Lab Assignment 1 CMT

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TASK 1

IaaS

Infrastructure as a service is a cloud hosting model where the provider sells access to its datacentre. Providing servers, storage and networking.
Examples include AWS EC2, Google Compute Engine, Azure Virtual Machines

PaaS

Platform as a service is a cloud hosting model where the provider sells access to its datacentre. Providing in addition to IaaS also an OS and management tools.
Examples include AWS Beanstalk, Azure Webapps, Google App Engine

SaaS

Software as a service is a cloud hosting model where the provider sells access to its datacentre. Providing the whole tier and thus responsible for everything from providing servers to the runtime and the applications.
Examples include Salesforce, Office 365, Google Apps

OS-level virtualization

This is a virtualization method which allows for the kernel to run multiple isolated userspace instances called containers. One popular implementation is Docker.

Cgroups

Control groups is a linux kernel feature which allows for the allocation of system resources among groups of defined tasks.

Copy On Write & Snapshots

In regards to containers, copy on write signifies the top writable layer in the container which lies on top of the read only layers. A snapshot is a captured state of data at a given point in time.

High Availability

A systems integrity, where a high availability system ensures the likelihood to operate continuously without failure. Implementation examples include redundancy of data, server replication.

Idempotency

This refers to operations that may be repeated multiple times and producing the same result.

Mutable vs Immutable Infrastructure

Mutable is when the state of the infrastructure may be changed, therefore immutable infrastructure is when the state cant be modified.

Configuration Management vs Orchestration
Configuration management is a declarative system that is used to manage the installation and configuration details of an instance. Examples include Ansible, Chef, Puppet and Salt.
Vs Orchestration which provisions infrastructure resources, such as the creation of n amount of servers. Examples of implementation include Terraform and Kubernetes.

Procedural vs Declarative
The procedural approach requires the step by step instructions to be defined and then carried out, while the declarative model, declares a desired high-level state that the tool itself will attempt to reach.

Git Submodule
When the need arises to use code from another repository, the git submodule is utilized. This is basically an embedded repository within another repository.

Ansible
- Inventory File
  Ansible works against multiple nodes in the infrastructure, these resources are defined in the inventory file /etc/ansible/hosts

- Playbook
  Each play in a playbook contains a list of tasks that are executed by Ansible in order, back to back. Written in yaml format using tags.

Kubernetes
- Compare Stateful and Stateless Applications
  The stateless application does not depend on persistent storage, its content is static. The stateful application on the other hand requires persistence.

- ReplicaSets, Deployments, Pods & Services
  ReplicaSets define the number of replicated pods that are run at any given time.
  Deployment declares a desired state, the deployment controller then moves to convert the actual state to the desired state.
  Pods are isolated sets of namespaces, cgroups etc, holding container nodes that share the resources within the pod.
  Services in Kubernetes is an abstraction layer by which a logical set of pods may be exposed and accessed.