Unit-Test Pipeline Code

HomeAway

Pipeline-as-code needs tests, too!

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Unit Tests

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What are Unit Tests?

1. Repeatable: You can rerun the same test as many times as you want.

2. Consistent: Every time you run it, you get the same result. (for example: Using threads can produce an inconsistent result)

3. In Memory: It has no "hard" dependencies on anything not in memory (such as file system, databases, network)

4. Fast: It should take less than half a second to run a unit test.

5. Checking one single concern or "use case" in the system: More than one can make it harder to understand what or where the problem is when the problem arises.

6. Implementation-Agnostic: Tests are written to the code's interface and/or contract and assume nothing about the underlying implementation. (Correct code is defined by its contract/behavior and interface; changes in implementation that don't change behavior are not wrong)

From "The Difference Between Unit Testing and Integration Testing"
https://www.typemock.com/unit-tests-integration-tests

Unit Tests

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Unit Test Glossary

1. Mock (noun): A “fake” object that implements the interface of a real object but does nothing. Logs all interactions to enable tests to make assertions about what did or should have happened.

2. Mocking (verb): The act of creating a mock of a certain type of object.

3. Stubbing (verb): The act of defining behavior or return value for a specific interaction with a Mock object.

Spock

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Spock can unit-test Groovy code:

http://spockframework.org/

Spock Web Console

```
1  import spock.lang.*
2
3  // Hit 'Run Script' below
4  class MyFirstSpec extends Specification {
5    def "let's try this!"() {
6      expect:
7      Math.max(1, 2) == 3
8    }
9  }
```

```
MyFirstSpec
 - let's try this!   FAILED

   Condition not satisfied:

   Math.max(1, 2) == 3
        |          |
        2          false

   at MyFirstSpec.let's try this!(Script1.groovy:7)
```

Pipeline Code

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What is pipeline code?

A **D**omain **S**pecific **L**anguage (DSL) on top of Groovy.

1. Jenkinsfile
2. Helper Scripts
3. Pipeline Shared Libraries

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Follow Along

github.com/HomeAway/jenkins-spock

“examples” directory

Slides:

bit.ly/2QHzRW9

Unit-Test a Jenkinsfile

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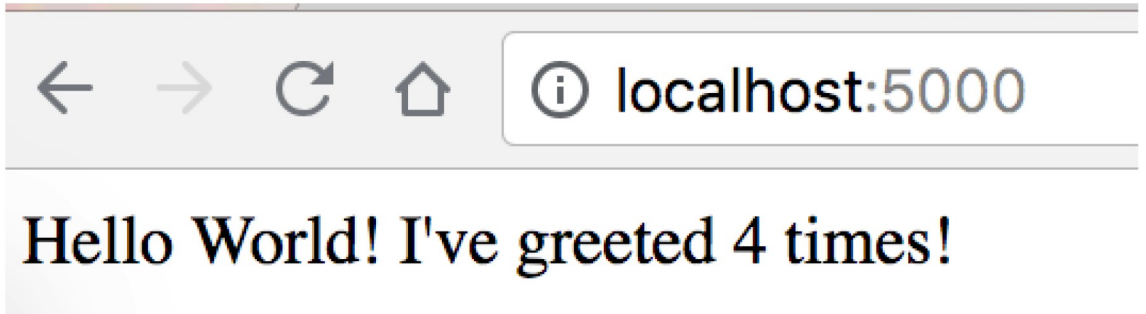
```
.
├── Dockerfile
├── Jenkinsfile
├── Makefile
├── README.md
└── app
    ├── counter.py
    ├── hello.py
    ├── hello.pyc
    ├── test_counter.py
    └── test_hello.py

1 directory, 9 files
```

```
1  FROM jfloff/alpine-python:3.6
2
3  RUN pip install --upgrade \
4      Flask \
5      pip
6
7  COPY app /app
8
9  WORKDIR app
10 ENV FLASK_APP=hello.py
11 EXPOSE 5000
12
13 ENTRYPOINT ["flask", "run", "--host", "0.0.0.0"]
```



Unit-Test a Jenkinsfile

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```
1  def deploy( _env ) {...
19
20 node {
21     stage( "Checkout" ) { checkout scm }
22
23     stage( "Build" ) { sh( "docker build --tag whole-pipeline ." ) }
24
25     stage( "Test" ) {
26         try {
27             sh( "docker run --entrypoint python whole-pipeline -m unittest discover" )
28         } catch( Exception e ) {
29             slackSend(
30                 color: 'error',
31                 message: 'whole-pipeline unit tests failed.' )
32             throw e
33         }
34     }
35
36     stage( "Push" ) { sh( "docker push whole-pipeline" )    }
37
38     stage( "Deploy to TEST" ) { deploy( "test" ) }
39
40     if( BRANCH_NAME == "master" ) {
41         stage( "Deploy to PRODUCTION" ) { deploy( "production" ) }
42     }
43 }
```

Unit-Test a Jenkinsfile

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Three Behaviors:

1. Notify Slack when tests fail.

2. Deploy non-master branches to the TEST environment.

3. Deploy *only the master branch* to the PRODUCTION environment.

Three tests to write!

Writing Our First Test

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```groovy
import com.homeaway.devtools.jenkins.testing.JenkinsPipelineSpecification

public class JenkinsfileSpec extends JenkinsPipelineSpecification {

    def Jenkinsfile = null

    public static class DummyException extends RuntimeException {
        public DummyException(String _message) { super( _message ); }
    }

    def setup() {
        Jenkinsfile = loadPipelineScriptForTest("/Jenkinsfile")
    }

    def "Slack is notified when tests fail" () {
        setup:
            getPipelineMock("sh")("docker run --entrypoint python whole-pipeline -m unittest discover") >> {
                throw new DummyException("Dummy test failure")
            }
        when:
            try {
                Jenkinsfile.run()
            } catch( DummyException e ) {}
        then:
            1 * getPipelineMock("slackSend")( _ as Map )
    }
}
```

Writing Our First Test

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```groovy
import com.homeaway.devtools.jenkins.testing.JenkinsPipelineSpecification

public class JenkinsfileSpec extends JenkinsPipelineSpecification {

    def Jenkinsfile = null

    public static class DummyException extends RuntimeException {
        public DummyException(String _message) { super( _message ); }
    }

    def setup() {
        Jenkinsfile = loadPipelineScriptForTest("/Jenkinsfile")
    }

    def "Slack is notified when tests fail" () {
        setup:
            getPipelineMock("sh")("docker run --entrypoint python whole-pipeline -m unittest discover") >> {
                throw new DummyException("Dummy test failure")
            }
        when:
            try {
                Jenkinsfile.run()
            } catch( DummyException e ) {}
        then:
            1 * getPipelineMock("slackSend")( _ as Map )
    }
}
```

Writing Our First Test

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    }

    def setup() {
        Jenkinsfile = loadPipelineScriptForTest("/Jenkinsfile")
    }

    def "Slack is notified when tests fail" () {
        setup:
            getPipelineMock("sh")("docker run --entrypoint python whole-pipeline -m unittest discover") >> {
                throw new DummyException("Dummy test failure")
            }
        when:
            try {
                Jenkinsfile.run()
            } catch( DummyException e ) {}
        then:
            1 * getPipelineMock("slackSend")( _ as Map )
    }
}
```

Writing Our First Test

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```groovy
import com.homeaway.devtools.jenkins.testing.JenkinsPipelineSpecification

public class JenkinsfileSpec extends JenkinsPipelineSpecification {

    def Jenkinsfile = null

    public static class DummyException extends RuntimeException {
        public DummyException(String _message) { super( _message ); }
    }

    def setup() {
        Jenkinsfile = loadPipelineScriptForTest("/Jenkinsfile")
    }

    def "Slack is notified when tests fail" () {
        setup:
            getPipelineMock("sh")("docker run --entrypoint python whole-pipeline -m unittest discover") >> {
                throw new DummyException("Dummy test failure")
            }
        when:
            try {
                Jenkinsfile.run()
            } catch( DummyException e ) {}
        then:
            1 * getPipelineMock("slackSend")( _ as Map )
    }
}
```

Running Our First Test

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Run that specification!

Wait… how?

Maven

Jenkins' components – core and plugins – are distributed as Maven artifacts. So is this test library. That's *very important!*

Running Our First Test

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Running Spock with Maven

```
<plugin>
    <groupId>org.codehaus.gmavenplus</groupId>
    <artifactId>gmavenplus-plugin</artifactId>
    <version>${groovy.gmaven.pluginVersion}</version>
    <executions>
        <execution>
            <id>groovy</id>
            <goals>
                <goal>addTestSources</goal>
                <goal>generateTestStubs</goal>
                <goal>compileTests</goal>
                <goal>removeTestStubs</goal>
            </goals>
            <configuration>
                <testSources>
                    <testSource>
                        <directory>src/test/groovy</directory>
                        <includes>
                            <include>**/*.groovy</include>
                        </includes>
                    </testSource>
                </testSources>
            </configuration>
        </execution>
    </executions>
</plugin>
```

```
<testResources>
    <testResource>
        <includes>
            <include>Jenkinsfile</include>
        </includes>
        <directory>${project.basedir}</directory>
    </testResource>
    <testResource>
        <directory>src/test/resources</directory>
    </testResource>
</testResources>
```

Mock Pipeline Steps

```
[ERROR] Slack is notified when tests fail(JenkinsfileSpec)  Time elapsed: 1.238 s  <<< ERROR!
java.lang.IllegalStateException:
There is no pipeline step mock for [sh].
        1. Is the name correct?
        2. Does the pipeline step have a descriptor with that name?
        3. Does that step come from a plugin? If so, is that plugin listed as a dependency in your pom.xml?
        4. If not, you may need to call explicitlyMockPipelineStep('sh') in your test's setup: block.
        at JenkinsfileSpec.Slack is notified when tests fail(JenkinsfileSpec.groovy:18)
```

Pipeline steps come from JARs.
Those JARs come from Maven dependencies.
Only the steps whose JARs you pull in get mocked!

```
<dependency>
    <!-- provides the sh() pipeline step -->
    <groupId>org.jenkins-ci.plugins.workflow</groupId>
    <artifactId>workflow-durable-task-step</artifactId>
    <version>2.21</version>
    <scope>test</scope>
</dependency>
```

Mock Pipeline Steps

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Bonus:

pom.xml now contains an explicit list of every Jenkins Plugin that a Jenkins Master needs to install in order to be able to run this project's pipeline!

Well, kind-of. Groovy is interpreted line-by-line, so if unit tests don't touch some code, they might never try to use a pipeline step and you might never know.

Really, you have a list of every plugin needed to be able to do *everything the tests say you can do*.

All the more reason to write a *full* test-suite!

Mock Pipeline Variables

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```
[ERROR] Slack is notified when tests fail(JenkinsfileSpec)  Time elapsed: 1.327 s  <<< ERROR!
java.lang.IllegalStateException:
There is no pipeline variable mock for [scm].
        1. Is the name correct?
        2. Is it a GlobalVariable extension point? If so, does the getName() method return [scm]?
        3. Is that variable normally defined by Jenkins? If so, you may need to define it by hand in your Spec.
        4. Does that variable come from a plugin? If so, is that plugin listed as a dependency in your pom.xml?
        5. If not, you may need to call explicitlyMockPipelineVariable("scm") during your test setup.
        at JenkinsfileSpec.Slack is notified when tests fail(JenkinsfileSpec.groovy:22)
Caused by: groovy.lang.MissingPropertyException: No such property: (intercepted on instance [Jenkinsfile@3ec2ecea]
 during test [JenkinsfileSpec@352e612e]) scm for class: Jenkinsfile
        at JenkinsfileSpec.Slack is notified when tests fail(JenkinsfileSpec.groovy:22)
```

Another missing <dependency>?
No – just some setup work that Jenkins does.
In this mocked-up test environment, the test author must do it.

```
11      def setup() {
12          Jenkinsfile = loadPipelineScriptForTest("/Jenkinsfile")
13          Jenkinsfile.getBinding().setVariable( "scm", null )
14      }
```

Our First Test

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There are some more missing dependencies, though. Add them and the test will complete!

```
<dependency>
    <!-- provides the slackSend() pipeline step -->
    <groupId>org.jenkins-ci.plugins</groupId>
    <artifactId>slack</artifactId>
    <version>2.3</version>
    <scope>test</scope>
</dependency>

<dependency>
    <!-- provides stage() step -->
    <groupId>org.jenkins-ci.plugins</groupId>
    <artifactId>pipeline-stage-step</artifactId>
    <version>2.3</version>
    <scope>test</scope>
</dependency>
```

```
<dependency>
    <!-- provides sshagent() step -->
    <groupId>org.jenkins-ci.plugins</groupId>
    <artifactId>ssh-agent</artifactId>
    <version>1.16</version>
    <scope>test</scope>
</dependency>
```

```
[INFO] Tests run: 1, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 5.923 s - in
 JenkinsfileSpec
[INFO]
[INFO] Results:
[INFO]
[INFO] Tests run: 1, Failures: 0, Errors: 0, Skipped: 0
```

Log Verbosity

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There are a lot of control handoffs in this process!

To ease debugging, the library is very talkative!

Don’t worry, though: It’s instrumented with the **SLF4J** logging facade & the **logback** logging framework, so a simple **logback-test.xml** will allow you to quiet it down for “normal” use.

There is nothing original about this use of logback so it is not included in these slides.

2nd Pipeline Test

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JenkinsfileSpec.groovy

```
28      def "Attempts to deploy MASTER branch to PRODUCTION" () {
29          setup:
30              Jenkinsfile.getBinding().setVariable( "BRANCH_NAME", "master" )
31          when:
32              Jenkinsfile.run()
33          then:
34              1 * getPipelineMock("sh")({it =~ /ssh deployer@app-prod .*/})
35      }
36
37      def "Does NOT attempt to deploy non-MASTER branch PRODUCTION" () {
38          setup:
39              Jenkinsfile.getBinding().setVariable( "BRANCH_NAME", "develop" )
40          when:
41              Jenkinsfile.run()
42          then:
43              0 * getPipelineMock("sh")({it =~ /ssh deployer@app-prod .*/})
44      }
```

3rd Pipeline Test

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Jenkinsfile

```
def deploy( _env ) {

    def DEPLOY_COMMAND="""
    docker-compose pull && \
    docker-compose down && \
    docker-compose rm -f && \
    docker-compose up -d --force-recreate"""

    if( _env == "test" ) {
        sshagent(["test-ssh"]) {
            sh( "ssh deployer@app-test -c '${DEPLOY_COMMAND}'" )
        }
    } else if( _env == "production" ) {
        sshagent(["prod-ssh"]) {
            sh( "ssh deployer@app-prod -c '${DEPLOY_COMMAND}'" )
        }
    }
}
```

3rd Pipeline Test

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JenkinsfileSpec.groovy

```
46      def "deploy function deploys to TEST when asked" () {
47          when:
48              Jenkinsfile.deploy( "test" )
49          then:
50              1 * getPipelineMock("sshagent")(["test-ssh"], _ as Closure)
51              1 * getPipelineMock("sh")({it =~ /ssh deployer@app-test .*/})
52      }
53
54      def "deploy function deploys to PRODUCTION when asked" () {
55          when:
56              Jenkinsfile.deploy( "production" )
57          then:
58              1 * getPipelineMock("sshagent")(["prod-ssh"], _ as Closure)
59              1 * getPipelineMock("sh")({it =~ /ssh deployer@app-prod .*/})
60      }
```

Jenkinsfile Test Suite

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```
[INFO] --- maven-surefire-plugin:2.22.0:test (default-test) @ jenkinsfile-test-whole-pipeline ---
[INFO]
[INFO] -------------------------------------------------------
[INFO]  T E S T S
[INFO] -------------------------------------------------------
[INFO] Running JenkinsfileSpec
[INFO] Tests run: 5, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 6.492 s - in JenkinsfileSpec
[INFO]
[INFO] Results:
[INFO]
[INFO] Tests run: 5, Failures: 0, Errors: 0, Skipped: 0
```

Unit-Testing Helper Scripts

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What if the “deploy” function got very long and complicated?

We might want to put it in its own file.

Could we still test it?

Yes!

Unit-Testing Helper Scripts

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Project Layout

pom.xml

```
<testResources>
    <testResource>
        <includes>
            <include>Jenkinsfile</include>
            <include>*.groovy</include>
        </includes>
        <directory>${project.basedir}</directory>
    </testResource>
    <testResource>
        <directory>src/test/resources</directory>
    </testResource>
</testResources>
```

Unit-Testing Helper Scripts Deployer.groovy

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```groovy
def deploy( _env ) {

    def DEPLOY_COMMAND="""
    docker-compose pull && \
    docker-compose down && \
    docker-compose rm -f && \
    docker-compose up -d --force-recreate"""

    if( _env == "test" ) {
        sshagent(["test-ssh"]) {
            sh( "ssh deployer@app-test -c '${DEPLOY_COMMAND}'" )
        }
    } else if( _env == "production" ) {
        sshagent(["prod-ssh"]) {
            sh( "ssh deployer@app-prod -c '${DEPLOY_COMMAND}'" )
        }
    }
}

return this
```

Unit-Testing Helper Scripts DeployerSpec.groovy

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```groovy
import com.homeaway.devtools.jenkins.testing.JenkinsPipelineSpecification

public class DeployerSpec extends JenkinsPipelineSpecification {

    def Deployer = null

    def setup() {
        Deployer = loadPipelineScriptForTest("/Deployer.groovy")
    }

    def "deploy function deploys to TEST when asked" () {
        when:
            Deployer.deploy( "test" )
        then:
            1 * getPipelineMock("sshagent")(["test-ssh"], _ as Closure)
            1 * getPipelineMock("sh")({it =~ /ssh deployer@app-test .*/})
    }

    def "deploy function deploys to PRODUCTION when asked" () {
        when:
            Deployer.deploy( "production" )
        then:
            1 * getPipelineMock("sshagent")(["prod-ssh"], _ as Closure)
            1 * getPipelineMock("sh")({it =~ /ssh deployer@app-prod .*/})
    }
}
```

Unit-Testing Helper Scripts Jenkinsfile

HomeAway

```
1   def Deployer = null
2
3   node {
4       stage( "Checkout" ) {
5           checkout scm
6           Deployer = load( "Deployer.groovy" )
7       }
```

```
28      stage( "Deploy to TEST" ) {
29          Deployer.deploy( "test" )
30      }
```

Unit-Testing Helper Scripts JenkinsfileSpec.groovy

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```
def setup() {
    Jenkinsfile = loadPipelineScriptForTest("/Jenkinsfile")
    Jenkinsfile.getBinding().setVariable( "scm", null )
    explicitlyMockPipelineVariable("Deployer")
    getPipelineMock("load")("Deployer.groovy") >> {
        getPipelineMock("Deployer")
    }
}
```

Deployer is a pipeline *variable.*

Remember “def Deployer = null” at the top of the Jenkinsfile?

Deployer does **not** come from a plugin or from Jenkins.

We must explicitly mock it.

When a pipeline tries to load the Deployer.groovy file, **stub** that interaction to return our mock.

Unit-Testing Helper Scripts JenkinsfileSpec.groovy

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```
def "Attempts to deploy MASTER branch to PRODUCTION" () {
    setup:
        Jenkinsfile.getBinding().setVariable( "BRANCH_NAME", "master" )
    when:
        Jenkinsfile.run()
    then:
        1 * getPipelineMock("Deployer.deploy")({it =~ /production/})
}

def "Does NOT attempt to deploy non-MASTER branch PRODUCTION" () {
    setup:
        Jenkinsfile.getBinding().setVariable( "BRANCH_NAME", "develop" )
    when:
        Jenkinsfile.run()
    then:
        0 * getPipelineMock("Deployer.deploy")({it =~ /production/})
}
```

Method calls on mock Pipeline **variables** are each their own Spock mock.

Unit-Testing Helper Scripts

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```
[INFO] --- maven-surefire-plugin:2.22.0:test (default-test) @ jenkinsfile-test-helper-script ---
[INFO]
[INFO] -------------------------------------------------------
[INFO]  T E S T S
[INFO] -------------------------------------------------------
[INFO] Running DeployerSpec
[INFO] Tests run: 2, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 5.967 s - in DeployerSpec
[INFO] Running JenkinsfileSpec
[INFO] Tests run: 3, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 2.794 s - in JenkinsfileSpec
[INFO]
[INFO] Results:
[INFO]
[INFO] Tests run: 5, Failures: 0, Errors: 0, Skipped: 0
```

Unit-Testing Shared Libraries

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Helper Scripts are Pipeline Variables? You know what else has Pipeline Variables? Shared Libraries!

Can we unit-test those?

Yes!

Unit-Testing Shared Libraries

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For large-scale Jenkins installations, common pieces of pipeline code may be delivered through the **Pipeline Shared Groovy Libraries** plugin, from different git repositories than the project source.

This allows one central location to define the common parts of many projects' pipelines.

Simple Shared Library

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Jenkinsfile

```
1  @Library( "python-webapp-library" ) _
2
3  DefaultPipeline()
```

Simple Shared Library

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Project Layout

```
.
├── Makefile
├── README.md
├── resources
│   └── com
│       └── example
│           └── SlackMessageTemplate.txt
├── src
│   └── com
│       └── example
│           └── SharedLibraryConstants.groovy
└── vars
    ├── DefaultPipeline.groovy
    └── Deployer.groovy
```

Simple Shared Library

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SlackMessageTemplate.txt

```
1  Unit Tests for build ${BUILD_TAG} failed!
2
3  ${BUILD_URL}
```

SharedLibraryConstants.groovy

```
1  package com.example
2
3  public class SharedLibraryConstants {
4      public static final String DEPLOY_COMMAND = """
5      docker-compose pull && \
6      docker-compose down && \
7      docker-compose rm -f && \
8      docker-compose up -d --force-recreate"""
9  }
```

Simple Shared Library vars/Deployer.groovy

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```groovy
import com.example.SharedLibraryConstants

def call( _env ) {

    if( _env == "test" ) {
        sshagent(["test-ssh"]) {
            sh( "ssh deployer@app-test -c '${SharedLibraryConstants.DEPLOY_COMMAND}'" )
        }
    } else if( _env == "production" ) {
        sshagent(["prod-ssh"]) {
            sh( "ssh deployer@app-prod -c '${SharedLibraryConstants.DEPLOY_COMMAND}'" )
        }
    }
}

```

Simple Shared Library vars/DefaultPipeline.groovy

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```groovy
def call( Map _args ) {

    node {
        stage( "Checkout" ) { checkout scm }

        stage( "Build" ) { sh( "docker build --tag whole-pipeline ." ) }

        stage( "Test" ) {
            try {
                sh( "docker run --entrypoint python whole-pipeline -m unittest discover" )
            } catch( Exception e ) {
                def message = evaluate( '"""' +
                    libraryResource( "com/example/SlackMessageTemplate.txt" ) + '"""' )
                slackSend( color: 'error', message: message )
                throw e
            }
        }

        stage( "Push" ) { sh( "docker push whole-pipeline" ) }

        stage( "Deploy to TEST" ) { Deployer( "test" ) }

        if( BRANCH_NAME == "master" ) {
            stage( "Deploy to PRODUCTION" ) {
                Deployer( "production" )
            }
        }
    }
}
```

Simple Shared Library pom.xml

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Must include vars/* Groovy scripts as resources
    This is how Jenkins will see them (initially).
Must include the “resources” directory as resources.
    This is *definitely* how Jenkins will see *them.*

```
<testResources>
    <testResource>
        <includes>
            <include>vars/**/*.groovy</include>
        </includes>
        <directory>${project.basedir}</directory>
    </testResource>
    <testResource>
        <directory>test/resources</directory>
    </testResource>
    <testResource>
        <directory>resources</directory>
    </testResource>
</testResources>
```

Simple Shared Library pom.xml

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The pom must also *compile* groovy sources!

```
<plugin>
    <groupId>org.codehaus.gmavenplus</groupId>
    <artifactId>gmavenplus-plugin</artifactId>
    <version>${groovy.gmaven.pluginVersion}</version>
    <executions>
        <execution>
            <id>groovy</id>
            <goals>
                <goal>addSources</goal>
                <goal>addTestSources</goal>
                <goal>generateStubs</goal>
                <goal>generateTestStubs</goal>
                <goal>compile</goal>
                <goal>compileTests</goal>
                <goal>removeStubs</goal>
                <goal>removeTestStubs</goal>
            </goals>
            <configuration>
                <sources>
                    <source>
                        <directory>src</directory>
                        <includes>
                            <include>**/*.groovy</include>
                        </includes>
                    </source>
                </sources>
                <testSources>
                    <testSource>
                        <directory>test</directory>
                        <includes>
                            <include>**/*.groovy</include>
                        </includes>
                    </testSource>
                </testSources>
            </configuration>
        </execution>
    </executions>
</plugin>
```

Testing Shared Global Vars

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Two minor changes: Path & invocation. Done!

```groovy
import com.homeaway.devtools.jenkins.testing.JenkinsPipelineSpecification

public class DeployerSpec extends JenkinsPipelineSpecification {

    def Deployer = null

    def setup() {
        Deployer = loadPipelineScriptForTest("vars/Deployer.groovy")
    }

    def "deploy function deploys to TEST when asked" () {
        when:
            Deployer( "test" )
        then:
            1 * getPipelineMock("sshagent")(["test-ssh"], _ as Closure)
            1 * getPipelineMock("sh")({it =~ /ssh deployer@app-test .*/})
    }

    def "deploy function deploys to PRODUCTION when asked" () {
        when:
            Deployer( "production" )
        then:
            1 * getPipelineMock("sshagent")(["prod-ssh"], _ as Closure)
            1 * getPipelineMock("sh")({it =~ /ssh deployer@app-prod .*/})
    }
}
```

Testing Shared Pipelines

HomeAway

Setup: Change the path. Also, stub **libraryResource** since this pipeline uses it.

```
def setup() {
    DefaultPipeline = loadPipelineScriptForTest("vars/DefaultPipeline.groovy")
    DefaultPipeline.getBinding().setVariable( "scm", null )
    getPipelineMock("libraryResource")(_) >> {
        return "Dummy Message"
    }
}
```

It comes from a plugin, so we'll need a new <dependency> too:

```
<dependency>
    <!-- provides libraryResource() step -->
    <groupId>org.jenkins-ci.plugins.workflow</groupId>
    <artifactId>workflow-cps-global-lib</artifactId>
    <version>2.10</version>
    <scope>test</scope>
</dependency>
```

Testing Shared Pipelines

HomeAway

Global Library variables are .call()'d, so expect *that* instead of .deploy()

```
def "Attempts to deploy MASTER branch to PRODUCTION" () {
    setup:
        DefaultPipeline.getBinding().setVariable( "BRANCH_NAME", "master" )
    when:
        DefaultPipeline()
    then:
        1 * getPipelineMock("Deployer.call")("production")
}
```

Unit-Testing Shared Libraries

HomeAway

```
[INFO] --- maven-surefire-plugin:2.22.0:test (default-test) @ jenkinsfile-test-helper-script ---
[INFO]
[INFO] -------------------------------------------------------
[INFO]  T E S T S
[INFO] -------------------------------------------------------
[INFO] Running DefaultPipelineSpec
[INFO] Tests run: 3, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 8.07 s - in DefaultPipelineSpec
[INFO] Running DeployerSpec
[INFO] Tests run: 2, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 2.93 s - in DeployerSpec
[INFO]
[INFO] Results:
[INFO]
[INFO] Tests run: 5, Failures: 0, Errors: 0, Skipped: 0
```

Unit-Testing Pipeline Code

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Able to write unit-tests

1. In Groovy
2. With the Spock framework
3. With automatic mocks for pipeline step dependencies

For code in

1. Jenkinsfiles
2. Shared Libraries

Unit-Testing Pipeline Code

HomeAway

1. Unit-test your Jenkinsfile
2. Unit-test your shared libraries

Source: **github.com/HomeAway/jenkins-spock**

Slides: **bit.ly/2QHzRW9**

(photograph this slide)

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