

Build automation



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Agenda



Build automation

Gradle

Gradle usage example

Other build automation tools

Software build

Includes a number of tasks

- Compiling source code
- Running automated tests
- Copying resources
- Packaging the application
- …

These tasks are…

- …repetitive
- …run multiple times a day
- …expected to be as fast as possible
- …expected to work on different machines
- …ideal candidate for automation



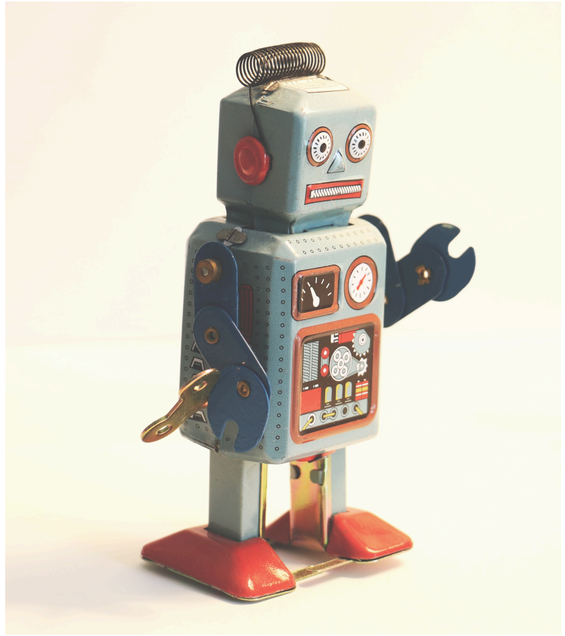
Build automation is the process of automating the creation of a software build and the associated processes

From https://en.wikipedia.org/wiki/Build_automation



Build automation

Build automation can bring a number of advantages.



- Accelerate compile and link processing
- Eliminate redundant tasks
- Minimize “bad builds”
- Save time and money

Moreover, it…

- …enables Continuous Integration
- …provides the scaffolding AI agents need to work

Gradle

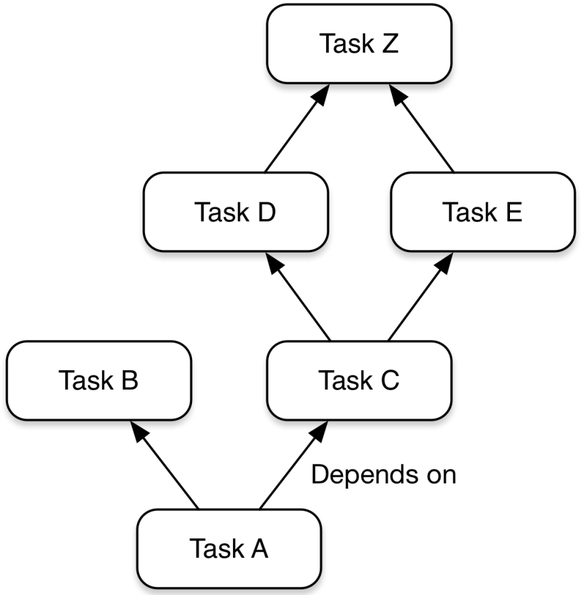
Open-source build automation tool.

- Flexibility
- Performance
- Support for many popular languages and technologies

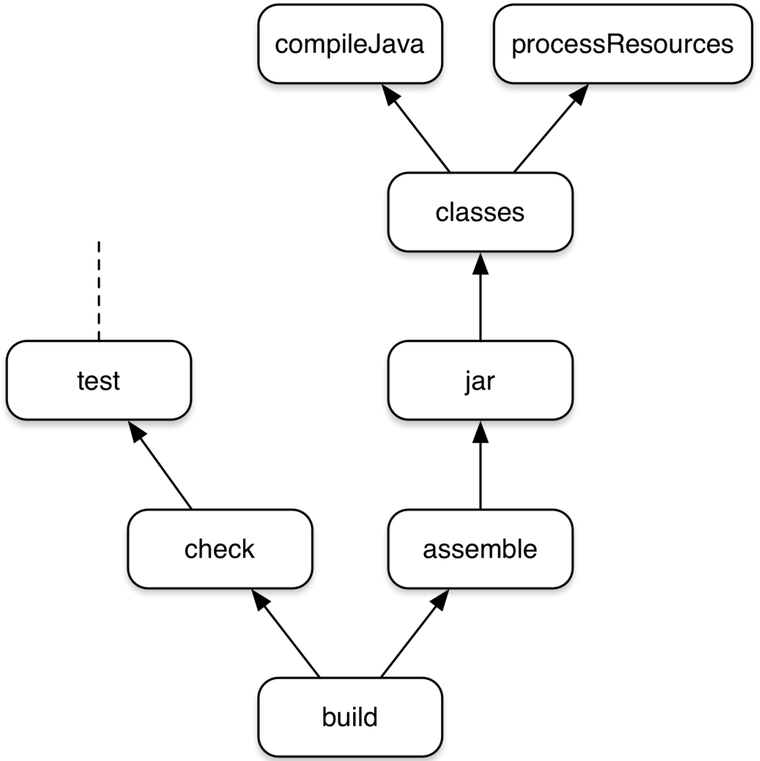


Tasks

Generic task graph



Partial task graph for a standard Java build



Picture from https://docs.gradle.org/current/userguide/what_is_gradle.html



Some Gradle features

Gradle is designed to be flexible enough to build almost any type of software.

- High performance
- Extensibility
- JVM foundations
- IDE support

Also, it is going agentic.



Picture from https://gradle.org

Gradle Plugins

Add useful features to Gradle.

- Add new tasks
- Configure the project according to conventions
- Extend core objects and objects from other plugins

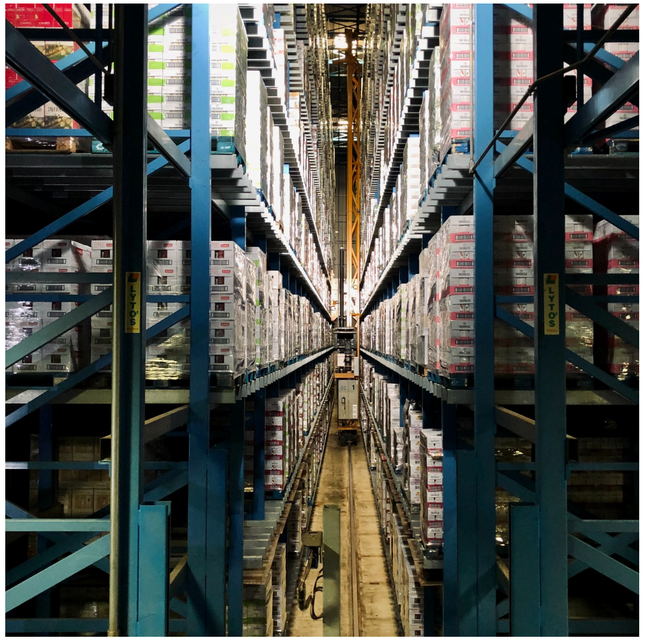


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Dependency management

Gradle most notable restriction.

- Maven repositories
- Ivy repositories
- Filesystem



Let’s try Gradle

Write a Java program that prints on the standard output the string “Hello *name*!”, where *name* is the first program argument, or “Hello stranger!” when no argument is provided.



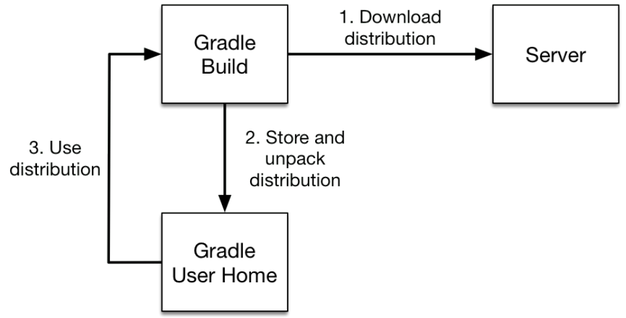
- Create a new Java project using Gradle
- Look at the project structure and files
- Write the program
- Run some tasks

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Gradle Wrapper

A script that invokes a declared version of Gradle, downloading it beforehand if necessary.

- Recommended way to execute Gradle build
- Developers can get up and running quickly
- Standardizes a project on a given Gradle version



Picture from https://gradle.org

Creating executable Java applications

```
plugins {
  id 'java'
}

[…]

jar {
  manifest {
    attributes('Main-Class': ‘myPackage.MyClass')
  }
}
```

Java plugin

Configure the jar manifest to create an executable jar file.

```
plugins {
  id ‘application'
}

[…]

application {
  mainClass = 'myPackage.MyClass'
}
```

Application plugin

Specify the main class (i.e. entry point) of the application.



Build automation and the final exam

Some suggestions.

We…

…run your application to see how it works and test it manually.

You should…

…configure your project for creating an executable Java application.

And also…

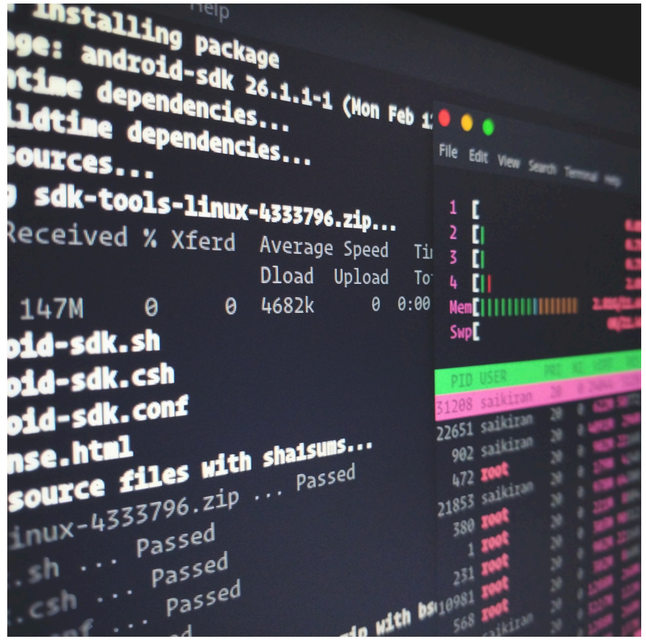
…provide instructions (e.g., on a README file) on how to build and run the application.



Other build automation tools

Gradle is only one of the available tools for build automation.

- make
- MSBuild
- Apache Ant
- Apache Maven
- ...



References



Build automation

https://en.wikipedia.org/wiki/Build_automation

What is Gradle?

https://docs.gradle.org/current/userguide/what_is_gradle.html

Gradle User Manual

https://docs.gradle.org/current/userguide/userguide.html