Capgemini
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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

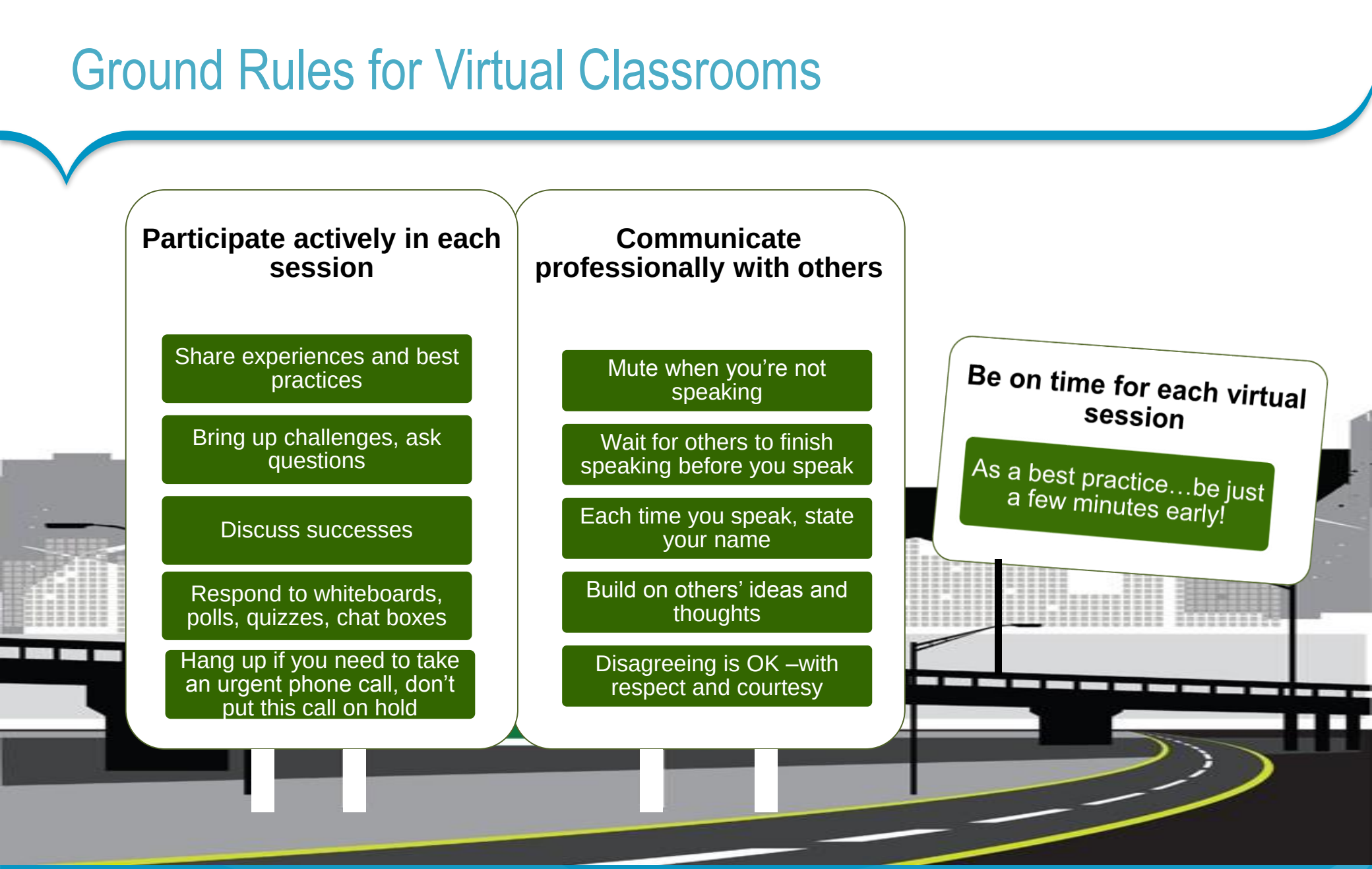
- Share experiences and best practices
- Bring up challenges, ask questions
- Discuss successes
- Respond to whiteboards, polls, quizzes, chat boxes
- Hang up if you need to take an urgent phone call, don't put this call on hold

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!



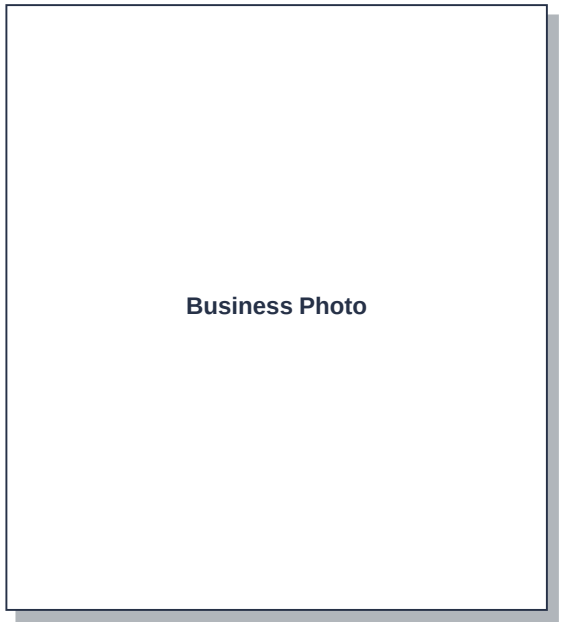
Module at a Glance

SME to provide the details required in the table.

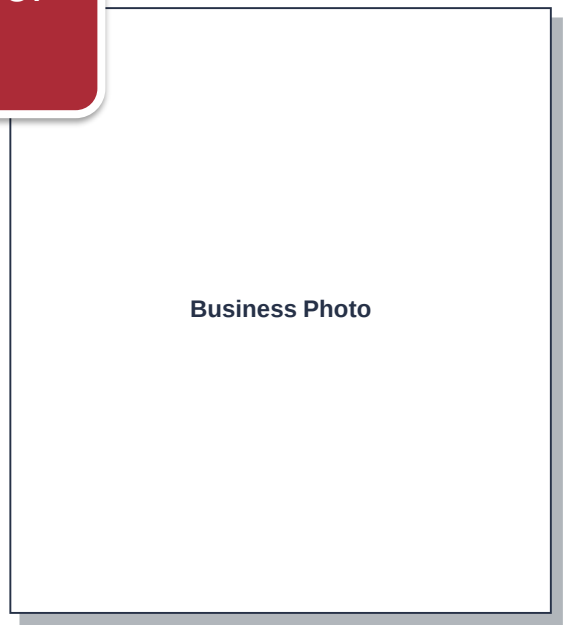
Target Audience:	
Course Level:	*Basic*
Duration (in hours):	30 mins
Pre-requisites, if any:	NA
Post-requisites, if any:	*Submit Session Feedback*
Relevant Certifications:	None

Introductions (for Virtual Classrooms)

SME to provide the photos and names of the facilitators.

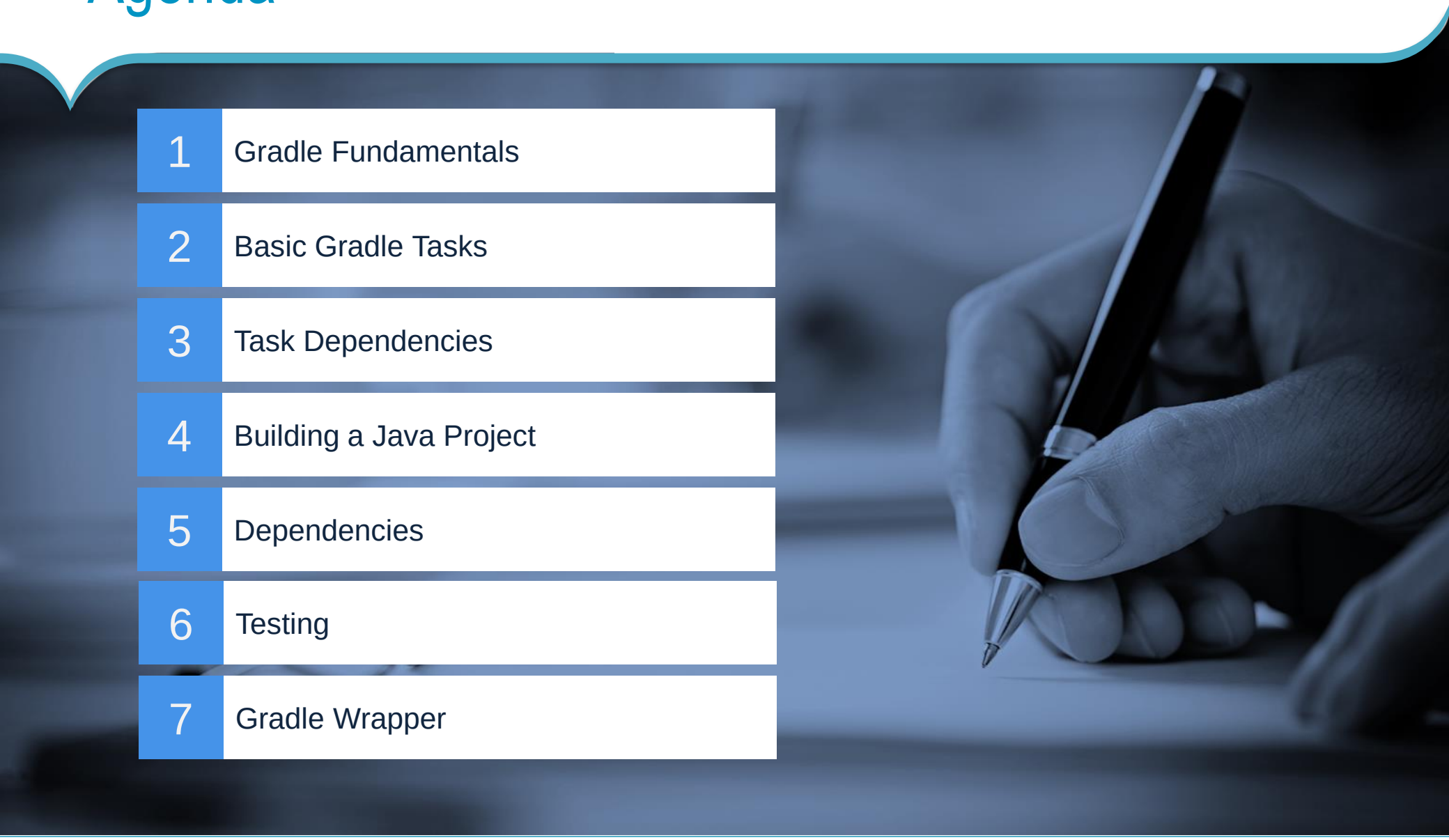


Facilitator
Name
Role



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

Module Objectives

Note to the SME : Please provide the module Objectives or validate the partially updated content

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

Gradle Fundamentals

What Is Gradle?

- **Build by convention**
- **Groovy DSL**
- **Supports dependencies Ivy and Maven**
- **Supports multi-project builds**
- **Easily customizable**

What Is Gradle? (contd.)

Declarative Build Language

- Expresses Intent
- Maintainable

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/

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

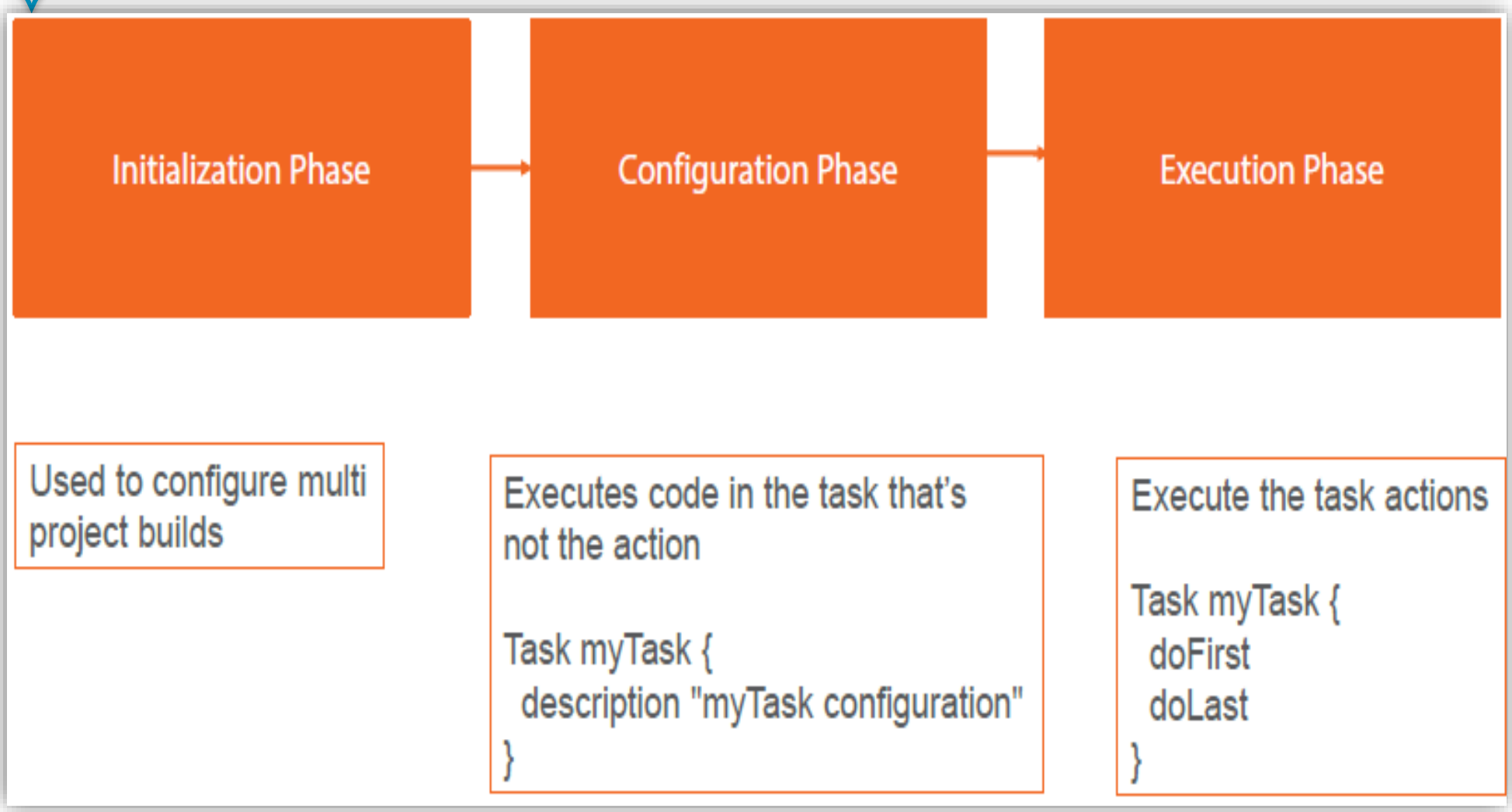
- Task Domain Specific Language (DSL)
- Task lifecycle
- Gradle properties

What Is a Task?

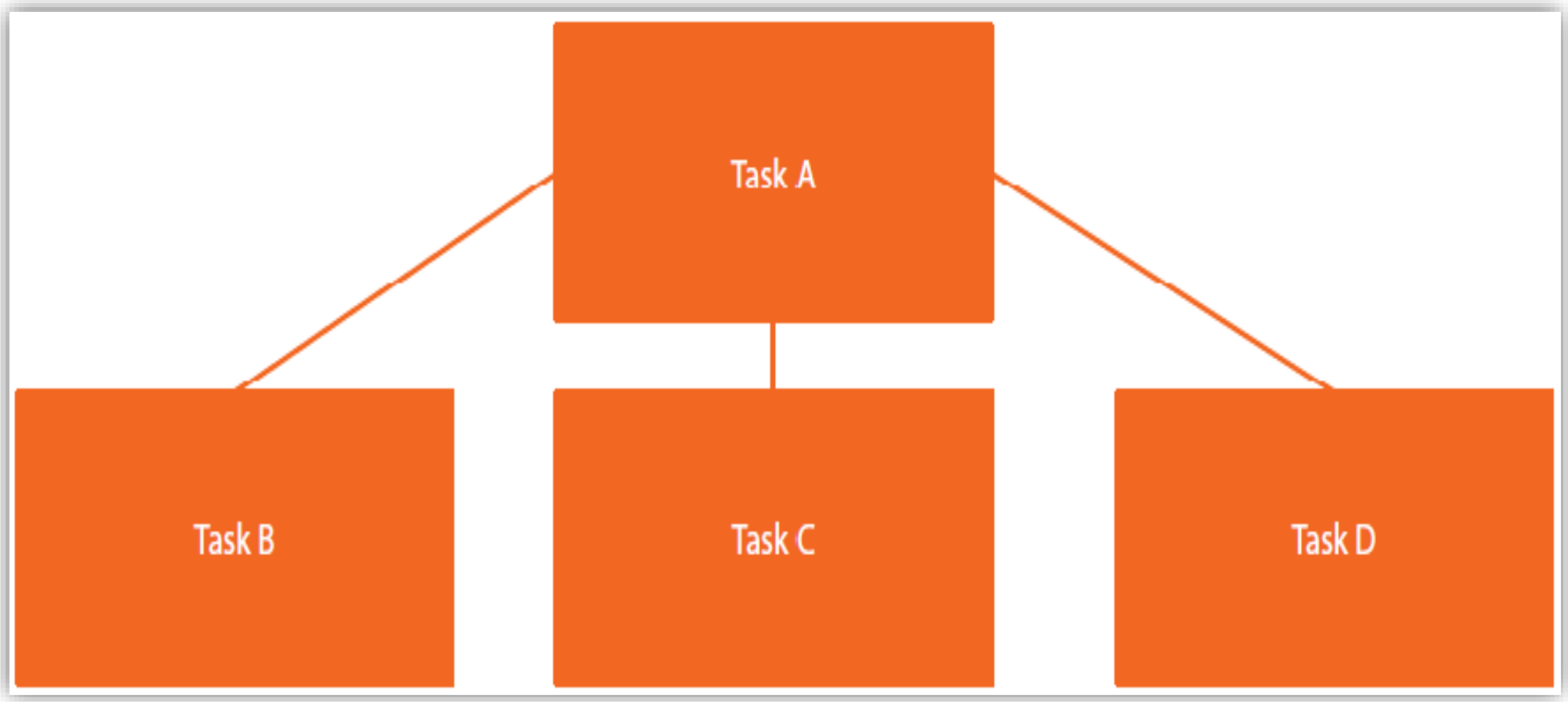
Code that Gradle executes:

- Has a lifecycle
- Has properties
- Has ‘actions’
- Has dependencies

Build Phases



Task Dependencies



Task Dependencies

Objectives

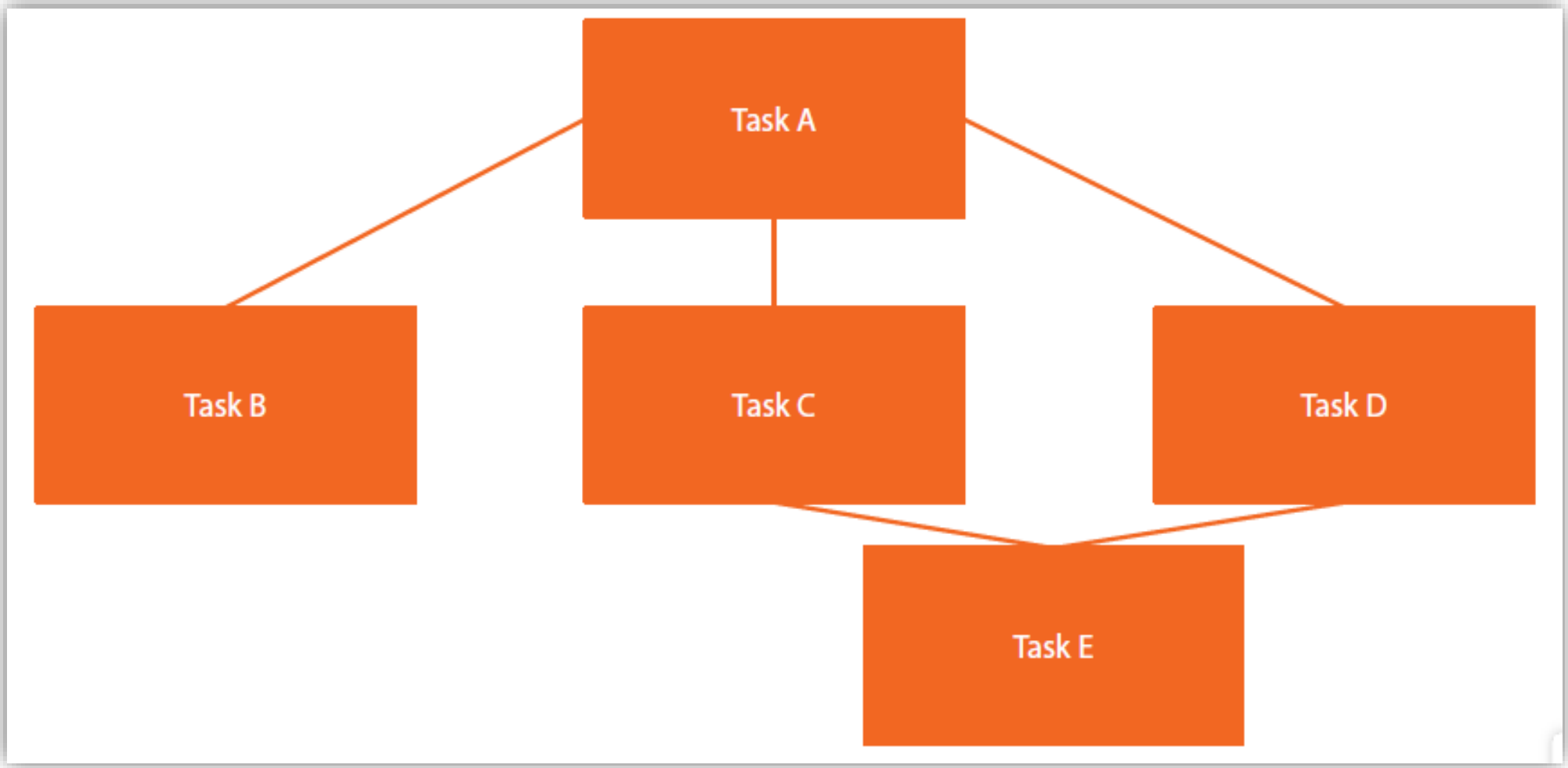
Understand how tasks can be linked

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.

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)

Expanding Text

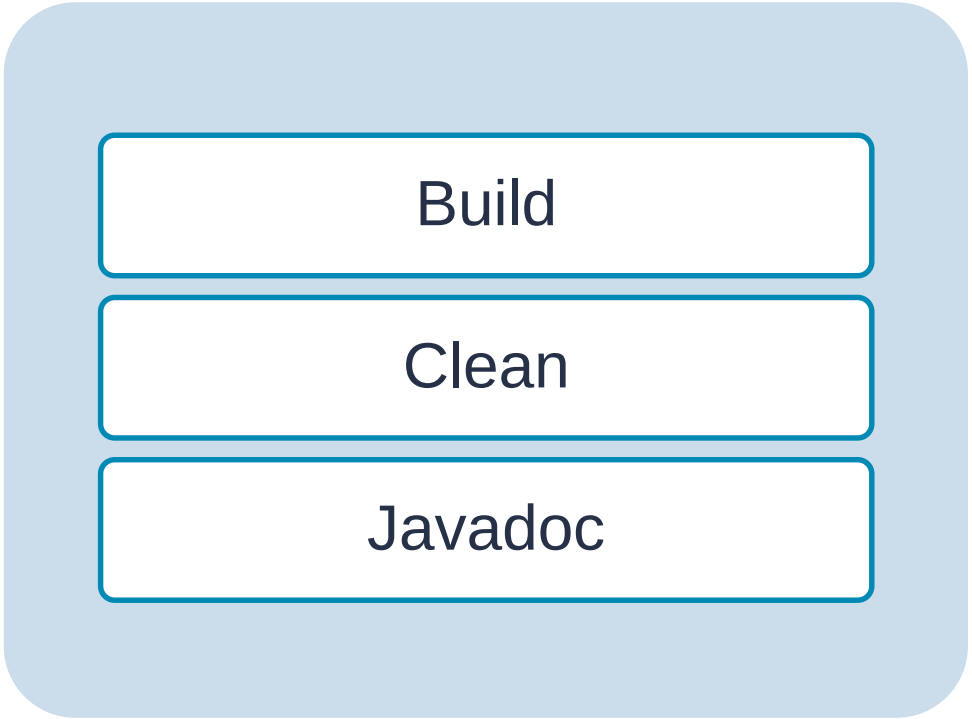
Building a Java Project

JAVA Plugin

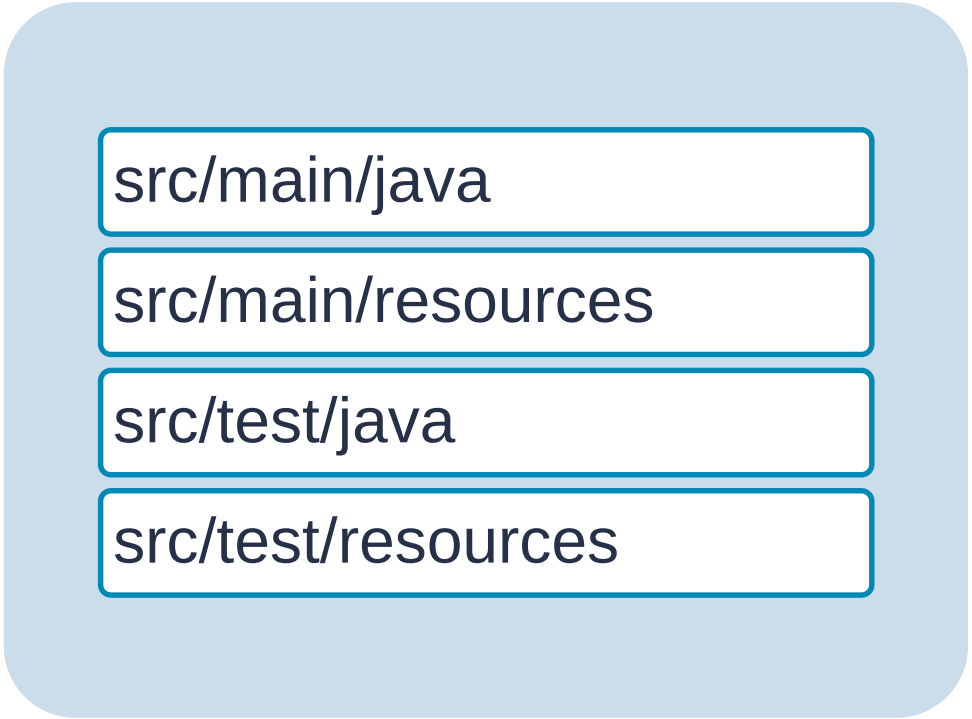
Java Plugin

```
apply plugin 'java'
```

Adds Many Tasks



Supports Standard Layout



SourceSets

If you have a different convention can configure the layout using a source set.

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.

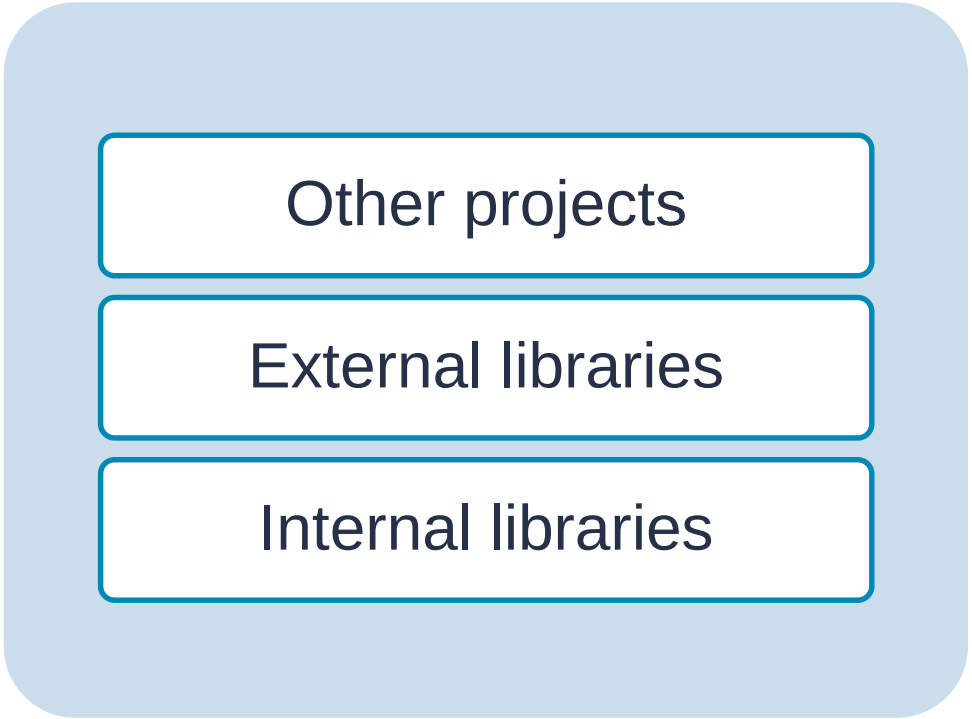
Has a non-gradlestructure so …
… will need source sets.

Basic dependency management.

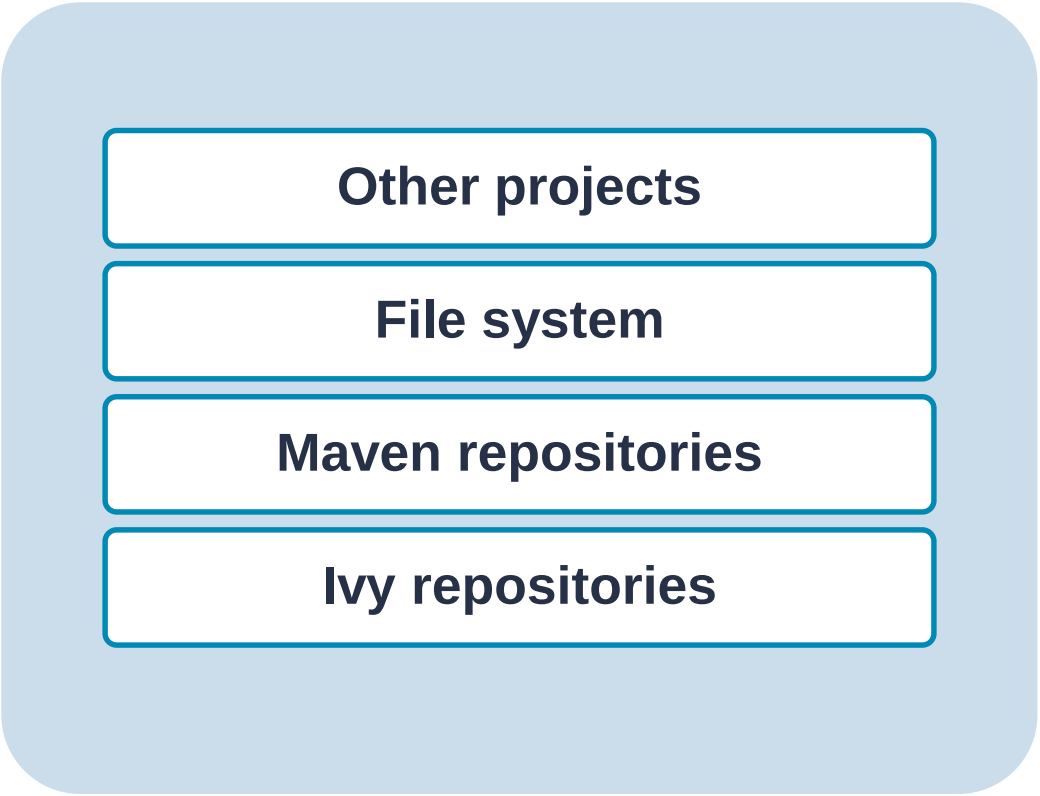
Basic testing.

Dependencies

Your Project Has Dependencies



Dependencies Can Be Satisfied From…



Can have Many Configurations

Java plugin introduces:

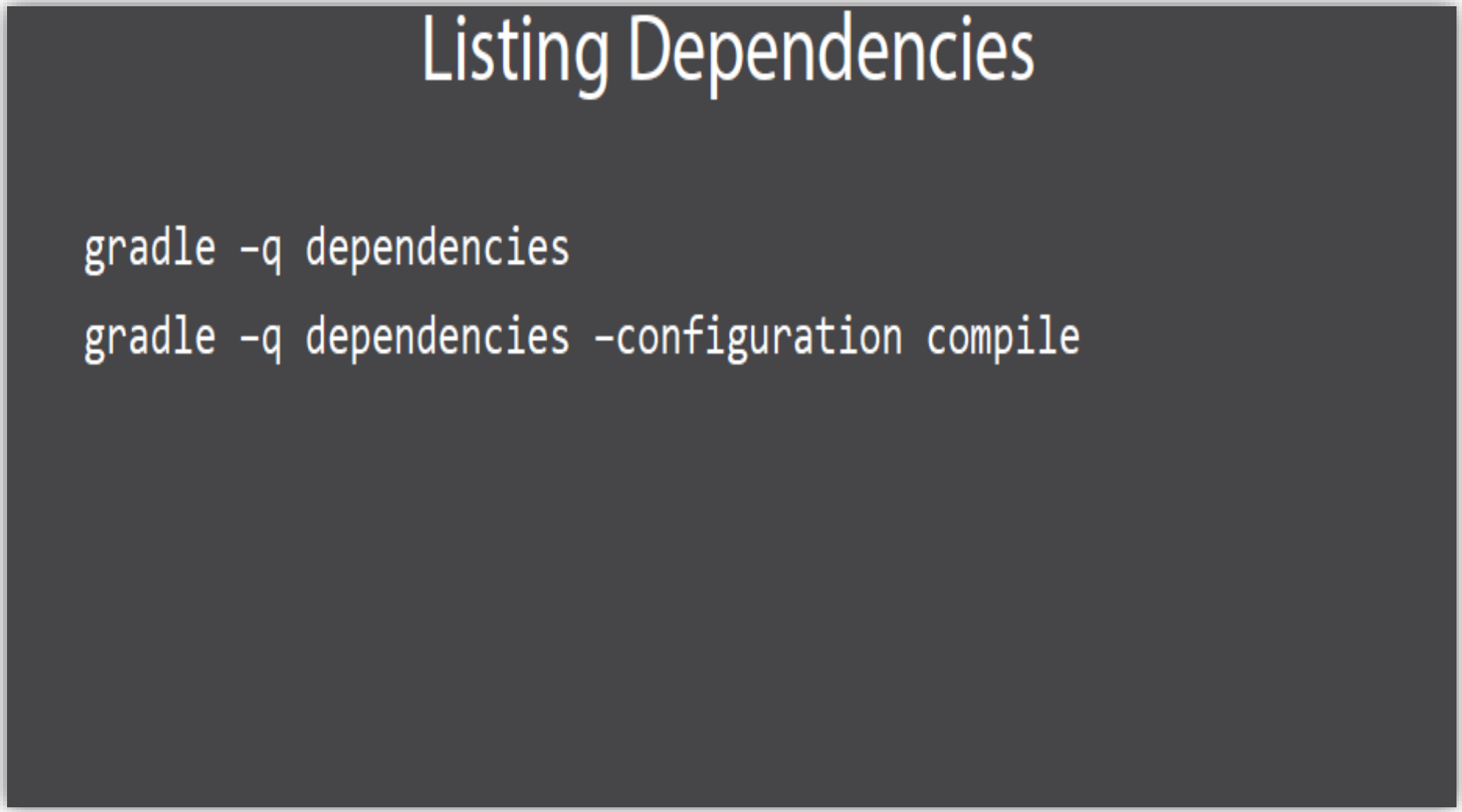
- compile
- runtime
- testCompile
- testRuntime

Transitive Dependencies

Some dependencies will depend on other libraries:

- These are 'transitive dependencies‘.

Listing Dependencies



Repositories – Maven Remote

Repositories – Maven Remote

```
repositories {
    mavenCentral()
}
repositories {
    jcenter() // https
}
```

Repositories – jcenter http

Repositories – jcenter http

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

Repositories – Maven Local / Custom

Repositories – Maven local/custom

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

Repositories – Ivy

Repositories - Ivy

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

// other custom options available
```

Repositories – Multiple

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.

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

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

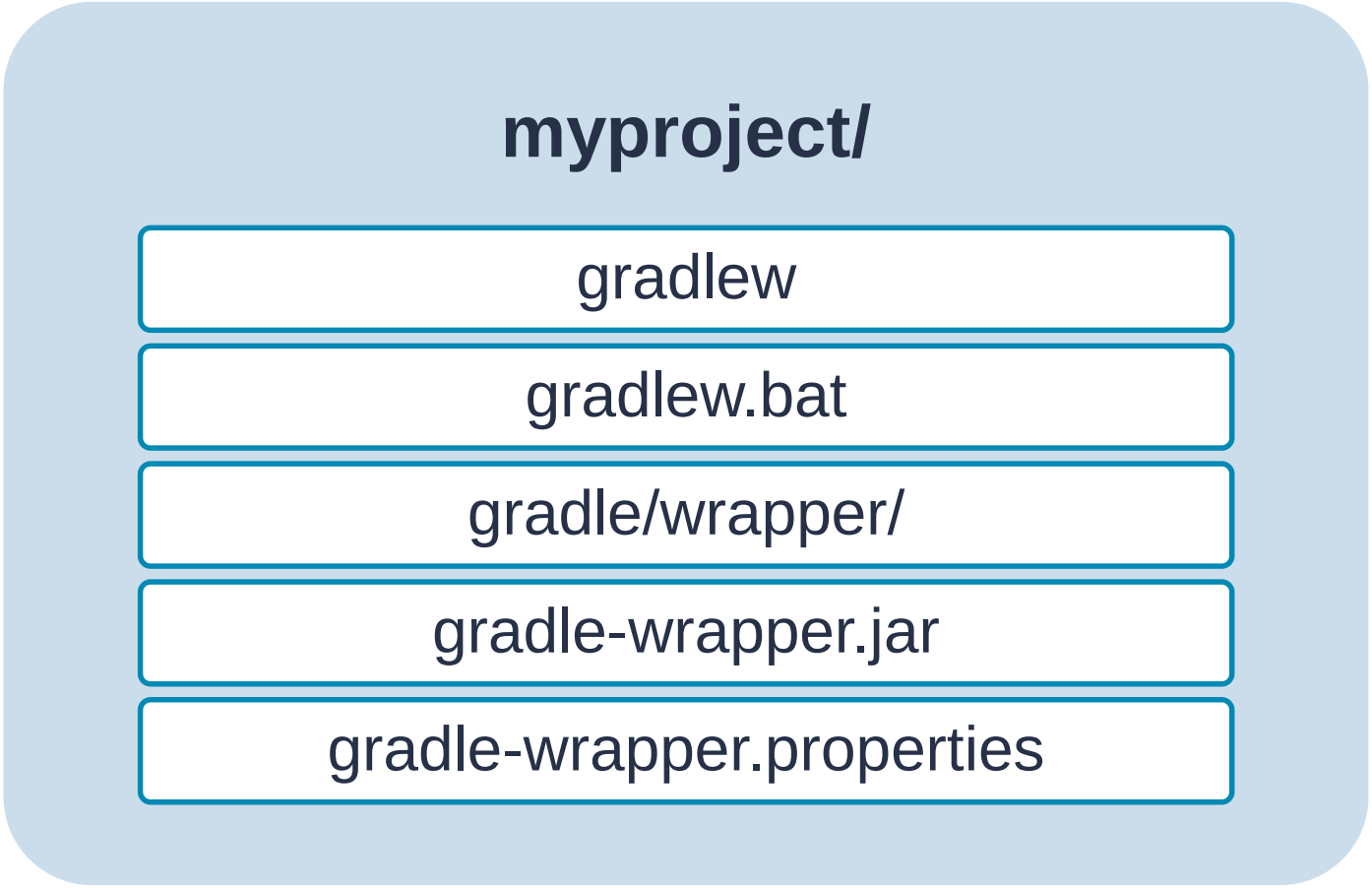
Standard task

- Always available

Wrapper Task

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

Install Bootstrap Files



Running the Wrapper

Checks if specific version of Gradle is available.

- Downloads if not.

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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People matter, results count.

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Together with its clients, Capgemini creates and delivers business and technology solutions that fit their needs and drive the results they want. A deeply multicultural organization, Capgemini has developed its own way of working, the Collaborative Business Experience™, and draws on Rightshore®, its worldwide delivery model.

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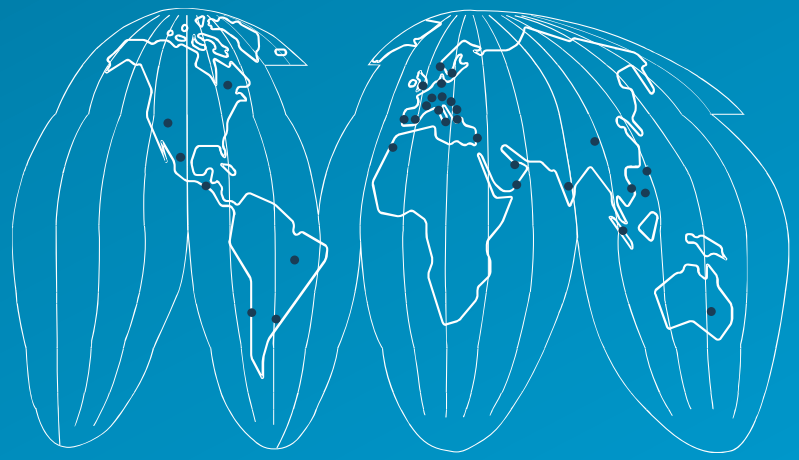

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