Enter The Gradle

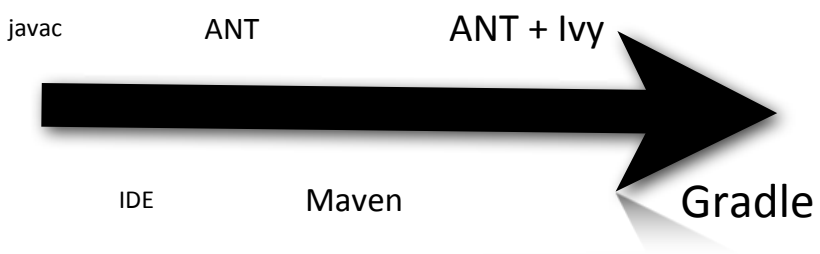
Ken Sipe - @kensipe

www.11.jdd.org.pl

About Speaker

http://kensipe.blogspot.com/
http://del.icio.us/kensipe
twitter: @kensipe
ken.sipe@gmail.com

Developer: Embedded, C++, Java, Groovy, Grails, C#, Objective C
Speaker: **JavaOne 2009 Rock Star**, NFJS, JAX
Microsoft MCP
Sun Certified Java 2 Architect
Master of Scrums
Agile Coach
Instructor: VisiBroker CORBA
Rational Rose, OOAD


javac
ANT
ANT + Ivy
IDE
Maven
Gradle

What is Gradle?

- Build **DSL** written in Groovy
- Built on top of **Ant + Ivy**
- Apache 2 License
- Uses Groovy AntBuilder
  - ant.compile, ant.jar
- Plugins define common tasks to build different types of projects
  - java, groovy, war, …

Gradle is Declarative

Specify **what**...

...not **how**

Gradle Benefits

- Convention over Config
  - project layout is maven
- Flexible
  - Many artifacts per project
- Incremental Builds
- Rich Object Model
- Groovy

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  - project layout is maven
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  - Many artifacts per project
- Incremental Builds
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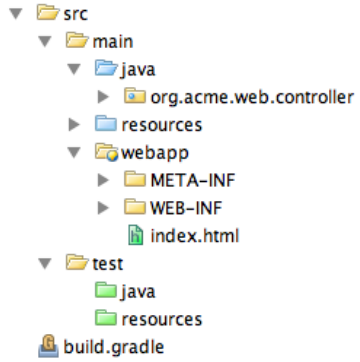
- Groovy (NOT XML)

Getting Started

- Project Name
  - Project Directory
- Project Structure
  - Maven Style
- Build.gradle



User Tasks

Create a task


```
task hello
```

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

task intro(dependsOn: hello) << {
    println "I'm Gradle"
}
```

```
project.tasks.add('someTask').doFirst {
  // do something
}
```

DSL Syntax And Tasks


```
task hello << { println 'Hello' }
// direct API access is fine for single statements
hello.dependsOn otherTask
// for multiple access we prefer closure syntax
hello {
  onlyIf { day == 'monday' }
  dependsOn otherTask
}
// combining Configuration and Actions
task hello {
  onlyIf {
      day == 'monday'
  }
  doFirst {println 'Hello'}
}
```

Task Types


```
task wrapper(type: Wrapper) {
    gradleVersion = '1.0-milestone-3'
}
```

Applying Plugins

- Any gradle script can be a plugin.
- Binary plugins must be in the build script classpath
  - can have id's (meta properties in the jar).

```
apply from: 'otherScript.gradle'
apply from: 'http://mycomp.com/otherScript.gradle'
```

```
apply plugin: org.gradle.api.plugins.JavaPlugin
apply plugin: 'java'
```

Standard Gradle Plugins

Plugin-Id	applies
base	
java-base	base
groovy-base	java-base
groovy	groovy-base
scala-base	java-base
scala	scala-base
war	java
osgi	
code-quality	
maven	
eclipse	

Sample Simple Build File


```
apply plugin:'war'
version = 0.1

repositories {
    mavenCentral()
}

dependencies {
    compile "commons-lang:commons-lang:2.4"
}
```

Demo

simple java project, tasks, github

Beyond the Basics

Free yourself from the **XML**

Non Declarative


```
version = "1.0-${new Date().format('yyyyMMdd')}"
```

Extensible Object Model


```
tasks.withType(Jar).allObjects { jarTask ->
  jarTask.osgi = new DefaultOsgiManifest()
  jarTask.doFirst { task ->
    importOsgiManifestIntoManifest(task) }
}
```

Rich and Extensible API


```
tasks.withType(Jar).allObjects { jarTask ->
   jarTask.manifest.mainAttributes(Provider: "CodeMentor Inc.")
}
```

Rich and Extensible API


```
configure(nonWebProjects()) {
  jar.manifest.attributes
     Implementor: 'Code Mentor'
}

def nonWebProjects() {
  subprojects.findAll {project ->
    !project.name.startsWith('web')
  }
}
```

Jump Between Phases


```
task release(dependsOn: assemble) << {
    println 'We release now'
}

build.taskGraph.whenReady { taskGraph ->
    if (taskGraph.hasTask(':release')) {
        version = '1.0'
    } else {
        version = '1.0-SNAPSHOT'
    }
}
```

Gradle Dependencies

Runtime Dependencies


```
dependencies {
     runtime group: 'org.springframework', name: 'spring-core', version: '2.5'
     runtime 'org.springframework:spring-core:2.5', 'org.springframework:spring-aop:2.5
}
```

Separate Classpaths


```
dependencies {
        compile 'org.springframework:spring-webmvc:3.0.0.RELEASE'

        testCompile 'org.springframework:spring-test:3.0.0.RELEASE'
        testCompile 'junit:junit:4.7'
}
```

Transitive

Options 1: Everything

```
configurations.compile.transitive = true

dependencies {
        compile 'org.springframework:spring-webmvc:3.0.0.RC2'

        testCompile 'org.springframework:spring-test:3.0.0.RC2'
        testCompile 'junit:junit:4.7'
}
```

Options 2: Selective

```
runtime('org.hibernate:hibernate:3.0.5') {
    transitive = true
}
runtime group: 'org.hibernate', name: 'hibernate', version: '3.0.5', transitive: true
runtime(group: 'org.hibernate', name: 'hibernate', version: '3.0.5') {
    transitive = true
}
```

File Dependencies


```
dependencies {
    runtime files('libs/a.jar', 'libs/b.jar') runtime
    fileTree(dir: 'libs', includes: ['*.jar'])
}
```

Naming Dependencies


```
List groovy = ["org.codehaus.groovy:groovy-all:1.5.4@jar",
"commons-cli:commons-cli:1.0@jar",
"org.apache.ant:ant:1.7.0@jar"]
List hibernate = ['org.hibernate:hibernate:3.0.5@jar',
'somegroup:someorg:1.0@jar']

dependencies {
    runtime groovy, hibernate
}
```

Maven Repos


```
repositories {
    mavenCentral()
}
```

Or

```
repositories {
     mavenCentral name: 'single-jar-repo',
          urls: "http://repo.mycompany.com/jars"
     mavenCentral name: 'multi-jar-repos',
          urls: ["http://repo.mycompany.com/jars1", "http://repo.mycompany.com/jars1"]
}
```

Or

```
repositories {
    mavenRepo urls: "http://repo.mycompany.com/maven2"
}
```

Flat File Repo


```
repositories {
    flatDir name: 'localRepository',
    dirs: 'lib' flatDir dirs: ['lib1', 'lib2']
}
```

Demo

Jetty WAR Project, Wrapper

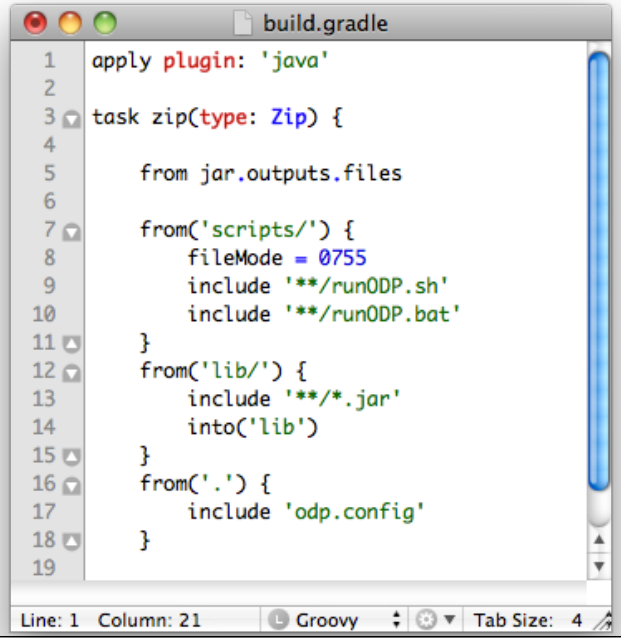
Common Interests

Bootstrap Gradle

- Jars can be added to the buildscript classpath
  - Custom build logic
  - Plugins
  - Helper classes (e.g. commons-math)

```
buildscript {
  repositories { mavenCentral() }
  dependencies {
    classpath "commons-lang:commons-lang:3.1"
    classpath files('lib/foo.jar')
  }
}
```

Implicit Depends



Test Task Example


```
test {
  jvmArgs: ["-Xmx512M"]
  include "**/tests/special/**/*Test.class"
  exclude "**/Old*Test.class"
  forkEvery = 30
  maxParallelForks = guessMaxForks()
}

def guessMaxForks() {
    int processors =
       Runtime.runtime.availableProcessors()
    return Math.max(2, (int) (processors / 2))
}
```

Disables Auto Detection

Ant Tasks

- Gradle provides an instance of the Groovy AntBuilder

```
ant.delete dir: 'someDir'
ant {
  ftp(server: "ftp.comp.org", userid: 'me', ...) {
    fileset(dir: "htdocs/manual") {
      include name: "**/*.html"
    }
    // high end
    myFileTree.addToAntBuilder(ant, 'fileset')
  }
  mkdir dir: 'someDir'
}
```

Importing Ant Builds

build.xml

```
<project>
  <target name="hello" depends="intro">
    <echo>Hello, from Ant</echo>
  </target>
</project>
```

build.gradle

```
ant.importBuild 'build.xml'
hello.doFirst { println 'Here comes Ant' }
task intro << { println 'Hello, from Gradle'}
```

```
>gradle hello
Hello, from Gradle
Here comes Ant
[ant:echo] Hello, from Ant
```

Integration with Maven

- Integration with Maven repositories
  - autogeneration of pom.xml
  - install to local Maven repo
  - deploy to any remote Repo
  - full maven metadata generation
- Integration of Maven builds in the future

Mulit-Project

Configuration Injection

- **ultimateApp**
  - api
  - webservice
  - shared

```
subprojects {
    apply plugin: 'java'
    dependencies {
        compile "commons-lang:commons-lang:3.1"
        testCompile "junit:junit:4.4"
    }
    test {
        jvmArgs: ['Xmx512M']
    }
}
```

Project Dependencies

- ultimateApp
  - **– api**
  - – webservice
  - – shared

```
dependencies {
  compile "commons-lang:commons-lang:3.1",
    project(':shared')
}
```

First Class Citizen

Settings File

- `settings.gradle`
  - location defines root
- root project is implicitly included

```
include 'project1','project2','project2:child1'

// Everything is configurable
rootProject.name = 'main'
project(':project1').projectDir = '/myLocation'
project(':project1').buildFileName =
  'project1.gradle'
```

Demo

Multi-Project

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Carrier
A United Technologies Company

Qi4j

ORBITZ

LinkedIn

GRIFFON

software AG

Farm Credit Canada

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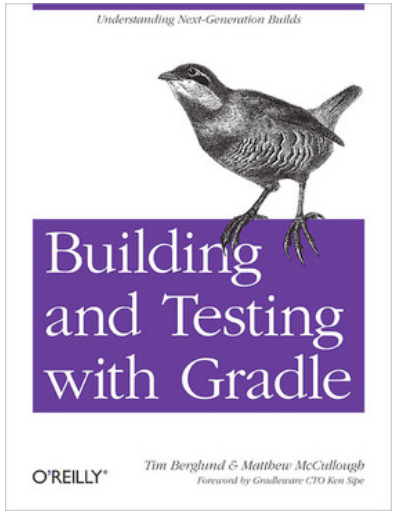
Gradle Book



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- Resources
  - http://forums.gradle.org
  - http://gradleware.com
  - Road Map
    - http://www.gradle.org/roadmap

Q&A

- Gradle: The Groovy Way to Build

- Ken Sipe
  - ken.sipe@gmail.com
  - kensipe.blogspot.com
  - twitter: @kensipe