

Understanding Gradle for Android

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Schedule

- The build file
- Groovy basics
- Back to the build file
- Custom tasks
- Tasks for Android
- Tips and tricks

The build file

The build file

```
apply plugin: 'com.android.application'
```

```
android {  
    compileSdkVersion 24  
    buildToolsVersion "24.2.0"  
    defaultConfig {  
        applicationId "com.muchgradle"  
    }  
}
```

```
dependencies {  
    compile 'com.android.support:appcompat-v7:24.2.0'  
}
```

Groovy basics

To get Gradle, you need to get Groovy

Verbosity

```
System.out.println("Hello, Java");
```

```
println("Hello, Java");
```

```
println("Hello, Java")
```

```
println "Hello, Java"
```

```
println 'Hello, Groovy'
```

Dynamic typing

```
String name = "Andy"
```

```
def name = 'Andy'
```

String interpolation

```
def name = 'Andy'
```

```
def greeting = "Hello, $name"
```

```
def name_size = "Your name is ${name.size()} characters long"
```


Methods

```
public int square(int num) {  
    return num * num;  
}
```

```
square(2);
```

```
def square(def num) {  
    num * num  
}
```

```
square 4
```

Closures

```
def square = { num ->  
  num * num  
}
```

```
square 8
```

```
Closure square = {  
  it * it  
}
```

```
square 16
```

Closures

```
void runClosure(Closure closure) {  
    closure()  
}
```

```
runClosure({ println 'Yo!' })
```

```
runClosure() { println 'Yo!' }
```

```
runClosure { println 'Yo!' }
```

Lists

```
List list = [1, 2, 3, 4, 5]
```

```
list.each { element ->  
  println element  
}
```

```
list.each { println it }
```

Maps

```
Map map = [one:1, two:2, three:3]
```

```
map.get('one')
```

```
map['two']
```

```
map.three
```

Maps

```
void print(Map args, String message) {  
    println args  
    println message  
}
```

```
print(one:1, two:2, three:3, 'hello')
```

The build file

Back to the build file

```
apply plugin: 'com.android.application'
```

```
android {  
    compileSdkVersion 24  
    buildToolsVersion "24.2.0"  
    defaultConfig {  
        applicationId "com.muchgradle"  
    }  
}
```

```
dependencies {  
    compile 'com.android.support:appcompat-v7:24.2.0'  
}
```


Back to the build file

```
apply plugin: 'com.android.application'
```

```
project.apply([plugin: 'com.android.application']);
```

Back to the build file

```
dependencies {  
    compile 'com.android.support:appcompat-v7:24.2.0'  
}  
  
project.dependencies({  
    add('compile', 'com.android.support:appcompat-v7:24.2.0', {  
        // Configuration statements  
    });  
});
```

Back to the build file

```
android {  
    compileSdkVersion 24  
    buildToolsVersion "24.2.0"  
    defaultConfig {  
        applicationId "com.muchgradle"  
    }  
}
```

Android plugin:

<https://developer.android.com/tools/building/plugin-for-gradle.html>

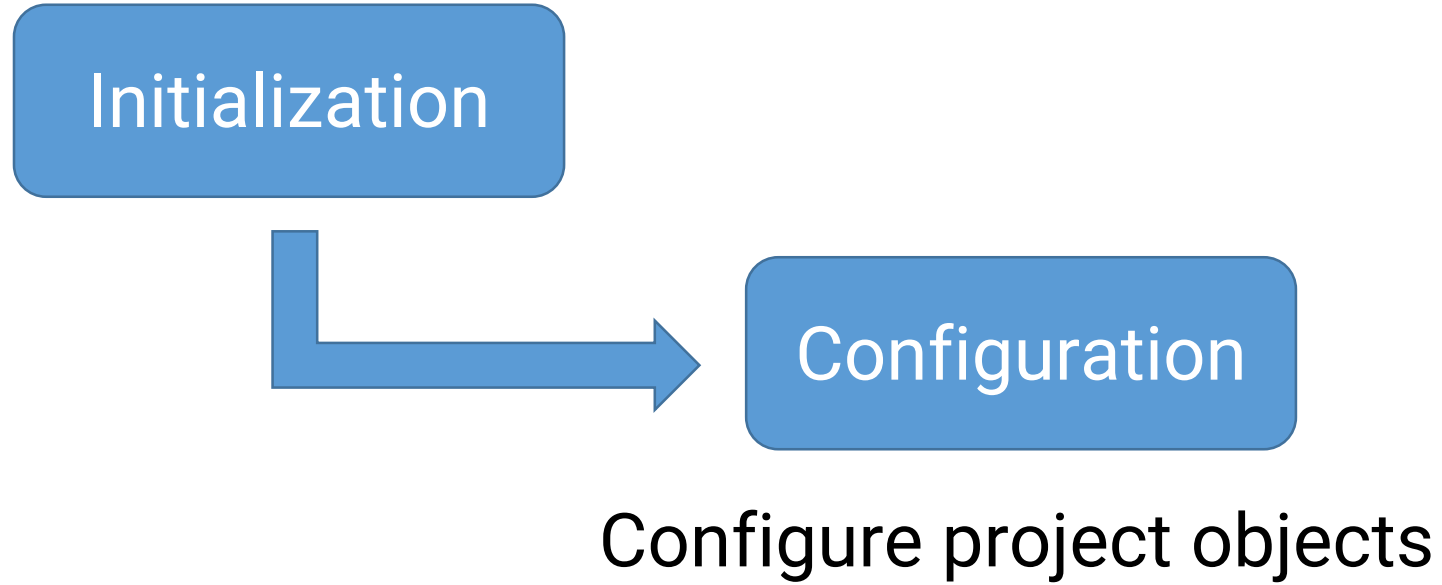
Custom tasks

Gradle build lifecycle

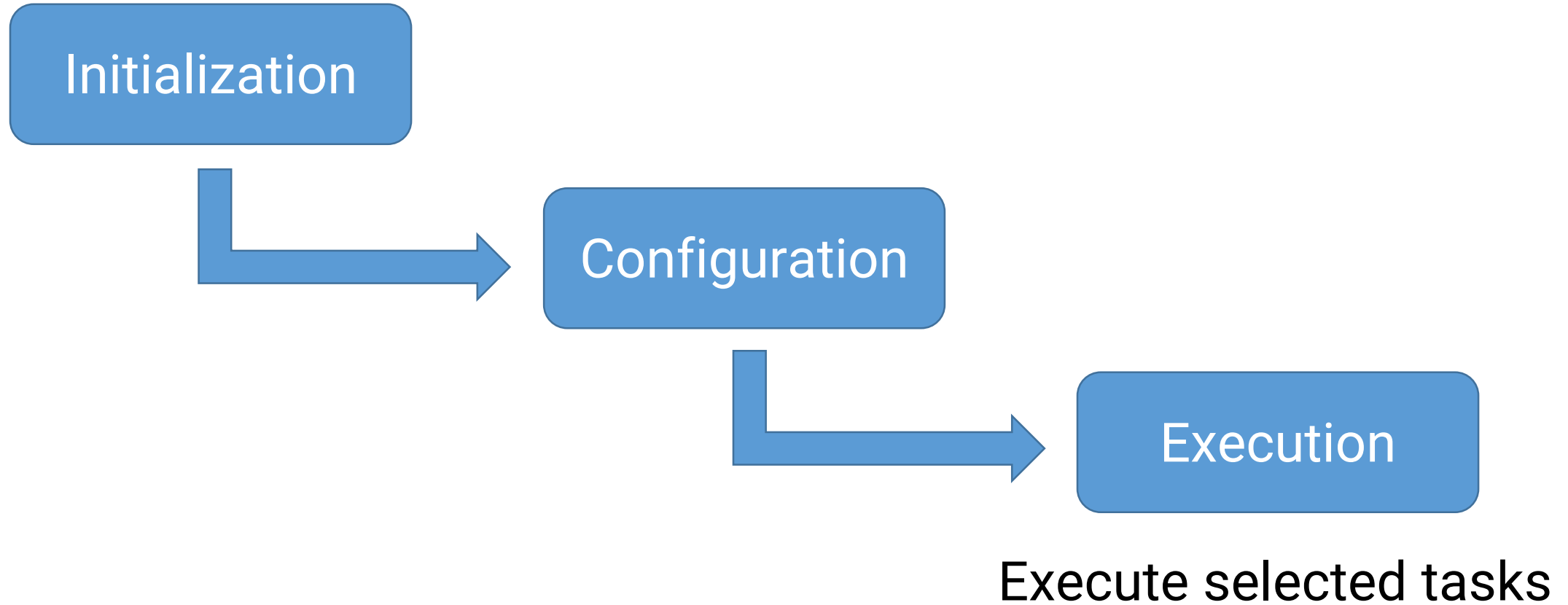
Initialization

Discover all modules

Gradle build lifecycle



Gradle build lifecycle



Defining a task

```
task hello {  
    doLast {  
        println 'Hello, world!'  
    }  
}
```

```
task hello << {  
    println 'Hello, world!'  
}
```


Defining a task

```
task hello {  
    println 'Configuration'  
  
    doLast {  
        println 'Goodbye'  
    }  
  
    doFirst {  
        println 'Hello'  
    }  
}
```

Ordering task actions

```
task hello {  
    doFirst { println 'Not really first' }  
    doFirst { println 'First' }  
    doLast { println 'Not really last' }  
    doLast { println 'Last' }  
}
```

Ordering tasks (1)

```
task task1 << {  
    println 'Task 1'  
}
```

```
task task2 << {  
    println 'Task 2'  
}
```

```
task2.mustRunAfter task1
```

```
> gradlew task2 task1
```

```
task1  
task2
```

Ordering tasks (2)

```
task task1 << {  
    println 'Task 1'  
}
```

```
task task2 << {  
    println 'Task 2'  
}
```

```
task2.dependsOn task1
```

```
> gradlew task2
```

```
task1  
task2
```

Android tasks

Hooking into the Android plugin

```
android.applicationVariants.all { variant ->
    println variant
}
```

Hooking into the Android plugin

```
task hello << {  
    println 'Hello'  
}
```

```
android.applicationVariants.all { variant ->  
    variant.assemble.dependsOn hello  
}
```

Automatically renaming APKs

```
android.applicationVariants.all { variant ->
    variant.outputs.each { output ->
        def file = output.outputFile

        output.outputFile = new File(file.parent,
            file.name.replace(".apk", "${variant.versionName}.apk"))
    }
}
```


Tips and tricks

The Gradle Wrapper

- It's there by default
- It's everywhere
- It's always the right version
- You can use different versions of Gradle for different projects

Speeding up the build

- Use the latest version of Gradle

```
distributionUrl=https\://services.gradle.org/distributions/  
gradle-2.8-all.zip
```

Speeding up the build

- Use the latest version of Gradle
- Change your Gradle properties

```
org.gradle.parallel=true  
org.gradle.daemon=true  
org.gradle.jvmargs=-Xms256m -Xmx1024m
```

Speeding up the build

- Use the latest version of Gradle
- Change your Gradle properties
- Build modules separately

```
gradlew :app:build :moduledirectoryname:build
```

Speeding up the build

- Use the latest version of Gradle
- Change your Gradle properties
- Build modules separately
- Exclude modules from the build

```
gradlew assemble -x :libraryproject:assemble
```

Speeding up the build

- Use the latest version of Gradle
- Change your Gradle properties
- Build modules separately
- Exclude modules from the build
- Do some profiling

```
gradlew task --profile
```

Optimizing the APK

- ProGuard

```
android {  
    buildTypes {  
        release {  
            minifyEnabled true  
            proguardFiles getDefaultProguardFile  
                ('proguard-android.txt'), 'proguard-rules.pro'  
            ...  
        }  
    }  
}
```


Optimizing the APK

- ProGuard
- Automatic resource shrinking

```
android {  
    buildTypes {  
        release {  
            minifyEnabled true  
            shrinkResources true  
            ...  
        }  
    }  
}
```

Optimizing the APK

- ProGuard
- Automatic resource shrinking
- Manual resource shrinking

```
android {  
    defaultConfig {  
        resConfigs "en", "da", "nl"  
    }  
}
```

Optimizing the APK

- ProGuard
- Automatic resource shrinking
- Manual resource shrinking

```
android {  
    defaultConfig {  
        resConfigs "hdpi", "xhdpi", "xxhdpi", "xxxhdpi"  
    }  
}
```

Resources

Resources

- Groovy SDK

- <http://www.groovy-lang.org/download.html>

- Gradle DSL

- <https://docs.gradle.org/current/dsl/>

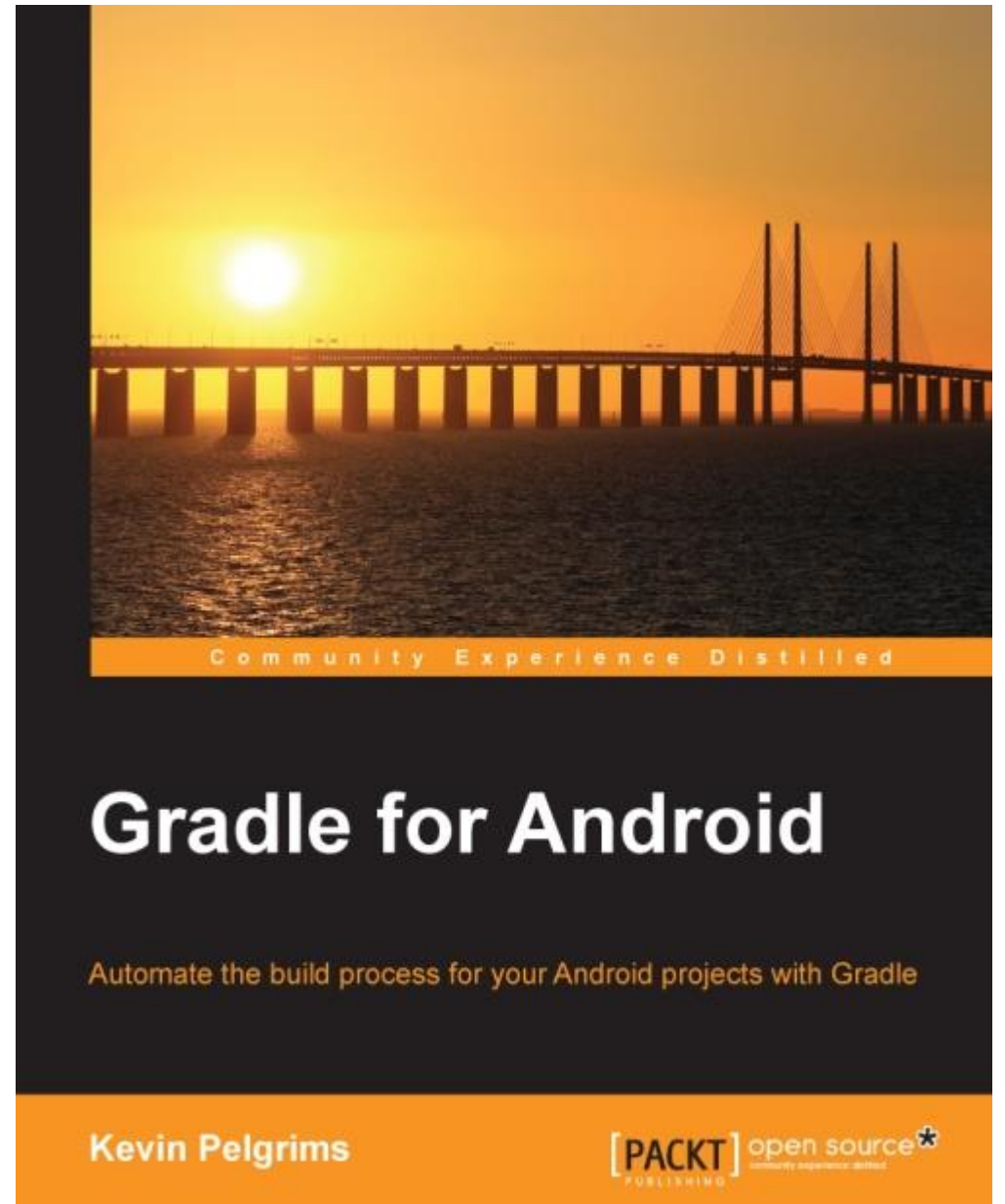
- Android plugin documentation

- <https://developer.android.com/tools/building/plugin-for-gradle.html>

Resources

I wrote a book!

[https://www.packtpub.com/
application-development/gradle-
android](https://www.packtpub.com/application-development/gradle-android)



Understanding Gradle for Android

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