DevOps Training

Suryaraj Timsina

Recap

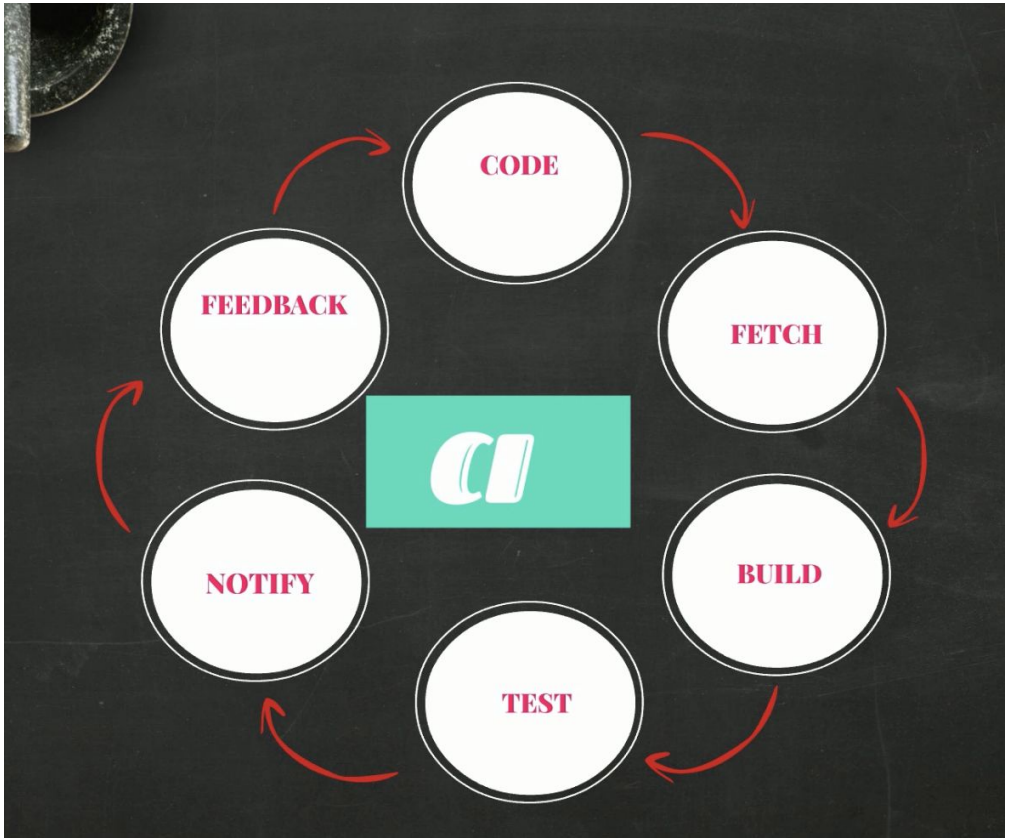
1. Syllabus
2. Introduction
3. Why Learn DevOps?
4. What is DevOps?

Agenda

1. What is Continuous Integration?
2. What is Continuous Delivery?
3. What is Virtualization?
4. VM Setup

What is Continuous Integration?

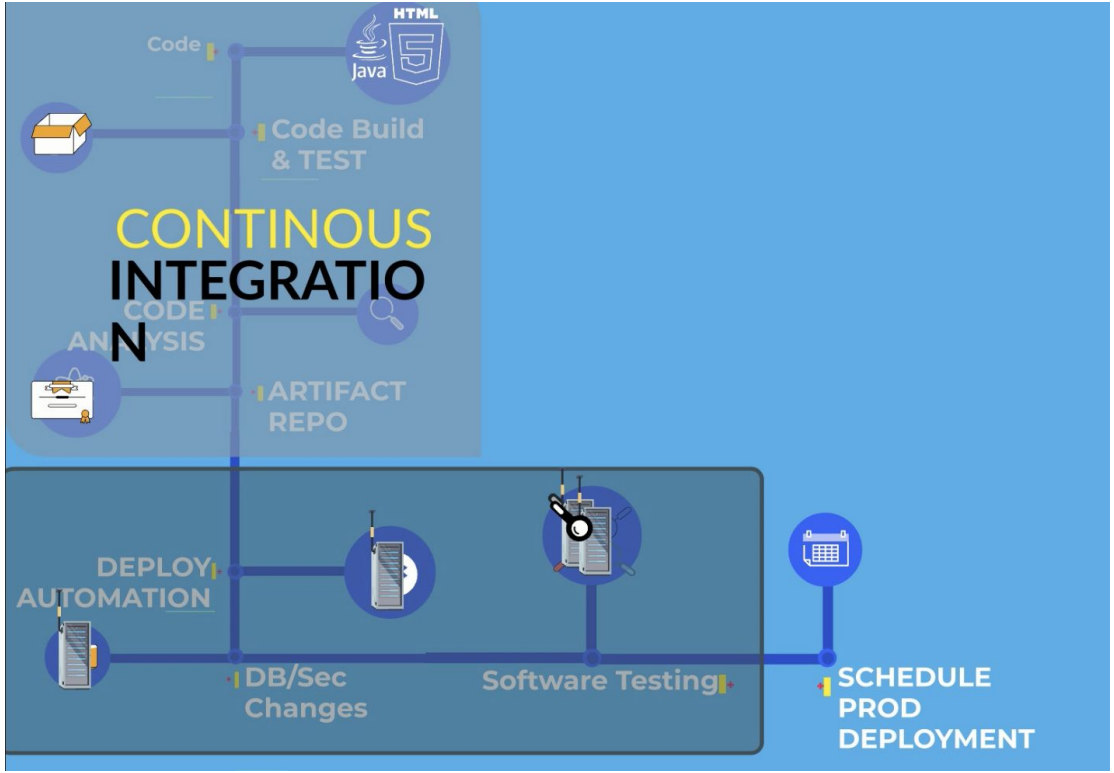
1. An automated process in DevOps which generates software and it's features quickly and efficiently.



What is Continuous Integration?

Goal of CI Process:

To detect the defects at very early stage so it is not multiplied.



It is a software development practice where developers regularly merge their code into a central repository after which automated builds and tests are run.

TOOLS

IDE

Used by developers for coding. These IDE will be integrated with version control system to store and version the code.

- Eclipse
- Visual Studio
- Atom
- Pycharm

TOOLS contd.

Version Control System(VCS)

- GIT
- SVN
- TFS
- PERFORCE

TOOLS contd.

Build Tools

Based on the programming language.

- MAVEN, ANT, GRADLE
- MSBUILD, VISUALBUILD
- IBM URBANCODE
- MAKE
- GRUNT

TOOLS contd.

Software Repository

To store software artifacts

- Sonatype Nexus
- JFROG Artifactory
- Archiva
- CloudSmith Package
- Grunt

TOOLS contd.

CI Tools

Integrates everything

- Jenkins
- CircleCI
- Teamcity
- Bamboo CI
- Cruise Control

What is Continuous Delivery?

1. An automated process of delivery of code changes to servers quickly and efficiently at an enormous phase.
2. It is the extension of continuous integration.
3. Deployment is not just about shipping the software to the servers, it’s more than that.
4. A deployment means also,

- Server provisioning
- Installing dependencies on servers
- Configuration changes
- Network and firewall rule changes.
- Deploy the artifact to the server
- Any other changes.

What is Continuous Delivery?

Problem:
Ops team will be flooded with requests and as CI process will generate faster and regularly.

- Regular deploy requests.
- No clear instructions.
- Already occupied.
- System uptime
- ITIL process driven

After the manual deployment, information will be sent to QA team for testing after conducting testing QA team will send back information.

There is too much of human intervention and manual approval in this process.
Solution:
- Automate it
- Any and every steps in deployment should be automated.

What is Continuous Delivery?

Deployment:

- Server provisioning
- Dependencies
- Config changes
- Network
- Artifact deploy
- Other changes

Tools:

There are alot of automation tools available in the market like

- Ansible, puppet, chef for system automation
- Terraform, cloudformation for cloud infrastructure automation.
- Jenkins, Octopus deploy for CICD automation

What is Continuous Delivery?

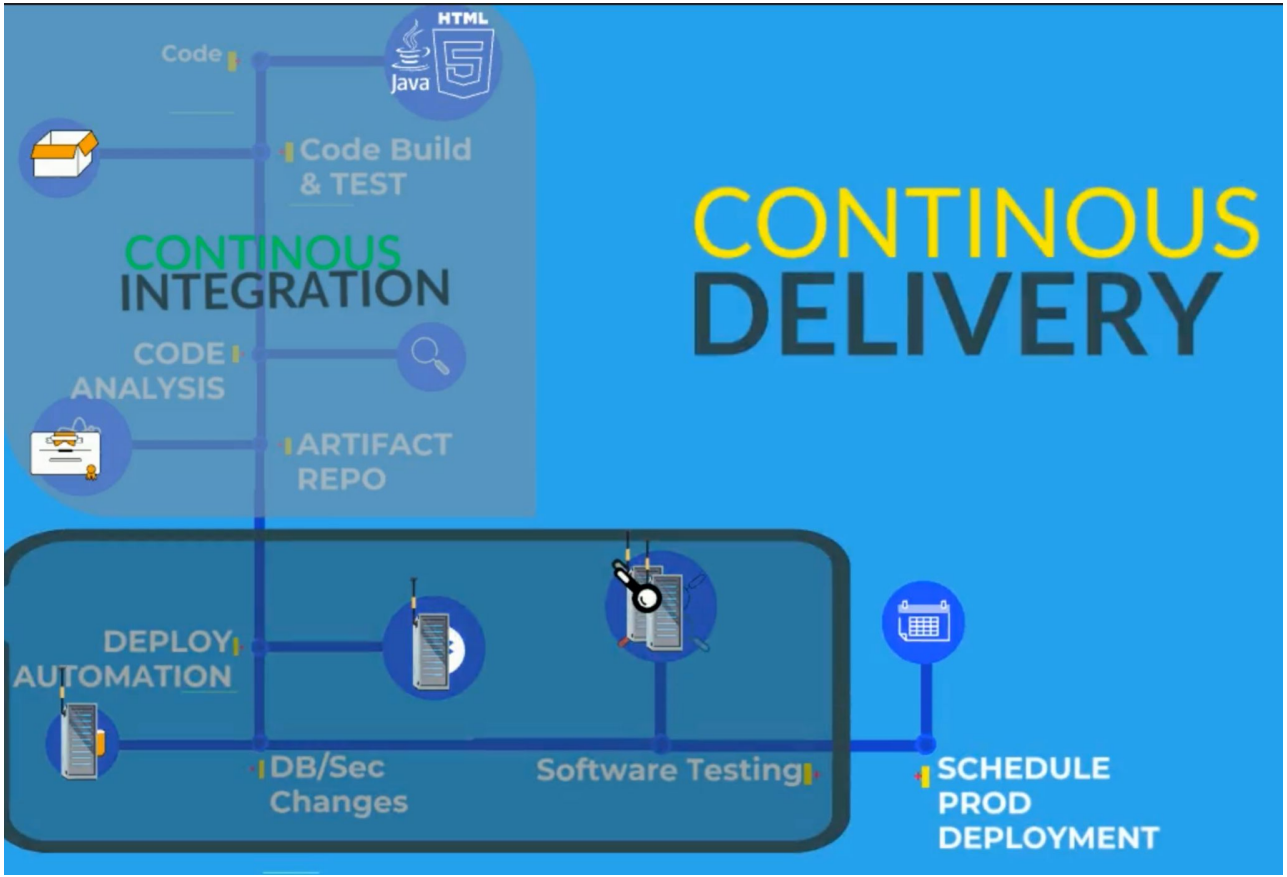
Test Automation

- Software testing also has to be automated.
- Any test process like functional, load, performance, databases, network and security

So Ops team will write automation code for deployment.

Tester will write code for software testing and sync it will developer source code.

What is Continuous Delivery?



What is Virtualization?

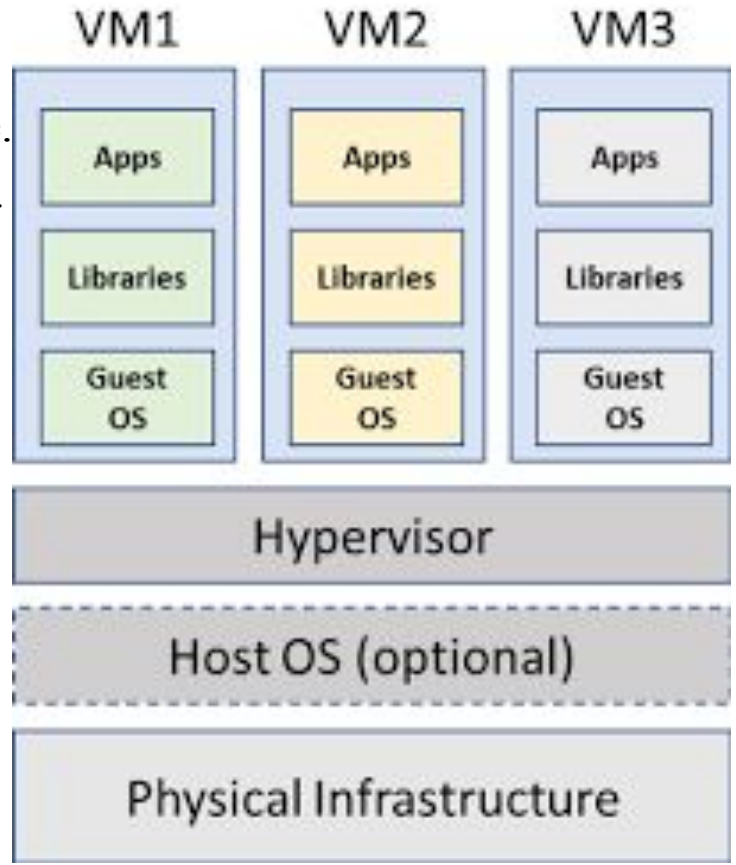
One computer can run multi OS parallelly.

Life before virtualization

- To run App/services we need servers.(Tomcat, apache2, mysql)
- Physical computers(servers in Datacenter)
- One service - One server(Isolation)
- Servers are always overprovisioned. If we need 8gb, 12gb is provisioned
- Server resources mostly underutilized.
- Huge capital expenditure and operating expenditure

What is Virtualization?

- Enter VMWare
- Allow one computer to run multiple OS.
- Partition physical resources in virtual resource.
- Virtual machine runs in isolation environment.
- Each VM needs it’s own OS.
- Server virtualization is the most common Virtualization. But there are other kind of virtualization as well(network, storage).



Terminologies

Host OS

- This is the OS of the physical machine.

Guest OS

- OS of the virtual machine. Virtual machines are also known as guest machine.

VM

- Short form of virtual machine.

Snapshot

- A way of taking backup of VM.

Hypervisor

- Enables virtualization
- Tool or the software that let’s us do or create VM.

Types of Hypervisor

Type-1

- Baremetal
- Runs as a Base OS
- Production
- E.g VMWare EsXI, Xen Hypervisor, Hyper-V

Type-2

- Runs as a software
- Learn and Test Purpose
- E.g Oracle Virtualbox, VMWare server

Creating VM on Virtualbox manually

Prerequisites

- Virtualbox

  https://www.virtualbox.org/

- Ubuntu 20.04 iso

  https://releases.ubuntu.com/focal/

Creating VM on Virtualbox automatically using Vagrant

What is Vagrant?

Vagrant is an automation tool to manage VM lifecycle, right from creating a virtual machine to making any changes, deleting it, recreating it, provisioning it, anything that we do manually with VMs, we can automate that by using vagrant. Vagrant is a command line tool.

- Create VM Automatically
- Vagrant Commands
- Vagrant Networking
- Provisioning
- RAM, CPU, & Disk
- Multi VM Vagrantfile
- Documentation

Creating VM

VM Management problems

- OS Installations
- Time Consuming
- Manual setup
- Tough Replication for Multi VM
- Documentations for Multi VM

Creating VM

Vagrant for VM's

- No OS installations
- VM Setup through Images(vagrant boxes)
- Images/ Boxes available in Vagrant cloud
- Manage VM's with a file(Vagrantfile)
- VM changes automatic through Vagrantfile
- Vagrant commands to manage VM's
- Provisioning VM/ Executing commands & scripts

Vagrant Setup

- VT(Virtualization Technology) Enabled in BIOS

Creating VM

Vagrant tool

- Hypervisor like Oracle Virtualbox
- CLI(Command line interface) like GIT Bash

VM Setup with Vagrant

- Vagrant Box name from https://app.vagrantup.com/boxes/search
- Project Directory(Folder/Directory at any location of your choice)
- Vagrantfile in Project Directory
- Vagrant commands like 'vagrant up'
- Login with 'vagrant ssh' command for Linux vm's