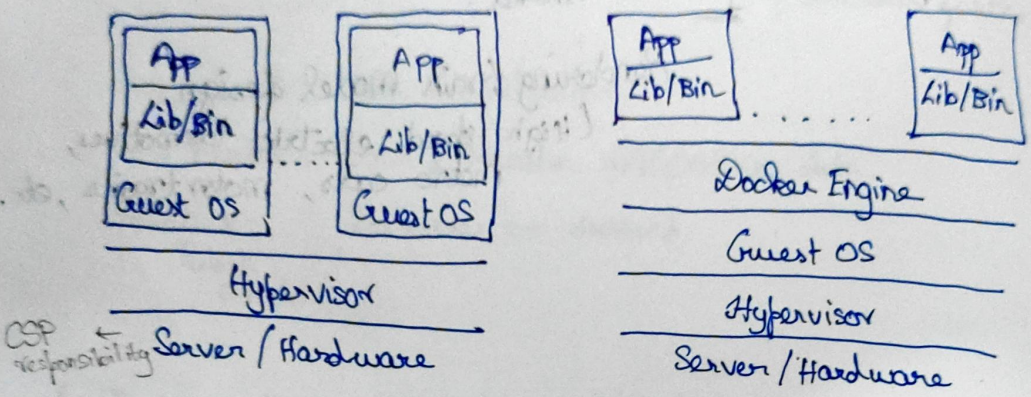
Unit 5

Introduction to Dockers - Containers - Cloud Storage - Cloud Monitoring - Identity Access Management (IAM)

Introduction to Dockers:



" Virtual Machine "

" Dockers & Containers "

VM-s
Hardware is virtualized

H/w virtualization - Default.
⇒ S/w or OS is virtualized

Only one OS - Guest OS

Docker - Program with all dependancies.
Gives flexibility of running

Definition:

* Docker is defined as the platform that enables users to build, test, deploy applications without the burden of focusing on the dependencies.

* Therefore, the application code along with software dependencies are readily available as containers for the users to make use of.

There are 3 options to work with dockers and containers in cloud

GUI = Command Line Tools
CLI = Cloud Shell

* Google Kubernetes Engine - Cluster Tech, Scheduled & scaling
* Cloud Run - Stateless cluster
* Google Compute Engine - Mainly to create VM

Docker Implementation

Cluster Tech → Dynamic, Auto update, Can shift b/w

Stateless Cluster → Static, Manual Update

GKE	Cloud Run	GCE
* Google Kubernetes Engine * Cluster Technology * Scheduling and scaling up of resources is supported. * Can be tuned to GPU, TPU, Regional, Zonal based work.	* Stateless Clusters * Scaling up and down of resources supported.	* Google Compute Engine * Stateless Clusters * Scaling up and down of resources supported.

Deploying an application using GKE:

GCR - Google Cloud Registry

→ GCR - It supports storage of containers,
- Build container images
- Focuses on access restriction

7 Steps:

1. Enable GKE API
2. Create repository in GCR
3. Build Container Image. (1 for every container) (If not, cache snapshot will be taken)
4. Create GKE Cluster
5. Deploy the app
6. Expose to Internet
7. Deploy the different version of App.

VM can be communicated remotely using SSH - Secure (Socket) Shell

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Cloud Storage:

* It supports online file storage services which includes both storing and accessing data in a cloud infrastructure

1. Cloud Store:
   - → Scalable, reliable, fully functional & Cost effective option
   - → Classified into 2 groups

Based on geographical location
- Multiregional → Accessed from any part of the world
- Regional - Accessed from only one part of world

Based on usage
- Nearline - Accessed only once in a month.
- Coldline - Accessed only once in a year.

2. Cloud SQL:

→ This storage option is useful for working with relational databases.

3 options

- App Engine - SQL support for existing applications
- GCE - Creating SQL support while creating VM itself.
- External Service - Using external IP address structured data can be stored.

3. Cloud BigTable:

→ It is a NoSQL database data service.

→ Google core services like GMail, Maps, Search Engine, Analytics Tool are supported by BigTable.

→ It supports integration with BigTable tools like Hadoop, Spark and so on.

→ It supports applications related to IoT, Financial data analytics, etc.

4. Cloud Data Store:

→ This storage option is useful for mobile apps and web based projects

→ It is highly scalable NoSQL datastore

→ It is used for analytics like making predictions based on customer behaviour in a realtime inventory management system.

Cloud Monitoring: (Monitors resources & services)

→ It supports monitoring and managing and reviewing cloud services in a controlled cloud environment.

→ It helps to secure the applications.

→ It helps to verify whether a cloud is operational.

Steps for monitoring:

→ Create a VM using GCE

→ Use SSH to establish remote terminal session with a VM.

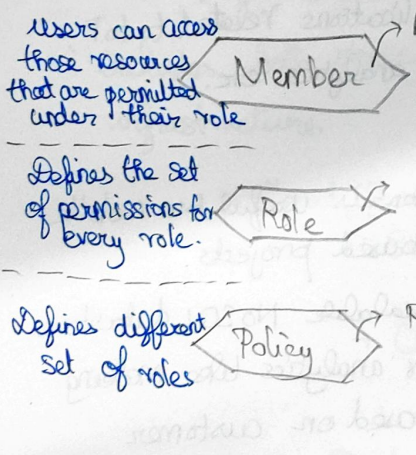
→ Deploy a webserver. (Appache, etc)

→ Install a monitoring agent

→ Set up uptime check.

→ Monitor the health of the services.

IAM: Identity Access Management. (Monitors users)



* Certain rights & certain permissions exist for different teams.
* Users are given with permissions to access only those resources allocated to them.
* No one has permissions to access, all the resources in the cloud.