

Getting Fixtures Right

Confoo 2014

Tobias Schlitt (@tobySen / @qafoo)
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What is a fixture?

- ▶ Everything that must be in place to run a test
 - ▶ Subject of Test (SUT)
 - ▶ Environment
 - ▶ Input / output
 - ▶ Expectation
 - ▶ Utilities
- ▶ Valid for all kinds of tests
- ▶ But different constraints apply

Goals

- ▶ Good tests
 - ▶ Safe
 - ▶ Fast
 - ▶ Easy
- ▶ Good fixtures
 - ▶ Test isolation
 - ▶ Ease of use
 - ▶ Few maintenance

About me

- ▶ Tobias Schlitt
 - ▶ Twitter: @tobySen
 - ▶ Email: toby@qafoo.com
- ▶ Consultant / Trainer at Qafoo (<http://qafoo.com>)
 - ▶ Object Oriented Design
 - ▶ Automated Testing

Code Examples

`http://qa.fo/confoo14_fixtures`

Outline

Unit Tests

Integration Tests

Conclusion

Test Doubles?

- ▶ Mock
- ▶ Stub
- ▶ (Spy)
- ▶ ...

So, “mocks”. #kthxbye

Mocks vs. Stubs

- ▶ Stub
 - ▶ Provides indirect input
 - ▶ Should not verify!
- ▶ Mock
 - ▶ Verifies interaction
 - ▶ Should not return data, if possible

Getting into code

```
https://github.com/QafooLabs/fixtures/  
blob/master/test/Qafoo/Fixtures/  
CheckoutTest.php
```

Creating SUT

- ▶ Tests are first class citizens of your project
 - ▶ Avoid code duplication
 - ▶ Keep code clean
 - ▶ Optimize for reading
- ▶ Especially duplicate SUT creation leads to hassle

Example: Duplicate SUT creation

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```
https://github.com/QafooLabs/fixtures/  
blob/master/test/Qafoo/Fixtures/  
CheckoutTest.php
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Which are better?

- ▶ Unit tests for
 - ▶ Business logic
 - ▶ High impact code
 - ▶ Infrastructure
- ▶ Integration tests for
 - ▶ External systems
 - ▶ Component / module interaction
 - ▶ Glue code

Integration with Filesystem

- ▶ Avoid where possible
 - ▶ Slow
 - ▶ Cumbersome setup
 - ▶ Hard cleanup

Virtual Filesystem

- ▶ Mocks filesystem
- ▶ Works through PHP stream API
- ▶ Sadly does not cover 100%
 - ▶ e.g. `glob()`
- ▶ <http://vfs.bovigo.org/>

Example: Using VFS and work arounds

Getting into code

```
https://github.com/QafooLabs/fixtures/  
blob/master/test/Qafoo/Fixtures/  
InvoiceLogTest.php
```

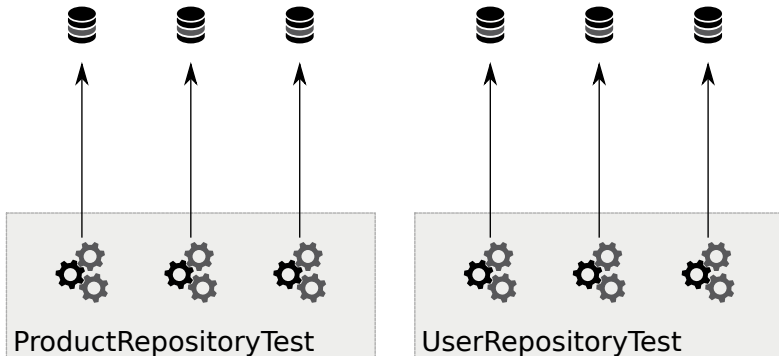

If you need a real file system

- ▶ Keep tests as small as possible
 - ▶ Tiny, low level abstraction
 - ▶ Mock abstraction everywhere else
- ▶ Leave failing results on disc
- ▶ Cleanup in `setup()`

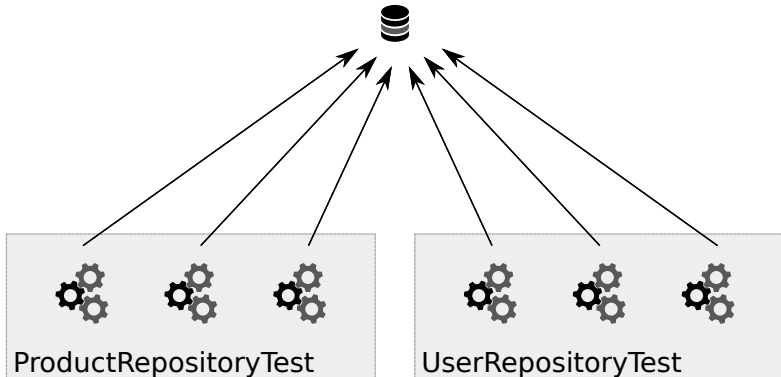
Testing against Database

- ▶ Not funny
 - ▶ Slow
 - ▶ Complex setup
 - ▶ Ugly cleanup
- ▶ But necessary
- ▶ Process
 1. Create database (schema)
 2. Insert test data
 3. Execute test
 4. (Cleanup database)

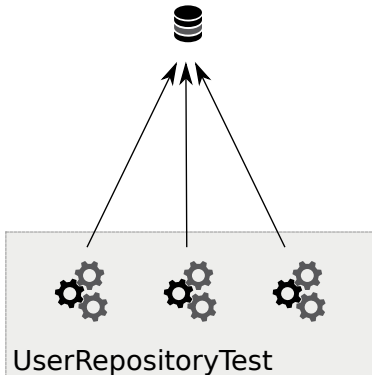
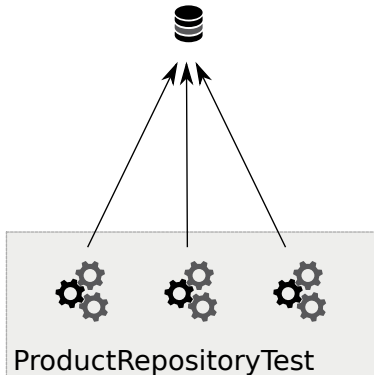
Isolated Fixture



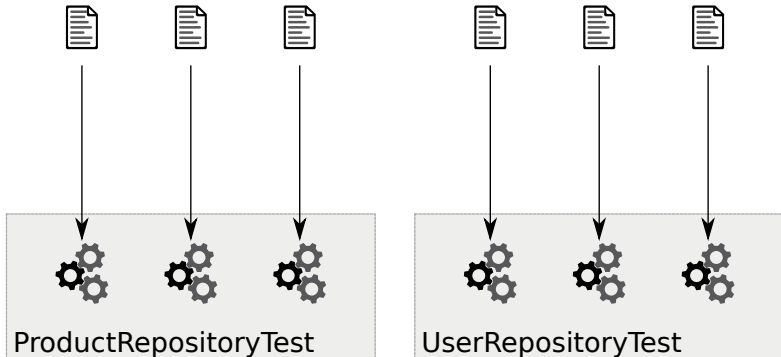
Shared Fixture



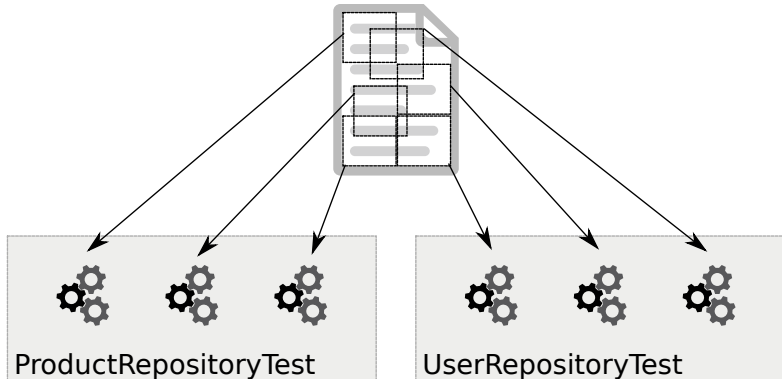
Compromise



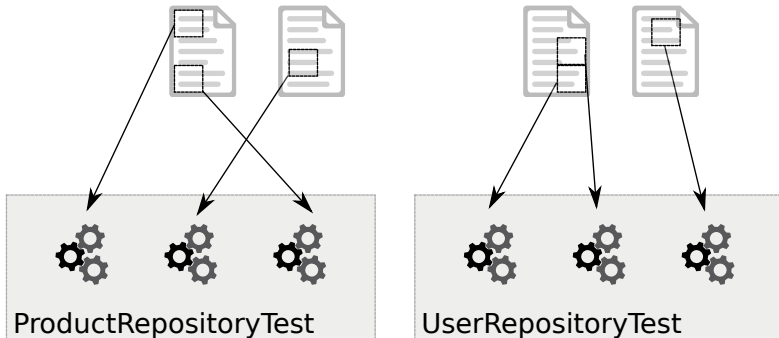
Micro Fixture



Macro Fixture



Compromise



Loading Fixtures

- ▶ DBUnit (<http://qa.fo/dbunit>)
- ▶ Frameworks
 - ▶ Doctrine: http://qa.fo/doctrine_fixtures
 - ▶ ...
- ▶ Custom
 - ▶ SQL files
 - ▶ Array structure
 - ▶ ...

Do's & Don'ts

▶ Don'ts

- ▶ Test everything against the database
- ▶ Compare generated SQL
- ▶ Don't attempt to mock PDO
- ▶ Don't re-create schema between tests
- ▶ Don't test against MySQL (if possible)

▶ Do's

- ▶ Test repositories against the database
- ▶ Let your build script create the DB
- ▶ Truncate tables between tests
- ▶ Use `sqlite::memory:` (if feasible)
- ▶ Share database connection between tests

Testing against External Service

- ▶ Many web service APIs suck
 - ▶ Unstable
 - ▶ Hardly documented
 - ▶ No staging available
- ▶ Tests over network are a no-go
 - ▶ Does code or the network fail?
 - ▶ Working offline?
 - ▶ API rate limits?

Record / Playback Tests

- ▶ Idea:
 1. Record response of service
 2. Playback for rapid feedback
 3. Do real integration in CI

Getting into code

```
https://github.com/QafooLabs/fixtures/  
blob/master/test/Qafoo/Fixtures/  
GoogleLocationServiceIntegrationTest.php
```

```
https://github.com/QafooLabs/fixtures/  
blob/master/test/Qafoo/Fixtures/  
GoogleLocationServiceTest.php
```

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Conclusion

- ▶ Take care of your fixtures!
 - ▶ Mocks
 - ▶ Database
 - ▶ Filesystem
 - ▶ Record / playback
- ▶ Treat tests as first class citizens
- ▶ Make your tests
 - ▶ Safe
 - ▶ Fast
 - ▶ Easy

http://qa.fo/confoo14_fixtures



THANK YOU

Rent a quality expert
qafoo.com