

---

# Automating the Software Development Workflow

— Continuous Integration —

---

# Continuous Integration and Delivery

- Building software involves many tasks
- It integrates frequently contributed software via many developers with automated build support
- Allows early detection of problems
- It is a server based system that runs on servlet container apache tomcat
- it monitors the execution of repeated jobs

# Jenkins -- OSS CI

- Open-source automation server
- 1.5K plugins to support the automation of many development tasks
- Works with major O/S and docker containers
- It builds your software as a workflow of tasks called **pipeline**
- SUCCESS or FAIL (with detailed log)
- Similar systems: GitLab CI, Buildbot, Drone, and Concourse

# What kind of tasks?

- Fetch code from repository
- Build software
- Run automated tests
- Create logs of all tasks, and their success status
- If all OK, deploy

# Task Phases

Pre build -- Coding conventions (StyleCop, JSminimizer)

Build -- fetch code, compile, run tests

Post build -- report, archive, deploy

# Testing and Deployment

Can create workflows -- integrate with external processes

- for deployment
- Issues (github, JIRA)
- Automated documentation
- Any API

Create pull requests with auto testing

# Triggers

Events that cause action

I.e. Every commit triggers a build

- New functionality will be build on a different empty machine
- automated verification
- Tests
  - Unit
  - Functional
  - Performance
  - Multiple Web platforms
  - Any errors will be notified to relevant person

# Benefits of CI and CD

- Automation creates consistency
- Testing and coverage are automated -- accuracy and reduction of error prone work
- Bugs caught early and often
- Faster development
- Easy deployment



# Big Picture

- **Source Control** -- Single source repository
- Each commit **triggers** an automated build with tests
- For each commit **testing** and code **coverage** is automatically performed
- Broken builds are **early** to team and responsible developer
- Test are run in a clone of **production** environment

# Continuous Delivery

