



SOFTWARE DEVELOPMENT TOOLS AND ENVIRONMENTS

To apply for Google Cloud, follow these steps

The screenshot shows the Google Cloud homepage with a dark blue header. The main heading is "Solve real business challenges on Google Cloud". Below it are two buttons: "Get started for free" (blue) and "Contact sales" (white). A large central box is titled "Run workloads for free" and contains three sections: "20+ free products for all customers", "\$300 in free credits for new customers", and "Start deploying pre-built solutions free". Below this is a section titled "Free Tier products" with four items: Compute Engine, Cloud Storage, BigQuery, and Google Kubernetes Engine. Each item has a brief description and a right-pointing arrow.

Solve real business challenges on Google Cloud

[Get started for free](#) [Contact sales](#)

Run workloads for free

20+ free products for all customers
All customers get [free hands-on experience](#) with popular products, including Compute Engine and Cloud Storage, [up to monthly limits](#).

\$300 in free credits for new customers
New customers get [\\$300 in free credits](#) to fully explore and conduct an assessment of Google Cloud. You won't be charged until you upgrade.

Start deploying pre-built solutions free
New customers get [\\$300 in free credits](#) on signup to use on deploying a dynamic website, launching a VM, building a three tier web app, and more [pre-built solutions templates](#).

Free Tier products

There is no charge to use these products up to their specified [free usage limit](#). The free usage limit does not expire, but is subject to change. Available for eligible customers.

Compute Engine Scalable, high-performance virtual machines. 1 e2-micro instance per month →	Cloud Storage Best-in-class performance, reliability, and pricing for all your storage needs. 5 GB-months Standard Storage →	BigQuery Fully managed, petabyte scale, analytics data warehouse. 1TB queries per month →	Google Kubernetes Engine One-click container orchestration via Kubernetes clusters, managed by Google. One Autopilot or Zonal cluster per month →
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<https://cloud.google.com/>

Free trial credit

 THB10,864
Free trial credit

Out of THB10,864

 90
Days remaining

Ends February 24, 2024

You are not billed during your Free Trial. When the Free Trial ends, all resources you created during the trial are stopped and you will not be charged, unless you upgrade to a paid Cloud Billing account.

Please note: The Free Trial period cannot be paused or extended. The Free Trial ends after all available credits are consumed, or at the end of the Free Trial period, whichever happens first.

[ACTIVATE](#) [LEARN MORE](#)

การสมัครใช้บริการ **Google Cloud** สามารถทำได้โดยขั้นตอนง่าย ๆ ดังนี้:

1. **เข้าไปที่เว็บไซต์ของ Google Cloud Platform (GCP)*:**

- เปิดเบราว์เซอร์และเข้าไปที่ [\[https://cloud.google.com/\]\(https://cloud.google.com/\)](https://cloud.google.com/).
- คลิกที่ปุ่ม "Get started for free" หรือ "ลงทะเบียนใช้งานฟรี" ที่อยู่บนหน้าเว็บไซต์.

2. **ลงทะเบียนหรือเข้าสู่ระบบด้วยบัญชี Google**:**

- ถ้าคุณมีบัญชี Google อยู่แล้ว (เช่น Gmail), คุณสามารถใช้บัญชีนั้นเข้าสู่ระบบ.
- ถ้าคุณยังไม่มีบัญชี Google, คุณจะต้องสร้างบัญชีใหม่.

3. **กรอกข้อมูลการลงทะเบียน**:**

- คุณจะต้องกรอกข้อมูลส่วนตัว, เช่น ชื่อ, นามสกุล, และข้อมูลการติดต่อ.
- ทำการยืนยันอีเมล์ที่ใช้สมัคร.

4. **กรอกข้อมูลการเงิน (เพื่อการยืนยันตัวตน)**:**

- แม้ว่า GCP จะเสนอเครดิตฟรีเมื่อคุณเริ่มใช้งาน, แต่ Google ยังคงต้องการข้อมูลบัตรเครดิตหรือบัญชีธนาคารเพื่อการยืนยันตัวตน.
- คุณจะไม่ถูกเรียกเก็บเงินจนกว่าจะใช้เครดิตที่ให้มาหมด.

5. **อ่านและยอมรับข้อกำหนดการใช้งาน**:**

- ตรวจสอบและยอมรับข้อกำหนดและเงื่อนไขการให้บริการของ Google Cloud.

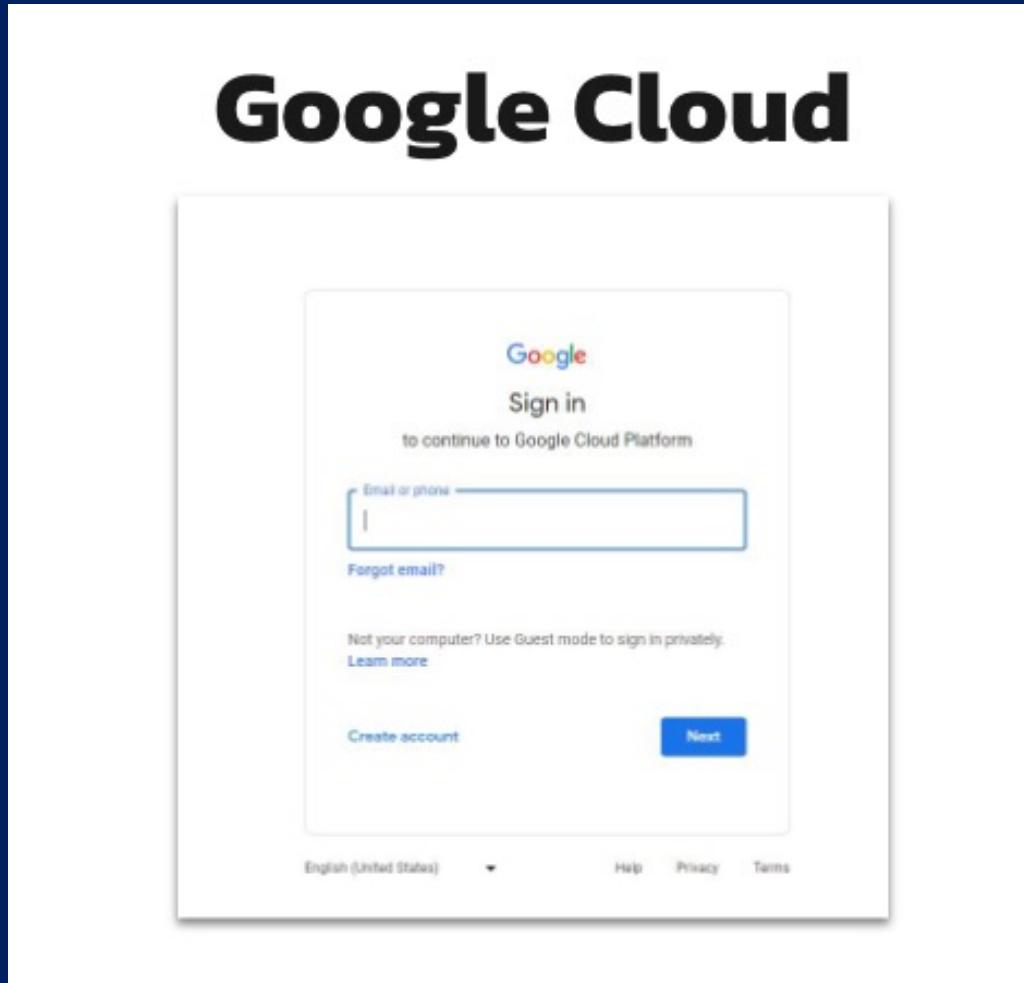
6. **การตั้งค่าโครงการและการใช้งาน**:**

- หลังจากลงทะเบียนเสร็จสิ้น, คุณสามารถเริ่มต้นสร้างโครงการและใช้งานบริการต่าง ๆ ใน Google Cloud.

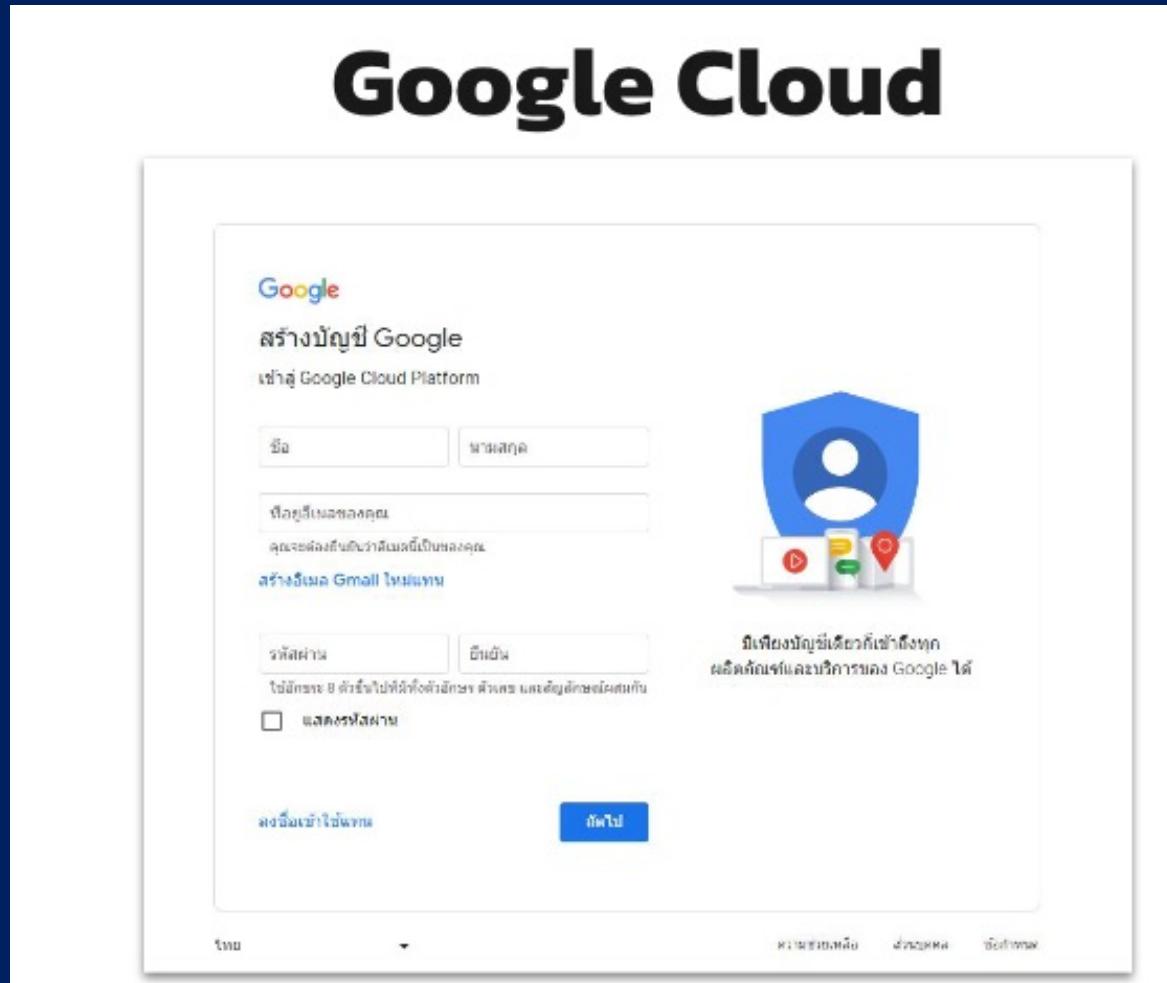
7. **การยืนยันตัวตนและการเริ่มต้นใช้งาน**:**

- Google อาจทำการยืนยันตัวตนผ่านโทรศัพท์หรือข้อความ SMS.
- หลังจากยืนยันแล้ว, คุณสามารถเข้าใช้งาน Google Cloud Console และเริ่มต้นใช้งานได้ทันที.

1



2



3

Google Cloud

Step 1 of 2 Account Information



deedmannew@gmail.com

SWITCH ACCOUNT

Country

What best describes your organization or needs?

Please select
Business idea / startup idea

Terms of Service

I have read and agree to the [Google Cloud Platform Terms of Service](#), [Supplemental Free Trial Terms of Service](#), and the terms of service of [any applicable services and APIs](#).

Required to continue

Email updates

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

CONTINUE

Access to all Cloud Platform Products

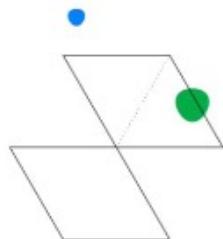
Get everything you need to build and run your apps, websites and services, including Firebase and the Google Maps API.

\$300 credit for free

Put Google Cloud to work with \$300 in credit to spend over the next 90 days.

No autocharge after free trial ends

We ask you for your credit card to make sure you are not a robot. You won't be charged unless you manually upgrade to a paid account.



4

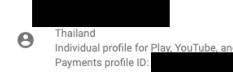
Try Google Cloud for free

Step 2 of 2 Payment Information Verification

Your payment information helps us reduce fraud and abuse. If using a credit or debit card, you won't be charged until you manually activate your account.

Payments profile

Choose the payments profile that will be associated with this account or transaction. A payments profile is shared and used across all Google products.



Payment method

**START FREE**

Access to all Google Cloud products

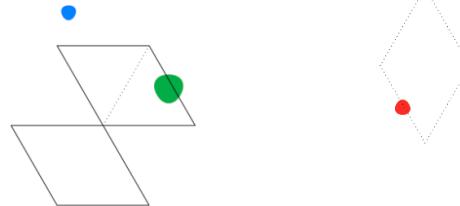
Get everything you need to build and run your apps, websites and services, including Firebase and the Google Maps API.

\$300 credit for free

Put Google Cloud to work with \$300 in credit to spend over the next 90 days.

No autocharge after free trial ends

We ask you for your credit card to make sure you are not a robot. If you use a credit or debit card, you won't be charged unless you manually activate your full account.



Welcome, Tuchsanai [REDACTED]

Try Generative AI Studio - Prompt, tune, and deploy Google's text, image, code, and speech foundation models ↗

Recommended based on your interest in General ▾

Pre-built solution templates ⓘ

Deploy a three-tier web app

Web app, rich media site, ecommerce website, database-backed website

Deploy load balanced managed VMs

Data analysis, data pipeline, application logs, log management, log intelligence

Create a data warehouse with BigQuery

Data warehouse, dashboards, ETL, analytics, data analysis

[View all Solutions](#)

Products

Create a VM

Compute Engine

Train and host ML models

Vertex AI

Create a database

Cloud SQL

Analyze and manage data

BigQuery

Create a storage bucket

Cloud Storage

Run containerized apps

Cloud Run

Create a containerized app

Kubernetes Engine

Embed maps

Google Maps Platform

Convert text to speech

Text-to-Speech API

Convert speech to text

Speech-to-Text API

[View all products](#)

[View all APIs](#)

[Compare with AWS and Azure](#) ↗

Interactive tutorials

Building a custom website with Google...

15 min

Get Started with Generative AI - Prompt...

Get started with Compute Engine

5-60 min

Query a public dataset with the Google Cloud...

5 min

[← Product details](#)

Compute Engine API

[Google Enterprise API](#)

Compute Engine API

[ENABLE](#)[TRY THIS API](#) [OVERVIEW](#)[DOCUMENTATION](#)[SUPPORT](#)

Overview

Creates and runs virtual machines on Google Cloud Platform.

Additional details

Type: [SaaS & APIs](#)

Last updated: 3/24/23

Category: [Compute](#), [Networking](#), [Google Enterprise APIs](#)

Service name: compute.googleapis.com

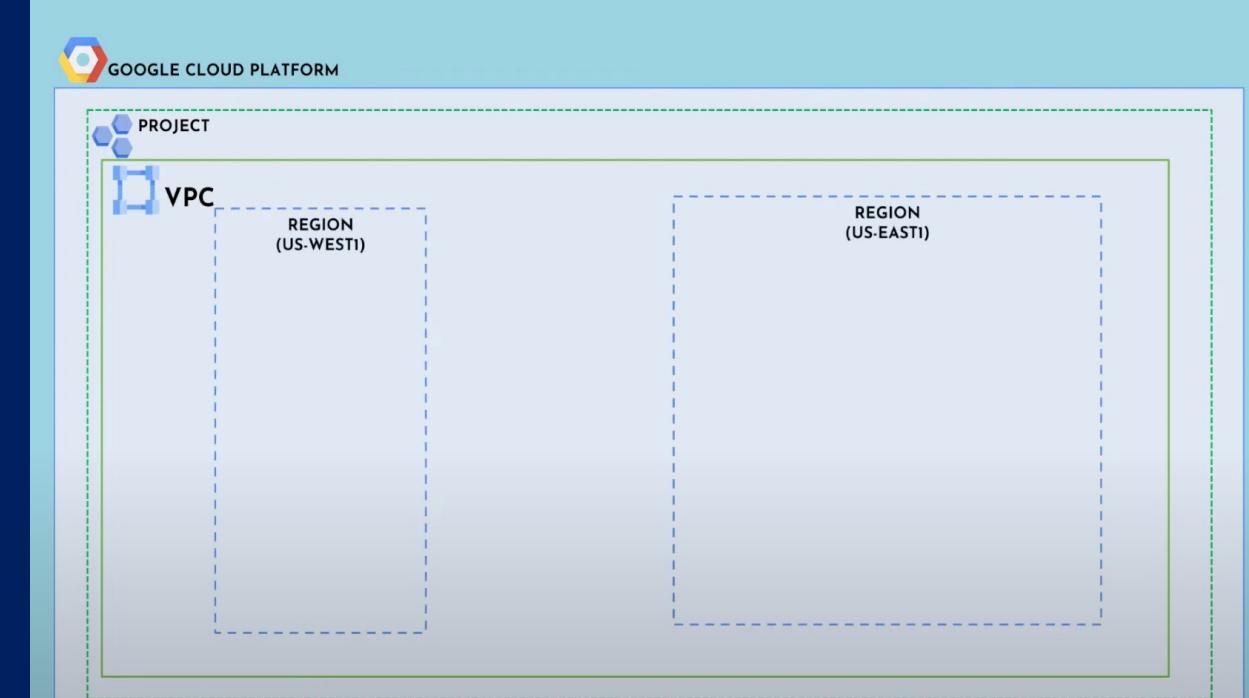
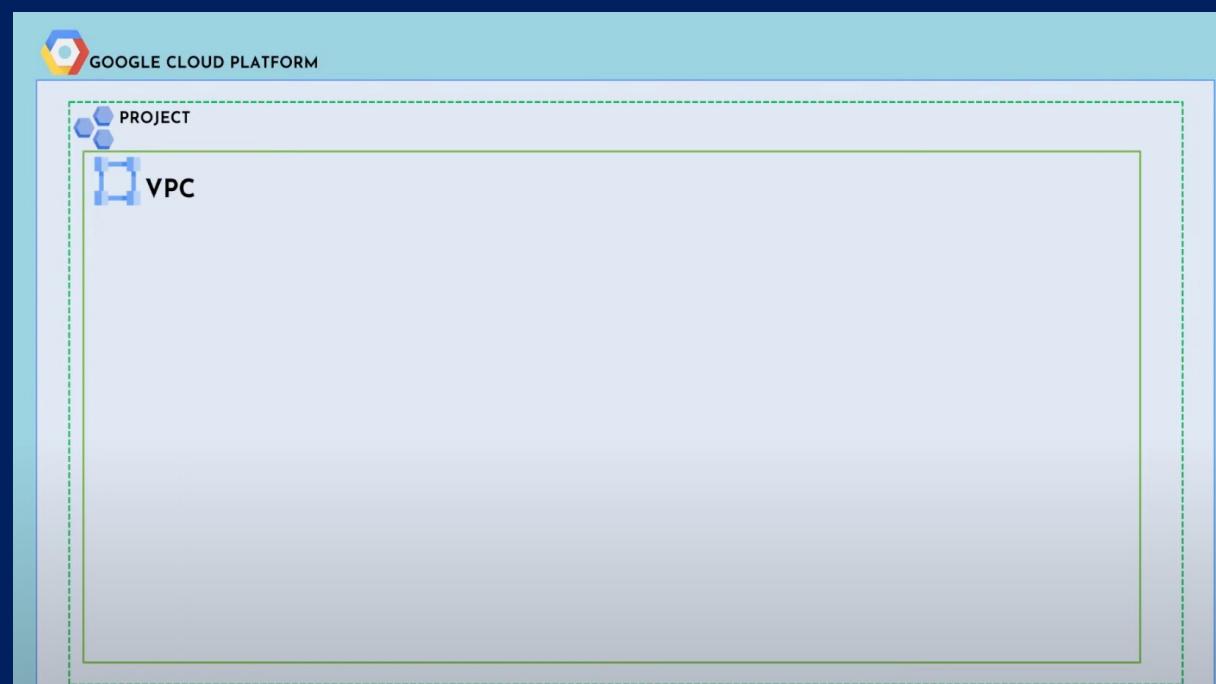
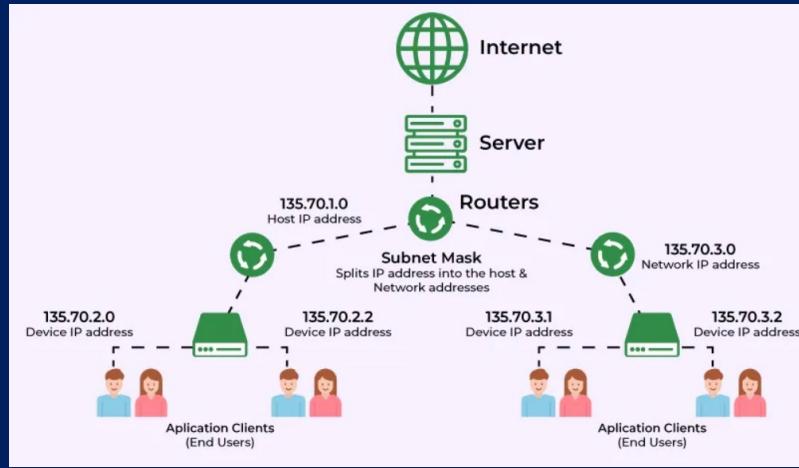
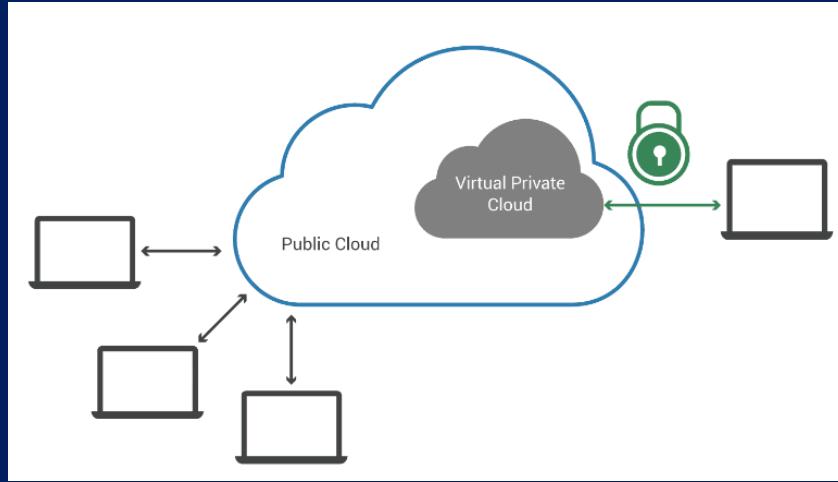
Tutorials and documentation

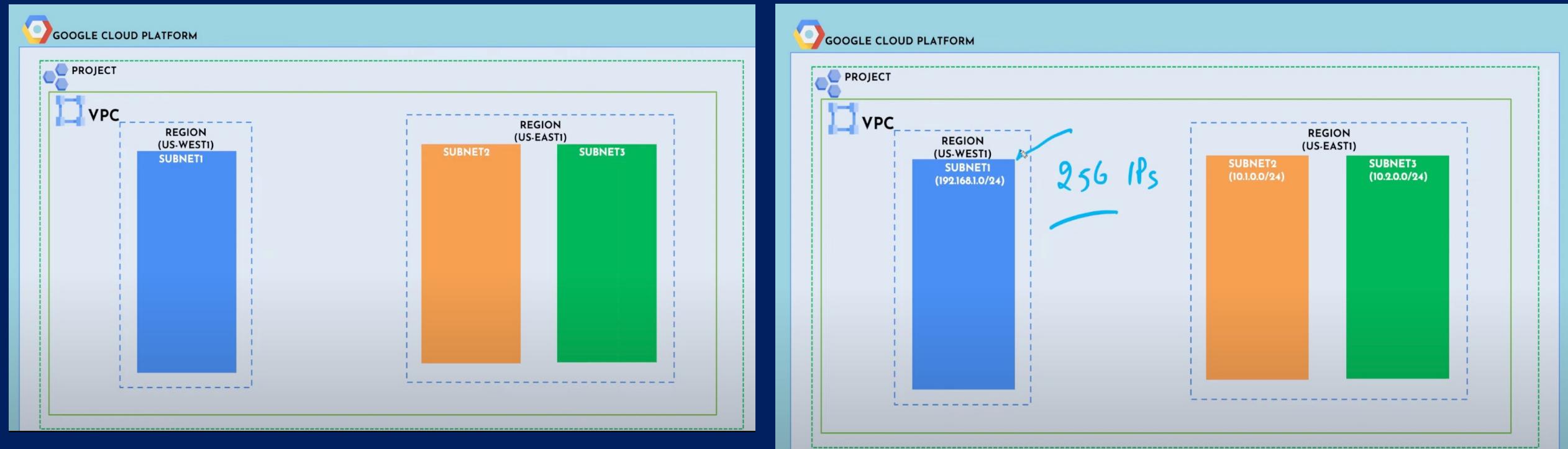
[Learn more](#)

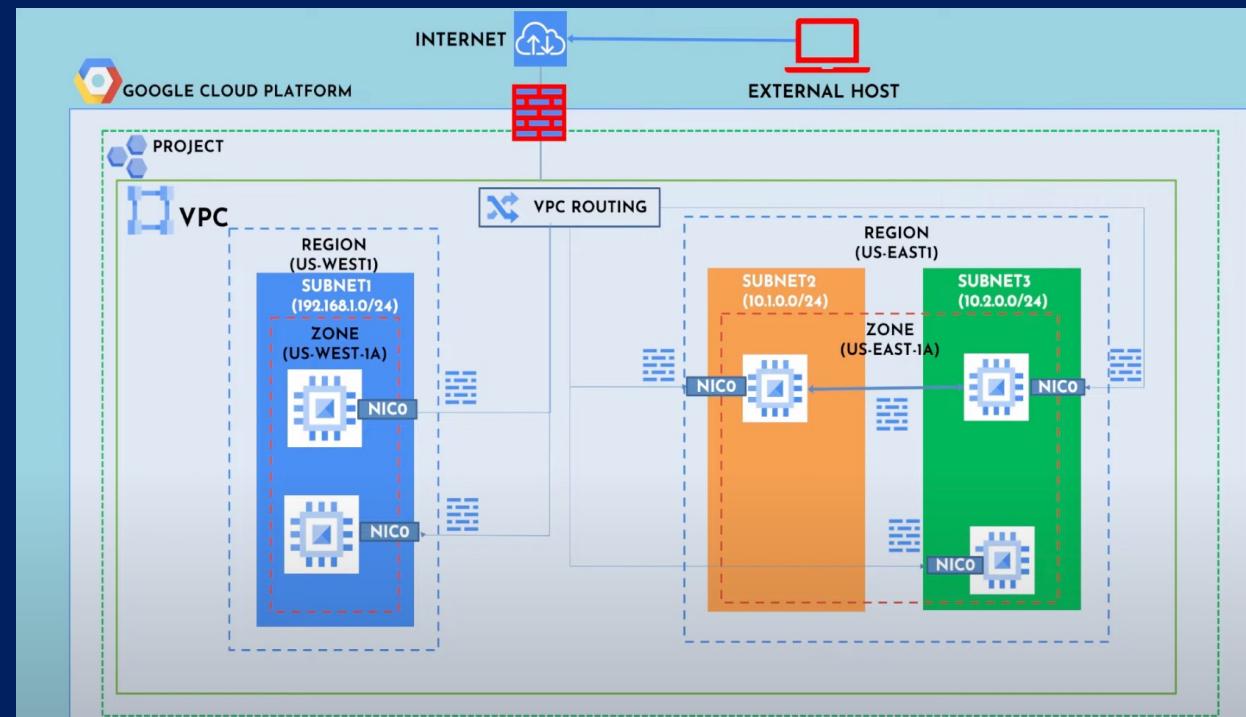
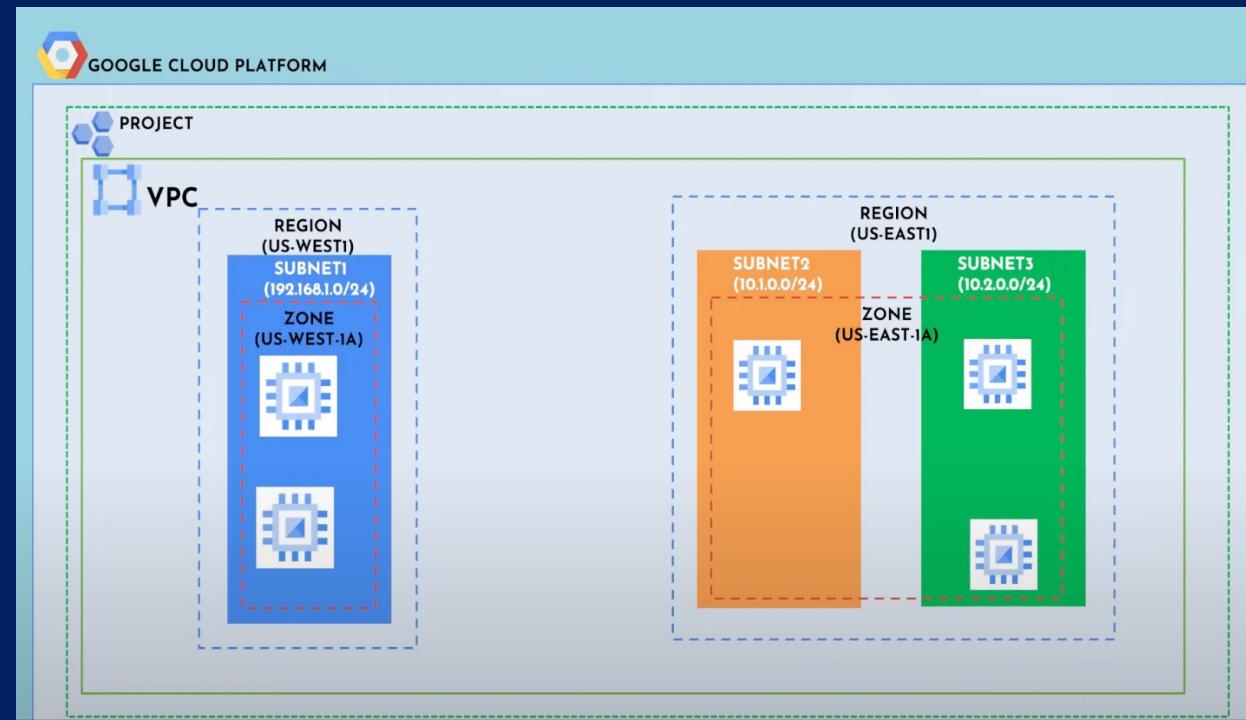
LAB1. Setup Infrastructure

Google Cloud VPC

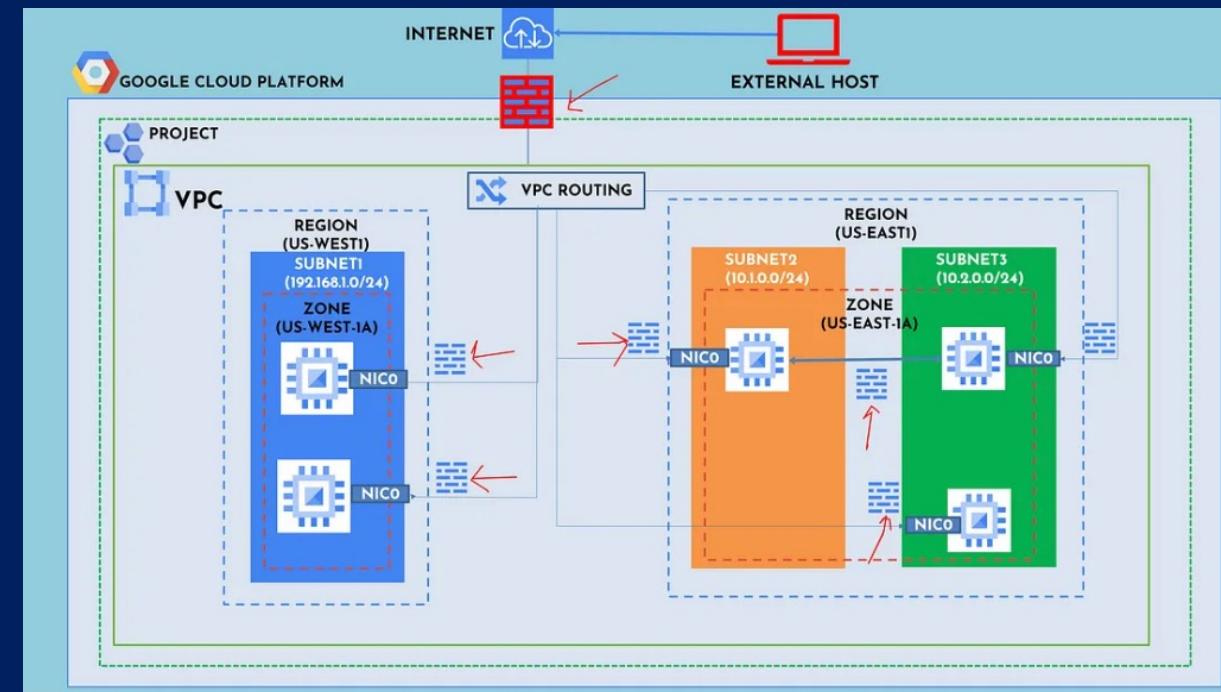
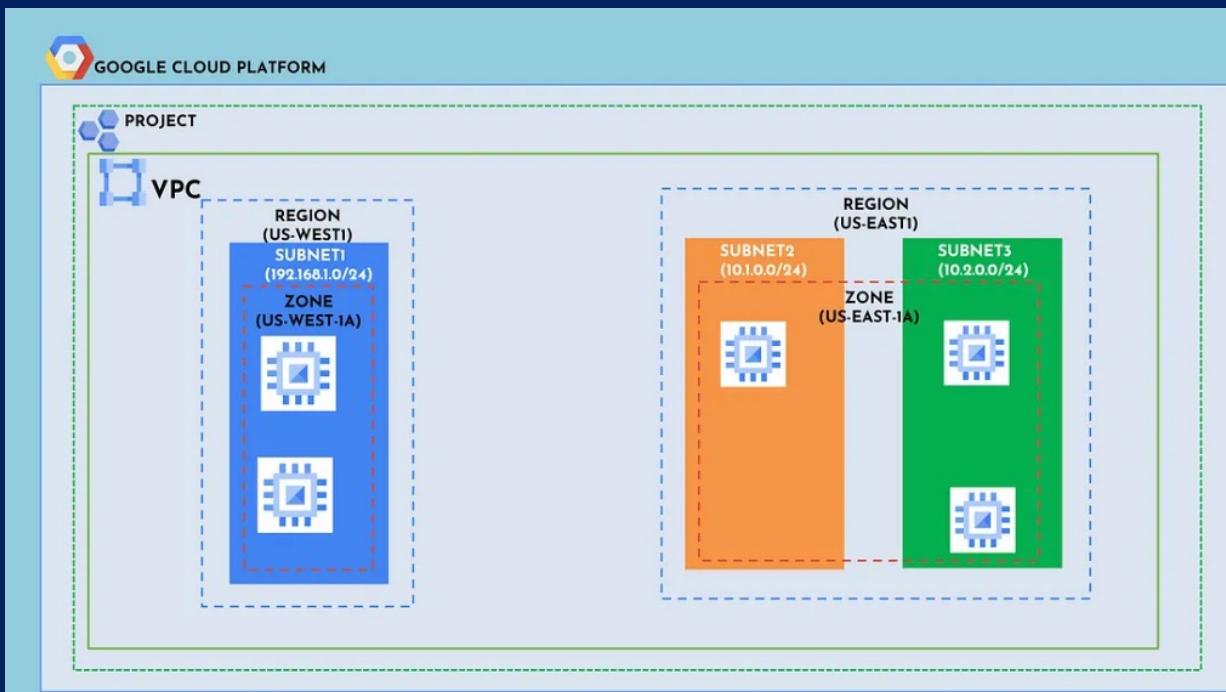
Virtual Private Cloud หรือ尼ยมเรียกย่อๆ ว่า VPC คือระบบเครือข่ายเสมือนที่เป็นส่วนตัวของเราใช้งานเชื่อมต่อสิ่งต่างๆ บน Google Cloud







"NIC0" refers to the network interface controller



asia-southeast1-a	Jurong West, Singapore, APAC	E2, N2, N2D, C3, C3D, T2D, N1, M1, M3, C2, C2D, G2	Intel Ivy Bridge, Sandy Bridge, Haswell, Broadwell, Skylake, Cascade Lake, Ice Lake, Sapphire Rapids, AMD EPYC Rome, AMD EPYC Milan, AMD EPYC Genoa	GPUs
asia-southeast1-b	Jurong West, Singapore, APAC	E2, N2, N2D, C3, C3D, T2D, T2A, N1, M1, M3, C2, C2D, A2, A3, G2	Intel Ivy Bridge, Sandy Bridge, Haswell, Broadwell, Skylake, Cascade Lake, Ice Lake, Sapphire Rapids, AMD EPYC Rome, AMD EPYC Milan, AMD EPYC Genoa, Ampere Altra Arm	GPUs
asia-southeast1-c	Jurong West, Singapore, APAC	E2, N2, N2D, C3, C3D, T2D, T2A, N1, M1, C2, C2D, A2, A3, G2	Intel Ivy Bridge, Sandy Bridge, Haswell, Broadwell, Skylake, Cascade Lake, Ice Lake, Sapphire Rapids, AMD EPYC Rome, AMD EPYC Milan, AMD EPYC Genoa, Ampere Altra Arm	GPUs

<https://cloud.google.com/compute/docs/regions-zones>

Subnet Example /24

Subnet Number	Network Address	Usable IP Range	Broadcast Address	Total Hosts
Subnet 1	192.168.0.0/24	192.168.0.1 - 192.168.0.254	192.168.0.255	254
Subnet 2	192.168.1.0/24	192.168.1.1 - 192.168.1.254	192.168.1.255	254
Subnet 3	192.168.2.0/24	192.168.2.1 - 192.168.2.254	192.168.2.255	254
Subnet 4	192.168.3.0/24	192.168.3.1 - 192.168.3.254	192.168.3.255	254
Subnet 5	192.168.4.0/24	192.168.4.1 - 192.168.4.254	192.168.4.255	254

รวมทั้งหมด, ทั้ง 5 subnet สามารถรองรับได้ประมาณ 1,270 เครื่อง (5×254).

Subnet Example/22

Subnet Number	Network Address	Usable IP Range	Broadcast Address	Total Hosts
Subnet 1	192.168.0.0/22	192.168.0.1 - 192.168.3.254	192.168.3.255	1022
Subnet 2	192.168.4.0/22	192.168.4.1 - 192.168.7.254	192.168.7.255	1022
Subnet 3	192.168.8.0/22	192.168.8.1 - 192.168.11.254	192.168.11.255	1022
Subnet 4	192.168.12.0/22	192.168.12.1 - 192.168.15.254	192.168.15.255	1022
Subnet 5	192.168.16.0/22	192.168.16.1 - 192.168.19.254	192.168.19.255	1022

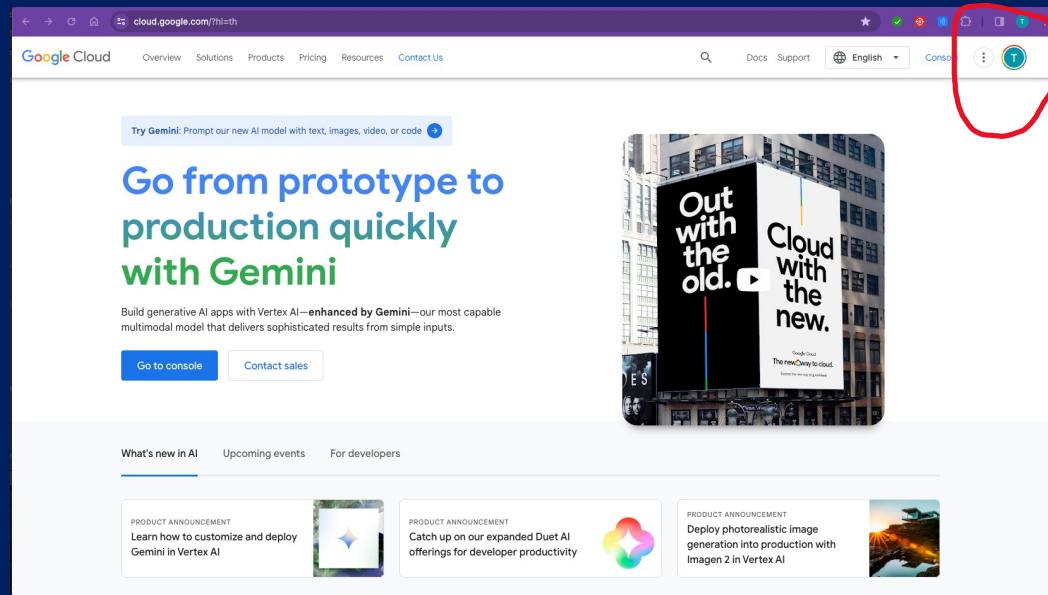
Subnet Example/20

Subnet Number	Network Address	Usable IP Range	Broadcast Address	Total Hosts
Subnet 1	192.168.0.0/20	192.168.0.1 - 192.168.15.254	192.168.15.255	4094
Subnet 2	192.168.16.0/20	192.168.16.1 - 192.168.31.254	192.168.31.255	4094
Subnet 3	192.168.32.0/20	192.168.32.1 - 192.168.47.254	192.168.47.255	4094
Subnet 4	192.168.48.0/20	192.168.48.1 - 192.168.63.254	192.168.63.255	4094
Subnet 5	192.168.64.0/20	192.168.64.1 - 192.168.79.254	192.168.79.255	4094

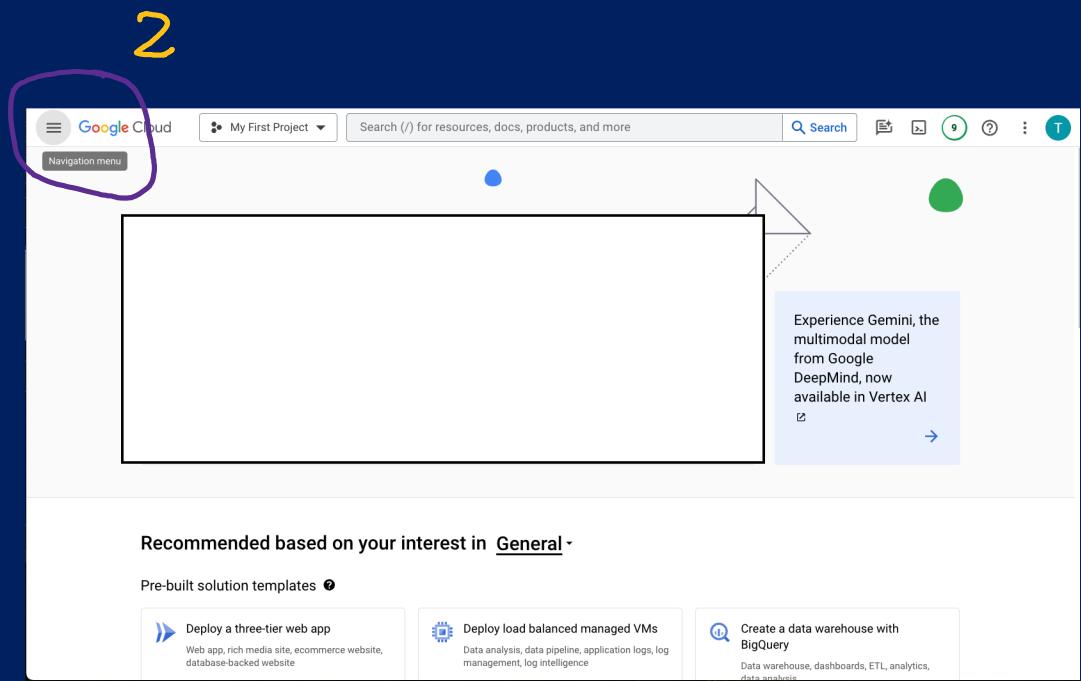
Each subnet has a `/20` mask, which allows for 4094 usable IP addresses (excluding the network and broadcast addresses). [\[x\]](#)

วิธีการสร้าง VPC บน Google Cloud Console

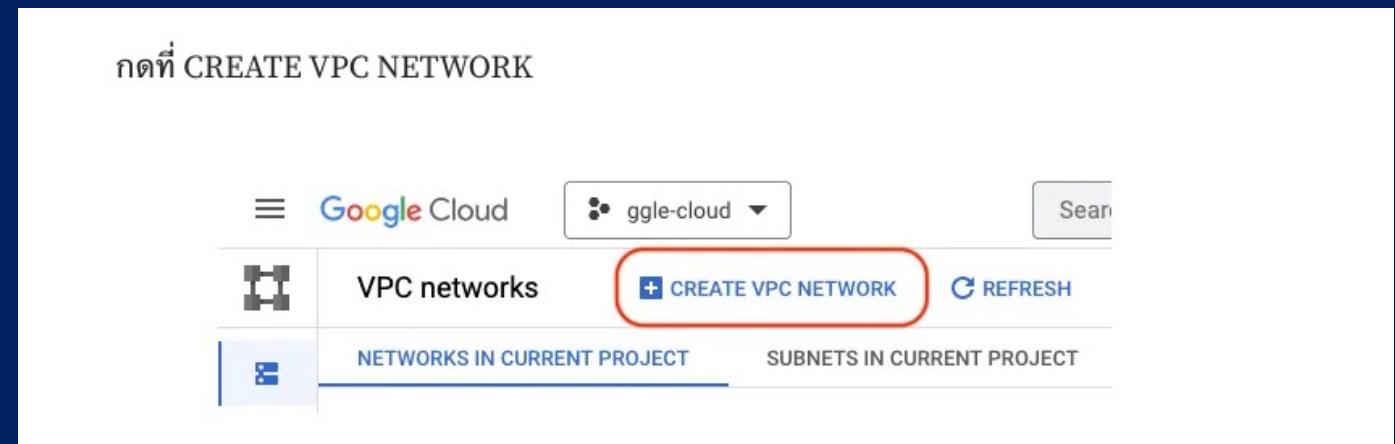
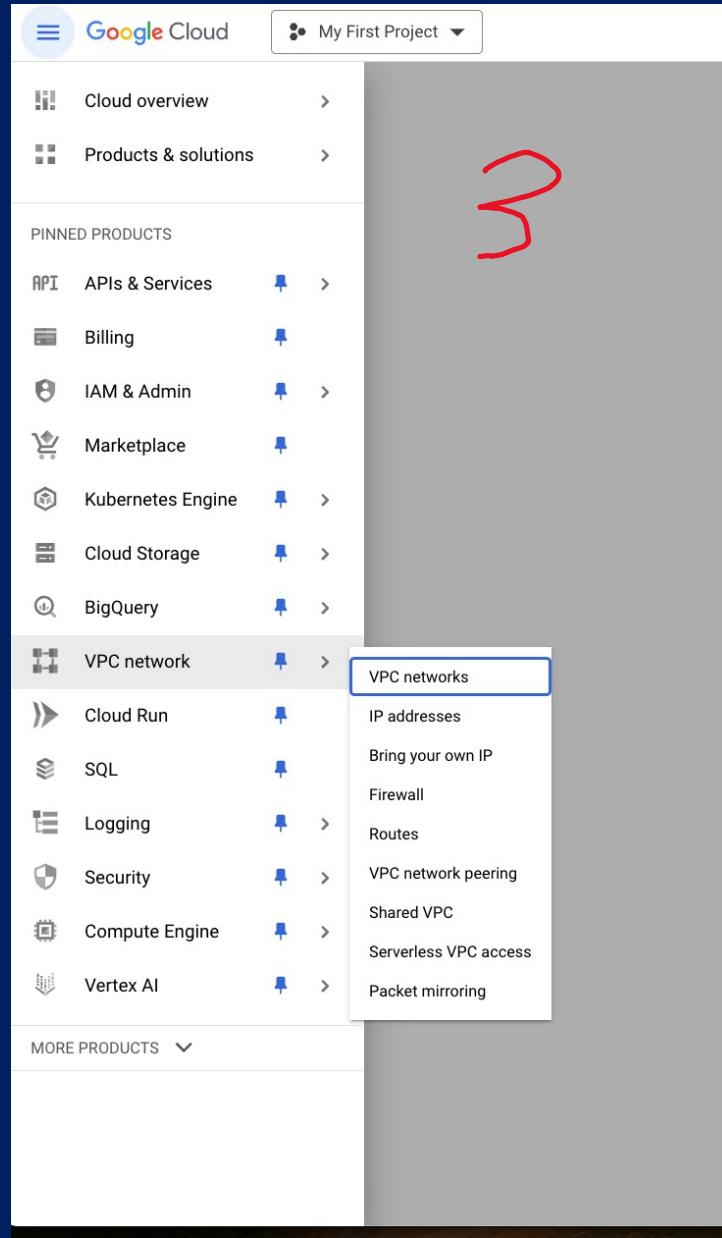
With 2 subnet : public and private



1



2



5

VPC network

VPC networks

Name * mymain-vpc
Lowercase letters, numbers, hyphens allowed

Description

Maximum transmission unit (MTU) 1460

VPC network ULA internal IPv6 range ?
Enabling this feature will assign a /48 from Google-defined ULA prefix fd20::/20.
 Enabled
 Disabled

Subnets

Subnets let you create your own private cloud topology within Google Cloud. Click Automatic to create a subnet in each region, or click Custom to manually define the subnets. [Learn more](#)

Subnet creation mode ?
 Custom
 Automatic

New subnet

Name * my-public
Lowercase letters, numbers, hyphens allowed

Description public networks

Region * asia-south1

IP stack type
 IPv4 (single-stack)
 IPv4 and IPv6 (dual-stack) ?

IPv4 range * 192.168.0.0/24
E.g. 10.0.0.0/24

CREATE SECONDARY IPV4 RANGE

Private Google Access ?
 On
 Off

Flow logs
Turning on VPC flow logs doesn't affect performance, but some systems generate a large number of logs, which can increase costs in Logging. [Learn more](#)

On
 Off

Hybrid subnet ?
 On
 Off

New subnet

Name * my-public
Lowercase letters, numbers, hyphens allowed

Description public networks

Region * asia-south1

IP stack type

IPv4 (single-stack)
 IPv4 and IPv6 (dual-stack) ?

IPv4 range * 192.168.0.0/24
E.g. 10.0.0.0/24

CREATE SECONDARY IPV4 RANGE

Private Google Access ?
 On
 Off

Flow logs
Turning on VPC flow logs doesn't affect performance, but some systems generate a large number of logs, which can increase costs in Logging. [Learn more](#) ?

On
 Off

Hybrid subnet ?
 On
 Off

ADD SUBNET

DONE



New subnet

Name * my-private
Lowercase letters, numbers, hyphens allowed

Description private networks

Region * asia-south1

IP stack type

IPv4 (single-stack)
 IPv4 and IPv6 (dual-stack) ?

IPv4 range * 192.168.1.0/24
E.g. 10.0.0.0/24

CREATE SECONDARY IPV4 RANGE

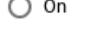
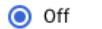
Private Google Access ?
 On
 Off

Flow logs
Turning on VPC flow logs doesn't affect performance, but some systems generate a large number of logs, which can increase costs in Logging. [Learn more](#) ?

On
 Off

Hybrid subnet ?
 On
 Off

DONE



Firewall rules 

Select any of the firewall rules below that you would like to apply to this VPC network. Once the VPC network is created, you can manage all firewall rules on the Firewall rules page.

	Name	Type	Targets	Filters	Protocols / ports	Action	Priority	EDIT
<input type="checkbox"/>	mymain-vpc-allow-custom 	Ingress	Apply to all	IP ranges: 192.168.0.0/24 192.168.1.0/24	all	Allow	65,534	EDIT
<input type="checkbox"/>	mymain-vpc-allow-icmp 	Ingress	Apply to all	IP ranges: 0.0.0.0/0	icmp	Allow	65,534	
<input type="checkbox"/>	mymain-vpc-allow-rdp 	Ingress	Apply to all	IP ranges: 0.0.0.0/0	tcp:3389	Allow	65,534	
<input type="checkbox"/>	mymain-vpc-allow-ssh 	Ingress	Apply to all	IP ranges: 0.0.0.0/0	tcp:22	Allow	65,534	
	mymain-vpc-deny-all-ingress 	Ingress	Apply to all	IP ranges: 0.0.0.0/0	all	Deny	65,535	
	mymain-vpc-allow-all-egress 	Egress	Apply to all	IP ranges: 0.0.0.0/0	all	Allow	65,535	

Dynamic routing mode 

Regional
Cloud Routers will learn routes only in the region in which they were created

Global
Global routing lets you dynamically learn routes to and from all regions with a single VPN or interconnect and Cloud Router

DNS server policy  

[CREATE](#) [CANCEL](#)

VPC network

[+ CREATE VPC NETWORK](#) [REFRESH](#)

NETWORKS IN CURRENT PROJECT **SUBNETS IN CURRENT PROJECT**



Get started with real-time analytics
Use Network Intelligence Center for comprehensive monitoring and troubleshooting. [Learn more](#)

-  Visualize your network resources
-  Diagnose and prevent connectivity issues
-  View packet loss and latency metrics
-  Keep your firewall rules strict and efficient

[TRY NOW](#) [REMIND ME LATER](#)

SMTP port 25 disallowed in this project. [Learn more](#)

VPC networks

Filter Enter property name or value

Name	Subnets	MTU	Mode	Internal IP ranges	Gateways	Firewall rules	Global dynamic routing
default	42	1460	Auto			9	Off
mymain-vpc	2	1460	Custom			0	Off

LAB2. How Creating your first instance (virtual machine) in Google Cloud Platform (GCP)

The screenshot shows the Google Cloud homepage at cloud.google.com/?hl=th. The top navigation bar includes links for Overview, Solutions, Products, Pricing, Resources, and Contact Us. On the right side of the bar, there are icons for Docs, Support, a language dropdown set to English, a Console link, and a user profile icon. A red circle highlights the user profile icon, and a red arrow points upwards towards the top right corner of the page.

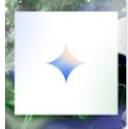
Try Gemini: Prompt our new AI model with text, images, video, or code →

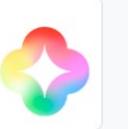
Go from prototype to production quickly with Gemini

Build generative AI apps with Vertex AI—enhanced by Gemini—our most capable multimodal model that delivers sophisticated results from simple inputs.

[Go to console](#) [Contact sales](#)

What's new in AI Upcoming events For developers

PRODUCT ANNOUNCEMENT
Learn how to customize and deploy Gemini in Vertex AI 

PRODUCT ANNOUNCEMENT
Catch up on our expanded Duet AI offerings for developer productivity 

PRODUCT ANNOUNCEMENT
Deploy photorealistic image generation into production with Imagen 2 in Vertex AI 

2

The screenshot shows the Google Cloud Platform homepage. At the top, there is a navigation bar with the Google Cloud logo, a dropdown for 'My First Project', a search bar, and various icons for notifications and account management. A purple circle highlights the 'Navigation menu' button. Below the navigation bar is a large, empty white box outlined in black. To the right of this box is a light blue callout box containing text about Gemini and a blue arrow icon. The text reads: 'Experience Gemini, the multimodal model from Google DeepMind, now available in Vertex AI'. At the bottom of the page, there is a section titled 'Recommended based on your interest in General' with a dropdown arrow. Below this, there is a heading 'Pre-built solution templates' with a question mark icon. Three cards are listed under this heading:

- Deploy a three-tier web app**
Web app, rich media site, ecommerce website, database-backed website
- Deploy load balanced managed VMs**
Data analysis, data pipeline, application logs, log management, log intelligence
- Create a data warehouse with BigQuery**
Data warehouse, dashboards, ETL, analytics, data analysis

3

4

The screenshot shows the Google Cloud Platform dashboard. A red number '3' is on the left, pointing to the 'Compute Engine' menu item in the main navigation bar. A red number '4' is at the top center, pointing to the 'VM instances' option in the 'Virtual Machines' dropdown menu. The 'Compute Engine' menu is open, displaying options like VM instances, Instance templates, Sole-tenant nodes, Machine images, TPUs, Committed use discounts, Reservations, Migrate to Virtual Machines, STORAGE, Disks, Snapshots, Images, Async Replication, INSTANCE GROUPS, Instance groups, Health checks, and VM MANAGER. At the bottom of the Compute Engine menu, there are two buttons: 'Deploy load balanced managed VMs' and 'Create a data warehouse with BigQuery'. The main dashboard area shows a project summary for 'My First Project' with number 603981601739 and ID acquired-router-406202, along with links to Add people to your project, Set up budget alerts, and Review product spend. A promotional banner for Gemini is also visible.

Google Cloud

VIRTUAL MACHINES

VM instances

Instance templates

Sole-tenant nodes

Machine images

TPUs

Committed use discounts

Reservations

Migrate to Virtual Machines

STORAGE

Disks

Snapshots

Images

Async Replication

INSTANCE GROUPS

Instance groups

Health checks

VM MANAGER

Deploy load balanced managed VMs

Create a data warehouse with BigQuery

Search

9

You're working on project [My First Project](#)

Number: 603981601739 ID: acquired-router-406202

Add people to your project

Set up budget alerts

Review product spend

Experience Gemini, the multimodal model from Google DeepMind, now available in Vertex AI

→

console.cloud.google.com/compute/instances?hl=th&project=acquired-router-406202

Google Cloud My First Project Search (/) for resources, docs, products, and more

Compute Engine VM instances CREATE INSTANCE IMPORT VM REFRESH

Virtual machines VM instances INSTANCE OBSERVABILITY INSTANCE SCHEDULES

VM instances Filter Enter property name or value

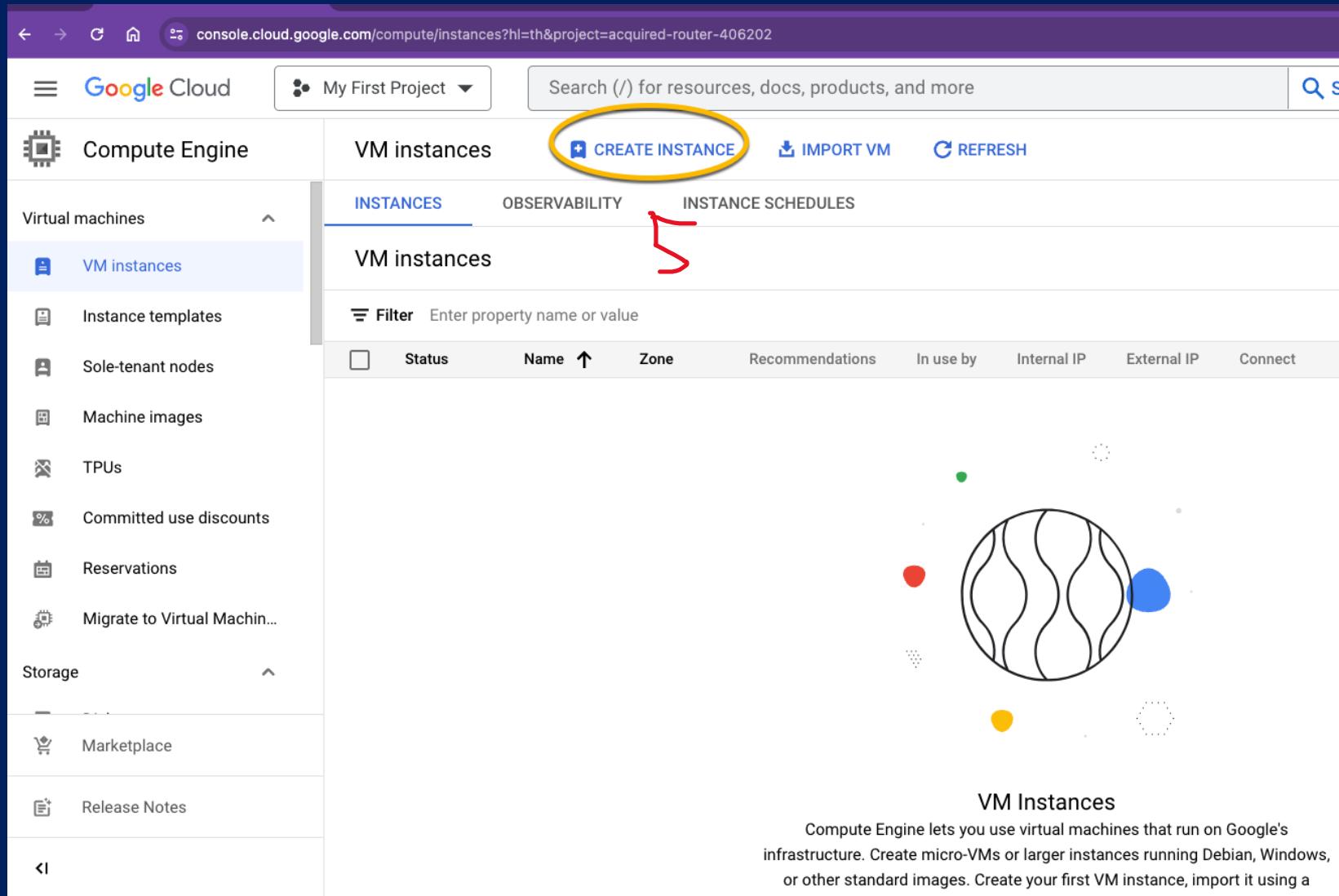
Status Name ↑ Zone Recommendations In use by Internal IP External IP Connect

TPUs Committed use discounts Reservations Migrate to Virtual Machin...

Storage Marketplace Release Notes

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



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-1

6

MANAGE TAGS AND LABELS

Region * asia-southeast1 (Singapore)

Zone * asia-southeast1-b

Region is permanent

Zone is permanent

Machine configuration

General purpose Compute optimized Memory optimized GPUs

Machine types for common workloads, optimized for cost and flexibility

Series	Description	vCPUs	Memory
<input type="radio"/> C3	Consistently high performance	4 - 176	8 - 1,408 GB
<input type="radio"/> C3D	Consistently high performance	4 - 360	8 - 2,880 GB
<input checked="" type="radio"/> E2	Low cost, day-to-day computing	0.25 - 32	1 - 128 GB
<input type="radio"/> N2	Balanced price & performance	2 - 128	2 - 864 GB
<input type="radio"/> N2D	Balanced price & performance	2 - 224	2 - 896 GB
<input type="radio"/> T2			

Monthly estimate

\$30.61

That's about \$0.04 hourly

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

Item	Monthly estimate
2 vCPU + 4 GB memory	\$30.17
10 GB standard persistent disk	\$0.44
Total	\$30.61

[Compute Engine pricing](#)

[LESS](#)

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

DEPLOY CONTAINER

Boot disk

Name	instance-1
Type	New standard persistent disk
Size	10 GB
License type	Free
Image	<input checked="" type="radio"/> Ubuntu 23.10

[CHANGE](#)

!!Selected Ubuntu

Identity and API access

Service accounts

Service account

Compute Engine default service account

Requires the Service Account User role (roles/iam.serviceAccountUser) to be set for users who want to access VMs with this service account. [Learn more](#)

Access scopes

Allow default access

[CREATE](#)

[CANCEL](#)

[EQUIVALENT CODE](#)

[EQUIVALENT CODE](#)

Monthly estimate

\$30.61

That's about \$0.04 hourly

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

Item	Monthly estimate
2 vCPU + 4 GB memory	\$30.17
10 GB standard persistent disk	\$0.44
Total	\$30.61

[Compute Engine pricing](#)

[LESS](#)

8

9

Google Cloud My First Project Search (/) for resources, docs, products, and more Search 10 ? T

Compute Engine VM instances CREATE INSTANCE IMPORT VM REFRESH LEARN

Virtual machines VM instances INSTANCE OBSERVABILITY INSTANCE SCHEDULES

VM instances Filter Enter property name or value

Status	Name ↑	Zone	Recommendations	In use by	Internal IP
<input type="checkbox"/>	instance-1	asia-southeast1-b			10.148.0.12 (nic0)

External IP Connect SSH ...

Related actions

Explore Backup and DR NEW View billing report Monitor VMs

Reservations Migrate to Virtual Machine... Storage Marketplace Release Notes

Explore VM logs Set up firewall rules Patch management

Load balance between VMs

Complete !

```
* Support:      https://ubuntu.com/advantage

System information as of Fri Dec 22 05:29:36 UTC 2023

System load: 0.16          Processes:        99
Usage of /: 21.0% of 8.65GB  Users logged in:   0
Memory usage: 6%           IPv4 address for ens4: 10.148.0.12
Swap usage:  0%

0 updates can be applied immediately.

The list of available updates is more than a week old.
To check for new updates run: sudo apt update

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.

tuchsanai@instance-1:~$
```

LAB3.How to create an SSH key for Google Cloud Platform (GCP)

Google Cloud My First Project Search (/) for resources, docs, products, and more Search 10 ? :

Compute Engine VM instances CREATE INSTANCE IMPORT VM REFRESH

Virtual machines VM instances Instance templates Sole-tenant nodes Machine images TPUs Committed use discounts Reservations Migrate to Virtual Machines Storage Disks Snapshots Images Marketplace Release Notes

INSTANCES OBSERVABILITY INSTANCE SCHEDULES

VM instances Filter Enter property name or value

Status	Name ↑	Zone	Recommendations	In use by	Internal IP	External IP	Connect
<input type="checkbox"/>	<input checked="" type="checkbox"/> instance-1	asia-southeast1-b			10.148.0.12 (nic0)	34.87.132.139 (nic0)	SSH

Related actions

1

- Explore Backup and DR NEW Back up your VMs and set up disaster recovery
- View billing report View and manage your Compute Engine billing
- Monitor VMs View outlier VMs across metrics like CPU and network
- Explore VM logs View, search, analyze, and download VM instance logs
- Set up firewall rules Control traffic to and from a VM instance
- Patch management Schedule patch updates and view patch compliance on VM instances
- Load balance between VMs Set up Load Balancing for your applications as your traffic and users grow

<https://console.cloud.google.com/compute/instancesDetail/zones/asia-southeast1-b/instances/instance-1?hl=th&project=acquired-router-406202>

2

Compute Engine

Virtual machines

- VM instances
- Instance templates
- Sole-tenant nodes
- Machine images
- TPUs
- Committed use discounts
- Reservations
- Migrate to Virtual Machin...

Storage

- Disks
- Snapshots
- Images
- Asvnc Replication
- Marketplace
- Release Notes

instance-1

EDIT (highlighted with a red box)

RESET

CREATE MACHINE IMAGE

OPERATIONS

DETAILS OBSERVABILITY OS INFO SCREENSHOT

SSH

CONNECT TO SERIAL CONSOLE

Connecting to serial ports is disabled

Logs

Logging

Serial port 1 (console)

SHOW MORE

Basic information

Name	instance-1
Instance Id	8857471466672270006
Description	None
Type	Instance
Status	Running
Creation time	Dec 22, 2023, 11:45:14 AM UTC+07:00
Zone	asia-southeast1-b
Instance template	None
In use by	None
Reservations	Automatically choose
Labels	None
Tags	-
Deletion protection	Disabled



Compute Engine

Edit instance-1 instance

Virtual machines

VM instances

Instance templates

Sole-tenant nodes

Machine images

TPUs

Committed use discounts

Reservations

Migrate to Virtual Machin...

Storage

Disks

Snapshots

Images

Asvnc Replication

Marketplace

Release Notes

Shielded VM ?

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](#)

+ ADD ITEM

Identity and API access ?

Service accounts ?

You must stop the VM instance to edit its service account

Service account

Compute Engine default service account



Requires the Service Account User role (`roles/iam.serviceAccountUser`) to be set for users

who want to access VMs with this service account. [Learn more](#)

Access scopes ?

You must stop the VM instance to edit its API access scopes



SAVE

CANCEL

3

4

Google Cloud My First Project Search (/) for resources, docs, products, and more

Compute Engine Edit instance-1 instance

Virtual machines

- VM instances
- Instance templates
- Sole-tenant nodes
- Machine images
- TPUs
- Committed use discounts
- Reservations
- Migrate to Virtual Machin...

Storage

- Disks
- Snapshots
- Images
- Sync Replication
- Marketplace
- Release Notes

Shielded VM

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 *

Enter public SSH key

+ ADD ITEM

Identity and API access

Service accounts

You must stop the VM instance to edit its service account

Service account: Compute Engine default service account

Requires the Service Account User role (roles/iam.serviceAccountUser) to be set for users

SAVE CANCEL

5

To create an SSH key for Google Cloud Platform (GCP) with the username "username" and save it in the current directory with the filename `mykey`, you can follow these steps:

Step 1: Generate the SSH Key Pair

1. **Open a Terminal:** On your local machine, open a terminal window.
2. **Navigate to the Desired Directory:** Use the `cd` command to navigate to the directory where you want to save the key. If you're already in the desired directory, you can skip this step.
3. **Generate the SSH Key Pair:** Use the `ssh-keygen` command to generate a new SSH key pair. The key will be saved in the current directory with the name `mykey`. Run the following command:

```
mkdir mykey  
cd mykey  
  
ssh-keygen -t rsa -b 2048 -C "tuchsanai" -f tuchsanai_gcp_key
```

- `-t rsa` : Specifies the type of key to create, in this case, RSA.
- `-b 2048` : Specifies the number of bits in the key, in this case, 2048 bits.
- `-C "username"` : Adds a comment to the key, here it is the username.
- `-f tuchsanai_gcp_key` : Specifies the filename and path of the key file.

4. **Set a Password (Optional):** You'll be prompted to enter a passphrase for additional security. This step is optional but recommended.

Step 2: Add the Public Key to GCP

1. **Locate the Public Key:** The command above creates two files in the current directory: `mykey` (private key) and `mykey.pub` (public key). You need to upload the public key to GCP.

2. **Copy the Public Key:** Display and copy the contents of the public key file by using the command:

```
cat ./username.pub
```

3. **Log in to GCP Console:** Go to your GCP console in a web browser.
4. **Navigate to SSH Keys Section:** Go to the "Compute Engine" section, then to "Metadata", and find the "SSH Keys" tab.
5. **Add the SSH Key:** Paste the copied public key into the SSH keys section and save the changes.

Step 3: Connect to a GCP Instance

1. **Find the External IP of Your Instance:** In the GCP console, go to the "VM instances" page and find the external IP address of the instance you want to connect to.
2. **Connect via SSH:** Use the SSH command to connect to the instance. Replace `[EXTERNAL_IP]` with the actual IP address:

```
ssh -i username.private username@[EXTERNAL_IP]  
  
◦ -i username.private : Specifies the private key file for authentication.  
◦ username@[EXTERNAL_IP] : The username and IP address of the GCP instance.
```

Following these steps, you should be able to generate an SSH key in your specified directory and use it to connect to your GCP instances securely. Remember to keep the private key (`mykey`) secure and private.

https://github.com/Tuchsanai/DevTools/tree/main/Docker/Google%20Cloud/Lab01_Create_SSH%20key%20_GCP

```
* Support:      https://ubuntu.com/advantage

System information as of Fri Dec 22 05:29:36 UTC 2023

System load: 0.16          Processes:        99
Usage of /: 21.0% of 8.65GB  Users logged in:   0
Memory usage: 6%           IPv4 address for ens4: 10.148.0.12
Swap usage:  0%

0 updates can be applied immediately.

The list of available updates is more than a week old.
To check for new updates run: sudo apt update

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.

tuchsanai@instance-1:~$
```

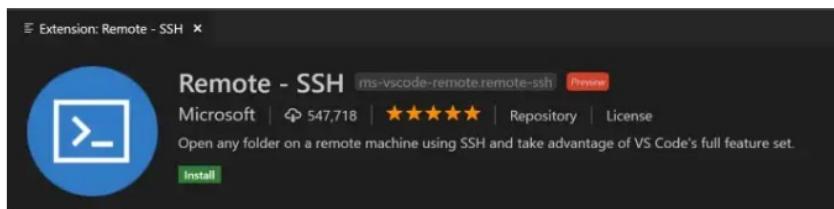
LAB4. Using VSCode remotely on an instance with Firewall

Using VSCode remotely on an EC2 instance

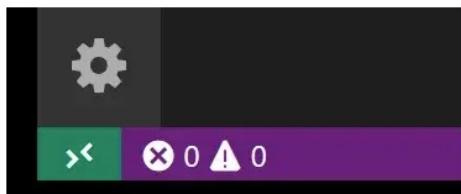
Install the Remote SSH Extension

If you haven't already, download and install VSCode for your OS from [here](#).

You can then search for the extension “Remote-SSH” in the VSCode marketplace.

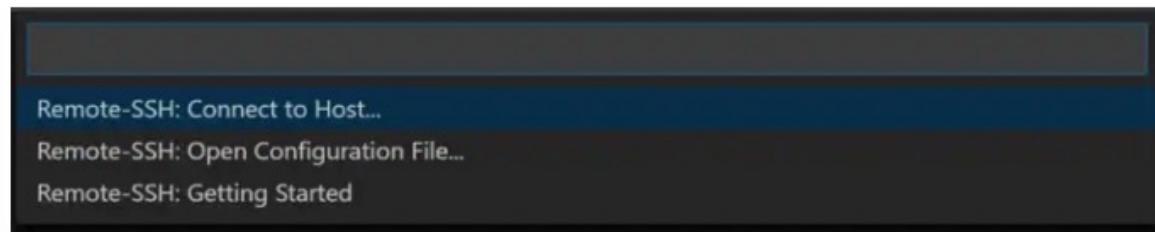


Once Installed, you should see a new Status bar item at the far left.

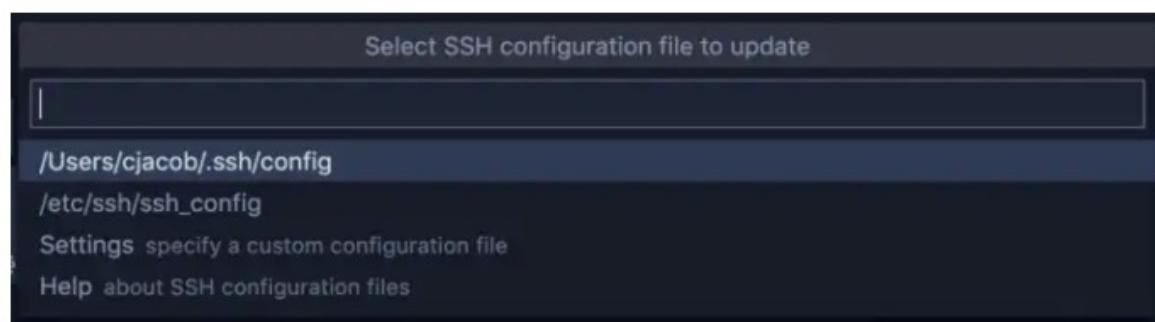


The status item can be used to quickly open the Remote SSH settings. Click on the status item.

The status item can be used to quickly open the Remote SSH settings. Click on the status item.



Open The Configuration file

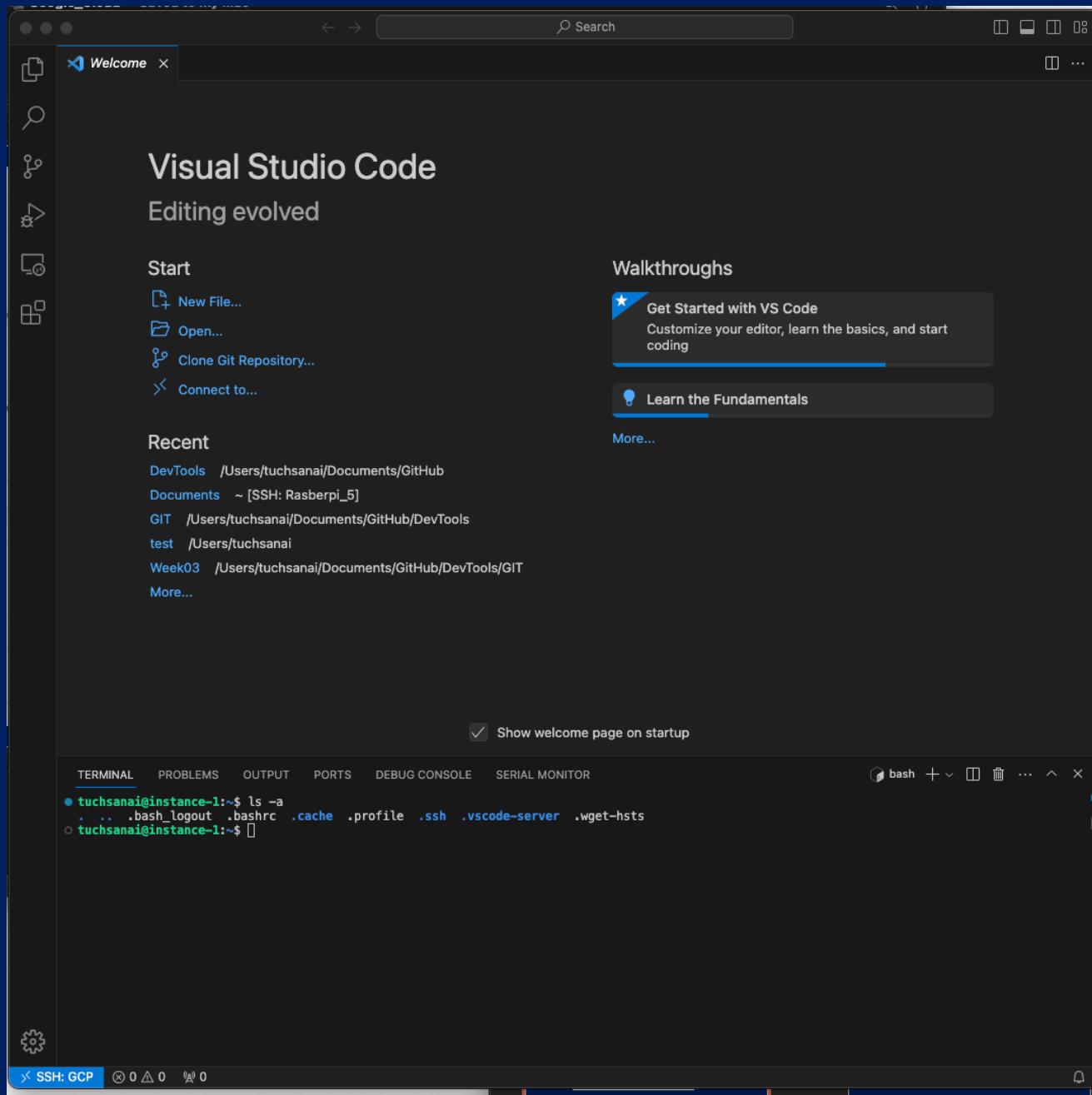


VM instances		CREATE INSTANCE	IMPORT VM	REFRESH				
INSTANCES		OBSERVABILITY	INSTANCE SCHEDULES					
VM instances								
Filter Enter property name or value								
<input type="checkbox"/>	Status	Name	Zone	Recommendations	In use by			
<input type="checkbox"/>		instance-1	asia-southeast1-b		10.148.0.12 (nic0)			
				External IP	Connect			
				34.87.132.139 (nic0)	SSH			

The screenshot shows a terminal window with the following content:

```
readme.md
config
Users > tuchsana / .ssh / config
1 # Read more about SSH config files: https://linux.die.net/man/5/ssh\_config
2
3
4 Host GCP
5   HostName 34.87.132.139
6   User tuchsana
7   IdentityFile /Users//my_gcp_key
8
9
10
11
12
13
14
15
```

The line "Host GCP" and its associated configuration (HostName, User, IdentityFile) are highlighted with a yellow box. The "config" tab in the terminal title bar is also highlighted with a yellow box.



Lab 5. How to Open Port for Cloud Platform (GCP)

The screenshot shows the Google Cloud Compute Engine interface for managing VM instances. On the left, there's a sidebar with categories like Compute Engine, Virtual machines, Storage, Instance groups, and VM Manager. The main area displays a list of VM instances, with one named "instance-2" selected. A context menu is open for this instance, listing actions such as Stop, Suspend, Reset, Delete, View network details (which is circled in purple), Create new machine image, View logs, and View monitoring. A large number "1" is handwritten in purple ink over the menu.

Compute Engine

VM instances [CREATE INSTANCE](#) [IMPORT VM](#) [REFRESH](#)

Virtual machines [VM instances](#) [Instance templates](#) [Sole-tenant nodes](#) [Machine images](#) [TPUs](#) [Committed use discounts](#) [Reservations](#) [Migrate to Virtual Machine](#)

Storage [Disks](#) [Snapshots](#) [Images](#) [Async Replication](#)

Instance groups [Instance groups](#) [Health checks](#)

VM Manager [Patch](#) [OS policies](#)

INSTANCES OBSERVABILITY INSTANCE SCHEDULES

VM instances

Filter Enter property name or value

Status	Name ↑	Zone	Recommendations	In use by	Internal IP	External IP	Connect
<input type="checkbox"/>	<input checked="" type="checkbox"/> instance-2	asia-southeast1-b			192.168.1.2 (nic0)	34.143.159.17 (nic0)	SSH

Related actions

[Explore Backup and DR NEW](#)
Back up your VMs and set up disaster recovery

[View billing report](#)
View and manage your Compute Engine billing

[Monitor VMs](#)
View outlier VMs across metrics like CPU and network

[Explore VM logs](#)
View, search, analyze, and export instance logs

More actions [Resume](#)

Stop
Suspend
Reset
Delete
Create a group based on this VM [PREVIEW](#)

[View network details](#) 1
[Create new machine image](#)
[View logs](#)
[View monitoring](#)

<https://www.youtube.com/watch?v=-RjDWwTZUnc&t=40s>

 VPC network VPC networks IP addresses Bring your own IP Firewall Routes VPC network peering Shared VPC Serverless VPC access Packet mirroring

← Network interface details

Selected network interface: nic0 ▾

Network interface details

Name	Network	Subnetwork	Primary internal IP address	Alias IP ranges	IP stack type	External IP address	Network Service Tier
nic0	myvpc	private	192.168.1.2	—	IPv4	34.143.159.17	Premium

VM instance details

Name	Zone	Network tags	Service account	IP forwarding
instance-2	asia-southeast1-b	http-server, https-server	603981601739-compute@developer.gserviceaccount.com	Off

Firewall and routes details

[FIREWALLS](#) [ROUTES](#) Filter Enter property name or value

Name	Enforcement order ↑	Type	Deployment scope	Rule priority	Targets	Source	Destination
vpc-firewall-rules	1	VPC firewall rules	Global				

Network analysis

[CONNECTIVITY TESTS](#)

Enable Network Management API

Connectivity test requires Network Management API. This is a one-time enablement per project and may take a few minutes to complete.

[ENABLE API](#)

Network Security

- Secure Web Proxy
- Cloud Armor
 - Cloud Armor policies
 - Adaptive Protection
 - Managed Protection
- Cloud IDS
 - IDS Dashboard
 - IDS Endpoints
 - IDS Threats
- Cloud Firewall
 - Firewall policies
 - Threats PREVIEW
 - Firewall endpoints PREVIEW
- Common components
 - Security profiles PREVIEW
 - SSL policies

Firewall policies [+ CREATE FIREWALL POLICY](#)

VPC firewall rules

Firewall rules control incoming or outgoing traffic to an instance. By default, incoming traffic from outside your network is blocked. [Learn more](#)

Note: App Engine firewalls are managed in the [App Engine Firewall rules section](#).

i SMTP port 25 disallowed in this project. [Learn more](#)

[REFRESH](#) [CONFIGURE LOGS](#) [DELETE](#)

[Filter](#) Enter property name or value

<input type="checkbox"/>	Name	Type	Targets	Filters	Protocols / ports
<input type="checkbox"/>	default-allow-health-check	Ingress	lb-health-ch	IP ranges: 35.191.0.0/1	tcp
<input type="checkbox"/>	default-allow-health-check-ipv6	Ingress	lb-health-ch	IP ranges: 2600:1901:8	tcp
<input type="checkbox"/>	default-allow-http	Ingress	http-server	IP ranges: 0.0.0.0/0	tcp:80
<input type="checkbox"/>	default-	Ingress	https-server	IP ranges: 0.0.0.0/0	tcp:443

3

Network Security

Create a firewall rule

Secure Web Proxy

Cloud Armor

Cloud Armor policies

Adaptive Protection

Managed Protection

Cloud IDS

IDS Dashboard

IDS Endpoints

IDS Threats

Cloud Firewall

Firewall policies

Threats PREVIEW

Firewall endpoints PREVIEW

Common components

Security profiles PREVIEW

SSL policies

Client Authentication

Name *

my-custom-firewalls



Lowercase letters, numbers, hyphens allowed

Description

My define Firewall

Logs

Turning on firewall logs can generate a large number of logs which can increase costs in Logging. [Learn more](#) On Off

Network *

default



Priority *

10000

CHECK PRIORITY OF OTHER FIREWALL RULES



Priority can be 0 - 65535

Direction of traffic

 Ingress Egress

Action on match

 Allow Deny

Targets

All instances in the network



Source filter

IPv4 ranges



Source IPv4 ranges *

0.0.0.0/0



Second source filter

None



4

5

Network Security

Create a firewall rule

Deny

Targets

All instances in the network



Source filter

IPv4 ranges



Source IPv4 ranges *

0.0.0.0/0



Second source filter

None



Destination filter

None



Protocols and ports

 Allow all Specified protocols and ports TCP

Ports

8080-8095

E.g. 20, 50-60

 UDP

Ports

E.g. all

 Other

Protocols

Separate multiple protocols by commas, e.g. ah, sctp

DISABLE RULE

CREATE

CANCEL

EQUIVALENT COMMAND LINE

6

Google Cloud My First Project Search (/) for resources, docs, products, and more Search

Network Security Firewall policies + CREATE FIREWALL POLICY + CREATE FIREWALL RULE

Note: App Engine firewalls are managed in the [App Engine Firewall rules section](#).

SMTP port 25 disallowed in this project. [Learn more](#)

REFRESH CONFIGURE LOGS DELETE

Filter Enter property name or value

<input type="checkbox"/>	Name	Type	Targets	Filters	Protocols / ports	Action	Priority	Network	Logs
<input type="checkbox"/>	default-allow-health-check	Ingress	lb-health-check	IP ranges: 35.191.0.0/16, 130.211.0.0/22, 209.85.152.0/22, 209.85.204.0/22	tcp	Allow	1000	default	Off
<input type="checkbox"/>	default-allow-health-check-ipv6	Ingress	lb-health-check	IP ranges: 2600:1901:8001::/48, 2600:2d00:1:b029::/64	tcp	Allow	1000	default	Off
<input type="checkbox"/>	default-allow-http	Ingress	http-server	IP ranges: 0.0.0.0/0	tcp:80	Allow	1000	default	Off
<input type="checkbox"/>	default-allow-https	Ingress	https-server	IP ranges: 0.0.0.0/0	tcp:443	Allow	1000	default	Off
<input type="checkbox"/>	my-custom-firewalls	Ingress	Apply to all	IP ranges: 0.0.0.0/0	tcp:8080-8095	Allow	10000	default	Off
<input type="checkbox"/>	default-allow-icmp	Ingress	Apply to all	IP ranges: 0.0.0.0/0	icmp	Allow	65534	default	Off
<input type="checkbox"/>	default-allow-internal	Ingress	Apply to all	IP ranges: 10.128.0.0/9	tcp:0-65535 udp:0-65535 icmp	Allow	65534	default	Off
<input type="checkbox"/>	default-allow-rdp	Ingress	Apply to all	IP ranges: 0.0.0.0/0	tcp:3389	Allow	65534	default	Off
<input type="checkbox"/>	default-allow-ssh	Ingress	Apply to all	IP ranges: 0.0.0.0/0	tcp:22	Allow	65534	default	Off
<input type="checkbox"/>	myvpc-allow-http	Ingress	http-server	IP ranges: 0.0.0.0/0	tcp:80	Allow	1000	myvpc	Off
<input type="checkbox"/>	myvpc-allow-https	Ingress	https-server	IP ranges: 0.0.0.0/0	tcp:443	Allow	1000	myvpc	Off
<input type="checkbox"/>	port8080	Ingress	Apply to all	IP ranges: 0.0.0.0/0	tcp:8080, 8081	Allow	1000	myvpc	Off
<input type="checkbox"/>	myvpc-allow-ssh	Ingress	Apply to all	IP ranges: 0.0.0.0/0	tcp:22	Allow	65534	myvpc	Off

Network firewall policies

Firewall policies let you group several firewall rules so that you can update them all at once, effectively controlled by Identity and Access Management (IAM) roles. [Learn more](#)

