DevOps

What is DevOps

- **DevOps is the practice of development and operations engineers participating together in the entire service lifecycle, from design through the development process to the production support.**

The benefits of DevOps

- Technical
- Culture
- Business

The benefits of DevOps

Technical benefits:

- Continuous software delivery
- Less complexity to manage
- Faster resolution of problems

Cultural benefits:

- Happier, more productive teams
- Higher employee engagement
- Greater professional development opportunities

Business benefits:

- Faster delivery of features
- More stable operating environments
- Improved communication and collaboration
- More time to innovate (rather than fix/maintain)

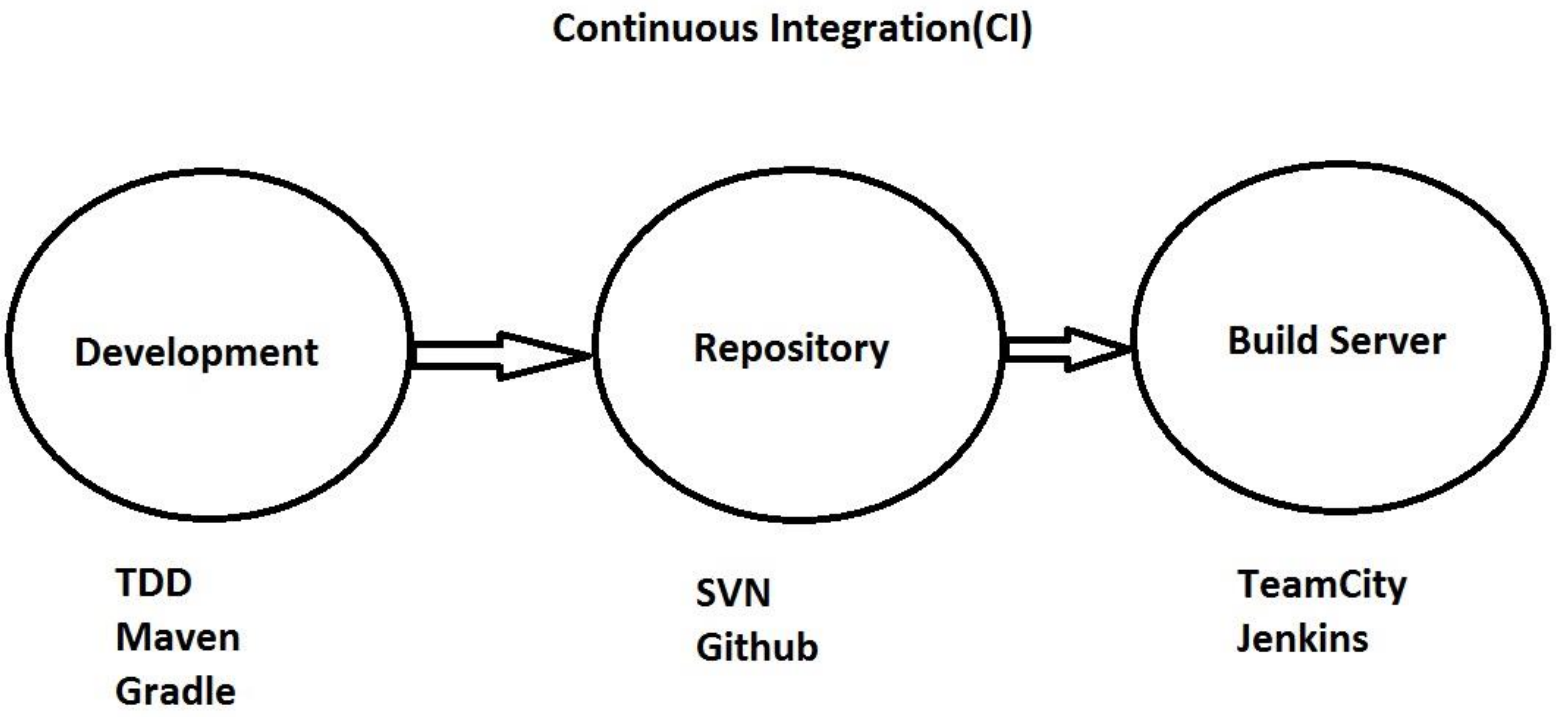
DevOps Divisions

- CI – Continuous Integration
- CD – Continuous Delivery
- CD – Continuous Deployment

Continuous Integration vs Continuous Delivery vs Continuous Deployment

- **Continuous Integration** basically just means that the developer's working copies are synchronized with a shared mainline several times a day.
- **Continuous Delivery** is described as the logical evolution of continuous integration: Always be able to put a product into production!
- **Continuous Deployment** is described as the logical next step after continuous delivery: Automatically deploy the product into production whenever it passes QA!

Continuous Integration



Benefits of Test Driven Development (TDD)

- Faster feedback
- Higher Acceptance
- Interfaces (don't think about the private methods or inner workings)
- Dependencies
- Increasing Returns
- Examples
    - Factorial test cases
    - Barclay on line evaluation
    - Bank Application Project

Build and Project management Tools

- Ant
- Maven
- Gradle

Maven pom.xml

- Consist of 4 major things

1) Project Info
2) Dependencies
3) Plugins
4) Repository

Gradle

- Gradle does not use XML. Instead, it has its own DSL(Domain Specific Language) based on ***Groovy*** (one of JVM languages)
- Gained a lot of attention in a short period of time. For example, Google adopted Gradle as the default build tool for the Android OS.
- Gradle effort can be summed as “convention is good and so is flexibility”.

SonarQube

Sonar covers below code quality

- Unit tests
- Duplicate code
- Potential bugs
- Complex code
- Coding standards
- Comments

Github

- Git offers a decentralized model
- Git is fast and excellent for managing large open source projects with many collaborators.
- GitHub lets you connect with and follow other developers, sort of like Facebook for software developers.

BDD

- Behavior Driven Development (BDD) is a software development process that originally emerged from Test Driven Development (TDD).
- BDD uses examples to illustrate the behavior of the system. These examples include –
  - Converted into executable specifications.
  - Used as the acceptance tests.

TDD vs BDD

- TDD describes how the software works.
- On the other hand, BDD –
  - Describes how the end user uses the software.

Story and Scenarios

Story

As a customer,

I want to withdraw cash from an ATM,

so that I do not have to wait in line at the bank.

Story and Scenario

- **Scenario 1** – Account is in credit

  Given the account is in credit

  And the card is valid

  And the dispenser contains cash

  When the customer requests cash

  Then ensure the account is debited

  And ensure cash is dispensed

  And ensure the card is returned

Story and Scenario

- **Scenario 2** – Account is overdrawn past the overdraft limit

  Given the account is overdrawn

  And the card is valid

  When the customer requests cash

  Then ensure a rejection message is displayed

  And ensure cash is not dispensed

  And ensure the card is returned

Docker

- With Docker containers, you can also ensure that developers don’t need an identical production environment set up.
- Can use their own system to run Docker containers on VirtualBox.
- Beauty of Docker is that you can run the same container on Amazon EC2 instances

AWS

- Cloud provider
  - IAAS(Infrastructure As A Service)
  - PAAS(Platform As A Service)
  - SAAS(Software As A Service)