

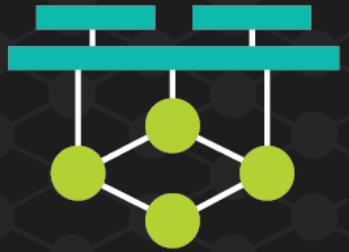
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# DevOps for Networking

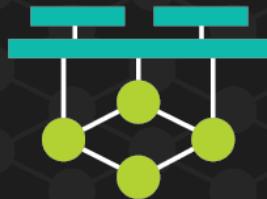
Category: Enterprise IT & Operations (Dev & Business)

Date: 3<sup>rd</sup> – 5<sup>th</sup> April'19

Venue : San Jose, CA, USA

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## PRESENTERS & CONTRIBUTORS



**JAY SHAH**

*DevOps & Network Engineer*

M.S - Telecommunication and Network Engineer  
Southern Methodist University, Dallas, TX



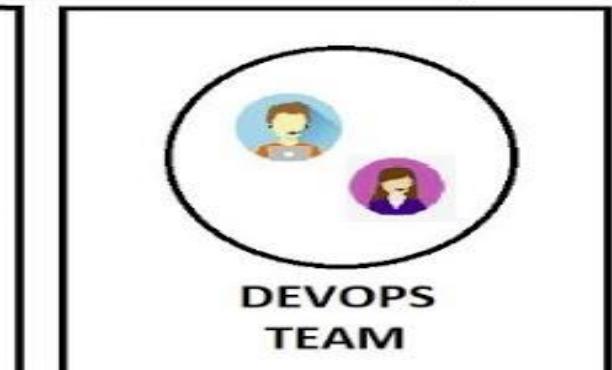
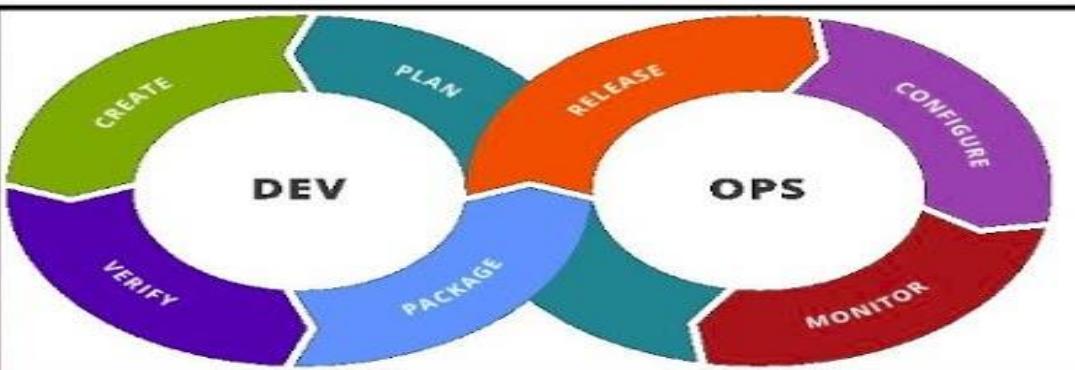
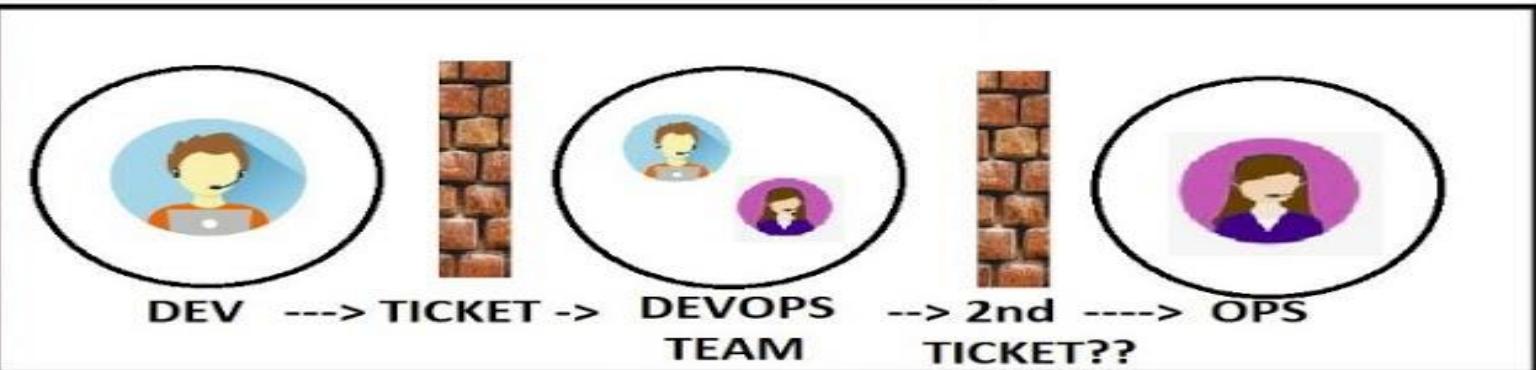
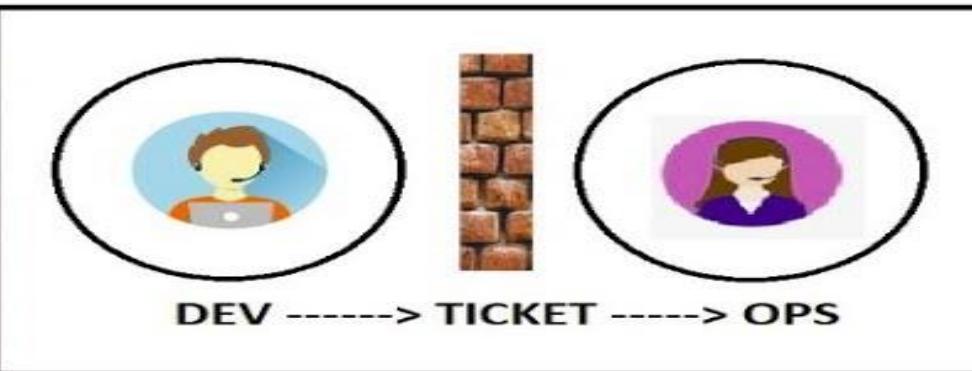
**DUSHYANT DUBARIA**

*DevOps & Cloud Engineer*

M.S - Telecommunication and Network Engineer  
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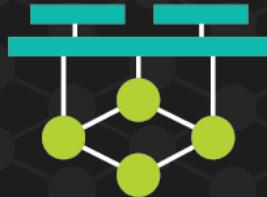
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# CONTENT

ABSTRACT

AGILE METHODOLOGY

DEVOPS CULTURE/ COLLABORATION

DEVOPS LIFECYCLE & TOOLS

CONTAINERIZATION & CLOUD

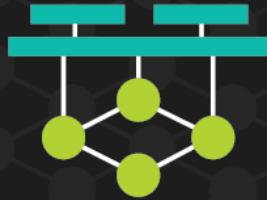
DOCKER / KUBERNETES

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WRAP UP

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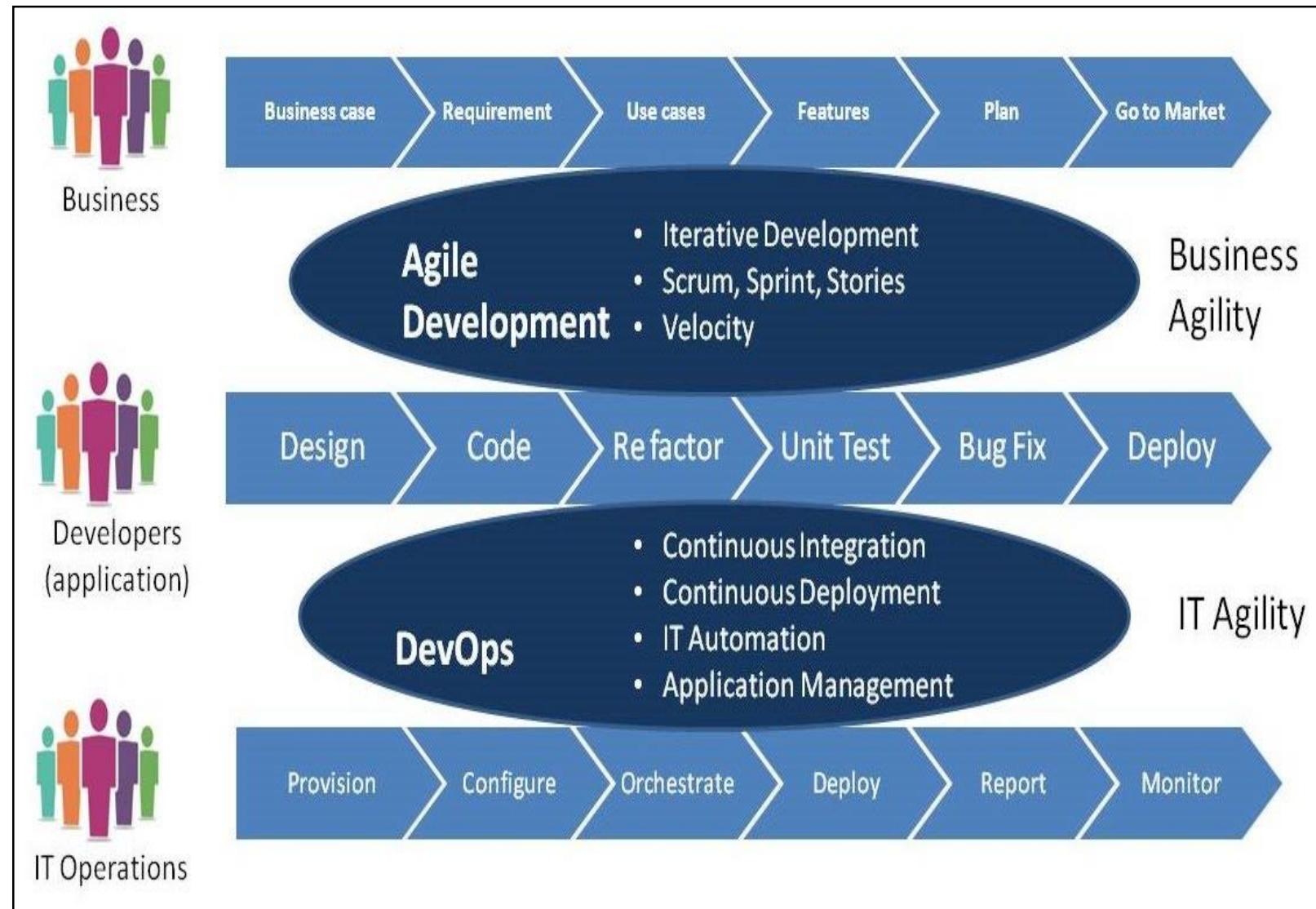
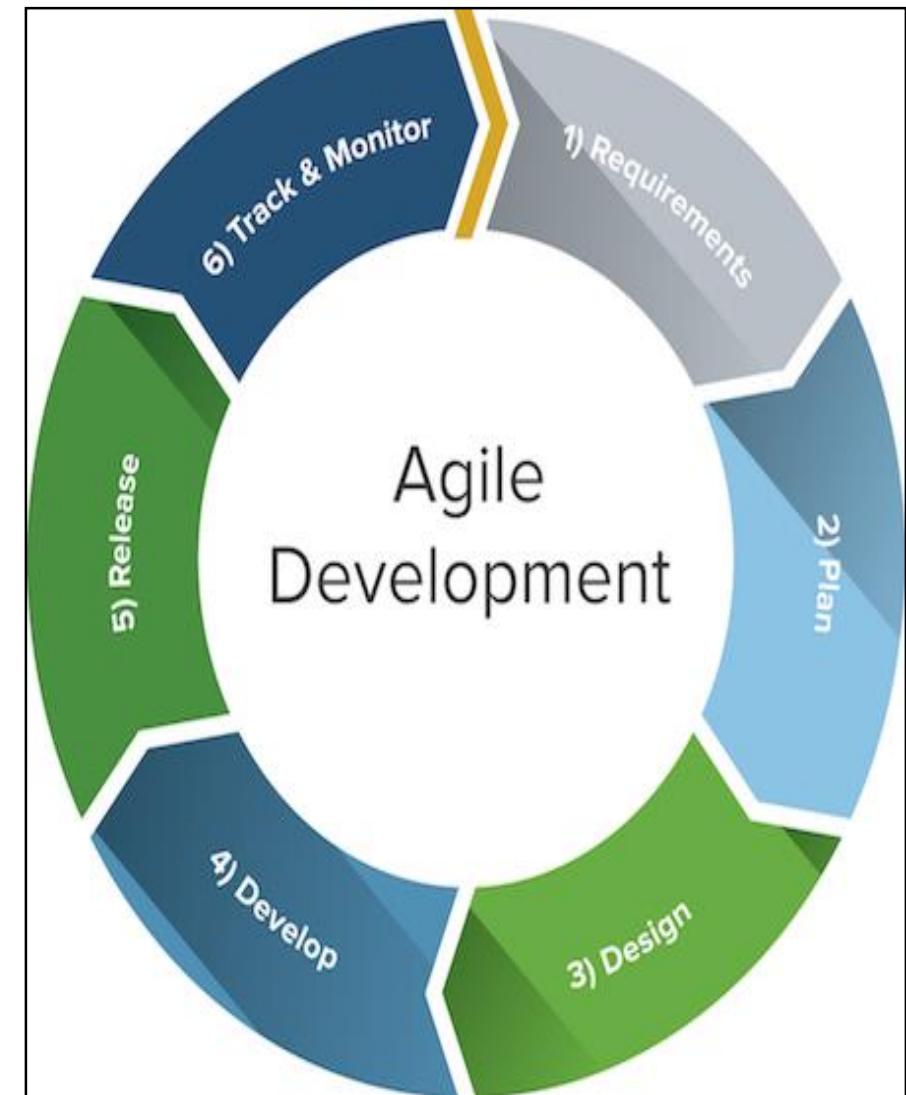
# ABSTRACT

- DevOps is a new methodology that combines developers and operations team.
- It closely integrates people, processes and technology for an automated software delivery that is agile, scalable and cost-effective.
- DevOps delivery is a combination of two previous methods; agile software development and the collaboration between development and operations team.
- By changing the way we think to deploy an infrastructure through the entire product life-cycle, from the design through the production phase, we can deliver consistent and repeatable designs.
- By abstracting the configuration needed to launch server instances with specific configurations into consistently repeatable recipes or manifests, the entire technology stack becomes converged.
- In order to do this, both operation and development skills are required.
- To demonstrate the power of DevOps tools we have deployed a web-based ticket booking website using GIT, Ansible, Vagrant, Docker and Jenkins.

# AGILE

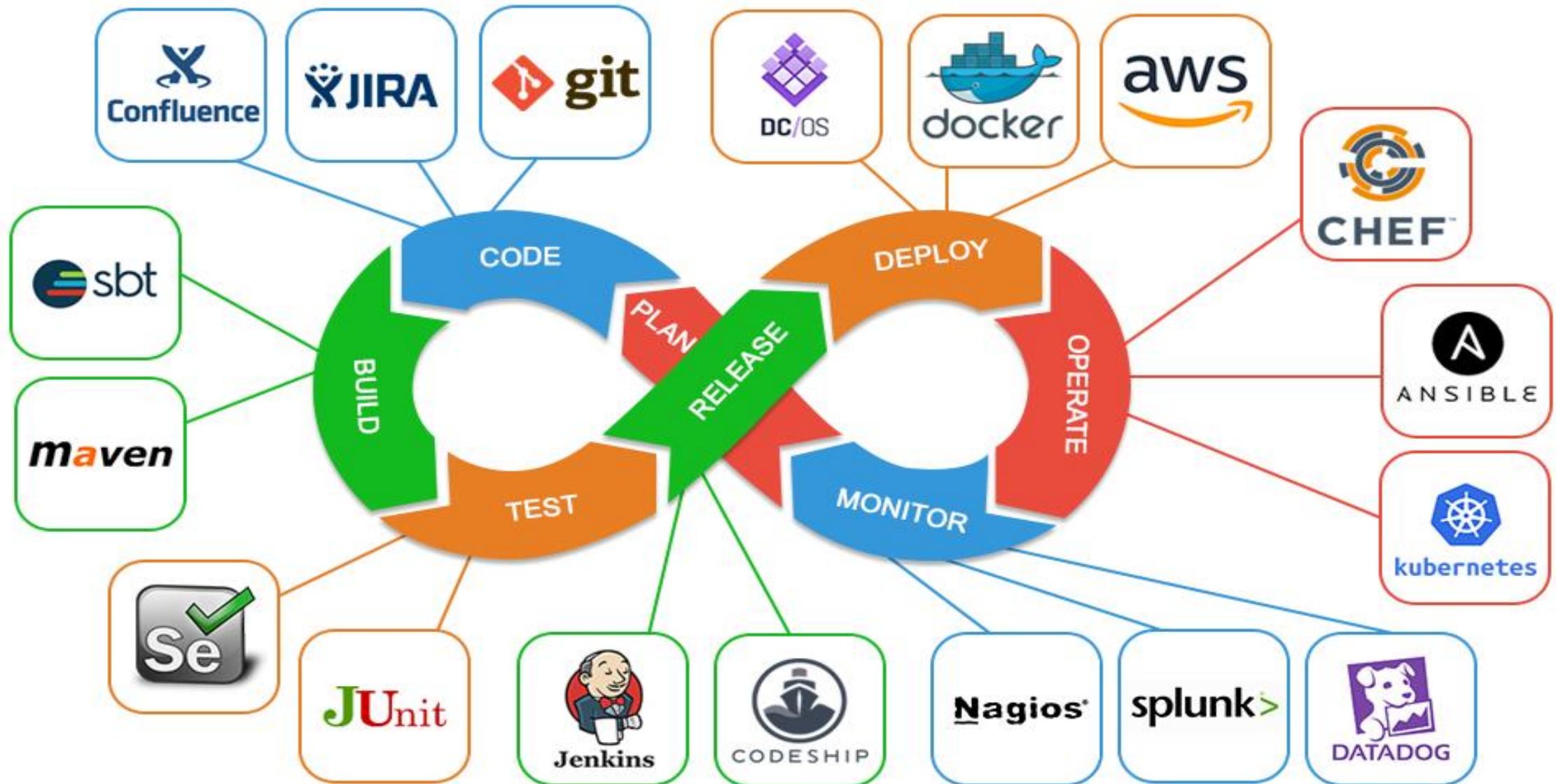
TO

# DEVOPS



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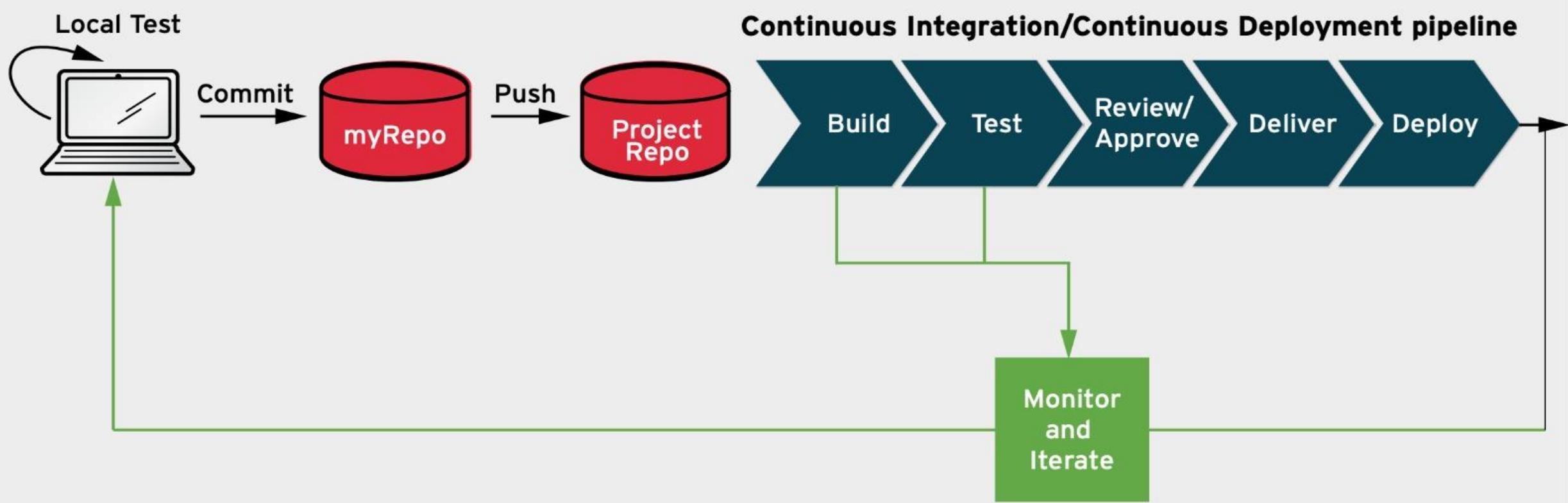
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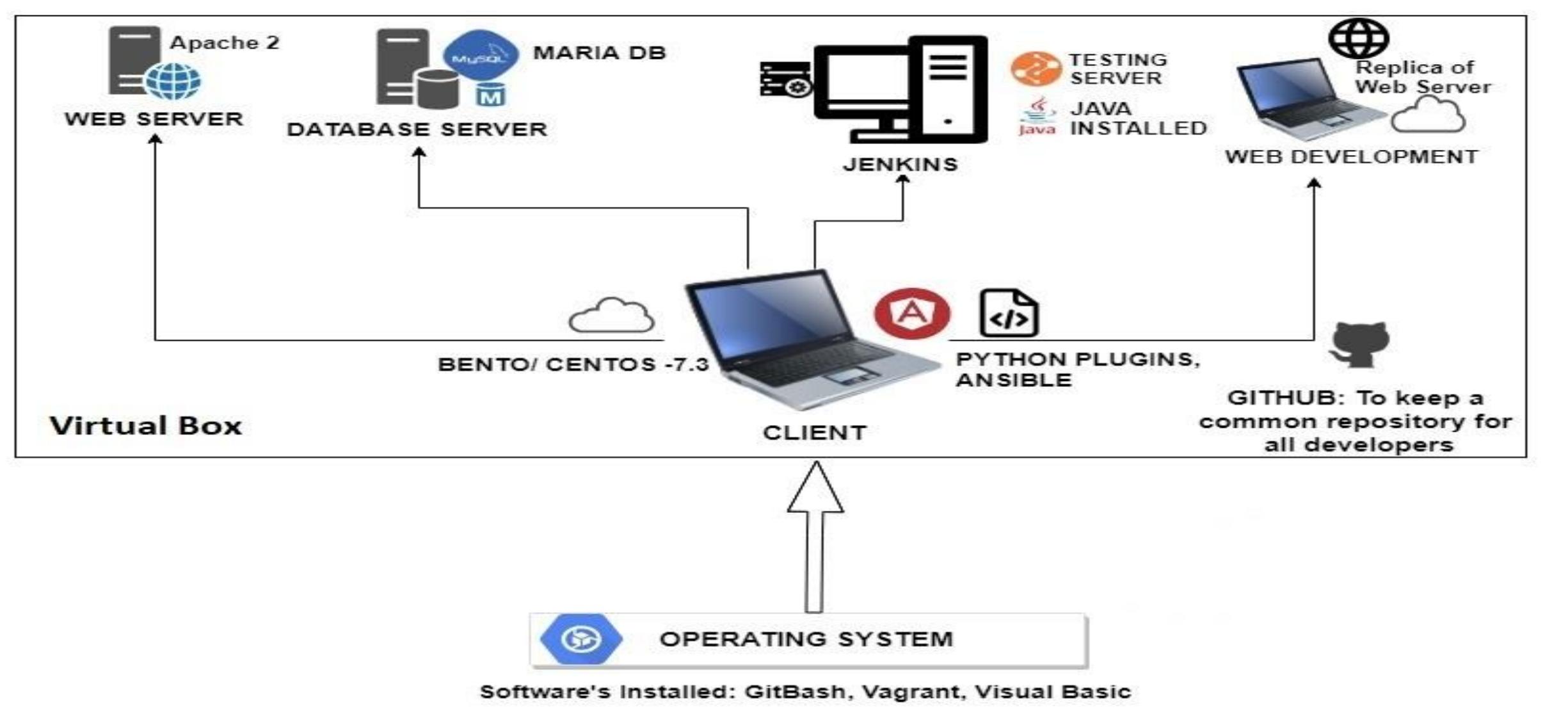
# DEVOPS CULTURE OF COLLABORATION



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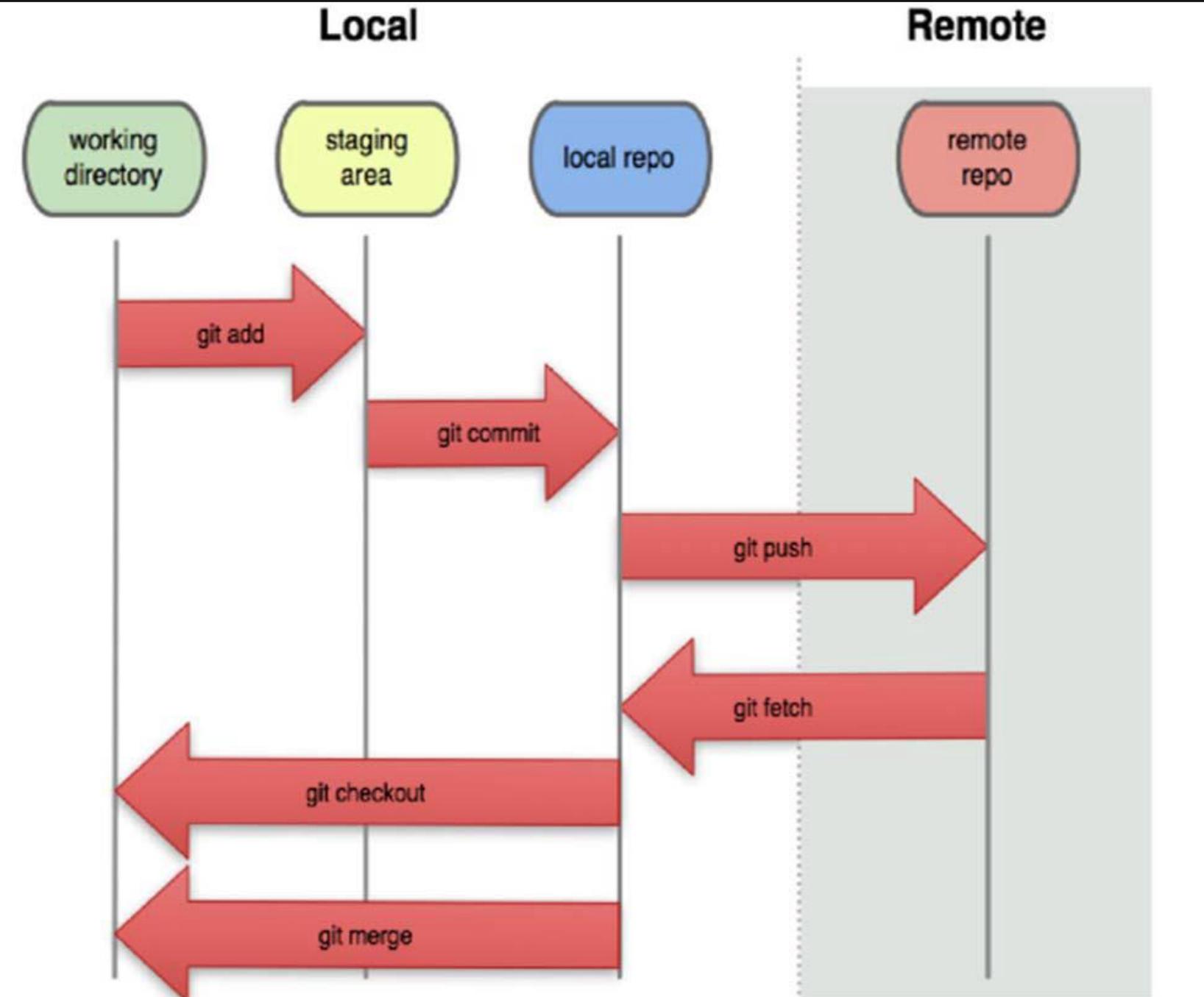
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# DEVOPS INFRASTRUCTURE



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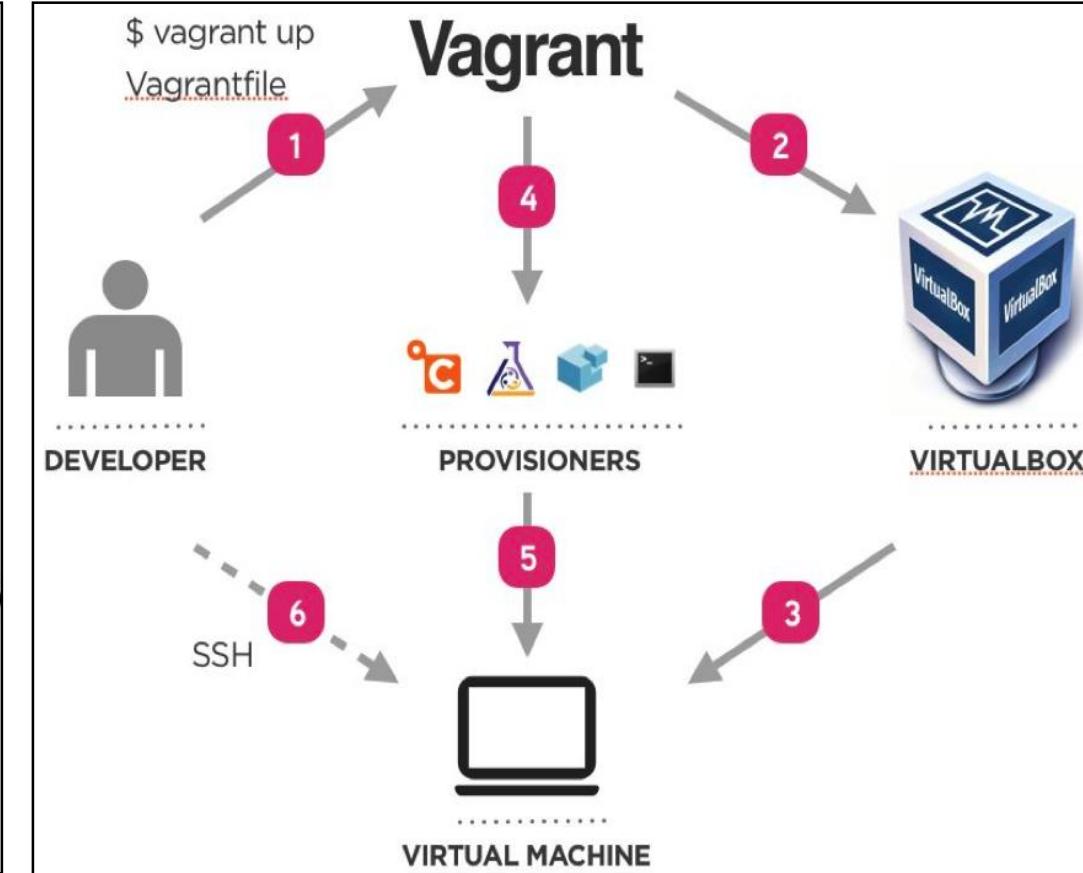
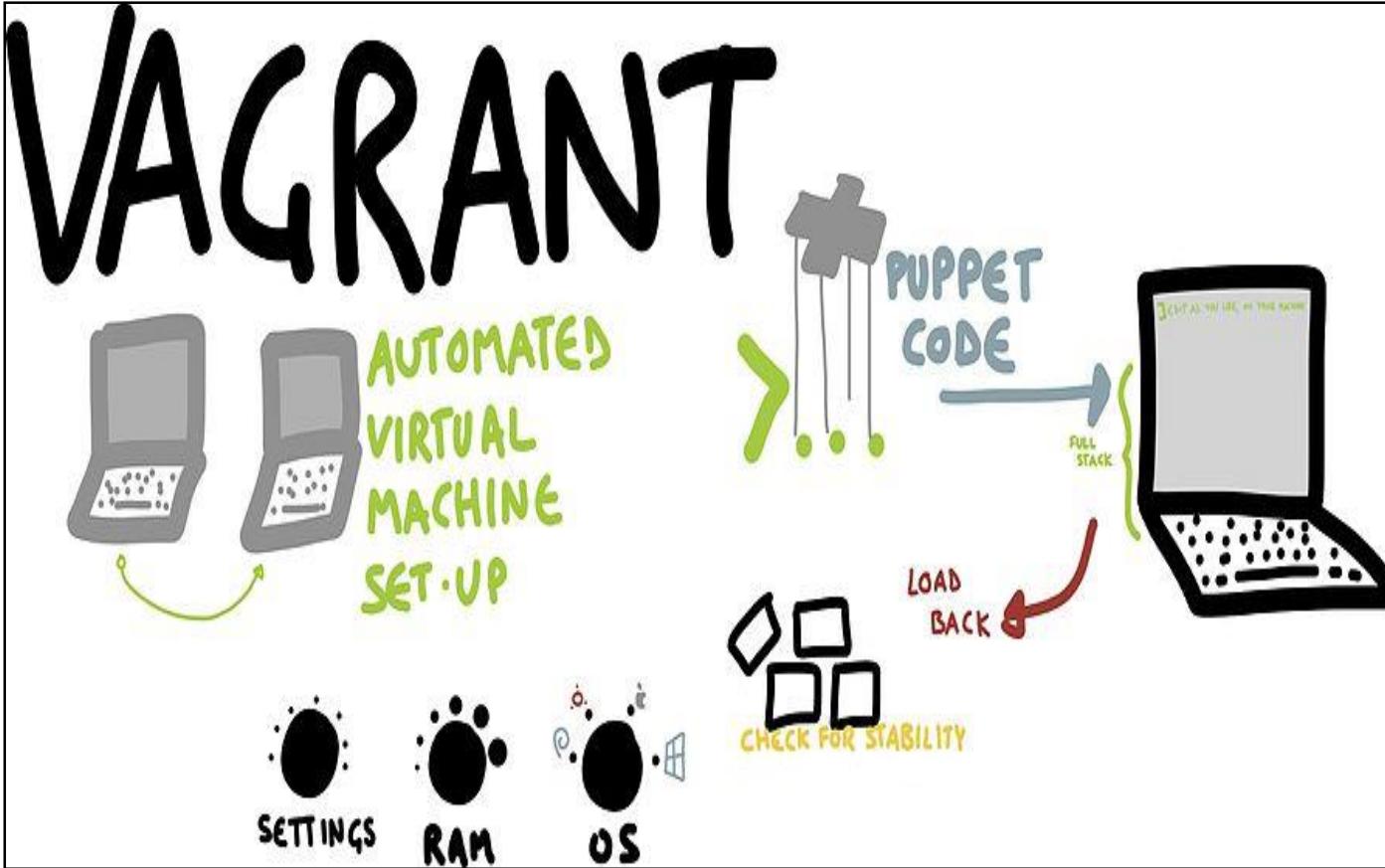
## GIT - DVCS

- Peer to peer approach
- contains full project history
- Ability to work on same project
- Developers can edit or change code and can work differently
- Git can be integrated with GitHub so repository can be accessed from anywhere

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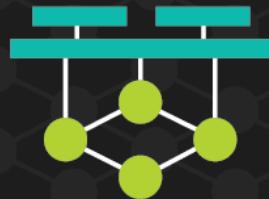
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# VAGRANT-PROVISIONING TOOL



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Public/Private  
Cloud



Users

Playbook

ANSIBLE ORCHESTRATION ENGINE

Inventory

API

Modules

Plugins

Hosts

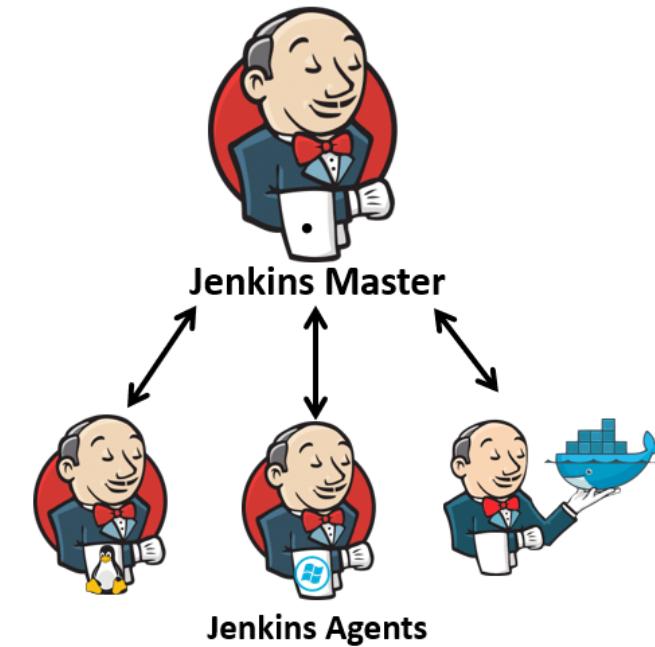
Networking



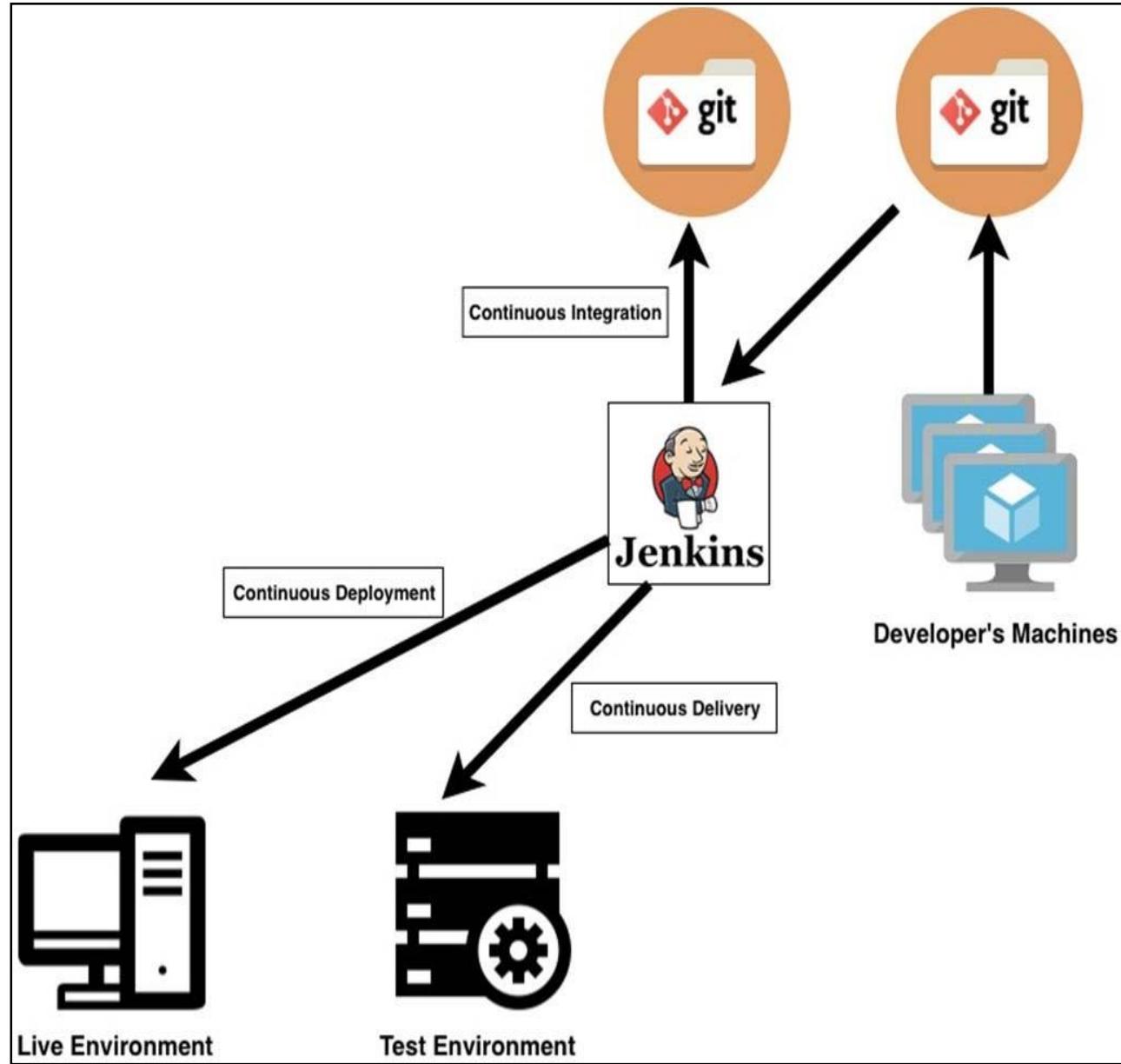
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# JENKINS



# CI/CD PIPELINE

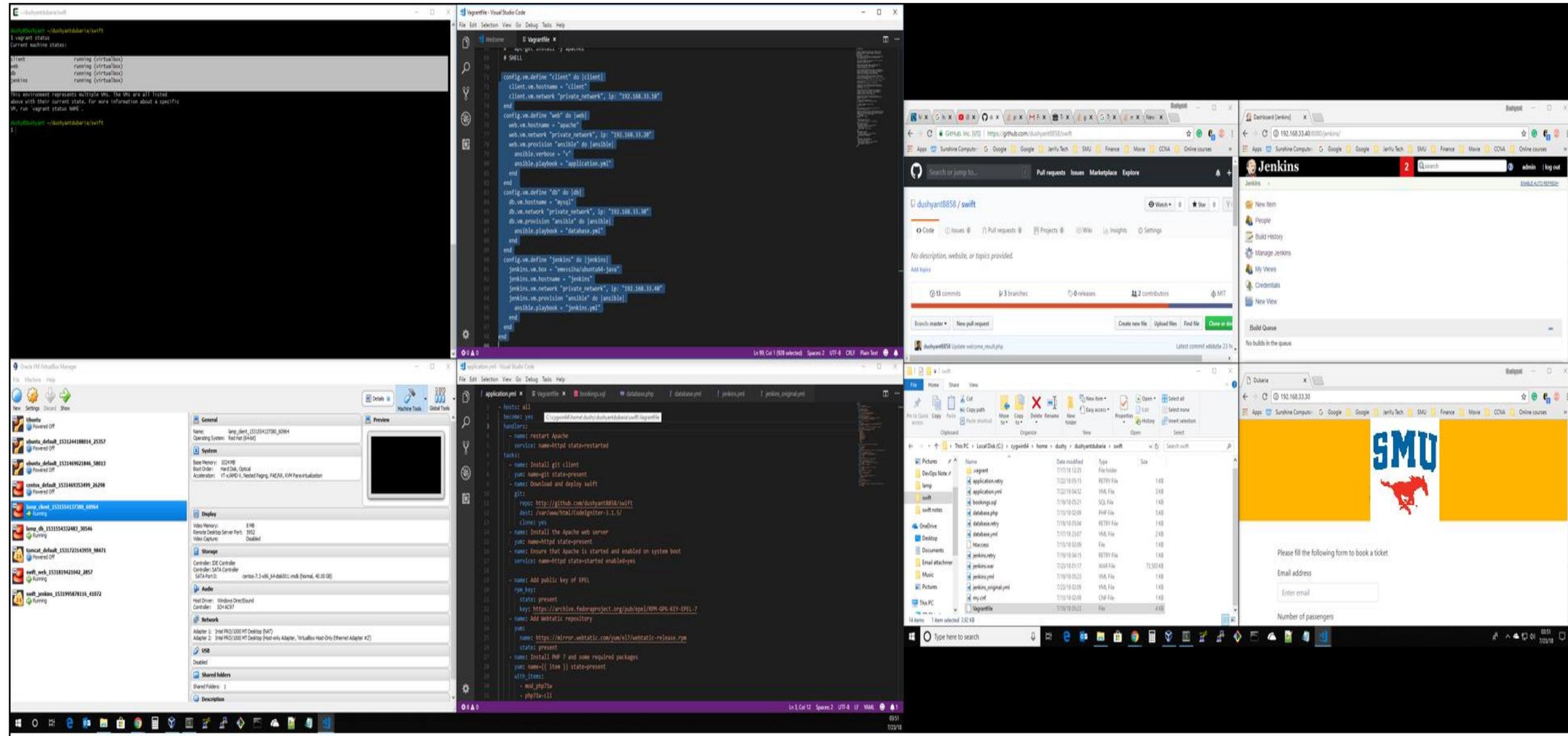


- **Continuous Integration:** Pull together various software components- build and test as single unit
- **Continuous Delivery:** More automation, delivers app code from master to non-prod
- **Continuous Deployment:** Full automation, code is deployed to binary artifacts and to live prod servers for users

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# TEST-USE CASES: WEB-BASED BOOKING APPLICATION



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# Cloud Providers



vs.



vs.

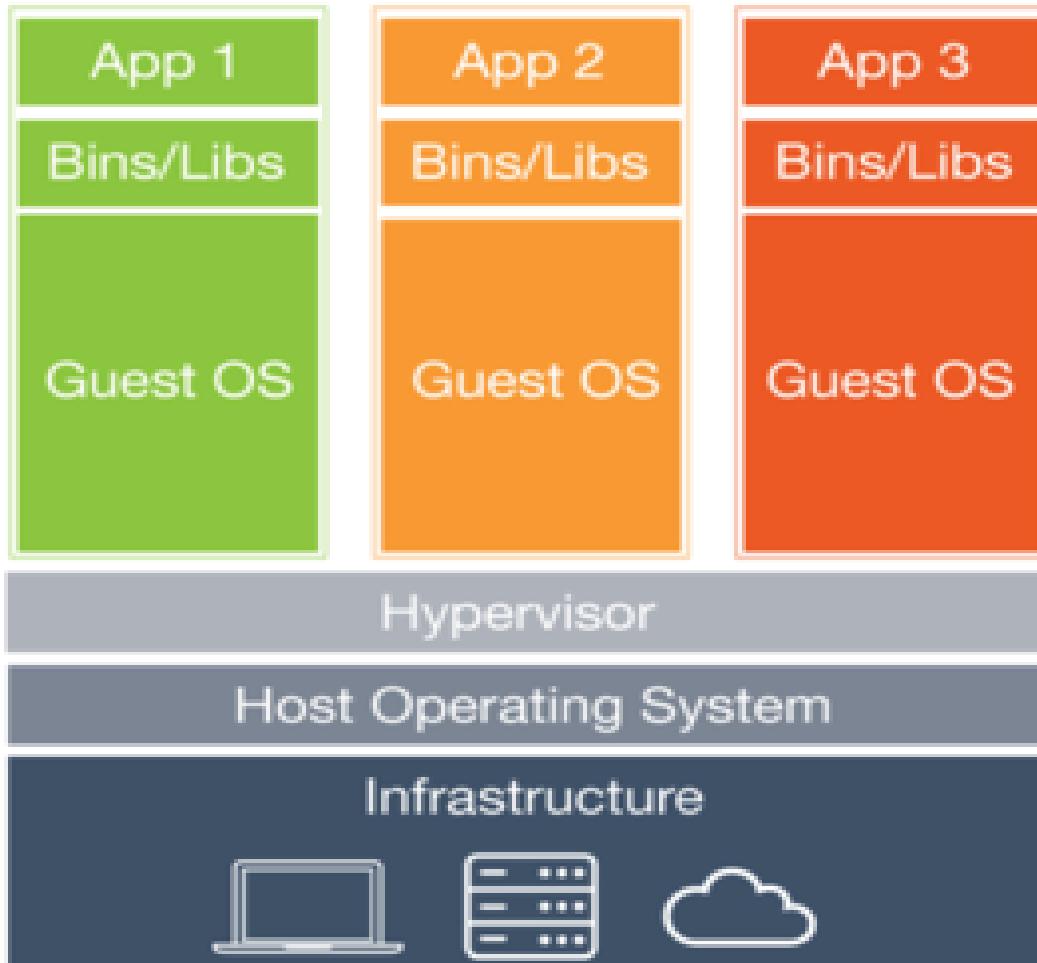


Google Cloud Platform

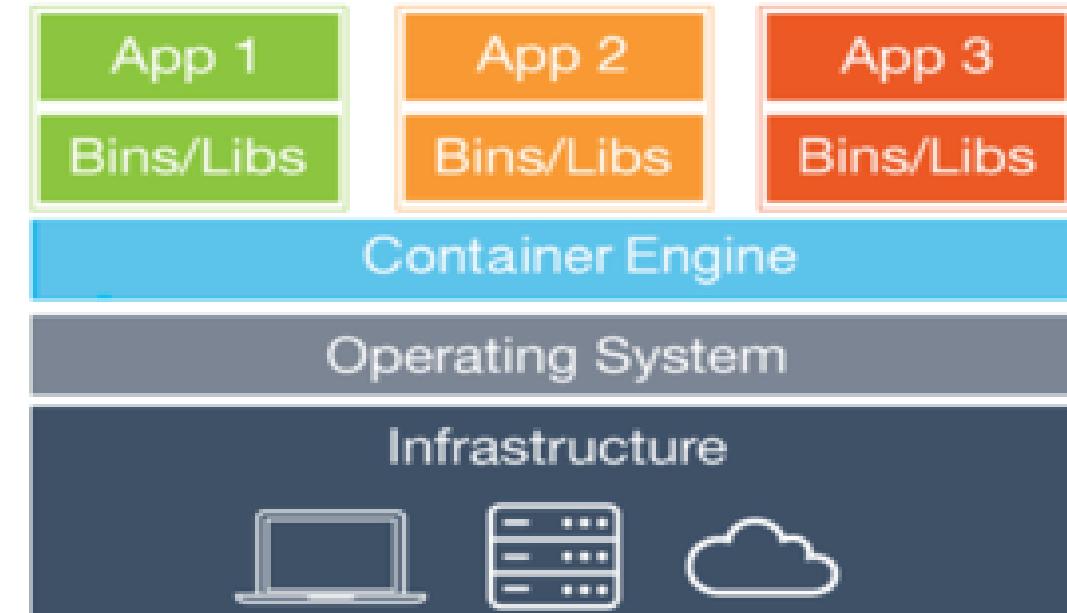
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# CONTAINERIZATION v/s VIRTUALIZATION



Hypervisor-based Virtualization



Container virtualization

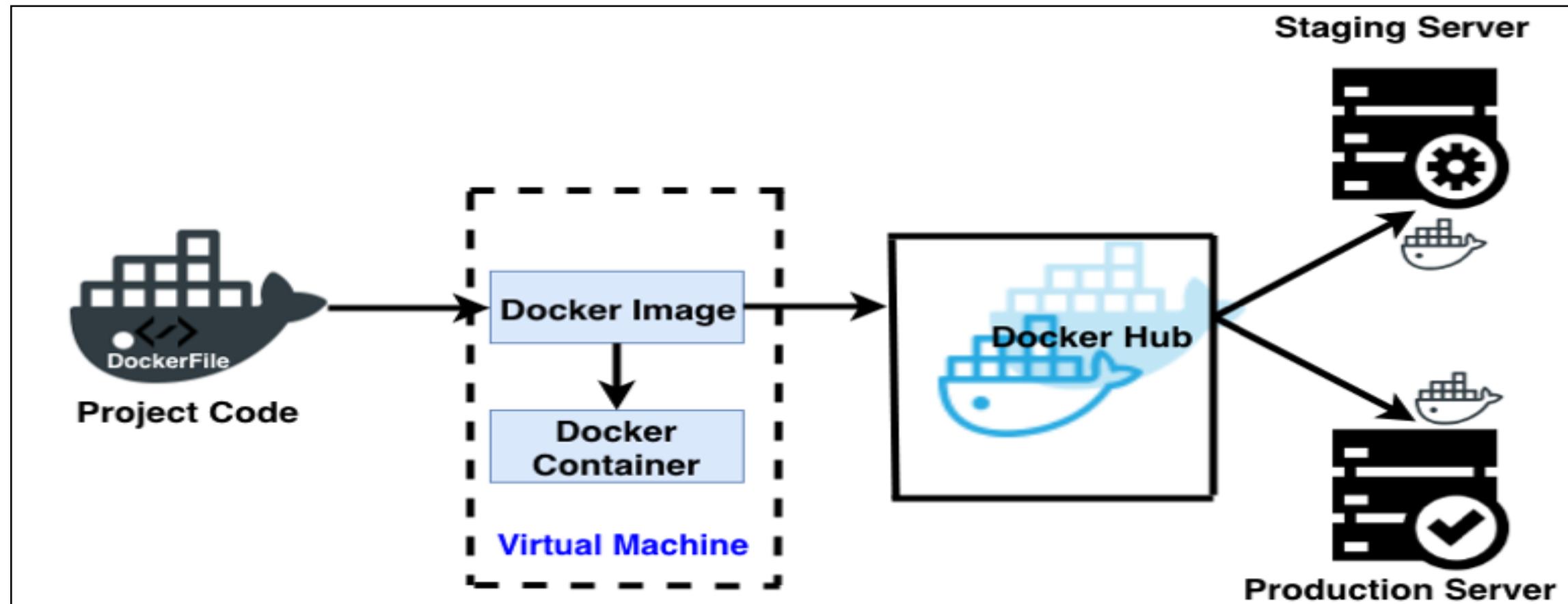
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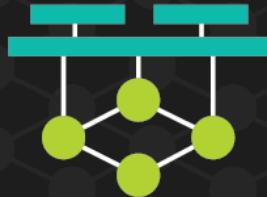
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# DOCKER





# DOCKER COMMANDS & STORAGE

- ❖ docker run – Runs a command in a new container
- ❖ docker start – Starts one or more stopped containers
- ❖ docker stop – Stops one or more running containers
- ❖ docker build – Builds an image from a Dockerfile
- ❖ docker pull – Pulls an image or a repository from a registry
- ❖ docker push – Pushes an image or a repository to a registry
- ❖ docker export – Exports a container's filesystem as a tar archive
- ❖ docker exec – Runs a command in a run-time container
- ❖ docker search – Searches the Docker Hub for images
- ❖ docker attach – Attaches to a running container

## ❖ VOLUMES

- It is stored in a part of the host file system managed by the docker

## ❖ BINDS

- It can be stored anywhere on host system whether they are important file system or directories. This mount can be modified by non-docker processes as well

## ❖ MOUNTS

- it stores data in memory of the host system

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# WORD-PRESS INSTALLATION USING DOCKER

WordPress > Installation - Mozilla Firefox

WordPress > Installation X New Tab X +

127.0.0.1:8080/wp-admin/install.php?step=1

Welcome

Welcome to the famous five-minute WordPress installation process! Just fill in the information below and you'll be on your way to using the most extendable and powerful personal publishing platform in the world.

Information needed

Please provide the following information. Don't worry, you can always change these settings later.

Site Title

Username

Usernames can have only alphanumeric characters, spaces, underscores, hyphens, periods, and the @ symbol.

Password  WVe6csSVT2&wBolai!  Strong

Important: You will need this password to log in. Please store it in a secure location.

Your Email

Double-check your email address before continuing.

VirtualBox VM Machine View Input Devices Window Help

Firefox Web Browser

Beginning DevOps - Just another WordPress site - Mozilla Firefox

localhost:8080

BEGINNING DEVOPS

Just another WordPress site

POSTS

SEPTEMBER 4, 2017 EDIT

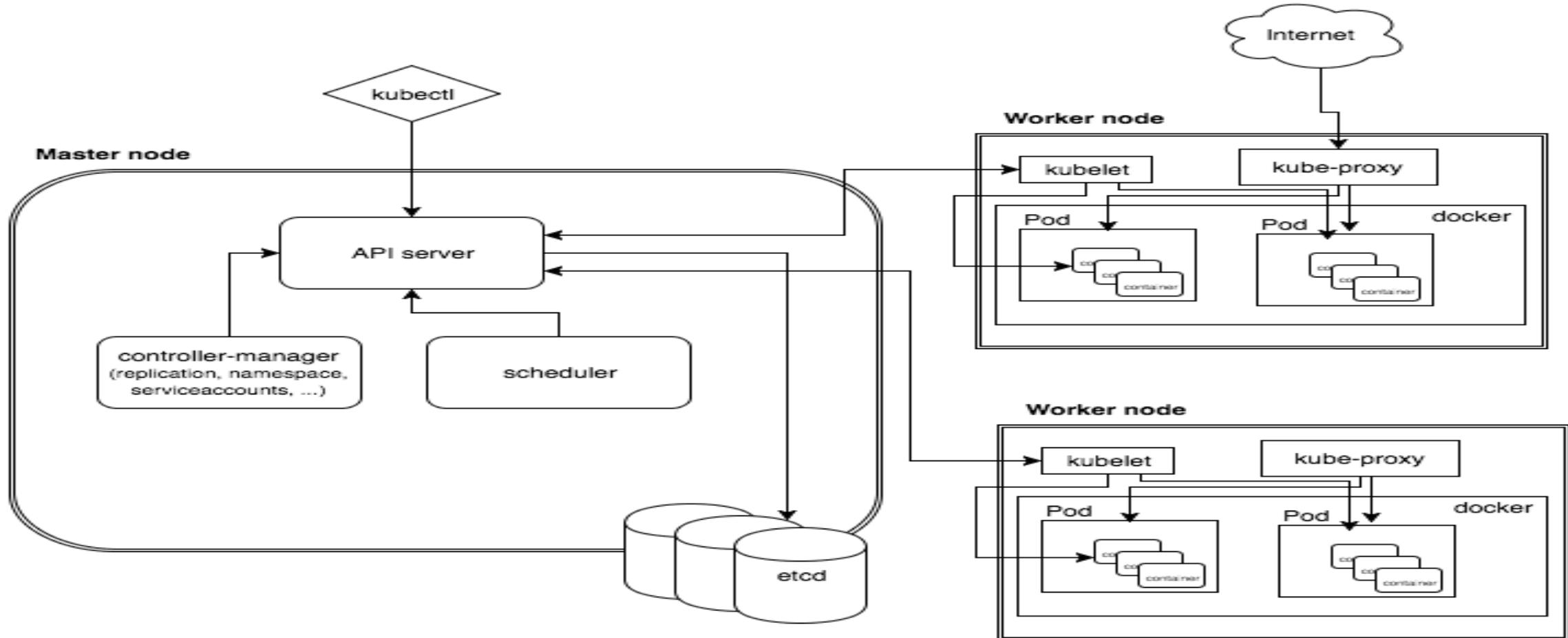
Hello world!

Search...

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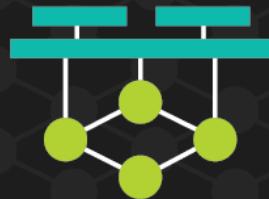
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# KUBERNETES – K8'S



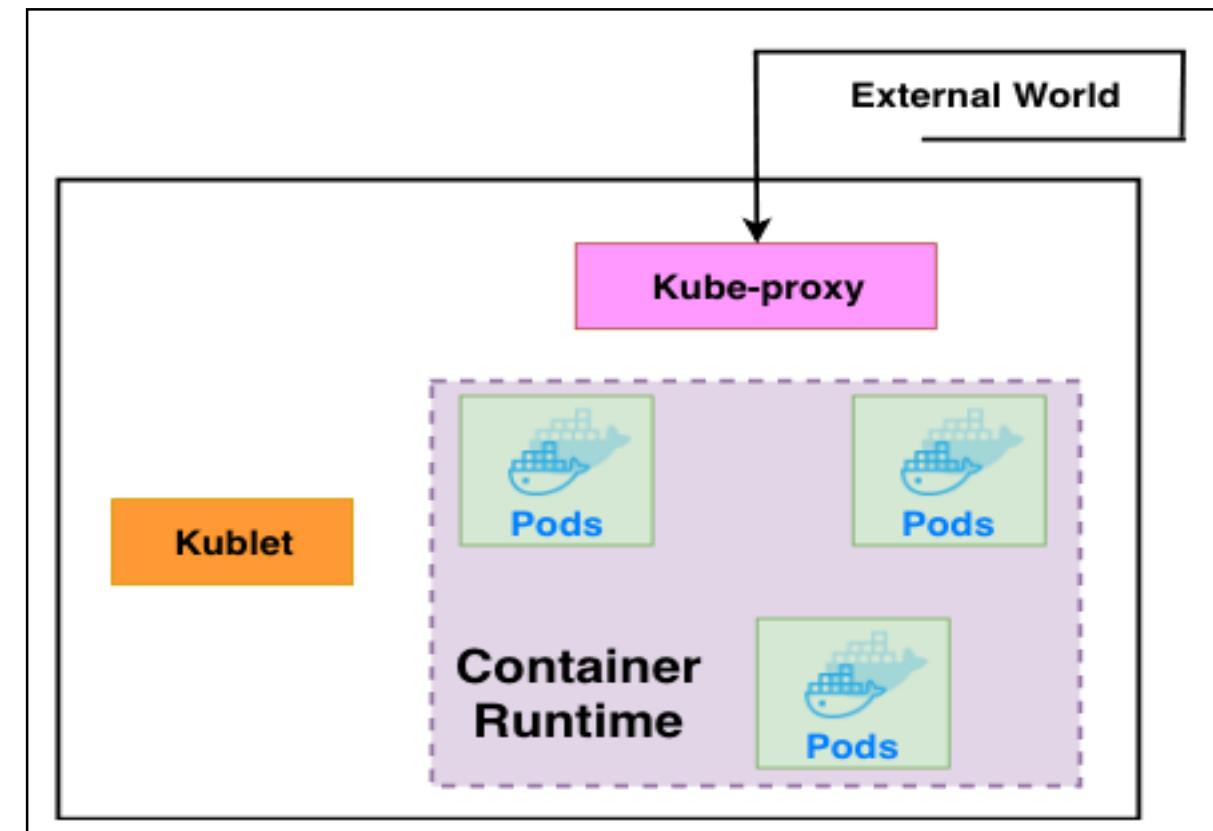
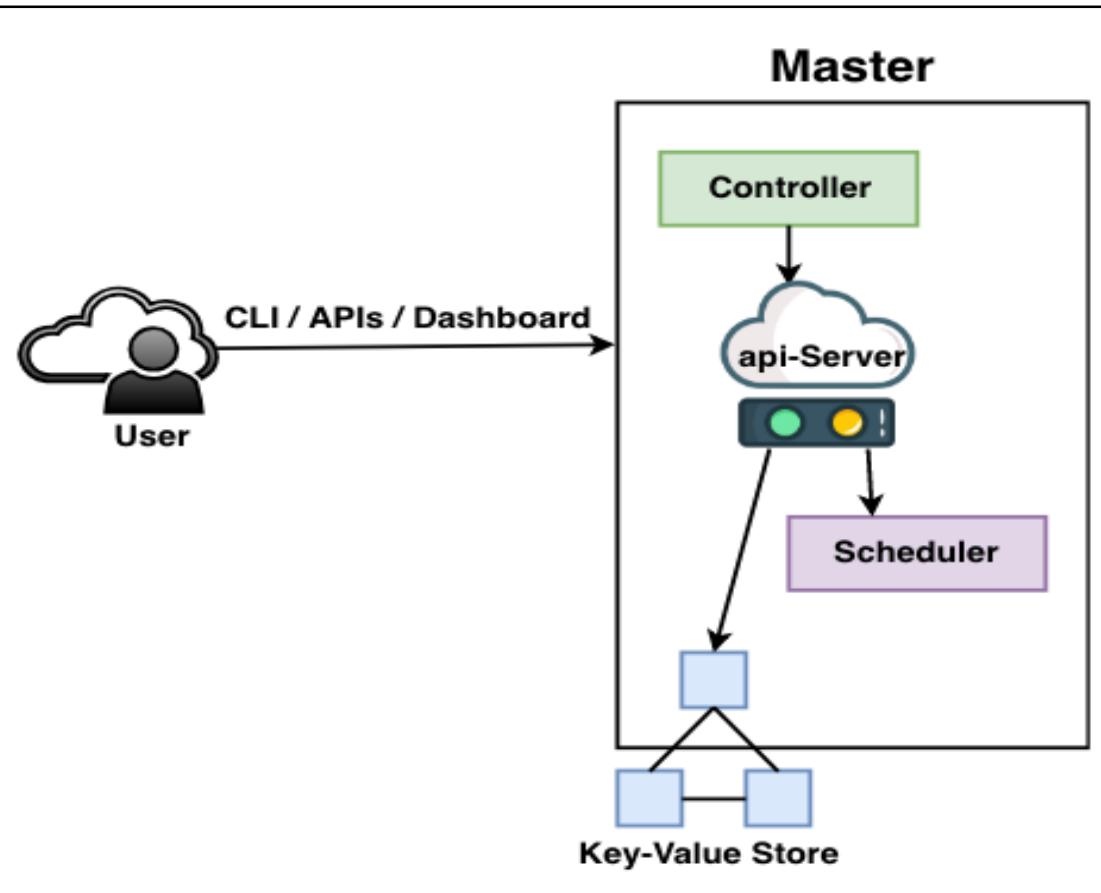
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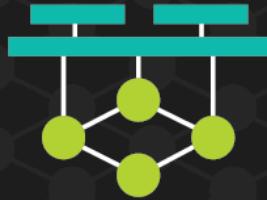
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# KUBERNETES ARCHITECTURE



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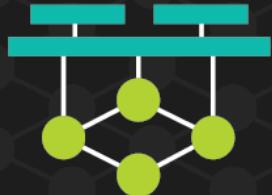
# HELM CHART & KUBE COMMANDS

- Helm is a package management tool and can be used to add packages, services etc to the APPs which are deployed using Kubernetes.
- Helm-Charts helps the user to install, upgrade any applications of Kubernetes
- The advantages of Helm-Chart is that they are easy to create, is faster, easy to version and easy to publish and share
- Helm-Charts describe even the most complex Kubernetes apps, they provide reliable application installation, and they serve as a single point of authority

- kubectl get pods
- kubectl get deployments
- kubectl get replicaSets
- kubectl get secrets
- kubectl get events

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## Usage of Kubernetes

- Developing a complex application and requires high resource computing without restrictions
- For deployment and monitoring option
- For fast and reliable response times
- Deploying a big cluster

## Usage of Docker

- To initiate with the tool without spending time on configuration and installation
- Developing a basic and standard application with default use of docker image
- Testing and running the same application on the different operating system is not an issue
- Functionality is provided and limited by Docker API

# DEVOPS TROUBLESHOOTING TOOLS



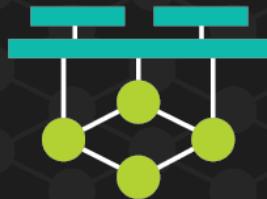
 **Progress**<sup>®</sup>  
Telerik<sup>®</sup> Fiddler™

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## CHECK OUR LIVE PROJECTS & FOLLOW US ON



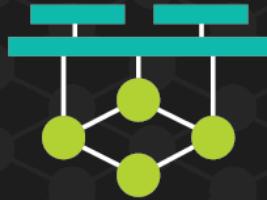
- Dushyant8858
- Shahjay9315



- ❖ shah-jay
- ❖ dushyant8858

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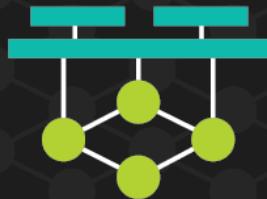
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## INTERNATIONAL CONFERENCE PAPERS

- Published Paper in ITERA on “***Software Defined Networking (SDN) in Telecommunication Industry***” at Lexington, Kentucky, Mar’18
- Published Paper in ‘IEEE-UEMCON’, on “***A Survey of DevOps tools for Networking***” at Columbia University, New York, Nov’18
- Published Paper in ‘IEEE-CCWC’ on “***Building Modern Clouds: Using Docker, Kubernetes & Google Cloud Platform***” held in Las Vegas, Nevada, Jan’19

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*So, get your Hands Dirty on DevOps !!*

**THANK YOU !**

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