py.test and the py lib

holger.krekel@merlinux.de
Testing and Python

• Automatically testing Python programs is a honking great idea, let’s do more of it!

• Unfortunately, Python projects have rather disparate test tools and “runners”

• pythoneers deserve better than the classical unittest.py
What is py.test

- py.test is an external project independent tool which
  - automatically and iteratively collects tests from directories, files, modules and classes
  - has extensive debugging aid
  - interacts with project-specific configuration to alter the collection and test execution process, including adding new command line options
  - is flexible enough to allow running PyPy’s tests on a different virtual machine while still providing nice tracebacks and introspection on failing tests
py.test features (1)

- assert with `assert` statement
- automatic collection of tests on all levels
- testing starts immediately
- generative tests: yielding more user-defined tests
- specify different python versions / executables
- no interference with cmdline utilities
py.test features (2)

- debug with the `print` statement
- order of running tests as they appear in the files
- useful tracebacks, e.g. recursion detection
- Manages test state across modules, classes and methods
- it has documentation
The idea of “py.test” and the py lib in general is “no API is the best API”. For testing this e.g. means reusing the assert statement.

```python
def f():
    return 23

def test_f():
    assert f() == 42
```

```python
def test_f():
    assert f() == 42
    assert 23 == 42
    + where 23 == f()
```
managing test state

setup and teardown resources at various levels

def setup_module(mod):
    mod.testfile = ...
def teardown_module(mod):
    mod.testfile.close()

class TestSomething:
def setup_class(cls):
    cls.resource = ...
def teardown_class(cls):
    cls.resource.finalize()

def setup_method(self, method):
    self.permethod = ...
def teardown_method(self, method):
    self.permethod.done()
generative tests

the easiest “Non-API” way to extend the collection process is with generators which allow to produce more tests on-the-fly:

def func(arg1, arg2):
    assert arg1 == arg2 * 2

def test_more():
    for x, y in ((1, 2), (2, 3), (2, 4)):
        yield func, x, y
it’s nice when it fails

• py.test offers a number of helpful debugging features
  • very useful tracebacks
  • isolating print statements per test
  • showing locals
  • dropping into pdb on failures
  • session: rerunning continously failing tests only
  • --nomagic --nocapture may be your friend :-)
interactive example

py.test py/documentation/example/pytest/failure демо.py
py.test near-future plans

py.test is to become a unified python testing tool
- refining and documenting project config
- doctests!
- gui/html reporting
- distributing tests across platforms
- releasing it ...
on to the py lib

- **py.test** is part and makes use of the **py lib**:
  - **py.path**: local and subversion filesystem objects
  - **py.execnet**: ad-hoc distribution of programs
  - **py.magic**: provides e.g. **greenlets**
  - **py.code**: nicifying python introspection
  - **py.xml**: providing simple xml/html object generation
- runs on python 2.2 onwards
goals of the py lib

• provide a high level and integrated standard set of services and methods useful for development

• **first step**: project independent and flexible testing tool

• experiment with improving python library development, e.g. via explicitly exporting names

• repackaging and extending python’s standard library, e.g. offering a unified Path object for both local and remote access
py lib highlight: ad-hoc distributing programs

- **py.execnet** provides a simple mechanism to execute arbitrary code in remote locations

- Communication between local and remote sites happen through channels

- It uses a **radically different idiom than traditional Remote Method Invocation** (i.e. CORBA/Pyro/XMLRPC, SOAP ...)

- ----> Interactive SSH Example
future (and thanks for) fish

• Finalize design of py.test & include doctests
• refine consistency and actually release the damn thing
• expose remote Path-Over-Ssh objects
• try improve windows-interactions

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py lib info

the py lib is driven by Holger Krekel and Armin Rigo

http://codespeak.net/py

py-dev@codespeak.net

feedback and co-developers welcome!

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