

INTERDISCIPLINARY PROJECT REPORT
at
Sathyabama Institute of Science and Technology
(Deemed to be University)

Submitted in partial fulfillment of the requirements for the
award of Bachelor of Technology in Information Technology

By

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REG. NO. 39120073



DEPARTMENT OF INFORMATION TECHNOLOGY

SCHOOL OF COMPUTING

**SATHYABAMA INSTITUTE OF SCIENCE AND
TECHNOLOGY**

**JEPPIAAR NAGAR, RAJIV GANDHI SALAI,
CHENNAI – 600119, TAMILNADU**

APRIL 2022



SATHYABAMA
INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)
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CHENNAI- 600119
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DEPARTMENT OF INFORMATION TECHNOLOGY

BONAFIDE CERTIFICATE

This is to certify that this Project Report is the bonafide work of
KATAKAM NAGASRISAI (Reg. No: 39120073) who carried out the
project entitled “**INSTANCE BACKUP AND RECOVERY IN GCP**”
under my supervision from Jan 2022 to April 2022.

Internal Guide

Dr. G. Mathivanan M.E., Ph.D.,

Head of the Department

Dr. R. Subhashini, M.E., Ph.D.,

Submitted for Viva voce Examination held on _____

Internal Examiner

External Examiner

DECLARATION

I, **KATAKAM NAGASRISAI** hereby declare that the project report entitled **“INSTANCE BACKUP AND RECOVERY IN GCP”** done by me under the guidance of **Dr.G.Mathivanan**, is submitted in partial fulfillment of the requirements for the award of Bachelor of Technology Degree in Information Technology.

DATE : 21-04-2022

K.NAGASRISAI

PLACE: CHENNAI

SIGNATURE OF THE CANDIDATE

ACKNOWLEDGEMENT

I am pleased to acknowledge my sincere thanks to **Board of Management** of **SATHYABAMA** for their kind encouragement in doing this project and for completing it successfully. I am grateful to them.

I convey my thanks to **Dr. T. Sasikala M.E., Ph.D., Dean**, School of Computing, , **Dr. R. Subhashini, M.E., Ph.D., Head of the Department of Information Technology** for providing me necessary support and details at the right time during the progressive reviews.

I would like to express my sincere and deep sense of gratitude to my Project Guide **Dr.G.Mathivanan.** for his valuable guidance, suggestions and constant encouragement paved way for the successful completion of my project work.

I wish to express my thanks to all Teaching and Non-teaching staff members of the **Department of Information Technology** who were helpful in many ways for the completion of the project.

TRAINING CERTIFICATE



Award of Completion

Katakam Nagasrisai

Has Successfully Completed

Star Cloud Computing

Star Authorized Delivery Partner

Advantage Pro

You can verify authenticity of this certificate by visiting
<http://www.starcertification.org/Verification/Participation>

11-04-2022

DATE

L9fZoBHAAO

CERTIFICATE NUMBER



DONALD WILLIAM
DIRECTOR
GLOBAL CERTIFICATIONS



ABSTRACT

Instance recovery and Backup in GCP : Google Cloud (also known as Google Cloud Platform or GCP) is a provider of computing resources for developing, deploying, and operating applications on the Web. All Google Cloud customers can use select Google Cloud products—like Compute Engine, Cloud Storage, and Big Query—free of charge, within specified monthly usage limits. The purpose of the backup is to create a copy of data that can be recovered in the event of a primary data failure. Primary data failures can be the result of hardware or software failure, data corruption, or a human-caused event, such as a malicious attack (virus or malware), or accidental deletion of data. In lack of disaster recovery strategy, unprecedented downtimes can cause significant losses for your business. It has been a major challenge for businesses big and small. In such scenarios, Disaster Recovery as a Service can best guarantee the safety and security of data. Cloud4C, a world-leading application-focused Cloud MSP and a trusted Google Cloud Platform consulting partner offer lack of disaster recovery strategy, unprecedented downtimes can cause significant losses for your business. It has been a major challenge for businesses big and small. In such scenarios, Disaster Recovery as a Service can best guarantee the safety and security of data Snapshots are a central part of the Google Cloud Backup architecture—they allow you to create a point-in-time backup of a persistent disk attached to a virtual machine instance, and save it to Google Cloud Storage. You can also rapidly restore a snapshot to a persistent disk.

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INSTANCE BACKUP AND RECOVERY IN GCP

CHAPTER 1

GCP

Introduction

Cloud computing today allows hardware and software products to co-exist remotely (in data centers) and at-scale. Together these products work to deliver specific services. Users typically can access, manage, and use the tools they require via a web-interface – and that's true for Google Cloud Platform services as well. This Project is related to cloud computing. It mainly deals about the instance backup and recovery in Google Cloud Platform (GCP). We have to create an instance and delete it and recover it in the original condition. The project main theme is to Create Backup, delete instance, deploy recovery using recovery option in Google Cloud Platform

1.1 Back Ground

Google Cloud Platform (GCP), offered by Google, is a suite of cloud computing services that runs on the same infrastructure that Google uses internally for its end-user products, such as Google Search, Gmail, Google Drive, and YouTube. Alongside a set of management tools, it provides a series of modular cloud services including computing, data storage, data analytics and machine learning. Registration requires a credit card or bank account details.

Google Cloud Platform provides infrastructure as a service, platform as a service, and serverless computing environments. In April 2008, Google announced App Engine, a platform for developing and hosting web applications in Google-managed data centers, which was the first cloud computing service from the company. The service became generally available in November 2011. Since the announcement of App Engine, Google added multiple cloud services to the platform.

Google Cloud Platform is a part of Google Cloud, which includes the Google Cloud Platform public cloud infrastructure, as well as Google Workspace (G Suite), enterprise versions of Android and Chrome OS, and application programming interfaces (APIs) for machine learning and enterprise mapping services.

CHAPTER 2

AIM, SCOPE, OBJECTIVE

2.1 Aim

The main aim of the project is To Instance recovery and Backup using GCP platform. Take a backup of instance, delete it and restore it in original condition

2.2 Scope

The purpose of this project mainly is to get the Create Backup, delete instance, deploy recovery using recovery option in Google Cloud Platform

2.3 Objective

- The Backup and Recovery in Google Cloud Platform
- Getting maximum knowledge on Cloud Computing
- Learning to increase accuracy of the Google cloud platform
- To gain complete Knowledge on GCP
- To be able to use GCP
- Able to Decrease Time Consumption

2.4 Hardware requirements

- **Processor:** intel core i5
- **Speed:** 1.19GHz
- **RAM:** 8.0GB
- **Memory usage:** 7.2kb
- **Keyboard:** Standard Keyboard
- **Monitor:** 15VGA color

2.5 Software Requirements

- **Operating System:** Windows
- **Online Services:** Google Cloud Platform

CHAPTER 3

TECHONOLOGIES LEARNT

3.1 GOOGLE CLOUD PLATFORM

Google Cloud (also known as Google Cloud Platform or GCP) is a provider of computing resources for developing, deploying, and operating applications on the Web. All Google Cloud customers can use select Google Cloud products—like Compute Engine, Cloud Storage, and Big Query—free of charge, within specified monthly usage limits. Cloud computing today allows hardware and software products to co-exist remotely (in data centers) and at-scale. Together these products work to deliver specific services. Users typically can access, manage, and use the tools they require via a web-interface – and that's true for Google Cloud Platform services as well. In addition to service accessibility, users also gain flexibility and choice when working with Google Cloud Platform: Each service is available 'a la carte' so that users can leverage different resources to develop the infrastructure they need.

3.1.1 ADVANTAGES OF GCP

- High Productivity with Innovation.
- Easy to Adopt Latest Functionalities.
- Remote Access.
- Smooth Collaboration.
- Unmatched Security.
- Reduced Breaches.
- High Reliability.
- Offers Flexibility and Control.

3.1.2 DISADVANTAGES OF GCP

- Expensive
- Google Cloud DNS is slower than Cloudflare
- No Free support

CHAPTER 4

ABOUT THE PROJECT

4.1 LOGIN

Firstly, we have to login into Google cloud platform with our email id

4.2 START

Start the project using free trail option given by Google

4.3 CREATE AN INSTANCE

Open the VM Instances option in GCP and click on the create instance

- Give a name to the instance
- Set Region as us-west (Oregon) and zone as us-west 1 (b)
- Series: E2 and Machine type: e2-small (2 vCPU, 4GB memory)
- Change the system to Ubuntu
- Allow full access to all cloud Api's
- On the Firewall
- And Click on Create

4.4 CHECK THE INSTANCE USING SSH KEY

Click on SSH and open the terminal of the instance and use the following codes

1. Sudo su
2. cd
3. apt update
4. apt install apache2
5. cd /var/www/html/
6. systemctl start apache2
7. Go to chrome and copy Ip address of the instance and check using <http://>
8. ll
9. cp -rf index.html /home/
10. rm -rf index.html
11. vim index.html
12. Enter the code what you want to display <html> <h1> Hello Guys, Welcome to our new project </h1> <html> and close using :wq!

13. `systemctl restart apache2`

14. And now you can see new display in chrome

4.5 CREATE A 2ND SSH KEY

Open the created instance and follow the steps

- Click on edit and go to SSH key option
- There will be already a key and we have to create 2nd ssh key
- Open puttygen software and generate a new key
- Copy that key in the 2nd ssh key column
- Save the ssh key in the file manager with any name
- Click on save and save the instance

4.6 CREATE A SNAPSHOT

Open snapshot option and follow the steps below

- Click on Create snapshot
- Name the snapshot and set description as snapshot of ubuntu
- Select Source disk as instance
- Location as Regional and then create

4.7 DELETE INSTANCE

Open the instance and click on delete

4.8 RECOVER

Go to the snapshot option and follow the steps below steps

- Open snapshot click on create a new instance
- Set the name as same as the previous instance
- And set all the options as same as the previous one and click on create
- Open putty copy the ip address and click on ssh and open
- And then you can see the both the instances created

5. RESULT AND CONCLUSION

The instance we require is recovered. We have created the instance using GoogleCloud Platform. Check the instance using SSH key option by doing some changes. Restart the instance. Add the 2nd SSH key using PuttyGen. Create the snapshot using snapshot option. Delete the instance and create new instance with same name in snapshot. Check weather the instance is recovered or not using Putty. The Instance is successfully Recovered

REFERENCES

- Google cloud platform
- Wikipedia
- Console developers
- Tech republic

SCREENSHOTS

Creating an Instance

Google Cloud Platform

qwiklabs-gcp-03-d3ea6ff5dc7d

Search Products, resources, docs (/)

Create an instance

HELP ASSISTANT

To create a VM Instance, select one of the options:

New VM instance
Create a single VM instance from scratch

New VM instance from template
Create a single VM instance from an existing template

New VM instance from machine image
Create a single VM instance from an existing machine image

Marketplace
Deploy a ready-to-go solution onto a VM instance

Name *

instance-11

Labels ?

+ ADD LABELS

Region *

us-west1 (Oregon)

Zone *

us-west1-b

Region is permanent

Zone is permanent

Machine configuration

Machine family

GENERAL-PURPOSE COMPUTE-OPTIMIZED MEMORY-OPTIMIZED GPU

Machine types for common workloads, optimized for cost and flexibility

Series

E2

CPU platform selection based on availability

Machine type

e2-small (2 vCPU, 2 GB memory)

vCPU

1 shared core

Memory

2 GB

✓ CPU PLATFORM AND GPU

Monthly estimate

\$13.23

That's about \$0.02 hourly

Pay for what you use: No upfront costs and per second billing

Item	Monthly estimate
2 vCPU + 2 GB memory	\$12.23
10 GB balanced persistent disk	\$1.00
Sustained use discount	-\$0.00
Total	\$13.23

[Compute Engine pricing](#)

^ LESS

Check the Instance using the SSH option

7

```
root@instance-11: ~ - Google Chrome
ssh.cloud.google.com/projects/qwiklabs-gcp-03-d3ea6ff5dc7d/zones/us-west1-b/instances/instance-11?authuser=2&hl=en_US&projectNumber=838125749&nonAdminProxySessionReason=1&troubleshoot4005Enabled=true&troublesho...

0 updates can be applied immediately.

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.

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.

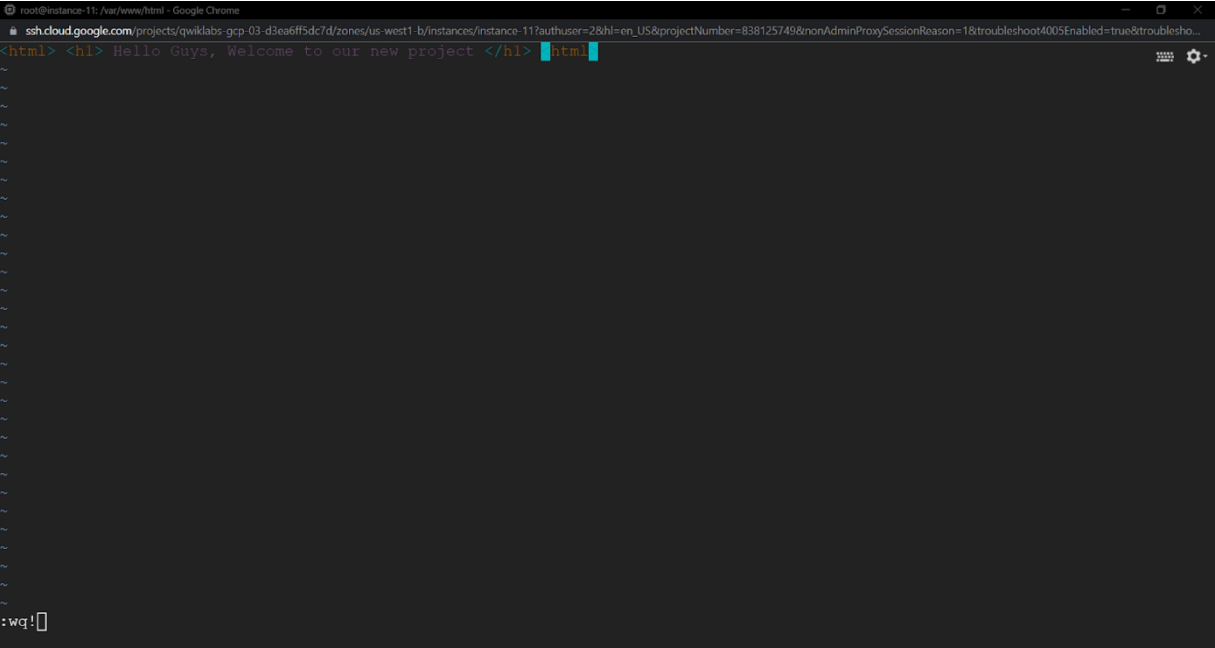
Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

Creating directory '/home/student-03-7fd14a29fc4a'.
student-03-7fd14a29fc4a@instance-11:~$ sudo su
root@instance-11:/home/student-03-7fd14a29fc4a# cd
root@instance-11:~#
root@instance-11:~#
root@instance-11:~#
root@instance-11:~# apt update
Hit:1 http://us-west1.gce.archive.ubuntu.com/ubuntu bionic InRelease
Get:2 http://us-west1.gce.archive.ubuntu.com/ubuntu bionic-updates InRelease [88.7 kB]
Get:3 http://us-west1.gce.archive.ubuntu.com/ubuntu bionic-backports InRelease [74.6 kB]
Get:4 http://security.ubuntu.com/ubuntu bionic-security InRelease [88.7 kB]
Get:5 http://us-west1.gce.archive.ubuntu.com/ubuntu bionic/universe amd64 Packages [8570 kB]
```

Check the Instance using the SSH option



Change the information and check

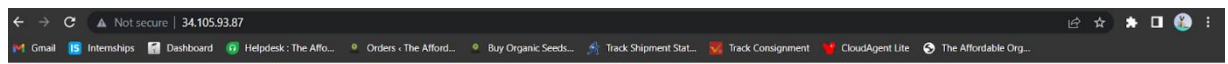


Restart the instance

```
root@instance-11: /var/www/html - Google Chrome
ssh.cloud.google.com/projects/qwiklabs-gcp-03-d3ea6ff5dc7d/zones/us-west1-b/instances/instance-11?authuser=2&hl=en_US&projectNumber=838125749&nonAdminProxySessionReason=1&troubleshoot4005Enabled=true&troubleshoot...

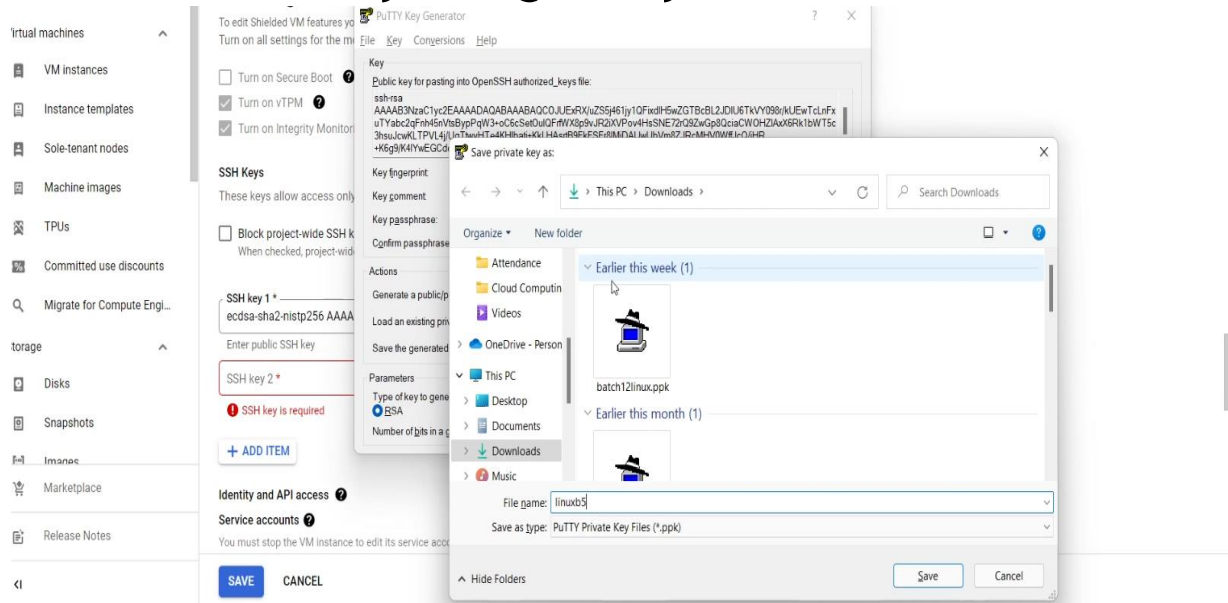
Enabling module mime.
Enabling module negotiation.
Enabling module setenvif.
Enabling module filter.
Enabling module deflate.
Enabling module status.
Enabling module reqtimeout.
Enabling conf charset.
Enabling conf localized-error-pages.
Enabling conf other-vhosts-access-log.
Enabling conf security.
Enabling conf serve-cgi-bin.
Enabling site 000-default.
Created symlink /etc/systemd/system/multi-user.target.wants/apache2.service → /lib/systemd/system/apache2.service.
Created symlink /etc/systemd/system/multi-user.target.wants/apache-htcacheclean.service → /lib/systemd/system/apache-htcacheclean.service.
Processing triggers for libc-bin (2.27-3ubuntu1.5) ...
Processing triggers for systemd (237-3ubuntu10.53) ...
Processing triggers for man-db (2.8.3-2ubuntu0.1) ...
Processing triggers for ufw (0.36-0ubuntu0.18.04.2) ...
Processing triggers for ureadahead (0.100.0-21) ...
root@instance-11:~# cd /var/www/html/
root@instance-11:/var/www/html# systemctl start apache2
root@instance-11:/var/www/html# ll
total 20
drwxr-xr-x 2 root root 4096 Apr 20 09:17 ./
drwxr-xr-x 3 root root 4096 Apr 20 09:17 ../
-rw-r--r-- 1 root root 10918 Apr 20 09:17 index.html
root@instance-11:/var/www/html# cp -rf index.html /home/
root@instance-11:/var/www/html# rm -rf index.html
root@instance-11:/var/www/html# vim index.htm;
root@instance-11:/var/www/html# systemctl restart apache2
```

Check the change in the browser



Hello Guys, Welcome to our new project

Add SSH 2dn key using PuttyGen



Add SSH 2dn key using PuttyGen

Compute Engine

Virtual machines

VM instances

Instance templates

Sole-tenant nodes

Machine images

TPUs

Committed use discounts

Migrate for Compute Engi...

Storage

Disks

Snapshots

Images

Marketplace

Release Notes

← Edit linux31march instance

HELP ASSISTANT

To edit Shielded VM features you need to stop the instance first.
Turn on all settings for the most secure configuration.

☐ Turn on Secure Boot ?

☒ Turn on vTPM ?

☒ Turn on Integrity Monitoring ?

SSH Keys

These keys allow access only to this instance, unlike project-wide SSH keys. [Learn more](#)

☐ Block project-wide SSH keys

When checked, project-wide SSH keys cannot access this instance. [Learn more](#)

SSH key 1 *

ecdsa-sha2-nistp256 AAAAE2VjZHNhLXNoYTItbmlzdGh5NTYAAAAIbmlzdGh5

Enter public SSH key

SSH key 2 *

ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQCOJUExRX/uZS5j461jy1QF

Enter public SSH key

+ ADD ITEM

Identity and API access ?

Service accounts ?

You must stop the VM instance to edit its service account.

SAVING CANCEL

Create Snapshot

Google Cloud Platform

qwiklabs-gcp-03-d3ea6ff5dc7d

Search Products, resources, docs (/)

Compute Engine

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Images

Marketplace

Release Notes

Snapshots are backups of persistent disks. They're commonly used to recover, transfer, or make data accessible to other resources in your project. [Learn more](#)

Name *
ubantuss
Name is permanent

Description
snapshot of [ubuntu](#)

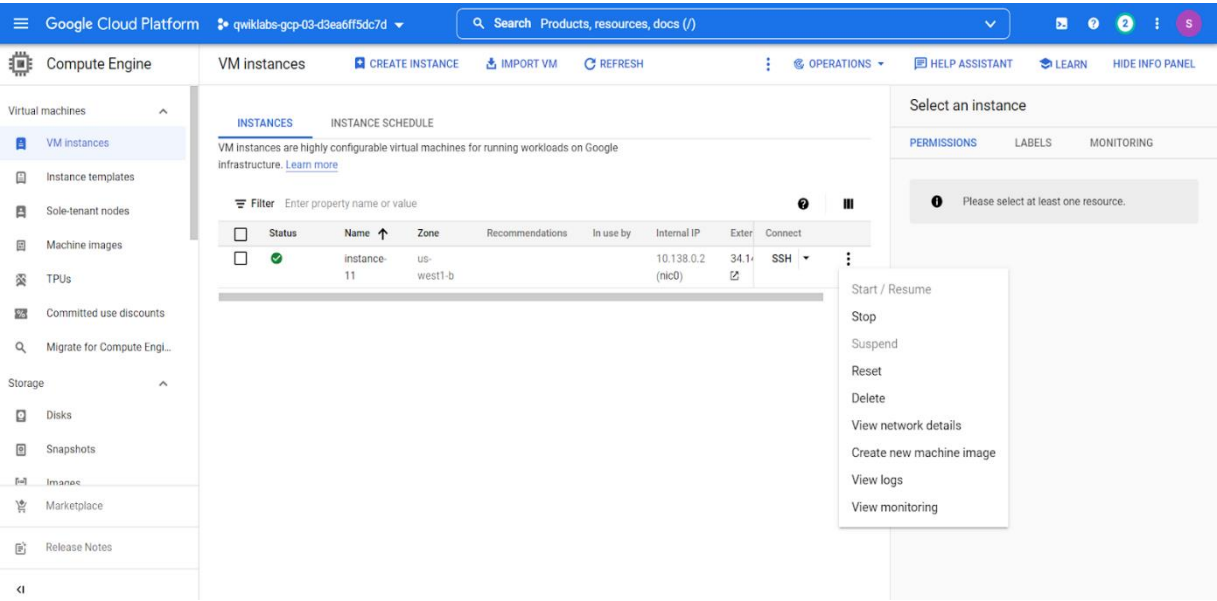
Source disk *
instance-11

Location ?
There may be a network transfer fee if you choose to store this snapshot in a location different than the source disk. [Learn more](#)
☐ Multi-regional
☒ Regional
Select location
us-west1 (Oregon)

Labels ?

CREATE CANCEL EQUIVALENT COMMAND LINE

Delete Instance



Create new instance with same name in

snapshot

Create an instance

To create a VM instance, select one of the options:

- New VM instance**
Create a single VM instance from scratch
- New VM instance from template**
Create a single VM instance from an existing template
- New VM instance from machine image**
Create a single VM instance from an existing machine image
- Marketplace**
Deploy a ready-to-go solution onto a VM instance

Name *

 instance-11

Labels ?

+ ADD LABELS

Region *
us-west1 (Oregon)

Zone *
us-west1-b

Region is permanent Zone is permanent

Machine configuration

Machine family

GENERAL-PURPOSE COMPUTE-OPTIMIZED MEMORY-OPTIMIZED GPU

Machine types for common workloads, optimized for cost and flexibility

Series
E2

CPU platform selection based on availability

Machine type
e2-small (2 vCPU, 2 GB memory)

	vCPU 1 shared core	Memory 2 GB
--	-----------------------	----------------

Monthly estimate

\$13.23

That's about \$0.02 hourly

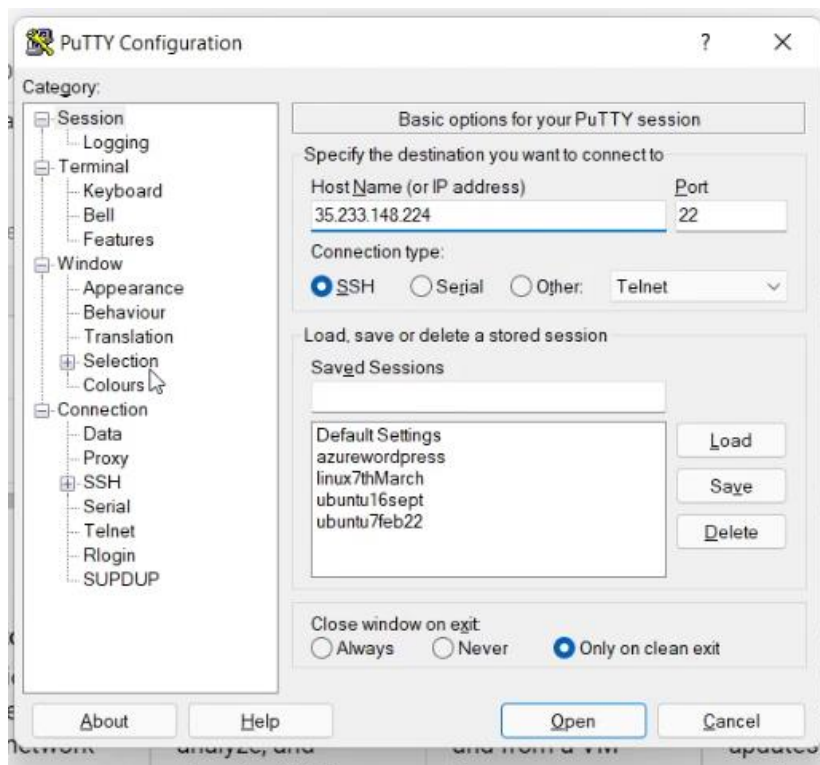
Pay for what you use: No upfront costs and per second billing

Item	Monthly estimate
2 vCPU + 2 GB memory	\$12.23
10 GB balanced persistent disk	\$1.00
Sustained use discount	-\$0.00
Total	\$13.23

[Compute Engine pricing](#)

< LESS

Check the recovery using Putty



The instance is recovered

```
root@linux31march: ~  
root@linux31march:/home/linux# ll  
total 32  
drwxr-xr-x 5 linux linux 4096 Mar 31 12:34 ./  
drwxr-xr-x 5 root root 4096 Mar 31 12:33 ../  
-rw-r--r-- 1 linux linux 220 Apr 4 2018 .bash_logout  
-rw-r--r-- 1 linux linux 3771 Apr 4 2018 .bashrc  
drwx----- 2 linux linux 4096 Mar 31 12:34 .cache/  
drwx----- 3 linux linux 4096 Mar 31 12:34 .gnupg/  
-rw-r--r-- 1 linux linux 807 Apr 4 2018 .profile  
drwx----- 2 linux linux 4096 Mar 31 12:33 .ssh/  
root@linux31march:/home/linux# cdd  
  
Command 'cdd' not found, but can be installed with:  
  
apt install cdd  
  
root@linux31march:/home/linux#  
root@linux31march:/home/linux# cd  
root@linux31march:~#  
root@linux31march:~#  
root@linux31march:~#  
root@linux31march:~# ll  
total 48  
drwx----- 6 root root 4096 Mar 31 13:11 ./  
drwxr-xr-x 23 root root 4096 Mar 31 13:22 ../  
-rw----- 1 root root 241 Mar 31 12:31 .bash_history  
-rw-r--r-- 1 root root 3106 Apr 9 2018 .bashrc  
drwx----- 3 root root 4096 Mar 31 13:09 .config/  
drwxr-xr-x 3 root root 4096 Mar 31 13:09 .gsutil/  
-rw-r--r-- 1 root root 148 Aug 17 2015 .profile  
drwx----- 2 root root 4096 Mar 31 12:24 .ssh/  
-rw----- 1 root root 1192 Mar 31 13:11 .viminfo  
drwx----- 3 root root 4096 Mar 31 13:09 snap/  
-rw-r--r-- 1 root root 40 Mar 31 13:09 testb5.txt  
-rw-r--r-- 1 root root 37 Mar 31 13:11 testingfromec2.txt  
root@linux31march:~#
```