

Lab Guide for GCP IAM, Management services

CONTENTS

Day-4 Assignments

Contents

| | |
|--|----|
| Lab Guide for GCP IAM, Management services..... | 1 |
| CONTENTS | 1 |
| Assignment 1: Managing roles and permissions | 2 |
| Assignment 2 : Create persistent disk..... | 27 |
| Assignment 3 : Add PD to instances | 32 |
| Assignment 4 : Create PD from snapshots | 37 |
| Assignment 5: Detach and delete PD | 44 |
| Assignment 6 : Host a static website | 45 |
| Assignment 7 : Creating data transfers..... | 51 |

Context

This document contains assignments to be completed as part of the hands on session for the course

Guidelines

- The lab guide has been designed to give hands on experience to map the concepts learnt in the theory session with real life business oriented case studies/assignments.

Day-4 Assignments

Assignment 1: Managing roles and permissions

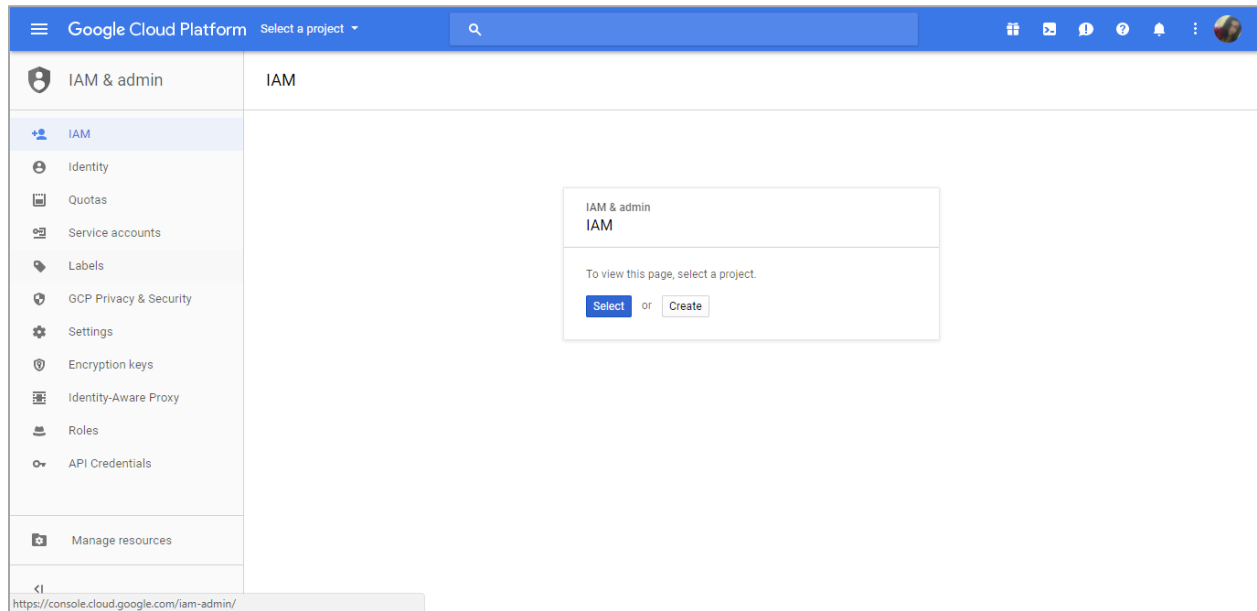
Objective: To create and manage permissions for Google Cloud Platform resources

Problem Description:



Step 1: Granting, changing and revoking access

Granting access to team members:

Open the IAM console and select a project.








Select

Recent

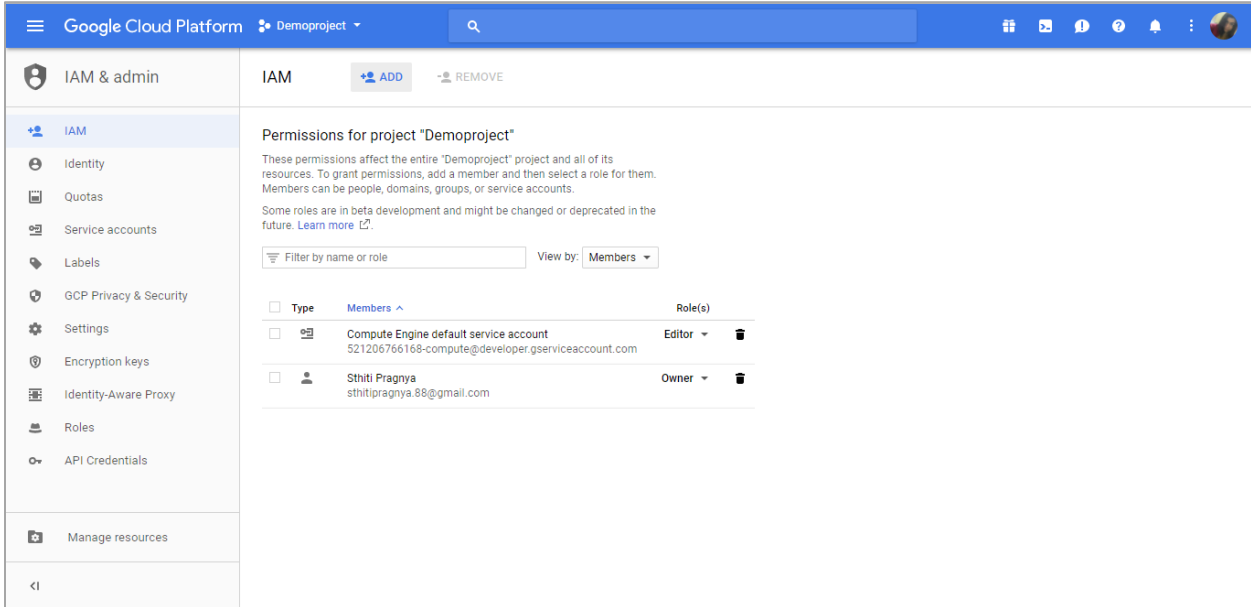
All

| Name | ID |
|---|--------------------|
|  OSCE | osce-159707 |
|  OSFP | osfp-159706 |
|  Firebase Demo Project | fir-demo-project |
|  Mysessiondemo | mysessiondemo |
|  Demoproject | demoproject-163505 |

CANCEL

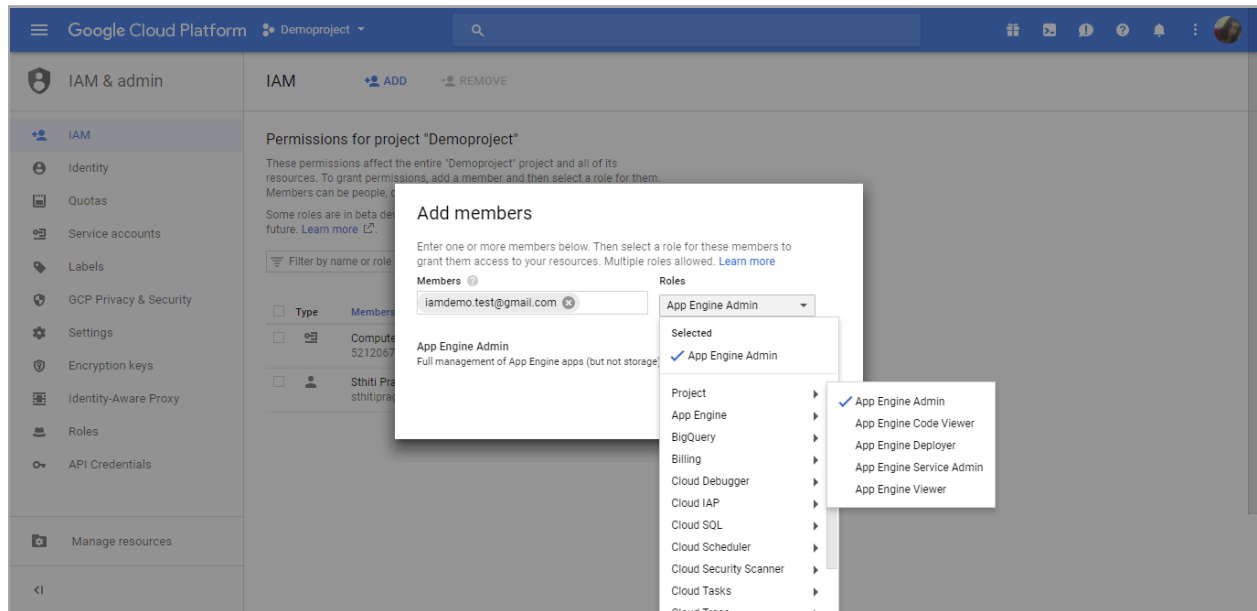
OPEN

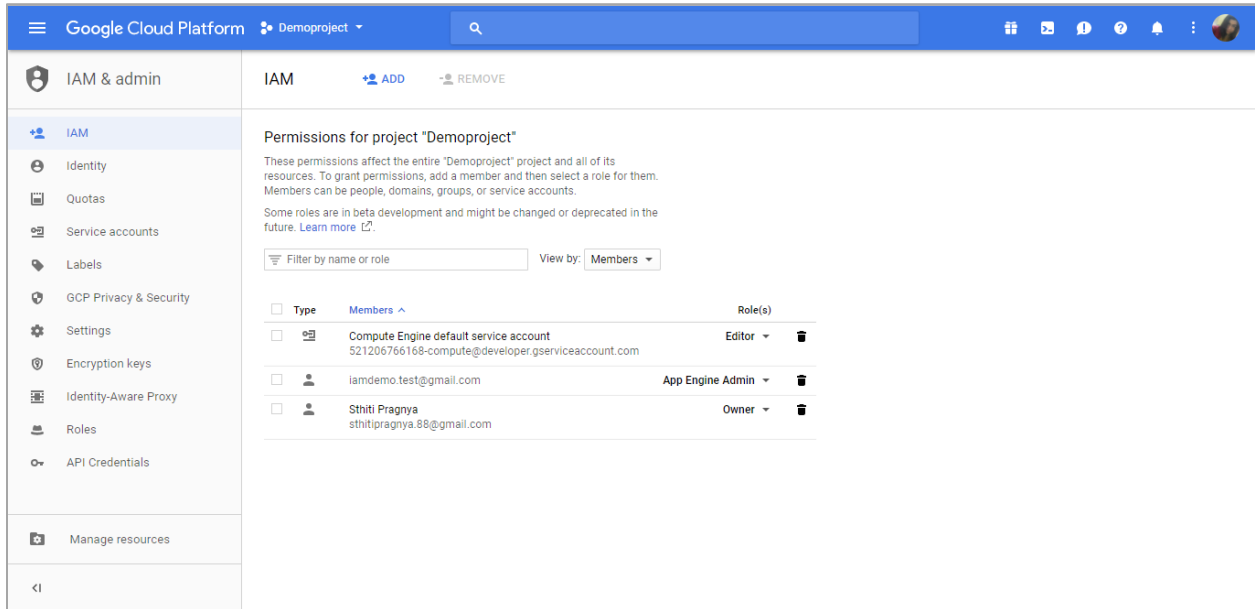
Click Add to add new member and set it's permission.



The screenshot shows the Google Cloud Platform interface for the 'Demoproject'. The left sidebar contains the 'IAM & admin' section with a list of sub-items: IAM, Identity, Quotas, Service accounts, Labels, GCP Privacy & Security, Settings, Encryption keys, Identity-Aware Proxy, Roles, API Credentials, and Manage resources. The main content area is titled 'IAM' and shows the 'Permissions for project "Demoproject"'. It includes a filter by name or role and a view by dropdown set to 'Members'. The table below lists the members and their roles.

| Type | Members | Role(s) |
|-----------------|--|---------|
| Service account | Compute Engine default service account 521206766168-compute@developer.gserviceaccount.com | Editor |
| User | Stithi Pragnya sthitipragnya.88@gmail.com | Owner |





The screenshot shows the Google Cloud Platform IAM & admin console for the project 'Demoproject'. The left sidebar contains a navigation menu with options: IAM (selected), Identity, Quotas, Service accounts, Labels, GCP Privacy & Security, Settings, Encryption keys, Identity-Aware Proxy, Roles, API Credentials, and Manage resources. The main content area is titled 'IAM' and shows 'Permissions for project "Demoproject"'. It includes a filter bar with 'Filter by name or role' and 'View by: Members'. Below this is a table of members:

| Type | Members | Role(s) |
|--------------------------|--|------------------|
| <input type="checkbox"/> | Compute Engine default service account 521206766168-compute@developer.gserviceaccount.com | Editor |
| <input type="checkbox"/> | iamdemo.test@gmail.com | App Engine Admin |
| <input type="checkbox"/> | Sthiti Pragnya sthitipragnya.88@gmail.com | Owner |

Grant a role to a member for more than one project.

Google Cloud Platform

Manage resources [CREATE PROJECT](#) [DELETE](#) [HIDE INFO PANEL](#)

Filter by name, ID, project number, or label Columns

| Project name | Project ID |
|---|--------------------|
| <input checked="" type="checkbox"/> Demoproject | demoproject-163505 |
| <input type="checkbox"/> Firebase Demo Project | fir-demo-project |
| <input checked="" type="checkbox"/> Mysessiondemo | mysessiondemo |
| <input type="checkbox"/> OSCE | osce-159707 |
| <input type="checkbox"/> OSFP | osfp-159706 |

Resources pending deletion

2 resources selected

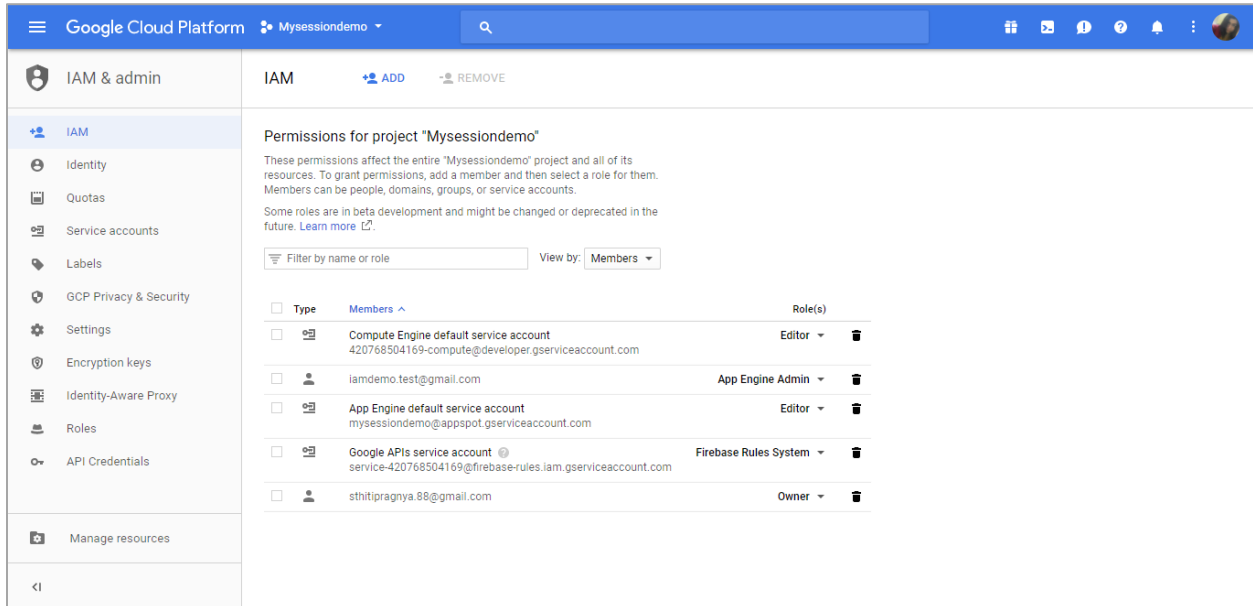
PERMISSIONS LABELS

Add members [iamdemo.test@gmail.com](#) Select a role Add

Search members

- Project
- App Engine
- BigQuery
- Billing
- Cloud Debugger
- Cloud IAP
- Cloud SQL
- Cloud Scheduler
- Cloud Security Scanner
- Cloud Tasks
- Cloud Trace
- Datastore
- Error Reporting

App Engine Admin (1 member)
Full management of App Engine apps

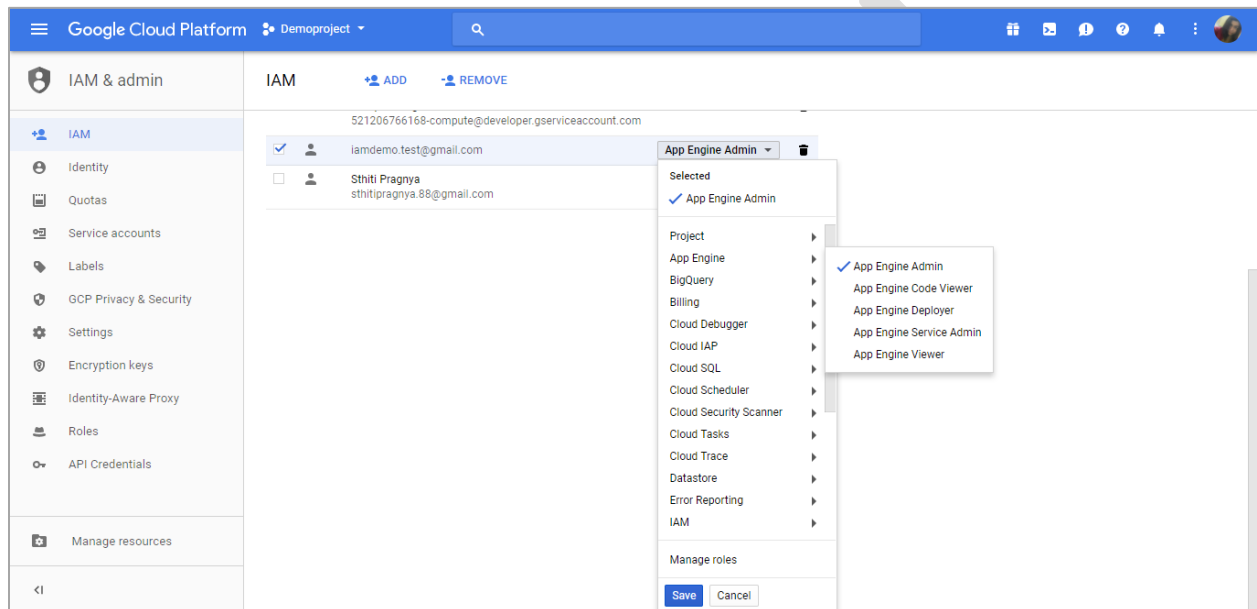


The screenshot shows the Google Cloud Platform IAM & admin console for the project 'Mysessiondemo'. The left sidebar lists various IAM & admin tools, with 'IAM' selected. The main content area displays the 'Permissions for project "Mysessiondemo"' page. It includes a filter bar with 'Filter by name or role' and 'View by: Members'. Below this is a table of members with columns for checkboxes, Type, Name, Role(s), and a delete icon.

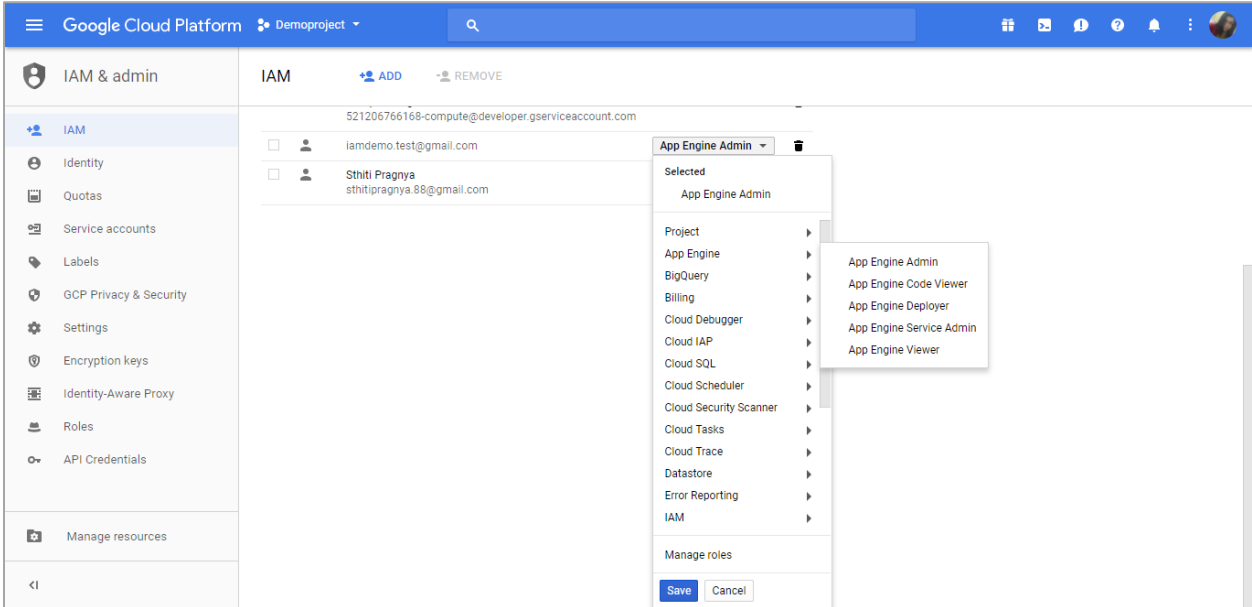
| | Type | Members | Role(s) | |
|--------------------------|-----------------|--|-----------------------|--|
| <input type="checkbox"/> | Service account | Compute Engine default service account 420768504169-compute@developer.gserviceaccount.com | Editor | |
| <input type="checkbox"/> | User | iamdemo.test@gmail.com | App Engine Admin | |
| <input type="checkbox"/> | Service account | App Engine default service account mysessiondemo@appspot.gserviceaccount.com | Editor | |
| <input type="checkbox"/> | Service account | Google APIs service account service-420768504169@firebase-rules.iam.gserviceaccount.com | Firebase Rules System | |
| <input type="checkbox"/> | User | sthitipragnya.88@gmail.com | Owner | |

To change or revoke the team member's

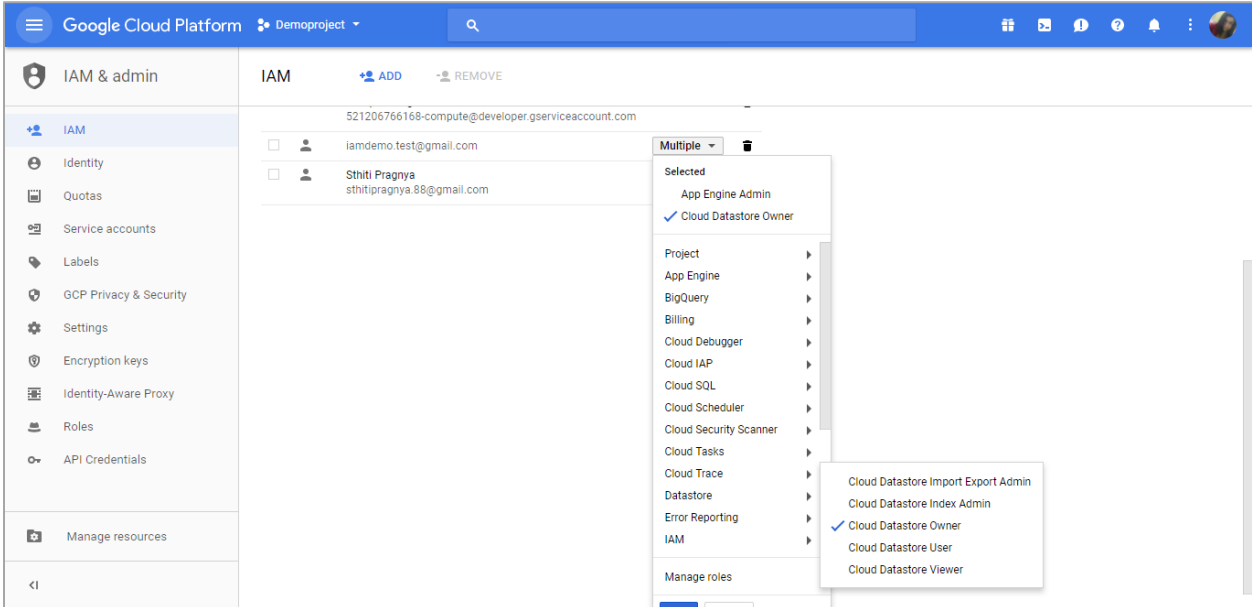
Select the member from whom you want to change or revoke the access.



In the Roles dropdown uncheck the roles and save.



The screenshot shows the Google Cloud Platform IAM & admin console. The left sidebar lists various IAM & admin tools, with 'IAM' selected. The main panel shows the 'IAM' page for a project named 'Demoproject'. A table lists two users: 'iamdemo.test@gmail.com' and 'Sthiti Pragnya' (sthitipragnya.88@gmail.com). A dropdown menu is open for the 'Sthiti Pragnya' user, showing a list of roles. The 'App Engine Admin' role is selected, and a secondary dropdown menu is open, showing a list of roles including 'App Engine Admin', 'App Engine Code Viewer', 'App Engine Deployer', 'App Engine Service Admin', and 'App Engine Viewer'. The 'App Engine Admin' role is selected in this secondary menu. The 'Save' button is visible at the bottom of the dropdown menu.



The screenshot shows the Google Cloud Platform IAM & admin console. The left sidebar contains the navigation menu with 'IAM & admin' selected. The main area shows the 'IAM' page for the project 'Demoproject'. A list of users is displayed, including a service account '521206766168-compute@developer.gserviceaccount.com'. A context menu is open over the service account, showing a list of roles. The 'Cloud Datastore Owner' role is selected, indicated by a checkmark. Other roles listed include 'App Engine Admin', 'Project', 'App Engine', 'BigQuery', 'Billing', 'Cloud Debugger', 'Cloud IAP', 'Cloud SQL', 'Cloud Scheduler', 'Cloud Security Scanner', 'Cloud Tasks', 'Cloud Trace', 'Datastore', 'Error Reporting', 'IAM', and 'Manage roles'. A secondary menu is also visible, showing 'Cloud Datastore Import Export Admin', 'Cloud Datastore Index Admin', 'Cloud Datastore Owner' (selected), 'Cloud Datastore User', and 'Cloud Datastore Viewer'.

The screenshot shows the Google Cloud Platform IAM & admin console for the project 'Demoproject'. The left sidebar lists various IAM & admin tools, with 'IAM' selected. The main content area displays 'Permissions for project "Demoproject"', explaining that these permissions affect the entire project and its resources. It includes a filter by name or role and a 'View by' dropdown set to 'Members'. A table lists the current members and their roles:

| Type | Members | Role(s) |
|-----------------|--|-----------------------|
| Service account | Compute Engine default service account 521206766168-compute@developer.gserviceaccount.com | Editor |
| User | iamdemo.test@gmail.com | Cloud Datastore Owner |
| User | Sthiti Pragnya sthitipragnya.88@gmail.com | Owner |

A notification at the bottom left states 'Roles Updated' with an 'Undo' button. A 'Notepad' window is also visible at the bottom right.

Source: google cloud platform

Step 2: Creating and managing custom roles.

Go to Roles and click on CREATE ROLE.

Google Cloud Platform

OSCE

IAM & admin

IAM

Identity

Quotas

Service accounts

Labels

GCP Privacy & Security

Settings

Encryption keys

Identity-Aware Proxy

Roles

API Credentials

Manage resources

Roles BETA

+ CREATE ROLE

Roles for "OSCE" project

⚠ Custom roles are a beta feature and should be used with caution. [Learn more](#)

A role is a group of permissions that you can assign to members. You can create a role and add permissions to it, or copy an existing role and adjust its permissions. Create custom roles by selecting one or more roles and create new role from selection.

Filter by name and permis

All role types

Any status

| <input type="checkbox"/> | Type | Name | Used in | Status | |
|--------------------------|------|--------------------------|------------|---------|---|
| <input type="checkbox"/> | | App Engine Admin | App Engine | Enabled | ⋮ |
| <input type="checkbox"/> | | App Engine Code Viewer | App Engine | Enabled | ⋮ |
| <input type="checkbox"/> | | App Engine Deployer | App Engine | Enabled | ⋮ |
| <input type="checkbox"/> | | App Engine Service Admin | App Engine | Enabled | ⋮ |
| <input type="checkbox"/> | | App Engine Viewer | App Engine | Enabled | ⋮ |
| <input type="checkbox"/> | | BigQuery Admin | BigQuery | Enabled | ⋮ |
| <input type="checkbox"/> | | BigQuery Data Editor | BigQuery | Enabled | ⋮ |
| <input type="checkbox"/> | | BigQuery Data Owner | BigQuery | Enabled | ⋮ |
| <input type="checkbox"/> | | BigQuery Data Viewer | BigQuery | Enabled | ⋮ |

No roles selected

This space is empty

Select one or more roles to create a new role and assign permissions

14 | Lab Guide

Google Cloud Platform

OSCE

+

CREATE ROLE

+

−

⌵

IAM & admin

IAM

Identity

Quotas

Service accounts

Labels

GCP Privacy & Security

Settings

Encryption keys

Identity-Aware Proxy

Roles

API Credentials

Manage resources

Roles

BETA

+

CREATE ROLE

+

−

⌵

Compute Instance Admin (v1)

165 combined permissions

compute.acceleratorTypes.get

compute.acceleratorTypes.list

compute.addresses.get

compute.addresses.list

compute.addresses.use

compute.autoscalers.create

compute.autoscalers.delete

compute.autoscalers.get

compute.autoscalers.list

compute.autoscalers.update

compute.backendBuckets.get

compute.backendBuckets.list

compute.backendServices.get

compute.backendServices.list

compute.diskTypes.get

compute.diskTypes.list

compute.disks.create

compute.disks.createSnapshot

compute.disks.delete

compute.disks.get

compute.disks.list

compute.disks.resize

compute.disks.setLabels

compute.disks.update

compute.disks.use

compute.disks.useReadOnly

compute.firewalls.get

compute.firewalls.list

compute.forwardingRules.externalGet

Roles for "OSCE" project

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A role is a group of permissions that you can assign to members. You can create a role and add permissions to it, or copy an existing role and adjust its permissions. Create custom roles by selecting one or more roles and create new role from selection.

compute instance

All role types

Any status

Type

Name

Used in

Status

☐

Compute Instance Admin (beta)

Compute Engine

Enabled

⋮

☒

Compute Instance Admin (v1)

Compute Engine

Enabled

⋮

Add a new role and assign permissions to it.

Google Cloud Platform

OSCE

IAM & admin

IAM

Identity

Quotas

Service accounts

Labels

GCP Privacy & Security

Settings

Encryption keys

Identity-Aware Proxy

Roles

API Credentials

Manage resources

Create Role BETA

Custom roles let you group permissions and assign them to members of your project or organization. You can manually select permissions or import permissions from another role. [Learn more](#)

Name

Test Custom Role

Description

Created on: 2017-11-30 for demo purpose

ID

CustomRole

Role launch stage

Alpha

+ Add Permissions

No assigned permissions

Filter permission

All services All types

Name

Create

Cancel

16 | Lab Guide

Add permissions

Display permissions from

Available Permissions ▾

All services ▾

All types ▾

| <input type="checkbox"/> Name |
|---|
| <input checked="" type="checkbox"/> appengine.applications.create |
| <input type="checkbox"/> appengine.applications.disable |
| <input type="checkbox"/> appengine.applications.get |
| <input type="checkbox"/> appengine.applications.list |
| <input type="checkbox"/> appengine.applications.update |
| <input type="checkbox"/> appengine.instances.delete |
| <input type="checkbox"/> appengine.instances.get |
| <input type="checkbox"/> appengine.instances.list |
| <input type="checkbox"/> appengine.instances.update |

CANCEL

ADD PERMISSIONS

Add permissions

Display permissions from

Available Permissions ▾

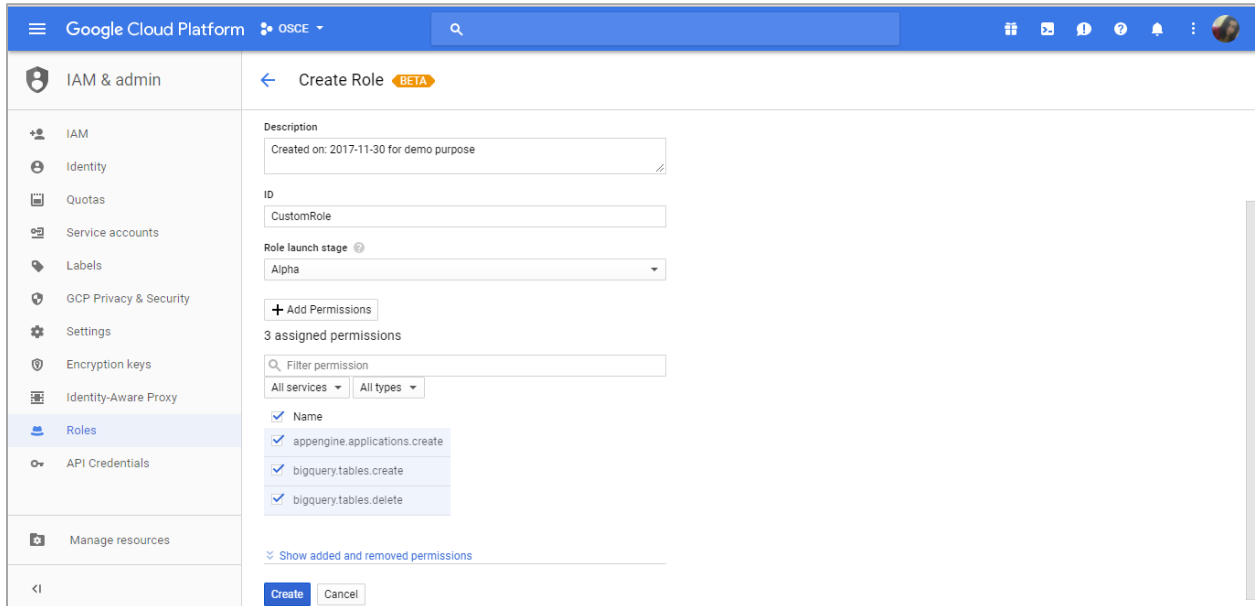
All services ▾

All types ▾

| <input type="checkbox"/> Name |
|--|
| <input checked="" type="checkbox"/> bigquery.tables.create |
| <input checked="" type="checkbox"/> bigquery.tables.delete |
| <input type="checkbox"/> bigquery.tables.export |
| <input type="checkbox"/> bigquery.tables.get |
| <input type="checkbox"/> bigquery.tables.getData |
| <input type="checkbox"/> bigquery.tables.list |
| <input type="checkbox"/> bigquery.tables.update |
| <input type="checkbox"/> bigquery.tables.updateData |
| <input type="checkbox"/> bigquery.transfers.get |

CANCEL

ADD PERMISSIONS



Google Cloud Platform OSCE

IAM & admin

Create Role BETA

Description
Created on: 2017-11-30 for demo purpose

ID
CustomRole

Role launch stage
Alpha

+ Add Permissions

3 assigned permissions

Filter permission

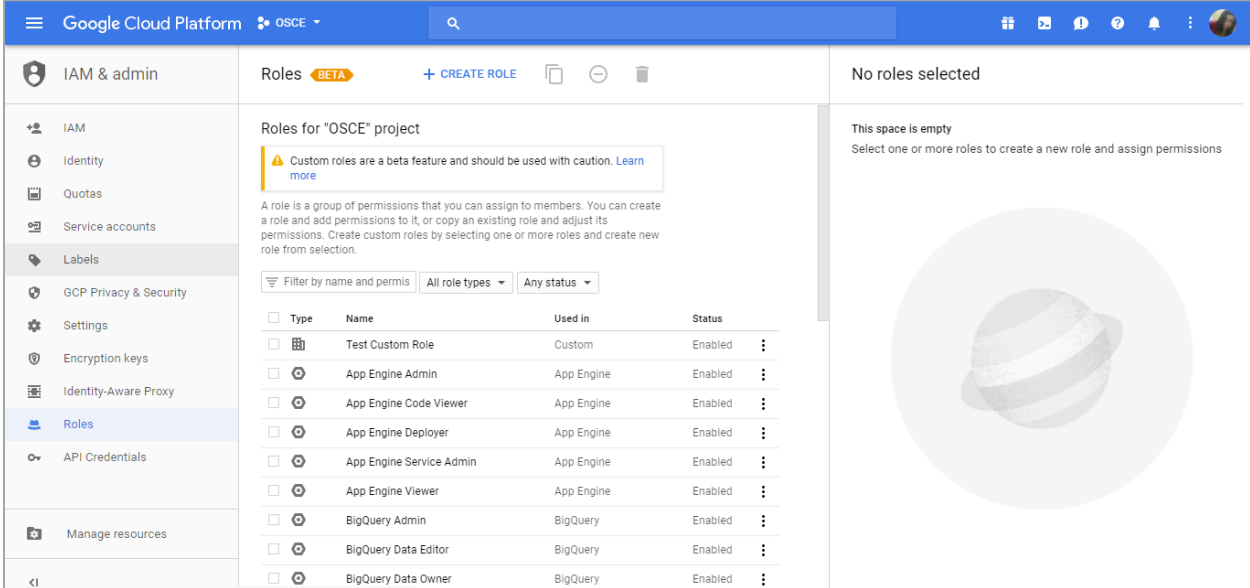
All services All types

- ☒ Name
- ☒ appengine.applications.create
- ☒ bigquery.tables.create
- ☒ bigquery.tables.delete

Show added and removed permissions

Create Cancel

Go back to the Roles page and check for the new role you have created.



Google Cloud Platform OSCE

IAM & admin

Roles **BETA** + CREATE ROLE

No roles selected

This space is empty
Select one or more roles to create a new role and assign permissions

Roles for "OSCE" project

⚠ Custom roles are a beta feature and should be used with caution. [Learn more](#)

A role is a group of permissions that you can assign to members. You can create a role and add permissions to it, or copy an existing role and adjust its permissions. Create custom roles by selecting one or more roles and create new role from selection.

Filter by name and permis All role types Any status

| Type | Name | Used in | Status |
|--------------------------|--------------------------|------------|---------|
| <input type="checkbox"/> | Test Custom Role | Custom | Enabled |
| <input type="checkbox"/> | App Engine Admin | App Engine | Enabled |
| <input type="checkbox"/> | App Engine Code Viewer | App Engine | Enabled |
| <input type="checkbox"/> | App Engine Deployer | App Engine | Enabled |
| <input type="checkbox"/> | App Engine Service Admin | App Engine | Enabled |
| <input type="checkbox"/> | App Engine Viewer | App Engine | Enabled |
| <input type="checkbox"/> | BigQuery Admin | BigQuery | Enabled |
| <input type="checkbox"/> | BigQuery Data Editor | BigQuery | Enabled |
| <input type="checkbox"/> | BigQuery Data Owner | BigQuery | Enabled |

Follow the above steps and create another role. Assign Test Custom Role as a permission to the new role.

Add permissions

Display permissions from

Test Custom Role ▼

Filter roles

Select all
None

Available Permissions

☒ Test Custom Role

☐ App Engine Admin

☐ App Engine Code Viewer

☐ App Engine Deployer

All types ▼

CANCEL

ADD PERMISSIONS

Add permissions

Display permissions from

Test Custom Role ▾

Filter permission

All services ▾

All types ▾

☐ Name

☒ appengine.applications.create

☒ bigquery.tables.create

☐ bigquery.tables.delete

CANCEL

ADD PERMISSIONS

Go back to the Roles console and check for the new role.

Google Cloud Platform

OSCE

IAM & admin

IAM

Identity

Quotas

Service accounts

Labels

GCP Privacy & Security

Settings

Encryption keys

Identity-Aware Proxy

Roles

API Credentials

Manage resources

Roles

BETA

+ CREATE ROLE

No roles selected

This space is empty

Select one or more roles to create a new role and assign permissions

Roles for "OSCE" project

Custom roles are a beta feature and should be used with caution. [Learn more](#)

A role is a group of permissions that you can assign to members. You can create a role and add permissions to it, or copy an existing role and adjust its permissions. Create custom roles by selecting one or more roles and create new role from selection.

Filter by name and permis

All role types

Any status

| Type | Name | Used in | Status |
|--------------------------|--------------------------|------------|---------|
| <input type="checkbox"/> | Test Custom Role | Custom | Enabled |
| <input type="checkbox"/> | Test Custom Role 2 | Custom | Enabled |
| <input type="checkbox"/> | App Engine Admin | App Engine | Enabled |
| <input type="checkbox"/> | App Engine Code Viewer | App Engine | Enabled |
| <input type="checkbox"/> | App Engine Deployer | App Engine | Enabled |
| <input type="checkbox"/> | App Engine Service Admin | App Engine | Enabled |
| <input type="checkbox"/> | App Engine Viewer | App Engine | Enabled |
| <input type="checkbox"/> | BigQuery Admin | BigQuery | Enabled |
| <input type="checkbox"/> | BigQuery Data Editor | BigQuery | Enabled |

23 | Lab Guide

Google Cloud Platform

OSCE

IAM & admin

IAM

Identity

Quotas

Service accounts

Labels

GCP Privacy & Security

Settings

Encryption keys

Identity-Aware Proxy

Roles

API Credentials

Manage resources

Roles BETA

+ CREATE ROLE

Roles for "OSCE" project

Custom roles are a beta feature and should be used with caution. [Learn more](#)

A role is a group of permissions that you can assign to members. You can create a role and add permissions to it, or copy an existing role and adjust its permissions. Create custom roles by selecting one or more roles and create new role from selection.

Filter by name and permis

All role types

Any status

| Type | Name | Used in | Status |
|-------------------------------------|--------------------------|------------|---------|
| <input checked="" type="checkbox"/> | Test Custom Role | Custom | Enabled |
| <input type="checkbox"/> | Test Custom Role 2 | Custom | |
| <input type="checkbox"/> | App Engine Admin | App Engine | |
| <input type="checkbox"/> | App Engine Code Viewer | App Engine | |
| <input type="checkbox"/> | App Engine Deployer | App Engine | Enabled |
| <input type="checkbox"/> | App Engine Service Admin | App Engine | Enabled |
| <input type="checkbox"/> | App Engine Viewer | App Engine | Enabled |
| <input type="checkbox"/> | BigQuery Admin | BigQuery | Enabled |
| <input type="checkbox"/> | BigQuery Data Editor | BigQuery | Enabled |

×

Test Custom Role

ID: projects/osce-159707/roles/CustomRole

Role launch stage: Alpha

Description

Created on: 2017-11-30 for demo purpose

3 combined permissions

appengine.applications.create

bigquery.tables.create

bigquery.tables.delete

Add members and assign the new roles to them.

Add members

Enter one or more members below. Then select a role for these members to grant them access to your resources. Multiple roles allowed. [Learn more](#)

Members ?

Roles

Select a role

Selected

Compute Engine

Container Builder

Custom

DNS

Dataflow

Datastore

Deployment Manager

Error Reporting

IAM

Kubernetes Engine

Logging

Test Custom Role

Test Custom Role 2

Engine Code Viewer

App Engine

Engine Deployer

App Engine

Engine Service Admin

App Engine

Engine Viewer

App Engine





ry Admin







BigQuery

ry Data Editor

BigQuery

Delete the new custom roles.

| Filter by name and permis | | All role types | Any status |
|---|--------------------|----------------|--|
| <input type="checkbox"/> Type | Name | Used in | Status |
| <input type="checkbox"/>  | Test Custom Role | Custom | Deleting  |
| <input checked="" type="checkbox"/>  | Test Custom Role 2 | Custom | Deleting  |

| Filter by name and permis | | All role types | Any status |
|---|------------------------|----------------|---|
| <input type="checkbox"/> Type | Name | Used in | Status |
| <input checked="" type="checkbox"/>  | Test Custom Role | Custom | Deleting  |
| <input checked="" type="checkbox"/>  | Test Custom Role 2 | Custom | <div> Create role from this role Enable Undelete Edit </div> |
| <input type="checkbox"/>  | App Engine Admin | App Engine | |
| <input type="checkbox"/>  | App Engine Code Viewer | App Engine | |
| <input type="checkbox"/>  | App Engine Deployer | App Engine | |

Step 3: Enter the gmail username and password when prompted and click on Login.

Estimated time: 5 minutes

Summary: You have learnt:

- *how to grant, change, and revoke access to Project members*
- *how to create and manage a custom role*

Day-4 Assignments

Assignment 2 : Create persistent disk

Highlights:

PD helps in increasing the storage capacity of instances

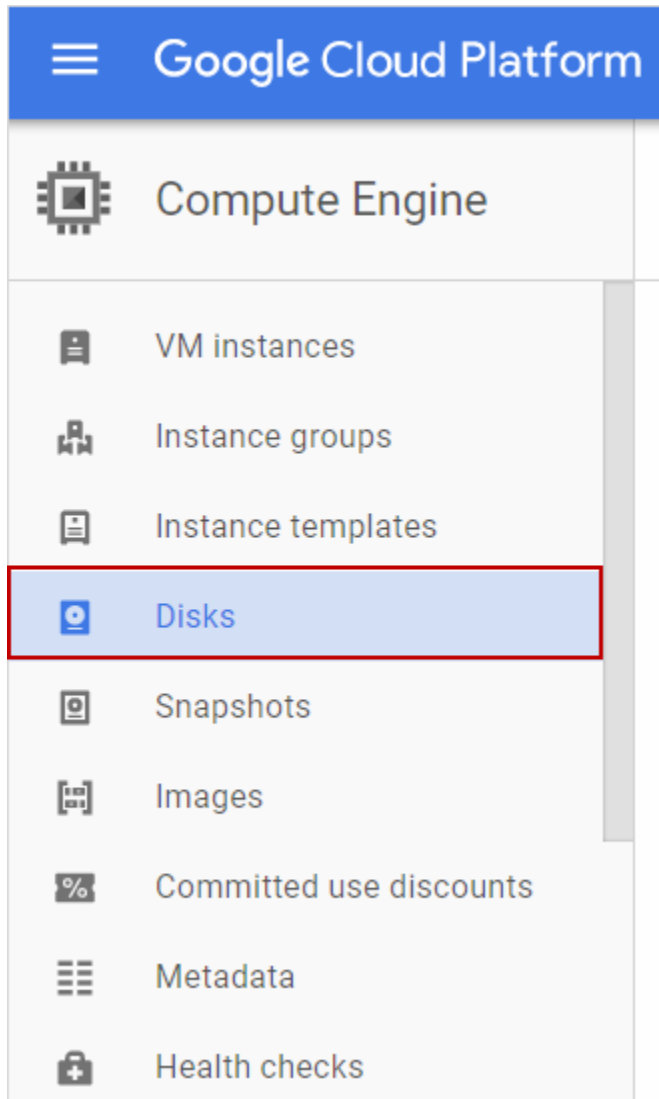
PD are available as either Standard HDD or SSD

Demosteps:

For personal computers, you can use external hard disks to increase the total storage capacity. PD helps in increasing the storage capacity of instances. You can create PD and customize according to the storage requirements of instances. You will now see the demo on how to create a standard PD:

Step 1:

To create a PD, navigate to disks and click create disks



Compute Engine
 Disks

Every Compute Engine VM instance is attached to at least one disk as a boot disk and for persistent storage. A persistent disk can be a standard (HDD) or a solid-state (SSD) drive. You can also attach an ephemeral local SSD for high-performance I/O.

[Learn more](#)

Create disk

Step 2:

Provide the name to the disk

Name ?

panchama-disk1

Description (Optional)

Zone ?

us-central1-c

Disk Type ?

Standard persistent disk

Step 3:

As disk are zonal resources, thus to attach the disk to instance select the zone in which your instance are placed.

- **Select None(blank disk) under Source Type**
- Select disk type as per Panchama's requirement. For standard, we can create disk upto 64TB

Source type ?

Image

Snapshot

None (blank disk)

Size (GB) ?

10

You have entered a volume size of under 200 GB. This may result in reduced performance. [Learn more](#)

Estimated performance ?

| Operation Type | Read | Write |
|-----------------------------------|------|-------|
| Sustained random IOPS limit | 7.50 | 15.00 |
| Sustained throughput limit (MB/s) | 1.20 | 1.20 |

Encryption ?


Automatic (recommended)

Create

Cancel

Step 4:

Click on **Create** and a new PD will be created as shown below:

| Disks | | | | | |
|--|--------------------------|-------|---------------|-----------|--|
| + CREATE DISK REFRESH DELETE | | | | | |
| <input type="text" value="Filter by label or name"/> | | | | | <input type="button" value="Columns"/> |
| <input type="checkbox"/> Name ^ | Type | Size | Zone | In use by | |
| <input type="checkbox"/>  panchama-disk-1 | Standard persistent disk | 10 GB | us-central1-c | ⋮ | |

PD are available as either Standard HDD (hard disk drives) or SSD (solid state drives). You can understand more [storage options to add to your instance](#) in GCP documentation.

Next, you will see how to attach this EBS volume to an EC2 instance to increase its storage capacity.

Assignment 3 : Add PD to instances

Highlights:

- PDs are zonal resources
- Multiple disks can be attached to the instance while creation

Demosteps:

Once PD is created, it will be in available state. You can attach them to instances to configure as a storage device. As the first step, you will create an instance, so that the PD can be attached to it.

Step 1: Create an instance

- *Navigate to GCP console and launch an instance from a Debian GNU image. You can proceed with micro (f1-micro) machine type*
- *Select the zone corresponding to the zone that you selected during PD creation*

← Create an instance

Name ?

Zone ?


us-central1-c

Machine type

micro (1 shared...

 0.6 GB memory
 [Customize](#)


Boot disk ?



New 10 GB standard persistent disk
 Image
 Debian GNU/Linux 9 (stretch)

Change

You can verify the instance created below:

| <input type="checkbox"/> Name ^ | Zone | Recommendation | Internal IP | External IP | Connect |
|--|---------------|----------------|-------------|---------------|---------|
| <input type="checkbox"/>  panchama-instance-1 | us-central1-c | | 10.128.0.2 | 35.192.64.238 | SSH ▾ ⋮ |

Step 2: Add PD to instance

- Select **Disks** by expand the **Management tab**

Management
Disks
Networking
SSH Keys

Deletion rule

☒ Delete boot disk when instance is deleted

Encryption ?

Automatic (recommended) ▾

Additional disks ? (Optional)

- Click **Add Item** to add the additional disk created for instance
- Select the PD created from the drop down list in **Name**

Management
Disks
Networking
SSH Keys

Deletion rule
☒ Delete boot disk when instance is deleted

Encryption ?
Automatic (recommended)

Additional disks ? (Optional)

| Name | Mode | When deleting instance |
|--|---|--|
| <input type="text"/> | <input type="text" value="Read/write"/> | <input type="text" value="Keep disk"/> |
| <div> Create disk </div> <div> <div> panchama-disk-1 </div> <div> Standard persistent disk, 10 GB, unmounted </div> </div> | | |

Click Create to launch the instance with disk attached to it

Once the volume is attached, you can connect to the instance, format the PD as per Panchama's requirement and make it available for use.

For more information, see [Formatting and mounting a non-boot persistent disk](#) from GCP documentation.

In the next section, you will see how to reuse existing PD to create replicas of it and use for data restoration.

Assignment 4 : Create PD from snapshots

Highlights:

- Snapshots are global resources
- Multiple disks can be created from single snapshot

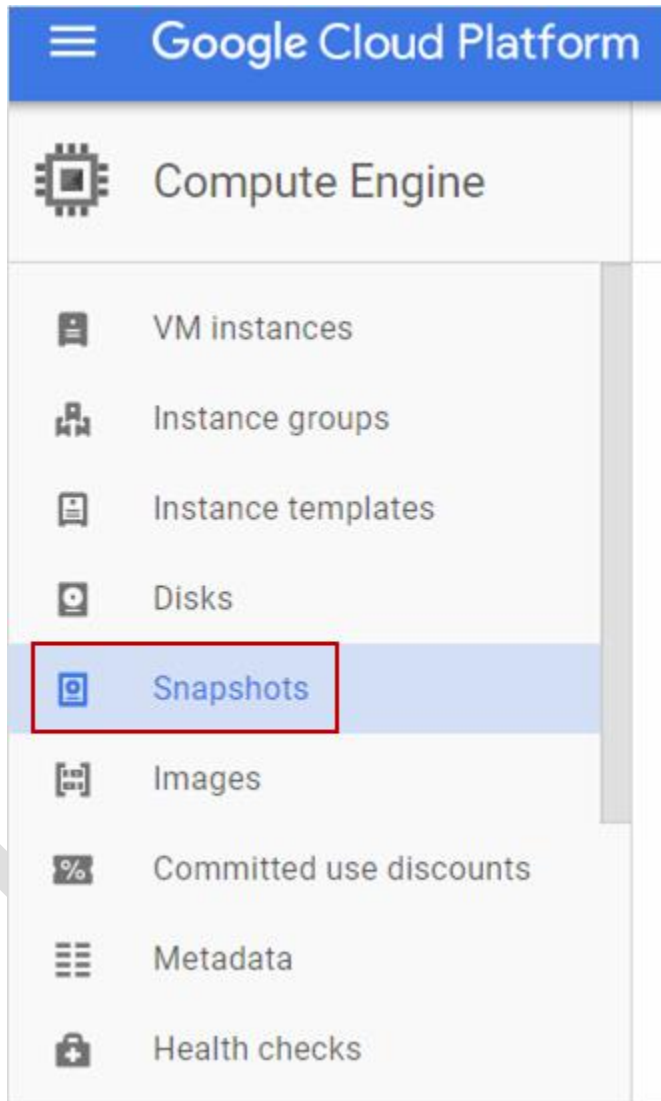
Demosteps:

Snapshots are useful to create periodic backup from PD to use as baseline for new volumes or for backup of data. The snapshots are incremental which makes regular snapshots on a PD faster at a much lower rate. Snapshot process takes place asynchronously and the data will be stored into storage buckets owned by GCP.

You will now see the demo on how to take snapshot and restore PD from it:

Step 1: Create a snapshot

- To create a snapshot, navigate to Compute Engine dashboard and click Snapshots



Compute Engine

Snapshots

You can take a snapshot of a Compute Engine persistent disk to quickly back up the disk so you can recover lost data, transfer contents to a new disk, or make static data available to multiple nodes. [Learn more](#)

Create snapshot

Select the required PD from the list Source Disk

←

Create a snapshot

Name ?

Description (Optional)

Source disk ?

panchama-disk-1
▼

Encryption ?

Automatic (recommended)
▼


Integrate volume shadow copy service ?

☐ Enable VSS



Create

Cancel

The list of completed snapshots can be seen in the **Snapshots** dashboard.

| <input type="checkbox"/> Name ^ | Source disk | Creation time | Disk size | Snapshot size |
|---|-----------------|--------------------------|-----------|---------------|
| <input type="checkbox"/>  panchama-disk-snapshot-1 | panchama-disk-1 | Oct 18, 2017, 3:35:05 PM | 10 GB | 0 B |

You can also create snapshot of a disk by selecting **Create snapshot** as shown:

| <input type="checkbox"/> Name ^ | Type | Size | Zone | In use by |
|---|--------------------------|-------|---------------|---------------------|
| <input type="checkbox"/>  panchama-disk-1 | Standard persistent disk | 10 GB | us-central1-c | panchama-instance-1 |
| <input type="checkbox"/>  panchama-instance-1 | Standard persistent disk | 10 GB | us-central1-c | panchama-instance-1 |

+ Create instance
 + Create snapshot
 Delete

Snapshots that are taken from encrypted volumes are automatically encrypted. Volumes that are created from encrypted snapshots are also automatically encrypted.

Taking a snapshot will not impact any ongoing read/write operations into the PD. The data blocks till the point-in-time of initiating snapshot will be considered. Hence you can take a snapshot of an attached volume that is in use.

Step 2: Restore PD from snapshot

- To create an PD out of an existing snapshot, navigate to **Disks**

Name ?

panchama-disk-2

Description (Optional)

Restored disk from snapshot.

Zone ?

us-central1-c

Disk Type ?

Standard persistent disk

Provide disk details as per Panchama's requirement and select **Snapshots** under Source **type**

Image

Snapshot
 None (blank disk)

Source snapshot ?

panchama-disk-snapshot-1
 ▼

Size (GB) ? (Optional)

10

Estimated performance ?




| Operation Type | Read | Write |
|-----------------------------------|------|-------|
| Sustained random IOPS limit | 7.50 | 15.00 |
| Sustained throughput limit (MB/s) | 1.20 | 1.20 |

Encryption ?

Automatic (recommended)
 ▼

Create
 Cancel

- *You can see a new disk created from the snapshot provided*

| <input type="checkbox"/> Name ^ | Type | Size | Zone | In use by | |
|--|--------------------------|-------|---------------|-------------------------------------|---|
| <input type="checkbox"/>  panchama-disk-1 | Standard persistent disk | 10 GB | us-central1-c | panchama-instance-1 | ⋮ |
| <input type="checkbox"/>  panchama-disk-2 | Standard persistent disk | 10 GB | us-central1-c | | ⋮ |
| <input type="checkbox"/>  panchama-instance-1 | Standard persistent disk | 10 GB | us-central1-c | panchama-instance-1 | ⋮ |

In the next section, you will see how to detach and delete an PD if it is no longer required.

Assignment 5: Detach and delete PD

You can detach a GCP PD from an instance explicitly or by terminating the instance. However, if the instance is running, you must first unmount the volume from the instance.

If PD is the root device of an instance, you must stop the instance before you can detach the volume.

Use the following command to unmount the disk mounted on location '/mnt/disks/PD1'.

sudo umount /mnt/disks/PD1

- *To detach a disk, first stop the instance so that any data can be saved.*
- *Select the instance of which disk needed to be detached.*
- *Click EDIT, cancel the attached disk under Additional disks.*

← VM instance details
 ✎ EDIT
🔄 RESET
📄 CLONE

☒ Delete boot disk when instance is deleted

Additional disks ? (Optional)

| Name | Mode | When deleting instance |
|-----------------|------------|------------------------|
| panchama-disk-1 | Read/write | Keep disk |

✕

+ Add item

Once a disk is deleted, the data stored will also be gone and the volume cannot be attached to any instance. You need to make sure that the data is properly backed up as snapshots so that this can be re-used at any point of time.

Assignment 6 : Host a static website

Highlights:

Upload static web files in cloud storage and server website through HTTPS

Registered domain can be used to create bucket and server through HTTP

Demosteps:

Panchama wants measure the performance of static web hosting in cloud storage bucket, as per requirement it will then register the domain. You will now see the demo on host static website in cloud storage:

Step 1:

Navigate to cloud storage and create the bucket in a specific region as per Panchama's requirement.

panchama

Default storage class ?

☐ Multi-Regional
Use to stream videos and host hot web content.
Best for data accessed frequently around the world.

☒ **Regional**
Use to store data and run data analytics.
Best for data accessed frequently in one part of the world.

☐ Nearline
Use to store rarely accessed documents.
Best for data accessed less than once per month.

☐ Coldline
Use to store very rarely accessed documents.
Best for data accessed less than once per year.

Regional location
Redundant within a single region.

us-central1

Specify labels




Create

Cancel

Step 2:

Upload required static files in bucket, as shown below static html files, image and an error file is uploaded.




Buckets / panchama

| <input type="checkbox"/> | Name | Size | Type | Storage class | Last modified |
|--------------------------|---|-----------|-----------|---------------|-------------------|
| <input type="checkbox"/> |  bimag4.png | 504.05 KB | image/png | Regional | 10/20/17, 3:14 PM |
| <input type="checkbox"/> |  error.html | 267 B | text/html | Regional | 10/20/17, 3:14 PM |
| <input type="checkbox"/> |  Panchama.html | 883 B | text/html | Regional | 10/20/17, 3:14 PM |

Step 3:

Make sure the file is made publicly accessible to serve it on HTTPS.

Buckets / panchama

| <input type="checkbox"/> | Name | Size | Type | Storage class | Last modified | Share publicly |
|--------------------------|---|-----------|-----------|---------------|-------------------|---|
| <input type="checkbox"/> |  bimag4.png | 504.05 KB | image/png | Regional | 10/20/17, 3:14 PM | <input checked="" type="checkbox"/> Public link |
| <input type="checkbox"/> |  error.html | 267 B | text/html | Regional | 10/20/17, 3:14 PM | <input checked="" type="checkbox"/> Public link |
| <input type="checkbox"/> |  Panchama.html | 883 B | text/html | Regional | 10/20/17, 3:14 PM | <input checked="" type="checkbox"/> Public link |

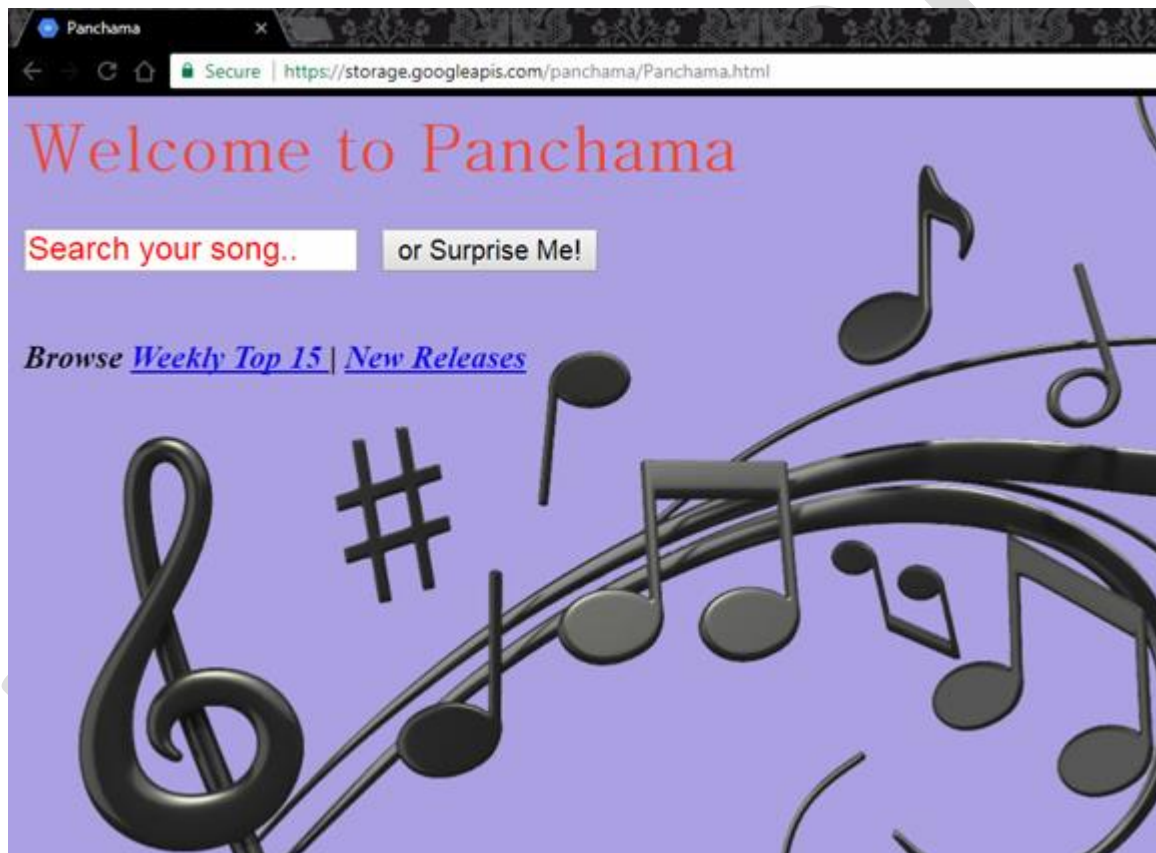
Step 4:

Copy the URL in browser in below format by specifying the bucket and object name as shown.

<https://storage.googleapis.com/panchama/Panchama.html>

Step 5:

Verify the output of the static html you uploaded in bucket.



If you created the bucket with verified domain, you can specify the index and error html files by clicking settings icon and edit website configuration as shown below.

Configure `panchama.com` website

Main page ?

404 (not found) page ?

CANCEL SAVE

Assignment 7 : Creating data transfers

Highlights:

Use the Google Cloud Platform Console to set up and manage transfer jobs

Demosteps:

Setting up a transfer job

1. Open the Transfer page in the Google Cloud Platform Console. Click **Create transfer job**.
2. Let's select **GOOGLE CLOUD STORAGE**
3. Then select **Google Cloud Storage bucket** and enter source bucket name.
4. Under **Select destination**, choose a sink bucket or create a new one. To transfer files to a new bucket, click **Browse** and then click the **New bucket** icon.
5. Enable overwrite/delete options if needed. By default, Storage Transfer Service overwrites an object if the source version is different from the sink version. No other objects are overwritten or deleted. You can enable additional overwrite/delete options under **Transfer options**.
6. Under **Configure transfer**, schedule your transfer job to **Run now** (one time) or **Run daily** at a time in your local timezone.
7. Click **Create**.

Internal