Approaching Gradle 3.0

latest efforts, current status & roadmap

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Gradle in a nutshell

- Multi purpose build system
- Completely open source
- Apache2 licensed
- Governed by Gradle Inc.

Gradle in a nutshell

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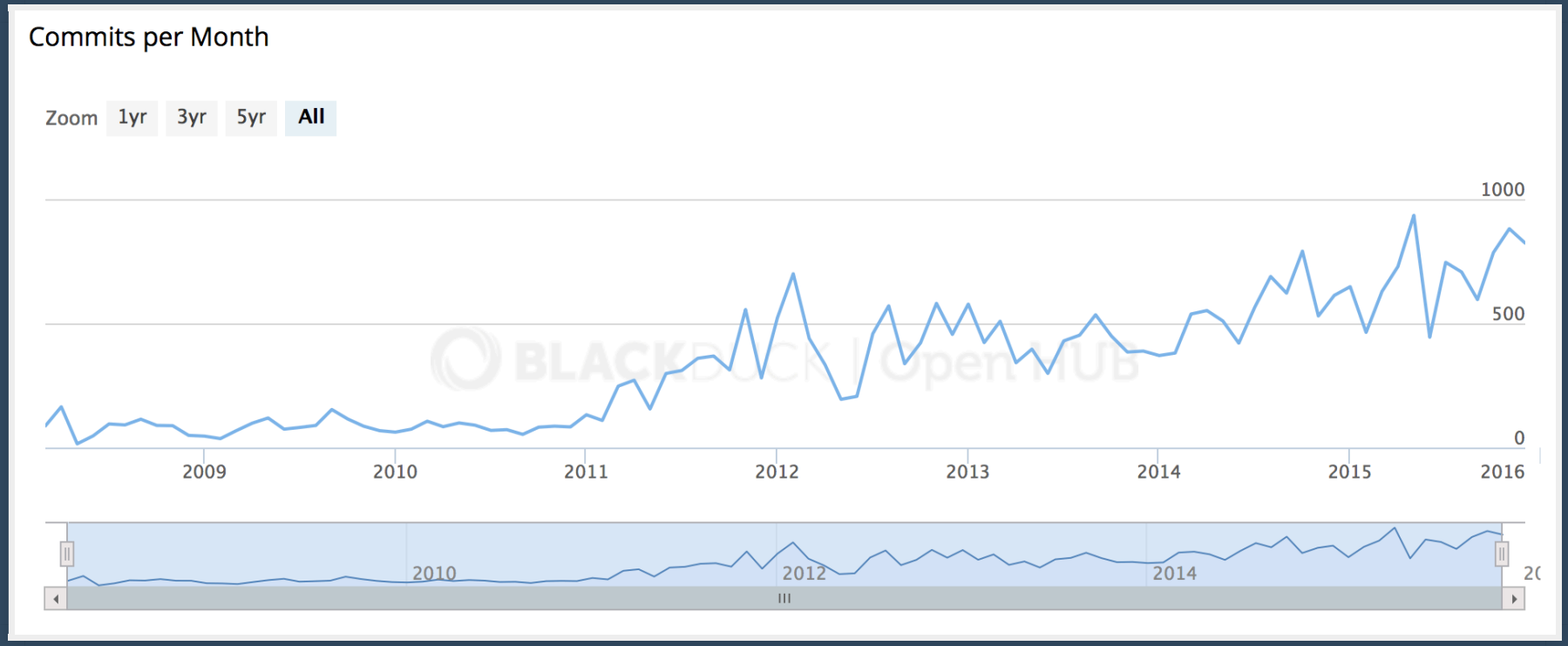


Gradle in a nutshell

Language Breakdown

Language	Code Lines	Comment Lines	Comment Ratio	Blank Lines	Total Lines	Total Percentage
Groovy	293,402	56,053	16.0%	61,201	410,656	45.2%

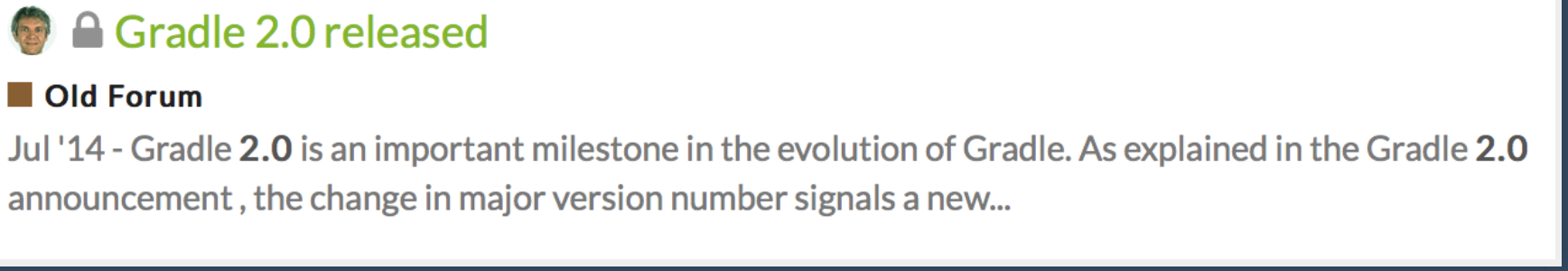
Gradle in a nutshell

A simple java project

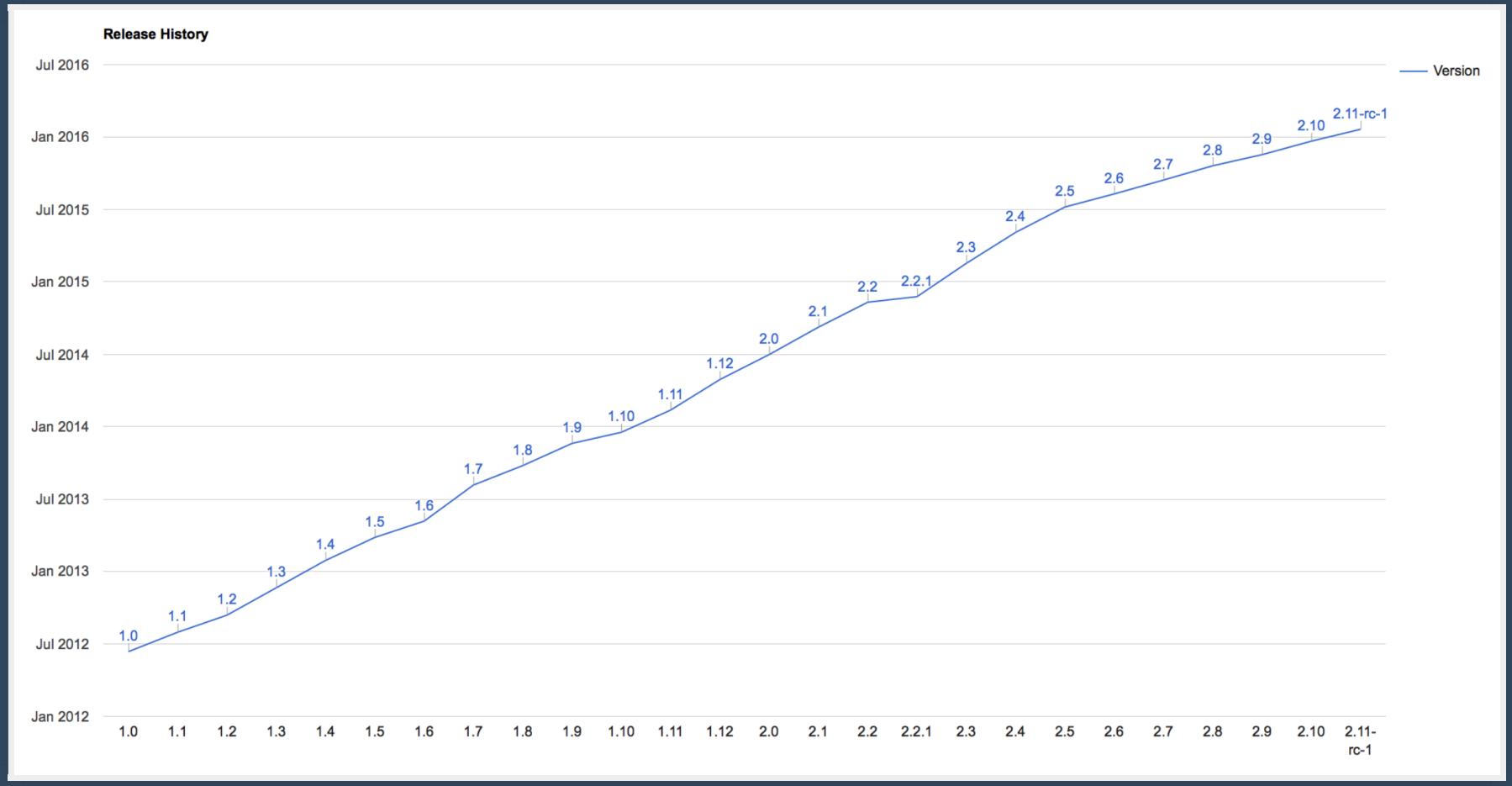
```
apply plugin:"java"

version = file("version.txt").text

repositories {
    jcenter()
}

dependencies {
    testCompile "junit:junit:4.+"
}

task printVersion << { println "We're using - version '$version'!" }
```

Gradle 2.0

Released 1st July 2014



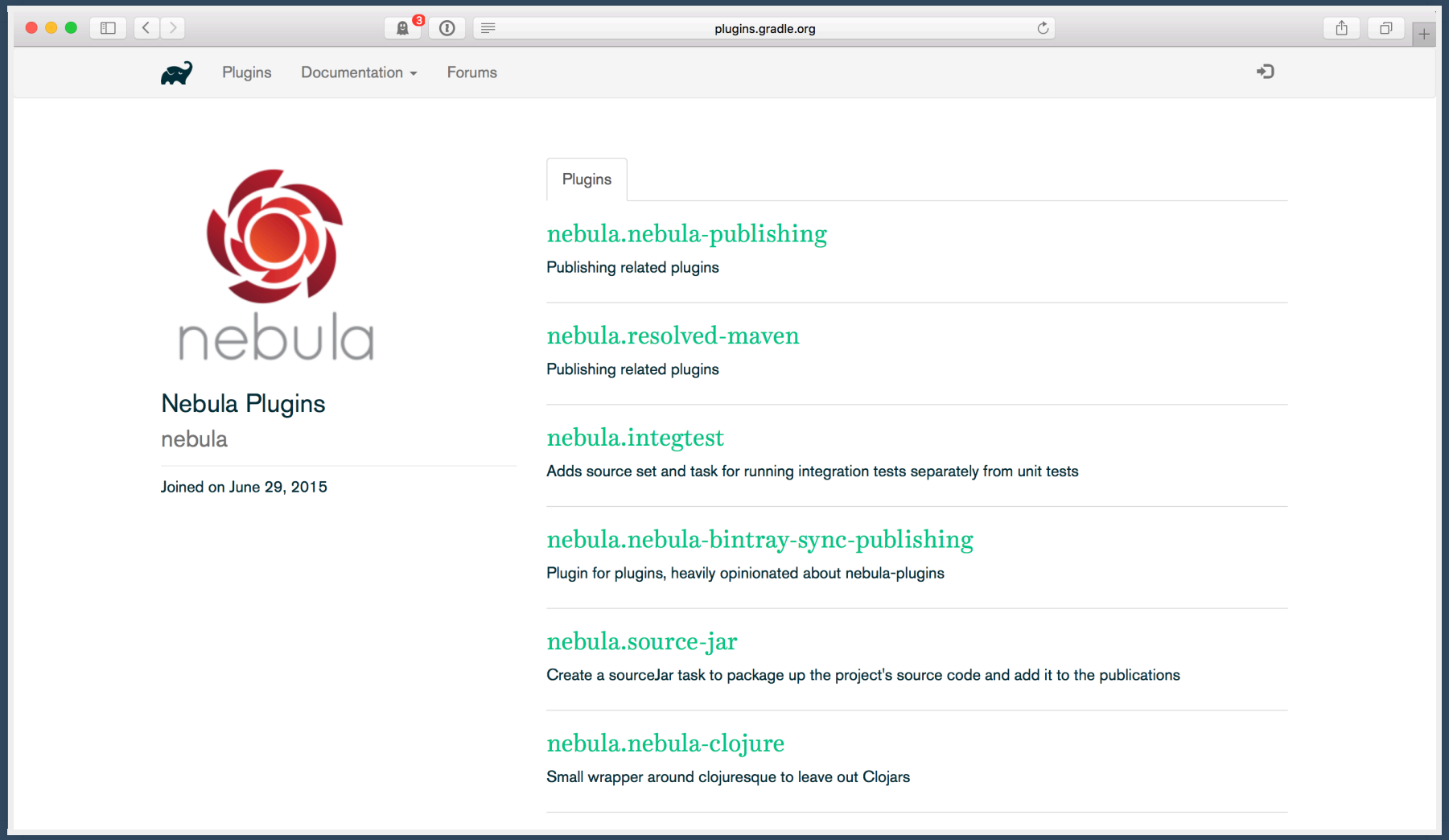
Gradle Release History



Let's take a closer look on

- Plugin Portal
- Play Support
- Gradle TestKit
- Even better Dependency Management
- **New Software Component Model**

Plugin Portal



Plugin Portal

Plugin Portal

```
...
...
apply plugin: "com.gradle.plugin-publish"
...
pluginBundle {
  website = 'http://acme.org/'
  vcsUrl = 'https://github.com/acme/greeting'
  description = 'Greetings from here!'
  tags = ['greetings', 'salutations']

  plugins {
    greetingsPlugin {
      id = 'org.acme.greeting'
      displayName = 'Acme Greeting plugin'
    }
  }
}
```

Continous Mode

```
> gradle build -t
```

Play Support

DEMO

Gradle TestKit

Functional testing of your build logic

```
apply plugin: 'groovy'

dependencies {
    testCompile localGroovy()
    testCompile gradleTestKit()
}

dependencies {
    testCompile('org.spockframework:spock-core:1.0-groovy-2.4') {
        exclude module: 'groovy-all'
    }
}

repositories {
    mavenCentral()
}
```

Gradle TestKit

```
def "helloWorld task prints hello world"() {
    given:
    buildFile << """
        task helloWorld << {
            println 'Hello world!'
        }"""

    when:
    def result = GradleRunner.create()
        .withGradleVersion(gradleVersion)
        .withArguments('helloWorld')
        .build()

    then:
    result.standardOutput.contains('Hello world!')
    result.task(":helloWorld").outcome == SUCCESS

    where:
    gradleVersion << ['2.8', '2.9', '2.10']
}
```

Dependency Management

Dependency Resolve Rules

Forcing consistent version for a group of libraries

```
configurations.all {
    resolutionStrategy.eachDependency { details ->
        if (details.requested.group == 'org.springframework') {
            details.useVersion '4.2.4.RELEASE'
        }
    }
}
```

Dependency Resolve Rules

Using a custom versioning scheme

```
dependencies {
    compile "org.acme:someLib:default"
}

configurations.all {
    resolutionStrategy {
        eachDependency { DependencyResolveDetails d ->
            if (d.requested.version == 'default') {
                def version = findDefaultVersion(d.requested.group,
                                                 d.requested.name)
                d.useVersion version
            }
        }
    }
}

Object findDefaultVersion(String group, String name) {
    // some custom logic that resolves the default
    // version into a specific version
    "1.0"
}
```

Dependency Resolve Rules

Changing dependency group and/or name at the resolution

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

Component Selection Rules

```
dependencies {
    compile 'org.slf4j:slf4j-api:+'
    testCompile 'junit:junit:4.11'
}

configurations {
    all {
        resolutionStrategy {
            componentSelection {
                withModule("org.slf4j:slf4j-api") { selection ->
                    if(selection.candidate.version == "1.7.10") {
                        selection.reject("known buggy version")
                    }
                }
            }
        }
    }
}
```

Artifact Query Api

read project licenses

```
task resolveMavenPomFiles << {
    def componentIds = configurations.compile.incoming.resolutionResult.all

    def result = dependencies.createArtifactResolutionQuery()
         .forComponents(componentIds)
         .withArtifacts(MavenModule, MavenPomArtifact)
         .execute()

    for(component in result.resolvedComponents) {
        component.getArtifacts(MavenPomArtifact).each {
            def pom = new XmlSlurper().parse(it.file)
            def licenses = pom.licenses
            // do something with the licenses
        }
    }
}
```

Dependency Substitution

Allows *elastic* dependencies

```
configurations.all {
    resolutionStrategy.dependencySubstitution {
        substitute project(":api") with module("org.utils:api:1.3")
    }
}
```

Buildship

- Eclipse plugin developed from scratch by Gradle Inc.
- Part of the eclipse foundation
- Shipped as part of the mars.1 release

Buildship

Demo

What's next?

- Composite Builds
- Tooling improvements
- New Gradle Software model

Better domain modelling

Domain modelling is Gradle's strength.
We want it to be even better.

Stronger modeling

↪ The JAR is not the task that creates it.

Cleaner modeling

↪ Avoid mixing execution concerns into the data model.

Collaborative modeling

↪ I know how to do something to JARs.

Comprehensible models

↪ Who is contributing to the contents of this JAR?

A new Gradle model

The current model

configuration → execution

- **configuration:**
  - input = build logic
  - output = build model
- **execution:**
  - input = build model
  - output = build artifacts

Current limitations

- implementation of declarative build api is hard
  - done in the imperative way
- lazyness
- hooks
- eagerness
- scaling

Too hard

For build engineers and build users.

We can do better.

The new Gradle model

A new approach to the configuration phase.

Really, the same solution for the "execution phase" applied to configuration.

A graph of dependent functions

An interpretable data model

Rule based configuration

Enter RuleSource

```
class PersonRules extends RuleSource {
  @Model void person(Person p) {}

  @Mutate void setFirstName(Person p) {
    p.firstName = "John"
  }

  @Mutate void createHelloTask(ModelMap<Task> tasks, Person p) {
    tasks.create("hello") {
      doLast {
        println "Hello $p.firstName $p.lastName!"
      }
    }
  }
}
```

Rule based configuration II

the build script

```
apply plugin: PersonRules

model {
  person {
    lastName = "Smith"
  }
}
```

The new Gradle model

as an enabler for

- Much faster, more memory efficient builds
- Just configure what is required
- Allow fundamental parallization
- Provide better diagnostics
- Reuse cached configuration
- …

Jvm Components

Gradle 3.0

Future plans

- Dependency Management
  - Variant aware dependency management
  - arbitrary dimensions
  - custom metadata
- Shared distributed cache
- Next level native build support
- More daemon utilisation
- Continued tooling improvements

Q & A

Links and pointers

- http://gradle.org/gradle-download/
- https://www.openhub.net/p/gradle/
- https://plugins.gradle.org
- https://projects.eclipse.org/projects/tools.buildship
- https://docs.gradle.org/current/userguide/userguide_single.html#software_model
- https://github.com/gradle/jigsaw-quick-start
- http://discuss.gradle.org/c/roadmap

Thanks!