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DevOps for Networking

Category: Enterprise IT & Operations (Dev & Business)

Date: 3rd – 5th April'19

Venue : San Jose, CA, USA

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PRESENTERS & CONTRIBUTORS



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DevOps & Network Engineer

M.S - Telecommunication and Network Engineer
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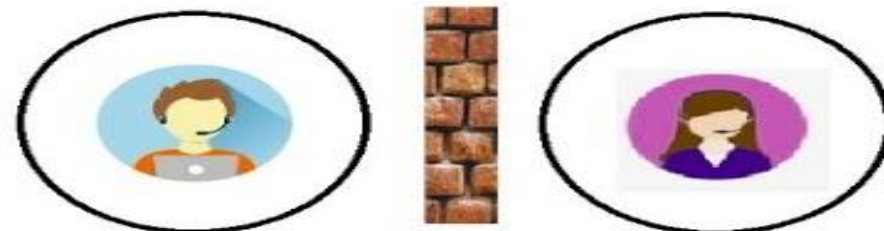
DUSHYANT DUBARIA

DevOps & Cloud Engineer

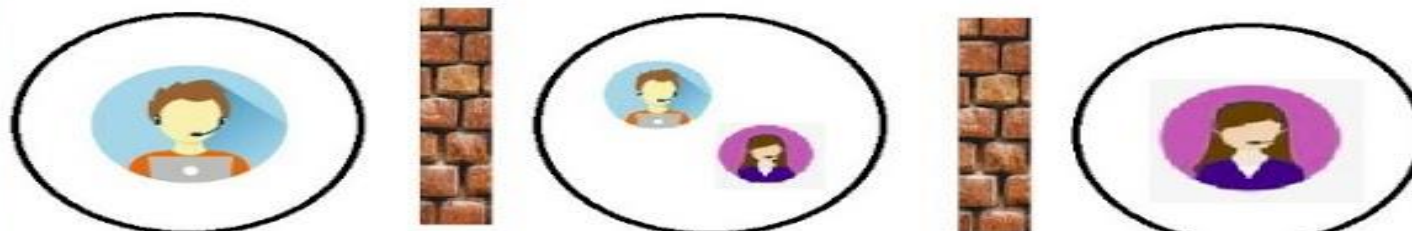
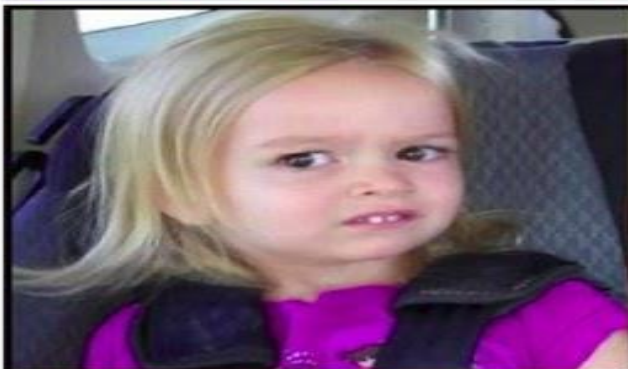
M.S - Telecommunication and Network Engineer
Southern Methodist University, Dallas, TX

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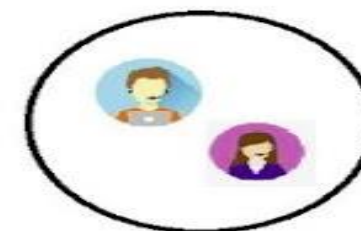
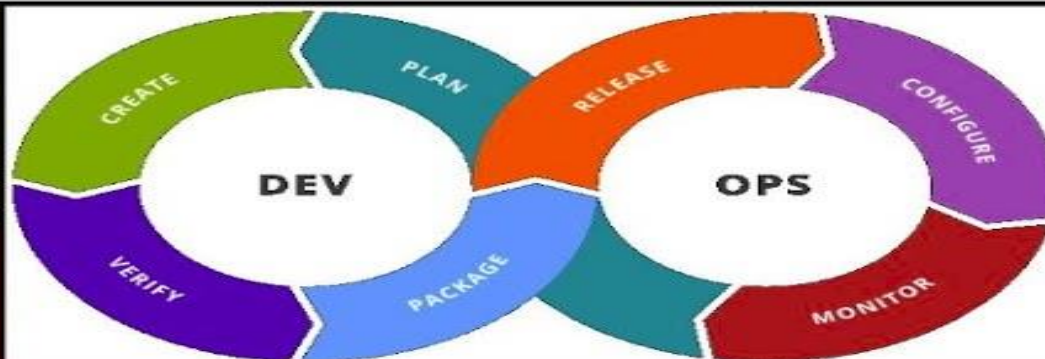
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DEV -----> TICKET -----> OPS



DEV ---> TICKET -> DEVOPS TEAM --> 2nd TICKET?? --> OPS



DEVOPS TEAM

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CONTENT

ABSTRACT

AGILE METHODOLOGY

DEVOPS CULTURE/ COLLABORATION

DEVOPS LIFECYCLE & TOOLS

CONTAINERIZATION & CLOUD

DOCKER / KUBERNETES

TEST USE CASES

WRAP UP

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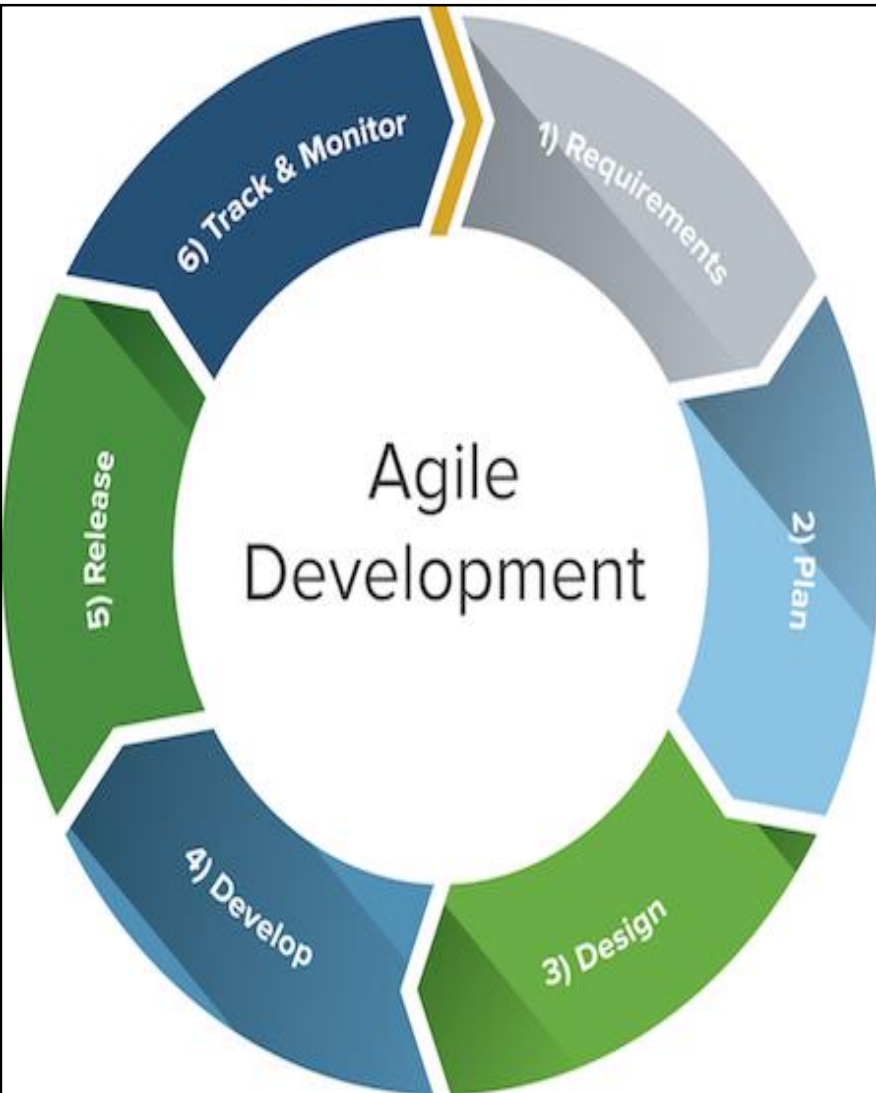
ABSTRACT

- DevOps is a new methodology that combines developers and operations team.
- It closely integrate 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 developments 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 tool we have deployed a web-based ticket booking website using GIT, Ansible, Vagrant, Docker and Jenkins.

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AGILE DEVOPS



Business



Agile Development

- Iterative Development
- Scrum, Sprint, Stories
- Velocity

Business Agility



Developers
(application)



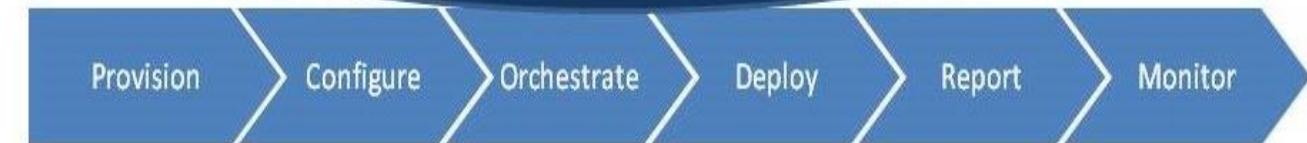
DevOps

- Continuous Integration
- Continuous Deployment
- IT Automation
- Application Management

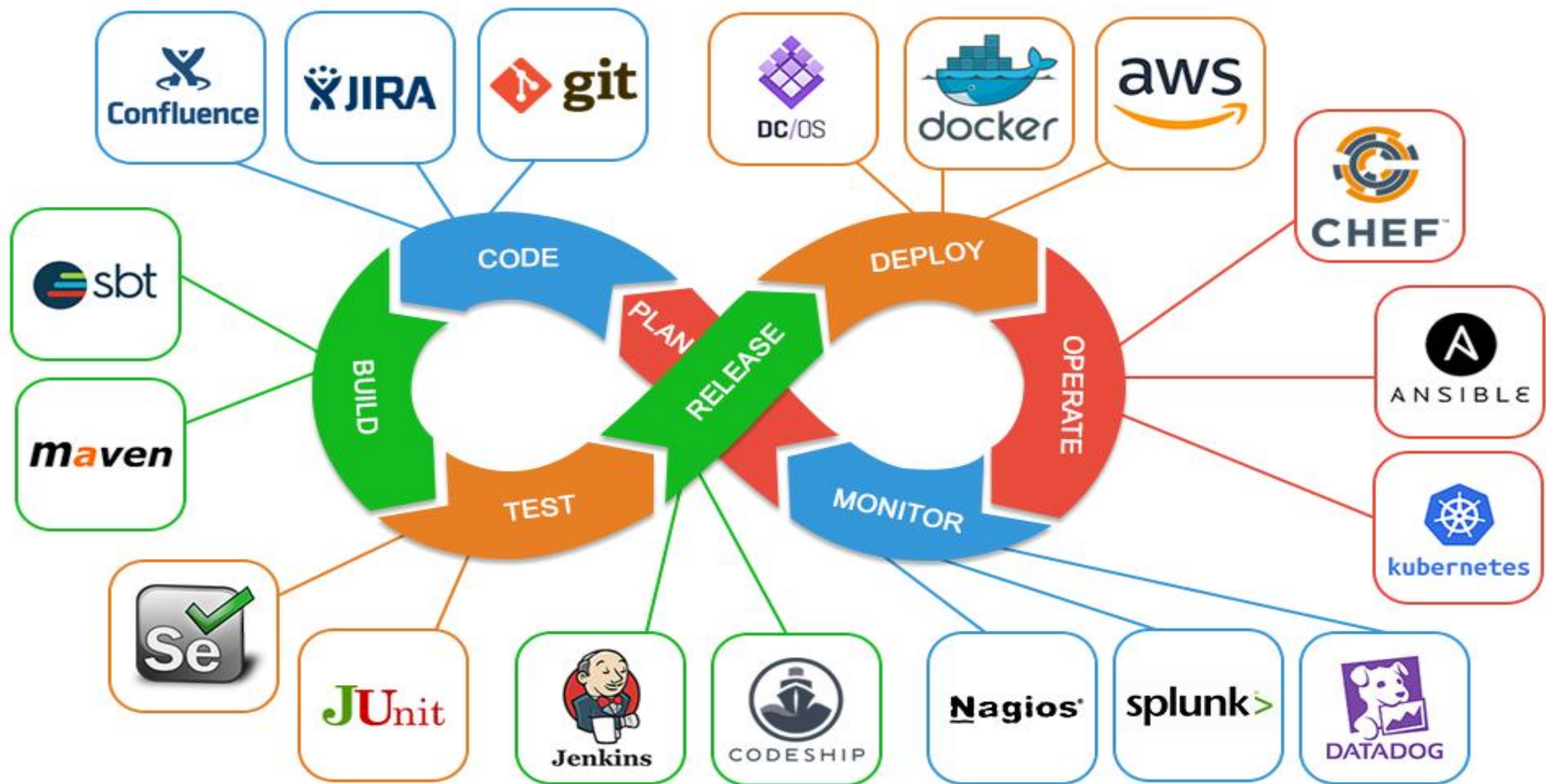
IT Agility



IT Operations

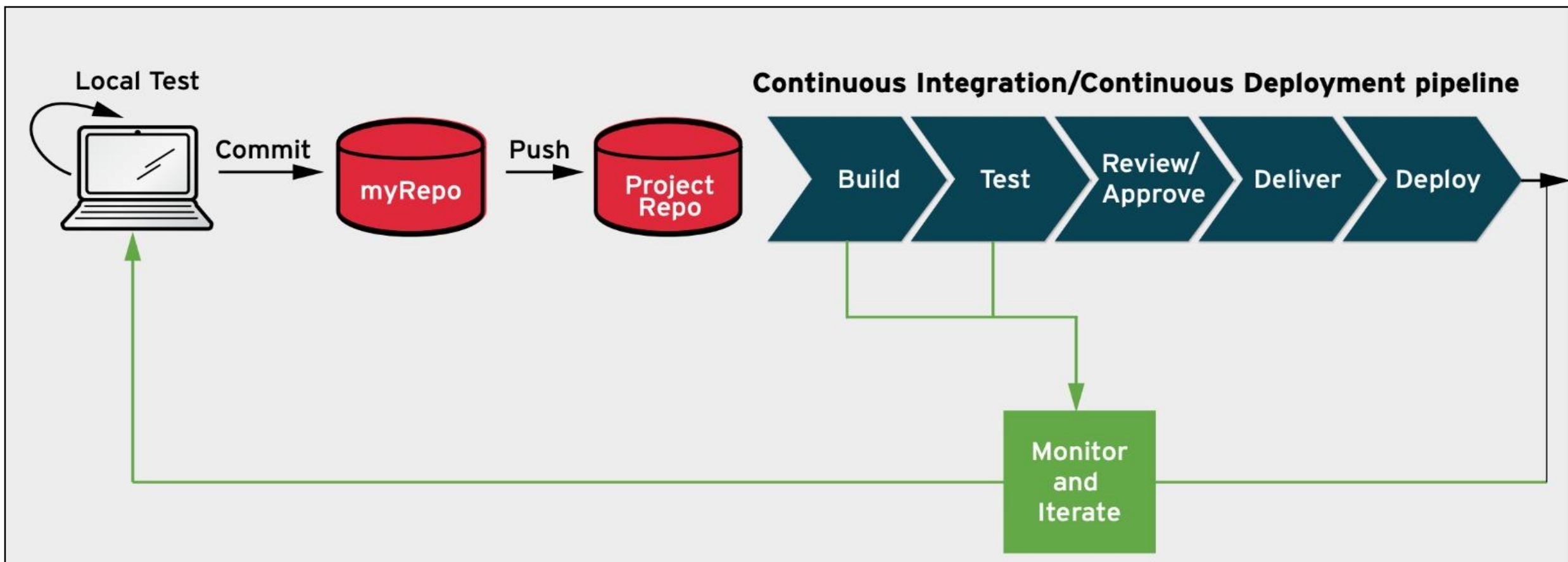


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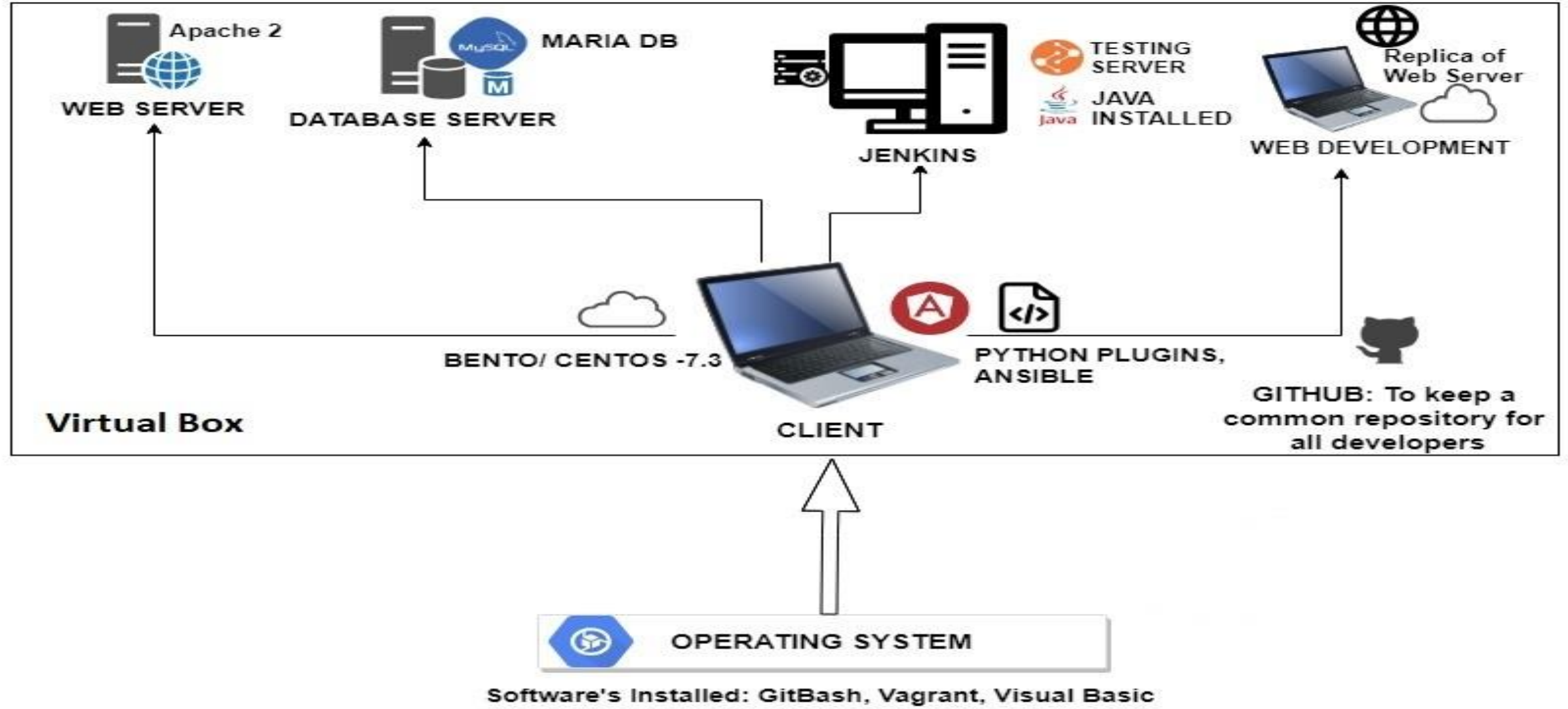
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DEVOPS CULTURE OF COLLABORATION

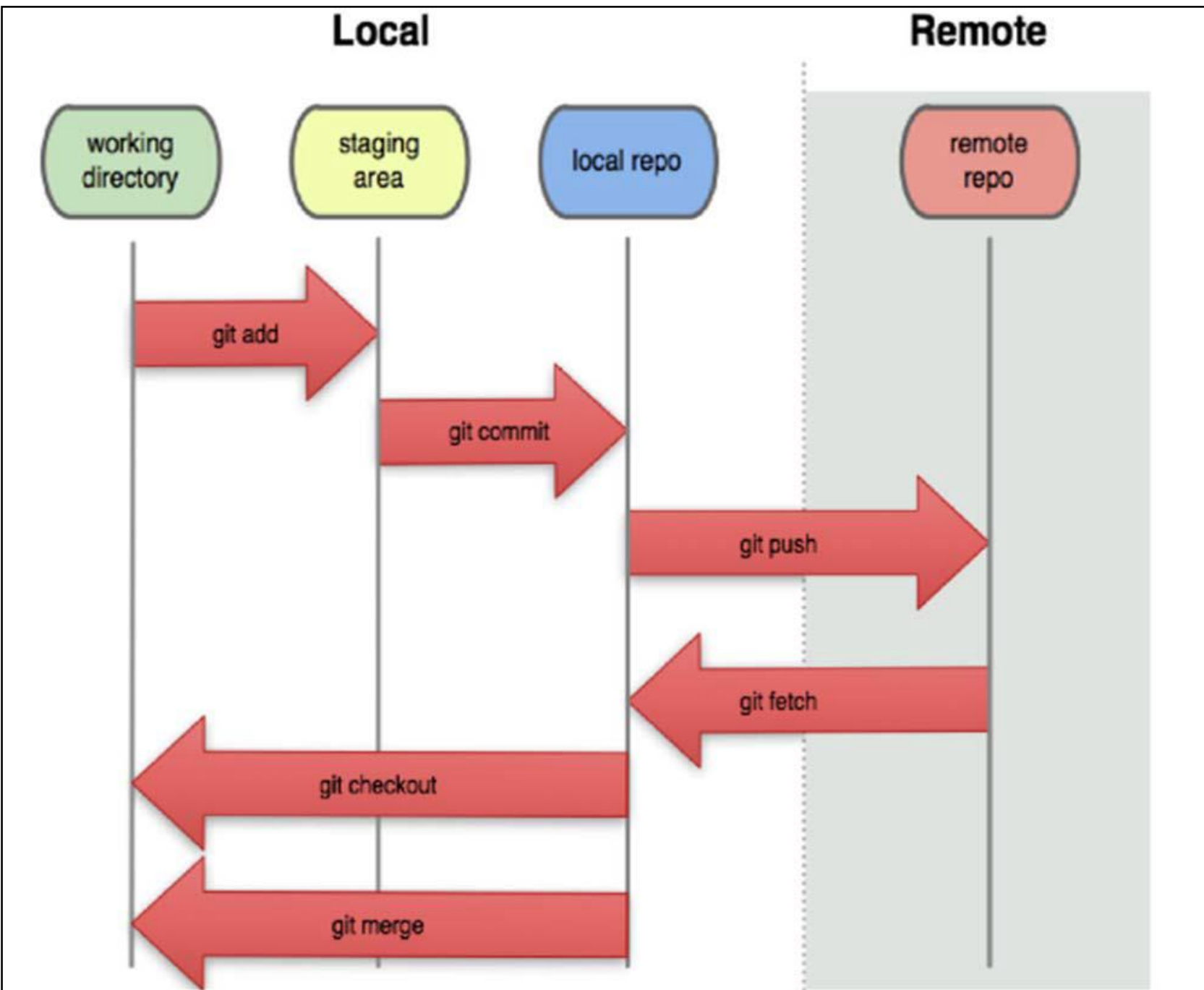


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DEVOPS INFRASTRUCTURE



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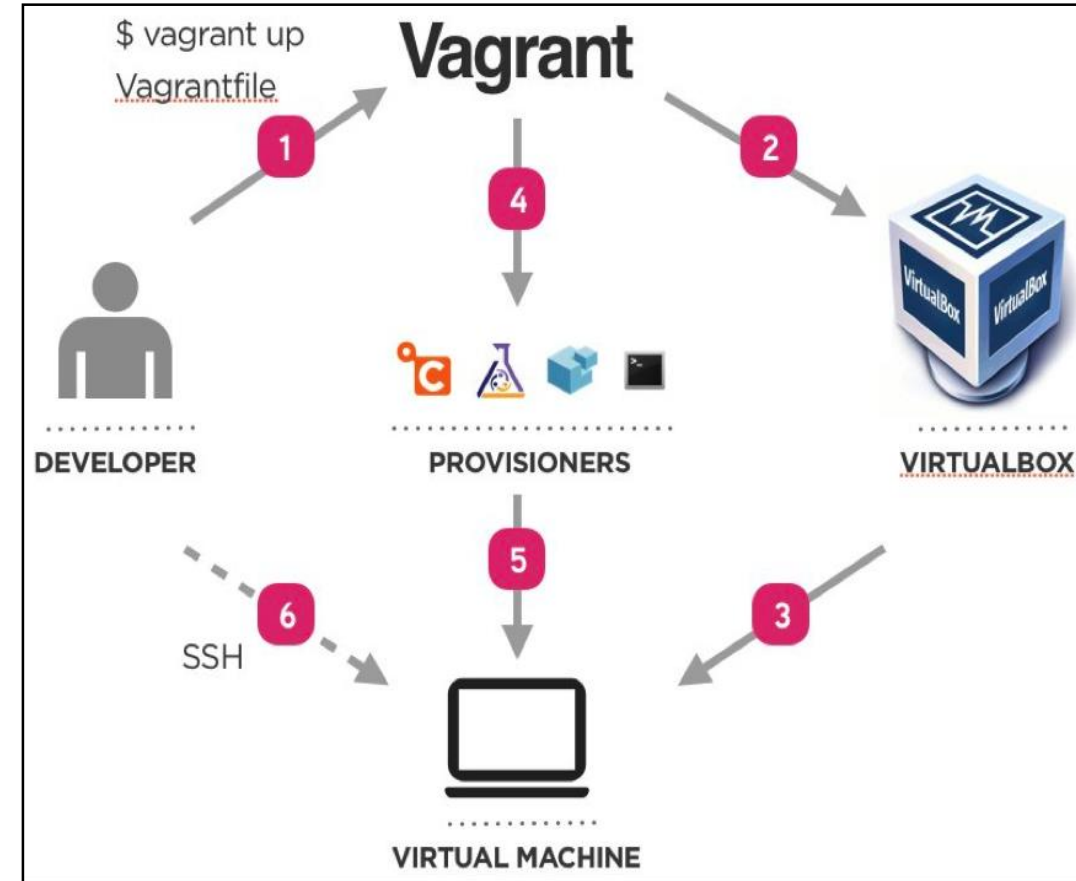
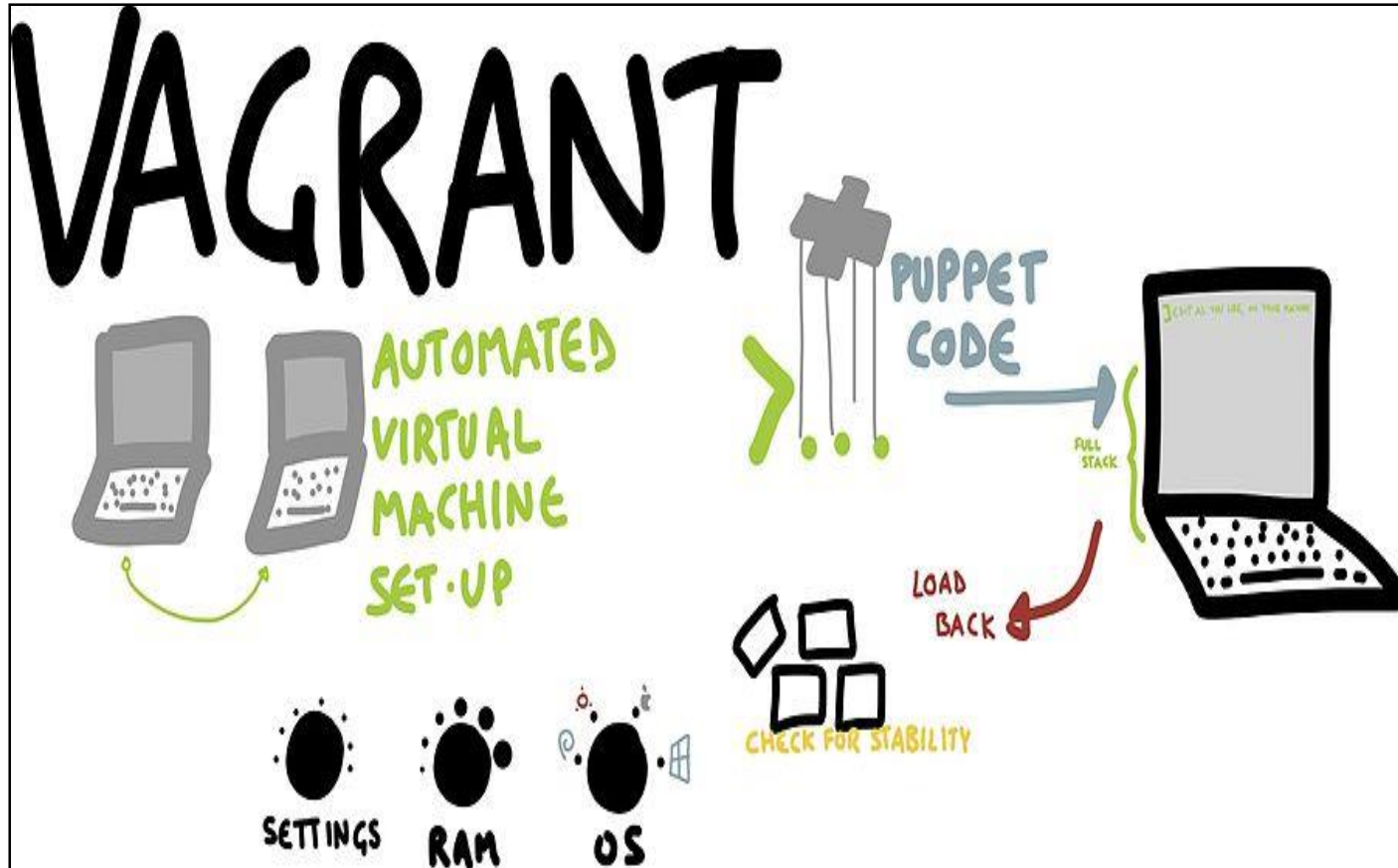


GIT - DVCS

- 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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VAGRANT-PROVISIONING TOOL



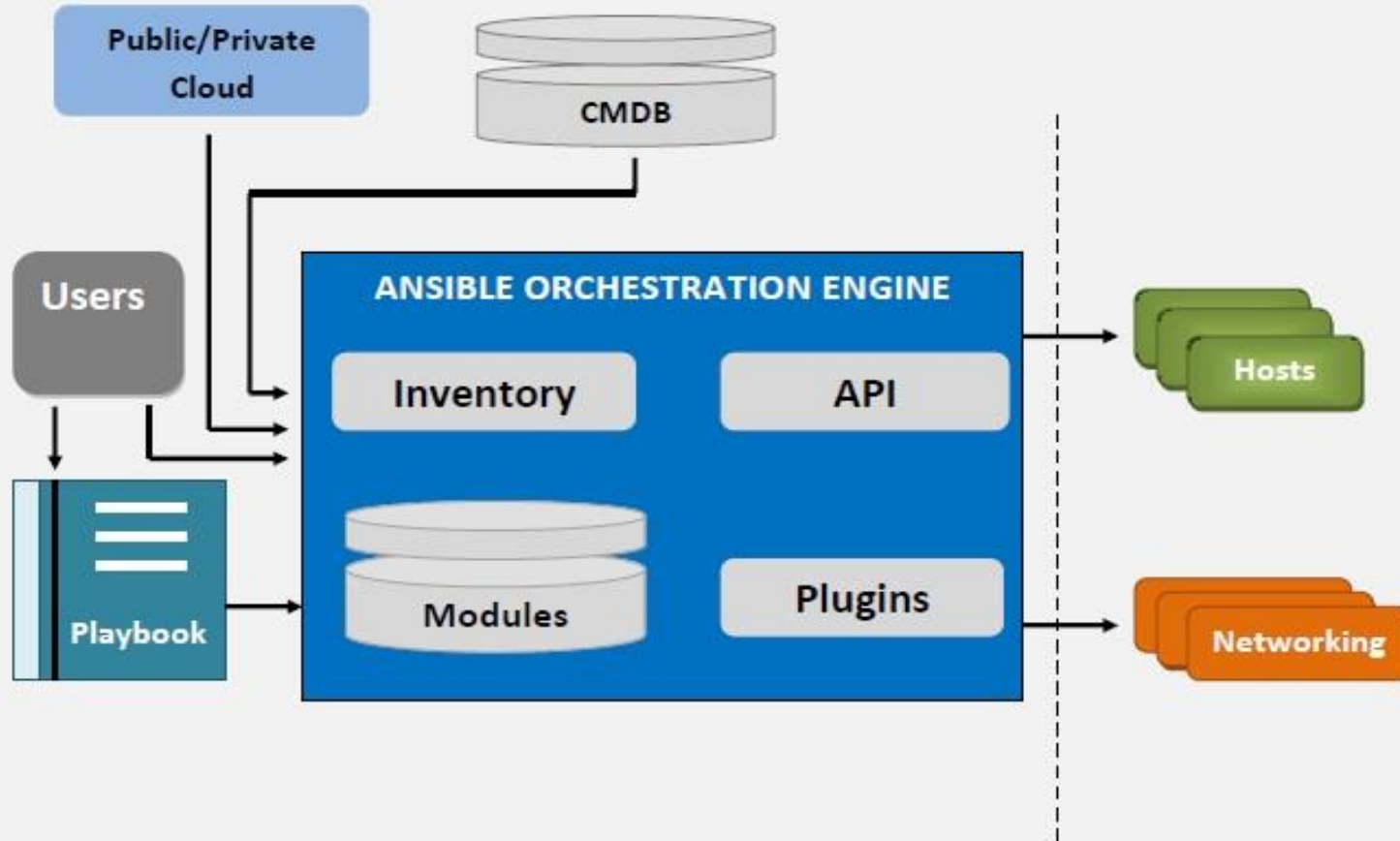
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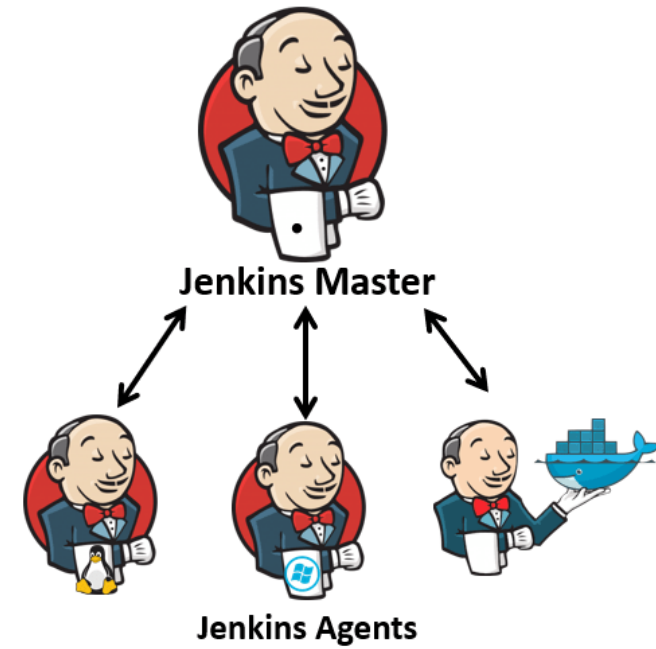


ANSIBLE

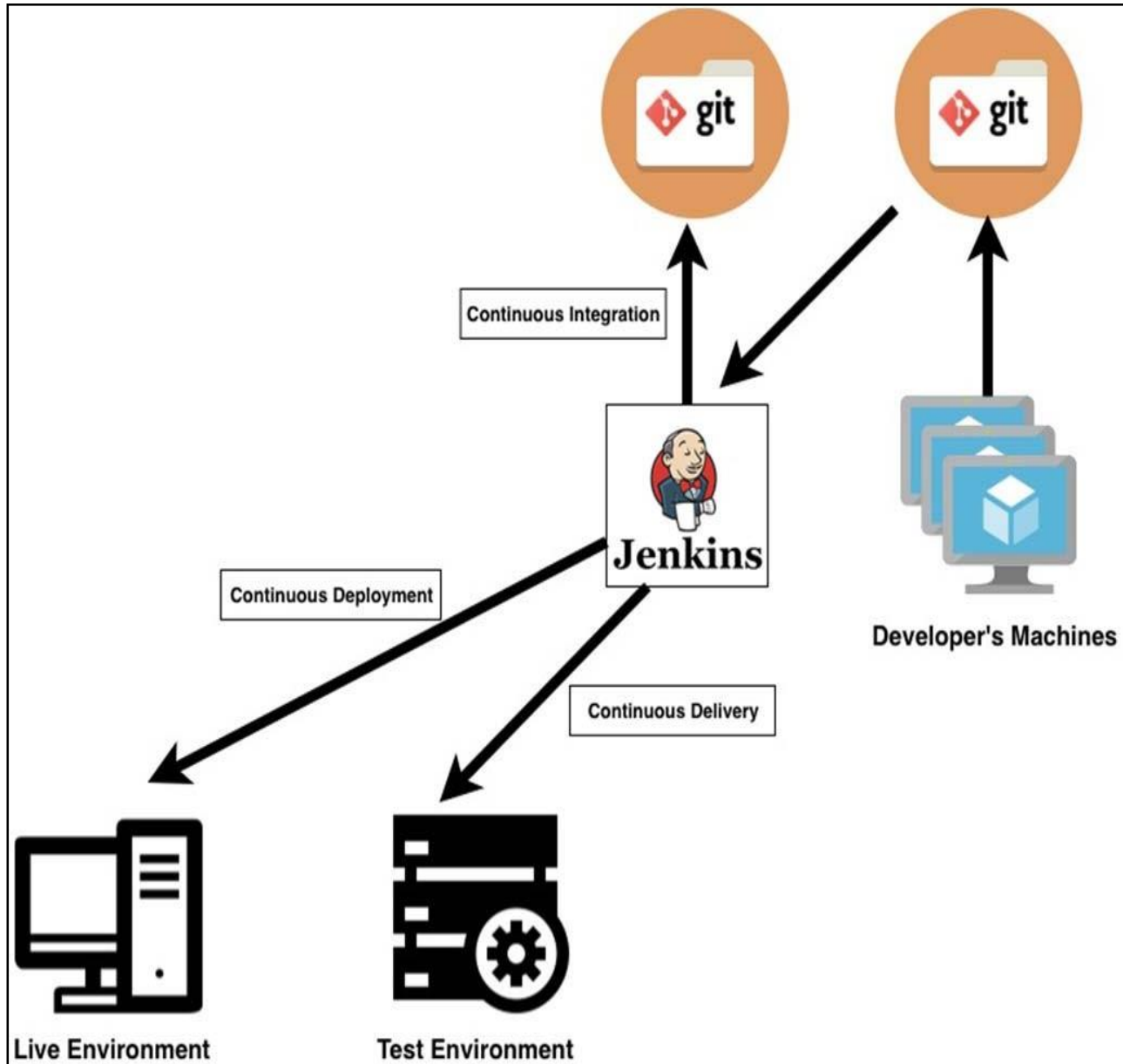
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JENKINS



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

The image is a collage of screenshots illustrating the development and testing of a web-based booking application. The top-left screenshot shows the Vagrant status of a virtual machine, indicating it is running. The top-middle screenshot displays the Vagrantfile configuration, which defines the virtual machine's settings, including the guest OS (Ubuntu), network configuration, and the Ansible playbook to be executed. The top-right screenshot shows the Jenkins dashboard, which is used for automating the build and deployment process. The bottom-left screenshot shows the Vagrant GUI, providing a visual overview of the virtual machine's hardware and software configuration. The bottom-middle screenshot shows the Ansible playbook, which defines the tasks to be executed on the virtual machine, such as installing the web server, database, and application code. The bottom-right screenshot shows a web browser displaying the booking application's interface, which includes a search bar, a list of available tickets, and a booking form.

The screenshots collectively demonstrate the workflow from development to deployment and testing of the web-based booking application.

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Cloud Providers



vs.



vs.

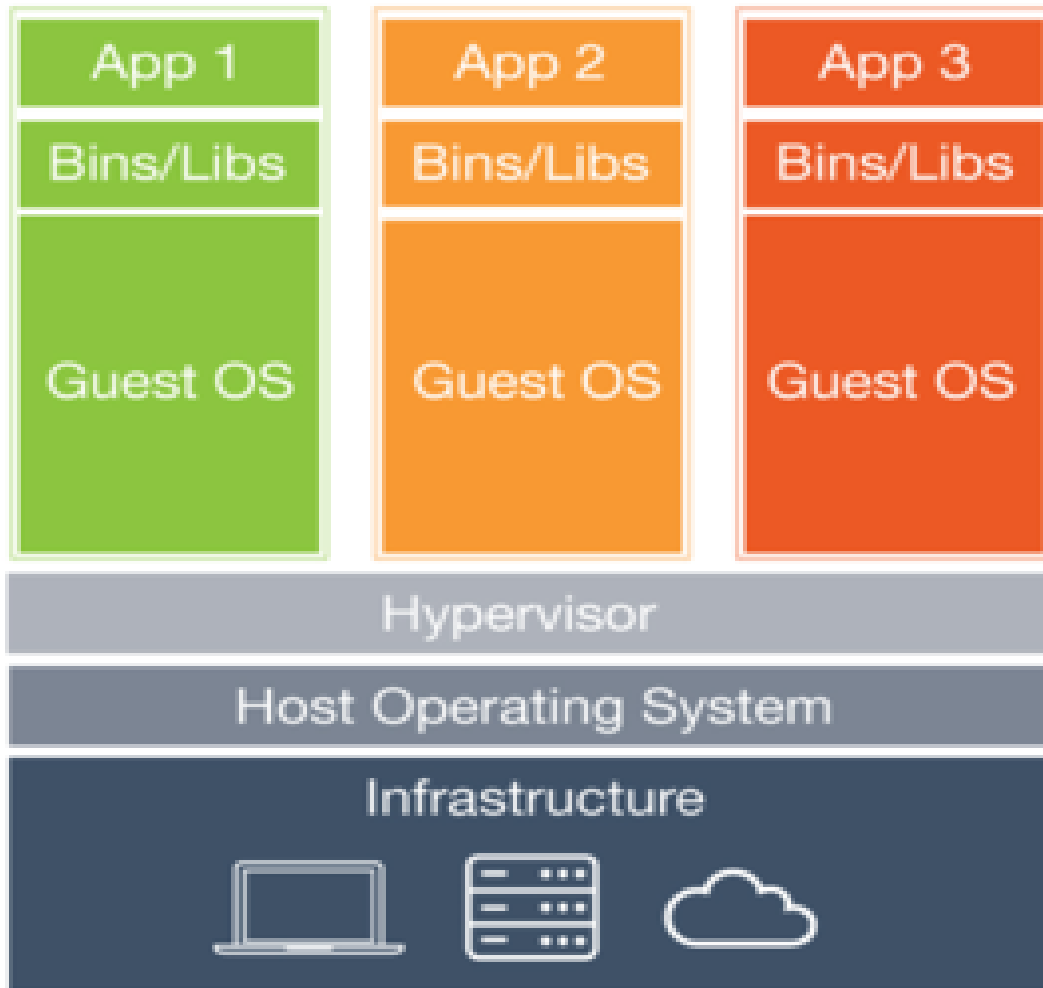


Google Cloud Platform

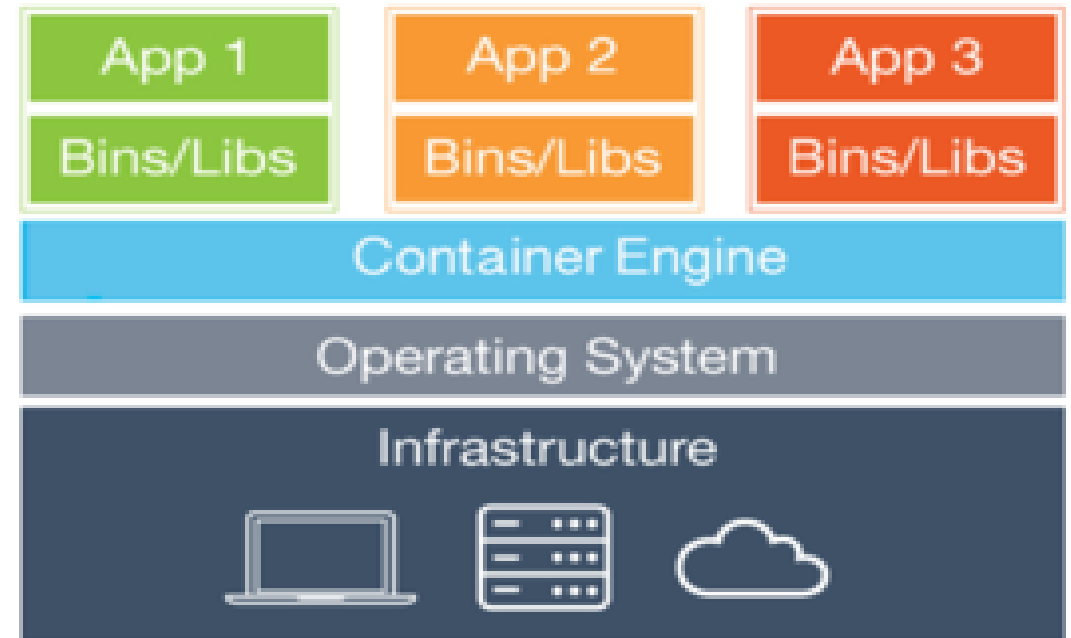
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CONTAINERIZATION v/s VIRTUALIZATION



Hypervisor-based Virtualization



Container virtualization

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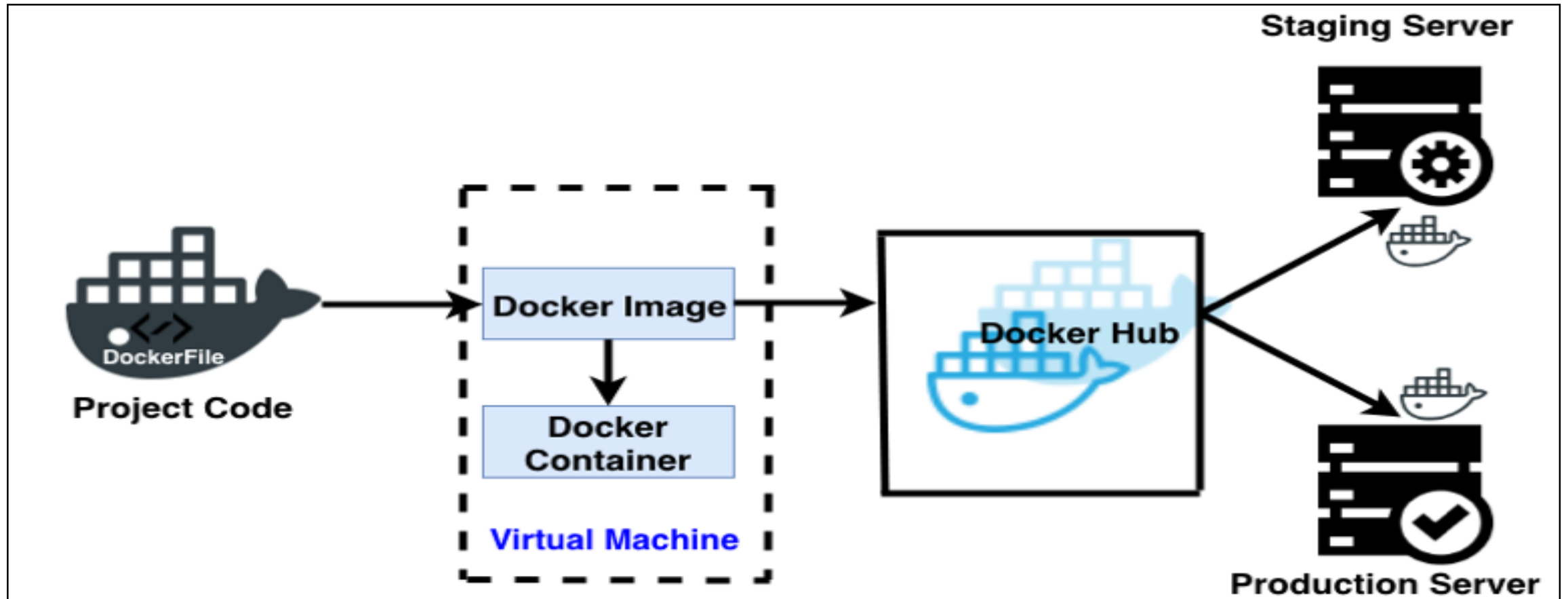


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DOCKER





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 Docker file
- ❖ 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

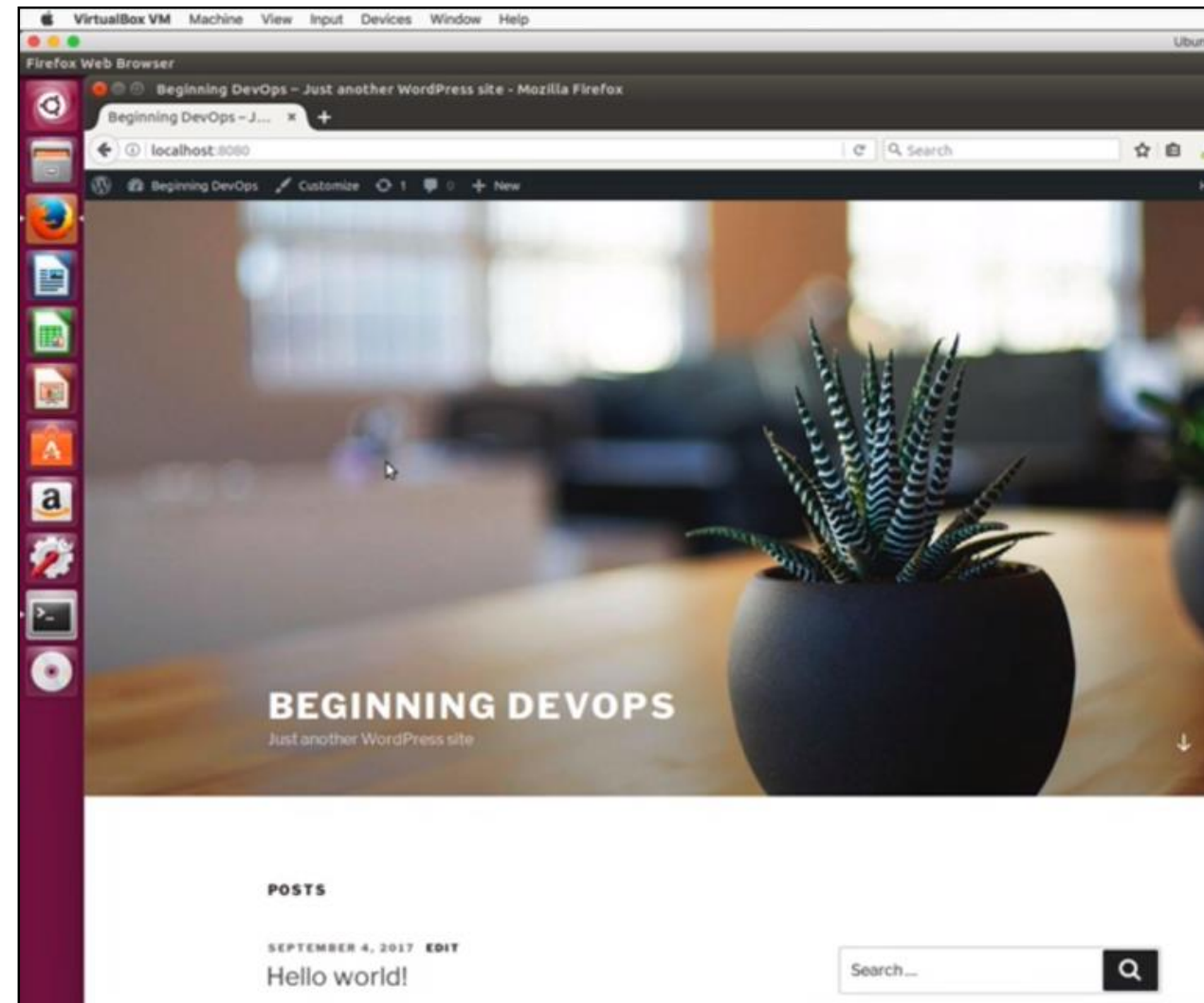
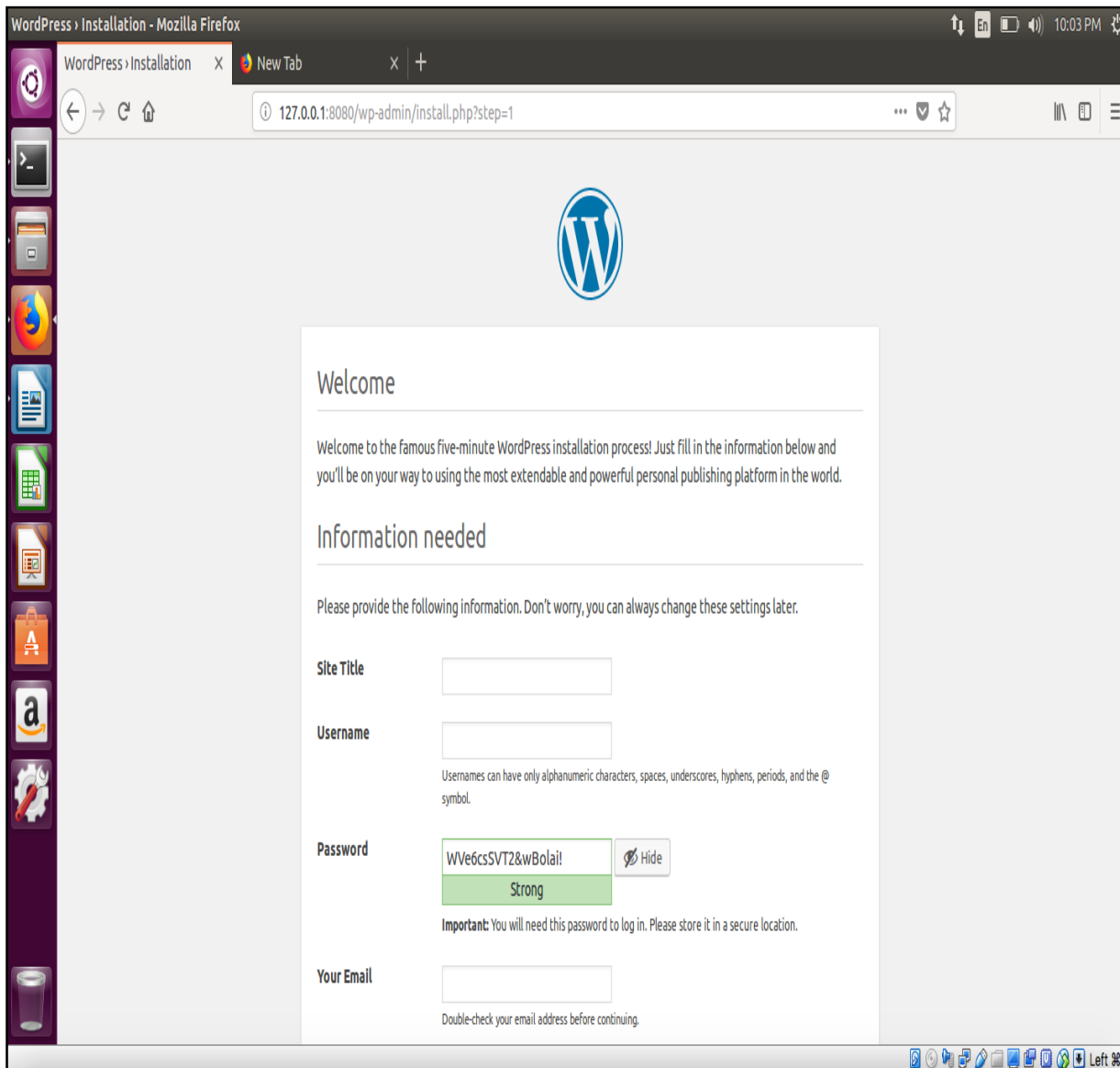
❖ BINDS

- 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

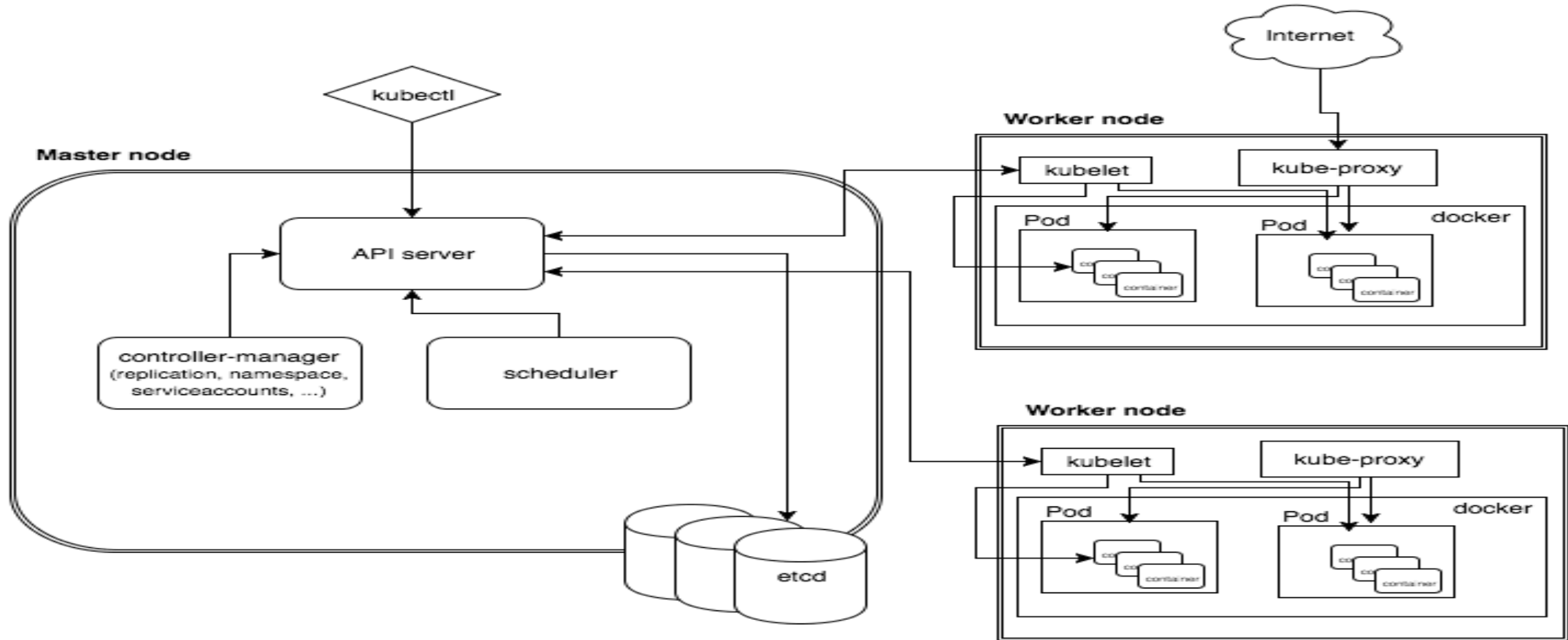
- it stores data in memory of the host system

WORD-PRESS INSTALLATION USING DOCKER



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KUBERNETES – K8'S



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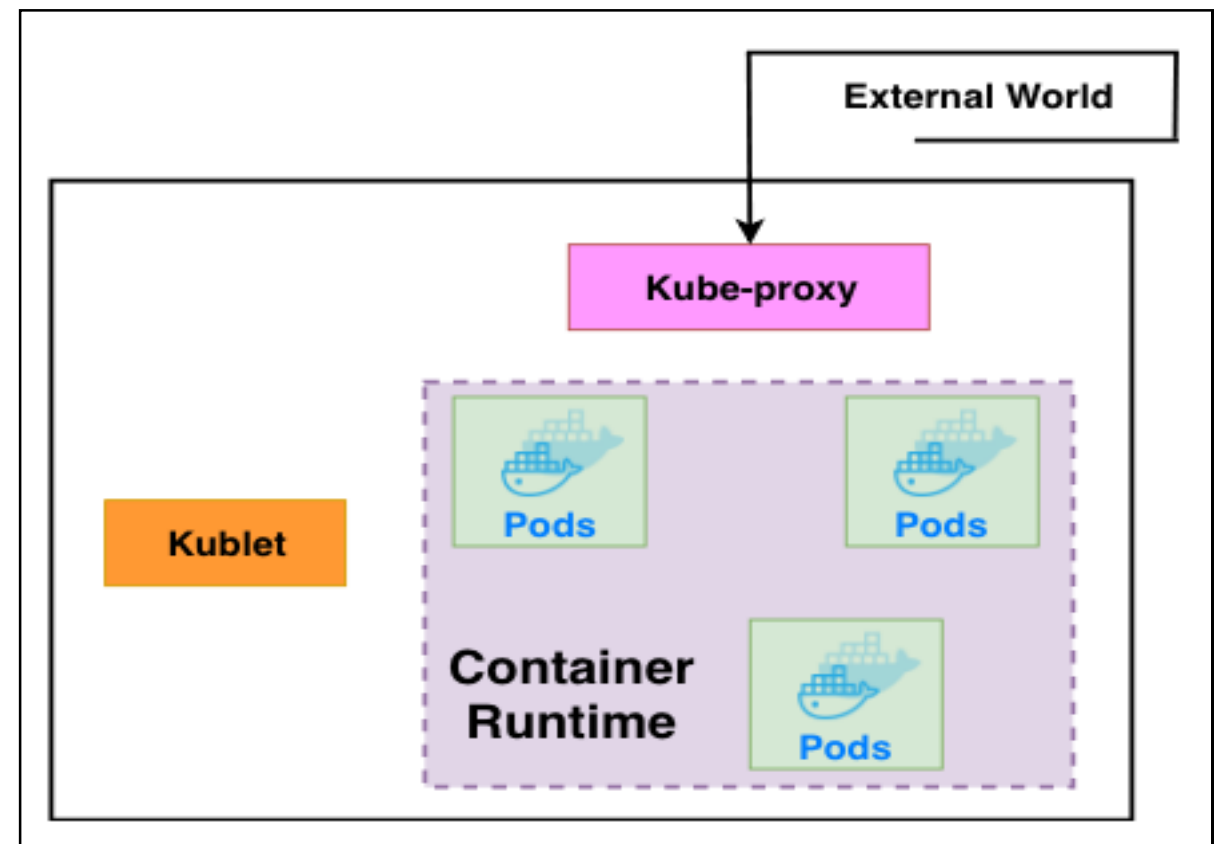
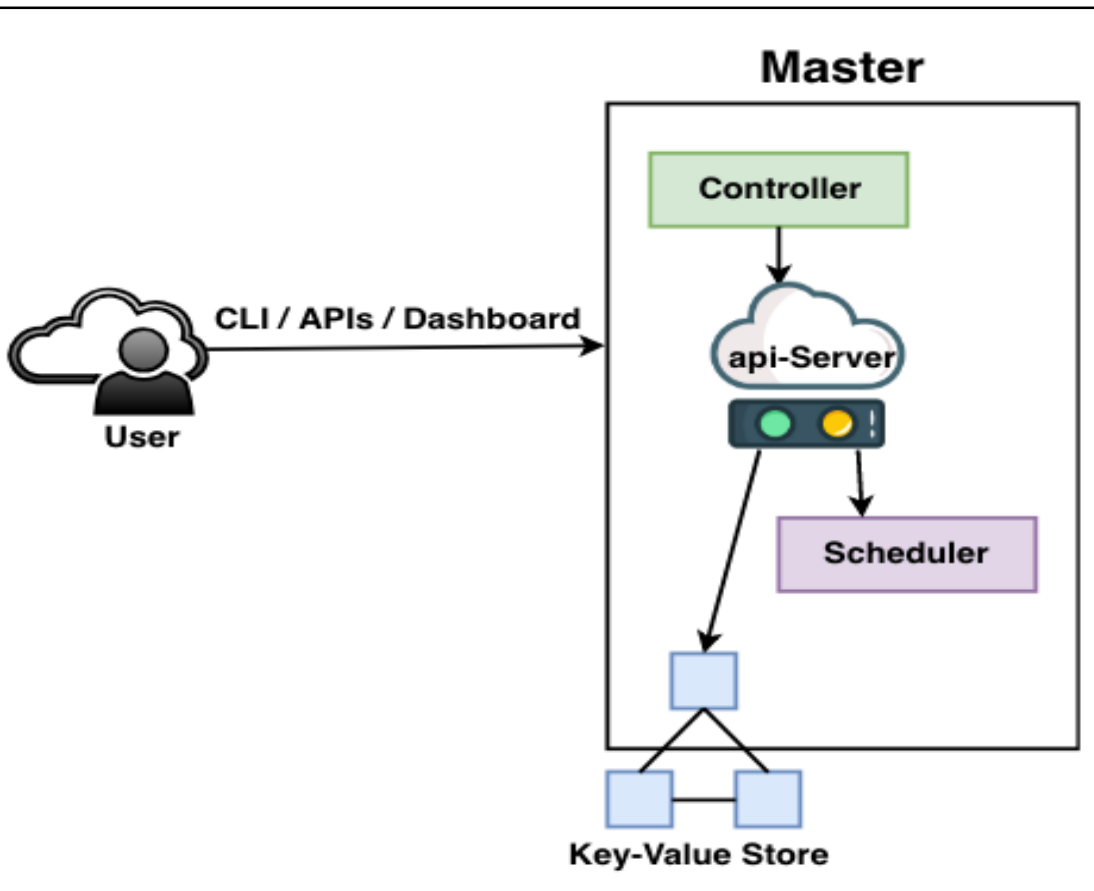


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KUBERNETES ARCHITECTURE



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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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kubernetes
by Google



docker

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

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DEVOPS TROUBLESHOOTING TOOLS



Nagios®



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CHECK OUR LIVE PROJECTS & FOLLOW US ON



GitHub

- Dushyant8858
- Shahjay9315



- ❖ shah-jay
- ❖ dushyant8858

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INTERNATIONAL CONFERNECE 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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