

GCP Fundamentals 실습

클라우드

2021/10/26 16:42

<http://blog.naver.com/applej424/222549000118>

* 메가존 클라우드의 GCP Fundamentals labs day를 정리합니다.

#실습1 Google Clud Fundatmentals: Getting Started with Compute Engine

The screenshot shows a browser-based lab interface for Google Cloud Fundamentals. On the left, there's a sidebar with navigation links like '실습 종료' (Finish Lab), '00:24:23' (Time elapsed), and a 'Google Console 열기' (Open Google Console) button. Below these are dropdown menus for '사용자 이름' (User Name), '비밀번호' (Password), 'GCP 프로젝트 ID' (Project ID), 'Region', and 'Zone'. The main content area is titled 'Task 2: Create a virtual machine using the GCP Console'. It contains a numbered list of 10 steps to create a VM. To the right of the main content are several vertical tabs: 'Overview', 'Objectives', 'Task 1: Sign in to the Google Cloud Platform (GCP) Console', 'Task 2: Create a virtual machine using the GCP Console' (which is currently selected and highlighted in yellow), 'Task 3: Create a virtual machine using the gcloud command line', 'Task 4: Connect between VM instances', 'Congratulations!', 'End your lab', and 'More Resources'. A yellow box in the top right corner indicates '0/1' tasks completed.

← Google Cloud Fundamentals: Getting Started with Compute Engine

00:24:23

실습 종료

Google Console 열기

주의사항: 본술 내에서는 실습 지침을 따르세요. 실습 지침을 따르지 않으면 계정이 차단될 수 있습니다. [자세히 알아보기](#)

사용자 이름
student-82-46fc04d6381d#

비밀번호
qZp8gq96TLK

GCP 프로젝트 ID
qwiklabs-gcp-04-fce26bc0

Region
us-central1

Zone
us-central1-a

Task 2: Create a virtual machine using the GCP Console

1. In the Navigation menu (≡), click Compute Engine > VM instances.
2. Click Create.
3. On the Create an Instance page, for Name, type my-vm-1.
4. For Region and Zone, select the region and zone assigned by Qwiklabs.
5. For Machine type, accept the default.
6. For Boot disk, if the Image shown is not Debian GNU/Linux 10 (Buster), click Change and select Debian GNU/Linux 10 (Buster).
7. Leave the defaults for Identity and API access unmodified.
8. For Firewall, click Allow HTTP traffic.
9. Leave all other defaults unmodified.
10. To create and launch the VM, click Create.

Overview

Objectives

Task 1: Sign in to the Google Cloud Platform (GCP) Console

Task 2: Create a virtual machine using the GCP Console

Task 3: Create a virtual machine using the gcloud command line

Task 4: Connect between VM instances

Congratulations!

End your lab

More Resources

0/1

Google Console 열기 클릭



로그인

Google 계정 사용

이메일 또는 휴대전화

student-02-46fc04d6381d@wikilabs.net

이메일을 잊으셨나요?

내 컴퓨터가 아닌가요? 게스트 모드를 사용하여 비공개로 로그인하세요. [자세히 알아보기](#)

[계정 만들기](#)

[다음](#)



Welcome student!

Create and manage your Google Cloud Platform instances, disks, networks, and other resources in one place.

Country

A dropdown menu showing "South Korea" as the selected option, with a downward arrow indicating it's a dropdown.

Terms of Service

- I agree to the [Google Cloud Platform Terms of Service](#), and the terms of service of [any applicable services and APIs](#).
- I confirm that I plan on using Google Cloud Platform for current or future [commercial purpose](#).

Email updates

- I would like to receive periodic emails on news, product updates and special offers from Google Cloud and Google Cloud Partners.

[AGREE AND CONTINUE](#)

≡ Google Cloud Platform

 Home >

 Marketplace

 Billing

 APIs & Services >

 Support >

 IAM & Admin >

 Getting started

 Compliance

 Security >

 Anthos >

COMPUTE

 Compute Engine >

 Kubernetes Engine >

VIRTUAL MACHINES

VM instances

Instance templates

Sole-tenant nodes

Machine images

TPUs

Committed use discounts

Migrate for Compute Engine

STORAGE

Disks

Snapshots

Images

INSTANCE GROUPS

Instance groups

Health checks

VM MANAGER

OS patch management

OS configuration management

VM instances

CREATE INSTANCE

Filter Enter property name or value

Status Name ↑ Zone Recommended Connect

VM Instances

Compute Engine lets you use virtual machines that run on Google's infrastructure. Create micro-VMs or larger instances running Debian, Windows, or other standard images. Create your first VM instance, import it using a migration service, or try the quickstart to build a sample app.

CREATE INSTANCE TAKE THE QUICKSTART

1) vm의 이름을 적는다.

2) Region 및 zone 설정

- 내 vm을 실제로 배치할 물리적인 옵션(서울사람들에게 빨리 vm을 제공하고 싶다면? South Korea로 설정할 것)

- zone은 내가 어떤 데이터센터 클래스에 vm을 지정할 수 있는지 설정.

기본적으로 3개~4개 되는 데이터센터를 구성한다.

만약 1개의 데이터 센터가 다운될 경우, 그 Region 전체에 서비스 제공이 불가능해지기에, 여러개의 데이터 센터를 일정 거리 띄어두고 분산배치한 것.

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

Custom

Select vCPU cores and memory

Shared-core

e2-micro

2 vCPU, 1 GB memory

e2-small

2 vCPU, 2 GB memory

e2-medium

2 vCPU, 4 GB memory

나에게 딱 맞는 custom 타입 vm을 사용할 수 있음

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-medium (2 vCPU, 4 GB memory)



vCPU

1 shared core

Memory

4 GB

e2-medium을 선택

원래는 외부 로컬 PC에서 my-vm-1 웹서버로 접속이 불가능하지만,

Firewall: Allow HTTP 허용하여 외부에서 들어오는 모든 HTTP 트래픽 허용이 가능하다.

Identity and API access ?

Service accounts ?

Service account

Compute Engine default service account



Access scopes ?

- Allow default access
- Allow full access to all Cloud APIs
- Set access for each API

Firewall ?

Add tags and firewall rules to allow specific network traffic from the Internet

Allow HTTP traffic

Allow HTTPS traffic

▼ NETWORKING, DISKS, SECURITY, MANAGEMENT, SOLE-TENANCY

You will be billed for this instance. [Compute Engine pricing](#)

CREATE

CANCEL

EQUIVALENT COMMAND LINE



vm 생성

Compute Engine

VM instances

[CREATE INSTANCE](#)

OPERATIONS

Virtual machines

- [VM instances](#)
- [Instance templates](#)
- [Sole-tenant nodes](#)
- [Machine images](#)
- [TPUs](#)
- [Committed use discounts](#)

INSTANCES INSTANCE SCHEDULE

VM instances are highly configurable virtual machines for running workloads on Google Infrastructure. [Learn more](#)

Filter Enter property name or value

Status	Name	Zone	Recommendation	Connect
<input checked="" type="checkbox"/>	my-vm-1	us-central1-a		SSH

뒤로

실습 종료

00:15:46

주의사항: 콘솔 내에서는 실습 지침을 따르세요. 실습 지침을 따르지 않으면 계정이 차단될 수 있습니다. [자세히 알아보기](#)

[Google Console 열기](#)

사용자 이름

student-02-46fc04d6381d@



비밀번호

qZp8gq96TLK



GCP 프로젝트 ID

qwiklabs-gcp-04-fce26bc0



Region

us-central1



7. Leave the defaults for **Identity and API access** unmodified.

8. For Firewall, click **Allow HTTP traffic**.

9. Leave all other defaults unmodified.

10. To create and launch the VM, click **Create**.

Note: The VM can take about two minutes to launch and be fully available for use.

Click *Check my progress* to verify the objective.



Create a virtual machine using the GCP Console

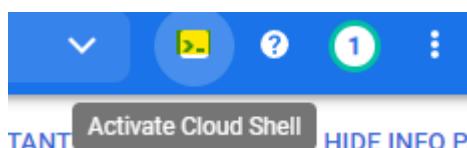
[내 진행 상황 확인하기](#)

Assessment Completed!

vm 생성 확인 : 내 진행상황 확인하기 Assesment Completed!

클라우드 쉘 활성화

Task 3: Create a virtual machine using the gcloud command line



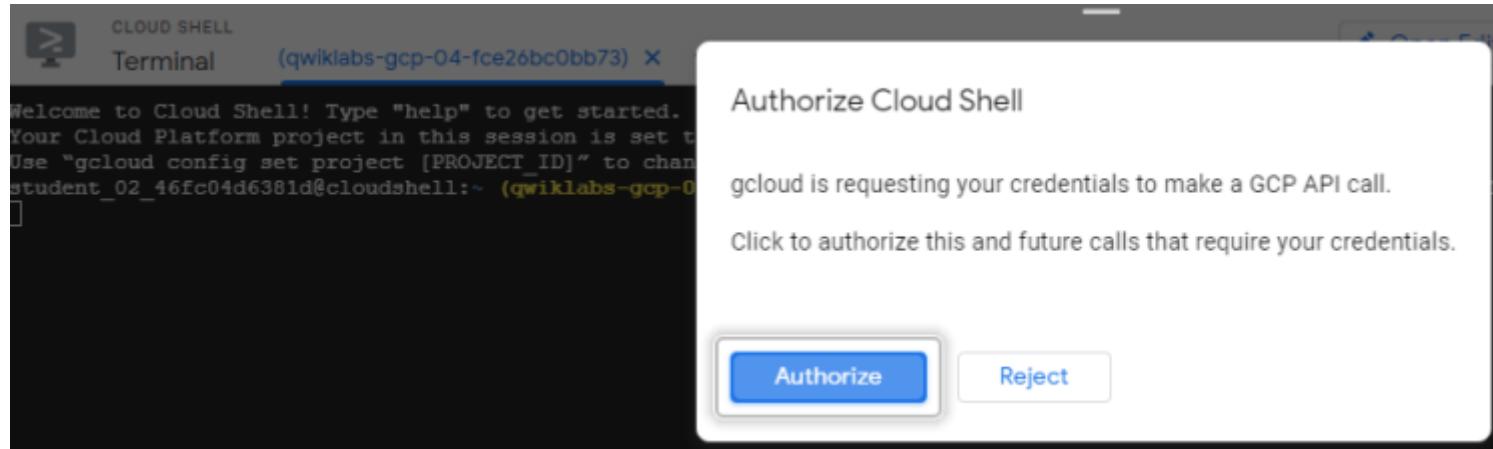
Cloud Shell

Manage your infrastructure and develop your applications from any browser with Cloud Shell.

Cloud Shell comes with Cloud SDK gcloud, Cloud Code, an online Code Editor and other utilities pre-installed, fully authenticated and up-to-date. [Learn more](#).

Cloud Shell is free for all users.

[Continue](#)



```
student_02_46fc04d6381d@cloudshell:~ (qwiklabs-gcp-04-fce26bc0bb73)$ gcloud compute zones list | grep us-central1
NAME: us-central1-c
REGION: us-central1
NAME: us-central1-a
REGION: us-central1
NAME: us-central1-f
REGION: us-central1
NAME: us-central1-b
REGION: us-central1
student_02_46fc04d6381d@cloudshell:~ (qwiklabs-gcp-04-fce26bc0bb73)$ gcloud config set compute/zone us-central1-b
Updated property [compute/zone].
```

내가 생성한 vm을 us-central1-b에 생성하겠다

```
student_02_46fc04d6381d@cloudshell:~ (qwiklabs-gcp-04-fce26bc0bb73)$ gcloud compute instances create "my-vm-2" \
> --machine-type "n1-standard-1" \
> --image-project "debian-cloud" \
> --image-family "debian-10" \
> --subnet "default"
Created [https://www.googleapis.com/compute/v1/projects/qwiklabs-gcp-04-fce26bc0bb73/zones/us-central1-b/instances/my-vm-2]
NAME: my-vm-2
ZONE: us-central1-b
MACHINE_TYPE: n1-standard-1
PREEMPTIBLE:
INTERNAL_IP: 10.128.0.3
EXTERNAL_IP: 34.123.176.22
STATUS: RUNNING
student_02_46fc04d6381d@cloudshell:~ (qwiklabs-gcp-04-fce26bc0bb73)$
```

Task 4: Connect between VM instances

The screenshot shows the Google Cloud Platform VM Instances page. At the top, there are navigation links: VM instances, CREATE INSTANCE, IMPORT VM, REFRESH, and OPERATIONS. Below the header, there are tabs for INSTANCES and INSTANCE SCHEDULE, with INSTANCES selected. A descriptive text states: "VM instances are highly configurable virtual machines for running workloads on Google infrastructure. [Learn more](#)". A filter bar allows entering a property name or value. The main table lists two VM instances:

	Status	Name	Zone	Recommendations	In use by	Connect	⋮
<input type="checkbox"/>	✓	my-vm-1	us-central1-a			SSH	⋮
<input type="checkbox"/>	✓	my-vm-2	us-central1-b			SSH	⋮

my-vm-1으로 커넥션을 시도해본다.

```
student-02-46fc04d6381d@my-vm-2: ~ - Chrome
ssh.cloud.google.com/projects/qwiklabs-gcp-04-fce26bc0bb73/zones/us-central1-b/instances/my-vm-2?authuser=0&hl=en_US&pro...
Connected, host fingerprint: ssh-rsa 0 FB:41:DE:0D:D8:28:F9:D6:DC:41:34:0F:5B:01
:ED:BF:5D:2D:CC:69:F0:6B:15:50:1 Please consider adding the IAP-secured Tunnel User IAM role
Linux my-vm-2 4.19.0-17-cloud-am to start using Cloud IAP for TCP forwarding for better
The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Creating directory '/home/student-02-46fc04d6381d'.
student-02-46fc04d6381d@my-vm-2:~$ ping my-vm-1.us-central1-a
PING my-vm-1.us-central1-a.c.qwiklabs-gcp-04-fce26bc0bb73.internal (10.128.0.2) 56(84) bytes of data.
64 bytes from my-vm-1.us-central1-a.c.qwiklabs-gcp-04-fce26bc0bb73.internal (10.128.0.2): icmp_seq=1 ttl=64 time=2.10 ms
64 bytes from my-vm-1.us-central1-a.c.qwiklabs-gcp-04-fce26bc0bb73.internal (10.128.0.2): icmp_seq=2 ttl=64 time=0.312 ms
64 bytes from my-vm-1.us-central1-a.c.qwiklabs-gcp-04-fce26bc0bb73.internal (10.128.0.2): icmp_seq=3 ttl=64 time=0.340 ms
64 bytes from my-vm-1.us-central1-a.c.qwiklabs-gcp-04-fce26bc0bb73.internal (10.128.0.2): icmp_seq=4 ttl=64 time=0.363 ms
64 bytes from my-vm-1.us-central1-a.c.qwiklabs-gcp-04-fce26bc0bb73.internal (10.128.0.2): icmp_seq=5 ttl=64 time=0.359 ms
64 bytes from my-vm-1.us-central1-a.c.qwiklabs-gcp-04-fce26bc0bb73.internal (10.128.0.2): icmp_seq=6 ttl=64 time=0.461 ms
64 bytes from my-vm-1.us-central1-a.c.qwiklabs-gcp-04-fce26bc0bb73.internal (10.128.0.2): icmp_seq=7 ttl=64 time=0.313 ms
64 bytes from my-vm-1.us-central1-a.c.qwiklabs-gcp-04-fce26bc0bb73.internal (10.128.0.2): icmp_seq=8 ttl=64 time=0.326 ms
64 bytes from my-vm-1.us-central1-a.c.qwiklabs-gcp-04-fce26bc0bb73.internal (10.128.0.2): icmp_seq=9 ttl=64 time=0.343 ms
^C
--- my-vm-1.us-central1-a.c.qwiklabs-gcp-04-fce26bc0bb73.internal ping statistics ---
9 packets transmitted, 9 received, 0% packet loss, time 155ms
rtt min/avg/max/mdev = 0.312/0.545/2.096/0.550 ms
student-02-46fc04d6381d@my-vm-2:~$
```

ssh로 my-vm-2에서 my-vm-1으로 접속한다.

```
student-02-46fc04d6381d@my-vm-2:~$ ssh my-vm-1.us-central1-a
The authenticity of host 'my-vm-1.us-central1-a (10.128.0.2)' can't be established.
ECDSA key fingerprint is SHA256:qJyQdWkJsv5Q5ejqh+YugAE9yyh3TY4aRuXmUDyG5k.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'my-vm-1.us-central1-a,10.128.0.2' (ECDSA) to the list of known hosts.
agent key RSA SHA256:DTRZ41cc01C6bqyy5IDe8NqRFh2cAwZXl8wdwgx4JuE returned incorrect signature type
Linux my-vm-1 4.19.0-17-cloud-amd64 #1 SMP Debian 4.19.194-3 (2021-07-18) x86_64

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

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Creating directory '/home/student-02-46fc04d6381d'.
student-02-46fc04d6381d@my-vm-1:~$
```

my-vm-1에서 Nginx Web Server를 설치한다.

```
student-02-46fc04d6381d@my-vm-1:~$ sudo apt-get install nginx-light -y
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  libnginx-mod-http-echo nginx-common
Suggested packages:
  nginx-extras
```

my-vm-1에서 exit해서 my-vm-2로 접속한다.

```
student-02-46fc04d6381d@my-vm-2:~$ curl http://my-vm-1.us-central1-a/
<!DOCTYPE html>
<html>
<head>
<title>Welcome to nginx!</title>
<style>
  body {
    width: 35em;
    margin: 0 auto;
    font-family: Tahoma, Verdana, Arial, sans-serif;
  }
</style>
</head>
<body>
<h1>Welcome to nginx!</h1>
<p>If you see this page, the nginx web server is successfully installed and
working. Further configuration is required.</p>

<p>For online documentation and support please refer to
<a href="http://nginx.org/">nginx.org</a>.<br/>
Commercial support is available at
<a href="http://nginx.com/">nginx.com</a>.</p>

<p><em>Thank you for using nginx.</em></p>
</body>
</html>
```

로컬 컴퓨터(외부)에서 GCP에 접속이 되는지 확인해본다.

	Status	Name	Zone	Recommendations	In use by	Internal IP	External IP	Connect
<input type="checkbox"/>	✓	my-vm-1	us-central1-a			10.128.0.2 (nic0)	35.184.123.61	SSH
<input type="checkbox"/>	✓	my-vm-2	us-central1-b			10.128.0.3 (nic0)	34.123.176.22	SSH

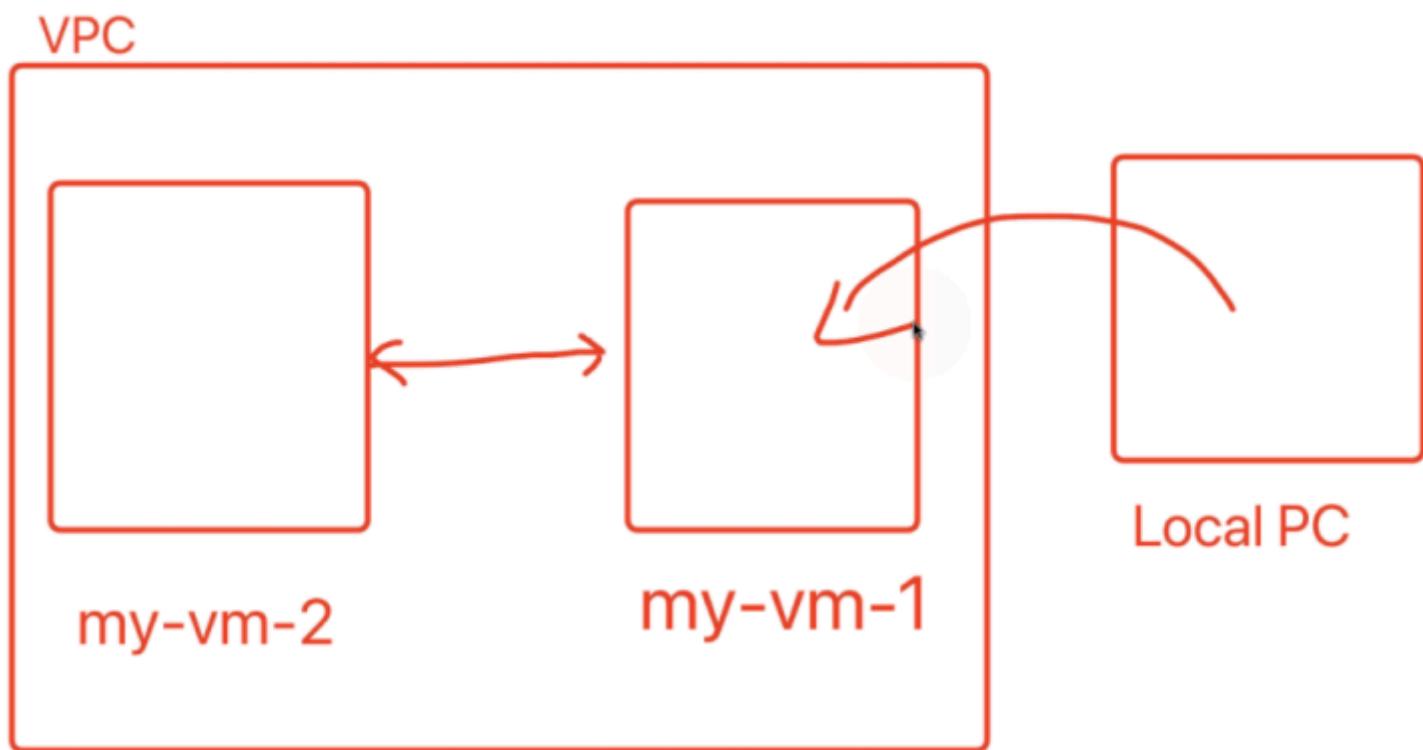
my-vm-1에 설치한 Nginx 서버에 외부에서 접속할 수 있다.

Welcome to nginx!

If you see this page, the nginx web server is successfully installed and working. Further configuration is required.

For online documentation and support please refer to nginx.org. Commercial support is available at nginx.com.

Thank you for using nginx.



#실습2 Google Cloud Fundamentals: Getting Started with GKE

구글GCP에서는 관리형으로 쿠버네티스 업데이트, 스케일링, 정비 등을 제공한다.

Task 3: Start a Kubernetes Engine cluster

실습 종료 00:35:00

실습 리소스 프로비저닝 중
남은 예상 시간: 1분 미만

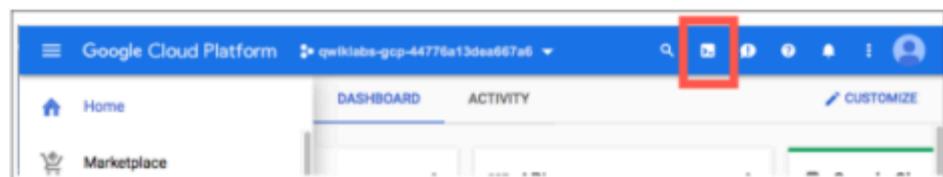
주의사항: 콘솔 내에서는 실습 지침을 따르세요. 실습 지침을 따르지 않으면 계정이 차단될 수 있습니다. 자세히 알아보기

[Google Console 열기](#)

사용자 이름: student-02-73d54166cbb0@
비밀번호: YM39cr3WDt
GCP 프로젝트 ID: quicklabs-gcp-01-2346a16f

Task 3: Start a Kubernetes Engine cluster

- In GCP console, on the top right toolbar, click the **Activate Cloud Shell** button.



- Click **Continue**.

Cloud Shell

Google Cloud Shell provides you with command-line access to your cloud resources directly from your browser. You can easily manage your projects and resources without having to install the Google Cloud SDK or other tools on your system. [Learn more](#).

Google

Sign in

Use your Google Account

Email or phone

student-02-73d54166cbb0@qwiklabs.net

[Forgot email?](#)

Not your computer? Use Guest mode to sign in privately.

[Learn more](#)

[Create account](#)

[Next](#)



Welcome



student-02-73d54166cbb0@qwiklabs.net ▾

Enter your password

.....

Show password

[Forgot password?](#)

[Next](#)

쿠버네티스 클러스터 생성

COMPUTE

Compute Engine >

the past 7 days

Kubernetes Engine >

Clusters

VMware Engine

Workloads

Services & Ingress

Kubernetes clusters

[CREATE](#)

[REFRESH](#)

Kubernetes Engine

Kubernetes clusters

Containers package an application so it can easily be deployed to run in its own isolated environment. Containers are run on Kubernetes clusters. [Learn more](#)

[CREATE](#)

[DEPLOY CONTAINER](#)

[TAKE THE QUICKSTART](#)

Cluster basics에서 클러스터 기본적인 것을 설정한다.

GKE Standard 모드로 생성한다.

Cluster basics

The new cluster will be created with the name, version, and in the location you specify here. After the cluster is created, name and location can't be changed.

To experiment with an affordable cluster, try [My first cluster in the Cluster set-up guides](#)

Name: webfrontend

Location type:

Zonal

Regional

Zone: us-central1-a

1) 마이크로서비스를 올릴 것이기에 이름을 webfrontend로 한다.

2)

- 내가 클러스터를 생성 시 노드들을 하나의 zone에 몰아넣겠다.
- 해당하는 Region에 있는 zone에 3개 ~ 4개에 노드들을 분산배치하겠다.

3) 마스터 노드에 해당하는 쿠버네티스의 업데이트를 어떻게 가져갈 것인가?

업데이트 전략을 직접 설정한다.

- Static 업데이트 하지 않고 가져가겠다.
- Release channel

Rapid 가능한 최신이 쿠버네티스 버전으로 업데이트 하겠다.

Stable 안정적인 쿠버네티스 버전을 선택하겠다.

Control plane version

Choose a release channel for automatic management of your cluster's version and upgrade cadence. Choose a static version for more direct management of your cluster's version. [Learn more](#).

- Static version
 - Release channel



설정한대로 설정할 수 있는 명령어

Google Cloud Platform • qwiklabs-gcp-01-2346a16fbdda Search products and resources

Create a Kubernetes cluster + ADD NODE POOL - REMOVE NODE POOL

Cluster basics

Node pools

- default-pool Nodes Security Metadata

Luster

- Automation
- Networking
- Security
- Metadata
- Features

Node pool details

The new cluster will be created with at least one node pool. A node pool is a template for groups of nodes created in this cluster. More node pools can be added and removed after cluster creation.

gcloud command line

This is the gcloud command line with the parameters you have selected. [gcloud reference](#)

```
gcloud beta container --project "qwiklabs-gcp-01-2346a16fbdda" clusters create "webfrontend" --zone "us-central1-a" --no-enable-basic-auth --cluster-version "1.20.10-gke.301" --release-channel "regular" --machine-type "e2-medium" --image-type "COS_CONTAINERD" --disk-type "pd-standard" --disk-size "100" --metadata disable-legacy-endpoints=true --scopes "https://www.googleapis.com/auth/devstorage.read_only","https://www.googleapis.com/auth/logging.write","https://www.googleapis.com/auth/monitoring","https://www.googleapis.com/auth/servicecontrol","https://www.googleapis.com/auth/service.management.readonly","https://www.googleapis.com/auth/trace.append" --max-pods-per-node "110" --num-nodes "2" --logging=SYSTEM,WORKLOAD --monitoring=SYSTEM --enable-ip-alias --network "projects/qwiklabs-gcp-01-2346a16fbdda/global/networks/default" --subnetwork "projects/qwiklabs-gcp-01-2346a16fbdda/regions/us-central1/subnetworks/default" --no-enable-intra-node-visibility --default-max-pods-per-node "110" --no-enable-master-authorized-networks --addons HorizontalPodAutoscaling,HttpLoadBalancing,GcePersistentDiskCsiDriver --enable-autoupgrade --enable-autorepair --max-surge-upgrade 1 --max-unavailable-upgrade 0 --enable-shielded-nodes --node-locations "us-central1-a"
```

Automation

Enable auto-upgrade

⚠ Clusters

Enable auto-repair

Surge upgrade ?

Max surge * 1

COPY TO CLIPBOARD RUN IN CLOUD SHELL CLOSE

```
student_02_73d54166ccb0@cloudshell:~ (qwiklabs-gcp-01-2346a16fbdd) ~ gcloud beta container --project "qwiklabs-gcp-01-2346a16fbdd" clusters create "webfrontend" --zone "us-central1-a" --no-enable-basic-auth --cluster-version "1.21.4-gke.1001" --release-channel "rapid" --machine-type "e2-medium" --image-type "COS_CONTAINERD" --disk-type "pd-standard" --disk-size "100" --metadata disable-legacy-endpoints=true --scopes "https://www.googleapis.com/auth/devstorage.read_only", "https://www.googleapis.com/auth/logging.write", "https://www.googleapis.com/auth/monitoring", "https://www.googleapis.com/auth/servicecontrol", "https://www.googleapis.com/auth/service.management.readonly", "https://www.googleapis.com/auth/cloud-platform" --tags append --max-pods-per-node "110" --num-nodes "2" --logging=SYSTEM,WORKLOAD --monitoring=SYSTEM --enable-ip-alias --network "projects/qwiklabs-gcp-01-2346a16fbdd/global/networks/default" --subnetnetwork "projects/qwiklabs-gcp-01-2346a16fbdd/regions/us-central1/subnetworks/default" --no-enable-intra-node-visibility --default-max-pods-per-node "110" --no-enable-master-authorized-networks --addons HorizontalPodAutoscaling,HttpLoadBalancing,GcePersistentDiskCsiDriver --enable-autoupgrade --enable-autorepair --max-surge-upgrade 1 --maxUnavailableUpgrade 0 --enable-shielded-nodes --node-locations "us-central1-a"
WARNING: The Pod address range limits the maximum size of the cluster. Please refer to https://cloud.google.com/kubernetes-engine/docs/how-to/flexible-pod-cidr to learn how to opt-out of this limitation.
```

Creating clusters subfunctions in *mu-montage*—a novel way

```

Creating cluster webfrontend1 in us-central1-a...working...
Creating cluster webfrontend1 in us-central1-a...done.
Created [https://container.googleapis.com/v1beta1/projects/qwiklabs-gcp-01-2346a16fbdda/regions/us-central1-a/clusters/webfrontend1].
To inspect the contents of your cluster, go to: https://console.cloud.google.com/kubernetes/workload_/gcloud/us-central1-a/webfrontend1?project=qwiklabs-gcp-01-2346a16fbdda
kubeconfig entry generated for webfrontend1.
NAME: webfrontend1
LOCATION: us-central1-a
MASTER_VERSION: 1.21.4-gke.1801
MASTER_IP: 35.184.33.50
MACHINE_TYPE: e2-medium
NODE_VERSION: 1.21.4-gke.1801
NUM_NODES: 2
STATUS: RUNNING

```

```

student_02_73d54166cbb0@cloudshell:~ (qwiklabs-gcp-01-2346a16fbdda)$ kubectl create deploy nginx --image=nginx:1.17.10
deployment.apps/nginx created
student_02_73d54166cbb0@cloudshell:~ (qwiklabs-gcp-01-2346a16fbdda)$ kubectl get pods
NAME           READY   STATUS    RESTARTS   AGE
nginx-674c77bcbb-8xzgc  1/1     Running   0          11s
student_02_73d54166cbb0@cloudshell:~ (qwiklabs-gcp-01-2346a16fbdda)$ kubectl expose deployment nginx --port 80 --type LoadBalancer
service/nginx exposed
student_02_73d54166cbb0@cloudshell:~ (qwiklabs-gcp-01-2346a16fbdda)$ kubectl get services
NAME            TYPE      CLUSTER-IP   EXTERNAL-IP   PORT(S)        AGE
kubernetes     ClusterIP  10.76.0.1   <none>        443/TCP       2m44s
nginx          LoadBalancer  10.76.10.197  <pending>    80:30415/TCP  13s
student_02_73d54166cbb0@cloudshell:~ (qwiklabs-gcp-01-2346a16fbdda)$ kubectl scale deployment nginx --replicas 3
deployment.apps/nginx scaled
student_02_73d54166cbb0@cloudshell:~ (qwiklabs-gcp-01-2346a16fbdda)$ kubectl get pods
NAME           READY   STATUS    RESTARTS   AGE
nginx-674c77bcbb-2pgc8  1/1     Running   0          6s
nginx-674c77bcbb-8xzgc  1/1     Running   0          44s
nginx-674c77bcbb-zjxng  1/1     Running   0          6s
student_02_73d54166cbb0@cloudshell:~ (qwiklabs-gcp-01-2346a16fbdda)$ kubectl get services
NAME            TYPE      CLUSTER-IP   EXTERNAL-IP   PORT(S)        AGE
kubernetes     ClusterIP  10.76.0.1   <none>        443/TCP       3m4s
nginx          LoadBalancer  10.76.10.197  <pending>    80:30415/TCP  33s
student_02_73d54166cbb0@cloudshell:~ (qwiklabs-gcp-01-2346a16fbdda)$

```

1) kubectl create deploy nginx --image=nginx:1.17.10 단일 nginx container 인스턴스를 생성한다.

쿠버네티스에서는 모든 containers는 pods 안에서 실행된다.

kubetl create 명령은 nginx container를 컨테이닝 하는 단일 pod의 배포구성을 생성하기 위해 쓴다.

쿠버네티스 배포는 지정된 수의 pods를 유지한다.

위 명령으로 기본적인 pods 1개를 생성한다.

2) kubectl get pods

nginx container를 실행중인 pods 를 확인한다.

3) kubectl expose deployment nginx --port 80 --type LoadBalancer

쿠버네티스는 서비스와 그 서비스에 public IP address가 부여된 외부 로드 밸런서를 생성한다.

해당 서비스에 부여된 public IP address는 서비스 종료 전까지 유지된다.

해당 public IP address로 들어오는 모든 네트워크 트래픽은 nginx pods로 라우팅된다.

4) kubectl get services

테스트를 위한 외부 IP address를 보여줄 수 있으며, 원격 nginx container와도 접촉할 수 있다.

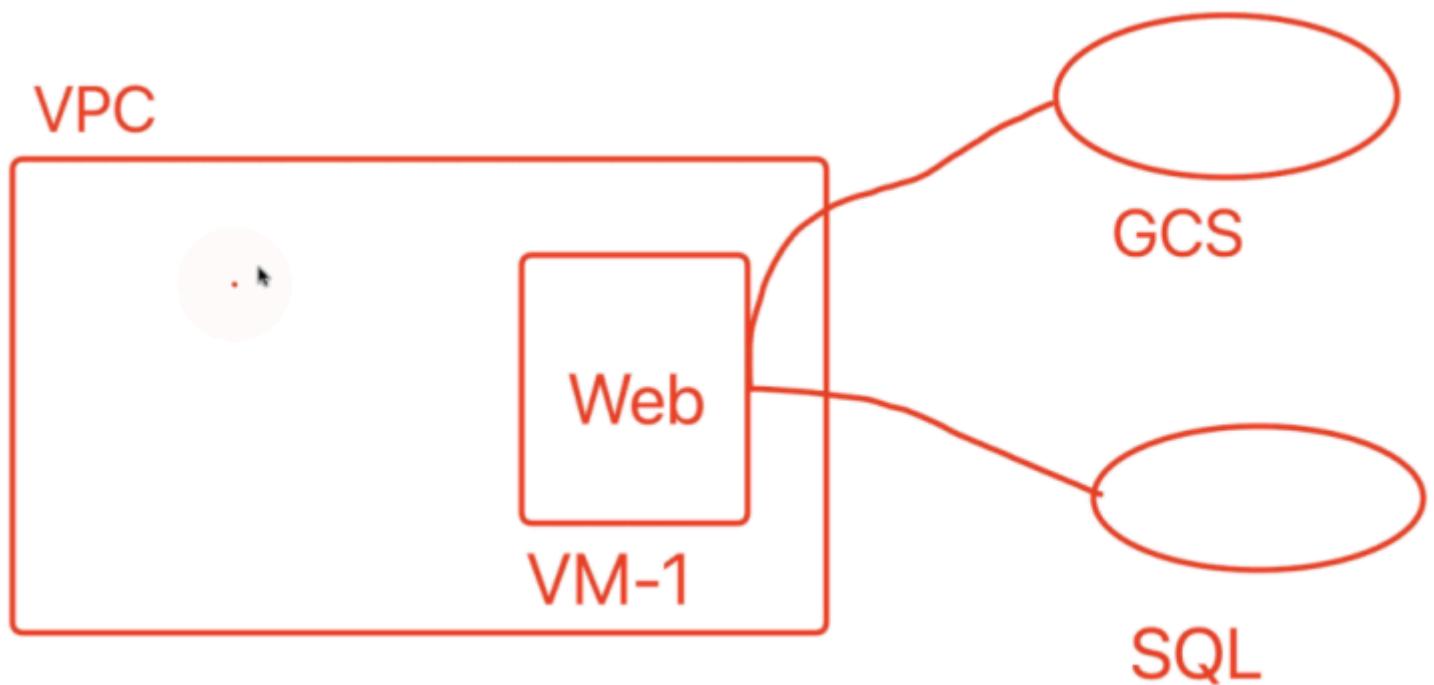
#실습3 Google Cloud 기초: Cloud Storage 및 Cloud SQL 시작하기

Cloud Storage = Object Storage

Cloud SQL = Managed RDBMS

object storage에 있는 파일은 굉장히 접근이 쉽다.

시나리오: GCS(Google Cloud Storage)와 SQL을 생성하고, 이를 vm-1의 웹서버와 연결하도록 한다.



웹 서버 VM 인스턴스 배포하자.

The screenshot shows the GCP dashboard with the following structure:

- Navigation Bar:** Google Cloud Platform, Home, Marketplace, Billing, APIs & Services, Support, IAM & Admin, Getting started, Compliance, Security, Anthos.
- Compute Section:** COMPUTE, Compute Engine (selected).
- VM Instances Submenu:** VM instances (selected), Instance templates, Sole-tenant nodes, Machine images, TPUs, Committed use discounts, Migrate for Compute Engine.
- Storage Submenu:** Disks, Snapshots, Images.
- Instance Groups Submenu:** Instance groups, Health checks.
- VM Manager Submenu:** OS patch management.

The main content area displays the Compute Engine VM instances page with the following details:

- Header:** Compute Engine, VM instances, CREATE INSTANCE, IMPORT VM, Help, More.
- Left Sidebar:** Virtual machines, VM instances (selected), Instance templates.
- Filter:** Filter Enter property name or value.
- Table Headers:** Status, Name (sorted), Zone, Recommendations, Connect.

1) bloghost로 이름 설정

웹서버 역할을 하는 호스트가 blog이기 때문에

2) 모두 기본값으로 Region 및 Zone 둔다.

3) 방화벽

Identity and API access ?

Service accounts ?

Service account

Compute Engine default service account



Access scopes ?

- Allow default access
- Allow full access to all Cloud APIs
- Set access for each API

Firewall ?

Add tags and firewall rules to allow specific network traffic from the Internet

Allow HTTP traffic

Allow HTTPS traffic

▼ NETWORKING, DISKS, SECURITY, MANAGEMENT, SOLE-TENANCY

You will be billed for this instance. [Compute Engine pricing](#)

CREATE

CANCEL

EQUIVALENT COMMAND LINE



startup Script 기능은 VM이 배치되자마자 바로 script가 실행되도록 하는 기능이다.

Firewall ?

Add tags and firewall rules to allow specific network traffic from the Internet

Allow HTTP traffic

Allow HTTPS traffic

▼ NETWORKING, DISKS, SECURITY, MANAGEMENT, SOLE-TENANCY

You will be billed for this instance. [Compute Engine pricing](#)

CREATE

CANCEL

EQUIVALENT COMMAND LINE



Startup script에 Quicwklabs에서 가져온 스크립트를 가져와 넣는다.

Management

Description, deletion protection, reservations, automation, and availability policies

Description

Deletion protection ?

Enable deletion protection

Reservations

Automatically use created reservation

Use an existing reservation when creating this VM instance

Automation

Startup script

apt-get update

apt-get install apache2 php php-mysql -y

service apache2 restart

You can choose to specify a startup script that will run when your instance boots up or restarts. Startup scripts can be used to install software and updates, and to ensure that services are running within the virtual machine. [Learn more](#)

gsutil 명령줄을 사용하여 Cloud Storage 버킷 만들기를 해본다.

cloud storage 페이지로 넘어간다.

The screenshot shows the Google Cloud Platform Cloud Storage interface. At the top, there's a blue header bar with the text "Google Cloud Platform" and "Cloud Storage". Below the header, there's a navigation sidebar on the left with options: "Cloud Storage" (selected), "Browser", "Monitoring", and "Settings". The main area is titled "Cloud Storage" and contains a table with columns: "Name" (with an upward arrow icon), "Created", "Location type", "Location", "Default storage class", "Last modified", and "Public access". A message at the bottom of the table says "No rows to display". There are also buttons for "CREATE BUCKET", "DELETE", and "REFRESH". On the right side of the main area, there are buttons for "SHOW INFO PANEL" and a user profile icon.



Name your bucket

Pick a globally unique, permanent name. [Naming guidelines](#)

qwiklabs-gcp-00-f164cc354e1a

Tip: Don't include any sensitive information

▼ LABELS (OPTIONAL)

[CONTINUE](#)

Choose where to store your data

Location: us (multiple regions in United States)

Location type: Multi-region

Choose a default storage class for your data

A storage class sets costs for storage, retrieval, and operations. Pick a default storage class based on how long you plan to store your data and how often it will be accessed. [Learn more](#)

Standard

Best for short-term storage and frequently accessed data

Nearline

Best for backups and data accessed less than once a month

Coldline

Best for disaster recovery and data accessed less than once a quarter

Archive

Best for long-term digital preservation of data accessed less than once a year

control access to objects 는 접근제어를 선택할 수 있는 옵션이다.

- uniform : 접근제어를 bucket 단위로
- Fine-grained: object 단위에서 uniform보다 더 세세히 접근제어 할 수 있다.

Choose how to control access to objects

Prevent public access

Restrict data from being publicly accessible via the internet. Will prevent this bucket from being used for web hosting. [Learn more](#)

Enforce public access prevention on this bucket

Access control

Uniform

Ensure uniform access to all objects in the bucket by using only bucket-level permissions (IAM). This option becomes permanent after 90 days. [Learn more](#)

Fine-grained

Specify access to individual objects by using object-level permissions (ACLs) in addition to your bucket-level permissions (IAM). [Learn more](#)

[CONTINUE](#)

• Choose how to protect object data

Your data is always protected with Cloud Storage but you can also choose from these additional data protection options to prevent data loss. Note that object versioning and retention policies cannot be used together.

Protection tools

None

Object versioning (best for data recovery)

For restoring deleted or overwritten objects. To minimize the cost of storing versions, we recommend limiting the number of noncurrent versions per object and scheduling them to expire after a number of days. [Learn more](#)

Retention policy (best for compliance)

For preventing the deletion or modification of the bucket's objects for a specified minimum duration of time after being uploaded. [Learn more](#)

DATA ENCRYPTION

[CREATE](#)

[CANCEL](#)

Cloud Storage

Bucket details

REFRESH

Browser

Monitoring

Settings

qwiklabs-gcp-00-f164cc354e1a

Location: us (multiple regions in United States)

Storage class: Standard

Public access: Subject to object ACLs

Protection: None

OBJECTS CONFIGURATION PERMISSIONS PROTECTION LIFECYCLE

Buckets > qwiklabs-gcp-00-f164cc354e1a

UPLOAD FILES UPLOAD FOLDER CREATE FOLDER MANAGE HOLDS DOWNLOAD DELETE

Filter by name prefix only ▾ Filter Filter objects and folders

<input type="checkbox"/>	Name	Size	Type	Created	Storage class	Last modified	Public access	Version history	Encryption	Re
No rows to display										

로컬에 있는 파일들을 'UPLOAD FILES'로 버켓에 업로드 할 수 있다. 또는 끌어다가 놓을 수 있다.

Cloud Shell 누군가가 만들어놓은 bucket image 파일을 다운받아 업로드해본다.

```
student_02_73d54166cbb0@cloudshell:~ (qwiklabs-gcp-00-2b34873fe659) $ gsutil cp gs://cloud-training/gcpfci/my-excellent-blog.png my-excellent-blog.png
Copying gs://cloud-training/gcpfci/my-excellent-blog.png...
/ [1 files] [ 8.2 KiB/ 8.2 KiB]
Operation completed over 1 objects/8.2 KiB.
student_02_73d54166cbb0@cloudshell:~ (qwiklabs-gcp-00-2b34873fe659) $ ls
my-excellent-blog.png README-cloudshell.txt
```

새로 만든 Cloud Storage 버킷(qwiklabs-gcp-00-f164cc354e1a)에 배너 이미지를 복사한다.

```
student_02_73d54166cbb0@cloudshell:~ (qwiklabs-gcp-00-2b34873fe659) $ gsutil cp my-excellent-blog.png gs://qwiklabs-gcp-00-f164cc354e1a/my-excellent-blog.png
Copying file://my-excellent-blog.png [Content-Type=image/png]...
/ [1 files] [ 8.2 KiB/ 8.2 KiB]
Operation completed over 1 objects/8.2 KiB.
```

The screenshot shows the Google Cloud Storage 'Object details' page for a file named 'my-excellent-blog.png'. The left sidebar has links for 'Browser', 'Monitoring', and 'Settings'. The main area shows the object's metadata:

LIVE OBJECT		VERSION HISTORY
 DOWNLOAD EDIT METADATA EDIT PERMISSIONS DELETE		
Overview		
Type	image/png	
Size	8.2 KB	
Created	Oct 26, 2021, 3:12:47 PM	
Last modified	Oct 26, 2021, 3:12:47 PM	
Storage class	Standard	
Custom time	—	
Public URL ?	Not applicable	
Authenticated URL ?	https://storage.cloud.google.com/qwiklabs-gcp-00-f164cc354e1a/my-excellent-blog.png?authuser=1	
gsutil URI ?	gs://qwiklabs-gcp-00-f164cc354e1a/my-excellent-blog.png	
Permissions		
Public access	Not public	
Protection		
Hold status	None edit	
Version history ?	—	
Retention policy	None	
Encryption type	Google-managed key	

A large gray box contains the text 'My Excellent Blog'.

Public URL 을 사용 가능하도록 하기 위해 Permissions를 설정한다.

Object details

Buckets > qwiklabs-gcp-00-f164cc354e1a > my-excellent-blog.png

LIVE OBJECT

VERSION HISTORY

DOWNLOAD

EDIT

Edit my-excellent-blog.png permissions

If you don't rely on individual object-level permissions, you can start managing all permissions uniformly at the bucket-level. Go to the bucket's Permissions tab to get started. [Learn more](#)

Entity *	Name	Access *
Project	owners-31731512535	Owner
Project	editors-31731512535	Owner
Project	viewers-31731512535	Reader
User	student-02-73d54166	Owner
Domain	enter ID, email, or domain	Reader

Domain
Group
User
Project
Public

CANCEL

SAVE

Edit my-excellent-blog.png permissions

⚠ This object is public and can be accessed by anyone on the internet. To remove public access, search for and remove all public entries from the object's permissions.

If you don't rely on individual object-level permissions, you can start managing all permissions uniformly at the bucket-level. Go to the bucket's Permissions tab to get started. [Learn more](#)

Entity *	Name	Access *
Project	owners-31731512535	Owner
Project	editors-31731512535	Owner
Project	viewers-31731512535	Reader
User	student-02-73d54166	Owner
Public	allUsers	Reader

[+ ADD ENTRY](#)

[CANCEL](#) [SAVE](#)

[DOWNLOAD](#)[EDIT METADATA](#)[EDIT PERMISSIONS](#)[DELETE](#)

Overview

Type	image/png
Size	8.2 KB
Created	Oct 26, 2021, 3:12:47 PM
Last modified	Oct 26, 2021, 3:16:18 PM
Storage class	Standard
Custom time	—
Public URL ?	https://storage.googleapis.com/qwiklabs-gcp-00-f164cc354e1a/my-excellent-blog.png 
Authenticated URL ?	https://storage.cloud.google.com/qwiklabs-gcp-00-f164cc354e1a/my-excellent-blog.png? authuser=1 
gsutil URI ?	gs://qwiklabs-gcp-00-f164cc354e1a/my-excellent-blog.png 

Permissions

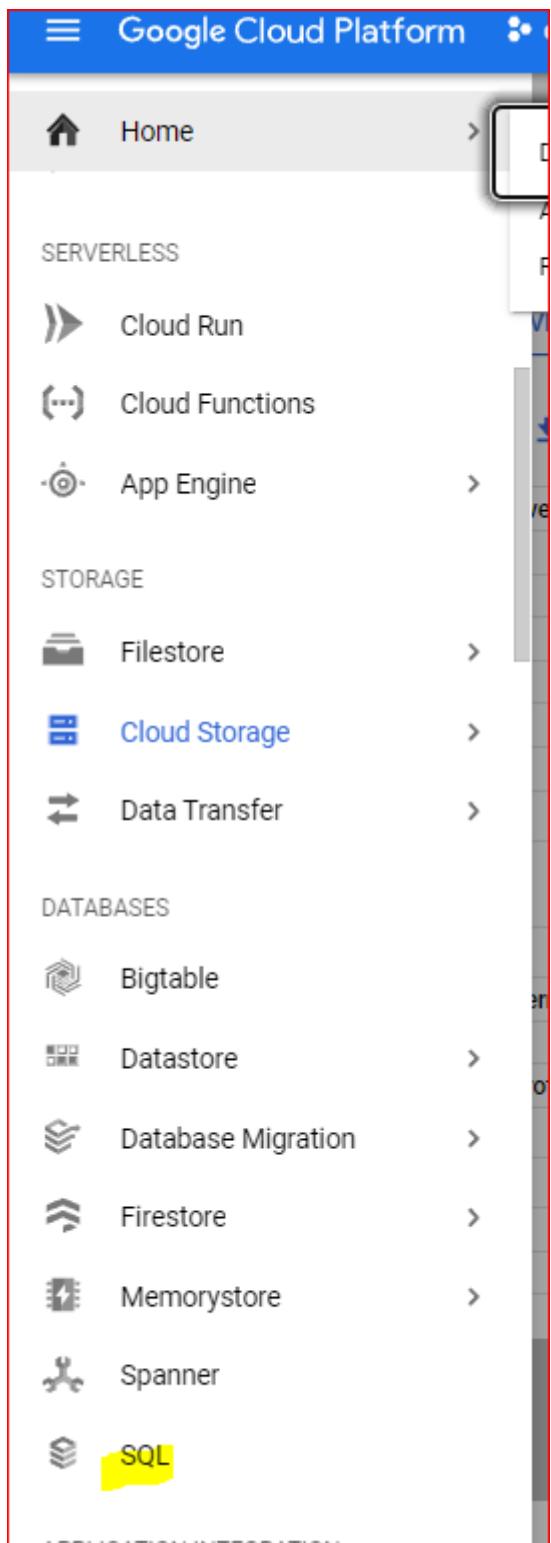
Public access	Public to internet
---------------	--------------------

Protection

Hold status	None 
Version history ?	—
Retention policy	None
Encryption type	Google-managed key

My Excellent Blog

Cloud Storage 생성하기



Google Cloud Platform • qwiklabs-gcp-00-2b34873fe659 ▾

Search products and resources

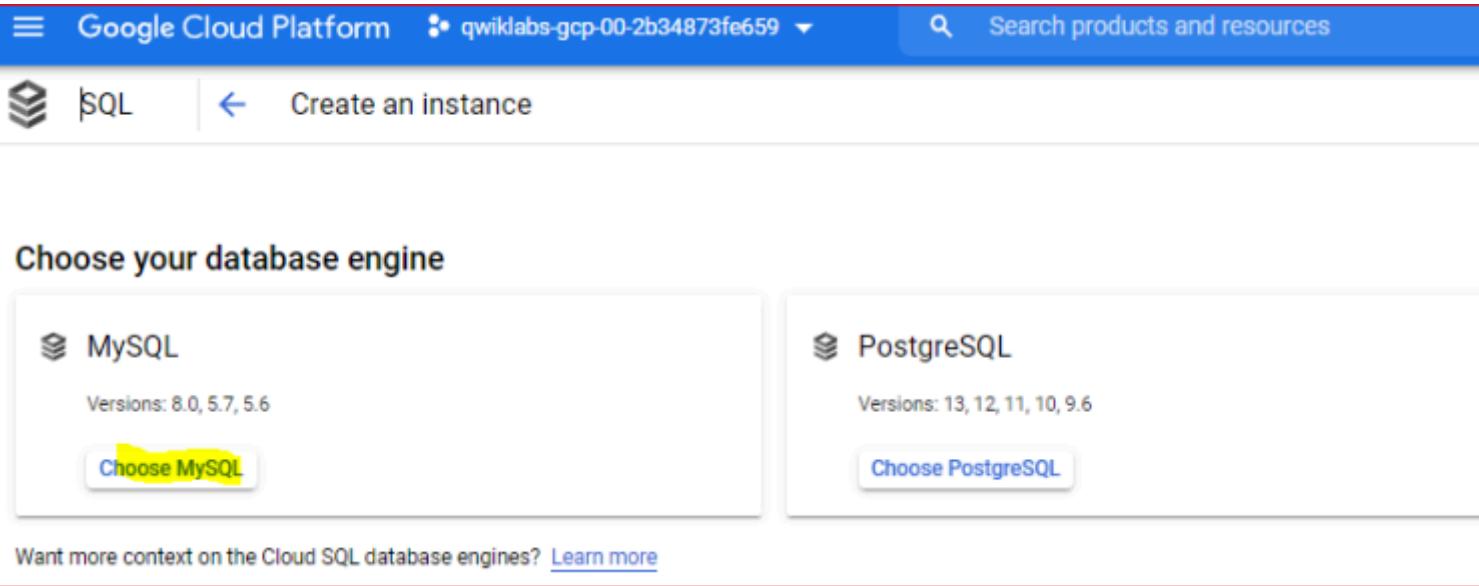
SQL Create an instance

Choose your database engine

 MySQL
Versions: 8.0, 5.7, 5.6
[Choose MySQL](#)

 PostgreSQL
Versions: 13, 12, 11, 10, 9.6
[Choose PostgreSQL](#)

Want more context on the Cloud SQL database engines? [Learn more](#)



1) 웹서버 역할을 하는 db 라는 이름

2) 패스워드 지정

3) 데이터베이스 버전 MySQL 5.6

4)

- multiple zones

A존 -> B존으로 Failover해서 A존에 있던 걸 바로 사용할 수 있도록 한다.(가용성)

5) Specify zones 에서는 us-central-a 라는 존에 vm을 생성했는데,

같은 데이터 센터 내에 위치하도록 하면 빠른 속도를 보장한다.

Choose region and zonal availability

For better performance, keep your data close to the services that need it. Region is permanent, while zone can be changed any time.

Region

us-central1 (Iowa)

Zonal availability

Single zone

In case of outage, no failover. Not recommended for production.

Multiple zones (Highly available)

Automatic failover to another zone within your selected region. Recommended for production instances. Increases cost.

Primary zone

Any

us-central1-a

us-central1-b

us-central1-c

us-central1-f

Cus

You can change configurations later

SHOW CONFIGURATION OPTIONS

CREATE INSTANCE

CANCEL

외부에서 들어오는 모든 접속을 기본적으로 차단하는데, 허가된 IP list들만 Cloud IP에 설정해야 한다.

Computer Engine > VM instances 에 가서 bloghost의 External IP 주소를 복사한다.

VM instances		CREATE INSTANCE	IMPORT VM	REFRESH	OPERATIONS				
INSTANCES		INSTANCE SCHEDULE							
VM instances are highly configurable virtual machines for running workloads on Google infrastructure. Learn more									
<input type="button"/> Sort <input type="button"/> Filter Enter property name or value									
Zone	Recommendations	In use by	Internal IP	External IP	Connect				
host	us-central1-a		10.128.0.2 (nic0)	104.155.171.138	SSH				

IP White listing 작업을 한다.

The screenshot shows the 'Connections' tab selected in the sidebar. The main area displays the 'blog-db' instance with its status as 'Runnable 5.7'. A section titled 'Networking' allows choosing a network path for connecting to the instance. It includes two options: 'Private IP' (unchecked) and 'Public IP' (checked). A note states that Public IP requires additional APIs and permissions. Below this is a 'Authorized networks' section with a message indicating no external networks have been authorized. At the bottom are 'ADD NETWORK' and 'SAVE/DISCARD CHANGES' buttons.

PRIMARY INSTANCE

All instances > blog-db

blog-db

Runnable 5.7

Networking

Choose a network path for connecting to this instance. For extra security, consider using the Cloud SQL proxy. [Learn more](#)

Private IP
Requires additional APIs and permissions, which may require your system admin. Can't be disabled once enabled. [Learn more](#)

Public IP
Authorize a network or use [Cloud SQL Proxy](#) to connect to this instance. [Learn more](#)

Authorized networks

You have not authorized any external networks to connect to your Cloud SQL instance. External applications can still connect to the instance through the Cloud SQL Proxy. [Learn more](#)

ADD NETWORK

SAVE **DISCARD CHANGES**

The dialog box is titled 'New network'. It contains a 'Name' field with 'webfrontend' entered, and a 'Network *' field with '104.155.171.138/32'. There is also a note about using CIDR notation. At the bottom are 'CANCEL' and 'DONE' buttons.

Authorized networks

New network

Name

Use [CIDR notation](#)

Network *

Example: 199.27.25.0/24

CANCEL DONE

Authorized networks

webfrontend (104.155.171.138/32)	(Not saved) ▾
ADD NETWORK	
SAVE	DISCARD CHANGES

Cloud SQL은 vm 인스턴스에서 날라오는 것을 Allow해줄 수 있게 되었다.

SQL

PRIMARY INSTANCE	Users								
	All instances > blog-db								
	blog-db								
	MySQL 5.7								
	User accounts enable users and applications to connect to your instance. Learn more								
	ADD USER ACCOUNT								
	<table><thead><tr><th>User name</th><th>Host name</th><th>Authentication</th></tr></thead><tbody><tr><td>root</td><td>% (any host)</td><td>Built-in</td></tr></tbody></table>			User name	Host name	Authentication	root	% (any host)	Built-in
	User name	Host name	Authentication						
root	% (any host)	Built-in							
⋮									

Add a user account to instance blog-db

Choose how to authenticate

You can manage access to this instance using Cloud IAM or MySQL built-in authentication. [Learn more](#)

Built-in authentication

Creates a new username and password specific to this instance. User account will have root access, but you can customize that later as needed. [Learn more](#)

User name *

blogdbuser

Password (Optional)



Host name [?](#)

Allow any host (%)

Restrict host by IP address or address range

Users created with built-in authentication have the same privileges as the root user. [Learn more](#)

Cloud IAM

Associates an existing IAM principal with this user account. Must have a role providing instance-level access assigned to connect.

ADD

CANCEL

All instances > blog-db

blog-db

Runnable 5.7

User accounts enable users and applications to connect to your instance. [Learn more](#)

+ ADD USER ACCOUNT

	User name	Host name	Authentication	
	blogdbuser	% (any host)	Built-in	
	root	% (any host)	Built-in	

Cloud SQL을 사용하도록 Compute Engine 인스턴스의 애플리케이션 구성하기

bloghost로 ssh 접속한다.

instances

VM instances are highly configurable virtual machines for running workloads on Google infrastructure. [Learn more](#)

ance templates

tenant nodes

line images

mi

student-02-73d54166cbb0@bloghost ~ - Chrome

ite ssh.cloud.google.com/projects/qwiklabs-gcp-00-2b34873fe659/zones/us-central1-a/instances/bloghost?authuser=0

Connected, host fingerprint: ssh-rsa 0 69:D8:FF:91:DE:FF:79:B0:7B:D0:D8:55:F2:2F
:07:FD:4B:B0:A7:52:41:6F:F3:7A:7

Linux bloghost 4.19.0-17-cloud-amd64 #4

Please consider adding the IAP-secured Tunnel User IAM role to start using Cloud IAP for TCP forwarding for better performance. [Learn more](#) [Dismiss](#)

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

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent permitted by applicable law.

Creating directory '/home/student-02-73d54166cbb0'.

student-02-73d54166cbb0@bloghost:~\$

SQL Instances + CREATE INSTANCE MIGRATE DATA

Filter Enter property name or value

<input type="checkbox"/> Instance ID	Type	Public IP address	Private IP address	IP
<input checked="" type="checkbox"/> blog-db	MySQL 5.7	130.211.206.62		0

```
GNU nano 3.2
```

```
<body>
<h1>Welcome to my excellent blog</h1>
<?php
$dbserver = "CLOUDSQLIP"; /
$dbuser = "blogdbuser"; /
$dbpassword = "DBPASSWORD"; /
// In a production blog, we would not store the MySQL
// password in the document root. Instead, we would store it in a
// configuration file elsewhere on the web server VM instance.
$conn = new mysqli($dbserver, $dbuser, $dbpassword);
if (mysqli_connect_error()) {
    echo ("Database connection failed: " . mysqli_connect_error());
} else {
    echo ("Database connection succeeded.");
}
?>
</body></html>
```

4째 라인을 지우고 Cloud Storage object의 주소를 넣는다.

The screenshot shows the 'Object details' page for a file named 'my-excellent-blog.png' in a bucket 'qwiklabs-gcp-00-f164cc354e1a'. The left sidebar has 'Cloud Storage' selected under 'Browser'. The main area shows the file's metadata, including its type as 'image/png', size as '8.2 KB', and creation date as 'Oct 26, 2021, 3:12:47 PM'. It also displays three URLs: 'Public URL' (https://storage.googleapis.com/qwiklabs-gcp-00-f164cc354e1a/my-excellent-blog.png), 'Authenticated URL' (https://storage.cloud.google.com/qwiklabs-gcp-00-f164cc354e1a/my-excellent-blog.png?authuser=1), and 'gsutil URI' (gs://qwiklabs-gcp-00-f164cc354e1a/my-excellent-blog.png).

public

Ctrl + O 저장 > Enter -> Ctrl + X로 종료

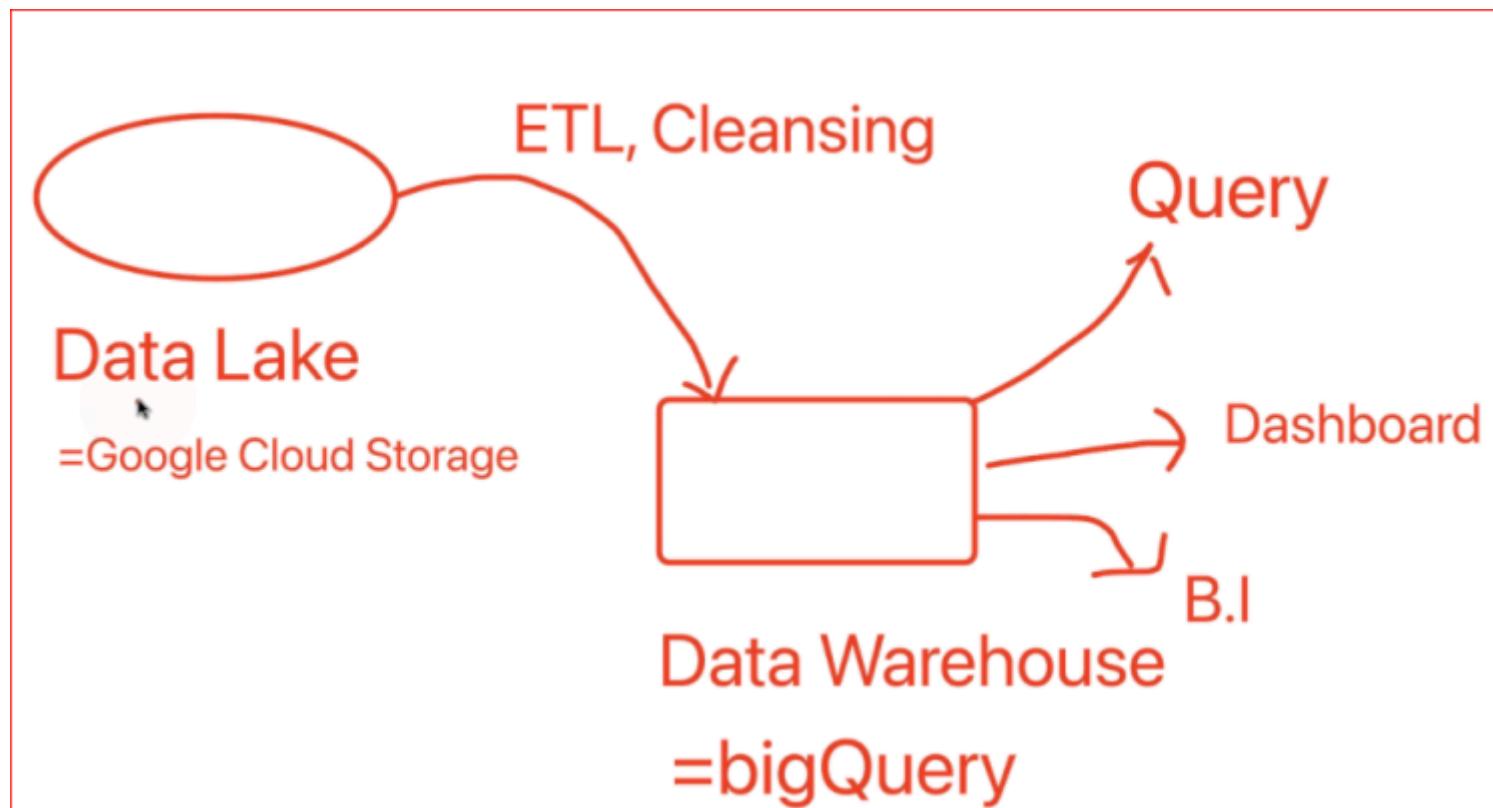
sudo service apache2 restart를 해준다.

#실습4 Google Cloud Fundamentals: Getting Started with BigQuery

Data Lake에서 Data Warehouse로 옮기는 과정(ETL, Cleansing)을 하면, Data Warehouse에서 Query 질의,

Dashboard 그림을 그리거나, B.I 툴을 사용해서 레포트를 그릴 수 있다.

Cloud Big Query는 Data Warehouse 서비스이다.



Data Lake의 데이터는 low data

Data Lake의 데이터를 제공하는 서비스가 Google Cloud Storage

Data Warehouse에는 라벨링, 분류, 바로 사용이 가능하도록 정리가 되어있는 저장소.

bigQuery에 데이터를 저장한 후 데이터 분석을 한다.

Google Cloud Platform

-  Home >
 -  Cloud Run for Anthos
 -  Deployment Manager >
 -  Endpoints >
 -  Identity Platform >
 -  Private Catalog Pin
 -  Apigee >
 -  Carbon Footpri... NEW
- BIG DATA
-  Composer
 -  Dataproc >
 -  Pub/Sub >
 -  Dataflow >
 -  Datastream >
 -  IoT Core
 -  BigQuery >
 -  Looker
 -  Data Catalog >

FEATURES & INFO SHORTCUT DISABLE EDITOR TABS

Explorer + ADD DATA

Type to search

Viewing pinned projects.

qwiklabs-gcp-01-53be426...

Open

Create dataset

EDITOR RUN SAVE SCHEDULE MORE

Create dataset

Dataset ID * Letters, numbers, and underscores allowed

Data location

Default table expiration

Enable table expiration

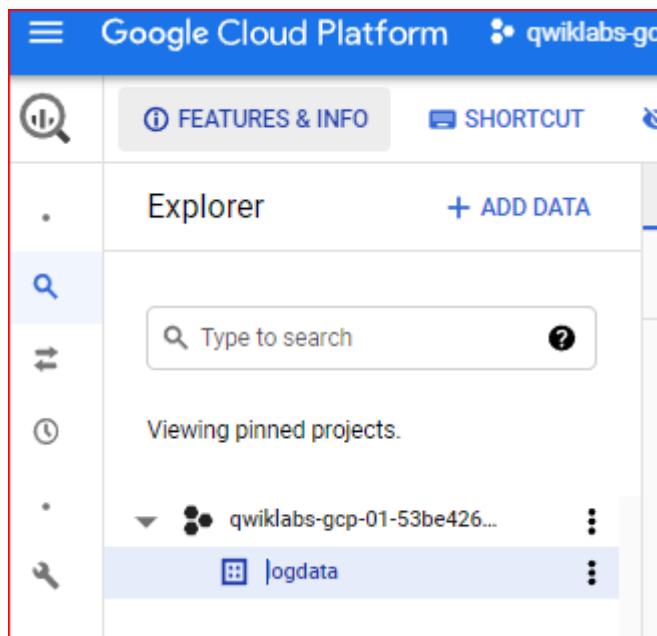
Default maximum table age Days

Encryption

Google-managed encryption key
No configuration required

Customer-managed encryption key (CMEK)
Manage via Google Cloud Key Management Service

CREATE DATASET CANCEL



dataset안에 테이블 형태의 셋을 넣을 것이다.

This screenshot shows the configuration page for the 'logdata' dataset. At the top, it displays the dataset ID: 'qwiklabs-gcp-01-53be426db7e4:logdata'. Below this are sections for 'Description' (None) and 'Labels' (None). The 'Dataset info' section contains the following details:

Dataset ID	qwiklabs-gcp-01-53be426db7e4:logdata
Created	Oct 26, 2021, 4:16:05 PM
Default table expiration	Never
Last modified	Oct 26, 2021, 4:16:05 PM
Data location	US

1) Source: Cloud Storage Bucket에서 데이터를 가져오기로 한다.

2) 다음 url 을 GCS bucket에서 가져오는 select file 에 넣는다.

7. Click on **CREATE TABLE**. On the **Create Table** page, in the **Source** section:

- For **Create table from**, choose select **Google Cloud Storage**, and in the field, type `gs://cloud-training/gcpfci/access_log.csv`.
- Verify **File format** is set to **CSV**.

3) Destination : 가져온 데이터를 어디에 저장할 것인가.

Destination

Search for a project Enter a project name

Project name: **qwiklabs-gcp-01-53be426db7e4** Dataset name: **logdata** Table type: **Native table**

Table name: **accesslog**

4) Schema를 자동 감지하는 기능이 있다(Auto detect)

우리가 가져온 csv 파일의 규격을 자동 감지한다.

Schema

Auto detect
 Schema and input parameters

ⓘ Schema will be automatically generated.

Partition and cluster settings

Partitioning: **No partitioning**

Clustering order (optional): ⓘ
Clustering order determines the sort order of the data. Clustering can be used on both partitioned and non-partitioned tables.

Comma-separated list of fields to define clustering order (up to 4)

Advanced options ⌄

5) Partitioning은 bigQuery 성능에 관심이 있다면 설정해준다.

The screenshot shows the Google Cloud BigQuery interface. At the top, there are three navigation links: 'FEATURES & INFO', 'SHORTCUT', and 'DISABLE EDITOR TABS'. Below these, the 'Explorer' tab is selected, and there is a '+ ADD DATA' button. A search bar with the placeholder 'Type to search' is present. The main area displays 'Viewing pinned projects.' and a tree view of datasets. Under the project 'qwiklabs-gcp-01-53be426db7e4', the 'logdata' dataset is expanded, showing its child table 'accesslog'. This table is highlighted with a yellow background. To the right of the dataset tree, a detailed view of the 'logdata' dataset is shown in a card. The 'Description' field is set to 'None'. The 'Dataset info' section provides the following details:

Dataset ID	qwiklabs-gcp-01-53be426db7e4:logdata
Created	Oct 26, 2021, 4:16:05 PM
Default table expiration	Never
Last modified	Oct 26, 2021, 4:16:05 PM
Data location	US

accesslog 테이블 생성완료

accesslog

SCHEMA DETAILS PREVIEW

Table schema

Filter Enter property name or value

Field name	Type	Mode	Policy
string_field_0	STRING	NULLABLE	
string_field_1	STRING	NULLABLE	
string_field_2	STRING	NULLABLE	
int64_field_3	INTEGER	NULLABLE	
string_field_4	STRING	NULLABLE	
int64_field_5	INTEGER	NULLABLE	
int64_field_6	INTEGER	NULLABLE	
int64_field_7	INTEGER	NULLABLE	
int64_field_8	INTEGER	NULLABLE	
string_field_9	STRING	NULLABLE	
string_field_10	STRING	NULLABLE	
int64_field_11	INTEGER	NULLABLE	
int64_field_12	INTEGER	NULLABLE	
string_field_13	STRING	NULLABLE	
string_field_14	STRING	NULLABLE	

[EDIT SCHEMA](#)

[VIEW ROW ACCESS POLICIES](#)

테이블 스키마

LOGDATA X ACCESS... X

accesslog

SCHEMA DETAILS PREVIEW

Table info

Table ID	qwiklabs-gcp-01-53be426db7e4:logdata.accesslog
Table size	304.56 MB
Long-term storage size	0 B
Number of rows	1,461,378
Created	Oct 26, 2021, 4:21:40 PM UTC+9
Last modified	Oct 26, 2021, 4:21:40 PM UTC+9
Table expiration	NEVER
Data location	US
Description	

테이블 정보

accesslog												QUERY	SHARE	COPY	DELETE	E
SCHEMA	DETAILS	PREVIEW														
string_field_0	string_field_1	string_field_2	int64_field_3	string_field_4	int64_field_5	int64_field_6	int64_field_7	int64_field_8	string_field_9	string_field_10	int64_field_11	int64_field_12	string_field_13	string_field_14		
192.168.164.217	-	-	10	May	2017	5	0	0	GET /services	HTTP/1.0	200	3070	-	Mozilla/5.0 (Windows		
10.95.179.80	-	-	10	May	2017	12	0	0	GET /careers	HTTP/1.0	200	3355	http://www.google.com	Mozilla/5.0 (iPad; CPU		
192.168.186.2	-	-	10	May	2017	9	0	0	GET /services	HTTP/1.0	200	2432	-	Mozilla/4.0 (compatible; MSIE 6.0; Windows NT 5.1; SV1; .NET CLR 1.1.4322)		
172.17.114.134	-	-	10	May	2017	13	0	0	GET /favicon.ico	HTTP/1.0	200	2597	http://www.google.com	Mozilla/5.0 (Linux x86_64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/28.0.1500.72 Safari/537.36		
192.168.221.216	-	-	10	May	2017	19	0	0	GET /products	HTTP/1.0	200	2967	-	Mozilla/5.0 (iPad; CPU like Mac OS X) AppleWebKit/536.26 (KHTML, like Gecko) Chrome/41.0.2272.78 Safari/536.26		
10.137.207.47	-	-	10	May	2017	9	0	0	GET /products/floorwaxes	HTTP/1.0	200	2423	http://www.google.com	Mozilla/5.0 (Windows NT 10.0; Win10_0_10240) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/51.0.2704.79 Safari/537.36		
10.76.214.54	-	-	10	May	2017	16	0	0	GET /index.html	HTTP/1.0	200	3996	-	Mozilla/5.0 (Windows NT 10.0; Win10_0_10240) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/51.0.2704.79 Safari/537.36		
192.168.237.155	-	-	10	May	2017	9	0	0	GET /services/turipwindings	HTTP/1.0	200	2261	-	Mozilla/5.0 (Windows NT 10.0; Win10_0_10240) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/51.0.2704.79 Safari/537.36		
192.168.50.177	-	-	10	May	2017	13	0	0	GET /store	HTTP/1.0	200	3700	http://www.google.com	Mozilla/5.0 (Linux x86_64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/28.0.1500.72 Safari/537.36		
192.168.53.86	-	-	10	May	2017	11	0	0	GET /store	HTTP/1.0	200	3378	-	Mozilla/5.0 (Windows NT 10.0; Win10_0_10240) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/51.0.2704.79 Safari/537.36		
10.16.179.166	-	-	10	May	2017	9	0	0	GET /index.html	HTTP/1.0	200	3310	http://www.google.com	Mozilla/5.0 (Windows NT 10.0; Win10_0_10240) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/51.0.2704.79 Safari/537.36		
172.22.236.20	-	-	10	May	2017	10	0	0	GET /index.html	HTTP/1.0	200	2881	-	Mozilla/5.0 (Windows NT 10.0; Win10_0_10240) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/51.0.2704.79 Safari/537.36		
172.27.22.252	-	-	10	May	2017	9	0	0	GET /store	HTTP/1.0	200	2021	http://www.google.com	Mozilla/5.0 (Windows NT 10.0; Win10_0_10240) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/51.0.2704.79 Safari/537.36		
10.11.39.116	-	-	10	May	2017	1	0	0	GET /products/desserttoppings	HTTP/1.0	200	2314	-	Mozilla/5.0 (Windows NT 10.0; Win10_0_10240) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/51.0.2704.79 Safari/537.36		
10.195.189.109	-	-	10	May	2017	15	0	0	GET /store	HTTP/1.0	200	3568	http://www.google.com	Mozilla/4.0 (compatible; MSIE 6.0; Windows NT 5.1; SV1; .NET CLR 1.1.4322)		
10.0.48.166	-	-	10	May	2017	10	0	0	GET /index.html	HTTP/1.0	200	3713	-	Mozilla/5.0 (Windows NT 10.0; Win10_0_10240) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/51.0.2704.79 Safari/537.36		
10.151.186.206	-	-	10	May	2017	21	0	0	GET /products/floorwaxes	HTTP/1.0	200	3809	http://www.google.com	Mozilla/5.0 (Windows NT 10.0; Win10_0_10240) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/51.0.2704.79 Safari/537.36		
172.28.171.185	-	-	10	May	2017	10	0	0	GET /products	HTTP/1.0	200	3274	-	Mozilla/5.0 (Linux x86_64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/28.0.1500.72 Safari/537.36		
192.168.114.99	-	-	10	May	2017	9	0	0	GET /favicon.ico	HTTP/1.0	200	3205	http://www.google.com	Mozilla/5.0 (iPad; CPU like Mac OS X) AppleWebKit/536.26 (KHTML, like Gecko) Chrome/41.0.2272.78 Safari/536.26		
192.168.11.106	-	-	10	May	2017	23	0	0	GET /products/desserttoppings	HTTP/1.0	200	2341	-	Mozilla/5.0 (iPad; CPU like Mac OS X) AppleWebKit/536.26 (KHTML, like Gecko) Chrome/41.0.2272.78 Safari/536.26		
192.168.42.213	-	-	10	May	2017	11	0	0	GET /products	HTTP/1.0	200	2723	http://www.google.com	Mozilla/5.0 (Windows NT 10.0; Win10_0_10240) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/51.0.2704.79 Safari/537.36		
172.28.20.55	-	-	10	May	2017	17	0	0	GET /products/floorwaxes	HTTP/1.0	200	4323	http://www.google.com	Mozilla/5.0 (Macintosh; Intel Mac OS X 10_12_6) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/51.0.2704.79 Safari/537.36		

Task 3: Perform a query on the data using the BigQuery web UI

EDITOR 부분에 쿼리문을 작성한다.

The screenshot shows the BigQuery Editor interface. At the top, there are buttons for 'RUN', 'SAVE', 'SCHEDULE', and 'MORE'. A status message at the top right says 'This query will process 11.1 MiB when run.' Below the buttons is a code editor containing the following SQL query:

```
1 select int64_field_6 as hour, count(*) as hitcount from logdata.accesslog
2 group by hour
3 order by hour
```

초록색 체크: 쿼리문 실행이 가능함을 의미 및 쿼리가 처리할 데이터 양을 미리 보여준다

bigQuery는 처리할 데이터 양에 따라 비용을 부여하기 때문에 주의할 것.

The screenshot shows the BigQuery results page. At the top, it displays the same query as in the editor. Below that, it shows the 'Query results' section with three tabs: 'Job information', 'Results' (which is selected), 'JSON', and 'Execution details'. The results table has columns 'Row', 'hour', and 'hitcount'. The data is as follows:

Row	hour	hitcount
1	0	26983
2	1	12287
3	2	8824
4	3	6607
5	4	10519
6	5	14581
7	6	26634
8	7	73708
9	8	218842
10	9	219769
11	10	115119
12	11	58151
13	12	55623
14	13	55625
15	14	56057
16	15	55675
17	16	55573

```

1 select int64_field_6 as hour, count(*) as hitcount from logdata.accesslog
2 group by hour
3 order by hour

```

Query results

SAVE RESULTS

EXPLORE DATA ▾

Query complete (0.5 sec elapsed, 11.1 MB processed)

Job information Results JSON Execution details

For help debugging or optimizing your query, check our documentation. [Learn more](#)

Elapsed time	Slot time consumed	Bytes shuffled	Bytes spilled to disk				
0.5 sec	0.515 sec	864 B	0 B				
Worker timing							
Stages	Wait		Read	Compute	Write	Rows	
	Avg:	0 ms	47 ms	296 ms	6 ms	Input:	1,461,378
S00: Input	Max:	0 ms	47 ms	296 ms	6 ms	Output:	24
	Avg:	1 ms	0 ms	4 ms	4 ms	Input:	24
S01: Aggregate	Max:	1 ms	0 ms	4 ms	4 ms	Output:	24
	Avg:	1 ms	0 ms	6 ms	53 ms	Input:	24
S02: Output	Max:	1 ms	0 ms	6 ms	53 ms	Output:	24
	Avg:	1 ms	0 ms	6 ms	53 ms	Input:	24

3단계 stage로 나눠 쿼리를 실행했음

파란색 그래프가 많을 수록 해당 작업에 부하가 집중되는 것을 의미함.

Active Cloud Shell에서 bigQuery를 날려본다.

```

student_02_9f40435be7f2@cloudshell:~ (qwiklabs-gcp-01-53be426db7e4) $ bq query "select string_field_10 as request, count(*) as requestcount from logdata.accesslog group by request order by requestcount desc"
Waiting on bqjob_r613d9625f06024c2_0000017cbb8256dc_1 ... (0s) Current status: DONE
+-----+-----+
| request | requestcount |
+-----+-----+
| GET /store HTTP/1.0 | 337293 |
| GET /index.html HTTP/1.0 | 336193 |
| GET /products HTTP/1.0 | 280937 |
| GET /services HTTP/1.0 | 169090 |
| GET /products/desserttoppings HTTP/1.0 | 56580 |
| GET /products/floorwaxes HTTP/1.0 | 56451 |
| GET /careers HTTP/1.0 | 56412 |
| GET /services/turnipwinding HTTP/1.0 | 56401 |
| GET /services/spacetravel HTTP/1.0 | 56176 |
| GET /favicon.ico HTTP/1.0 | 55845 |
+-----+-----+
student_02_9f40435be7f2@cloudshell:~ (qwiklabs-gcp-01-53be426db7e4) $

```

