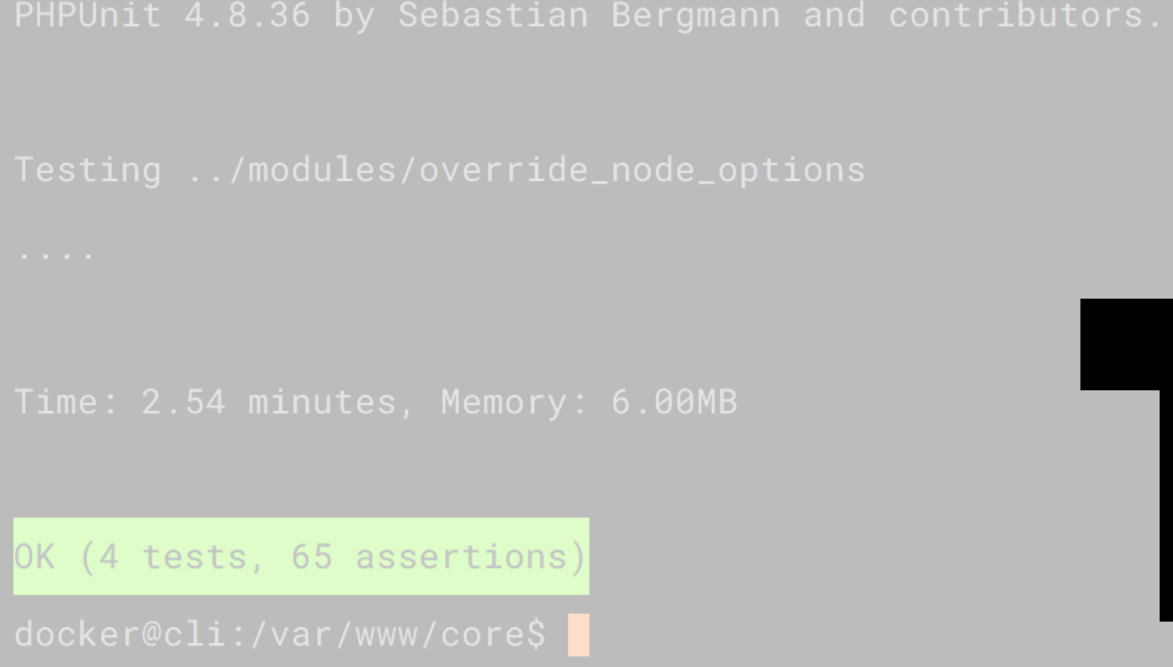
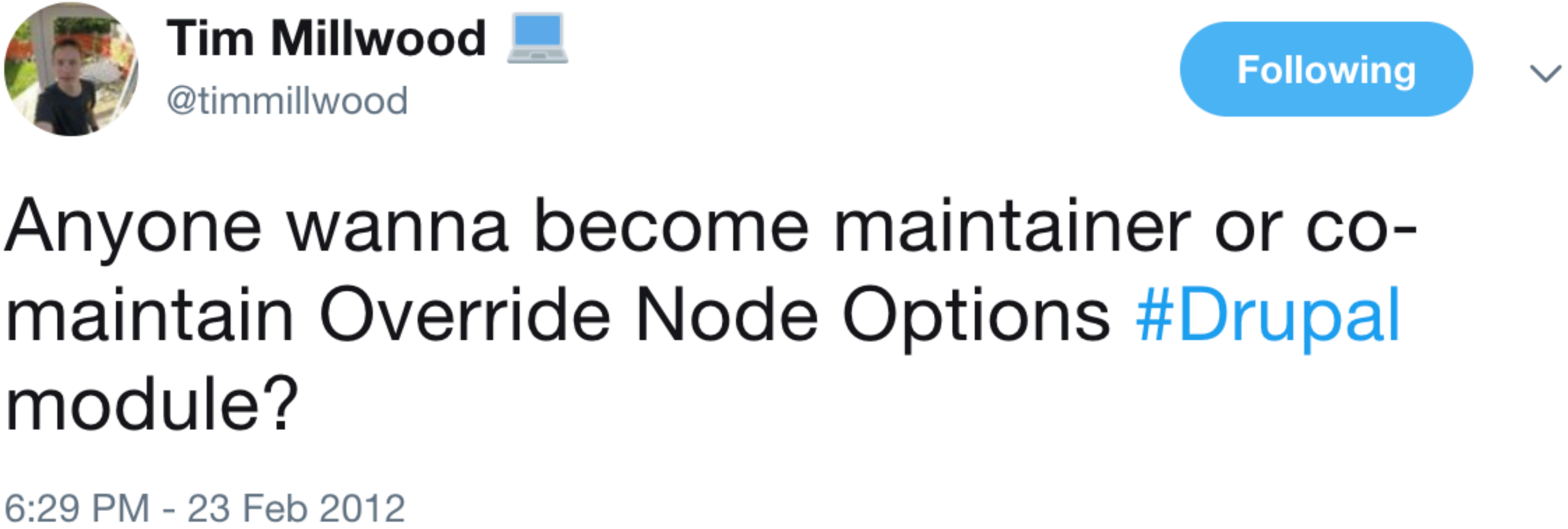
TDD - Test Driven Drupal



```
PHPUnit 4.8.36 by Sebastian Bergmann and contributors.

Testing ../modules/override_node_options
....

Time: 2.54 minutes, Memory: 6.00MB

OK (4 tests, 65 assertions)
docker@cli:/var/www/core$
```

- PHP code
- Mixture of D7 and D8
- SimpleTest (D7)
- PHPUnit (D8)

- Senior Developer at Microserve
- Contrib module maintainer
- Occasional core contributor
- Sticker collector and elePHPant herder
- @opdavies
- oliverdavies.uk



Tim Millwood 💻
@timmillwood

Anyone wanna become maintainer or co-maintain Override Node Options #Drupal module?

6:29 PM - 23 Feb 2012

Why Test?

- Catch bugs earlier
- Piece of mind
- Prevent regressions
- Write less code
- Documentation
- Drupal core requirement - https://www.drupal.org/core/gates#testing
- More important with regular D8 releases

Why Not Test?

- Don't know how
- No time/budget to write tests

Core Testing Gate

New features should be accompanied by automated tests.

If the feature does not have an implementation, provide a test implementation.

Bug fixes should be accompanied by changes to a test (either modifying an existing test case or adding a new one) that demonstrate the bug.

https://www.drupal.org/core/gates#testing

Testing in Drupal - SimpleTest

- Based on http://www.SimpleTest.org
- In D7 core
- `*.test` files
- All test classes in one file

Testing in Drupal - PHPUnit

- Used in other PHP projects (e.g. Symfony, Laravel)
- In D8 core, but not default
- `*.php` files
- One test class per file

The PHPUnit Initiative

- https://www.drupal.org/node/2807237
- D8 core tests to change to PHPUnit
- Deprecate SimpleTest, remove in D9
- "A big chunk of old tests" converted on Feb 21st

The PHPUnit Initiative

As part of the PHPUnit initiative **a considerable part of Simpletests will be converted to PHPUnit based browser tests on February 21st 2017**. A backwards compatibility layer has been implemented so that many Simpletests can be converted by just using the new BrowserTestBase base class and moving the test file. There is also a script to automatically convert test files in the conversion issue.

Developers are encouraged to use BrowserTestBase instead of Simpletest as of Drupal 8.3.0, but both test systems are fully supported during the Drupal 8 release cycle.

The timeline for the deprecation of Simpletest's WebTestBase is under discussion.

https://groups.drupal.org/node/516229

Types of Tests

Unit Tests

- `UnitTestCase`
- Tests PHP logic
- No database interaction
- Fast to run

Types of Tests

Unit Tests

Pros:

- Verify individual parts
- Quickly find problems in code
- Fast execution
- No system setup for the test run

Types of Tests

Unit Tests

Cons:

- Rewrite on every refactoring
- Complicated mocking
- No guarantee that the whole system actually works

Types of Tests

Kernel Tests

- Kernel tests are integration tests that test on components. You can install modules.
- `KernelTestBase`

https://www.drupal.org/docs/8/testing/types-of-tests-in-drupal-8

Types of Tests

Kernel Tests

Pros:

- Verify that components actually work together
- Somewhat easy to locate bugs

Types of Tests

Kernel Tests

Cons:

- Slower execution
- System setup required
- No guarantee that end user features actually work

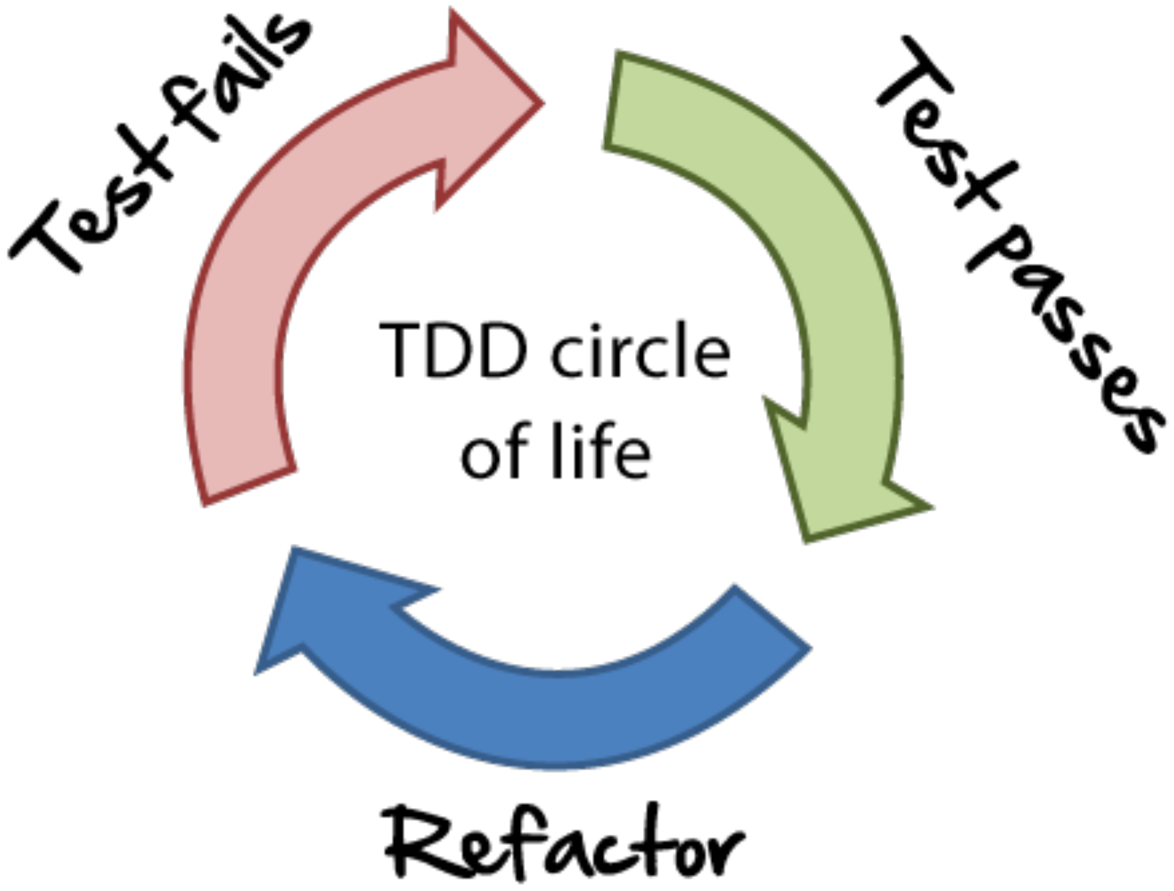
Types of Tests

Web/Functional/FunctionalJavascript Tests

- `DrupalWebTestCase` (D7)
- `WebTestBase`, `BrowserTestBase`, `JavascriptTestBase` (D8)
- Tests functionality
- Interacts with database
- Slower to run
- With/without JavaScript (D8)

Test Driven Development (TDD)

- Write a test, see it fail
- Write code until test passes
- Repeat
- Refactor when tests are green



http://www.agilenutshell.com/assets/test-driven-development/tdd-circle-of-life.png

Porting Modules to Drupal 8

- Make a new branch

  ```
  git checkout --orphan 8.x-1.x
  ```

- Add/update the tests
- Write code to make the tests pass
- Refactor
- Repeat

Writing Tests (SimpleTest)

```
# example.info

name = Example
core = 7.x
files[] = example.test
```

```
// example.test

class ExampleTestCase extends DrupalWebTestCase {

  public static function getInfo() {
    return array(
      'name' => 'Example tests',
      'description' => 'Web tests for the example module.',
      'group' => 'Example',
    );
  }

}
```

```
class ExampleTestCase extends DrupalWebTestCase {

  ...

  public function testSomething {
    $this->assertTrue(TRUE);
  }

}
```

Writing Tests (PHPUnit)

- No need to load test classes expicitly.
- Add classes into `tests/src` directory.
- Extend `BrowserTestBase`.
- No `getInfo` method.

Creating the World

```
public function setUp() {
  // Enable any other required modules.
  parent::setUp(['foo', 'bar']);

  // Anything else we need to do.
}
```

Creating the World

```
$this->drupalCreateUser();

$this->drupalLogin();

$this->drupalCreateNode();

$this->drupalLogout();
```

Assertions

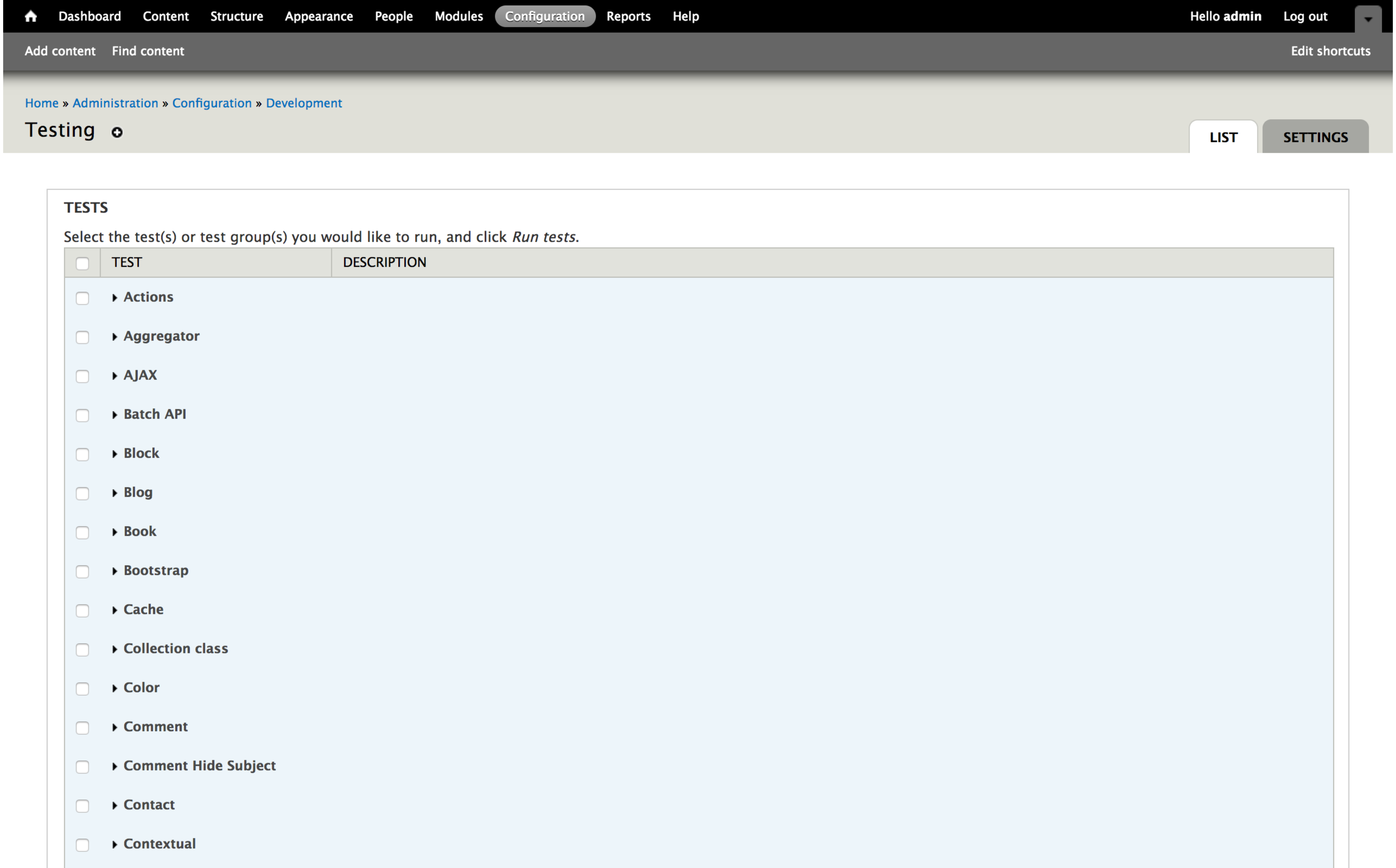
- `assertTrue`
- `assertFalse`
- `assertNull`
- `assertNotNull`
- `assertEqual`
  `assertEquals`

Assertions

- `assertRaw`
- `assertResponse`
  `assertSession()->statusCodeEquals()`
- `assertField`
- `assertFieldById`
- `assertTitle`

Running Tests

SimpleTest UI



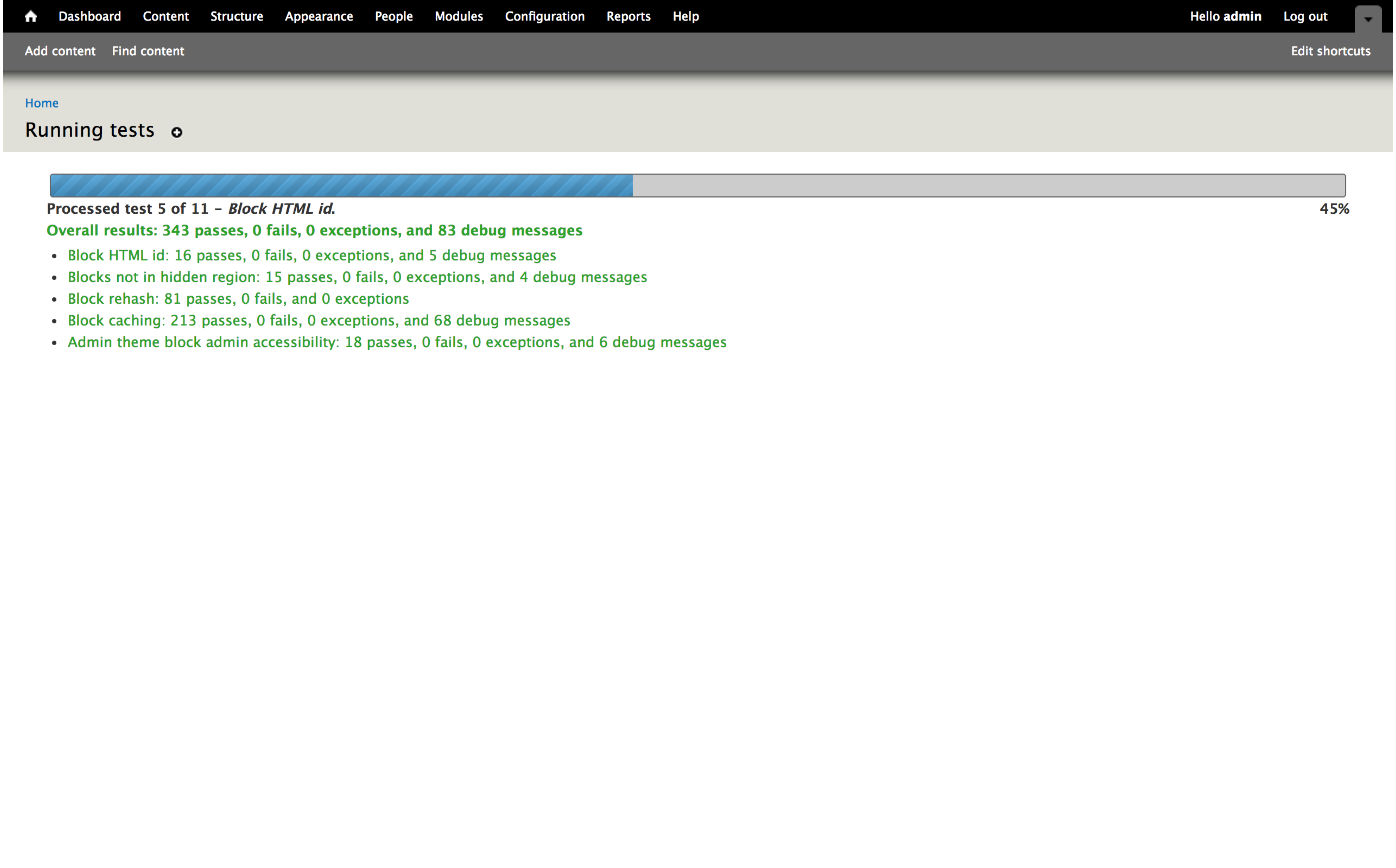
Home » Administration » Configuration » Development

Testing

TESTS

Select the test(s) or test group(s) you would like to run, and click *Run tests*.

□	TEST	DESCRIPTION
□	▸ **Actions**	
□	▸ **Aggregator**	
□	▸ **AJAX**	
□	▸ **Batch API**	
□	▸ **Block**	
□	▸ **Blog**	
□	▸ **Book**	
□	▸ **Bootstrap**	
□	▸ **Cache**	
□	▸ **Collection class**	
□	▸ **Color**	
□	▸ **Comment**	
□	▸ **Comment Hide Subject**	
□	▸ **Contact**	
□	▸ **Contextual**	

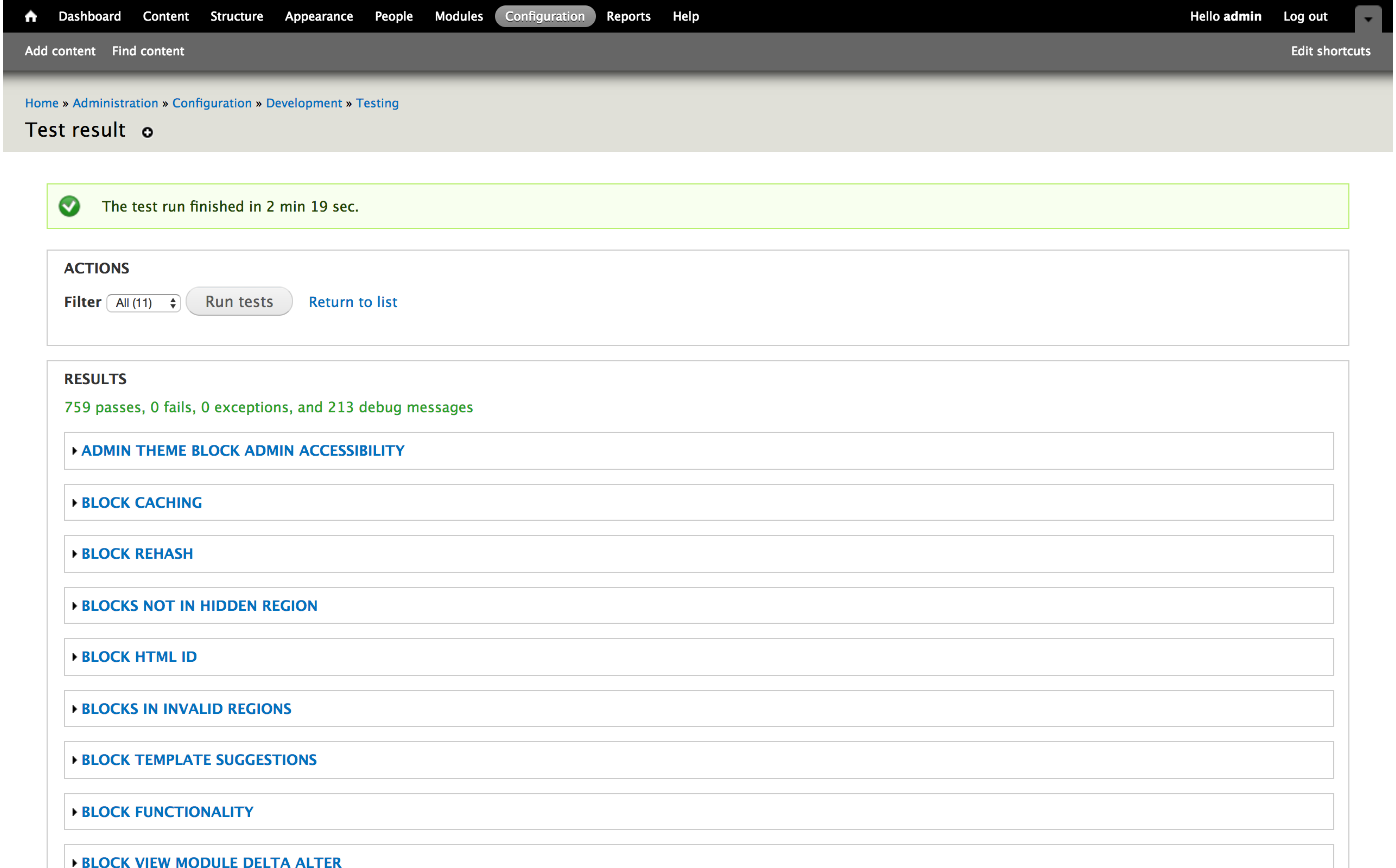


Running tests

Processed test 5 of 11 - *Block HTML id*. **45%**

Overall results: 343 passes, 0 fails, 0 exceptions, and 83 debug messages

- Block HTML id: 16 passes, 0 fails, 0 exceptions, and 5 debug messages
- Blocks not in hidden region: 15 passes, 0 fails, 0 exceptions, and 4 debug messages
- Block rehash: 81 passes, 0 fails, and 0 exceptions
- Block caching: 213 passes, 0 fails, 0 exceptions, and 68 debug messages
- Admin theme block admin accessibility: 18 passes, 0 fails, 0 exceptions, and 6 debug messages



Test result

The test run finished in 2 min 19 sec.

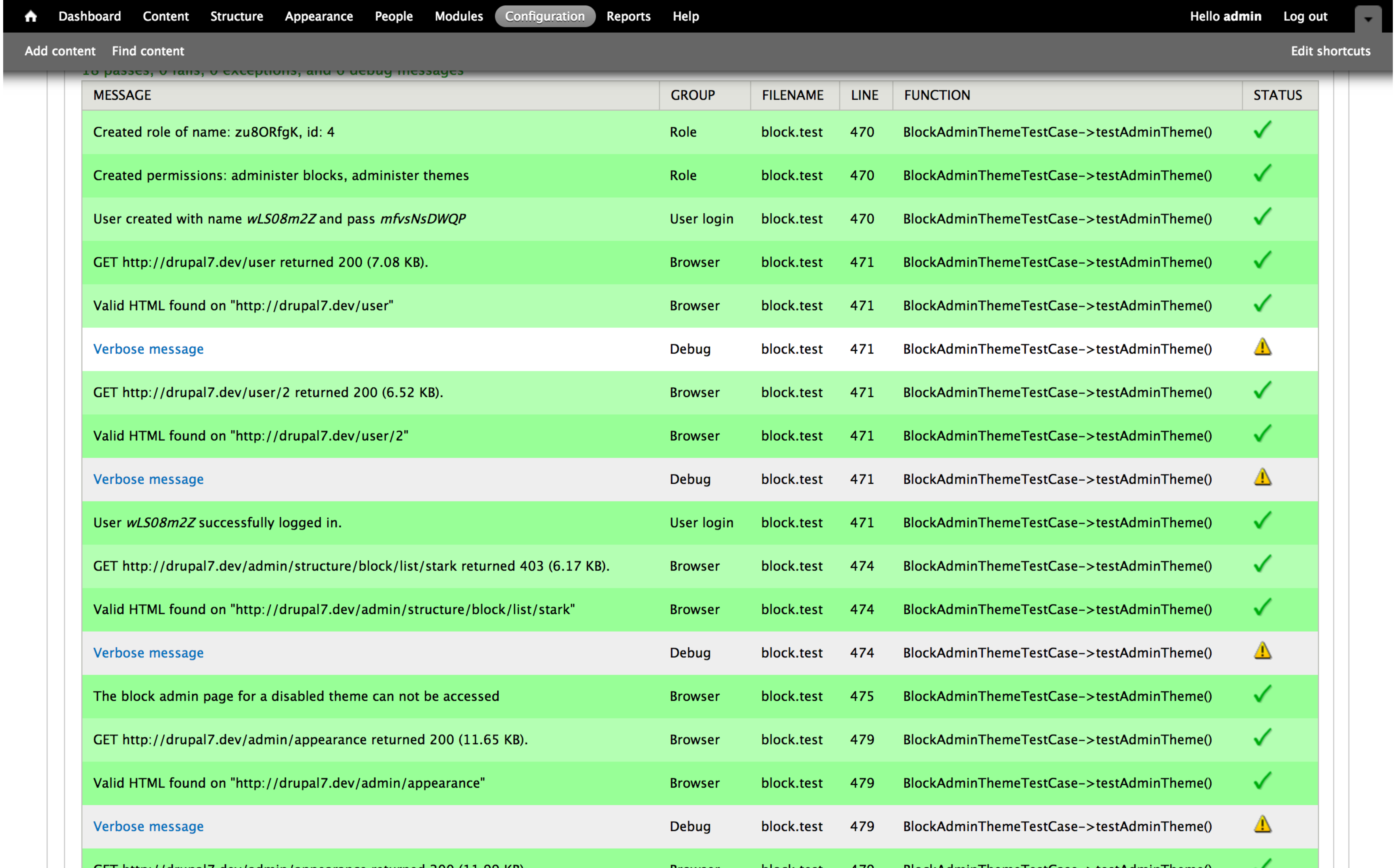
ACTIONS

Filter All (11)

RESULTS

759 passes, 0 fails, 0 exceptions, and 213 debug messages

- ADMIN THEME BLOCK ADMIN ACCESSIBILITY
- BLOCK CACHING
- BLOCK REHASH
- BLOCKS NOT IN HIDDEN REGION
- BLOCK HTML ID
- BLOCKS IN INVALID REGIONS
- BLOCK TEMPLATE SUGGESTIONS
- BLOCK FUNCTIONALITY
- BLOCK VIEW MODULE DELTA ALTER



18 passes, 0 fails, 0 exceptions, and 0 debug messages

MESSAGE	GROUP	FILENAME	LINE	FUNCTION	STATUS
Created role of name: zu8ORfgK, id: 4	Role	block.test	470	BlockAdminThemeTestCase->testAdminTheme()	✓
Created permissions: administer blocks, administer themes	Role	block.test	470	BlockAdminThemeTestCase->testAdminTheme()	✓
User created with name *wLS08m2Z* and pass *mfvsNsDWQP*	User login	block.test	470	BlockAdminThemeTestCase->testAdminTheme()	✓
GET http://drupal7.dev/user returned 200 (7.08 KB).	Browser	block.test	471	BlockAdminThemeTestCase->testAdminTheme()	✓
Valid HTML found on "http://drupal7.dev/user"	Browser	block.test	471	BlockAdminThemeTestCase->testAdminTheme()	✓
Verbose message	Debug	block.test	471	BlockAdminThemeTestCase->testAdminTheme()	⚠
GET http://drupal7.dev/user/2 returned 200 (6.52 KB).	Browser	block.test	471	BlockAdminThemeTestCase->testAdminTheme()	✓
Valid HTML found on "http://drupal7.dev/user/2"	Browser	block.test	471	BlockAdminThemeTestCase->testAdminTheme()	✓
Verbose message	Debug	block.test	471	BlockAdminThemeTestCase->testAdminTheme()	⚠
User *wLS08m2Z* successfully logged in.	User login	block.test	471	BlockAdminThemeTestCase->testAdminTheme()	✓
GET http://drupal7.dev/admin/structure/block/list/stark returned 403 (6.17 KB).	Browser	block.test	474	BlockAdminThemeTestCase->testAdminTheme()	✓
Valid HTML found on "http://drupal7.dev/admin/structure/block/list/stark"	Browser	block.test	474	BlockAdminThemeTestCase->testAdminTheme()	✓
Verbose message	Debug	block.test	474	BlockAdminThemeTestCase->testAdminTheme()	⚠
The block admin page for a disabled theme can not be accessed	Browser	block.test	475	BlockAdminThemeTestCase->testAdminTheme()	✓
GET http://drupal7.dev/admin/appearance returned 200 (11.65 KB).	Browser	block.test	479	BlockAdminThemeTestCase->testAdminTheme()	✓
Valid HTML found on "http://drupal7.dev/admin/appearance"	Browser	block.test	479	BlockAdminThemeTestCase->testAdminTheme()	✓
Verbose message	Debug	block.test	479	BlockAdminThemeTestCase->testAdminTheme()	⚠
GET http://drupal7.dev/admin/appearance returned 200 (11.90 KB).	Browser	block.test	479	BlockAdminThemeTestCase->testAdminTheme()	✓
]

Running SimpleTest From The Command Line

```
# Drupal 7
$ php scripts/run-tests.sh

# Drupal 8
$ php core/scripts/run-tests.sh
```

Running SimpleTest From The Command Line

```
--color

--verbose

--all

--module

--class

--file
```

Running PHPUnit From The Command Line

```
$ vendor/bin/phpunit

$ vendor/bin/phpunit [directory]

$ vendor/bin/phpunit --filter [method]
```

Example: Collection Class

Collection Class

- http://dgo.to/collection_class
- Adds a `Collection` class, based on Laravel’s
- Provides helper methods for array methods
- Drupal 7, uses xautoload

```php
$collection = collect([1, 2, 3, 4, 5]);

// Returns all items.
$collection->all();

// Counts the number of items.
$collection->count();

// Returns the array keys.
$collection->keys();
```

```php
namespace Drupal\collection_class;

class Collection implements \Countable, \IteratorAggregate {
  private $items;

  public function __construct($items = array()) {
    $this->items = is_array($items) ? $items
      : $this->getArrayableItems($items);
  }

  public function __toString() {
    return $this->toJson();
  }

  ...
```

```php
public function all() {
  return $this->items;
}

public function count() {
  return count($this->items);
}


public function isEmpty() {
  return empty($this->items);
}

public function first() {
  return array_shift($this->items);
}
```

Testing

```
public function setUp() {
  $this->firstCollection = collect(['foo', 'bar', 'baz']);

  $this->secondCollection = collect([
      array('title' => 'Foo', 'status' => 1),
      array('title' => 'Bar', 'status' => 0),
      array('title' => 'Baz', 'status' => 1)
  ]);

  parent::setUp();
}
```

Testing

```
public function testCollectFunction() {
  $this->assertEqual(
    get_class($this->firstCollection),
    'Drupal\collection_class\Collection'
  );
}
```

Testing

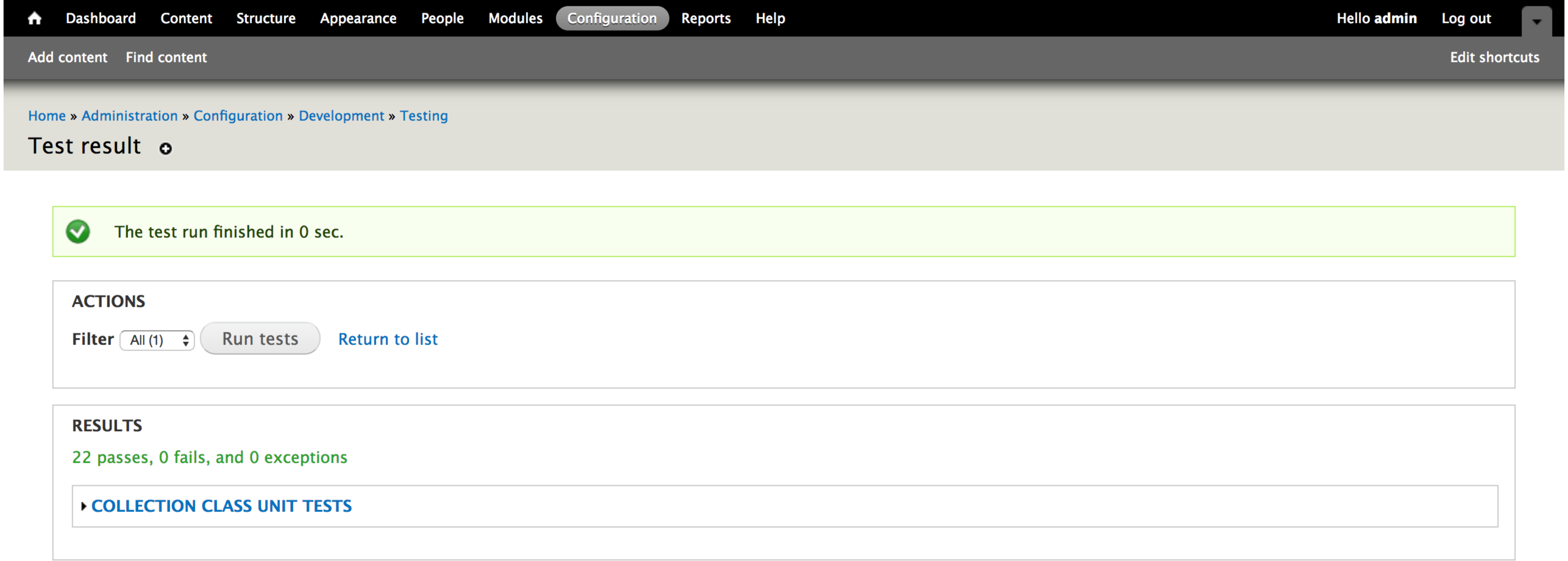
```
public function testAll() {
  $this->assertEqual(
    array('foo', 'bar', 'baz'),
    $this->firstCollection->all()
  );
}
```

Testing

```
public function testCount() {
  $this->assertEqual(
    3,
    $this->firstCollection->count()
  );
}
```

Testing

```
public function testMerge() {
  $first = collect(array('a', 'b', 'c'));
  $second = collect(array('d', 'e', 'f'));

  $this->assertEqual(
    array('a', 'b', 'c', 'd', 'e', 'f'),
    $first->merge($second)->all()
  );
}
```



Test result

The test run finished in 0 sec.

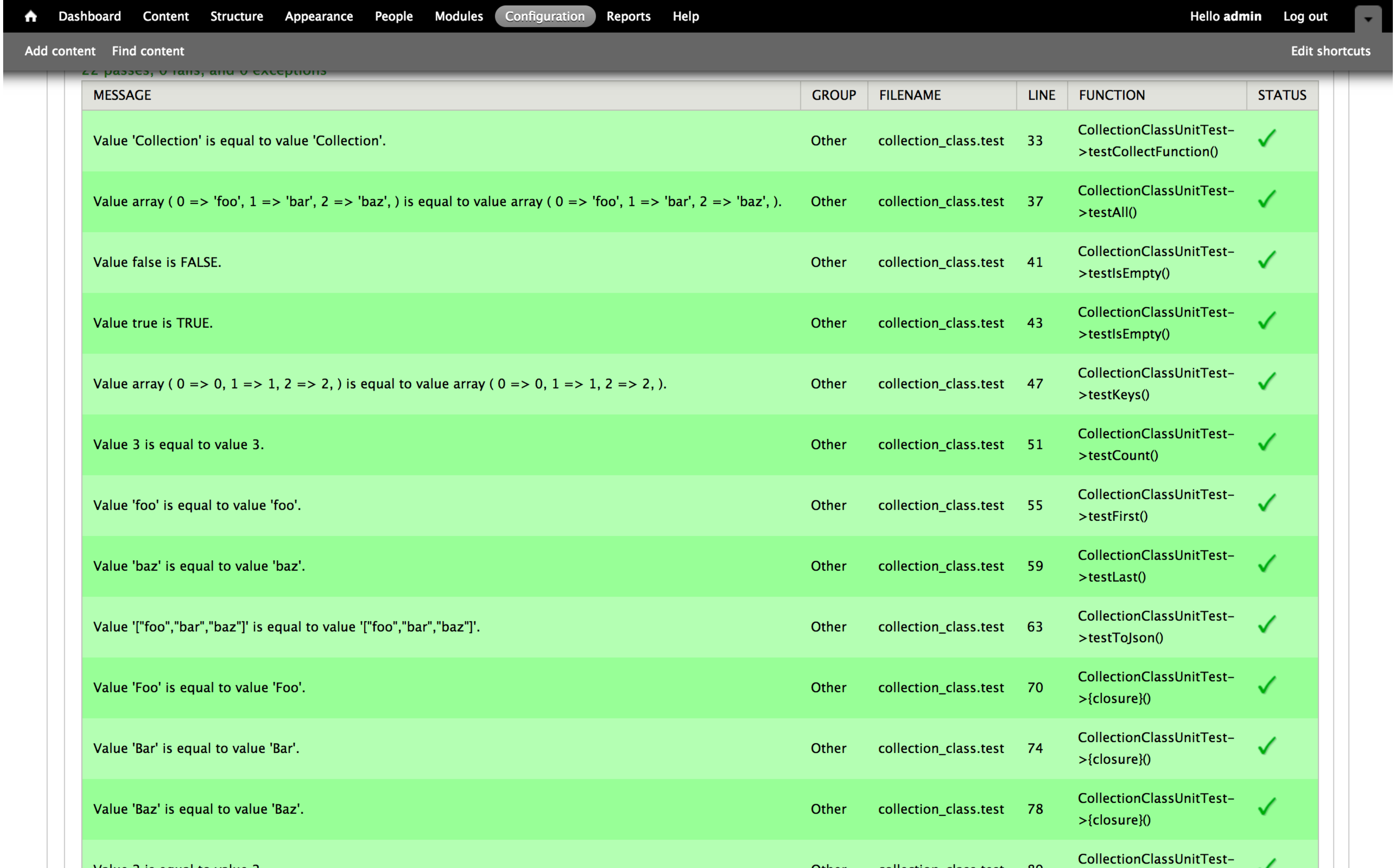
ACTIONS

Filter All (1) Run tests Return to list

RESULTS

22 passes, 0 fails, and 0 exceptions

COLLECTION CLASS UNIT TESTS



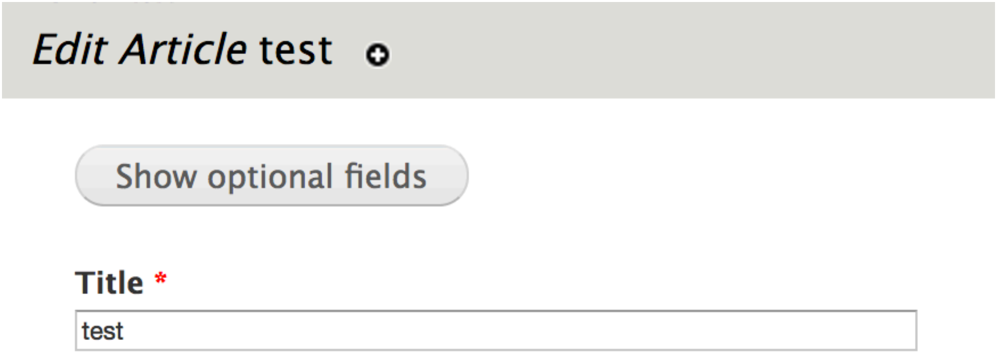
22 passes, 0 fails, and 0 exceptions

MESSAGE	GROUP	FILENAME	LINE	FUNCTION	STATUS
Value 'Collection' is equal to value 'Collection'.	Other	collection_class.test	33	CollectionClassUnitTest->testCollectFunction()	✓
Value array (0 => 'foo', 1 => 'bar', 2 => 'baz',) is equal to value array (0 => 'foo', 1 => 'bar', 2 => 'baz',).	Other	collection_class.test	37	CollectionClassUnitTest->testAll()	✓
Value false is FALSE.	Other	collection_class.test	41	CollectionClassUnitTest->testIsEmpty()	✓
Value true is TRUE.	Other	collection_class.test	43	CollectionClassUnitTest->testIsEmpty()	✓
Value array (0 => 0, 1 => 1, 2 => 2,) is equal to value array (0 => 0, 1 => 1, 2 => 2,).	Other	collection_class.test	47	CollectionClassUnitTest->testKeys()	✓
Value 3 is equal to value 3.	Other	collection_class.test	51	CollectionClassUnitTest->testCount()	✓
Value 'foo' is equal to value 'foo'.	Other	collection_class.test	55	CollectionClassUnitTest->testFirst()	✓
Value 'baz' is equal to value 'baz'.	Other	collection_class.test	59	CollectionClassUnitTest->testLast()	✓
Value '["foo","bar","baz"]' is equal to value '["foo","bar","baz"]'.	Other	collection_class.test	63	CollectionClassUnitTest->testToJson()	✓
Value 'Foo' is equal to value 'Foo'.	Other	collection_class.test	70	CollectionClassUnitTest->{closure}()	✓
Value 'Bar' is equal to value 'Bar'.	Other	collection_class.test	74	CollectionClassUnitTest->{closure}()	✓
Value 'Baz' is equal to value 'Baz'.	Other	collection_class.test	78	CollectionClassUnitTest->{closure}()	✓
Value 2 is equal to value 2.	Other	collection_class.test	80	CollectionClassUnitTest-	✓

Example: Toggle Optional Fields

Toggle Optional Fields

- http://dgo.to/toggle_optional_fields
- Adds a button to toggle optional fields on node forms using form alters
- Possible to override using an custom alter hook
- Uses unit and web tests



Edit Article test

Title *

test

Example

```
// Looping through available form elements...

// Only affect fields.
if (!toggle_optional_fields_element_is_field($element_name)) {
  return;
}

$element = &$form[$element_name];

if (isset($overridden_fields[$element_name])) {
  return $element['#access'] = $overridden_fields[$element_name];
}

// If the field is not required, disallow access to hide it.
if (isset($element[LANGUAGE_NONE][0]['#required'])) {
  return $element['#access'] = !empty($element[LANGUAGE_NONE][0]['#required']);
}
```

What to Test?

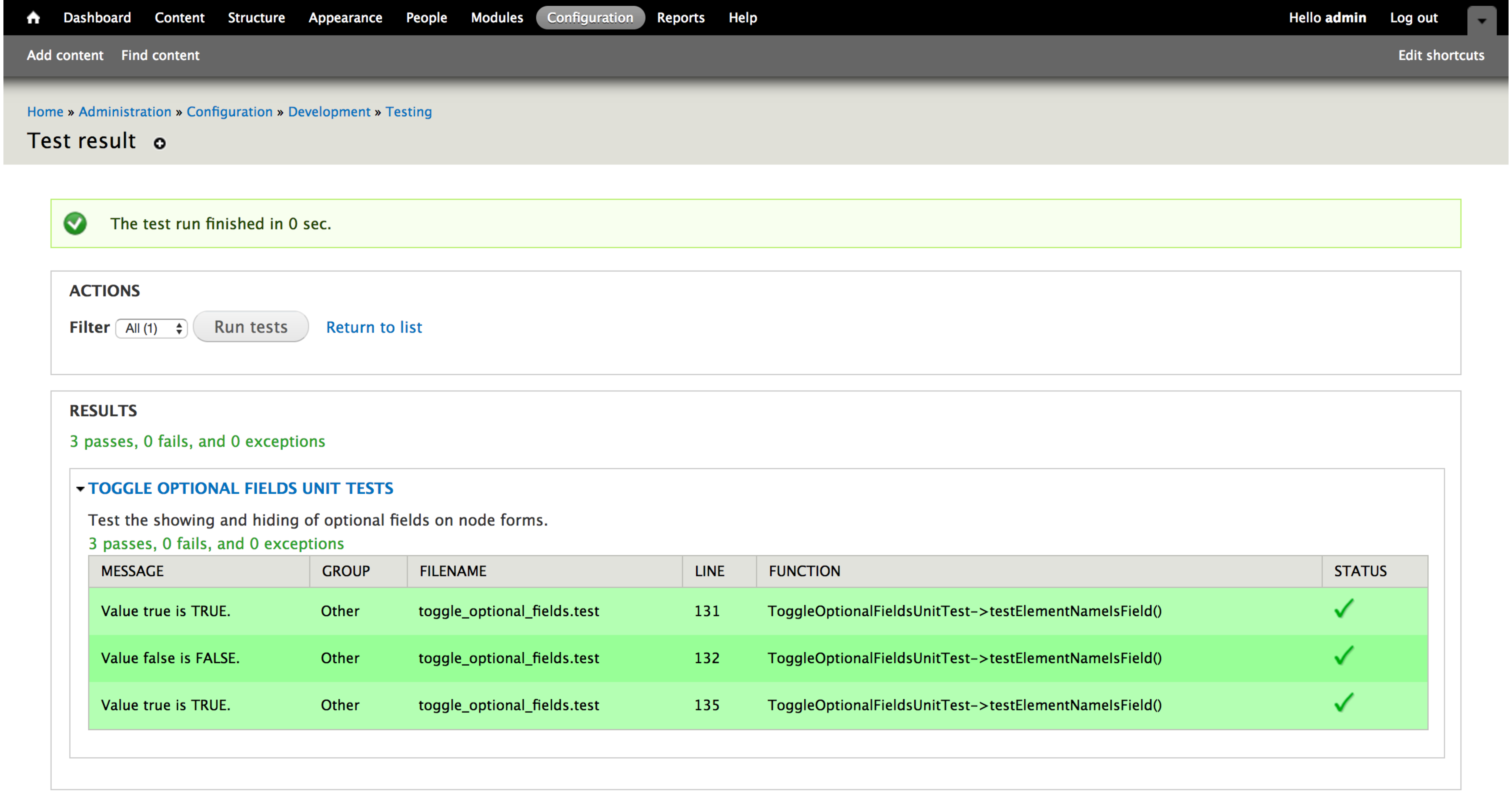
- **Functional:** Are the correct fields shown and hidden?
- **Unit:** Is the field name check returning correct results?

Unit Tests

```
// Returns TRUE or FALSE to indicate if this is a field.

function toggle_optional_fields_element_is_field($name) {
  if (in_array($name, array('body', 'language'))) {
    return TRUE;
  }

  return substr($name, 0, 6) == 'field_';
}
```

Unit Tests

```
$this->assertTrue(
  toggle_optional_fields_element_is_field('field_tags')
);

$this->assertTrue(
  toggle_optional_fields_element_is_field('body')
);

$this->assertFalse(
  toggle_optional_fields_element_is_field('title')
);
```



Test result

✓ The test run finished in 0 sec.

ACTIONS

RESULTS

3 passes, 0 fails, and 0 exceptions

TOGGLE OPTIONAL FIELDS UNIT TESTS

Test the showing and hiding of optional fields on node forms.

3 passes, 0 fails, and 0 exceptions

MESSAGE	GROUP	FILENAME	LINE	FUNCTION	STATUS
Value true is TRUE.	Other	toggle_optional_fields.test	131	ToggleOptionalFieldsUnitTest->testElementNameIsField()	✓
Value false is FALSE.	Other	toggle_optional_fields.test	132	ToggleOptionalFieldsUnitTest->testElementNameIsField()	✓
Value true is TRUE.	Other	toggle_optional_fields.test	135	ToggleOptionalFieldsUnitTest->testElementNameIsField()	✓

Web Tests

```
public function setUp() {
  parent::setUp();

  $this->drupalLogin(
    $this->drupalCreateUser(array(
      'create article content',
      'create page content'
    ));
  );

  // Enable toggling on article node forms.
  variable_set('toggle_optional_fields_node_types', array('article'));

  $this->refreshVariables();
}
```

Custom Assertions

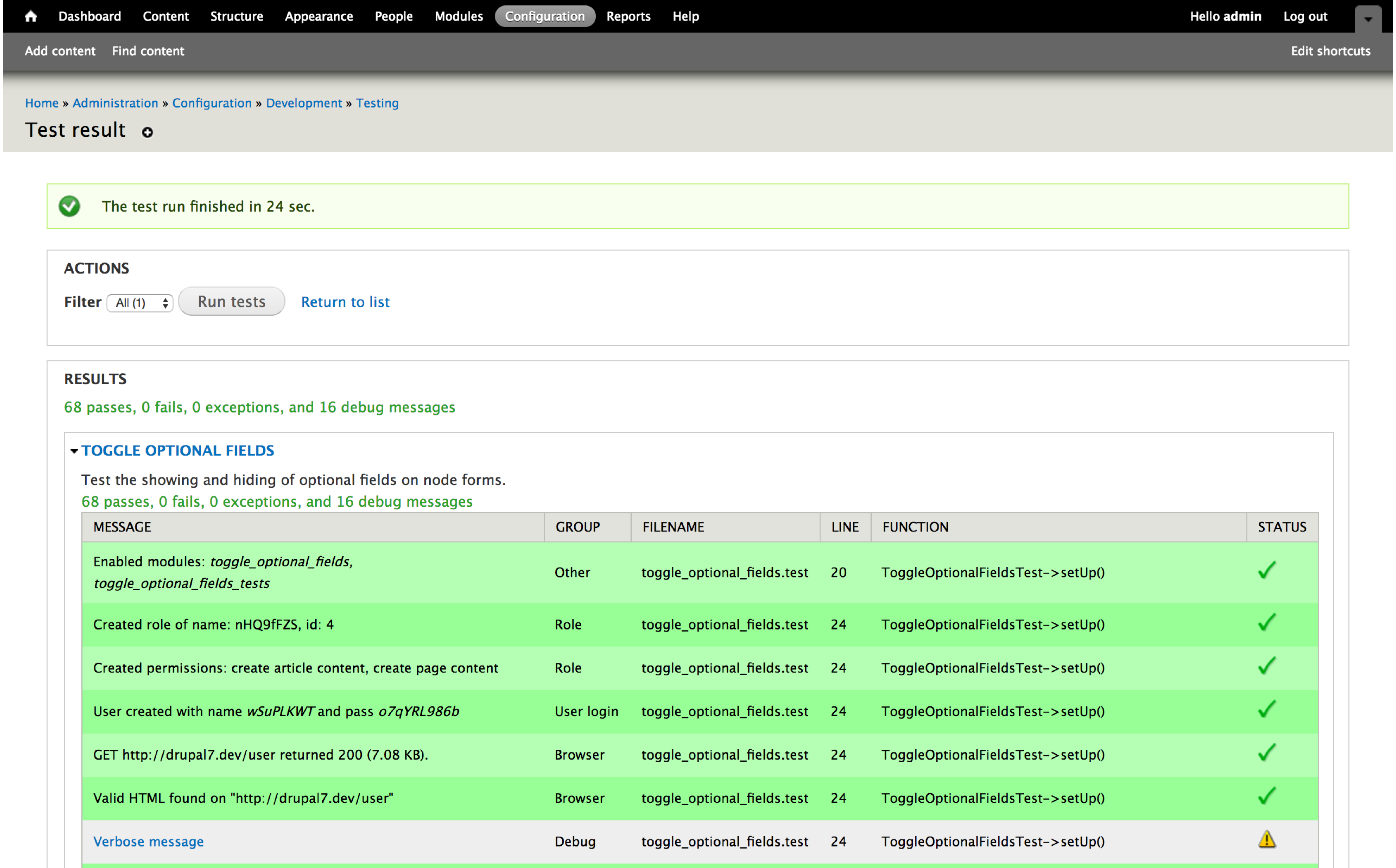
```
private function assertTagsFieldNotHidden() {
  $this->assertFieldByName(
    'field_tags[und]',
    NULL,
    t('Tags field visible.')
  );
}
```

Testing Hidden Fields

```
public function testFieldsHiddenByDefault() {
  variable_set('toggle_optional_fields_hide_by_default', TRUE);

  $this->refreshVariables();

  $this->drupalGet('node/add/article');

  $this->assertShowOptionalFieldsButtonFound();
  $this->assertHideOptionalFieldsButtonNotFound();
  $this->assertTagsFieldHidden();

  ...
```

Testing Hidden Fields

```
  ...

  $this->drupalPost(
    'node/add/article',
    array(),
    t('Show optional fields')
  );

  $this->assertHideOptionalFieldsButtonFound();
  $this->assertShowOptionalFieldsButtonNotFound();
  $this->assertTagsFieldNotHidden();
}
```



Test result

The test run finished in 24 sec.

ACTIONS

Filter All (1)

RESULTS

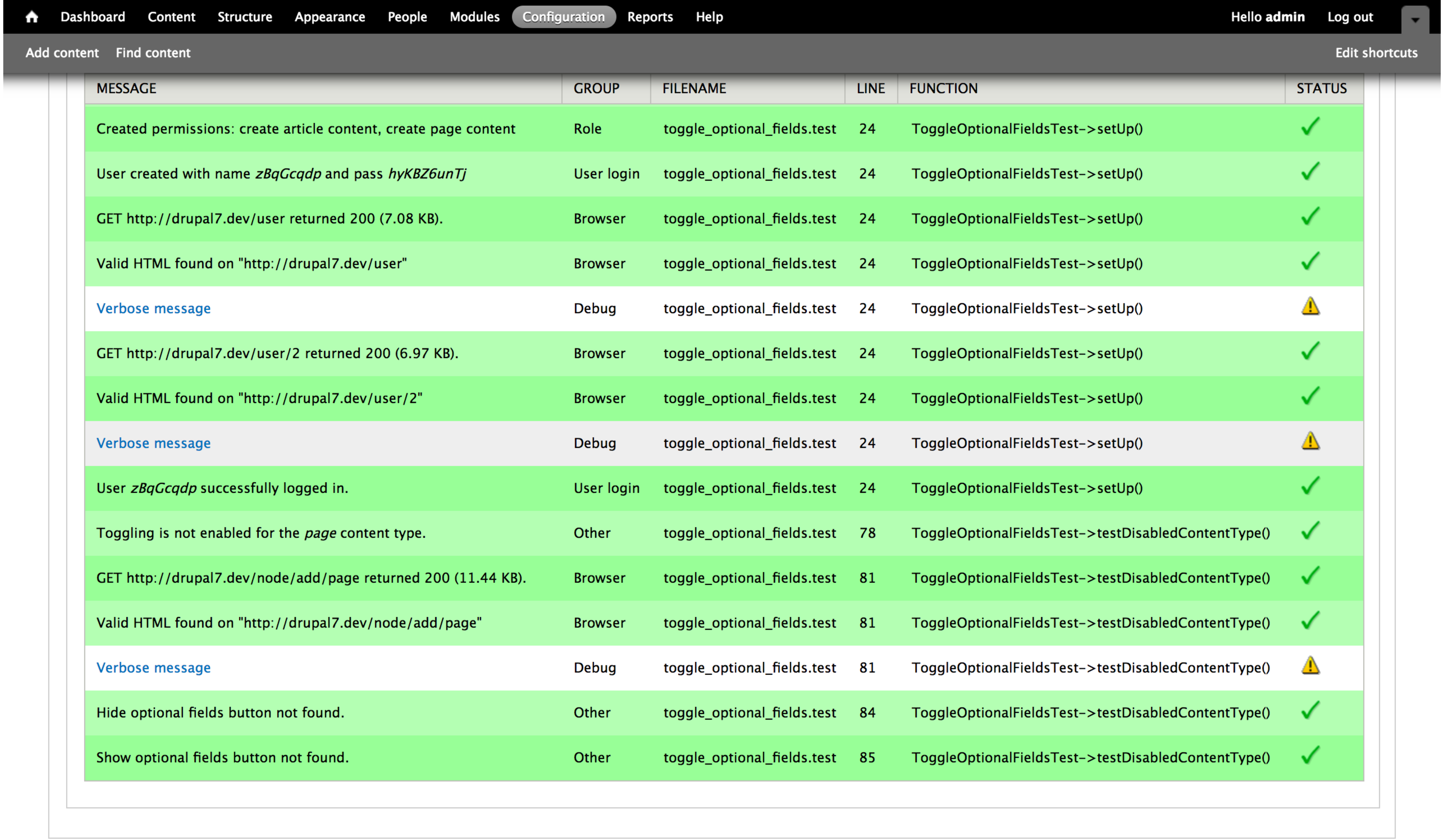
68 passes, 0 fails, 0 exceptions, and 16 debug messages

TOGGLE OPTIONAL FIELDS

Test the showing and hiding of optional fields on node forms.

68 passes, 0 fails, 0 exceptions, and 16 debug messages

MESSAGE	GROUP	FILENAME	LINE	FUNCTION	STATUS
Enabled modules: *toggle_optional_fields, toggle_optional_fields_tests*	Other	toggle_optional_fields.test	20	ToggleOptionalFieldsTest->setUp()	✓
Created role of name: nHQ9fFZS, id: 4	Role	toggle_optional_fields.test	24	ToggleOptionalFieldsTest->setUp()	✓
Created permissions: create article content, create page content	Role	toggle_optional_fields.test	24	ToggleOptionalFieldsTest->setUp()	✓
User created with name *wSuPLKWT* and pass *o7qYRL986b*	User login	toggle_optional_fields.test	24	ToggleOptionalFieldsTest->setUp()	✓
GET http://drupal7.dev/user returned 200 (7.08 KB).	Browser	toggle_optional_fields.test	24	ToggleOptionalFieldsTest->setUp()	✓
Valid HTML found on "http://drupal7.dev/user"	Browser	toggle_optional_fields.test	24	ToggleOptionalFieldsTest->setUp()	✓
Verbose message	Debug	toggle_optional_fields.test	24	ToggleOptionalFieldsTest->setUp()	⚠



MESSAGE	GROUP	FILENAME	LINE	FUNCTION	STATUS
Created permissions: create article content, create page content	Role	toggle_optional_fields.test	24	ToggleOptionalFieldsTest->setUp()	✓
User created with name *zBqGcqdp* and pass *hyKBZ6unTj*	User login	toggle_optional_fields.test	24	ToggleOptionalFieldsTest->setUp()	✓
GET http://drupal7.dev/user returned 200 (7.08 KB).	Browser	toggle_optional_fields.test	24	ToggleOptionalFieldsTest->setUp()	✓
Valid HTML found on "http://drupal7.dev/user"	Browser	toggle_optional_fields.test	24	ToggleOptionalFieldsTest->setUp()	✓
Verbose message	Debug	toggle_optional_fields.test	24	ToggleOptionalFieldsTest->setUp()	⚠
GET http://drupal7.dev/user/2 returned 200 (6.97 KB).	Browser	toggle_optional_fields.test	24	ToggleOptionalFieldsTest->setUp()	✓
Valid HTML found on "http://drupal7.dev/user/2"	Browser	toggle_optional_fields.test	24	ToggleOptionalFieldsTest->setUp()	✓
Verbose message	Debug	toggle_optional_fields.test	24	ToggleOptionalFieldsTest->setUp()	⚠
User *zBqGcqdp* successfully logged in.	User login	toggle_optional_fields.test	24	ToggleOptionalFieldsTest->setUp()	✓
Toggling is not enabled for the *page* content type.	Other	toggle_optional_fields.test	78	ToggleOptionalFieldsTest->testDisabledContentType()	✓
GET http://drupal7.dev/node/add/page returned 200 (11.44 KB).	Browser	toggle_optional_fields.test	81	ToggleOptionalFieldsTest->testDisabledContentType()	✓
Valid HTML found on "http://drupal7.dev/node/add/page"	Browser	toggle_optional_fields.test	81	ToggleOptionalFieldsTest->testDisabledContentType()	✓
Verbose message	Debug	toggle_optional_fields.test	81	ToggleOptionalFieldsTest->testDisabledContentType()	⚠
Hide optional fields button not found.	Other	toggle_optional_fields.test	84	ToggleOptionalFieldsTest->testDisabledContentType()	✓
Show optional fields button not found.	Other	toggle_optional_fields.test	85	ToggleOptionalFieldsTest->testDisabledContentType()	✓

Building a new D8 module with TDD

As a site visitor

I want to see a list of all published pages at /pages

Ordered alphabetically by title.

```yaml
# dublintest.yml

name: DrupalCamp Dublin test
core: 8.x
type: module
```

```
// tests/src/Functional/ListingPageTest.php

class ListingPageTest extends BrowserTestBase {

  protected static $modules = ['dublintest'];

  public function testListingPageExists() {
    $this->drupalGet('pages');

    $this->assertSession()->statusCodeEquals(200);
  }
}
```

```
docker@cli:/var/www/core$ ../vendor/bin/phpunit ../modules/dublintest/tests
PHPUnit 4.8.36 by Sebastian Bergmann and contributors.

Testing ../modules/dublintest/tests/
E

Time: 25.94 seconds, Memory: 6.00MB

There was 1 error:

1) PageListTest::testListingPage
Behat\Mink\Exception\ExpectationException: Current response status code is 404,
but 200 expected.

/var/www/vendor/behat/mink/src/WebAssert.php:770
/var/www/vendor/behat/mink/src/WebAssert.php:130
/var/www/modules/dublintest/tests/src/PageListTest.php:11
```

- Add the view.
- Copy the config into `config/install`.

```
docker@cli:/var/www/core$ ../vendor/bin/phpunit ../modules/dublintest/tests
PHPUnit 4.8.36 by Sebastian Bergmann and contributors.

Testing ../modules/dublintest/tests/
E

Time: 19.07 seconds, Memory: 6.00MB

There was 1 error:

1) PageListTest::testListingPage
Drupal\Core\Config\UnmetDependenciesException:
Configuration objects provided by <em class="placeholder">dublintest</em>
have unmet dependencies:
<em class="placeholder">node.type.page (node),
views.view.pages (node, views)</em>
```

```
name: DrupalCamp Dublin tests
core: 8.x
type: module

dependencies:
  - drupal:node
  - drupal:views
```

```
docker@cli:/var/www/core$ ../vendor/bin/phpunit ../modules/dublintest/tests
PHPUnit 4.8.36 by Sebastian Bergmann and contributors.

Testing ../modules/dublintest/tests/
.

Time: 29.58 seconds, Memory: 6.00MB

OK (1 test, 1 assertion)
```

```
public function testOnlyPublishedPagesAreShown() {
  // Given I have a mixture of published and unpublished pages,
  // as well as other types of content.

  // When I view the pages list.

  // I should only see the published pages.
}
```

```
public function testOnlyPublishedPagesAreShown() {
  $this->drupalCreateContentType(['type' => 'article']);

  $this->drupalCreateNode(['type' => 'page', 'status' => TRUE]);

  $this->drupalCreateNode(['type' => 'article']);

  $this->drupalCreateNode(['type' => 'page', 'status' => FALSE]);

  // When I view the pages list.

  // I should only see the published pages.
}
```

```php
public function testOnlyPublishedPagesAreShown() {
  ...

  $results = views_get_view_result('pages');

  $nids = collect($results)->pluck('nid')->all();
  // [1, 3]

  // I should only see the published pages.
}
```

```
public function testOnlyPublishedPagesAreShown() {
  ...

  $results = views_get_view_result('pages');

  $nids = collect($results)->pluck('nid')->all();
  // [1, 3]

  $this->assertEquals([1], $nids);
}
```

```
docker@cli:/var/www/core$ ../vendor/bin/phpunit ../modules/dublintest/tests
--filter=testOnlyPublishedPagesAreShown
PHPUnit 4.8.36 by Sebastian Bergmann and contributors.

Testing ../modules/dublintest/tests
F

Time: 26.4 seconds, Memory: 6.00MB

There was 1 failure:
```

```
1) PageListTest::testOnlyPublishedPagesAreShown
Failed asserting that two arrays are equal.
--- Expected
+++ Actual
@@ @@
 Array (
-    0 => 1
+    0 => '1'
+    1 => '3'
 )

/var/www/core/tests/Drupal/Tests/BrowserTestBase.php:1240
/var/www/modules/dublintest/tests/src/PageListTest.php:25

FAILURES!
Tests: 1, Assertions: 3, Failures: 1.
```

- Edit the view
- Add the status filter
- Update the module config

```
docker@cli:/var/www/core$ ../vendor/bin/phpunit ../modules/dublintest/tests
--filter=testOnlyPublishedPagesAreShown
PHPUnit 4.8.36 by Sebastian Bergmann and contributors.

Testing ../modules/dublintest/tests
.

Time: 26.53 seconds, Memory: 6.00MB

OK (1 test, 3 assertions)
```

```
public function testPagesAreOrderedAlphabetically() {
  // Given I have multiple pages with different titles.

  // When I view the pages list.

  // I see the pages in the correct order.
}
```

```
public function testPagesAreOrderedAlphabetically() {
  $this->drupalCreateNode(['title' => 'Page A']);
  $this->drupalCreateNode(['title' => 'Page D']);
  $this->drupalCreateNode(['title' => 'Page B']);
  $this->drupalCreateNode(['title' => 'Page C']);

  $results = views_get_view_result('pages');

  $nids = collect($results)->pluck('nid')->all();

  $this->assertEquals([1, 3, 4, 2], $nids);
}
```

```
docker@cli:/var/www/core$ ../vendor/bin/phpunit ../modules/dublintest/tests
-filter=testPagesAreOrderedAlphabetically
PHPUnit 4.8.36 by Sebastian Bergmann and contributors.

Testing ../modules/dublintest/tests
F

Time: 28.03 seconds, Memory: 6.00MB

There was 1 failure:
```

```
1) PageListTest::testPagesAreOrderedAlphabetically
Failed asserting that two arrays are equal.
--- Expected
+++ Actual
@@ @@
 Array (
-    0 => 1
-    1 => 3
-    2 => 4
-    3 => 2
+    0 => '1'
+    1 => '2'
+    2 => '3'
+    3 => '4'
 )

/var/www/core/tests/Drupal/Tests/BrowserTestBase.php:1240
/var/www/modules/dublintest/tests/src/PageListTest.php:36
```

- Edit the view
- Remove the default sort criteria (created on)
- Add new sort criteria
- Update the module config

```
docker@cli:/var/www/core$ ../vendor/bin/phpunit ../modules/dublintest/tests
--filter=testPagesAreOrderedAlphabetically
PHPUnit 4.8.36 by Sebastian Bergmann and contributors.

Testing ../modules/dublintest/tests
.

Time: 27.67 seconds, Memory: 6.00MB

OK (1 test, 2 assertions)
```

```
docker@cli:/var/www/core$ ../vendor/bin/phpunit ../modules/dublintest/tests
PHPUnit 4.8.36 by Sebastian Bergmann and contributors.

Testing ../modules/dublintest/tests
...

Time: 1.17 minutes, Memory: 6.00MB

OK (3 tests, 6 assertions)
```

Takeaways

- Testing has made me a better developer
- Testing can produce better quality code
- Writing tests is an investment
- OK to start small, introduce tests gradually
- Easier to refactor
- Tests can pass, but things can still be broken. Tests only report on what they cover.

Thanks!

Questions?

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