

Introduction to Gradle

Who am I?

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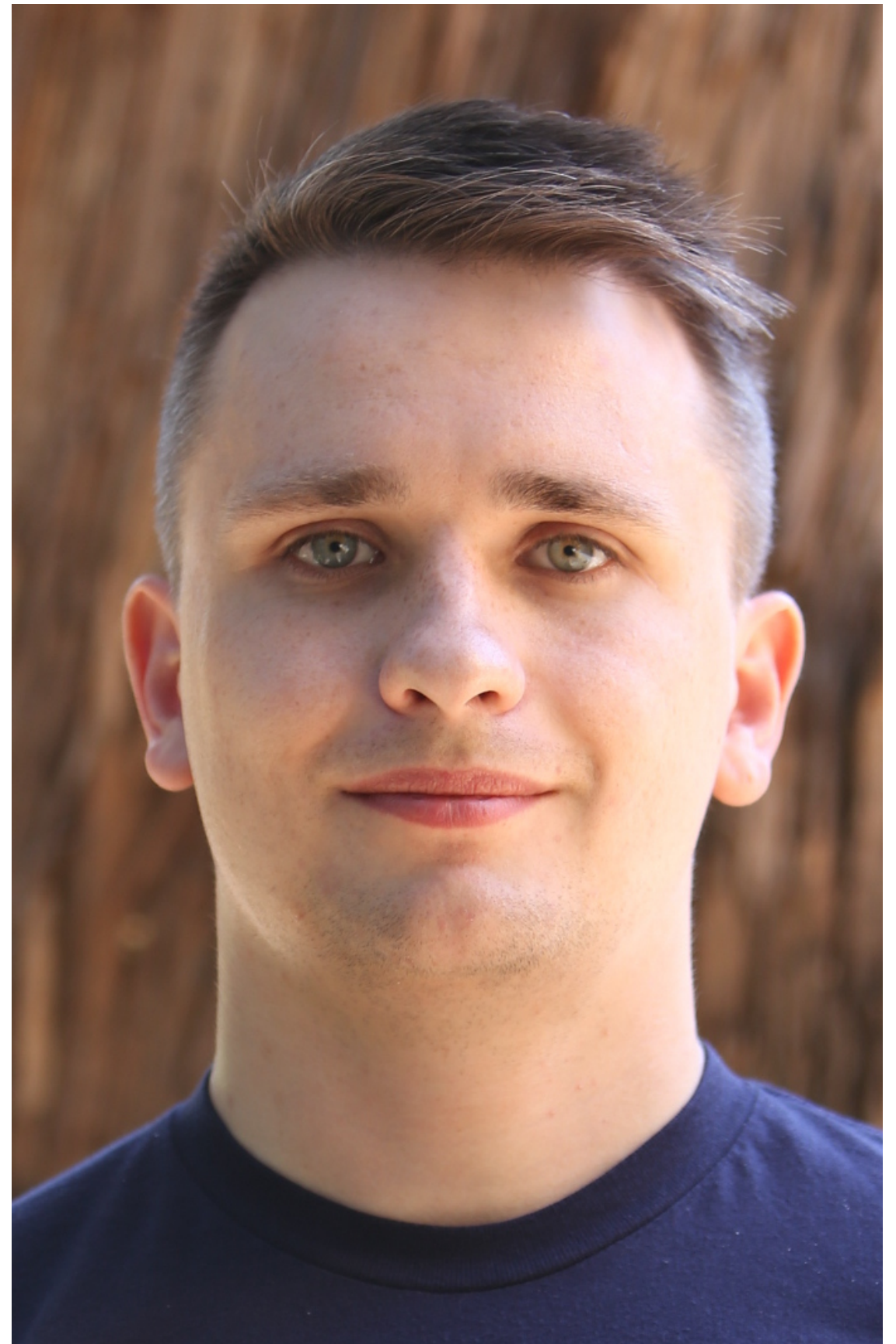


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Introduction



The Gradle Build Tool

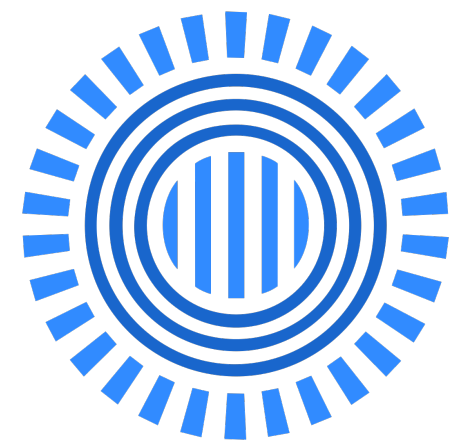
“The Gradle Build Tool is a modern open source polyglot build automation system”

- Like Maven, but...
- No restrictions, only conventions
- Build delivery pipelines

Success stories

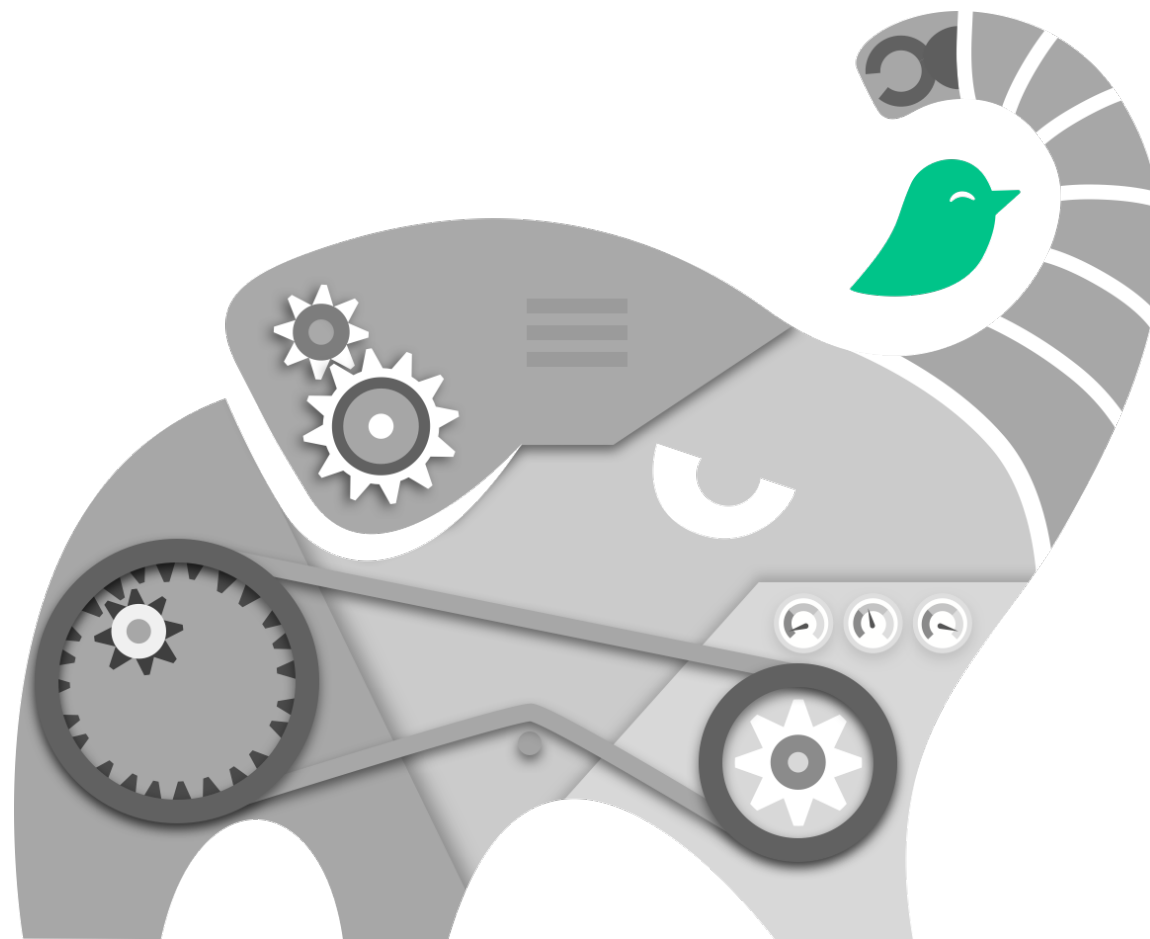


NETFLIX



Prezi

Gradle core features



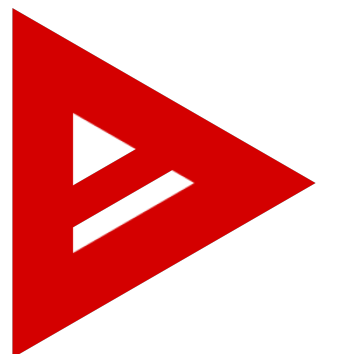
Build definition

- `build.gradle` script
 - Groovy language + Gradle DSL
- Resources
 - User guide
 - DSL reference

Task definition

```
task sayHello << {  
    println "Hello, World!"  
}
```

- Task = single unit of work
- Backed by an [org.gradle.api.Project](#) instance
- << is shorthand for the [Task.doLast\(Closure\)](#) method



Built-in tasks

```
Terminal
$ gradle tasks
:tasks
[
-----
All tasks runnable from root project
-----
[
Build Setup tasks
-----
init - Initializes a new Gradle build. [incubating]
wrapper - Generates Gradle wrapper files. [incubating]

Help tasks
-----
buildEnvironment - Displays all buildscript dependencies declared in root project 'emptyproject'.
components - Displays the components produced by root project 'emptyproject'. [incubating]
dependencies - Displays all dependencies declared in root project 'emptyproject'.
dependencyInsight - Displays the insight into a specific dependency in root project 'emptyproject'.
help - Displays a help message.
model - Displays the configuration model of root project 'emptyproject'. [incubating]
projects - Displays the sub-projects of root project 'emptyproject'.
properties - Displays the properties of root project 'emptyproject'.
tasks - Displays the tasks runnable from root project 'emptyproject'.

To see all tasks and more detail, run gradle tasks --all

To see more detail about a task, run gradle help --task <task>

BUILD SUCCESSFUL

Total time: 0.616 secs
$
```

Task properties

- Group and description: visual aid to organise tasks

```
task sayHello {  
  description "Prints out the text 'Hello, World!'"  
  group 'Incquery Academy'  
  
  doLast {  
    println 'Hello, World!'  
  }  
}
```

```
properties - Displays the properties of root project 'example-project'.  
tasks - Displays the tasks runnable from root project 'example-project'.
```

```
Incquery Academy tasks
```

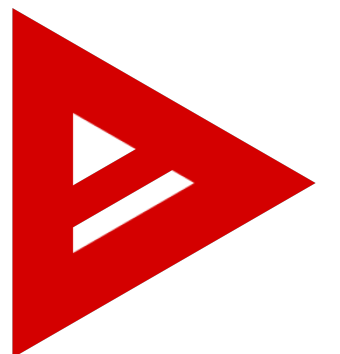
```
-----
```

```
sayHello - Prints out the text 'Hello, World!'
```

Task properties

- Dependencies

```
task a << { println "Task A" }  
task b(dependsOn: a) << { println "Task B" }
```



Task types

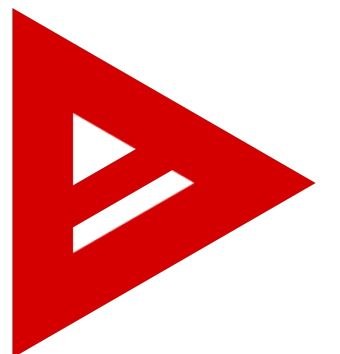
- Each tasks have task types
- `DefaultTask` is used if not defined
- Built-in tasks: `Copy`, `Exec`, `Zip`, `Jar`, etc
 - Listed in the [DSL reference](#)
- Can implement a custom one

```
task copyDoc(type: Copy) {  
    from 'src/doc'  
    into 'build/doc'  
}
```

Inputs and Outputs

- Tasks can declare their input and output files and folders
- Task execution is skipped if task is 'up-to-date'
 - input same
 - output untouched

```
task copyDoc(type: Copy) {  
    from 'src/doc'  
    into 'build/doc'  
}
```

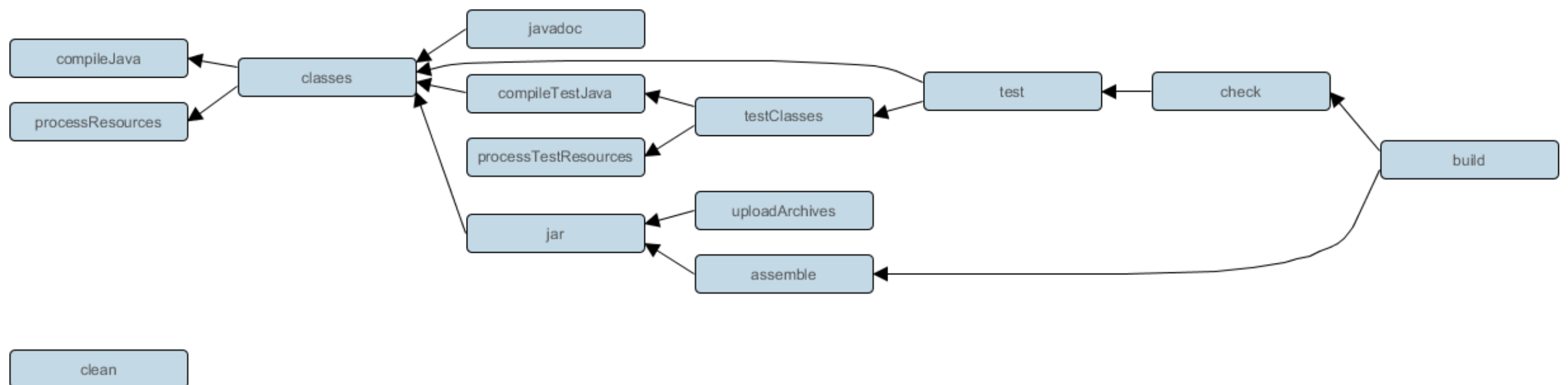


Plugins

- Contributes additional features
- Gradle core functionality is organised into plugins
- ~800 external plugins are in the [Gradle plugin portal](#)

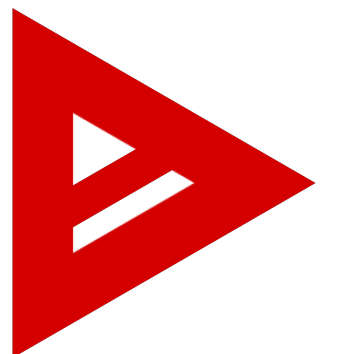
Java plugin

- apply plugin: 'java'
- compilation, testing, bundling
- basis for other plugins (e.g. [war plugin](#))



Project customization

- Via DSL configuration, or
- Programmatically



Dependency management

- Transitive dependencies
- non-managed dependencies
- Customisable resolution
- Support for existing infrastructure

Dependency management

- Repository definition

```
repositories {  
    flatDir name: 'libs', dirs: "$projectDir/libs"  
    maven { url 'https://repo.gradle.org/gradle/libs-releases' }  
    mavenCentral()  
}
```

Dependency management

- Defining dependencies

```
dependencies {  
    compile 'com.google.guava:guava:19.0'  
    testCompile "org.spockframework:spock-core:2.0-groovy-2.4"  
    runtime('org.hibernate:hibernate:3.0.5') {  
        transitive = false  
    }  
}
```

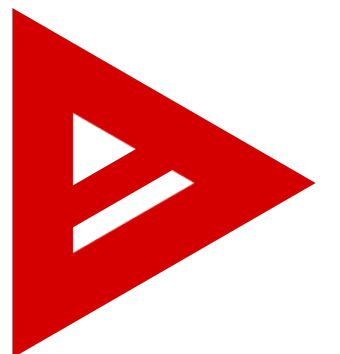
Dependency management

- Dependency substitution

```
configurations.all {  
    resolutionStrategy.eachDependency { DependencyResolveDetails details ->  
        if (details.requested.name == 'log4j') {  
            details.useTarget "org.slf4j:log4j-over-slf4j:1.7.10"  
        }  
    }  
}
```

Gradle wrapper

- A script to download and execute Gradle
- It can be checked into VCS
- No need to install Gradle for compilation
- Transparent Gradle upgrade



IDE integration



Buildship: Eclipse plugins for Gradle

- Developed by Gradle Inc.
 - My main focus :)
- Top-level Eclipse project
- Pre-installed in 3 packages since Eclipse 4.5
- Latest release 1.0.18
- Vision: single source of build logic



Buildship hands-on

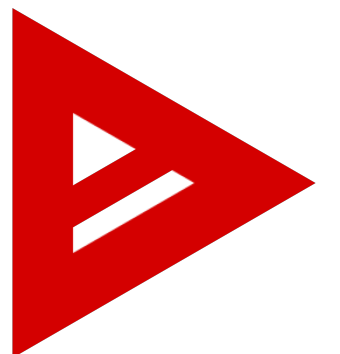
- Project import
- Project synchronisation
- Tasks view
- Executions view
- Test execution

The logo features a large, light gray circle. Inside the circle, there are several stylized icons: a dark blue elephant in the bottom left, a dark blue mountain range in the top left, a dark blue mountain range in the bottom right, and a yellow and dark blue cloud in the top right. A small yellow bird is flying in the upper right corner of the slide.


Gradle Cloud Services

Gradle Cloud Services

- Gradle Inc. has been purely a services company
- GCS introduced this year
 - Commercial products & services on top of Gradle
- First service: Build Scans
 - Shareable build insights
 - Free offering



Build scans



The screenshot shows a web browser window with the address bar displaying `https://scans.gradle.com/s/o7qdwg77k2qk4`. The page title is "Build Scan for 'step7' today at". The browser's address bar also shows a "Donát" button. The page content is divided into a dark teal sidebar on the left and a main white area on the right.

Sidebar:

- Gradle logo
- Summary >
- Performance
- Tests
- Tasks
- Projects
- Dependencies
- Plugins
- Switches
- Infrastructure

Main Content:

- Profile:** A circular profile picture of a man with the username "csdonat".
- Build Status:** A green box with a checkmark and "step7", followed by a light blue box with "clean build", and a share icon.
- Build Details:**
 - Ran for 8 sec
 - Started today at 21:45:44 CEST, finished today at 21:45:52 CEST
 - Gradle 3.0-rc-1
 - Build Scan Plugin 1.0
 - [See console output](#)
- Performance:**
 - A large "8.6" with "sec" below it.
 - A table showing task execution times:

Initialization and Configuration	7.062s
Task Execution	1.560s
 - [See performance details](#)
- Test Results:**
 - 1 test executed in 1 project taking 0.662s
 - Class: `ClassHelloTest`, test: `test`, 0.002s

There's so much more

- Publishing artifacts
- Gradle Kotlin script
- Composite builds
- Gradle daemon
- Plugin authoring
- Java 9 support
- Build script testing
- Multi-project builds
- Native builds
- Framework x support
- Task cache
- Continuous build

Get in touch with us

- Gradle forums: <http://discuss.gradle.org>
- Buildship project page: <http://eclipse.org/buildship>
- Try build scans: <http://gradle.com>
- Contact me: donat@gradle.com, or
- Follow us: [@donatcsikos](#), [@gradle](#), [@gradlephant](#)