicast port if you don't want to use the default.
<code>cluster.join.multicast.ttl</code>	32	If the cluster join type is multicast, this is the <a href="#">time to live</a> threshold. The default, 32, means the scope is restricted to the same site, organization or department. Specify this property if you want to use a different threshold.
<code>cluster.interfaces</code>	Defaults to the same value as <code>SERVER_IP</code>	This is the network interface Synchrony will use to communicate between nodes. Specify this property if you don't want to use the default, which uses the value of the required property Defaults to the same value as <code>SERVER_IP</code> (also known as <code>synchrony.bind</code> ).
<code>synchrony.cluster.bind</code>	Defaults to the same value as <code>SERVER_IP</code>	This is the Aleph binding address. This should be set to the same value as <code>cluster.interfaces</code> .  Specify this property if you did not use the default value for <code>cluster.interfaces</code> .
<code>synchrony.port</code>	8091	This is the HTTP port that Synchrony runs on. If port 8091 is not available, specify this property to choose a different port.
<code>synchrony.context.path</code>	Defaults to the context path of <code>SYNCHRONY_URL</code>	This is the context path for Synchrony. There should be no need to change this.

## Start and stop Synchrony

To start Synchrony, run `start-synchrony.sh` or `start-synchrony.bat`. A process ID (PID) file will be created in your synchrony directory.

To stop Synchrony, run `stop-synchrony.sh` or `stop-synchrony.bat`. This will destroy the PID file that the start script created in your Synchrony directory. If you've customised the location for storing the PID file in the `start-synchrony` script, you'll need to also update this in the `stop-synchrony` script.

If you're unable to start Synchrony, check that there is not an existing PID file in your Synchrony directory.

You can only use these scripts to start and stop Synchrony in Confluence Data Center.

To restart Synchrony in Confluence server head to



> **General Configuration** > **Collaborative editing**.

## Run Synchrony as a service

If you'd prefer to run Synchrony as a service, see [Run Synchrony-standalone as a service on Linux](#).

It's currently not possible to run Synchrony as a service on Windows.

## Accessing Synchrony logs

Your Synchrony logs will be stored in the Synchrony directory in each node (wherever you run the start and stop scripts from).

## Notes

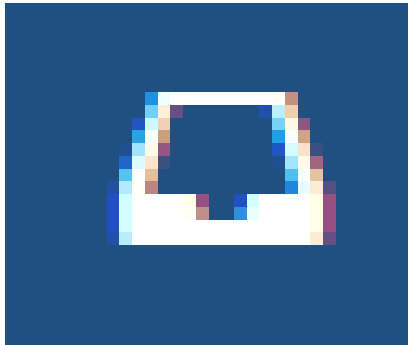
If your users are unlikely to be able to get a WebSocket connection to Synchrony (for example your load balancer or reverse proxy does not support WebSockets) you can enable XHR fallback by passing the `synchrony.enable.xhr.fallback` [system property](#) to Confluence. Note that this is a *Confluence* system property and must be passed to Confluence, it is not part of your start Synchrony command.

You will need to open Synchrony's port, as you can't use the built-in Synchrony proxy with Data Center. The `synchrony.proxy.enabled` system property mentioned in the Confluence Server documentation has no effect in Data Center.

## Restricted Functions in Confluence Data Center

There are some features that are disabled or limited in Confluence Data Center. This is to ensure the integrity and performance of your cluster.

The current restricted functions are:

Restricted function	Data Center Status	Explanation
Workbox plugins	Available from 5.7	<p>The <a href="#">workbox</a></p>  <p>provides notifications collected from Confluence page watches, shares, and mentions. This is disabled in Confluence Data Center 5.6 to ensure notifications are correctly handled across the cluster.</p> <p>Disabled plugins included Workbox common plugin, Workbox Jira provider plugin, Workbox confluence provider plugin, Workbox host plugin. You will not be able to enable these plugins in the universal plugin manager.</p>

Confluence Quick Reload Plugin	Available from 5.6.3	<p>The quick reload function notifies users when a new comment has been added to a page they are currently viewing.</p> <div> New comment from Rachel Admin <a href="#">Show</a> <a href="#">Ignore</a>  New edit by Rachel Admin <a href="#">Reload</a> <a href="#">Ignore</a> </div> <p>This is disabled in Confluence Data Center 5.6 and 5.6.1 for performance reasons. You will not be able to enable the Confluence Quick Reload Plugin in the universal plugin manager.</p> <p>See <b>CONFSERVER-34680</b> - Make quick reload plugin available in Confluence Data Center <b>RESOLVED</b> for more info.</p>
Application links authentication: <ul style="list-style-type: none"> <li>Basic access (http)</li> <li>Trusted Applications</li> </ul>	<b>RESTRICTED</b>	<p>When creating <a href="#">Application links</a> to other applications (for example Jira) Basic HTTP and Trusted Applications authentication is not supported for Confluence Data Center.</p> <p>All application links must use OAuth authentication in a cluster.</p>
Confluence Usage Stats plugin	<b>DISABLED</b>	<p>The Confluence Usage Stats plugin provides <a href="#">space activity information</a> for a space (statistics). This is disabled by default in Confluence Server and should not be enabled in Confluence Data Center.</p>
Scheduled jobs history and status	<b>LIMITED</b>	<p>On the Scheduled Jobs page in the Confluence Data Center administration console you will not be able to access the last execution time or history for each job. The page will also only show the configured status (scheduled or disabled) of each job, and will not indicate when a job is in progress.</p>
Remember me on by default	<b>LIMITED</b>	<p>Remember me on the log in page is enabled by default (and does not appear) to allow users to move seamlessly between nodes. You can use the <code>cluster.login.rememberme.enabled</code> <a href="#">system property</a> to override the default and show the checkbox - users will be prompted to log in to another node if their current node is unavailable.</p>

## Confluence Data Center Performance

This document describes the performance tests we conducted on Confluence Data Center within Atlassian and the results of those tests. You can compare these data points to your own implementation to predict the type of results you might expect from implementing Confluence Data Center in your own organization.

We started our performance tests by taking a fixed load profile (read/write ratio), then tested different cluster set ups against multiples of that load profile.

### On this page

- [Testing results summary](#)
- [Testing methodology and specifications](#)
  - [How we tested](#)
  - [What we tested](#)
  - [Hardware](#)
- [Comparison to Confluence Server response times](#)

### Testing results summary

**Performance gains** - Under a high load, clustered Confluence has improved performance overall.

**Request responses don't diminish under increased load** - Adding more nodes increases throughput, handles higher load and decreases response times.

*You might observe a different trend/behavior based on your configuration and usage. For details, please see the [What we tested](#) section below.*

### Testing methodology and specifications

The following sections detail the testing environment and methodology we used in our performance tests.

#### How we tested

Our performance tests were all run on the same controlled isolated lab at Atlassian. For each test, the entire environment was reset and rebuilt. The testing environment included the following components and configuration:

- Apache proxy\_balancer
- Postgres database and the required data
- G1GC garbage collector
- 8GB Xmx settings per node
- 6 CPUs per node
- Confluence Server on one machine or Confluence Data Center on two, or four machines as required for the specific test.

To run the test, we used a number of machines in the lab to generate load using scripted browsers and measuring the time taken to perform an action. An action here, means a complete user operation like creating a page or adding comment. Each browser was scripted to perform an action from a predefined list of actions and immediately move on to the next action (i.e. zero think time). Please note that this resulted in each browser performing more tasks than would be possible by a real user and you should not interpret the number of browsers to be equal to the number of real world users. Each test was run for 20 minutes, after which statistics were collected.

#### What we tested

- All tests used the same Postgres database containing the same number of spaces and pages.
- The mix of actions we included in the tests represented a sample of the most common user actions\* representing six typical types of users (personas). The table below shows the ratio of actions performed by each of these personas. These user-based actions were repeated until the test was completed.

Persona	Ratio of actions
PageReader	7

Searcher	1
Editor	1
Creator	1
Commenter	1
Liker	1

Tests were performed with differing load sizes, from 4 up to 96 browsers. For larger load sets, profiles were scaled up, that is, doubling each amount for the 24 browser load, tripled for the 36 browser load.

\* The tests did not include admin actions as these are assumed to be relatively infrequent.

## Hardware

All performance tests were all run on the same controlled, isolated lab at Atlassian using the hardware listed below.

Hardware	Description	How many?
Rackform iServ R304.v3	CPU: 2 x Intel Xeon E5-2430L, 2.0GHz (6-Core, HT, 15MB Cache, 60W) 32nm  RAM: 48GB (6 x 8GB DDR3-1600 ECC Registered 2R DIMMs) Operating at 1600 MT/s Max  NIC: Dual Intel 82574L Gigabit Ethernet Controllers - Integrated  Controller: 8 Ports 3Gb/s SAS, 2 Ports 6Gb/s SATA, and 4 Ports 3Gb/s SATA via Intel C606 Chipset  PCIe 3.0 x16: Intel X540-T2 10GbE Dual-Port Server Adapter (X540) 10GBASE-T Cat 6A - RJ45  Fixed Drive: 240GB Intel 520 Series MLC (6Gb/s) 2.5" SATA SSD  Power Supply: 600W Power Supply with PFC - 80 PLUS Gold Certified	20
Arista DCS-7050T-36-R	4PORT SFP+ REAR-TO-FRONT AIR 2XAC	1
HP ProCurve Switch	1810-48G 48 Port 10/100/1000 ports Web Managed Switch	1

## Hardware testing notes:

- In order to quickly put more stress on the Confluence nodes with less load, cluster nodes were set to use only 4 cores out of 6 from each CPU, thereby reducing its processing power.
- For instances being tested, 6 GB of memory was allocated to the JVM consistently across all tests. This may not be optimized for all cases but allowed for consistency and comparability between the tests.
- During the tests we did not observe high CPU or IO load on either the database or load balancer servers.
- During the tests we did not observe running out of HTTP connections in the load balancer or connections to database.
- The browser and servers are in the same location so there was very low latency between client and server.

## Comparison to Confluence Server response times

The following table shows the relative performance as the load increases for each Confluence instance configuration: Confluence Server, two node Confluence Data Center, and four node Confluence Data Center. The table shows the response time relative to the baseline response time which we determined to be Confluence Server with sixteen browsers.

Browsers	16	24	36	48	60	72	84	96
Server	100.00%	125.28%	142.95%	222.76%	276.54%	334.79%	393.03%	451.28%
2 Node	93.79%	122.61%	123.50%	141.98%	168.47%	201.97%	235.47%	268.97%
4 Node	94.24%	122.22%	103.94%	123.47%	114.76%	134.61%	138.90%	160.95%

### Ready to get started?

[Contact us](#) to speak with an Atlassian or [get going with Data Center](#) straight away.

For a detailed overview of Confluence's clustering solution see [Confluence Data Center Technical Overview](#). For help with installation, take a look at [Installing Confluence Data Center](#).

## Confluence Data Center disaster recovery

A disaster recovery strategy is a key part of any business continuity plan. It outlines the processes to follow in the event of a disaster, to ensure that the business can recover and keep operating. For Confluence, this means ensuring Confluence's availability in the event that your primary site becomes unavailable.

[Confluence Data Center](#) is the only Atlassian-supported high-availability solution for Confluence. However, if you don't choose Confluence Data Center, our Experts may be able to help implementing a high availability solution for your environment. [Contact our Experts team](#) for more information.

This page demonstrates how you can use Confluence Data Center 5.9 or later in implementing and managing a disaster recovery strategy for Confluence. It doesn't, however, cover the broader business practices, like setting the key objectives (RTO, RPO & RCO<sup>1</sup>), and standard operating procedures.

### What's the difference between high availability and disaster recovery?

The terms "high availability", "disaster recovery" and "failover" can often be confused. For the purposes of this page, we've defined them as follows:

- **High availability** – A strategy to provide a specific level of availability. In Confluence's case, access to the application and an acceptable response time. Automated correction and failover (within the same location) are usually part of high-availability planning.
- **Disaster recovery** – A strategy to resume operations in an alternate data center (usually in another geographic location), if the main data center becomes unavailable (i.e. a disaster). Failover (to another location) is a fundamental part of disaster recovery.
- **Failover** – is when one machine takes over from another machine, when the aforementioned machines fails. This could be within the same data center or from one data center to another. Failover is usually part of both high availability and disaster recovery planning.

### Overview

Before you start, you need Confluence Data Center 5.9 or later to implement the strategy described in this guide.

This page describes what is generally referred to as a 'cold standby' strategy, which means the standby Confluence instance isn't continuously running and that you need to take some administrative steps to start the standby instance and ensure it's in a suitable state to service the business needs of your organization.

### Maintaining a runbook

The detailed steps will vary from organization to organization and, as such, we recommend you keep a full runbook of steps on file, away from the production system it references. Make your runbook detailed

enough such that anyone in the relevant team should be able to complete the steps and recover your service, regardless of prior knowledge or experience. We expect any runbook to contain steps that cover the following parts of the disaster recovery process:

1. Detection of the problem
2. Isolation of the current production environment and bringing it down gracefully
3. Synchronization of data between failed production and intended recovery point
4. Warm up instructions for the recovery instance
5. Documentation, communication, and escalation guidelines

The major components you need to consider in your disaster recovery plan are:

<b>Confluence installation</b>	Your standby site should have exactly the same version of Confluence installed as your production site.
<b>Database</b>	This is the primary source of truth for Confluence and contains most of the Confluence data (except for attachments, avatars, etc). You need to replicate your database and continuously keep it up to date to satisfy your RPO <sup>1</sup>
<b>Attachments</b>	All attachments are stored in the Confluence Data Center shared home directory, and you need to ensure it's replicated to the standby instance.
<b>Search Index</b>	The search index isn't a primary source of truth, and can always be recreated from the database. For large installations, though, this can be quite time consuming and the functionality of Confluence will be greatly reduced until the index is fully recovered. Confluence Data Center stores search index backups in the shared home directory, which are covered by the shared home directory replication.
<b>Plugins</b>	User installed plugins are stored in the database and are covered by the database replication.
<b>Other data</b>	A few other non-critical items are stored in the Confluence Data Center shared home. Ensure they're also replicated to your standby instance.

## Set up a standby system

### Step 1. Install Confluence Data Center 5.9 or higher

Install the same version of Confluence on your standby system. Configure the system to attach to the standby database.

#### **DO NOT start the standby Confluence system**

***Starting Confluence would write data to the database and shared home, which you do not want to do.***

You may want to test the installation, in which case you should temporarily connect it to a different database and different shared home directory and start Confluence to make sure it works as expected. Don't forget to update the database configuration to point to the standby database and the shared home directory configuration to point to the standby shared home directory after your testing.

### Step 2. Implement a data replication strategy



Replicating data to your standby location is crucial to a cold standby failover strategy. You don't want to fail over to your standby Confluence instance and find that it's out of date or that it takes many hours to re-index.

<b>Database</b>	<p>All of the following Confluence supported database suppliers provide their own database replication solutions:</p> <p>▼ <a href="#">Show me...</a></p> <ul style="list-style-type: none"> <li>• Oracle: <a href="http://www.oracle.com/technetwork/database/features/data-integration/index.html">http://www.oracle.com/technetwork/database/features/data-integration/index.html</a></li> <li>• PostgreSQL: <a href="https://wiki.postgresql.org/wiki/Binary_Replication_Tutorial">https://wiki.postgresql.org/wiki/Binary_Replication_Tutorial</a></li> <li>• MySQL: <a href="http://dev.mysql.com/doc/refman/5.7/en/replication.html">http://dev.mysql.com/doc/refman/5.7/en/replication.html</a></li> <li>• Microsoft SQL Server: <a href="http://msdn.microsoft.com/en-us/library/ms151198.aspx">http://msdn.microsoft.com/en-us/library/ms151198.aspx</a></li> </ul> <p>You need to implement a database replication strategy that meets your RTO, RPO and RCO<sup>1</sup>.</p>
<b>Files</b>	<p>You also need to implement a file server replication strategy for the Confluence shared home directory that meets your RTO, RPO and RCO<sup>1</sup>.</p>

## Clustering considerations

For your clustered environment you need to be aware of the following, in addition to the information above:

<b>Standby cluster</b>	<p>There's no need for the configuration of the standby cluster to reflect that of the live cluster. It may contain more or fewer nodes, depending on your requirements and budget. Fewer nodes may result in lower throughput, but that may be acceptable depending on your circumstances.</p>
<b>File locations</b>	<p>Where we mention <code>&lt;confluencesharedhome&gt;</code> as the location of files that need to be synchronized, we're referring to the shared home for the cluster. <code>&lt;confluencelocalhome&gt;</code> refers to the local home of the node in the cluster.</p>
<b>Starting the standby cluster</b>	<p>It's important to <b>initially start only one node</b> of the cluster, allow it to recover the search index, and check it's working correctly before starting additional nodes.</p>

## Disaster recovery testing

You should exercise extreme care when testing any disaster recovery plan. Simple mistakes may cause your live instance to be corrupted, for example, if testing updates are inserted into your production database. You may detrimentally impact your ability to recover from a real disaster, while testing your disaster recovery plan.

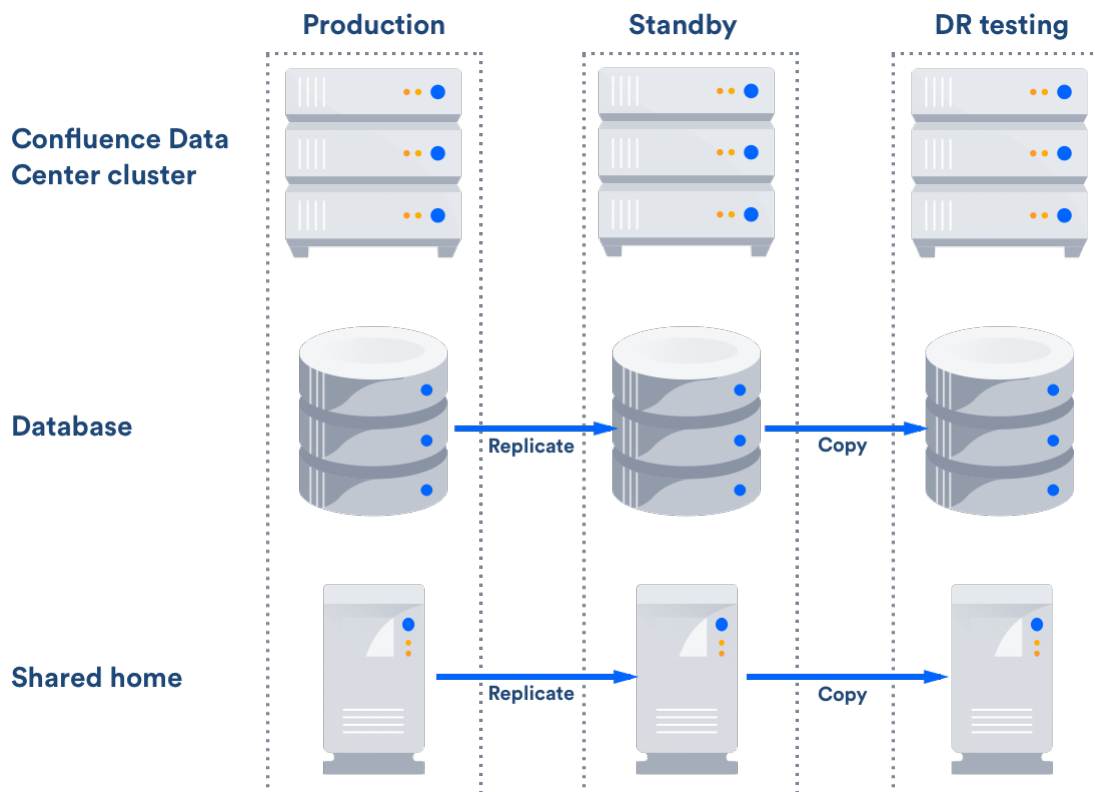
The key is to **keep the main data center as isolated as possible from the disaster recovery testing**.

This procedure will ensure that the standby environment will have all the right data, but as the testing environment is completely separate from the standby environment, possible configuration problems on the standby instance are not covered.

## Prerequisites

Before you perform any testing, you need to isolate your production data.

<b>Database</b>	<ol style="list-style-type: none"><li>1. Temporarily pause all replication to the standby database</li><li>2. Replicate the data from the standby database to another database that's isolated and with no communication with the main database</li></ol>
<b>Attachments, plugins and indexes</b>	<p>You need to ensure that no plugin updates or index backups occur during the test:</p> <ol style="list-style-type: none"><li>1. Disable index backups</li><li>2. Instruct sysadmins to not perform any updates in Confluence</li><li>3. Temporarily pause all replication to the standby shared home directory</li><li>4. Replicate the data from the standby shared home directory to another directory that's isolated and with no communication with the main shared home directory</li></ol>
<b>Installation folders</b>	<ol style="list-style-type: none"><li>1. Clone your standby installation separate from both the live and standby instances</li><li>2. Change the connection to the database in the <code>&lt;confluencelocalhome&gt;/confluence.cfg.xml</code> file to avoid any conflict</li><li>3. Change the location of the shared home directory in the <code>&lt;confluencelocalhome&gt;/confluence.cfg.xml</code> file to avoid any conflict</li><li>4. If using TCP/IP for cluster setup, change the IP addresses to that of your testing instances in <code>&lt;confluencelocalhome&gt;/confluence.cfg.xml</code></li></ol>



After this you can resume all replication to the standby instance, including the database.

### Perform disaster recovery testing

Once you have isolated your production data, follow the steps below to test your disaster recovery plan:

1. Ensure that the new database is ready, with the latest snapshot and no replication
2. Ensure that the new shared home directory is ready, with the latest snapshot and no replication
3. Ensure you have a copy of Confluence on a clean server with the right database and shared home directory settings in `<confluencelocalhome>/confluence.cfg.xml`
4. Ensure you have `confluence.home` mapped, as it was in the standby instance, in the test server
5. Disable email (See `atlassian.mail.senddisabled` in [Configuring System Properties](#))
6. Start Confluence

### Handling a failover

In the event your primary site is unavailable, you'll need to fail over to your standby system. The steps are as follows:

1. Ensure your live system is shutdown and no longer updating the database
2. Ensure the contents of `<confluencesharedhome>` is synced to your standby instance
3. Perform whatever steps are required to activate your standby database
4. Start Confluence on one node in the standby instance
5. Wait for Confluence to start and check it is operating as expected
6. Start up other Confluence nodes
7. Update your DNS, HTTP Proxy, or other front end devices to route traffic to your standby server

### Returning to the primary instance

In most cases, you'll want to return to using your primary instance after you've resolved the problems that caused the disaster. This is easiest to achieve if you can schedule a reasonably-sized outage window.

You need to:

- Synchronize your primary database with the state of the secondary
- Synchronize the primary shared home directory with the state of the secondary

### Perform the cut over

1. Shutdown Confluence on the standby instance
2. Ensure the database is synchronized correctly and configured to as required
3. Use `rsync` or a similar utility to synchronize the shared home directory to the primary server
4. Start Confluence
5. Check that Confluence is operating as expected
6. Update your DNS, HTTP Proxy, or other front end devices to route traffic to your primary server

### Other resources

#### Atlassian Answers

Our community and staff are active on Atlassian Answers. Feel free to contribute your best practices, questions and comments. Here are some of the answers relevant to this page:

- [Disaster Recovery Configuration for Jira and Confluence](#)

### Troubleshooting

If you encounter problems after failing over to your standby instance, check these FAQs for guidance:

#### ▼ [What should I do if my database isn't synchronized correctly?](#)

If your database doesn't have the data available that it should, then you'll need to restore the database from a backup.

Once you've restored your database, the search index will no longer be in sync with the database. You can either do a full re-index, background or foreground, or recover from the latest index snapshot if you have one. This includes the journal id file for each index snapshot. The index snapshot can be older than your database backup; it'll synchronize itself as part of the recovery process.

#### ▼ [What should I do if my search index is corrupt?](#)

If the search index is corrupt, you can either do a full re-index, background or foreground, or recover from an earlier index snapshot from the shared home directory if you have one.

#### ▼ [What should I do if attachments are missing?](#)

You may be able to recover them from backups if you have them, or recover from the primary site if you have access to the hard drives. Tools such as `rsync` may be useful in these circumstances. Missing attachments won't stop Confluence performing normally; the missing attachments won't be available, but users may be able to upload them again.

#### ▼ [What happens to my application links during failover?](#)

Application links are stored in the database. If the database replica is up to date, then the application links will be preserved.

You do, however, also need to consider how each end of the link knows the address of the other:

- If you use host names to address the partners in the link and the backup Confluence server has the same hostname, via updates to the DNS or similar, then the links should remain intact and working.
- If the application links were built using IP addresses and these aren't the same, then the application links will need to be re-established.
- If you use IP addresses that are valid on the internal company network but your backup system is remote and outside the original firewall, you'll need to re-establish your application links.


### Definitions

RPO	Recovery Point Objective	How up-to-date you require your Confluence instance to be after a failure.
RTO	Recovery Time Objective	How quickly you require your standby system to be available after a failure.
RCO	Recovery Cost Objective	How much you are willing to spend on your disaster recovery solution.

## Data Center Troubleshooting

This page covers troubleshooting for a Data Center installation of Confluence.

If you're experiencing Cluster Panic messages in non-clustered installation of Confluence, visit the Knowledge Base article ['Database is being updated by an instance which is not part of the current cluster' Error Message](#).

 You must ensure the clocks on your cluster nodes don't diverge, as it can result in a range of problems with your cluster.

### Symptoms

Below is a list of potential problems with Confluence Data Center, and their likely solutions.

#### On this page:

- [Symptoms](#)
- [Didn't find a solution?](#)

#### Related pages:

- [Troubleshooting a Data Center cluster outage](#)

Problem	Likely solutions
Database is being updated by an instance which is not part of the current cluster errors on a stand-alone	<a href="#">'Database is being updated by an instance which is not part of the current cluster' Error Message</a>
Database is being updated by an instance which is not part of the current cluster errors on a cluster	<a href="#">Add multicast route, Check firewall, Cluster Panic due to Multiple Deployments</a>
Cannot assign requested address on startup, featuring an IPv6 address	<a href="#">Prefer IPv4</a>
Error in log: The interface is not suitable for multicast communication	<a href="#">Change multicast interface, Add multicast route</a>
Multicast being sent, but not received	<a href="#">Check firewall, Check intermediate routers, Increase multicast TTL</a>
Add-on is unlicensed on some nodes after updating the license on one node.	<a href="#">Disable and re-enable the add-on in the Universal Plugin Manager.</a>
After a add-on update, strings appear in the UI instead of buttons and icons on some nodes.	<a href="#">Restart the affected node.</a>
Hazelcast CANNOT start on this node. No matching network interface found.	<a href="#">See Hazelcast CANNOT start on this node. No matching network interface found KB article</a>
Any issue not covered here	<a href="#">Contact support</a>

### Multicast

- Which multicast address?

The multicast address and port used by Confluence can be found on the Cluster Configuration page, or in `confluence.cfg.xml` in the Confluence home directory.

- Multicast address generation.

Confluence uses a hashing algorithm to take the inputted name during setup and it is then turned into a multicast address stored in the config file. Thus, once the initial setup is completed, Confluence will use the address this is the reason why user can change the address if needed, without actually changing the name. Consequently the additional nodes using the same multicast address specified in the config file are able to join the cluster.

Each node has a multicast address configured in the `confluence.cfg.xml` file

```
name="confluence.cluster.address">xxx.xx.xxx.xxx</property>
```

A warning message is displayed when an user changes the address from the one that Confluence has generated by the hashing of the name. There is no way of eliminating the message any other way other than by returning the address to the one that matches the cluster name. Purpose of the warning message is to remind the user that the address has been changed - as it is not the hashed version any longer - consequently the node can not join the cluster just by using the name. It is also necessary to provide the correct address as well.

### Mapping interface to IP address.

To ensure that the interface name is mapped correctly, the following [tool](#) can be used. It shows the mapping of the interface name to the IP address.

```
C:\>java -jar list-interfaces.jar
interfaces.size() = 4
networkInterface[0] = name:lo (MS TCP Loopback interface) index: 1
addresses:
/127.0.0.1;

networkInterface[1] = name:eth0 (VMware Virtual Ethernet Adapter for
VMnet8) index: 2 addresses:
/192.168.133.1;

networkInterface[2] = name:eth1 (VMware Virtual Ethernet Adapter for
VMnet1) index: 3 addresses:
/192.168.68.1;

networkInterface[3] = name:eth2 (Broadcom NetXtreme 57xx Gigabit
Controller - Packet Scheduler Miniport) index: 4 addresses:
/192.168.0.101;
```

### Debugging tools

Listed below are some debugging tools that help determine what the status of the multicast traffic is:

Tool	Information provided
<code>netstat -gn</code>	Lists multicast groups. Does not work on Mac OS X.
<code>netstat -rn</code>	Lists system routing table.

```
tcpdump -i interface
```

Captures network traffic on the given interface. Most useful on an interface that only receives cluster traffic.

### Add multicast route

Multicast networking requirements vary across operating systems. Some operating systems require little configuration, while some require the multicast address to be explicitly added to a network interface before Confluence can use it. If multicast traffic can't be sent or received correctly, adding a route for multicast traffic on the correct interface will often fix the problem. The example below is for a Ubuntu Linux system:

```
route add -net 224.0.0.0 netmask 240.0.0.0 dev eth0
```

To support multiple applications using multicast on different interfaces, you may need to specify a route specific to the Confluence multicast address.

### Check firewall

Ensure your firewall allows UDP traffic on the multicast address and port used by Confluence.

### Prefer IPv4

There are known issues relating to IPv6. You should configure your JVM to try binding to an IPv4 address first.

### Change multicast interface

Confluence might have selected the incorrect interface for multicast traffic, which means it cannot connect to other nodes in the cluster. To override the interface used for multicast traffic after initial setup, edit the `confluence.cluster.interface` property in `<local-home>/confluence.cfg.xml` and specify the network interface. For example to tell Confluence to use `eth1`:

```
<property name="confluence.cluster.interface">eth1</property>
```

### Overriding Hazelcast Configuration

If the solution to your problem involves changes to the Hazelcast configuration, these changes should **not** be made to the Confluence configuration files. Instead, to ensure your configuration survives upgrades, make your changes by creating a Hazelcast override file.

### Increase multicast TTL

The multicast time-to-live (TTL) specifies how many *hops* a multicast packet should be allowed to travel before it is discarded by a router. It should be set to the number of routers in between your clustered nodes: 0 if both are on the same machine, 1 if on two different machines linked by a switch or cable, 2 if on two different machines with one intermediate router, and so on.

To increase the multicast TTL by edit the `confluence.cluster.ttl` property in the `<local-home>/confluence.cfg.xml` file on each node. For example to set the TTL to 3:

```
<property name="confluence.cluster.ttl">3</property>
```



## Check intermediate routers

Advanced switches and routers have the ability to understand multicast traffic, and route it appropriately. Unfortunately sometimes this functionality doesn't work correctly with the multicast management information (IGMP) published by the operating system running Confluence.

If multicast traffic is problematic, try disabling advanced multicast features on switches and routers in between the clustered nodes. These features can prevent multicast traffic being transmitted by certain operating systems.

## Didn't find a solution?

### Check Related Articles from the Confluence Knowledge Base

- [Hazelcast CANNOT start on this node. No matching network interface found.](#)
- [Recovering from a Data Center cluster split-brain](#)
- [Starting Confluence node fails with 'Port \[5801\] is already in use and auto-increment is disabled. Hazelcast cannot start' error](#)
- ["Exception bootstrapping cluster:Shared home directory is not configured correctly" Error during Confluence Data Center startup](#)
- [Multicast communication works only one-way](#)
- [Cannot find "external\\_id" column when trying to upgrade to a Confluence CDC license after upgrading from a pre-5.5 Confluence Clustered installation](#)
- [Cluster Panic due to Multicast Traffic Communication Problem](#)
- [Configuration of Confluence Cluster Fails with 'Cannot assign requested address'](#)
- [How to suppress cluster warning messages in the Confluence log files](#)

### Contact Atlassian support

We have dedicated staff on hand to support your installation of Confluence. Please follow the instructions for [raising a support request](#) and mention that you're having trouble setting up your Confluence cluster.

## Troubleshooting a Data Center cluster outage

Confluence Data Center cluster outages can be difficult to troubleshoot as the environments are complex and logging can be very verbose.

This page provides a starting point for investigating outages in your cluster.

### Establish the originating node

The most common outage scenario is when something, such as database connectivity issue, network outage or a long garbage collection (GC) process, causes a node to fail to communicate with the cluster for 30 seconds or more and is removed by Hazelcast. The affected node then continues to write to the database, causing a cluster panic.

To establish the originating node:

1. Gather the `atlassian-confluence.log` files from each node as soon as possible after the outage. Time is critical as the logs will roll over and you may lose the relevant time period.
2. Record identifying information about each node to help you interpret the log messages (IP address, node ID and name of each node).
3. Make a chronological timeline of the events:
  - a. Record the time that users or monitoring systems started reporting problems.

#### On this page:

- [Establish the originating node](#)
- [Investigate common root causes](#)
  - [Garbage collection](#)
  - [Database connections](#)
  - [Network connectivity](#)
- [Still having trouble?](#)

- b. View the logs for each node side by side (Hint: we find opening three tabs in node number order helps you always know which logs you are viewing).
- c. Search the logs for 'removing member' and 'panic'. This will give you a good idea of which nodes caused the issue and when.
- d. Make a chronological timeline of events from errors to node removal to panics. You can essentially disregard all logging that happens post-panic because once a node panics it needs to be restarted to function effectively. There will be a lot of noise in the logs, but it won't be very useful. The time period we're most interested in will be the minute or so leading up to the first removal or panic event in the logs.

For example:

```
2:50:15 (approx) Node 3 stopped heartbeating to the cluster
for 30s
(we can estimate this from the time of node removal)
02:50:45 Node 3 was removed by Node 2
02:53:15 Node 4 panics
02:54:15 Node 1, Node 3 and Node 4 receive the panic event
and stop processing
Node 2 remains serving requests
```

- e. When you've established when the first affected node was removed, or when the first cluster panic occurred, look back in time in the logs on that node, to look for root causes.

### Investigate common root causes

Once you know when the first affected node was removed you can start investigating root causes. From this point on, you're only looking at events on the affected node around the time of removal (in our example above, this is Node 3 at around 2:50). The subsequent removals and panics are usually flow-on effects of the original node removal event, and aren't likely to provide useful root cause information.

#### *Garbage collection*

Check the GC logs for the node that was removed (Node 3 in our example). Were there any GC pauses longer than the Hazelcast heartbeat interval (30 seconds by default)? Nodes can't heartbeat during Garbage Collection, so they will be removed from the cluster by one of the other nodes.

If there was a cluster panic, but the node was not removed from the cluster first, check the GC logs for pauses around the time of the panic - pauses that are relatively short (less than 30 seconds) can sometimes still cause panics (due to a race condition) in Confluence 5.10.1 and earlier.

#### *Database connections*

Check any database monitoring tools you may have. How many connections to the database were there at the time of the outage? Heartbeats can fail to send if a node can get a connection from its connection pool but not from the database itself, which can lead to nodes being removed from the cluster.

You won't be able to diagnose this from the Confluence logs and will need to look at any external monitoring tools you have for your database. If the outage happens again, check the current number of connections at the db level during the outage.

#### *Network connectivity*

Check your network monitoring tools. If a node drops off the network for a short time and cannot communicate with the cluster, it can be removed by the other nodes. Your load balancer logs may be useful here.

### Still having trouble?

Contact [Support](#) for help troubleshooting these outages. Provide them with as much of the information above

as possible, to help their investigation.

## Getting help and support

Need an answer to your question? Looking for a real person to solve a problem? We're here to help!

### Online help

Check the [documentation](#) for information about using and administering Confluence.

### Online community

If you can't find what you need in the documentation, try asking in our question and answers forum, [Atlassian Answers](#).

### Support team

For one-on-one help, create a support request at [Atlassian Support](#). A support engineer will follow up with you quickly.

If you don't have an account yet, you can create one - just follow the prompts. When creating your support request, please provide as much detail as possible. This will help us resolve your issue faster. See [Troubleshooting Problems and Requesting Technical Support](#).

### Troubleshooting and support tools

Administrators can access a range of troubleshooting and support tools within Confluence. Go to



> **General Configuration > Troubleshooting and support tools** to check the health of your instance, scan your logs, or send a support zip to our Support team.

### Features and bugs

We love to hear your requests for new features and improvements! You make a feature suggestion in the Confluence (CONF) project in our [Jira issue tracker](#).

Alas, bugs do happen. If you find one, we'll do our best to fix it. Please raise a bug report in our [Jira issue tracker](#).

## Confluence Resources

### Resources for evaluators

- [Free trial](#)
- [Feature tour](#)

### Resources for administrators

- [Confluence knowledge base](#)
- [The big list of Atlassian gadgets](#)

### Resources for developers

- [Atlassian Developers site](#)
- [Developer topics on Atlassian Answers](#)

### Downloadable documentation

- [Confluence documentation in PDF format](#)

#### Add-ons and plugins

- [Atlassian Marketplace](#)

#### Support

- [Atlassian Support](#)
- [Support policies](#)

#### Training

- [Atlassian training](#)

#### Answers

- [Confluence at Atlassian Answers](#)

#### Mailing lists

- Visit <http://my.atlassian.com> to sign up for mailing lists relating to Atlassian products, such as technical alerts, product announcements and developer updates.

#### Feature requests and bug reports

- [Issue tracker for Confluence](#)

### Support Policies

Welcome to the support policies index page. Here, you'll find information about how Atlassian Support can help you and how to get in touch with our helpful support engineers. Please choose the relevant page below to find out more.

- [Bug Fixing Policy](#)
- [New Features Policy](#)
- [Security Bugfix Policy](#)

To request support from Atlassian, please raise a support issue in our online support system. To do this, visit [support.atlassian.com](http://support.atlassian.com), log in (creating an account if need be) and create an issue under Confluence. Our friendly support engineers will get right back to you with an answer.

#### Bug Fixing Policy

##### Summary

- Our Support team will help with workarounds and bug reporting
- We'll generally fix critical bugs in the next maintenance release
- We schedule non-critical bugs according to a variety of considerations

##### [Report a bug](#)

### Building an add-on

Are you developing an add-on for an Atlassian product or using one of our APIs? Report any related bugs [here](#).

#### Bug reports

Atlassian Support is eager and happy to help verify bugs—we take pride in it! Create an issue in our [support system](#), providing as much information as you can about how to replicate the problem you're experiencing. We'll replicate the bug to verify, then lodge the report for you. We'll also try to construct workarounds if possible.

### Search existing bug reports

Use our [issue tracker](#) to search for existing bugs, and [watch](#) the ones that are important to you. When you watch an issue, we'll send you an e-mail notification when the issue's updated.

### How we approach bug fixing

Bug fix releases come out more frequently than feature releases, and attempt to target the most critical bugs affecting our customers. The notation for a bug fix release is the final number in the version (the 1 in 6.0.1, for example).

If a bug is critical (production application down or major malfunction causing business revenue loss or high numbers of staff unable to perform their normal functions) we'll fix it in the next bug fix release, provided that:

- The fix is technically feasible (it doesn't require a major architectural change)
- It doesn't impact the quality or integrity of a product

Non-critical bugs are prioritised by these factors:

- How many of our supported configurations are affected by the problem
- Whether there is an effective workaround or patch
- How difficult the issue is to fix
- Whether many bugs in one area can be fixed at one time

Teams responsible for fixing bugs also monitor comments on existing and new bugs, so you can comment to provide feedback if you need to. We give high priority to [security issues](#).

When considering the priority of a non-critical bug, we try to determine a *value* score for a bug. The score takes into account the severity of the bug from our customers' perspective, how prevalent the bug is, and whether new features on our roadmap may render the bug obsolete. Our developers combine the value score with a *complexity* score (how difficult the bug is) when selecting issues to work on.

### How to get access to bug fixes

To get access to bug fixes you will need to upgrade to a release that contains the fix.

### Release terminology

To make understanding our bug fix policy easier, here's some definitions.

- **Platform release** (4.0) contains significant or breaking changes. For example changes or removal of existing APIs, significant changes to the user experience, or removal of a major feature.
- **Feature release** (3.6) can contain new features, changes to existing features, changes to supported platforms (such as databases, operating systems, Git versions), or removal of features. These were previously referred to as 'major' releases by most products.
- **Bug fix release** (3.6.2) can contain bug fixes, stability and performance improvements. Depending on the nature of the bug fixes they may introduce minor changes to existing features, but do not include new features or high risk changes, so can be adopted quickly. We recommend regularly upgrading to the latest bug fix release for your current version. These were previously referred to as 'maintenance' releases by most products.

In addition to the three main release types, a feature release can also be designated an **Enterprise release**, which means it will receive bug fixes for a longer period of time than a standard feature release.

### Enterprise releases

Enterprise releases are for Server and Data Center customers who prefer to allow more time to prepare for upgrades to new feature versions, but still need to receive critical bug fixes. If you only upgrade to a new feature version about once a year, an Enterprise release may be a good fit for your organisation. For Jira Software and Confluence we will:

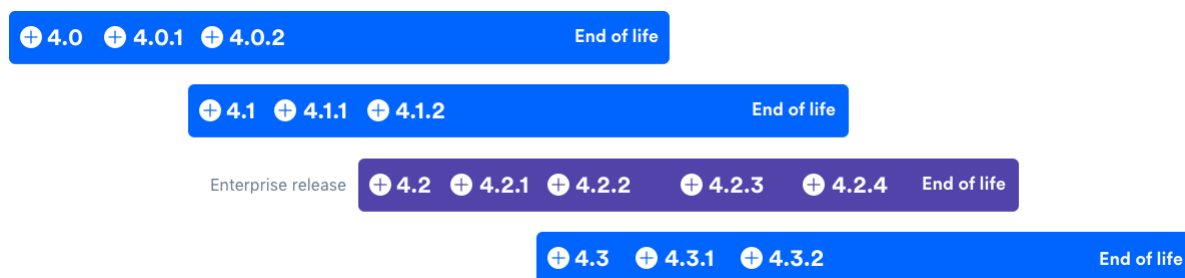
- Designate a feature release as an Enterprise release, at least every 12 months.
- Backport critical security fixes, as outlined in our current security bug fix policy, and fixes relating to stability, data integrity or critical performance issues.
- Make bug fix releases available for the designated version until it reaches end of life.

- Provide a change log of all changes between one Enterprise release and the next to make upgrading easier.

Not all bug fixes will be backported. We'll target the bugs and regressions that we deem most critical, focusing on stability, data integrity, or performance issues. There may also be some fixes that we choose not to backport due to risk, complexity or because the fix requires changes to an API, code used by third party add-ons, or infrastructure that we would usually reserve for a platform release.

For Jira Software Data Center customers, we'll endeavour to allow zero downtime upgrades between one Enterprise release and the next Enterprise release, but can't guarantee that down time will not be required, depending on the nature of the changes. The change log will indicate if zero downtime upgrade will be available.

In the example below, version 4.2 has been designated an Enterprise release. The number of bug fix releases and timing illustrated below is just an example, your product's release cadence may differ.



### Further reading

See [Atlassian Support Offerings](#) for more support-related information.

### New Features Policy

#### Summary

- We encourage and display customer comments and votes openly in our issue tracking system, <http://jira.atlassian.com>.
- We do not publish roadmaps.
- Product Managers review our most popular voted issues on a regular basis.
- We schedule features based on a variety of factors.
- Our [Atlassian Bug Fixing Policy](#) is distinct from this process.
- Atlassian provides consistent updates on the top 20 issues.

#### How to track what features are being implemented

When a new feature or improvement is scheduled, the 'fix-for' version will be indicated in the Jira issue. This happens for the upcoming release only. We maintain roadmaps for more distant releases internally, but because these roadmaps are often pre-empted by changing customer demands, we do not publish them.

#### How Atlassian chooses what to implement

In every [major release](#) we *aim* to implement highly requested features, but it is not the only determining factor. Other factors include:

- **Customer contact:** We get the chance to meet customers and hear their successes and challenges at Atlassian Summit, Atlassian Unite, developer conferences, and road shows.
- **Customer interviews:** All product managers at Atlassian do customer interviews. Our interviews are not simply to capture a list of features, but to understand our customers' goals and plans.
- **Community forums:** There are large volumes of posts on [answers](#), of votes and comments on [jira.atlassian.com](#), and of conversations on community forums like groups on LinkedIn.
- **Customer Support:** Our support team provides clear insights into the issues that are challenging for customers, and which are generating the most calls to support
- **Atlassian Experts:** Our [Experts](#) provide insights into real-world customer deployments, especially for



customers at scale.

- **Evaluator Feedback:** When someone new tries our products, we want to know what they liked and disliked and often reach out to them for more detail.
- **In product feedback:** The [Jira Issue Collectors](#) that we embed our products for evaluators and our Early Access Program give us a constant pulse on how users are experiencing our product.
- **Usage data:** Are customers using the features we have developed?
- **Product strategy:** Our long-term strategic vision for the product.
- Please read our [post on Atlassian Answers](#) for a more detailed explanation.

### How to contribute to feature development

#### Influencing Atlassian's release cycle

We encourage our customers to vote on issues that have been raised in our public Jira instance, <http://jira.atlassian.com>. Please find out if your request already exists - if it does, vote for it. If you do not find it you may wish to create a new one.

#### Extending Atlassian products

Atlassian products have powerful and flexible extension APIs. If you would like to see a particular feature implemented, it may be possible to develop the feature as a plugin. Documentation regarding the [plugin APIs](#) is available. Advice on extending either product may be available on the user mailing-lists, or at [Atlassian Answers](#).

If you require significant customisations, you may wish to get in touch with our [partners](#). They specialise in extending Atlassian products and can do this work for you. If you are interested, please [contact us](#).

### Further reading

See [Atlassian Support Offerings](#) for more support-related information.

#### Security Bugfix Policy

See [Security @ Atlassian](#) for more information on our security bugfix policy.

## Troubleshooting Problems and Requesting Technical Support

Having problems with your Confluence site? This page provides some basic troubleshooting steps and tools to help you get your site back on track.

### Troubleshooting a problem

If you're not a Confluence administrator, you should report your problem to your Confluence admin.

If you're an administrator:

1. Run the health check and log scanner for known issues with your site.
2. Search our [knowledge base](#) for solutions to known issues
3. Check our [issue tracker](#) for known bugs.
4. If you suspect the problem is related to an add-on, you can run Confluence in [Safe Mode](#) or temporarily disable any third party add-ons.

If you're unable to solve the problem, create a support zip with your logs and configuration files, then contact our Support team for help.

### Running a health check

Health checks provide a simple way to check the set up of your Confluence instance. The health check looks at things like your license validity, basic database setup, file system configuration and more.

To run the health check go to

#### On this page:

- [Troubleshooting a problem](#)
- [Running a health check](#)
- [Using the log analyzer](#)
- [Raise a support request with an add-on vendor](#)
- [Raise a support request with Atlassian](#)
- [Creating a support zip file](#)
- [Logging a bug](#)

#### Related pages:

- [Requesting Support for External User Management](#)
- [Requesting Performance Support](#)
- [Confluence Knowledge Base](#)





> **General Configuration** > **Troubleshooting and support tools** > **Instance health**.

The health check will let you know if there are any problems.

### Using the log analyzer

The log analyzer scans your Confluence logs for errors, matching them to known issues in our knowledge base and issue tracker.

To run the log analyzer, go to



> **General Configuration** > **Troubleshooting and support tools** > **Log analyzer**. It will return a list of links to matching articles in our knowledge base and/or bugs in our issue tracker.

Good to know:

- The log scanner uses regular expressions to match errors in your logs with errors reported in knowledge base articles and bugs.
- The most recently reported problems are displayed first. Only the most recent 10 matches are displayed. Click "Show all" to see all the results if more than 10 matches are returned.
- The links will take you to our knowledge base or issue tracker.

### Raise a support request with an add-on vendor

If your problem is related to a third party add-on, you'll need to:

- check whether the add-on is supported by a third party vendor on the [Atlassian Marketplace](#)
- contact the add-on vendor directly - there will be information in the [Marketplace](#) listing

You can read more about [Atlassian support for add-ons](#).

### Raise a support request with Atlassian

There are two ways to raise a support request with us:

- from within Confluence: go to



> **General Configuration** > **Troubleshooting and support tools** > **Get help** and follow the prompts to create the request. See [Create a Support Request](#) for more info.

- from our support site: go to <https://support.atlassian.com> and follow the prompts to choose your product and type of request.

You'll receive email updates about the request progress, and see the status of your request at any time in the Support site.

Good to know:

- If your problem concerns user management or performance, please take a look at the additional requirements in [Requesting Support for External User Management](#) or [Requesting Performance Support](#) before creating a request.
- Provide us as much information as possible about your problem, and your Confluence environment. The following are particularly helpful for our support team:
  - A support zip. See [Create a Support Zip](#) to find out how to generate it.
  - Your log files (if your instance won't start up). See [Working with Confluence Logs](#) to find out how to access your log files.

### Creating a support zip file

We recommend that you attach a support zip file to every interaction with our support team. You'll need

Confluence Administrator or System Administrator permissions to create a support zip.

To create a support zip go to



> **General Configuration** > **Troubleshooting and support tools** > **Create support zip**.

See [Create a Support Zip](#) for more information on which files are included in the support zip file.

## Logging a bug

If you've found a bug, follow the steps above to raise a support request. Our support team can then create the bug report for you - this helps reduce duplication in our issue tracker, and our support team may be able to help you with a workaround in the meantime.

## Content Anonymizer for Data Backups

Atlassian may request a copy of the `entities.xml` file from your exported zip file (backup file), in order to diagnose database corruption or to troubleshoot a bug in Confluence.

If your data is confidential, you can run an anonymizer program over your `entities.xml` file to remove all your data and leaving only the structure of the export.

### Usage

To run the Content Anonymizer on your backup file:

1. Download the [anonymizer JAR](#) (attached to this page).
2. Extract the `entities.xml` file from your zipped backup file to the same directory as the JAR.
3. Use the command prompt to go to the directory where all three files are located.
4. To create `cleaned.xml`, run the command:

```
java -jar confluence-export-cleaner-1.1-jar-with-dependencies.jar  
entities.xml cleaned.xml
```

5. Move the original `entities.xml` file to a different location and then rename `cleaned.xml` to `entities.xml`.
6. Re-ZIP the new `entities.xml` with its `exportDescriptor.properties` to ensure Atlassian Support know exactly which version of Confluence the XML backup was exported from.

### How it works

The Content Anonymizer replaces all text content in file `entities.xml` with 'x' characters. For example, the word "Atlassian" will be transformed to "xxxxxxxxx". The resulting `cleaned.xml` file is expected to have the same size as the original file.

This release of the Content Anonymizer uses [STX](#), a fast and efficient XML transformation technology. It should not require a lot of memory to run, even for a large backup.

## Enabling Detailed SQL Logging

Confluence uses the open source persistence framework [Hibernate](#). This page tells you how to configure Confluence's logging to report individual SQL requests that are sent to the database by Hibernate. It is useful for troubleshooting the following events:

- [XML site backups](#) that fail to import.
- Exceptions caused by an illegal database operation.
- Problems caused by long-running database queries.

SQL debug logging with parameters is extremely verbose, and should only be enabled temporarily, while you're troubleshooting.


#### Related pages:

- [Troubleshooting SQL exceptions](#)
- [Working with Confluence Logs](#)

If you have a database problem and need support assistance, it's a good idea to temporarily enable detailed SQL logging **before** sending us the log files. This will assist us in determining what SQL queries were running during the reported problem. After you've enabled hibernate logging, replicate the action that you suspect is causing the error. This is the best way to ensure that the Confluence log file contains relevant SQL logging.


#### Log SQL queries with parameters

##### To enable temporary SQL logging:

1. Go to  **> General Configuration > Logging and Profiling.**
2. Choose **Enable SQL Logging.**

This logging level will persist until you choose **Disable SQL Logging** or Confluence is restarted. If you need the logging levels to persist (useful for troubleshooting startup problems related to your database, for example) follow the steps below to modify `log4j.properties`.

##### To enable persistent SQL logging:

 Use this method if you're using Confluence 5.9.10 or earlier to ensure that parameters are also logged. You can revert the changes once you're done troubleshooting.

1. Stop Confluence.
2. Edit `<install-directory>\confluence\WEB-INF\classes\log4j.properties`
3. Change the following lines from `ERROR` to `DEBUG`:

```
## log hibernate prepared statements/SQL queries (equivalent to
setting 'hibernate.show_sql' to 'true')
## DEBUG, TRACE or ALL is required to see query strings
log4j.logger.net.sf.hibernate.SQL=DEBUG
```

4. Uncomment the following lines:

```
## log hibernate prepared statement parameter values. Note: due
to caching in net.sf.hibernate.type.NullableType, requires
restart to take effect
## TRACE or ALL is required to see parameter values
## Note that log4j.appender.confluencelog.Threshold (or other
appenders) also must be TRACE or ALL to see any trace messages
in the logs
log4j.logger.net.sf.hibernate.type=TRACE
```

5. Change the following lines from `DEBUG` to `TRACE`:

```
log4j.appender.confluencelog.Threshold=TRACE
```

6. Start Confluence.

This logging level will persist, even when Confluence is restarted. As SQL logging is very verbose, you should revert your changes to `log4j.properties` once you no longer need the additional info.

## Generating a Heap Dump

Sometimes you may see that Confluence is holding onto a chunk of memory over a period of time (for example, tenured space is increasing close to Xmx). In such a situation, it is useful to find out what is stacking up in the memory by analyzing the heap dump.

#### On this page:

- [Automatically Generating a Heap Dump when Confluence Hits OutOfMemory Error](#)
- [Manually Generating a Heap Dump when Confluence Stops Responding](#)
- [Submitting a Heap Dump to Atlassian Support](#)

#### Tips when getting a heap dump

If you have a large Xmx size, please limit your Xmx size to 1024m. This will help to keep Confluence heap dump smaller while still containing sufficient information to analyze it.

#### Automatically Generating a Heap Dump when Confluence Hits OutOfMemory Error

Typically, we would like to analyze the heap dump produced when Confluence died from an OutOfMemory Error. For this, you can add additional JVM parameters like below:

```
-XX:+HeapDumpOnOutOfMemoryError -XX:HeapDumpPath=<path to this heap dump file>
```

If you do not set the HeapDumpPath parameter, by default the heap dump will be saved in the folder where Tomcat is run from.

**i** If you are setting these parameters in the Windows registry (when running Confluence on Windows as a service), be sure that each parameter is on its own line.

#### Manually Generating a Heap Dump when Confluence Stops Responding

It is also possible to get a heap dump manually using a JDK bundled tool called [jmap](#), although we recommend that you use the automatic method above for best result.

#### For Linux/Solaris-based Operating Systems:

Please execute the following command on Linux OS:

```
$JAVA_HOME/bin/jmap -dump:format=b,file=heap.bin <pid>
```

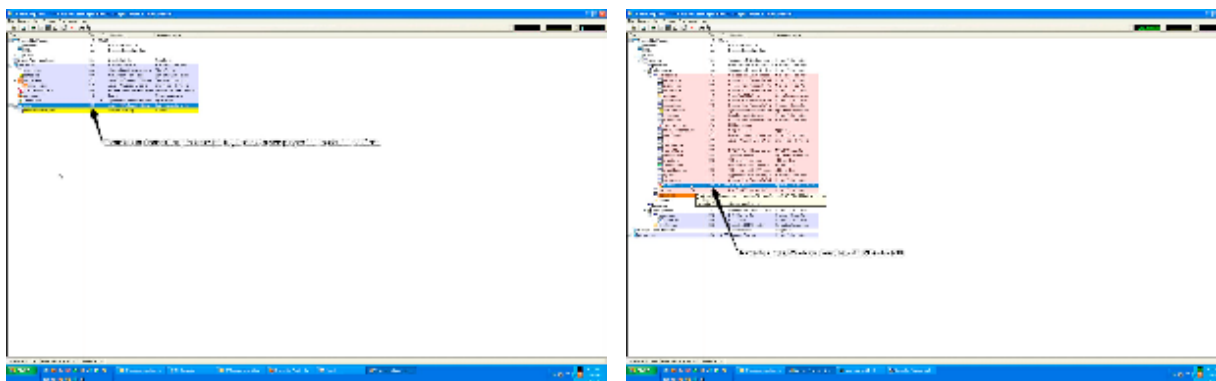
#### For Windows:

Please find your Confluence process ID (see below) and then execute the command below on a Windows command line:

```
%JAVA_HOME%\bin\jmap -dump:format=b,file=heap.bin <pid>
```

To find out the process ID for your Java process in Windows, you can use [Process Explorer](#) from Microsoft. This is what it looks like:

#### *Using Process Explorer to find your Tomcat process ID*



### Submitting a Heap Dump to Atlassian Support

Please zip the file and then send it to [Atlassian Support](#).

#### RELATED TOPICS

[Getting Java Crash Log File](#)

[Memory Usage and Requirements](#)

[Garbage Collector Performance Issues](#)

[Generating a Thread Dump](#)

[How to fix out of memory errors by increasing available memory](#)

### Generating a Thread Dump

If Confluence is performing poorly, behaving unexpectedly or stops responding and you can generate a thread dump to help diagnose the cause of the problem. Including a thread dump can be very useful to the Atlassian Support team when investigating your problems.

The thread dump shows the current state of each thread in the JVM, including a stack trace, so it needs to be taken while the application is experiencing problems.

Information about what locks are being held and waited upon by a thread are not included in the simple thread dump that you can generate from within Confluence. If you need this additional information, you'll need to generate a thread dump [externally](#).

#### On this page:

- [Stack traces and security](#)
- [Generating a thread dump within Confluence](#)
- [Generating a thread dump externally](#)

#### Stack traces and security

To help when debugging a problem, Confluence provides stack traces through the web interface when an error occurs. These stack traces include information about what Confluence was doing at the time, and some information about your deployment server.

Only non-personal information is supplied such as operating system and version and Java version. With proper network security, this is not enough information to be considered dangerous. No usernames or passwords are included.

#### Generating a thread dump within Confluence

To generate a thread dump:

1. Go to



> **General Configuration > Troubleshooting and support tools.**

2. Choose **Create Support Zip**

3. Make sure **Thread Dumps** is selected (you can deselect any other options that you don't want to include - if you're creating the support zip to provide to Atlassian Support, we recommend including as much information as possible)
4. Click **Create**.

A zip file containing your thread dumps (and anything else you chose to include) will be saved to your home directory.

### Generating a thread dump externally

If Confluence stops responding or you require information on locks being held and waited upon by threads, then use one of methods described in [Generating a Thread Dump Externally](#).

Our support team may ask you to use this method if the simple thread dump generated within Confluence does not include enough information to diagnose the problem.

## Generating a Thread Dump Externally

If Confluence stops responding and you can't create a thread dump within Confluence, you can create thread dumps outside the application. External thread dumps are also useful if you require information on locks being held or waited upon by threads.

### Take Multiple Thread Dumps

Typically you'll want to take several dumps about 10 seconds apart, in which case you can generate several dumps and output the stack traces to a single file.

### On this page:

- [Generating thread dumps on Linux](#)
- [Generating thread dumps on windows](#)
  - [Generating a thread dump from the console](#)
  - [Generating a thread dump using jstack](#)
- [Output](#)
- [Thread dump analysis tools](#)

### Generating thread dumps on Linux

To generate a thread dump on Linux (or Solaris or other Unixes):

1. Identify the **java** process that Confluence is running in.: This can be achieved by running a command similar to:

```
ps -ef | grep java.
```

2. Use the process ID from the above to generate the thread dumps:

```
kill -3 <pid>
```

This won't kill your server (so long as you included the "-3" option with no space in between).

### Generating thread dumps on windows

#### Generating a thread dump from the console

If you are not running Confluence as a service, you can generate a thread dump directly in the console.

Click the console window and press <CTRL>+BREAK (or SHIFT+CTRL+PAUSE on some keyboards). The thread dump will print directly to the console.

#### Generating a thread dump using jstack

The JDK (Java Development Kit) includes [jstack](#), which is used for generating thread dumps.

**Note:** The JRE (Java Runtime Environment) that is bundled with the Confluence installer does not include jstack. You'll need to have the full JDK installed.

To generate a thread dump using jstack:

1. Identify the process. Launch the task manager by, pressing `Ctrl + Shift + Esc` and find the Process ID of the Java (Confluence) process. (If you can't see the PID column right click a column heading in Task Manager and choose PID).
2. Run `jstack <pid>` to Capture a Single Thread Dump. This command will take one thread dump of the process id <pid>, in this case the pid is 22668:

```
adam@track:~$ jstack 22668 > threaddump.txt
```

This will create a file called threaddump.txt to your current directory.

Common issues with jstack:

- You must run jstack as the same user that is running Confluence
- If the jstack executable is not in your \$PATH, then please look for it in your <JDK\_HOME>/bin directory
- If you receive `java.lang.NoClassDefFoundError: sun/tools/jstack/JStack` check that tools.jar is present in your JDK's lib directory. If it is not, download a full version of the JDK.
- If you see the following message: 'Not enough storage is available to process this command,' see [this article](#).
- If you get the error "Not enough storage is available to process this command", download the 'psexec' utility from [here](#), then run the following command using:  
`psexec -s jstack <pid> >> threaddumps.txt`

## Output

Thread dumps appear in the catalina.out file in the application directory's logs folder. Search for "thread dump" in the log file for the beginning of the dump.

Often Support may ask you to generate a sequence of thread dumps over a short period, so that they can compare what each dump contains and to look for any long running threads that could be the cause of the performance issue.

You can manually generate multiple thread dumps by executing the command repeatedly, but it is often easier to use a small script to automate the process. Here's an example that you can adapt to run on your Linux server:

```
for i in `seq 1 10` ; do
  echo ${i}
  your/path/to/jstack `ps aux | grep java | grep confluence | grep -v
grep | awk '{print $2}'` >> threaddump.log
  sleep 10
done
```

## Thread dump analysis tools

- [Thread Dump Analyzer TDA](#)
- [Samurai](#)

## Getting Java Crash Log File

If you discovered that Confluence died without manual intervention, there may be something goes wrong during



a local Java session. Java will produce a log file that looks like the following: `hs_err_pid20929.log`.

The location of this log file is usually in the directory where Tomcat is run eg. `/bin` folder. For Windows Services, it should be located in where Windows Services are run.

#### Useful JVM Option

To define the path to the `hs_err_pid` file, add the following JVM Parameter to your existing ones:

```
-XX:ErrorFile=./hs_err_pid<$pid>.log
```

## Profiling using the YourKit Plugin


There is a plugin for Confluence 2.2 and later which allows easy profiling using the [YourKit profiler](#). No license is required to generate a memory or CPU snapshot, but you will need at least an evaluation license to analyze the results.

#### On this page:

- [Configuring YourKit in your JVM](#)
  - [Windows Configuration](#)
  - [Linux/Mac OS X Configuration](#)
- [Performance Impact](#)
- [Installing the YourKit Plugin](#)

#### Configuring YourKit in your JVM

[Download YourKit 6.0](#) for your platform and follow the installation instructions to install it.

 Note: YourKit version 7 is not compatible with the Confluence yourkit plugin.

The following instructions apply to Confluence and Tomcat installations with the Oracle (previously Sun) JDK. They should be easily applicable to other application servers and JVMs, however. The YourKit documentation covers this in more detail.

#### Windows Configuration

On Windows, add to your PATH environment variable the `bin/win32/` directory underneath the YourKit installation directory. For example, you might add "C:\Program Files\YourKit Java Profiler 6.0.12\bin\win32" to your PATH, via Control Panel, System, Advanced, Environment Variables.

To configure Confluence's JVM to use the YourKit agent, you need to add a parameter to `CATALINA_OPTS` in the `bin/setenv.bat` file in your Confluence application directory. This file controls the startup parameters for Tomcat, so you'll need to restart it after making the changes.

Add the 'agentlib' parameter to the end like this:

```
set CATALINA_OPTS=%CATALINA_OPTS% -Xms1024m -Xmx1024m  
-XX:MaxPermSize=256m -XX:+UseG1GC -agentlib:yjpagent
```

#### Linux/Mac OS X Configuration

On Unix-based systems, include the installation directory in the library path environment variable, as shown below:

- For the Mac: `export DYLD_LIBRARY_PATH=$DYLD_LIBRARY_PATH:/path/to/yourKitAgent`
- For other Unix-based systems: `export LD_LIBRARY_PATH=$LD_LIBRARY_PATH:/path/to/yourKitAgent`

In general, to configure the JDK, you add the `agentlib` parameter:

```
java -agentlib:yjpagent ...
```

You can add this to Tomcat's `bin/setenv.sh` like this:

```
CATALINA_OPTS="$CATALINA_OPTS -Djava.awt.headless=true"  
-agentlib:yjpagent "
```

### Performance Impact

Running YourKit can have detrimental effects on performance.

To minimize performance problems use the following modifications to the `agentlib` parameter:

```
-agentlib:yjpagent=disablecounts,disablealloc,disablej2ee
```

See also [Profiling overhead: how to reduce or avoid](#) in the YourKit documentation.

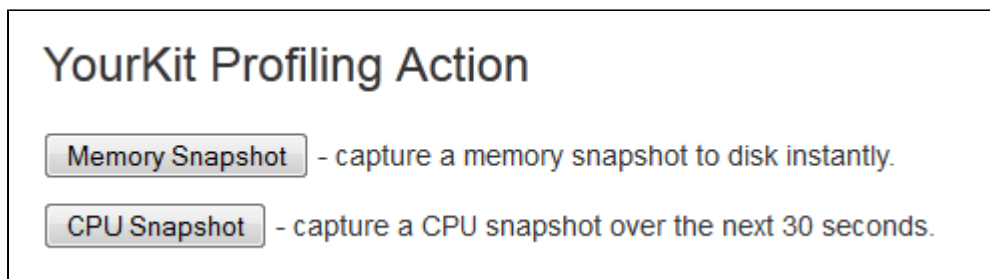
### Installing the YourKit Plugin

[Download the plugin](#) and upload it into Confluence through the Administration, Plugins page.

A new menu option, 'YourKit Profiling' will appear under the 'Administration' heading. Click it and you should see the options to take a memory or CPU snapshot.

This profiler dump will be saved to a local temp directory, and the path shown once it is complete. For the CPU snapshot, this will take at least 30 seconds. For the memory snapshot, 10-15 seconds.

*Screenshot: You can take a memory or CPU snapshot*



## Why would I do this?

Analyzing a profiler dump enables Atlassian Support (or you, if you are interested) to see exactly what is happening in your application: what classes are using the memory, what is using CPU and so on. This can help us debug tricky performance problems which would otherwise be impossible to analyze remotely.

Take a CPU snapshot if:

- Confluence is sometimes unresponsive
- Pages take a long time to load
- Confluence's CPU usage is peaking.

Take a memory snapshot if:

- Confluence's memory usage is higher than you expect
- You are getting `OutOfMemoryError`'s in your logs.

**i** If you run into situations where Confluence is unresponsive and you are not able to trigger a memory snapshot, please ensure that you start Confluence with the `onexit=memory` parameter in the JVM options (as in the example below) and simply shut down Confluence. Before shutting down a memory snapshot will be

created.

```
-agentlib:yjpaget=onexit=memory
```