Creating Java Applications

build passing (https://travis-ci.org/gradle-guides/creating-java-applications)

Table of Contents

This guide demonstrates how to create a Java project in the standard form using Gradle's Build Init plugin.

What you'll build

You'll generate a Java application with the standard layout.

What you'll need

- About 15 minutes
- A text editor
- A command prompt
- The Java Development Kit (JDK), version 1.7 or higher
- Any recent Gradle distribution

Check the user manual

Gradle comes with a built-in plugin called the Build Init plugin. It is documented in the Gradle User Manual at https://docs.gradle.org/current/userguide/build_init_plugin.html.

The plugin has one task, called `init`, that generates the project. The `init` task calls the (also built-in) `wrapper` task to create a Gradle wrapper script, `gradlew`.

To run the `init` task, you run the following from a command prompt:

```
$ gradle init --type <name>
```

where `name` is one of the following:

- `java-application`
- `java-library`
- `scala-library`
- `groovy-library`
- `basic`

This guide uses the `java-application` type.

The first step is to create a folder for the new project and change directory into it.

```
$ mkdir java-demo
$ cd java-demo
```

Run the init task

From inside the new project directory, run the `init` task with the `java-application` argument.

```
$ gradle init --type java-application
Starting a Gradle Daemon (subsequent builds will be faster)
:wrapper
:init

BUILD SUCCESSFUL
```

The `init` task runs the `wrapper` task first, which generates the `gradlew` and `gradlew.bat` wrapper scripts. Then it creates the new project with the following structure:

```
├── build.gradle
├── gradle      1
│   └── wrapper
│       ├── gradle-wrapper.jar
│       └── gradle-wrapper.properties
├── gradlew
├── gradlew.bat
├── settings.gradle
└── src
    ├── main
    │   └── java   2
    │       └── App.java
    └── test       3
        └── java
            └── AppTest.java
```

1 Generated folder for wrapper files

2 Default Java source folder

3 Default Java test folder

Review the generated project files

The `settings.gradle` file is heavily commented, but has only one active line:

GROOVY

```groovy
rootProject.name = 'java-demo'
```

This assigns the name of the root project to `java-demo`, which is the default.

The generated `build.gradle` file also has many comments. The active portion is reproduced here (note version numbers for the dependencies may be updated in later versions of Gradle):

Example 1. Generated build.gradle

GROOVY

```groovy
apply plugin: 'java'
apply plugin: 'application'

repositories {
    jcenter()   1
}

dependencies {
    compile 'com.google.guava:guava:20.0'   2
    testCompile 'junit:junit:4.12'          3
}

mainClassName = 'App'   4
```

1 public Bintray Artifactory repository

2 Google Guava library

3 JUnit testing library

4 Class with "main" method (used by Application plugin)

The build file adds the `java` and `application` plugins. The former support Java projects. The latter lets you designate one class as having a `main` method, which can be executed by the build from the command line. In the demo, the name of the `main` class is `App`.

The file `src/main/java/App.java` is shown here:

Example 2. The generated App.java class

JAVA

```java
public class App {
    public String getGreeting() {
        return "Hello world.";
    }

    public static void main(String[] args) {   1
        System.out.println(new App().getGreeting());
    }
}
```

1 Called by Application plugin "run" task

The test class, `src/test/java/AppTest.java` is shown next:

Example 3. The JUnit test, AppTest

```java
import org.junit.Test;
import static org.junit.Assert.*;

public class AppTest {
    @Test public void testAppHasAGreeting() {
        App classUnderTest = new App();
        assertNotNull("app should have a greeting",
                       classUnderTest.getGreeting());
    }
}
```

The generated test class has a single test annotated with JUnit's `@Test` annotation. The test instantiates the `App` class, invokes the `getGreeting` method, and checks that the returned value is not null.

Execute the build

To build the project, run the `build` command. You can use the regular `gradle` command, but when a project includes a wrapper script, it is considered good form to use it instead.

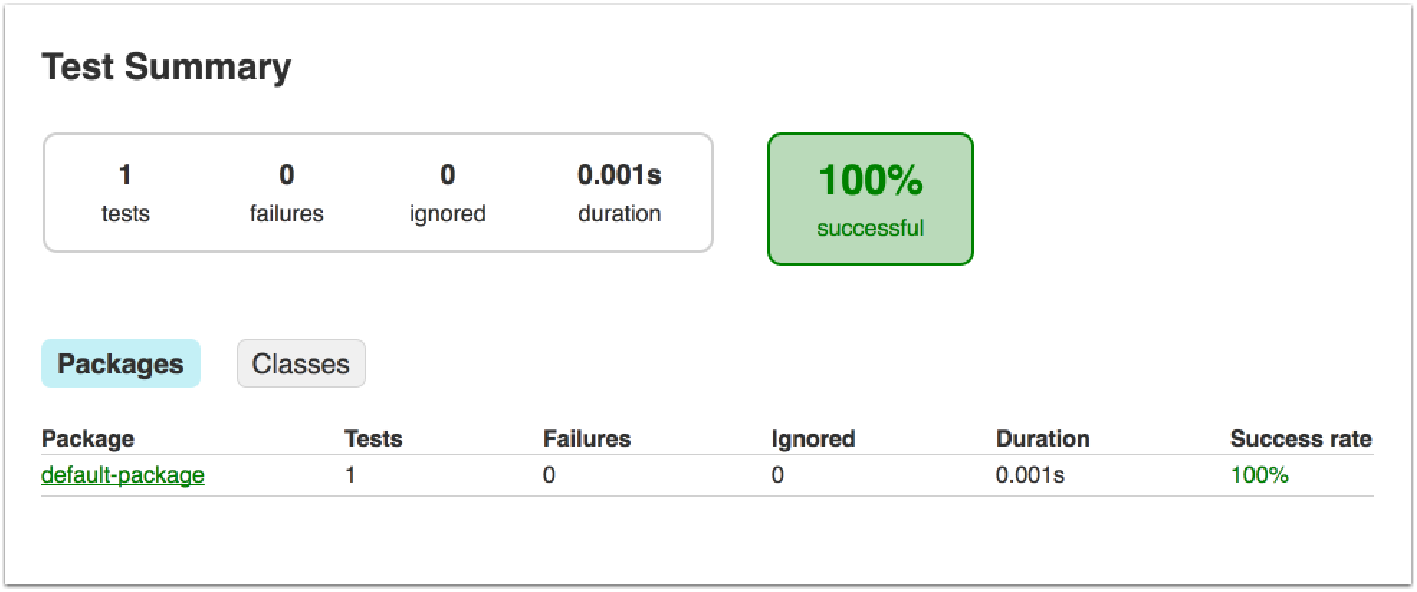
```
$ ./gradlew build
:compileJava
// Download of Guava if not already cached...
:processResources UP-TO-DATE
:classes
:jar
:startScripts
:distTar
:distZip
:assemble
:compileTestJava
// Download of JUnit if not already cached...
:processTestResources UP-TO-DATE
:testClasses
:test
:check
:build

BUILD SUCCESSFUL
```

The first time you run the wrapper script, `gradlew`, there may be a delay while that version of `gradle` is downloaded and stored locally in your `~/.gradle/wrapper/dists` folder.

The first time you run the build, Gradle will check whether or not you already have the Guava and JUnit libraries in your cache under your `~/.gradle` directory. If not, the libraries will be downloaded and stored there. The next time you run the build, the cached versions will be used. The `build` task compiles the classes, runs the tests, and generates a test report.

You can view the test report by opening the HTML output file, located at `build/reports/tests/test/index.html`.

A sample report is shown here:



Test Summary

1	0	0	0.001s	100%
tests	failures	ignored	duration	successful

Package	Tests	Failures	Ignored	Duration	Success rate
default-package	1	0	0	0.001s	100%

Run the application

Because the Gradle build used the Application plugin, you can run the application from the command line. First, use the `tasks` task to see what task has been added by the plugin.

```
$ ./gradlew tasks
:tasks

------------------------------------------------------------
All tasks runnable from root project
------------------------------------------------------------

Application tasks
-----------------
run - Runs this project as a JVM application

// ... many other tasks ...
```

The `run` task tells Gradle to execute the `main` method in the class assigned to the `mainClassName` property.

```
$ ./gradlew run
:compileJava UP-TO-DATE
:processResources UP-TO-DATE
:classes UP-TO-DATE
:run
Hello world.

BUILD SUCCESSFUL
```

Summary

You now have a new Java project that you generated using Gradle's build init plugin. In the process, you saw:

- How to generate a Java application
- How the generated build file and sample Java files are structured
- How to run the build and view the test report
- How to execute a Java application using the `run` task from the Application plugin

Last updated 2017-02-22 09:46:06 UTC