Testable PHP Applications

Confoo 2013

Tobias Schlitt (@tobySen)

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About me

- Degree in computer sience

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- Proessional PHP since 2000

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- Open source enthusiast

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- Proessional PHP since 2000
- Open source enthusiast
- Passion for
  - Software Design
  - Automated Testing

Co-founder of

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Support teams mastering challenges in web application development.

http://qafoo.com

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`http://qafoo.com`

- Expert consulting
- Individual training

Outline

Classification of Tests

Unit Testing

Acceptance Testing

Testability

Build Pipeline

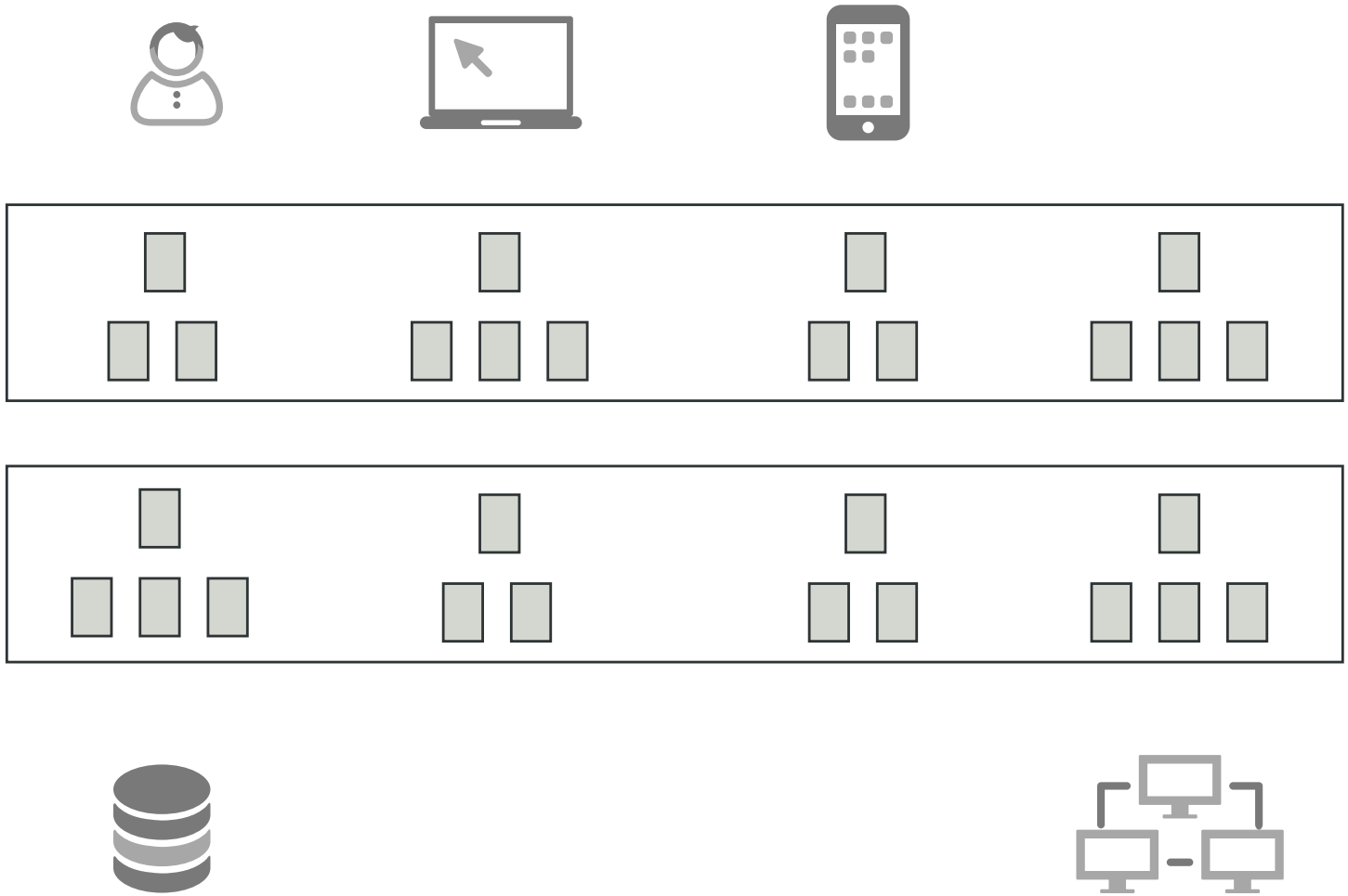
Conclusion

Outline

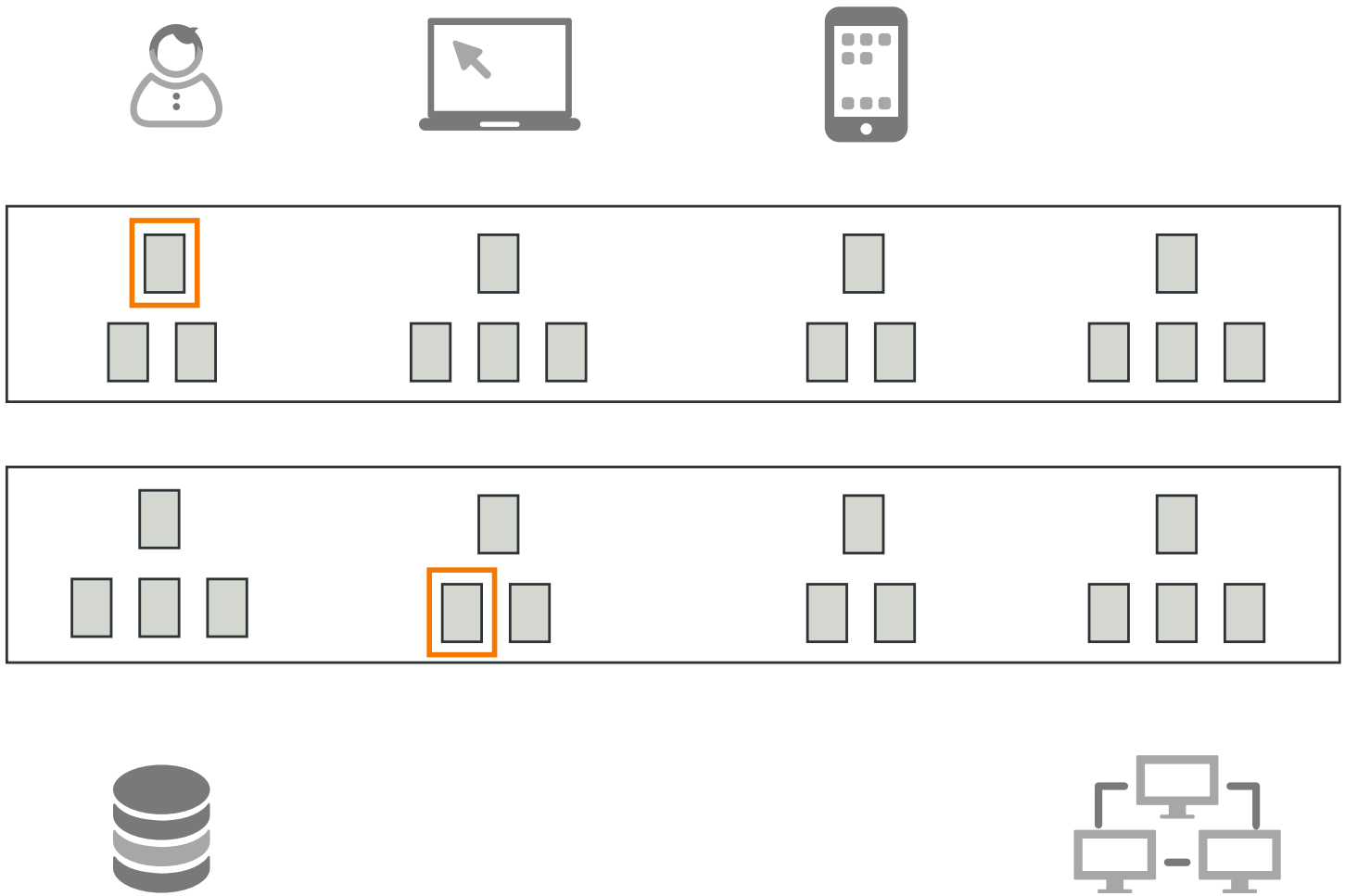
How Do You Test?

- Click & Play
- Unit Test
- Integration Tests
- Acceptance
- Performance Tests

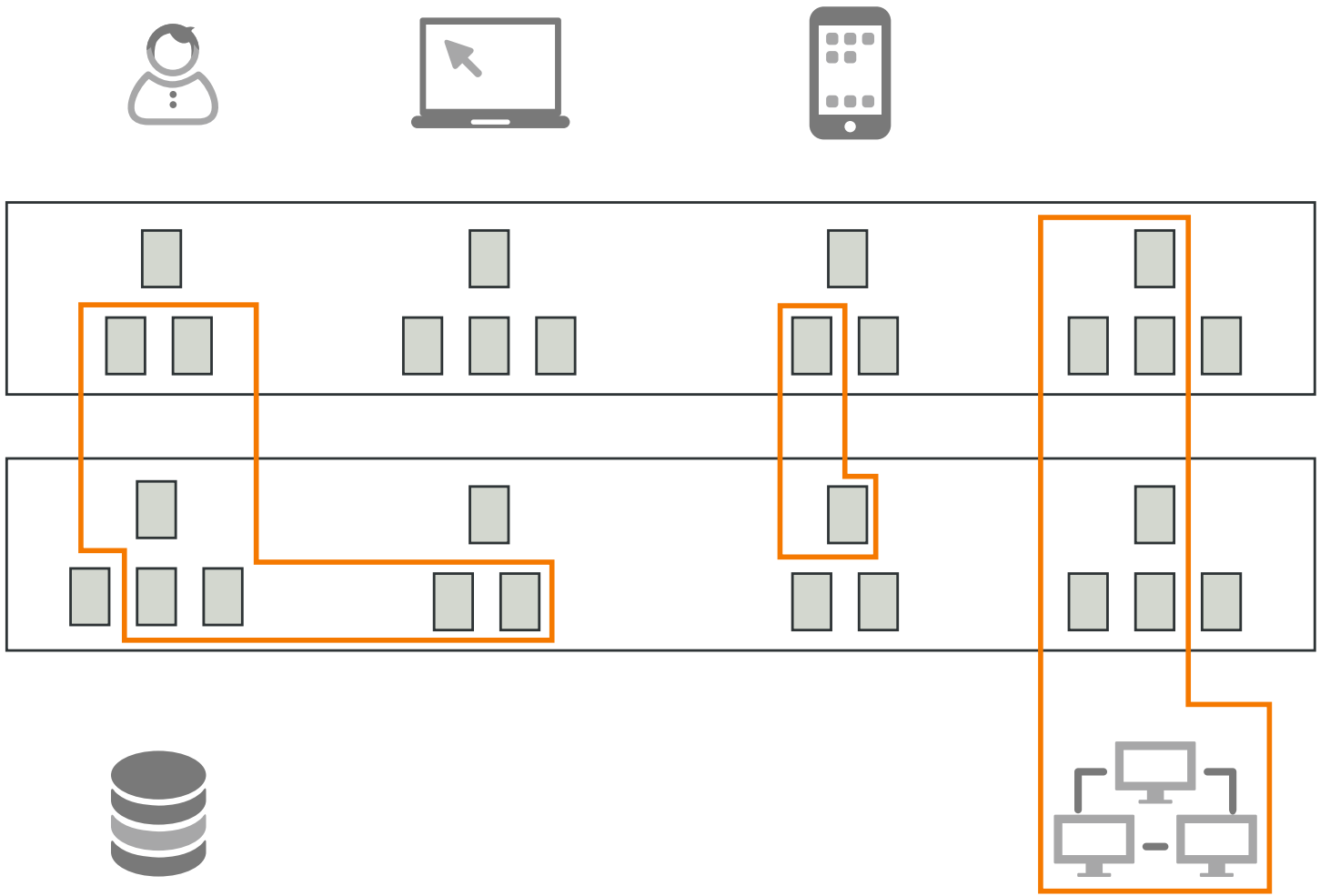
Common Test Mehods



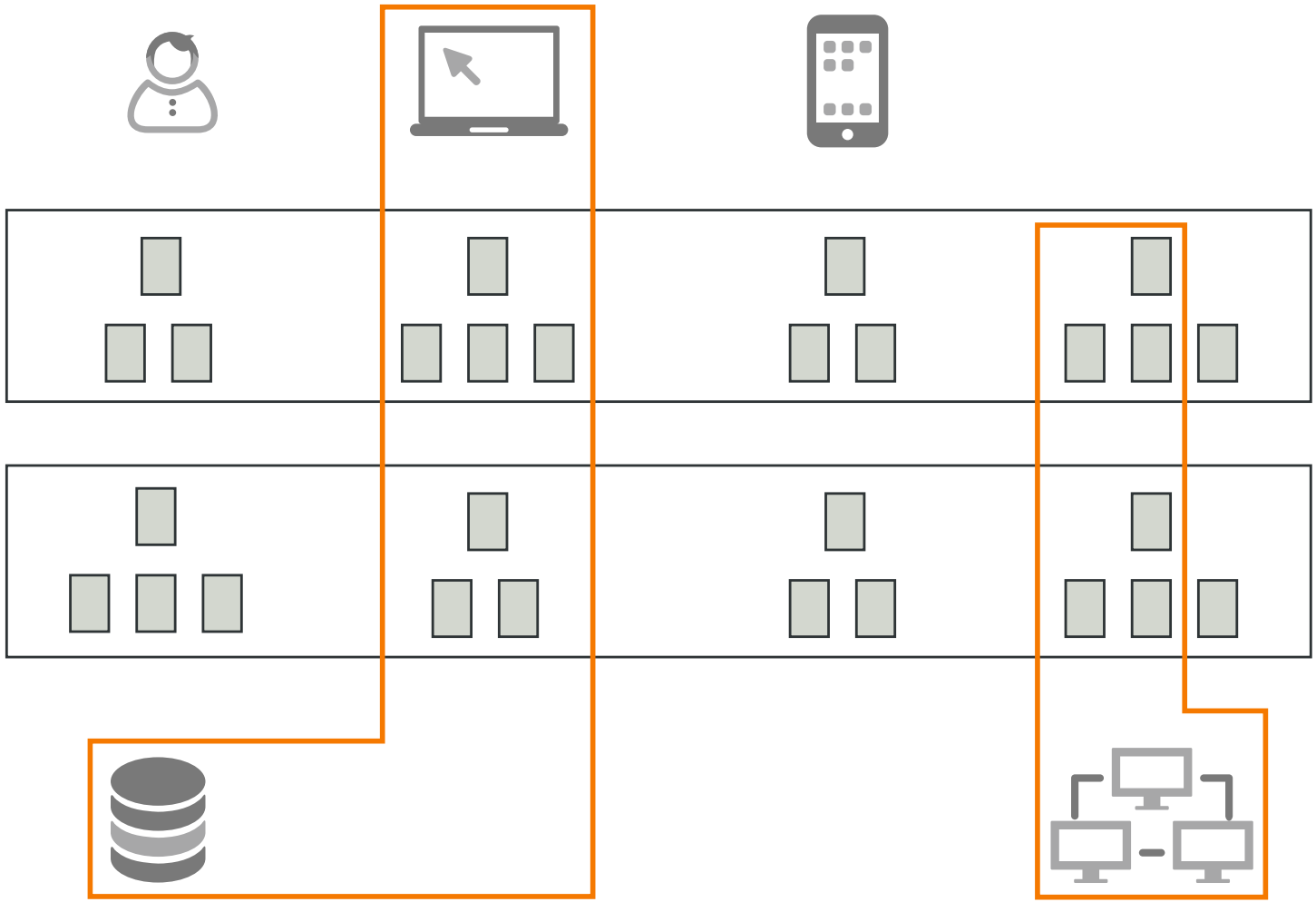
Unit Test



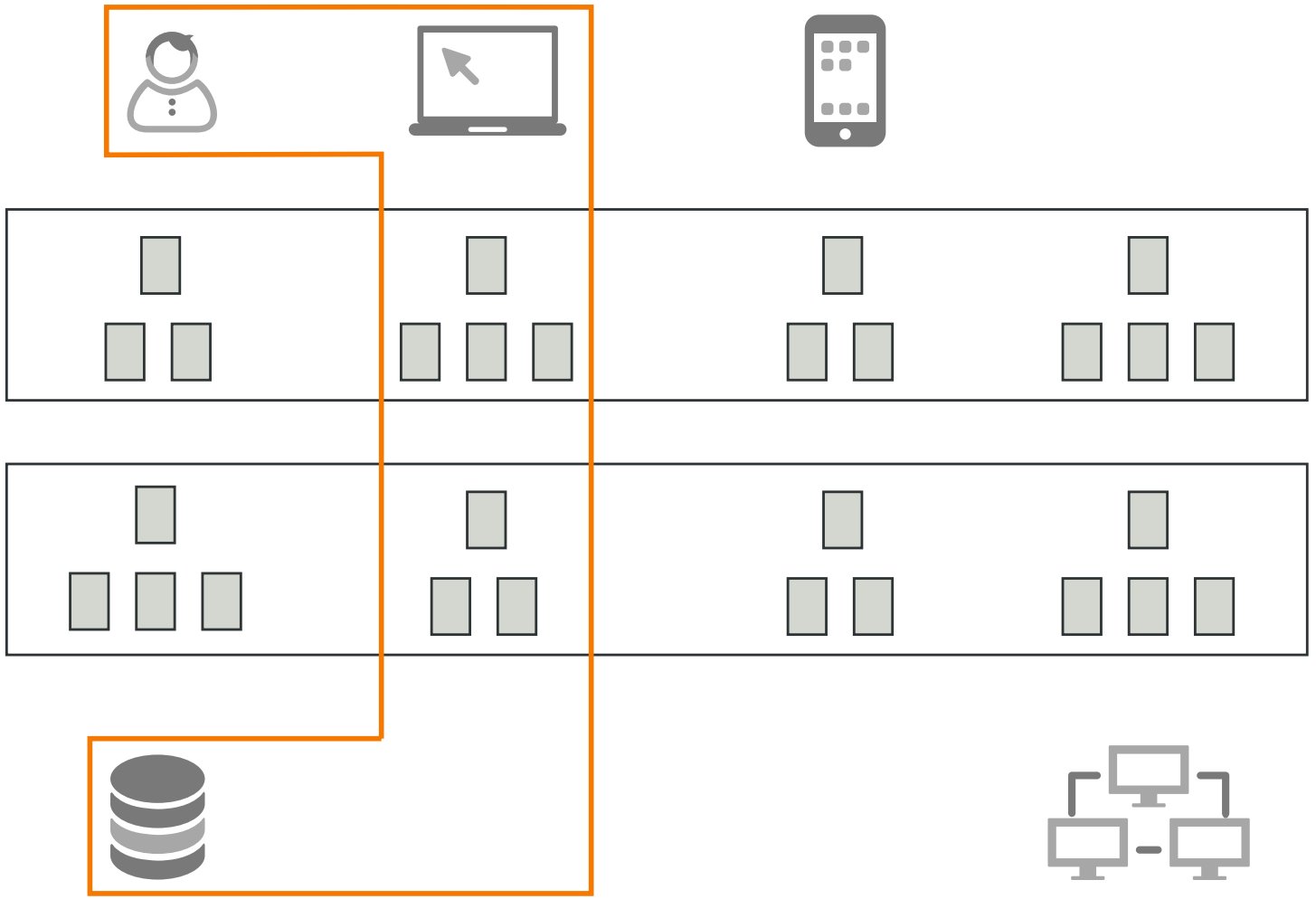
Integration Test



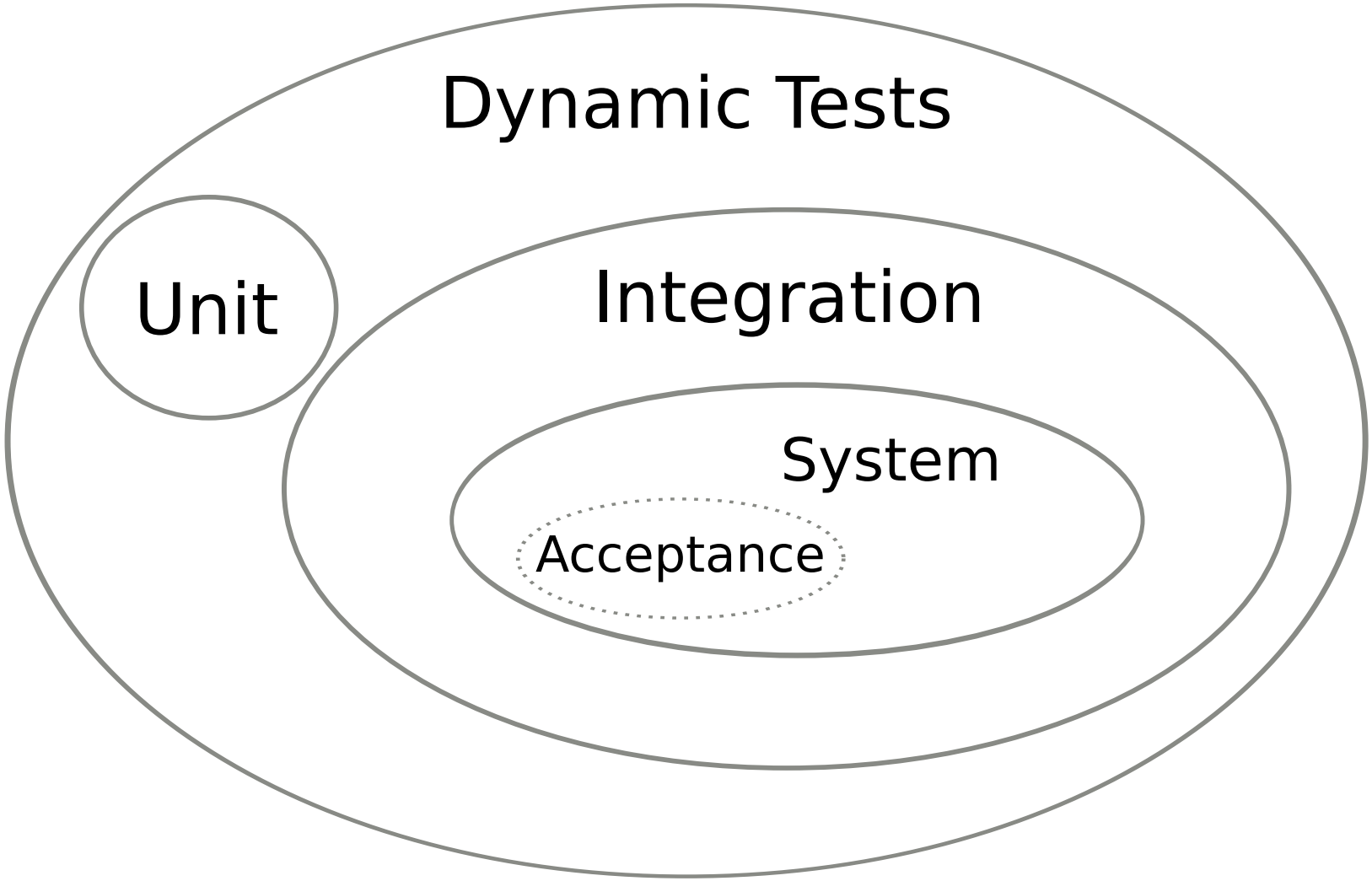
System Test



Acceptance Test



Test Relations



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- Most popular test method

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- xUnit implementation: PHPUnit
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  - Raise quality of OOD/OOP
  - Start with automated testing

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- Test Driven Development anyone?

Example

```php
class Loader
{
    public function __construct( Service $weatherService, Logger $logger = null )
    {
    }
    public function getWeatherForLocation( Struct\Location $location )
    {
    }
}
```

```php
class LoaderTest extends \PHPUnit_Framework_TestCase
{
    public function testGetWeather()
    {
        $loader = new Loader( $this->getFunctionalServiceMock(), new Logger\Null() );

        $locatedWeather = $loader->getWeatherForLocation(
            new Struct\Location( 'Berlin', 'Germany' )
        );

        $this->assertInstanceOf(
            'Qafoo\\Weather\\Struct\\LocatedWeather',
            $locatedWeather
        );
    }
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Unit / Integration Testing Issues

- Too many responsibilities
- Un-replaceable dependencies
- Too many dependencies

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  - Integration testing

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  - Customer communication
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- Behavior Driven Development (BDD) anyone?

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Feature:
  BDD tests for the eZ Publish Section API

  Scenario: Admin user can delete a section
    Given I have a section with name "MySection" and identifier "MySectionKey"
      And I am logged in as user "admin"
     When I delete section with identifier "MySectionKey"
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class FeatureContext extends BehatContext
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Acceptance Testing Issues

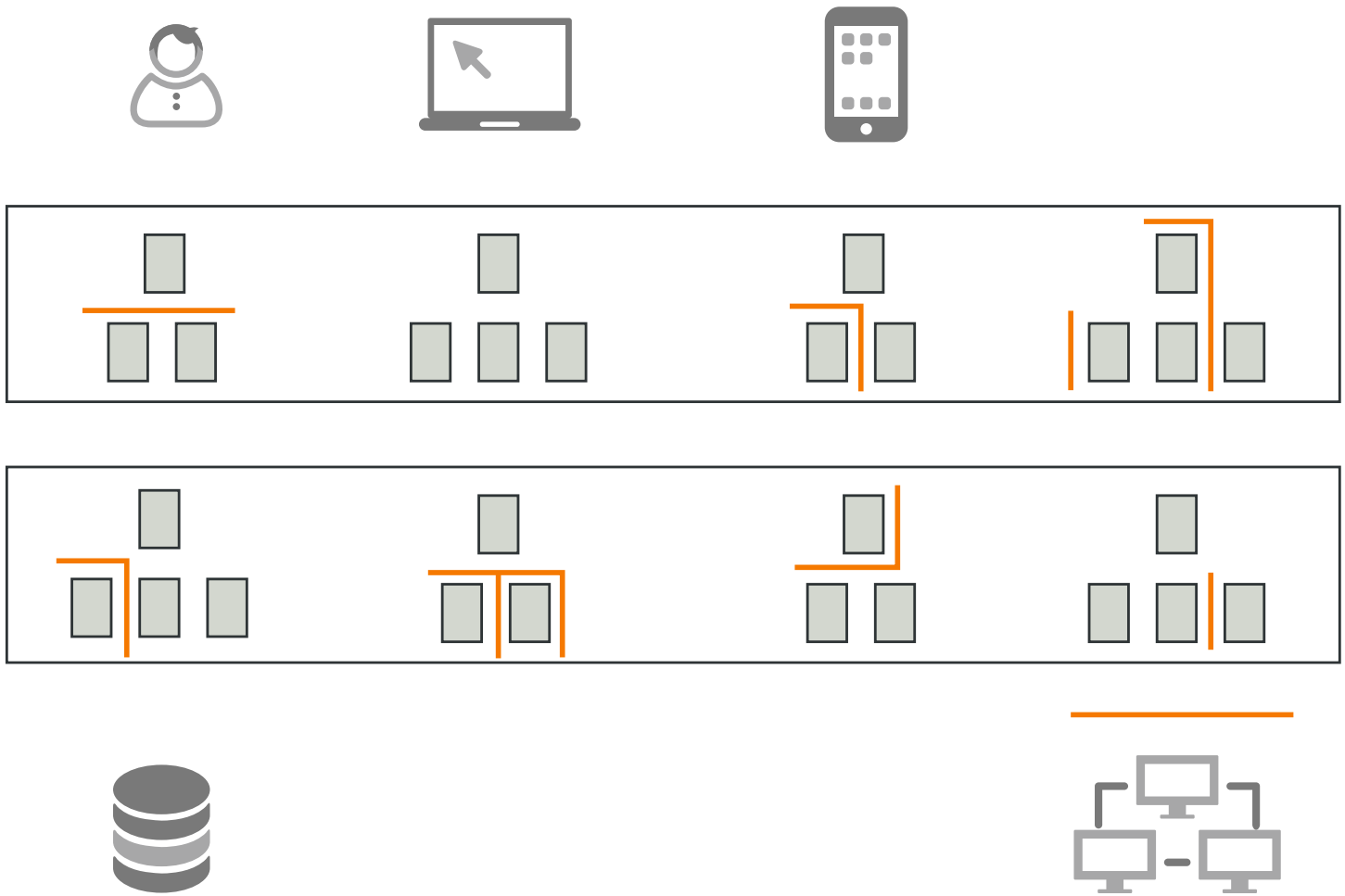
- Slow
  - Integration test are by definition
  - Sensible slicing points can help
- System not machine accesible
- Development overhead
  - if not done carefully

Outline

Testability Issues

- Tight coupling
- Too many responsibilities

Slicing your Application



Testable Code

- Single Responsibility per
  - Module
  - Class
  - Method
- Dependency Inversion
  - Provide cut points
  - Code against abstractions
  - Dependency injection
- Law of Demeter
  - Don’t “reach through” objects

Single Responsibility

```php
<?php

class GoogleWeatherService
{
    public function getWeatherForLocation( Location $location )
    {
        $xml     = $this->getData( $location );
        $weather = $this->extractWeather( $xml );
        return $weather;
    }

    protected function extractWeather( $xml )
    {
        $weather = new Weather();
        $weather->conditions = $this->parseConditions( $xml );
        // ...
        $weather->windSpeed = $this->convertMilesToKilometer(
            $this->parseWindSpeed( $xml )
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        return $weather;
    }

    /* ... */
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    /* ... */
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```

Single Responsibility Principle

```php
<?php

class GoogleWeatherService
{
    public function __construct(
        HttpClient $client, GoogleDataParser $parser )
    { /* ... */ }

    public function getWeatherForLocation( Location $location )
    {
        $data = $this->client->get( sprintf(
            'http://.../?city=%s',
            $location->city
        ) );
        return $this->parser->parseWeather( $data );
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Single Responsibility Principle

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Single Responsibility

- One responsibility per class
- Separation of concerns

Dependency Inversion

```php
<?php

class WeatherLoader
{
    public function __construct(
        GoogleWeatherService $weatherService, FileLogger $logger )
    {
        $this->weatherService = $weatherService;
        $this->logger         = $logger;
    }
    public function getWeatherForLocation( Location $location )
    {
        // ...
        $this->logger->log( 'Some log message.' );
        // ...
        $this->logger->writeToFile();
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- Abstractions hide complexity
- Depend on interfaces, not realizations
- Dependency inversion anyone?

Law of Demeter

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<?php

class WeatherService
{
    public function __construct( AppRegistry $registry )
    {
        // ...
    }
    public function getWeather( Location $location )
    {
        $httpClient = $this->appRegistry->get( 'http_client' );
        $url = sprintf( 'http://...?city=%s', $city );
        return $httpClient->get( $url );
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        return $this->httpClient->get( $url );
    }
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Law of Demeter

- Do not pull dependencies . . .
- . . . push them
- Do not reach through objects

Outline

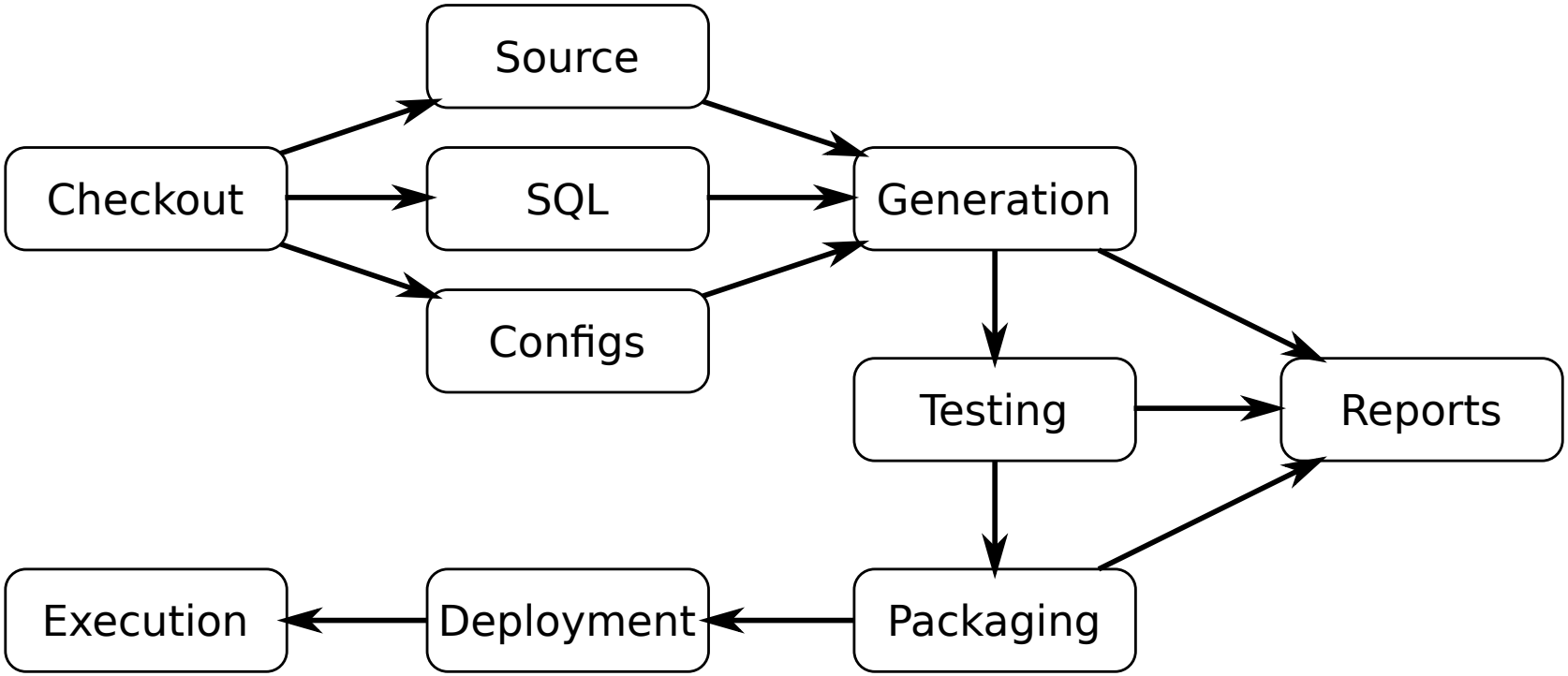
Software Metrics

- Find weak spots
- Find high impact code
- Watch change rate over time
- Watch quality over time

Software Metrics

- PDepend
  - `http://pdepend.org/`
  - Measure complexity / dependencies
- PHPMD
  - `http://phpmd.org/`
  - Detect metric violations
- PHP_CodeSniffer
  - `http://pear.php.net/PHP_CodeSniffer`
  - Enforce coding style

Build Process



Shameless Plug

Ant Build Commons

`http://abc.tools.qafoo.com/`

Outline

Conclusion

- Test mixture

Conclusion

- Test mixture
- Slicing your application

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Conclusion

- Test mixture
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- Build pipeline

Thanks for Listening

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