# Continuous Integration

Overview

- It is the process of **automating** the building and testing of code, each time developer commits changes to the version control system

- The main aim of CI is to prevent manual integration problem

- CI requires developers to have frequent builds

- The common practice is that whenever a code commit occurs, a build should be triggered

changes → SCM → build → test → deploy
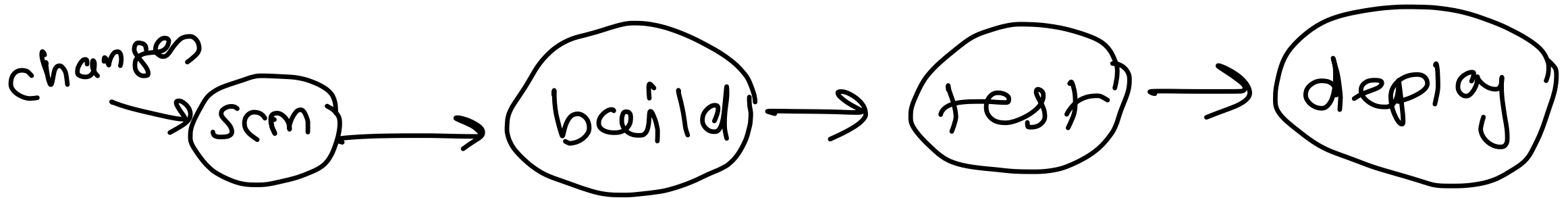
Importance

- Improves product quality
  - Improves the product quality by running the various unit test cases every time developer commits changes
- Increase productivity
  - Automating build of code saves a lot of time, thereby increasing productivity
  - Developer can utilize the time more to develop the code
- Reduces risk
  - Eliminates the potential human errors by automating test

Popular CI tools

Jenkins

TeamCity

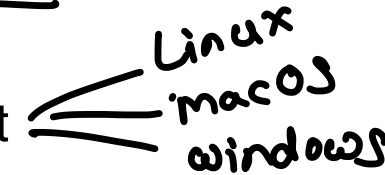Bamboo

GitLab CI

Travis CI
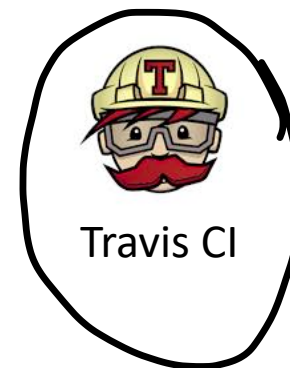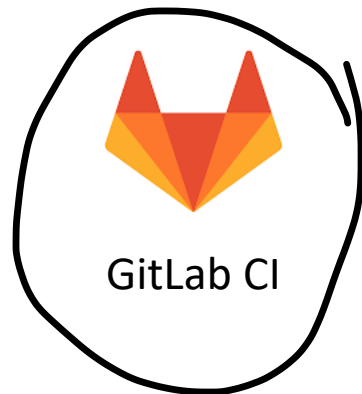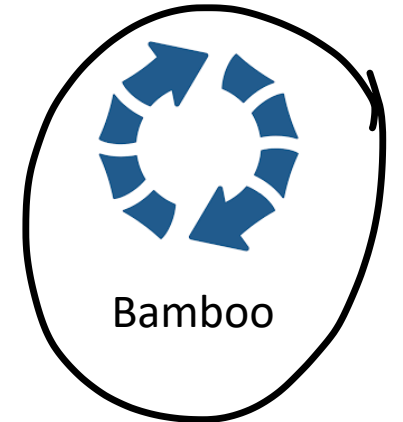
Jenkins

Overview

- Jenkins is a powerful application that allows continuous integration and continuous delivery of projects
- It is a free source that can handle any kind of build or continuous integration
- It was first started as project Hudson at Sun Microsystems in 2004 and was first released in Feb 2005
- In 2011, Oracle created fork of Hudson as Jenkins, since when these two projects exist as two independent projects
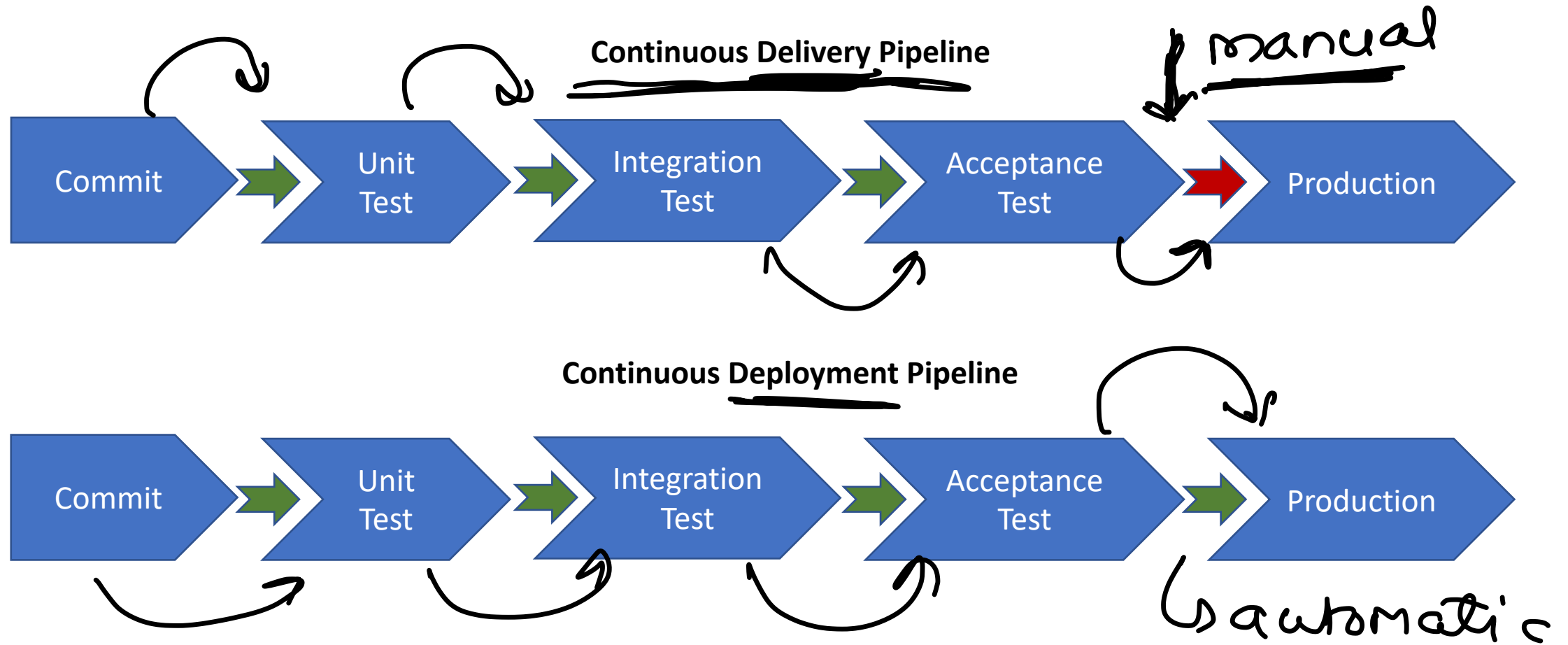
Hudson jenkins

Why Jenkins?

- It is open source and free

- It has got plugin support

- It has a huge community

- It is fast and reliable

- It has good OS support ← Linux
  macOS
  windows

- It supports scripted build

CI/CD Pipeline

Continuous Delivery Pipeline

manual

| Commit | → | Unit Test | → | Integration Test | → | Acceptance Test | → | Production |

Continuous Deployment Pipeline

| Commit | → | Unit Test | → | Integration Test | → | Acceptance Test | → | Production |

automatic

Jenkins Projects

- Freestyle
    - Used to build the project with any SCM and any build system
- Pipeline
    - Suitable for building pipelines or organizing complex activities that do not easily fit in the free style
- Multi configuration
    - Suitable for projects that need large number of different configurations
- Folder
    - Used to create containers (folders) to organize the jobs
- GitHub Organization
    - Used for GitHub projects