Programación de Aplicaciones Telemáticas

TEMA 8: TESTING EN UNA APLICACIÓN

AGENDA

SESSIÓN 1

- Introducción
- Test funcionales
- Test no funcionales
- Piramide de testing
- Tests unitarios
- Test Doubles
- Consideracion de diseño de Tests
- Librerias
- TDD

AGENDA

SESSIÓN 2

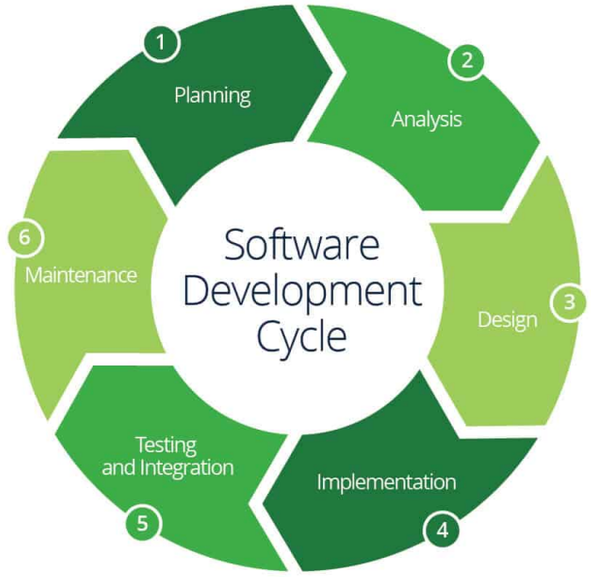
- Test de Integración
- Wiremock
- TestContainers

SESSIÓN 1

INTRODUCIÓN

¿POR QUE NECESITAS TESTS?

Es necesario verificar que el software cumple con las expectativas / requerimientos.



TEST FUNCIONALES

Una prueba funcional es una prueba de tipo caja negra basada en la ejecución, revisión y retroalimentación de las funcionalidades previamente diseñadas para el software.

TEST FUNCIONALES

- Configuracion del Build System
- Unit Tests
- Integration Tests
- Code Coverage
- Documentación

TEST NO FUNCIONALES

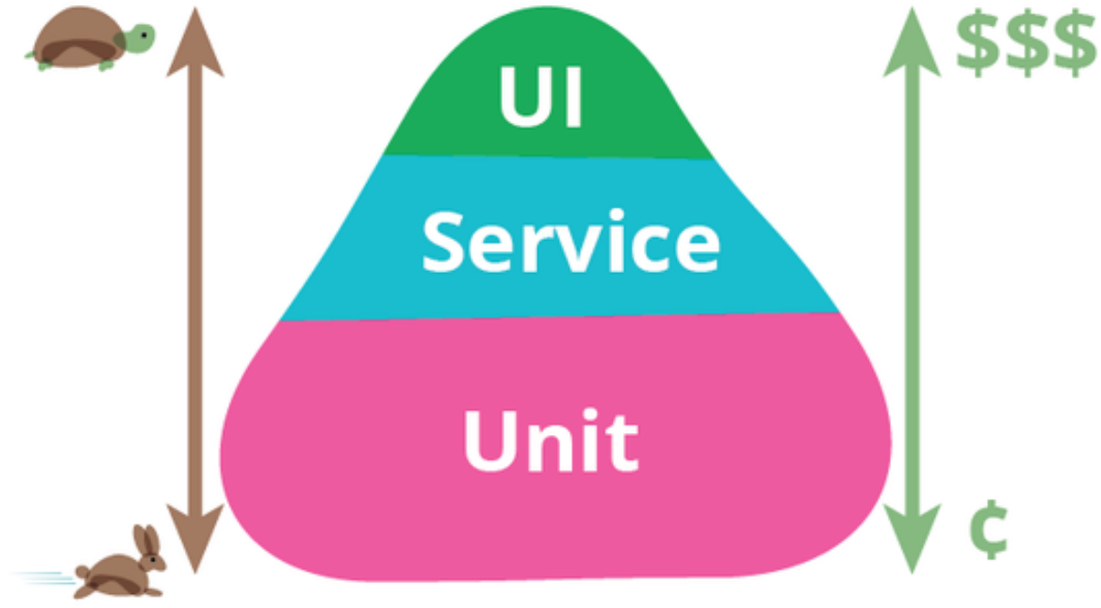
Una prueba funcional es una prueba de tipo caja negra basada en la ejecución, revisión y retroalimentación de las funcionalidades previamente diseñadas para el software.

TEST NO FUNCIONALES

- Performance Testing
- Monitoring Testing
- Profiling Testing
- Security Testing

PIRÁMIDE DE TESTING

The test pyramid is a way of thinking about how different kinds of automated tests should be used to create a balanced portfolio.

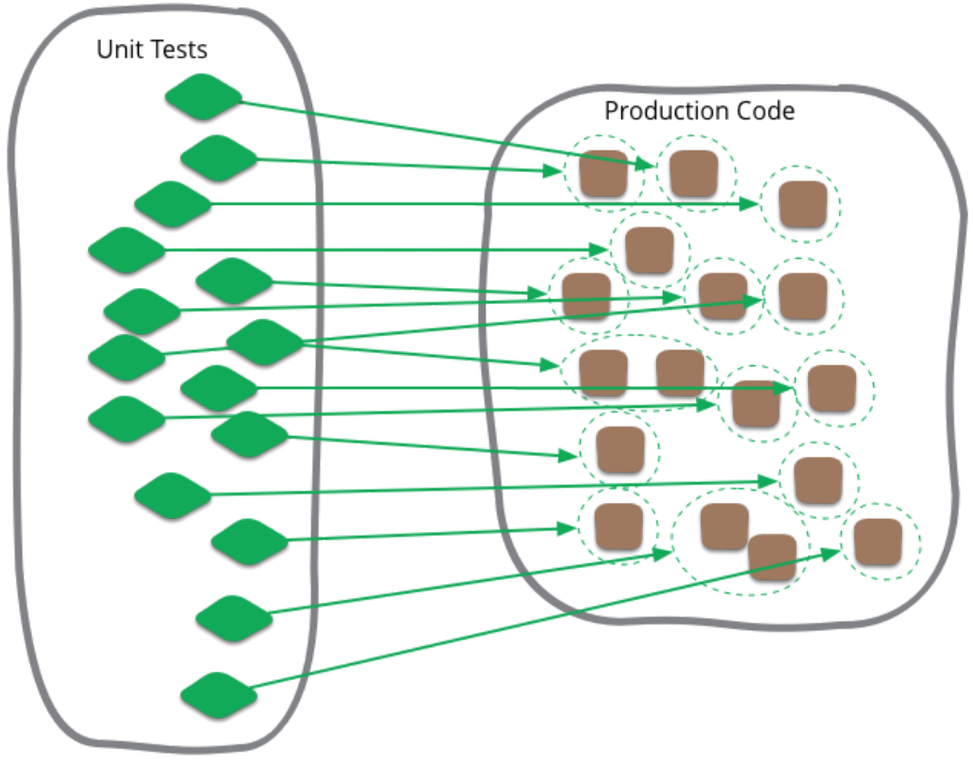


PIRÁMIDE DE TESTING

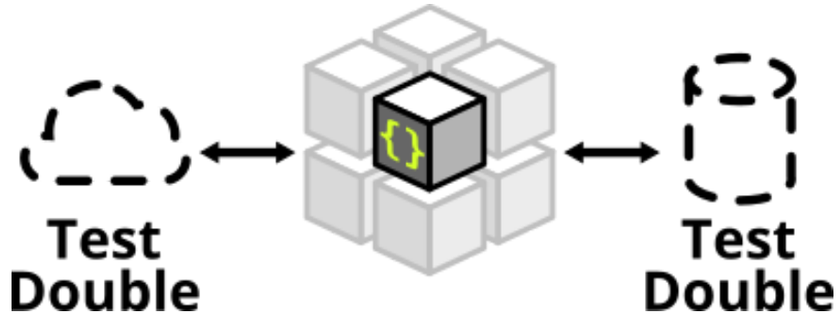
- Unit Tests
- Integration Tests
- E2E Tests

TESTS UNITARIOS

Your unit tests make sure that a certain unit (your subject under test) of your codebase works as intended.



TESTS UNITARIOS



TEST DOUBLES

The term Test Double as the generic term for any kind of pretend object used in place of a real object for testing purposes.

TEST DOUBLES

- Mocks are what we are talking about here: objects pre-programmed with expectations which form a specification of the calls they are expected to receive.
- Stubs provide canned answers to calls made during the test, usually not responding at all to anything outside what's programmed in for the test.
- Spies are stubs that also record some information based on how they were called.

TEST DOUBLES

- Fake objects actually have working implementations, but usually take some shortcut. (an in memory database is a good example).
- Dummy objects are passed around but never actually used.

CONSIDERACION DE DISEÑO DE TESTS

PRINCIPIOS FIRST

- Fast
- Independent
- Repeatable
- Self-validating
- Timely

CONSIDERACION DE DISEÑO DE TESTS

THE RIGHT BICEP

- Right – are the results right?
- B – are all the boundary conditions CORRECT?
- I – can you check inverse relationships?
- C – can you cross-check results using other means?
- E – can you force error conditions to happen?
- P – are performance characteristics within bounds?

CONSIDERACION DE DISEÑO DE TESTS

THE RIGHT BICEP

TESTS FOR BOUNDARY CONDITIONS

- Conformance – Does the value conform to an expected format?
- Ordering – is the set of values ordered or unordered as appropriate?
- Range – is the value within reasonable minimum and maximum values?

CONSIDERACION DE DISEÑO DE TESTS

THE RIGHT BICEP

TESTS FOR BOUNDARY CONDITIONS

- Reference – does the code reference anything external that isn’t under direct control of the code itself?Existence – Does the value exist?
- Cardinality – are there exactly enough values?
- Time – is everything happening in order? At the right time? In time?

JUNIT

JUnit is a unit testing framework for Java programming language. It plays a crucial role test-driven development, and is a family of unit testing frameworks collectively known as xUnit

JUNIT

JUnit promotes the idea of "first testing then coding", which emphasizes on setting up the test data for a piece of code that can be tested first and then implemented. This approach is like "test a little, code a little, test a little, code a little."

JUNIT

FEATURES

- Provides annotations to identify test methods
- Provides assertions for testing expected results
- Provides test runners for running tests
- Allow coding faster, which increases quality
- Elegantly simple
- Can be run automatically and they check their own results and provide immediate feedback
- Tests can be organized into test suites

JUNIT

EXAMPLE

```
public class MyUnit {

    public String concatenate(String one, String two){
        return one + two;
    }
}
```

JUNIT

EXAMPLE

```
public class MyUnitTest {

    @Test
    public void given_MyUnit_when_concatenate_then_Ok() {
        MyUnit myUnit = new MyUnit();

        String result = myUnit.concatenate("one", "two");

        assertEquals("onetwo", result);

    }
}
```

MOCKITO

Mockito is a mocking framework, JAVA-based library that is used for effective unit testing of JAVA applications. Mockito is used to mock interfaces so that a dummy functionality can be added to a mock interface that can be used in unit testing.

MOCKITO

FEATURES

- Mockito allows to write test methods compatible with "arrange/act/assert" approach.
- Mockito can be used to write Behavior Driven Development (BDD)-style.
- Mockito provides a nice, easily readable syntax.
- It is easy to read Mockito's error messages.

MOCKITO

EXAMPLE

```
public class WeatherForecast {
    private WeatherService globalWeather; [1]
    private WeatherService localService; [1]

    public WeatherForecast(WeatherService globalWeather, Weath
        this.localService = localService;
        this.globalWeather = globalWeather;
    }

    public Weather getForecast(String city) { [2]
        if (localService.hasForecastFor(city)) {
            return localService.getWeather(city);
        }
        return globalWeather.getWeather(city);
    }
```

MOCKITO

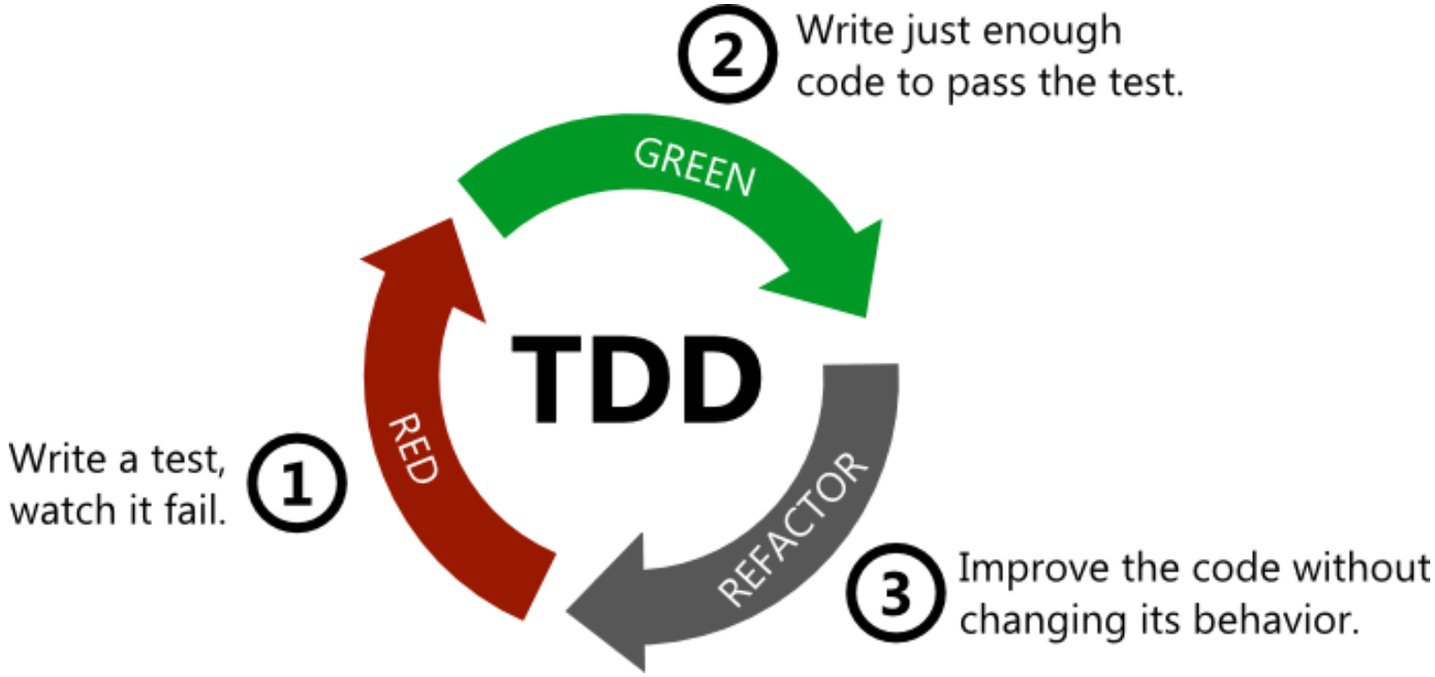
EXAMPLE

```
@Test
public void shouldFetchWeatherForecastFromGlobalServiceIfNotAv
        //Given
        WeatherService localWeatherService = Mockito.mock(Weat
        WeatherService globalWeatherService = Mockito.mock(Wea

        //When
        WeatherForecast forecast = new WeatherForecast(globalW
        Mockito.when(localWeatherService.hasForecastFor(anyStr
        .thenReturn(false);
        Weather forecastedWeather = new Weather();
        Mockito.when(globalWeatherService.getWeather(anyString
        .thenReturn(forecastedWeather);

        //Then
```

TDD


2
Write just enough
code to pass the test.
GREEN
TDD
RED
REFACTOR
Write a test,
watch it fail.
1
3
Improve the code without
changing its behavior.

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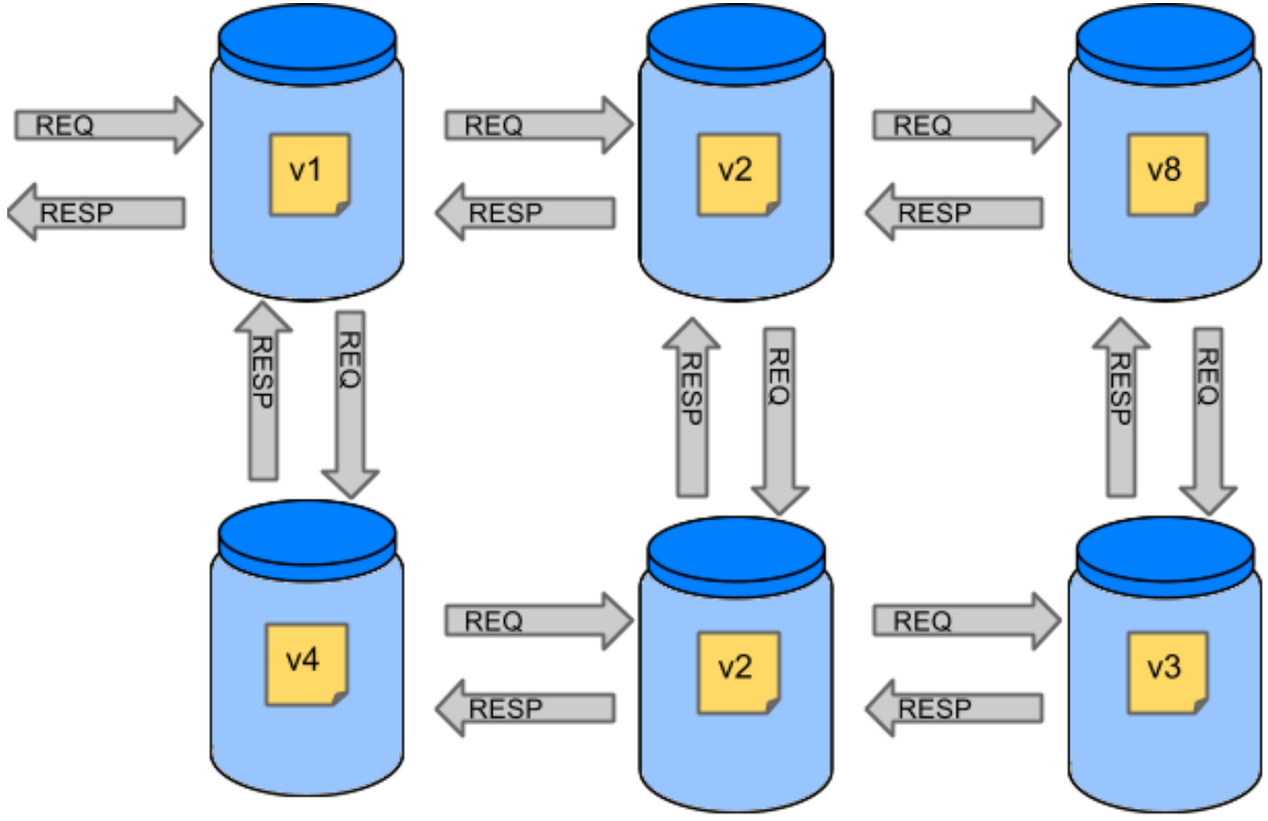
SESSIÓN 2

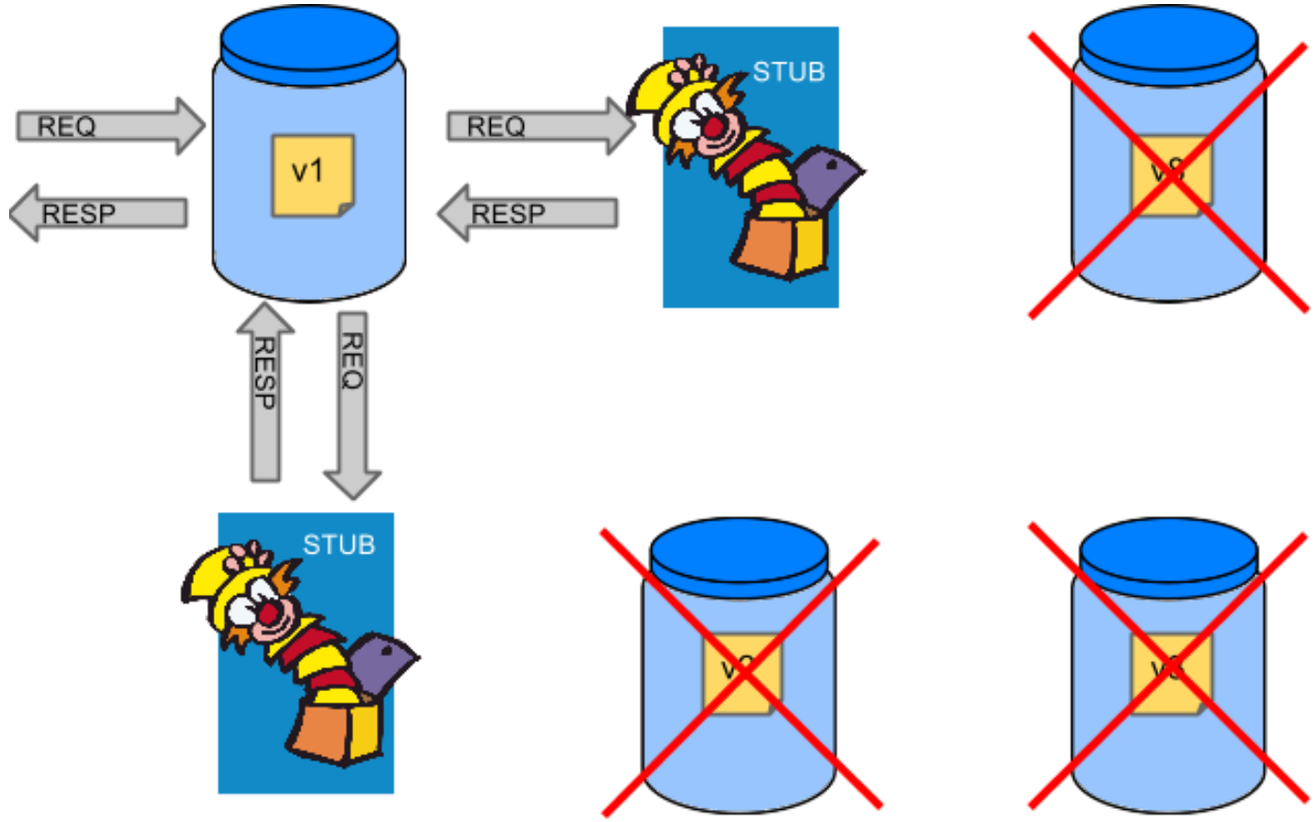
TEST DE INTEGRACIÓN

Integration testing (sometimes called integration and testing, abbreviated I&T) is the phase in software testing in which individual software modules are combined and tested as a group.

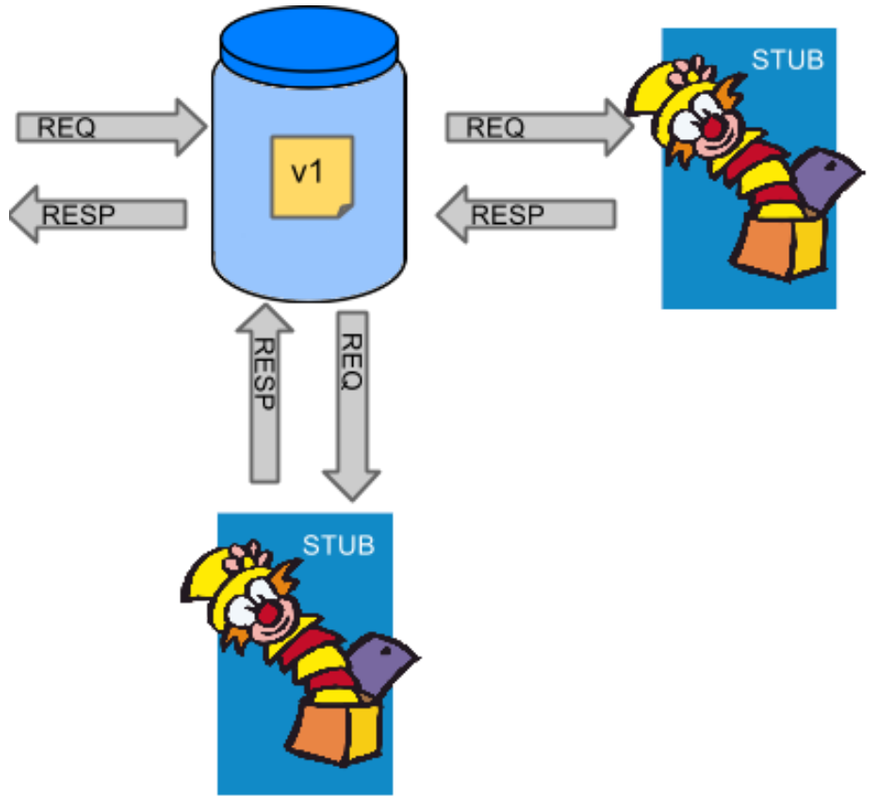
TEST DE INTEGRACIÓN



TEST DE INTEGRACIÓN



TEST DE INTEGRACIÓN



WIREMOCK

WireMock is a simulator for HTTP-based APIs. Some might consider it a service virtualization tool or a mock server.

WIREMOCK

EXAMPLE

```
@Test
public void exampleTest() {
    stubFor(get(urlEqualTo("/my/resource"))
            .withHeader("Accept", equalTo("text/xml"))
            .willReturn(aResponse()
                .withStatus(200)
                .withHeader("Content-Type", "text/xml")
                .withBody("<response>Some content</response>")

    Result result = myHttpServiceCallingObject.doSomething();

    assertTrue(result.wasSuccessful());

    verify(postRequestedFor(urlMatching("/my/resource/[a-z0-9]
            .withRequestBody(matching(".*<message>1234</messag
```

REFERENCIAS

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- https://martinfowler.com/bliki/TestDouble.html
- http://wiremock.org/
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