

Building Software Systems

Lecture 7.2 **CI and CD**

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What is Continuous Integration?

Continuous Integration (CI) is a software development practice usually used in Agile Development

- CI is useful where members of a team integrate their work frequently (e.g., multiple commits in repo every day)
- CI involves executing a set of automated tests every time a pre-defined event occurs (e.g., a push to the repo)
- The idea is to detect early integration errors, before a QA team takes up thorough testing of the product

There are three key components of CI

- **Source Code Repository:** All project code is stored in a version control system, accessible by every team member
- The repository (usually a git repository) is placed at some centralised server, where developers “push” changes
- **Automated Building:** A framework that automatically compiles and builds the code on a change
- We will have a look at one such example today – Maven for Java Projects
- **Automated Testing:** A framework that automatically executes tests over a prepared build of the code
- While we will not see an example of the same, Maven can be easily integrated with tools like JUnit to do the same

The purpose of CI is to perform automated Sanity/Smoke/Regression Testing over a change

What is Continuous Deployment?

Continuous Deployment or Delivery (CD) is a software development practice usually preceded by CI

- It involves deploying an artifact to a deployment server
- The artifact could be technology-specific (e.g., JAR/WAR file for Java, Wheel/Egg for Python, Gems for Ruby etc.)
- They could also be produced in the form of VM/Container Images

Typically, CD and CI are part of one automated process, called a *CI/CD Pipeline*

- It is called a pipeline since there are multiple steps in the process ...
- ... and the output of one step may be required as input in another step
- Since the central point is the code repo, it is usually provided by the repo hosting vendor/service
- You are required to provide the steps to perform the CI/CD through config files (usually in YAML format)

We will have a look at these pipelines on two different platforms today

Check out the Video Recording of the Lecture

<https://www.youtube.com/watch?v=yX0ot1H1J0g>