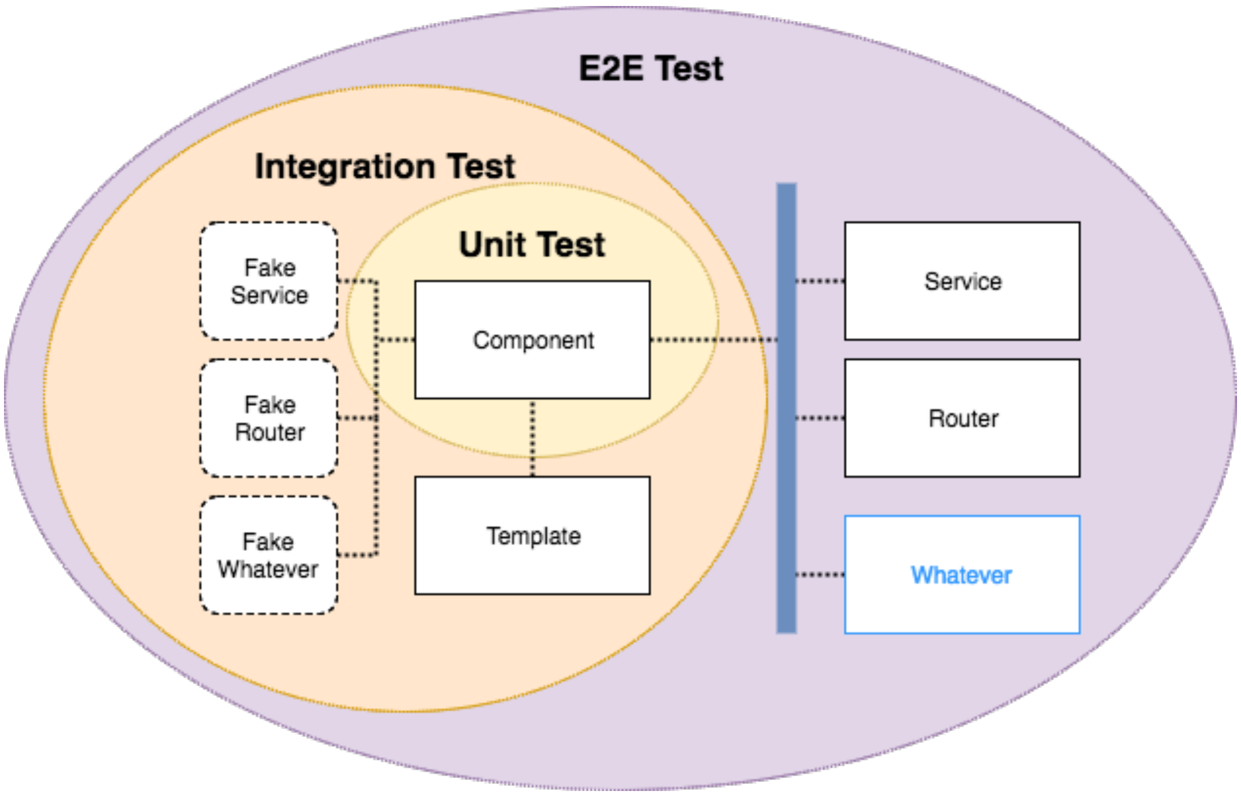
Testing in Angular

`Last update: 2017-10-28`

- specStarted(result)
- suiteDone(result)
- suiteStarted(result)

Introduction



Setup

```
npm install -g @angular/cli
ng new ng-testing --routing
npm start
ng test
ng test --code-coverage
```

Angular CLI and its ingredients

Angular CLI (@angular/cli) is a CLI Tool for Angular Applications.

Angular - JavaScript Framework

RxJS - Reactive Extensions

Webpack - Bundle for JavaScript

Jasmine - Unit & Integration Tests

Protractor - End to end Testing for Angular

Karma - Testrunner for JavaScript

Istanbul - JavaScript Code Coverage Tool

Linter (eslint, tslint,..)

Jasmine

```
describe('suite title', function () {
    it('spec title', function () {
        // ...
    });
});
```

Note: `timeouts` in following table are optional.

Global	Signature	Description
		Timeout in milliseconds. **Be careful**, sharing the

afterAll	`afterAll (function, timeout)`	teardown from a afterAll makes it easy to accidentally **leak state** between your specs so that they erroneously pass or fail.
afterEach	`afterEach (function, timeout)`	
beforeAll	`beforeAll (function, timeout)`	Same **danger**, see `afterAll above |` `|beforeEach` `|` beforeEach (function, timeout)
describe	`describe(description, specDefinitions)`	
expect	`expect(actual) → {matchers}`	See matchers in coming chapters
fail	fail(error)	Explicitly mark a spec as failed.
fdescribe	fdescribe(description, specDefinitions)	If suites or specs are focused, only those that are focused will be executed
fit	fit(description, testFunction, timeout)	focused, see `fdescribe` above
it	it(description, testFunction, timeout)	
		Mark a spec as

pending	pending(message)	pending, expectation results will be ignored.
spyOn	spyOn(obj, methodName) → {Spy}	Install a spy onto an existing object. More details about says in coming chapters
spyOnProperty	spyOnProperty(obj, propertyName, accessTypeopt) → {Spy}	
xdescribe	xdescibe(description, specDefinitions)	temporarily disabled
xit	xit(description, testFunctionopt)	A temporarily disabled it

Matchers

nothing

`expect().nothing();` expect nothing explicitly.

toBe

`expect(thing).toBe(realThing);` expect the actual value to be === to the expected value

toBeCloseTo

`expect(12.34).toBeCloseTo(12.3, 1);` → success
`expect(12.34).toBeCloseTo(12.3, 1);` → failure

toBeDefined

`expect(result).toBeDefined();` → Not undefined

toBeFalsy

expect(result).toBeFalsy();

toBeGreaterThan

`expect(result).toBeGreaterThan(3);`

toBeGreaterThanOrEqual

`expect(result).toBeGreaterThanOrEqual(25);`

toBeLessThan

`expect(result).toBeLessThan(0);`

toBeLessThanOrEqual

expect(result).toBeLessThanOrEqual(123);

toBeNaN()

toBeNegativeInfinity()

toBeNull()

toBePositiveInfinity()

toBeTruthy()

toBeUndefined()

toContain

`expect(array).toContain(anElement);` → Array
`expect(string).toContain(substring);` → String

toEqual

expect the actual value to be equal to the expected, using **deep equality**

comparison.

`expect(bigObject).toEqual({"foo": ['bar', 'baz']});`

toHaveBeenCalled

expect the actual (a Spy) to have been called.

`expect(mySpy).toHaveBeenCalled();` → called → succes
`expect(mySpy).not.toHaveBeenCalled();` → not called → success

toHaveBeenCalledBefore

expect the actual value (a Spy) to have been called before another Spy.

`expect(mySpy).toHaveBeenCalledBefore(otherSpy);`

toHaveBeenCalledTimes

`expect(mySpy).toHaveBeenCalledTimes(3);`

toHaveBeenCalledWith

expect the actual (a Spy) to have been called with particular arguments at least once.

`expect(mySpy).toHaveBeenCalledWith('foo', 'bar', 2);`

toMatch

expect the actual value to match a **regular expression**

`expect("my string").toMatch(/string$/);`

`expect("other string").toMatch("her");`

toThrow

expect a function to throw something.

`expect(function() { return 'things'; }).toThrow('foo');`

`expect(function() { return 'stuff'; }).toThrow();`

toThrowError

expect a function to throw an `Error`.

`toThrowError(expected, message);` Both parameters are optional. `message` is `RegExp` or `String.

`expect(function() { return 'things'; }).toThrowError(MyCustomError, 'message');`

`expect(function() { return 'things'; }).toThrowError(MyCustomError, /bar/);`

`expect(function() { return 'stuff'; }).toThrowError(MyCustomError);`

`expect(function() { return 'other'; }).toThrowError(/foo/);`

`expect(function() { return 'other'; }).toThrowError();`

Spy

Do not use `spy()` directly, use the following:

spyOn

`spyOn(obj, methodName);` Install a spy onto an existing object. `methodName` is the name of the method to replace with a `Spy`.

spyOnProperty

`spyOnProperty(obj, propertyName, accessType)`

EBIA: Would the following work? Test it,..

`spyOnProperty(someService, 'myValue', 'get').and.returnValue(false)`

jasmine.createSpy

`(static) createSpy(nameopt, originalFunction` opt `) → {Spy}`

jasmine.createSpyObj

Create an object with multiple Spys as its members.

`(static) createSpyObj(baseName` opt `, methodNames) → {Object}`

`methodNames` are either `Array<String>` or `Object

Spy#and

callFake(fn)

callThrough()

exec()

identity() → {String}

returnValue(value)

tell the spy to return the value when invoked

returnValues (...values)

Tell the spy to return one of the specified values (sequentially) each time the spy is invoked.

stub()

ell the spy to do nothing when invoked. This is the default.

throwError(something)

Tell the spy to throw an error when invoked.

Spy#calls

all() → {Array.<Spy.callData>}

Get the raw calls array for this spy.

allArgs() → {Array}

Get all of the arguments for each invocation of this spy in the order they were received.

any() → {Boolean}

Check whether this spy has been invoked.

argsFor(index) → {Array}

Get the arguments that were passed to a specific invocation of this spy. (0-based invocation index)

count() → {Integer}

Get the number of invocations of this spy.

first() → {ObjecSpy.callData}

Get the first invocation of this spy.

mostRecent() → {ObjecSpy.callData}

Get the most recent invocation of this spy.

reset()

Reset this spy as if it has never been called.

saveArgumentsByValue()

Set this spy to do a shallow clone of arguments passed to each invocation.

Classes

Clock

Jasmine's mock clock is used when testing time dependent code.

new Clock()

Note: Do not construct this directly, Jasmine will make one during booting. You can get the current clock with jasmine.clock.

install() → {Clock}

Install the mock clock over the built-in methods.

mockDate(initialDate$_{opt}$)

Instruct the installed Clock to also mock the date returned by new Date()

tick(millis)

Tick the Clock forward, running any enqueued timeouts along the way

uninstall()

Uninstall the mock clock, returning the built-in methods to their places.

withMock(Function)

Execute a function with a mocked Clock. The clock will be **installed** before the function is called and **uninstalled** in a finally after the function completes.

Env()

The Jasmine environment. new Env() **Note:** Do not construct this directly, Jasmine will make one during booting.

addReporter(reporterToAdd)

Add a custom reporter to the Jasmine environment.

jsApiReporter

Reporter added by default in boot.js to record results for retrieval in javascript code. An instance is made available as jsApiReporter on the global object.

executionTime() → {Number}

Get the number of milliseconds it took for the full Jasmine suite to run.

specResults(index, length) → {Array.}

Get the results for a set of specs. Retrievable in slices for easier serialization.

specs() → {Array.}

Get all spec results.

status() → {String}

Get the current status for the Jasmine environment, returns one of loaded, started, or done

suiteResults(index, length) → {Array.}

Get the results for a set of suites. Retrievable in slices for easier serialization.

suites() → {Object}

Get all of the suites in a single object, with their id as the key.

Spy (see above)

Interfaces

Reporter

This represents the available reporter callback for an object passed to Env#addReporter.

jasmineDone(suiteInfo)

When the entire suite has finished execution jasmineDone is called

jasmineStarted(suiteInfo)

jasmineStarted is called after all of the specs have been loaded, but just before execution starts.

specDone(result)

specDone is invoked when an it and its associated beforeEach and afterEach functions have been run.

Important! While jasmine doesn't require any specific functions, not defining a specDone will make it impossible for a reporter to know when a spec has failed.

specStarted(result)

specStarted is invoked when an it starts to run (including associated beforeEach functions)

suiteDone(result)

suiteDone is invoked when all of the child specs and suites for a given suite have been run

Important! While jasmine doesn't require any specific functions, not defining a suiteDone will make it impossible for a reporter to know when a suite has failures in an afterAll.

suiteStarted(result)

suiteStarted is invoked when a describe starts to run