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Gradle Training

March 2016

People matter, results count.

Ground Rules for Face-to-face Classrooms

Everyone participates	Respect individual opinions and diversities
Be open and honest	Give headlines, be concise
One speaker at a time	Make language a non-issue
Stick to time contracts	Seek first to understand, and then to be understood
Clean desk / room policy	No mobile phone, No computer (except for surveys, polls etc)
Clients & Leadership are often around, please remember that	Maintain a spirit of fun and enthusiasm

Ground Rules for Virtual Classrooms

Participate actively in each session

- Share experiences and best practices
- Bring up challenges, ask questions
- Discuss successes
- Respond to whiteboards, polls, quizzes, chat boxes
- Hang up if you need to take an urgent phone call, don't put this call on hold

Communicate professionally with others

- Mute when you're not speaking
- Wait for others to finish speaking before you speak
- Each time you speak, state your name
- Build on others' ideas and thoughts
- Disagreeing is OK –with respect and courtesy

Be on time for each virtual session

As a best practice…be just a few minutes early!

Module at a Glance

SME to provide the details required in the table.

Target Audience:	
Course Level:	*Basic*
Duration (in hours):	30 mins
Pre-requisites, if any:	NA
Post-requisites, if any:	*Submit Session Feedback*
Relevant Certifications:	None

Introductions (for Virtual Classrooms)

SME to provide the photos and names of the facilitators.

Business Photo

Business Photo

Facilitator
Name
Role

Moderator
Name
Role

Agenda

1	Gradle Fundamentals
2	Basic Gradle Tasks
3	Task Dependencies
4	Building a Java Project
5	Dependencies
6	Testing
7	Gradle Wrapper

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Module Objectives

What you will learn

At the end of this module, you will learn:

- What is Gradle

What you will be able to do

At the end of this module, you be able to:

- Understand what is Gradle

- List the Basic Gradle Tasks

- State the Task Dependencies

- Describe how to build a Java Project

- Understand Testing in Gradle

- Explain what is a Gradle Wrapper

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Gradle Fundamentals

What Is Gradle?

Build by convention

Groovy DSL

Supports dependencies Ivy and Maven

Supports multi-project builds

Easily customizable

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What Is Gradle? (contd.)

Declarative Build Language

- Expresses Intent
- Maintainable

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Ant

XML Build Script

- Hard to read
- Difficult to maintain

Maven

XML Build Script

- Same issues as Ant, but:

Supports dependencies

Something of a standard

Installing Gradle

From the web site

- http://gradle.org

Using gvm

- Groovy enVironmentManager
- http://gvmtool.net/

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Groovy Environment Manager

Get from gvmtool.net

Download with:

- curl -s get.gvmtool.net | bash

Add to the path

Install Gradle

- gvminstall gradle

Groovy Environment Manager (contd.)

Gradle has a build file.

- Typically build.gradle

This contains tasks:

- And plugins
- And dependencies
- But mostly tasks

Basic Gradle Tasks

Objectives

Defining and Using Tasks

Task Domain Specific Language (DSL)

Task lifecycle

Gradle properties

What Is a Task?

Code that Gradle executes:

- Has a lifecycle
- Has properties
- Has 'actions'
- Has dependencies

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Build Phases

Initialization Phase → Configuration Phase → Execution Phase

Used to configure multi project builds	Executes code in the task that's not the action
	
	Task myTask {
	  description "myTask configuration"
	}
		Execute the task actions
		
		Task myTask {
		  doFirst
		  doLast
		}

Task Dependencies
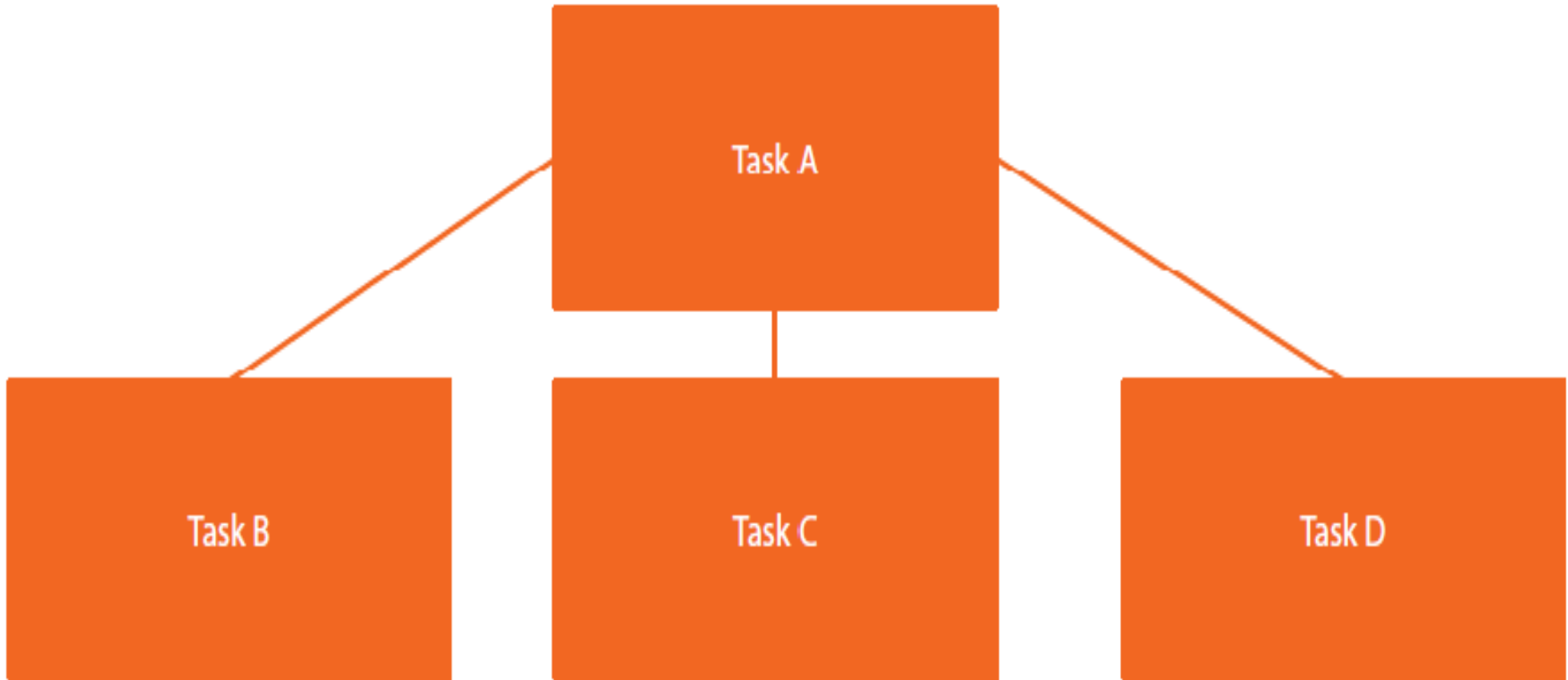
Task Dependencies

Objectives

Understand how tasks can be linked

What Is a Task?

Code that Gradle executes:

- Has a lifecycle
- Has properties
- Has 'actions'
- Has dependencies

Task Dependencies
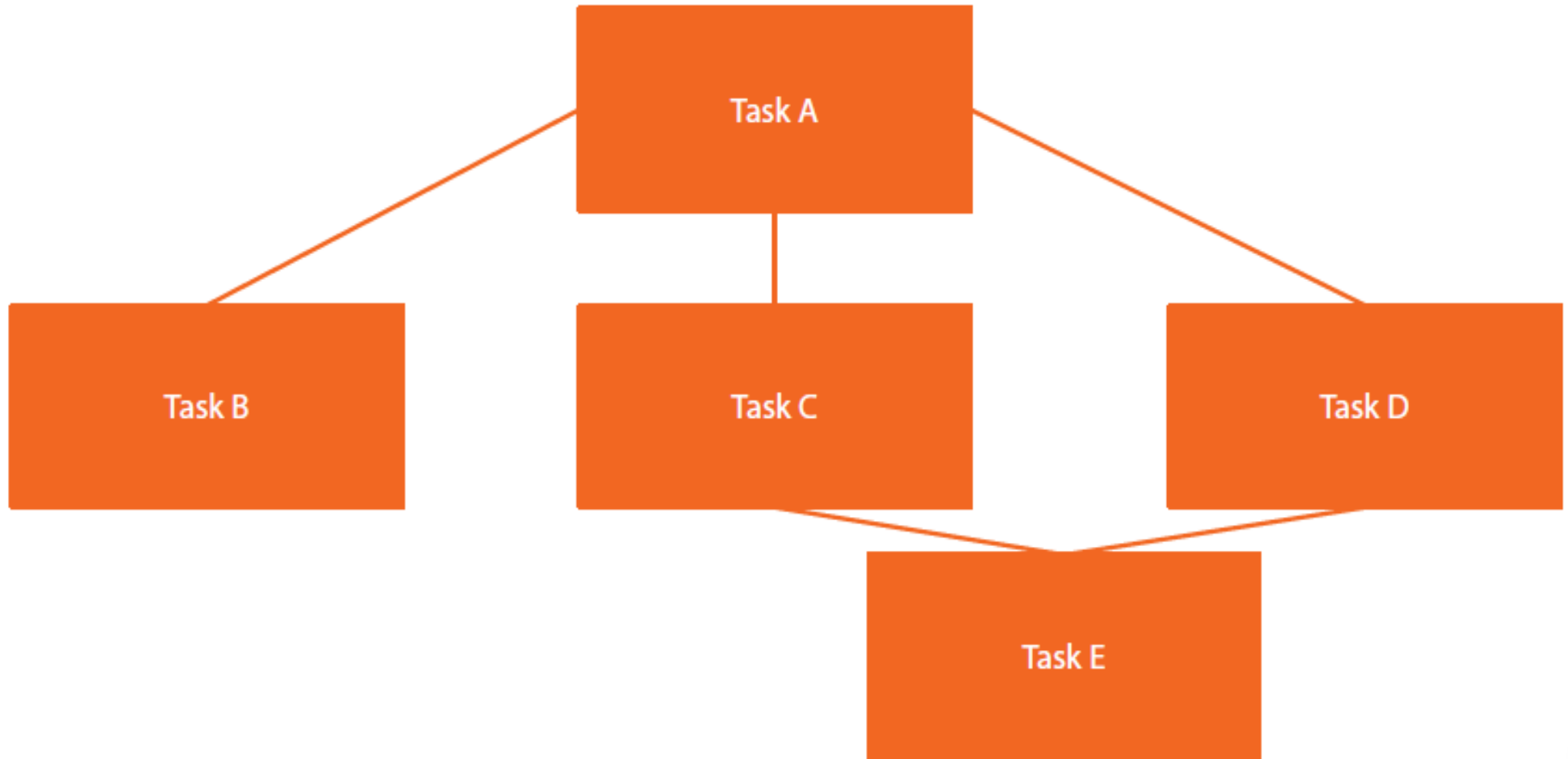
Other Dependencies

mustRunAfter	• If two tasks execute one **must run after the other.**
shouldRunAfter	• If two tasks execute one **should run after the other.** • This ignores circular dependencies.
finalizedBy (incubating in 2.6)	• Inverted dependency.

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Ad-hoc Tasks

All the tasks we've created up until now:

- task Task1
- task Task2 << {}
- task Task3 {}

Typed Tasks

Suppose we want something more complex.

Copying files?

- Open file/read file/ write file

Zipping files?

Would like this to be re-useable.

Enter typed tasks

What Built-in Task Types Are There?

https://docs.gradle.org/current/dsl/

Full DSL reference.

List task types and examples of their use.

The Copy Task

The Copy Task

```
task copyImages (type: Copy) {

    from 'src'

    into 'dest'

}
```

The Copy Task (contd.)

Can also:

- Rename files
- Restructure directories
- 'Expand' files (text replacement)

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Expanding Text

```
Expanding Text

task copyConfig (type: Copy) {
    include 'web.xml'
    from 'src'
    into 'config'
    expand ([
        resourceRefName: 'jdbc/JacketDB'
    ])
}
```

Building a Java Project

JAVA Plugin

Java Plugin

```
apply plugin 'java'
```

Adds Many Tasks

Build

Clean

Javadoc

Supports Standard Layout

src/main/java

src/main/resources

src/test/java

src/test/resources

SourceSets

Configure the Layout

```
sourceSets {
    main {
        java {
            srcDir 'src/java'
        }
        resources {
            srcDir 'src/resources'
        }
    }
}
```

Basic Single Project Build

build.gradlefile

- Add the Java plugin

Create source directories and add sources.

Add top level settings.gradle

- List of all the projects in the build.j

Multi-project Builds

Add top level build.gradle

- Defines project wide build functionality.
- Defines dependencies.

Gradle Build from Scratch

Start with an existing Java projectSimple existing application.

Has a non-gradlestructure so …
… will need source sets.

Basic dependency management.

Basic testing.

Dependencies

Your Project Has Dependencies

Other projects

External libraries

Internal libraries

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Dependencies Can Be Satisfied From…

Other projects

File system

Maven repositories

Ivy repositories

Can have Many Configurations

Java plugin introduces:

- compile
- runtime
- testCompile
- testRuntime

Transitive Dependencies

Some dependencies will depend on other libraries:

- These are 'transitive dependencies'.

Listing Dependencies

Listing Dependencies

```
gradle -q dependencies

gradle -q dependencies -configuration compile
```

Repositories – Maven Remote

```
repositories {

    mavenCentral()

}

repositories {

    jcenter() // https

}
```

Repositories – jcenter http

```
repositories {
    url "http://jcenter.bintray.com/"
}
```

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Repositories – Maven Local / Custom

Repositories – Maven local/custom

```
repositories {

    mavenLocal()

}

repositories {

    maven {

        url "http://repo.mycompany.com/maven2"

    }

}
```

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Repositories – Ivy

Repositories - Ivy

```
repositories {
    ivy {
        url "http://repo.mycompany.com/repo"
    }
}

// other custom options available
```

Repositories – Multiple

```
repositories {
    maven {
        url "http://repo.mycompany.com/maven2"
    }


    ivy {
        url "http://repo.mycompany.com/repo"
    }
}
```

Gradle Cache

Modules are cached	- File based. - Meta data and files stored separately. - Repository caches are independent.
Dependencies can be refreshed	*refresh-dependencies* *flag* - Will check if it needs to re-download.
Can safely delete cached files	Gradle will re-download them.

Testing

Integral to Java Plugin

Define

- A source set.
- Task to compile the tests.
- Task to run the tests.

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Source Set

Looks for unit tests in src/test/java

Outputs to build/classes/test

Reports to build/reports/test

Filtering

Can filter to only run a subset of tests:

- Single test
- All tests from a package
- Wildcard is supported

Filtering (contd.)


```
Filtering

test {
  filter {
    includeTestsMatching "com.foo.shouldCreateASession"
    includeTestsMatching "*shouldCreateASession"
  }
}
```

Filtering (contd.)

Filtering

```
gradle test --tests *shouldCreateASession
```

What About Other Testing?

Integration tests for example?

Can use gradle-testsets-plugin

https://github.com/unbroken-dome/gradle-testsets-plugin

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What About Other Testing? (contd.)

Add plugin

- Add a testSet.
- Set other configuration parameters (dependsOnetc…).
- Set output reports directory.

Gradle Wrapper

What is the Wrapper

Provides a specific version of Gradle to the project.

- Get consistent builds
- gradlew.baton Windows
- gradleshell script on *nix

Uses Wrapper Task

Standard task

- Always available

Wrapper Task

```
task wrapper(type: Wrapper) {
    gradleVersion = '2.6'
}
```

Install Bootstrap Files

myproject/

gradlew

gradlew.bat

gradle/wrapper/

gradle-wrapper.jar

gradle-wrapper.properties

Running the Wrapper

Checks if specific version of Gradle is available.

- Downloads if not.

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Why Build Server

Continuous integration is very important.

If not CI then at least nightly builds.

If not nightly then a clean place to build.

- Works on my machine.

Team City

Build server from Jet Brains.

- https://www.jetbrains.com/teamcity/

Adding a GradleBuild

Team City can use the Gradle wrapper.

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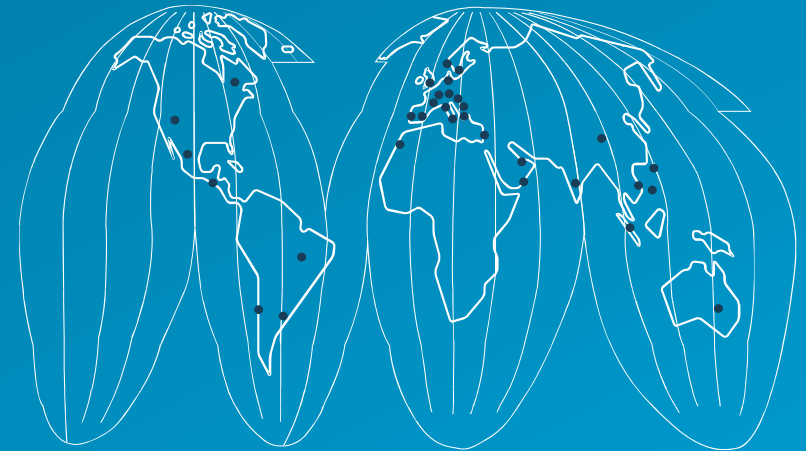
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