



Overview of Cloud Computing – GCP



Course Objective

The following will be discussed and practiced during this session:

- Overview of GCP
- Google Compute Engine
- Google Cloud Shell
- Deploying sample application on GCE
- Introduction to Google App Engine
- Introduction to Google cloud Storage (GCS)



Overview of GCP

Runs on Google Infrastructure

- GCP is Google owns Infra which return billions of search results in milliseconds. Its all come down to its Network.
 - You will be using Google Infrastructure :
 - VM
 - Network
 - Storage.
- Global Network
- Redundancy
- Innovative Infrastructure



[360 degree view of Google Data center](#)

Google data center in Mayes County

Wingspan References

https://hsbc.onwingspan.com/viewer/lex_auth_01281262813536256010128/lex_auth_0128119949566771209624

GCP – Products classification

- Compute
- Storage and Databases
- Networking
- Big Data
- Machine Learning
- Management Tools
- Developer Tools
- Identity & Security

Assignment 1: Creating an account and logging to Google Cloud Platform

Wingspan References

https://hsbc.onwingspan.com/toc/lex_auth_01281262813536256010128/about



Google Compute Engine



Tea Break !!



Deploying sample application on GCE

GCP Instances

Use **Instances** to create virtual machine(VM) hosted on Google's Infra instead of procuring new hardware.

- Connect to your instances using SSH(Secure Shell), to perform advance configuration you can use **sudo** to run commands
- The number of virtual CPUs(vCPU), amount of memory supported by the VM is dependent on the machine type selected :
 - Predefined : have fixed collection of resources including memory size, virtual CPU(vCPU) count and storage
 - Custom : specify your own vCPU count and memory

VM


Creating Instance

- VM is created over same project.
- ← Create an instance

Name ?
mamtavm01

Zone ?
us-central1-b

Machine type
micro (1 shared vCPU) 0.6 GB memory [Customize](#)
[Upgrade your account](#) to create instances with up to 32 cores

Boot disk ?
 New 10 GB standard persistent disk
Image
Ubuntu 14.04 LTS [Change](#)

Identity and API access ?
Service account ?
Compute Engine default service account

Name the Instance

Select Zones based on Availability

Chose the VM Configuration

Select the boot disk image

Enable Firewall As Desired

Assignment 2: Creating Project and launching an instance

Accessing Instance

- Connect to the instance by the click on SSH: View on browser

The image shows a terminal window on the left and a cloud console interface on the right. The terminal window displays the output of an SSH connection to a Google Cloud instance named 'mamtavm01'. The output includes the host fingerprint, a welcome message for Ubuntu 14.04.5 LTS, system information (date, time, load, memory usage, processes, disk usage, swap usage, users logged in), and links to documentation and cloud support. The cloud console interface on the right shows a graph of CPU usage over time, with a red box highlighting the 'SSH' button in the 'Connect' section.

```
etainfy@mamtavm01: ~ - Google Chrome
https://ssh.cloud.google.com/projects/mamta01-141405/zones/us-central1-b/instances/mamtavm01?authuser=2&hl=en_U
Connected, host fingerprint: ssh-rsa 2048 28:54:16:3E:3B:A3:27:AB:20:A4:EC:21:F5:65:1B:E7
Welcome to Ubuntu 14.04.5 LTS (GNU/Linux 4.4.0-34-generic x86_64)

* Documentation:  https://help.ubuntu.com/

System information as of Thu Aug 25 08:17:55 UTC 2016

System load: 0.08      Memory usage: 9%    Processes:      76
Usage of /:  10.2% of 9.81GB  Swap usage:  0%    Users logged in: 0

Graph this data and manage this system at:
https://landscape.canonical.com/

Get cloud support with Ubuntu Advantage Cloud Guest:
http://www.ubuntu.com/business/services/cloud

0 packages can be updated.
0 updates are security updates.

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

etainfy@mamtavm01:~$
```

MySQL :: MySQL Conn

DISMISS UP

START STOP DELETE

Aug 25, 1:45 PM Aug 25, 1:59 P

IP 7.21.250 Connect

SSH

Assignment 3: Connecting to instances

Deploy web application

- Deploying an application in the instance requires utilities like application server, deployment platform, database support and few other configuration changes.
 1. Run an Apache server on the instance
 2. Deploy a simple PHP application on the server
 3. Test the application on the browser

Assignment 4: Deploying sample application on GCE

Wingspan References

https://hsbc.onwingspan.com/viewer/lex_auth_01281262640734208010129/lex_auth_0128119983396864009669



Google Cloud Shell

Interacting Methods with GCP

- GCP Console and Market place
 - Web based GUI to manage GCP resources and Projects
 - Can create new/ work with existing project
- Command Line Interface
 - **gcloud** Command line tool provided by Google Cloud SDK
 - Used to manage both development work flow and Cloud platform resources
 - <https://cloud.google.com/sdk/gcloud/reference/>
- Client Libraries
 - Create and Manager resources through APIs
 - App APIs – to provide access to services
 - Admin APIs- to provide resource management
 - <https://cloud.google.com/sdk/cloud-client-libraries>
 - Ex: APIs for Google Maps, you tube, Google Drive etc..

Google Cloud (gcloud)

- Is a command line interface tool to manage your Google cloud platform resources
- It allows you to perform many common tasks from the command line through automated scripts
- gcloud CLI manages authentication, local configuration, developer workflow and interaction with the Google cloud platform APIs
- The cloud SDK is a set of tools which contains gcloud, bq, and gsutil
- Using gcloud you can create and manage:

Google
Compute
engine
instances

Google
Cloud SQL
instances

Google
Container
Engine
clusters

Google
Cloud DNS
managed
zones and
record sets

Google
Cloud
Dataproc
clusters and
jobs

Google
Cloud
Deployment
manager
deployments

Wingspan References

https://hsbc.onwingspan.com/viewer/lex_auth_01281262640734208010129/lex_auth_0128119933942415369664



Progress check

Progress Check

- Overview of GCP
- Google Compute Engine
- Google Cloud Shell
- Deploying sample application on GCE

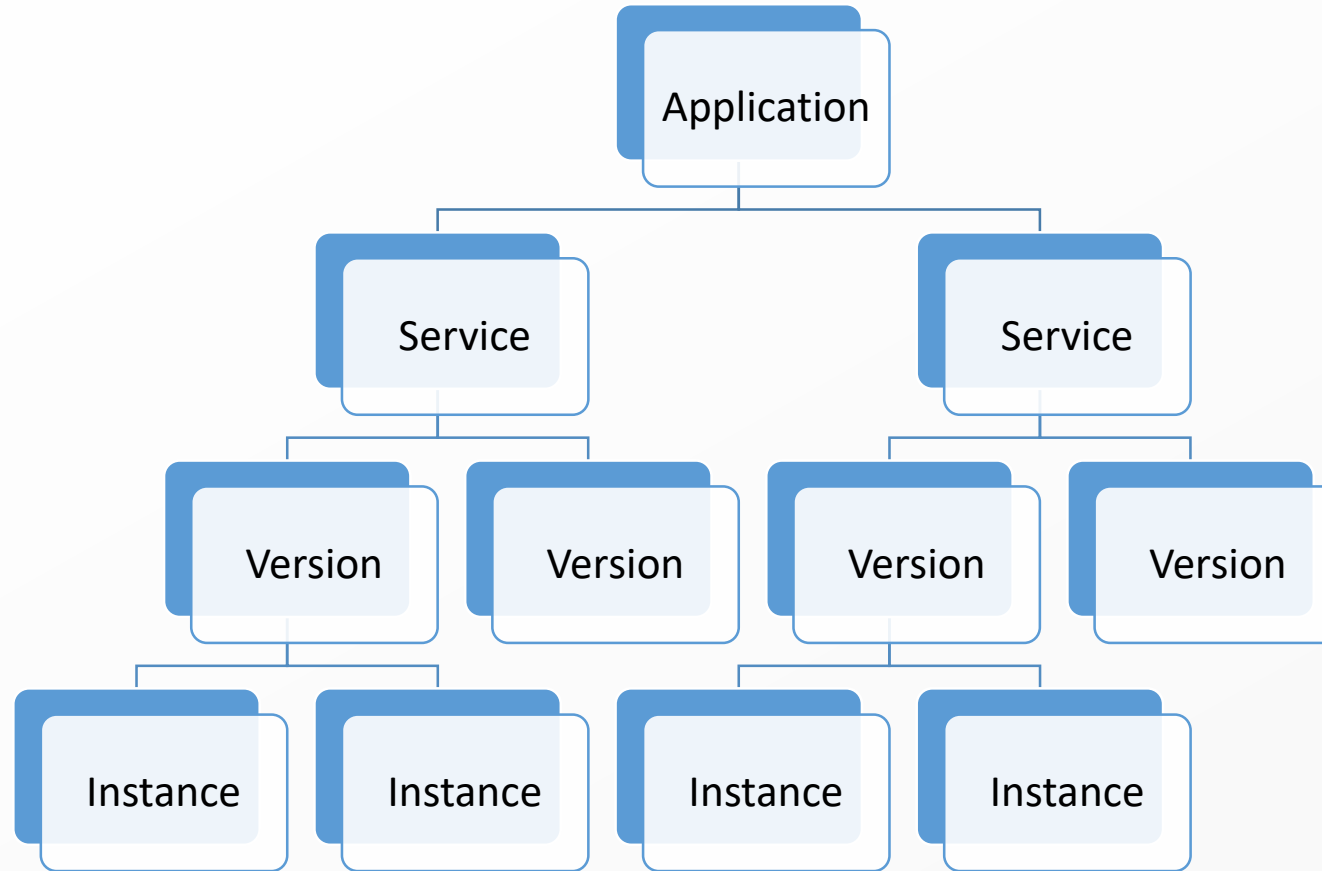


Lunch Break !!

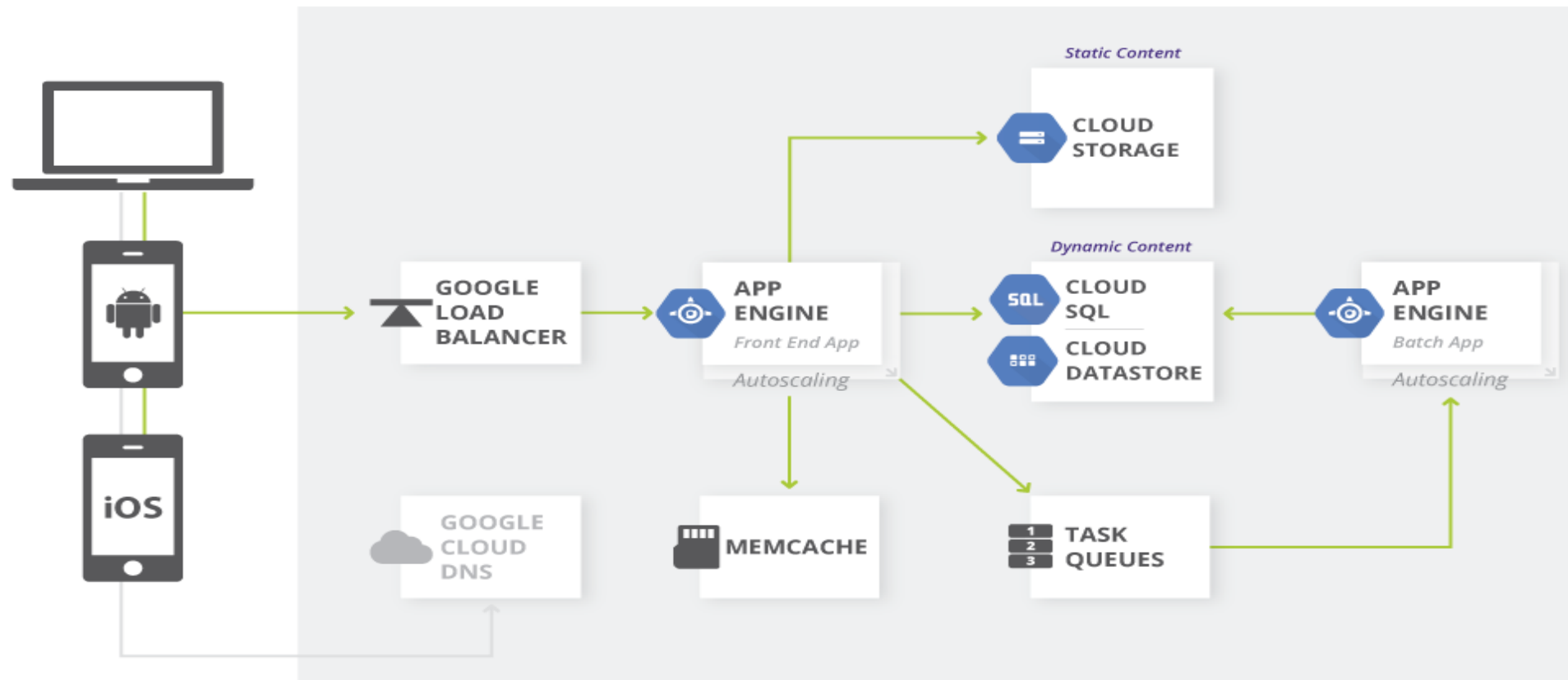


Introduction to Google App Engine

Hierarchy of a running App Engine application



GAE Architecture



Lab Work

Assignment 5: [Deploy Spring Boot Application in App Engine standard](#)
(OR)

Assignment 5: [Deploy a simple Python web application on App engine](#)

Quiz Time

Quiz 1

John is trying to build and deploy an application using App Engine which runs reliably under heavy load with large amount of data. Which of the following environment in App Engine helps her for her application ?

- ☐ Flexible environment
- ☐ Standard environment
- ☐ Premium environment

Quiz 2

Sam works on developing in App Engine with one of the supported language “Java”. Apart from that, which of the following languages are supported by App Engine

- ☐ Python
- ☐ PHP
- ☐ Ruby
- ☐ Node.js
- ☐ All of the above options

Wingspan References

https://pfizer.onwingspan.com/viewer/lex_auth_01281269890973696011447

Progress Check

- Overview of GCP
- Google Compute Engine
- Google Cloud Shell
- Deploying sample application on GCE
- Google App Engine



Tea Break !!



Introduction to Google Cloud Storage(GCS)

Storage Classes

Class	Characteristics	Use Cases	Examples
Multi-Regional	<ul style="list-style-type: none">• 99.95% availability• Geo-redundant	Frequently accessed hot objects around the world	Website Content, Streaming videos ,Game & Mobile Apps
Regional	<ul style="list-style-type: none">• 99.9% Availability• Data in Narrow Geo region• Lower cost /GB	Frequently accessed in same region	Data Analytics
Nearline	<ul style="list-style-type: none">• 99.0% Availability• Very Low Cost/GB• Data Retrieval & Per operation costs are higher• 30 day min storage	Not frequently accessed data Not more than once /month	back-up and serving long-tail multimedia content.
Coldline	<ul style="list-style-type: none">• 99.0% Availability• Lower Cost/GB• Data Retrieval & Per operation costs are higher• 90 day min storage	Not frequently accessed data Not more than once /year	Disaster recovery , data archived and not needed at future time

Lab Work

Assignment 6a: Creating a bucket in Cloud Storage

Assignment 6b: Upload objects in to a bucket in Cloud Storage

Quiz Time

Quiz 1

A company similar to Youtube needs to enable video streaming from its website accessible across globe. Which of the storage class is recommended for high availability?

- ☐ Regional
- ☐ Nearline
- ☐ Multi-Regional

Quiz 2

Which of these statement is FALSE with respect to Cloud Storage option on GCP?

- ☐ Objects can be edited in place on Cloud Storage
- ☐ Any type and any size of the file can be uploaded
- ☐ It is a BLOB storage
- ☐ Cloud storage is fully managed and scalable resource

Wingspan References

https://pfizer.onwingspan.com/viewer/lex_auth_0128119940262461449641

https://pfizer.onwingspan.com/viewer/lex_auth_01281262813536256010128/lex_auth_0128119938974679049655

Summary

- GCP Global infrastructure (Regions, Zones etc..)
- GCP compute, storage , DB and networking services
- GCP Compute(GCE)
- Cloud shell
- Deploying application on GCE
- Google App Engine
- Google Cloud Storage



Thank You