

GRADLE

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一、基本概念

起源

- 创世之初（1977），只有Make ===> GNU Make、BSD make、Microsoft nMake 等



Ant + Ivy (2000)



Maven (2004)



Gradle (2012)

- Gradle follows the concept of convention over configuration

安装&配置

- Gradle_home : D:\java\ast\androidstudio\gradle\gradle-2.14.1
- Android_home: D:\java\ast\sdk
- Java_home: D:\java\jdk8

```
jd5737@jd5737-pc MINGW64 /e/Java/Workspace/HelloGradle/android (master)
$ gradle --version

-----
Gradle 2.14.1
-----

Build time: 2016-07-18 06:38:37 UTC
Revision: d9e2113d9fb05a5caabba61798bdb8dfdc83719

Groovy: 2.4.4
Ant: Apache Ant(TM) version 1.9.6 compiled on June 29 2015
JVM: 1.8.0_91 (Oracle Corporation 25.91-b15)
OS: Windows 7 6.1 amd64
```

最小配置

```
jd5737@jd5737-pc MINGW64 /e/Java/Workspace/HelloGradle/android (master)
$ ls
build.gradle  local.properties  src/
```

- 最简单的build.gradle
- 由3个部分组成：

```
buildscript {
    repositories {
        jcenter()
    }
    dependencies {
        classpath 'com.android.tools.build:gradle:2.1.3'
    }
}
apply plugin: 'com.android.application'
android {
    compileSdkVersion 23
    buildToolsVersion "23.1.0"
}
```

基本命令

- gradle tasks

```
jd5737@jd5737-pc MINGW64 /e/Java/Workspace/HelloGradle/android (master)
$ gradle tasks
Incremental java compilation is an incubating feature.
:tasks

-----
All tasks runnable from root project

-----
Android tasks

-----
androidDependencies - Displays the Android dependencies for this project.
signingReport - Displays the signing info for each variant.
sourceSets - Prints out all the source sets defined.

Build tasks

-----
assemble - Assembles all variants of all application components.
assembleAndroidTest - Assembles all the Test application components.
assembleDebug - Assembles all Debug builds.
assembleRelease - Assembles all Release builds.
```

- gradle sourcesets

```
jd5737@jd5737-pc MINGW64 /e/Java/Workspace/HelloGradle/android (master)
$ gradle sourceSets
Incremental java compilation is an incubating feature.
:sourceSets

-----
Root project

-----
androidTest

-----
Compile configuration: androidTestCompile
build.gradle name: android.sourceSets.androidTest
Java sources: [src\androidTest\java]
Manifest file: src\androidTest\AndroidManifest.xml
Android resources: [src\androidTest\res]
Assets: [src\androidTest\assets]
AIDL sources: [src\androidTest\aidl]
```

基本命令

- `gradle init`:
- 提供`build.gradle`等模板
- `gradle wrapper`:
- 自动安装并保证安装正确的版本

```
jd5737@jd5737-pc MINGW64 /e/tmp/gradletest
$ gradle init
:wrapper
:init

BUILD SUCCESSFUL
Total time: 1.649 secs

jd5737@jd5737-pc MINGW64 /e/tmp/gradletest
$ ls
gradle/ gradlew* gradlew.bat

jd5737@jd5737-pc MINGW64 /e/tmp/gradletest
$ gradle init
:wrapper
:init

BUILD SUCCESSFUL
Total time: 1.867 secs
```

基本命令

- Gradle assemble/assembleDebug/assembleRelease
- Gradle lint/check
- Gradle build = assemble + check + ...
- Gradle clean
- Gradle installDebug/installDebugAndroidTest
- Gradle uninstallDebug/uninstallAll
- 在Android5.0+上有问题，可以使用Adb install path/to/apk/*.apk

IDE 设置

- **File > project structure > project**
- Android plugin for gradle version: top-level build.Gradle

```
buildscript {  
    ...  
    dependencies {  
        classpath  
        'com.android.tools.build:gradle:2.2.0'  
    }  
}
```

- Gradle version: gradle/wrapper/gradle-wrapper.Properties

```
distributionUrl = https\://services.gradle.org/distributions/gradle-2.10-all.zip
```

二、常用配置

常用配置

- Manifest entries
- Dependencies: libraries、repositories、projects
- Build types
- Build type + product flavor = build variant
- BuildConfig
- Signing configurations
- ProGuard
- Lint support、test、java language level ...

1.Manifest Entries

```
defaultconfig {  
    applicationid "com.arcsoft.hellogradle.test"  
    minSdkVersion 14  
    targetSdkVersion 23  
    versionCode 1  
    versionName "1.0"  
}
```

2. Dependencies

- 1.Lib directory:

```
dependencies {  
    compile fileTree(dir: 'libs', include: ['*.jar'])  
}
```

- 2. Repositories:

```
repositories { jcenter() }  
dependencies {  
    compile 'com.google.guava:guava:18.0'  
}
```

- 3.Library projects:

```
include ':app', ':libraries:lib1'  
dependencies {  
    compile project(':libraries:lib1')  
}
```

3. Build Types

```
android {  
    buildTypes {  
        debug {  
            applicationIdSuffix ".debug"  
        }  
  
        debug_ant {  
            initWith(buildTypes.debug)  
            applicationIdSuffix ".ant"  
        }  
    }  
}
```

AndroidTest

main

Debug

Release

debug_ant

test

testDebug

testRelease

testDebug_ant

4. Product Flavor

```
android {  
    ...  
  
    productFlavors {  
        flavor_maven {  
            ...  
        }  
    }  
}
```

AndroidTest	
AndroidTestFlavor_maven	
main	test
Debug	testDebug
Release	testRelease
debug_ant	testDebug_ant
Flavor_maven	testFlavor_maven
Flavor_mavenDebug	testFlavor_mavenDebug
Flavor_mavenRelease	testFlavor_mavenRelease
Flavor_mavenDebug_ant	testFlavor_mavenDebug_ant

5. BUILD CONFIG

```
flavor_gradle {  
    applicationId "com.arcsoft.gradle"  
    buildConfigField "int", "show_gradle", "1"  
}
```

In MainActivity.java

```
if (BuildConfig.SHOW_GRADLE == 1) {  
    ...  
}
```

1. boolean DEBUG – if the build is debuggable
2. int VERSION_CODE
3. String VERSION_NAME
4. String APPLICATION_ID
5. String BUILD_TYPE – name of the build type, e.g. "release"
6. String FLAVOR – name of the flavor, e.g. "flavor_gradle"

References

- <https://docs.gradle.org/current/userguide/userguide>
- <http://tools.android.com/tech-docs/new-build-system/user-guide>
- <https://technologyconversations.com/2014/06/18/build-tools/>
- <https://code.google.com/p/android/issues/detail?id=180674>
- <https://developer.android.com/studio/releases/gradle-plugin.html#revisions>
- <https://developer.android.com/studio/build/building-cmdline.html>
- <http://google.github.io/android-gradle-dsl/current/>