Gradle on Steroids

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Disclaimer

Your Mileage May Vary

Always Measure First

Gradle Build Lifecycle Phases

Initialization

Configuration

Execution

Initialization and Configuration

The overhead tax you have to pay whenever you invoke gradle

Measuring the overhead

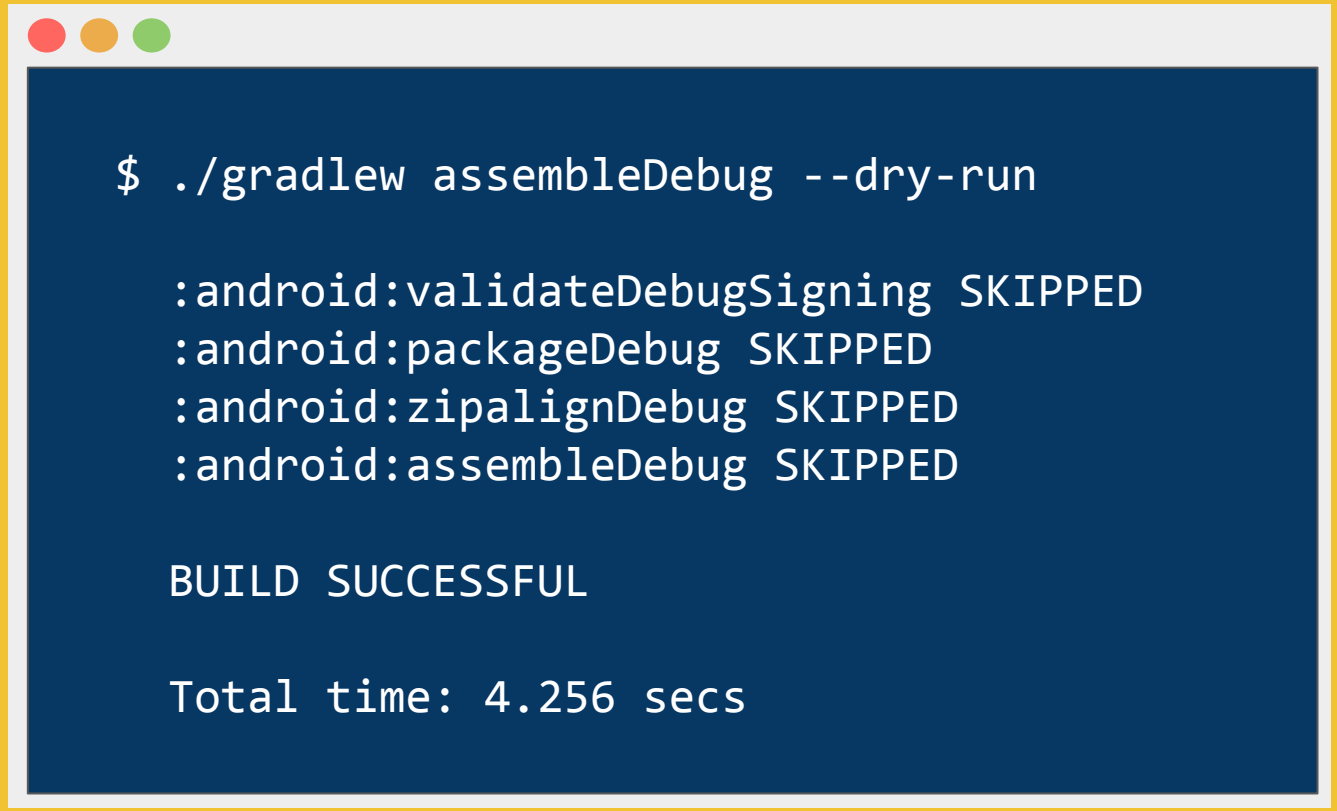
Test Subject: Google IO App

- 28 libraries
- 53149 method references

https://github.com/google/iosched

Measuring the Overhead

The --dry-run command line flag skips running all the tasks



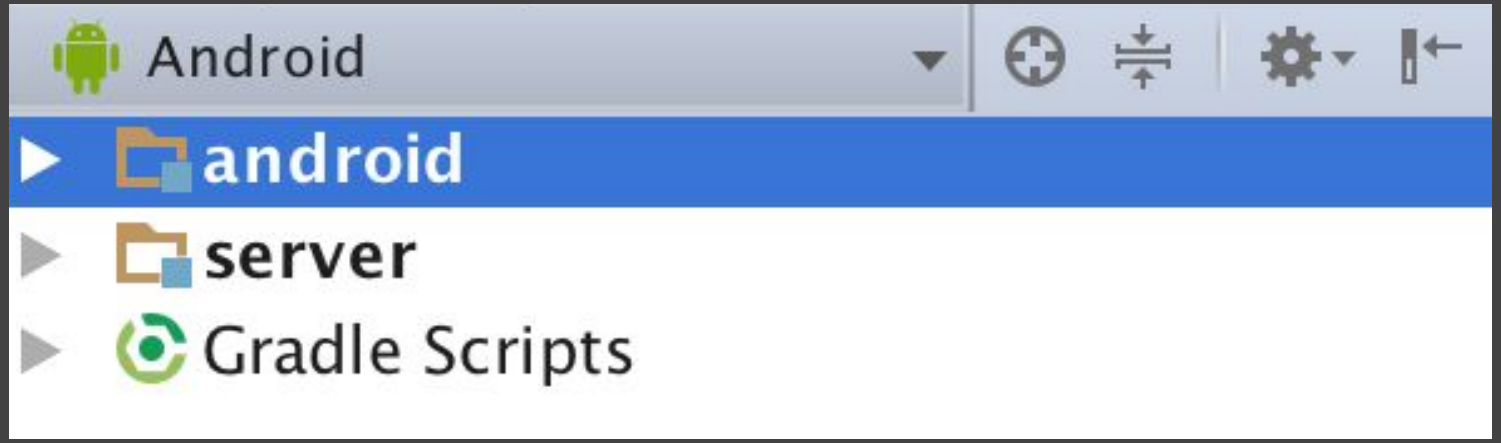
```
$ ./gradlew assembleDebug --dry-run

  :android:validateDebugSigning SKIPPED
  :android:packageDebug SKIPPED
  :android:zipalignDebug SKIPPED
  :android:assembleDebug SKIPPED

  BUILD SUCCESSFUL

  Total time: 4.256 secs
```

Configuration on Demand


Android
android
server
Gradle Scripts

./gradlew assembleDebug -dry-run

--configure-on-demand

Without `--configure-on-demand`

```
./gradlew build --dry-run
  ...

  BUILD SUCCESSFUL

  Total time: 4.286 secs
```

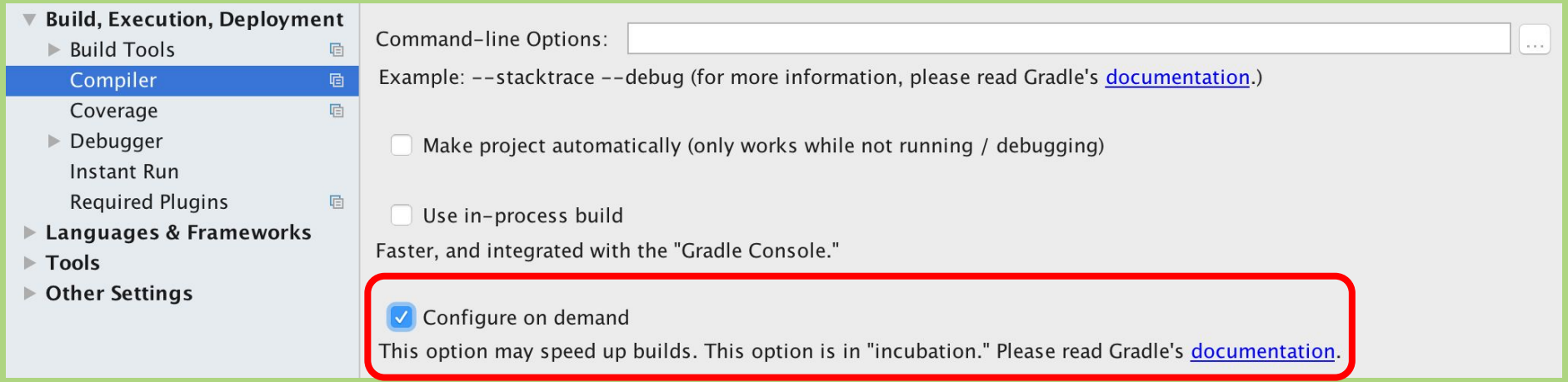
With `--configure-on-demand`

```
./gradlew build --dry-run --configure-on-demand
  ...

  BUILD SUCCESSFUL

  Total time: 3.574 secs
```

Enable Configure on Demand in
Preferences > Build, Execution, Deployment > Compiler



Enable the Daemon

- Keeps JVM instance running in background
- Speeds up startup time

```
./gradlew assembleDebug -dry-run
--configure-on-demand
```

--daemon

Without `--daemon`

```
./gradlew build --dry-run --configure-on-demand --no-daemon
  ...

  BUILD SUCCESSFUL

  Total time: 3.63 secs
```

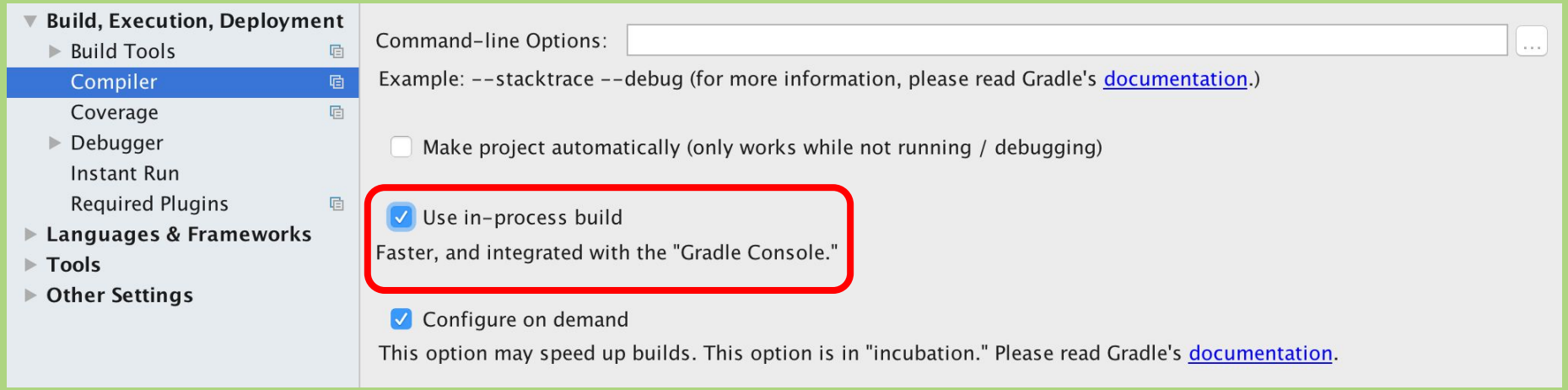
With `--daemon`

```
./gradlew build --dry-run --configure-on-demand --daemon
 ...

 BUILD SUCCESSFUL

 Total time: 1.709 secs
```

Enable Configure on Demand in
Preferences > Build, Execution, Deployment > Compiler



Use latest Gradle Distribution

Gradle 2.2.1

```
./gradlew build --dry-run --configure-on-demand --daemon
  ...

  BUILD SUCCESSFUL

  Total time: 1.709 secs
```

Gradle 2.14

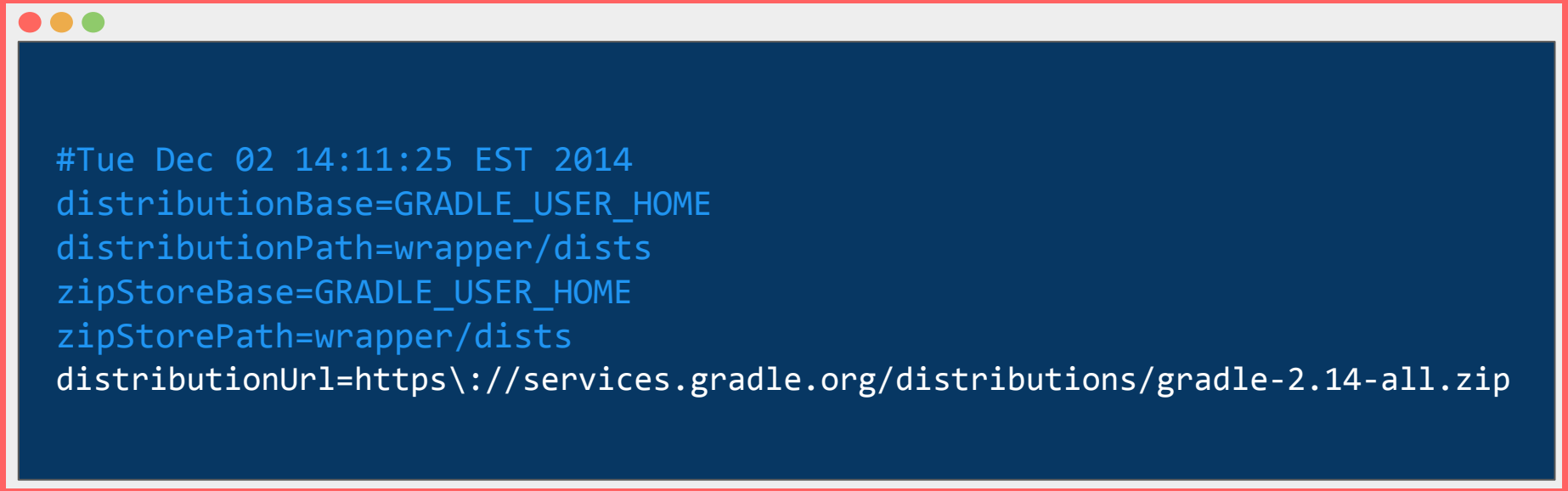
```
./gradlew build --dry-run --configure-on-demand --daemon
 ...

 BUILD SUCCESSFUL

 Total time: 1.104 secs
```

Gradle Version

Upgrade Gradle Version in
`gradle/wrapper/gradle-wrapper.properties`



Issues with using dynamic versions

```
dependencies {
    compile 'com.google.code.gson:gson:2.+'
}
```

Offline Mode

```
./gradlew assembleDebug -dry-run
 --configure-on-demand --daemon
```

--offline

Parallel Builds

```
./gradlew assembleDebug -dry-run
--configure-on-demand --daemon --offline
--parallel
```

...but when is it useful?

- Multi-project build
- Decoupled projects
- No single project dominates build time

Apply Plugins Judiciously

Apply Plugins Judiciously

Android Maps Utils : Polyline Decoding

`com.google.maps.android:android-maps-utils:0.4.4`

Methods count: **1228**

Apply Plugins Judiciously

Google Play Services : Maps

Don’t use

```
com.google.android.gms:play-services:9.4.0
Methods count : 74646
```

Use

```
com.google.android.gms:play-services-maps:9.4.0
Methods count : 15306
```

Avoid Expensive or Blocking Tasks

```
def cmd = 'git rev-list HEAD --count'
def gitVersion = cmd.execute().text.trim().toInteger()

android {
  defaultConfig {
    versionCode gitVersion
  }
}
```

Splitting `build.gradle`

CI Gradle File

Developer Gradle File

Dev Gradle		CI Gradle
	Building all flavours and variants.	
	Generating test coverage reports.	

Dev Gradle		CI Gradle
	Compiling libraries: Crashlytics, New Relic, etc.	
	Expensive/blocking tasks	

But what happens when you add a dependency to Dev gradle file and forget to add it in CI gradle file?

Build Fails

Sharing common dependencies between Dev and CI gradle files

`dependencies.gradle`

Centralising Libraries

`libraries.gradle`

Centralising Libraries

- In multi-module projects, it is very effective in restricting usage to a single version of a given library.
- It makes maintaining and upgrading libraries a lot easier.

Grouping libraries by vendor for compatibility

```
ext {
    version = '23.4.0'
    supportLibraries = [
            cardView    : "cas:cardview-v7:${version}",
            recyclerView: "cas:recyclerview-v7:${version}",
            design      : "cas:design:${version}"
    ]
}
```

- **com.android.support** is replaced with **cas**

Removing unused dependencies

Other Performance Tweaks

Boost daemon’s heap size

Invest in fast CPUs

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Boost daemon’s heap size

Invest in fast CPUs

Thank you.