

Setting Up a Standard GKE Cluster and Compute Engine Instance on Google Cloud Platform (GCP)

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Introduction

This guide demonstrates the process of setting up a Google Kubernetes Engine (GKE) cluster and a Compute Engine instance, configuring them to interact seamlessly. You'll also install essential tools such as the gCloud SDK and `kubectl`.

Prerequisites

1. **Google Cloud Platform (GCP) Account:**
 - Ensure you have an active GCP account.
 - Billing enabled on the project.
 2. **Project Setup:**
 - Create or use an existing GCP project.
 - Enable the following APIs in your project:
 - Kubernetes Engine API
 - Compute Engine API
 - Cloud Build API
 - IAM Service Account Credentials API
 3. **Tools:**
 - Access to a terminal or Cloud Shell.
 - Basic familiarity with GCP Console and CLI.
-

Step 1: Create a Service Account

1. Navigate to **IAM & Admin > Service Accounts** in the GCP Console.

2. Click **Create Service Account**.

◦ **Service Account Name:** `gke-cluster`

Google Cloud | mavericsy-1732863913796 | Search (/) for resources, docs, products, and more

IAM & Admin / Service accounts / Create service account

Create service account

- Service account details**

Service account name: `gke-cluster`
Display name for this service account

Service account ID: `gke-cluster`
Email address: gke-cluster@mavericsy-1732863913796.iam.gserviceaccount.com

Service account description:
Describe what this service account will do

[CREATE AND CONTINUE](#)
- Grant this service account access to project (optional)**
- Grant users access to this service account (optional)**

[DONE](#) [CANCEL](#)

3. Click **Create and Continue** and click **Done**.

4. Copy the service **account name**

<input type="checkbox"/>	gke-cluster@mavericsy-1732863913796.iam.gserviceaccount.com	<input checked="" type="checkbox"/> Enabled	gke-cluster	You don't have permission to view keys	117125152595613878683	Copy to clipboard	View
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5. Navigate to **IAM** and select **GRANT ACCESS**

Google Cloud | mavericsy-1732863913796 | Search (/) for resources, docs, products, and more

IAM & Admin / IAM

IAM

[ALLOW](#) [DENY](#) [RECOMMENDATIONS HISTORY](#)

Permissions for project "mavericsy-1732863913796"
 These permissions affect this project and all of its resources. [Learn more](#)

☐ Include Google-provided role grants

[VIEW BY PRINCIPALS](#) [VIEW BY ROLES](#)

[GRANT ACCESS](#) [REMOVE ACCESS](#)

Filter: Enter property name or value

<input type="checkbox"/> Type	Principal	Name	Role
<input type="checkbox"/>	245198031641-compute@developer.gserviceaccount.com	Compute Engine default service account	Compute Admin Kubernetes Engine Admin Logs Writer Service Account User Storage Admin Storage Object Viewer
<input type="checkbox"/>	mvaric-serviceaccount@mavericsy-1732863913796.iam.gserviceaccount.com	mvaric-serviceaccount	App Engine Admin App Engine Creator App Engine Deployer

6. Make sure you add service **account name** in new principals.

Grant access to "mavericsy-1732863913796"

Grant principals access to this resource and add roles to specify what actions the principals can take. Optionally, add conditions to grant access to principals only when a specific criteria is met. [Learn more about IAM conditions](#)

Resource

• mavericsy-1732863913796

Add principals

Principals are users, groups, domains, or service accounts. [Learn more about principals in IAM](#)

New principals *

gke-cluster@mavericsy-1732863913796.iam.gserviceaccount.com

?

Assign roles

Roles are composed of sets of permissions and determine what the principal can do with this resource. [Learn more](#)

Select a role *

IAM condition (optional) ?
[+ ADD IAM CONDITION](#)



[+ ADD ANOTHER ROLE](#)

SAVE

CANCEL

7. Add the following roles to the service account:

- Compute Admin
- Kubernetes Engine Admin
- Logs Writer
- Service Account User
- Storage Admin
- Storage Object Viewer
- App Engine Admin
- App Engine Creator
- App Engine Deployer
- Cloud Build Editor
- Editor
- Service Usage Admin

8. Click **Save**.



gke-cluster@mavericsy-1732863913796.iam.gserviceaccount.com

gke-cluster

App Engine Admin



App Engine Creator

App Engine Deployer

Cloud Build Editor

Compute Admin

Editor

Kubernetes Engine Admin

Logs Writer

Service Account User

Service Usage Admin

Storage Admin

Storage Object Viewer

Step 2: Create a Standard GKE Cluster

1. Navigate to **Kubernetes Engine > Clusters**.
2. Click **Create** and select **Standard Cluster**.

Google Cloud mavericsy-1732863913796 Search (/) for resources, docs, products, and more Search

Create an Autopilot cluster SWITCH TO STANDARD CLUSTER LEARN

Ensure that the default GKE node service account has, at a minimum, the Kubernetes Engine Default Node Service Account [role permissions](#) on your project.

- Cluster basics
Set up basics for your cluster
- Fleet registration
Manage multiple clusters together
- Networking
Define applications communication in the cluster
- Advanced settings
Review additional options
- Review and create
Review all settings and create your cluster

Cluster basics

Create an Autopilot cluster by specifying a name and region. After the cluster is created, you can deploy your workload through Kubernetes and we'll take care of the rest, including:

- ✓ **Nodes:** Automated node provisioning, scaling, and maintenance
- ✓ **Networking:** VPC-native traffic routing for clusters
- ✓ **Security:** Shielded GKE Nodes and Workload Identity
- ✓ **Telemetry:** Cloud Operations logging and monitoring

Name
autopilot-cluster-1

Region
us-central1

The regional location in which your cluster's control plane and nodes are located. You cannot change the cluster's region once it's created.

Cluster tier

CREATE CANCEL Equivalent REST or COMMAND LINE

- **Cluster Name:** my-cluster
- **Location Type:** Zonal
- **Zone:** us-central1-a

Google Cloud mavericsy-1732863913796 Search (/) for resources, docs, products, and more

Create a Kubernetes cluster ADD NODE POOL REMOVE NODE POOL USE A SETUP GUIDE SWITCH TO AUTOPILOT CLUSTER LEARN

Ensure that the default GKE node service account has, at a minimum, the Kubernetes Engine Default Node Service Account [role permissions](#) on your project.

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
my-cluster
Cluster names must start with a lowercase letter followed by up to 39 lowercase letters, numbers, or hyphens. They can't end with a hyphen. You cannot change the cluster's name once it's created.

Location type
Resource prices may vary between certain regions. [Learn more](#)

☒ Zonal
☐ Regional
Zone
us-central1-a
☐ Specify default node locations

Estimated monthly cost **PREVIEW**
\$176.38
That's about \$0.24 per hour
Pricing is based on the resources you use, management fees, discounts and credits. [Learn more](#)

[SHOW COST BREAKDOWN](#)

CREATE CANCEL Equivalent REST or COMMAND LINE

3. In the **Node Pool** -> **Security** section:

- Select the service account: **gke-cluster**

Google Cloud mavericsy-1732863913796 Search (/) for resources, docs, products, and more

Create a Kubernetes cluster ADD NODE POOL REMOVE NODE POOL USE A SETUP GUIDE SWITCH TO AUTOPILOT CLUSTER LEARN

Ensure that the default GKE node service account has, at a minimum, the Kubernetes Engine Default Node Service Account [role permissions](#) on your project.

Node security

These node security settings will be used when new nodes are created using this node pool.

Identity defaults
Specify the default identity for new auto-provisioned node pools using a service account or access scopes. To improve security, we recommend creating and using a minimally privileged service account. [Learn more](#)

Service account
gke-cluster
GKE uses this service account for tasks like logging and monitoring. Ensure that the service account has, at a minimum, the Kubernetes Engine Default Node Service Account role [Kubernetes Engine Default Node Service Account role](#) permissions on your project.

Access scopes
Access scopes are permanent. Select the type and level of API access to grant the VM. [Learn more](#)
Use IAM roles with service accounts to control VM access. [Learn more](#)

☐ Enable sandbox with gVisor

Shielded options
☒ Enable integrity monitoring

Estimated monthly cost **PREVIEW**
\$176.38
That's about \$0.24 per hour
Pricing is based on the resources you use, management fees, discounts and credits. [Learn more](#)

[SHOW COST BREAKDOWN](#)

CREATE CANCEL Equivalent REST or COMMAND LINE

4. Click **Create** to provision the cluster. Wait until the cluster is ready.

Step 3: Create a Compute Engine Instance

- Navigate to **Compute Engine > VM Instances**.
- Click **Create Instance**.
 - Name:** **gke-instance**
 - Region:** **us-central1 (Iowa)**
 - Zone:** Select any zone within the region.
 - Machine Type:** Choose the desired configuration (default is fine).

Machine configuration

Name *
gke-instance

Region *
us-central1 (Iowa)

Zone *
Any

Region is permanent

Google will choose a zone on your behalf, maximizing VM obtainability. Zone is permanent.

General purpose | Compute optimized | Memory optimized | Storage optimized | GPUs

Machine types for common workloads, optimized for cost and flexibility

Series	Description	vCPUs	Memory	Platform
<input type="radio"/> C4	Consistently high performance	2 - 192	4 - 1,488 GB	Intel Emerald Rapids
<input type="radio"/> C4A	Arm-based consistently high performance	1 - 72	2 - 576 GB	Google Axion
<input type="radio"/> N4	Flexible & cost-optimized	2 - 80	4 - 640 GB	Intel Emerald Rapids
<input type="radio"/> C3	Consistently high performance	4 - 192	8 - 1,536 GB	Intel Sapphire Rapids
<input type="radio"/> C3D	Consistently high performance	4 - 360	8 - 2,880 GB	AMD Genoa
<input checked="" type="radio"/> E2	Low cost, day-to-day computing	0.25 - 32	1 - 128 GB	Based on availability
<input type="radio"/> N2	Balanced price & performance	2 - 128	2 - 864 GB	Intel Cascade Lake
<input type="radio"/> N2D	Balanced price & performance	2 - 224	2 - 896 GB	AMD EPYC
<input type="radio"/> T2A	Scale-out workloads	1 - 48	4 - 192 GB	Ampere Altra Arm

Monthly estimate
\$25.46
That's about \$0.03 hourly

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

Item	Monthly estimate
2 vCPU + 4 GB memory	\$24.46
10 GB balanced persistent disk	\$1.00
Total	\$25.46

[Compute Engine pricing](#)

[LESS](#)

CREATE CANCEL EQUIVALENT CODE

3. OS: Ubuntu 20.04 LTS

Operating system and storage

Name gke-inst

Type New boot disk

Size 10 GB

Snapshot schedule No schedule

License type Free

Image Ubuntu 20.04 LTS

CHANGE

Additional storage and VM back

+ ADD NEW DISK + ATTACH EXISTING DISK

Backup plan PREVIEW

Secure your backups against deletion through backup retention policy. Managed by Backup and DR Service, a separate service. [Learn more](#)

Backup plan

Container

CREATE CANCEL EQUIVALENT CODE

Boot disk

Select an image or snapshot to create a boot disk; or attach an existing disk. Can't find what you're looking for? Explore hundreds of VM solutions in [Marketplace](#)

PUBLIC IMAGES CUSTOM IMAGES SNAPSHOTS ARCHIVE SNAPSHOTS EXISTING DISKS

Operating system
Ubuntu

Version *
Ubuntu 20.04 LTS

x86_64, amd64 focal image built on 2024-12-19

Boot disk type *
Balanced persistent disk

COMPARE DISK TYPES

Size (GB) *
10

Provision between 10 and 65536 GB

SHOW ADVANCED CONFIGURATION

SELECT CANCEL

4. Under **Security > Access Scopes**:

- Select **Allow full access to all Cloud APIs**.
- Choose the service account: **gke-cluster**.

Security

Identity and API access

Service accounts

Service account: gke-cluster

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

☒ Allow full access to all Cloud APIs

☐ Set access for each API

Confidential VM service

☐ Confidential Computing is disabled on this VM Instance

[ENABLE](#)

Shielded VM

Turn on all settings for the most secure configuration.

☐ Turn on Secure Boot

☒ Turn on vTPM

☒ Turn on Integrity Monitoring

[CREATE](#) [CANCEL](#) [EQUIVALENT CODE](#)

Monthly estimate

\$25.46

That's about \$0.03 hourly

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

Item	Monthly estimate
2 vCPU + 4 GB memory	\$24.46
10 GB balanced persistent disk	\$1.00
Total	\$25.46

[Compute Engine pricing](#)

[LESS](#)

5. Click **Create** to provision the VM.

Step 4: Connect to the VM and Install gCloud SDK

1. Connect to the VM using SSH:

- Go to **Compute Engine > VM Instances**.
- Click **SSH** in the **gke-instance**.

Compute Engine **gke-instance** [EDIT](#) [RESET](#) [CREATE MACHINE IMAGE](#) [CREATE SIMILAR](#) [START / RESUME](#) [EQUIVALENT CODE](#) [LEARN](#)

Virtual machines

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

Storage

- Disks
- Storage Pools
- Marketplace
- Release Notes

DETAILS **OBSERVABILITY** **OS INFO** **SCREENSHOT**

SSH [CONNECT TO SERIAL CONSOLE](#)

Connect:

- Open in browser window**
- Open in browser window on custom port
- Open in browser window using provided private SSH key
- View gcloud command
- Use another SSH client

Logs

[Logging](#) [Serial port](#) [SSH](#)

Basic information

Name	gke-instance
Instance Id	1356635873896637880
Description	None
Type	Instance
Status	Running
Creation time	Jan 13, 2025, 10:19:29 AM UTC+05:30
Location	us-central1-a
Instance template	None
In use by	None
Reservations	Automatically chosen

[EQUIVALENT CODE](#)

2. Update the package list:

```
sudo apt update
```

```
vijay_1bf28e8a_ed99_431d_a5a3_a7@gke-instance:~$ sudo apt update
Hit:1 http://us-central1.gce.archive.ubuntu.com/ubuntu focal InRelease
Get:2 http://us-central1.gce.archive.ubuntu.com/ubuntu focal-updates InRelease [128 kB]
Get:3 http://us-central1.gce.archive.ubuntu.com/ubuntu focal-backports InRelease [128 kB]
Get:4 http://security.ubuntu.com/ubuntu focal-security InRelease [128 kB]
Get:5 http://us-central1.gce.archive.ubuntu.com/ubuntu focal/universe amd64 Packages [8628 kB]
Get:6 http://us-central1.gce.archive.ubuntu.com/ubuntu focal/universe Translation-en [5124 kB]
Get:7 http://us-central1.gce.archive.ubuntu.com/ubuntu focal/universe amd64 c-n-f Metadata [265 kB]
Get:8 http://us-central1.gce.archive.ubuntu.com/ubuntu focal/multiverse amd64 Packages [144 kB]
Get:9 http://us-central1.gce.archive.ubuntu.com/ubuntu focal/multiverse Translation-en [104 kB]
Get:10 http://us-central1.gce.archive.ubuntu.com/ubuntu focal/multiverse amd64 c-n-f Metadata [9136 B]
Get:11 http://us-central1.gce.archive.ubuntu.com/ubuntu focal-updates/main amd64 Packages [3742 kB]
Get:12 http://us-central1.gce.archive.ubuntu.com/ubuntu focal-updates/main Translation-en [571 kB]
Get:13 http://us-central1.gce.archive.ubuntu.com/ubuntu focal-updates/restricted amd64 Packages [3504 kB]
Get:14 http://us-central1.gce.archive.ubuntu.com/ubuntu focal-updates/restricted Translation-en [490 kB]
Get:15 http://us-central1.gce.archive.ubuntu.com/ubuntu focal-updates/universe amd64 Packages [1253 kB]
Get:16 http://us-central1.gce.archive.ubuntu.com/ubuntu focal-updates/universe Translation-en [300 kB]
Get:17 http://us-central1.gce.archive.ubuntu.com/ubuntu focal-updates/universe amd64 c-n-f Metadata [28.3 kB]
Get:18 http://us-central1.gce.archive.ubuntu.com/ubuntu focal-updates/multiverse amd64 Packages [27.9 kB]
Get:19 http://us-central1.gce.archive.ubuntu.com/ubuntu focal-updates/multiverse Translation-en [7968 B]
Get:20 http://us-central1.gce.archive.ubuntu.com/ubuntu focal-updates/multiverse amd64 c-n-f Metadata [612 B]
Get:21 http://us-central1.gce.archive.ubuntu.com/ubuntu focal-backports/main amd64 Packages [45.7 kB]
Get:22 http://us-central1.gce.archive.ubuntu.com/ubuntu focal-backports/main Translation-en [16.3 kB]
Get:23 http://us-central1.gce.archive.ubuntu.com/ubuntu focal-backports/main amd64 c-n-f Metadata [1420 B]
Get:24 http://us-central1.gce.archive.ubuntu.com/ubuntu focal-backports/restricted amd64 c-n-f Metadata [116 B]
Get:25 http://us-central1.gce.archive.ubuntu.com/ubuntu focal-backports/universe amd64 Packages [25.0 kB]
Get:26 http://us-central1.gce.archive.ubuntu.com/ubuntu focal-backports/universe Translation-en [16.3 kB]
Get:27 http://us-central1.gce.archive.ubuntu.com/ubuntu focal-backports/universe amd64 c-n-f Metadata [880 B]
Get:28 http://us-central1.gce.archive.ubuntu.com/ubuntu focal-backports/multiverse amd64 c-n-f Metadata [116 B]
Get:29 http://security.ubuntu.com/ubuntu focal-security/main amd64 Packages [3364 kB]
Get:30 http://security.ubuntu.com/ubuntu focal-security/main Translation-en [491 kB]
Get:31 http://security.ubuntu.com/ubuntu focal-security/restricted amd64 Packages [3357 kB]
Get:32 http://security.ubuntu.com/ubuntu focal-security/restricted Translation-en [470 kB]
Get:33 http://security.ubuntu.com/ubuntu focal-security/universe amd64 Packages [1031 kB]
Get:34 http://security.ubuntu.com/ubuntu focal-security/universe Translation-en [218 kB]
Get:35 http://security.ubuntu.com/ubuntu focal-security/universe amd64 c-n-f Metadata [21.4 kB]
Get:36 http://security.ubuntu.com/ubuntu focal-security/multiverse amd64 Packages [24.8 kB]
Get:37 http://security.ubuntu.com/ubuntu focal-security/multiverse Translation-en [5968 B]
Get:38 http://security.ubuntu.com/ubuntu focal-security/multiverse amd64 c-n-f Metadata [540 B]
```

3. Install prerequisites:

```
sudo apt install apt-transport-https ca-certificates gnupg curl
```

```
vijay_1bf28e8a_ed99_431d_a5a3_a7@gke-instance:~$ sudo apt install apt-transport-https ca-certificates gnupg curl
Reading package lists... Done
Building dependency tree
Reading state information... Done
ca-certificates is already the newest version (20240203~20.04.1).
ca-certificates set to manually installed.
curl is already the newest version (7.68.0-1ubuntu2.25).
curl set to manually installed.
gnupg is already the newest version (2.2.19-3ubuntu2.2).
gnupg set to manually installed.
The following NEW packages will be installed:
  apt-transport-https
0 upgraded, 1 newly installed, 0 to remove and 6 not upgraded.
Need to get 1704 B of archives.
After this operation, 162 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://us-central1.gce.archive.ubuntu.com/ubuntu focal-updates/universe amd64 apt-transport-https all 2.0.1
0 [1704 B]
Fetched 1704 B in 0s (59.6 kB/s)
Selecting previously unselected package apt-transport-https.
(Reading database ... 62257 files and directories currently installed.)
Preparing to unpack .../apt-transport-https_2.0.10_all.deb ...
Unpacking apt-transport-https (2.0.10) ...
Setting up apt-transport-https (2.0.10) ...
vijay_1bf28e8a_ed99_431d_a5a3_a7@gke-instance:~$
```

4. Add the Cloud SDK distribution URI:

```
echo "deb [signed-by=/usr/share/keyrings/cloud.google.gpg]
http://packages.cloud.google.com/apt cloud-sdk main" | sudo tee -a
/etc/apt/sources.list.d/google-cloud-sdk.list
```



```
vijay_1bf28e8a_ed99_431d_a5a3_a7@gke-instance:~$ echo "deb [signed-by=/usr/share/keyrings/cloud.google.gpg] http://packages.cloud.google.com/apt cloud-sdk main" | sudo tee -a /etc/apt/sources.list.d/google-cloud-sdk.list
deb [signed-by=/usr/share/keyrings/cloud.google.gpg] http://packages.cloud.google.com/apt cloud-sdk main
vijay_1bf28e8a_ed99_431d_a5a3_a7@gke-instance:~$
```

5. Import the Google Cloud public key:

```
curl https://packages.cloud.google.com/apt/doc/apt-key.gpg | sudo gpg --dearmor -o /usr/share/keyrings/cloud.google.gpg
```

```
vijay_1bf28e8a_ed99_431d_a5a3_a7@gke-instance:~$ curl https://packages.cloud.google.com/apt/doc/apt-key.gpg | sudo gpg --dearmor -o /usr/share/keyrings/cloud.google.gpg
% Total    % Received % Xferd Average Speed   Time    Time     Time  Current
           Dload Upload   Total   Spent    Left   Speed
100 1022  100 1022    0     0  32967      0 --:--:-- --:--:-- --:--:-- 32967
vijay_1bf28e8a_ed99_431d_a5a3_a7@gke-instance:~$
```

6. Update the package list:

```
sudo apt update
```

```
vijay_1bf28e8a_ed99_431d_a5a3_a7@gke-instance:~$ sudo apt update
Hit:1 http://us-central1.gce.archive.ubuntu.com/ubuntu focal InRelease
Hit:2 http://us-central1.gce.archive.ubuntu.com/ubuntu focal-updates InRelease
Hit:3 http://us-central1.gce.archive.ubuntu.com/ubuntu focal-backports InRelease
Get:4 http://packages.cloud.google.com/apt cloud-sdk InRelease [1618 B]
Hit:5 http://security.ubuntu.com/ubuntu focal-security InRelease
Get:6 http://packages.cloud.google.com/apt cloud-sdk/main all Packages [1606 kB]
Get:7 http://packages.cloud.google.com/apt cloud-sdk/main amd64 Packages [3500 kB]
Fetched 5107 kB in 1s (5133 kB/s)
Reading package lists... Done
Building dependency tree
Reading state information... Done
6 packages can be upgraded. Run 'apt list --upgradable' to see them.
vijay_1bf28e8a_ed99_431d_a5a3_a7@gke-instance:~$
```

7. Install the Cloud SDK:

```
sudo apt install google-cloud-sdk
```

```

vijay_1bf28e8a_ed99_431d_a5a3_a7@gke-instance:~$ sudo apt install google-cloud-sdk
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  google-cloud-cli google-cloud-cli-anthoscli
Suggested packages:
  google-cloud-cli-app-engine-java google-cloud-cli-app-engine-python google-cloud-cli-pubsub-emulator
  google-cloud-cli-bigtable-emulator google-cloud-cli-datastore-emulator kubectl
The following NEW packages will be installed:
  google-cloud-cli google-cloud-cli-anthoscli google-cloud-sdk
0 upgraded, 3 newly installed, 0 to remove and 6 not upgraded.
Need to get 110 MB of archives.
After this operation, 634 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://packages.cloud.google.com/apt cloud-sdk/main amd64 google-cloud-cli amd64 505.0.0-0 [84.9 MB]
Get:2 http://packages.cloud.google.com/apt cloud-sdk/main amd64 google-cloud-cli-anthoscli amd64 505.0.0-0 [24.9 MB]
Get:3 http://packages.cloud.google.com/apt cloud-sdk/main all google-cloud-sdk all 467.0.0-0 [1706 B]
Fetched 110 MB in 2s (65.6 MB/s)
Selecting previously unselected package google-cloud-cli.
(Reading database ... 62261 files and directories currently installed.)
Preparing to unpack .../google-cloud-cli_505.0.0-0_amd64.deb ...
Unpacking google-cloud-cli (505.0.0-0) ...
Selecting previously unselected package google-cloud-cli-anthoscli.
Preparing to unpack .../google-cloud-cli-anthoscli_505.0.0-0_amd64.deb ...
Unpacking google-cloud-cli-anthoscli (505.0.0-0) ...
Selecting previously unselected package google-cloud-sdk.
Preparing to unpack .../google-cloud-sdk_467.0.0-0_all.deb ...
Unpacking google-cloud-sdk (467.0.0-0) ...
Setting up google-cloud-cli (505.0.0-0) ...
Setting up google-cloud-sdk (467.0.0-0) ...
Setting up google-cloud-cli-anthoscli (505.0.0-0) ...
Processing triggers for man-db (2.9.1-1) ...

Processing triggers for libc-bin (2.31-0ubuntu9.16) ...
vijay_1bf28e8a_ed99_431d_a5a3_a7@gke-instance:~$

```

8. Initialize the Cloud SDK:

```
gcloud init
```

```

vijay_1bf28e8a_ed99_431d_a5a3_a7@gke-instance:~$ gcloud init
Welcome! This command will take you through the configuration of gcloud.

Your current configuration has been set to: [default]

You can skip diagnostics next time by using the following flag:
  gcloud init --skip-diagnostics

Network diagnostic detects and fixes local network connection issues.
Checking network connection...done.
Reachability Check passed.
Network diagnostic passed (1/1 checks passed).

Choose the account you want to use for this configuration.
To use a federated user account, exit this command and sign in to the gcloud CLI with your login configuration
file, then run this command again.

Select an account:
[1] gke-cluster@mavericsy-1732863913796.iam.gserviceaccount.com
[2] Sign in with a new Google Account
[3] Skip this step
Please enter your numeric choice: 1

You are signed in as: [gke-cluster@mavericsy-1732863913796.iam.gserviceaccount.com].

Pick cloud project to use:
[1] mavericsy-1732863913796
[2] Enter a project ID
[3] Create a new project
Please enter numeric choice or text value (must exactly match list item): 1

Your current project has been set to: [mavericsy-1732863913796].

Do you want to configure a default Compute Region and Zone? (Y/n)? y

```

Step 5: Install kubectl and Configure Cluster Access

1. Verify the cloud-sdk repository:

```
grep -rHE ^deb /etc/apt/sources.list* | grep "cloud-sdk"
```

```
vijay_1bf28e8a_ed99_431d_a5a3_a7@gke-instance:~$ grep -rHE ^deb /etc/apt/sources.list* | grep "cloud-sdk"
deb [signed-by=/usr/share/keyrings/cloud.google.gpg] http://packages.cloud.google.com/apt cloud-sdk main
vijay_1bf28e8a_ed99_431d_a5a3_a7@gke-instance:~$
```

- If not listed, install the Cloud SDK as described above.

2. Install `kubectl`:

```
sudo apt-get update
sudo apt-get install -y kubectl
```

```
vijay_1bf28e8a_ed99_431d_a5a3_a7@gke-instance:~$ sudo apt-get update
Hit:1 http://us-central1.gce.archive.ubuntu.com/ubuntu focal InRelease
Hit:2 http://us-central1.gce.archive.ubuntu.com/ubuntu focal-updates InRelease
Hit:3 http://us-central1.gce.archive.ubuntu.com/ubuntu focal-backports InRelease
Hit:4 http://packages.cloud.google.com/apt cloud-sdk InRelease
Hit:5 http://security.ubuntu.com/ubuntu focal-security InRelease
Reading package lists... Done
vijay_1bf28e8a_ed99_431d_a5a3_a7@gke-instance:~$ sudo apt-get install -y kubectl
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following NEW packages will be installed:
  kubectl
0 upgraded, 1 newly installed, 0 to remove and 6 not upgraded.
Need to get 75.2 MB of archives.
After this operation, 366 MB of additional disk space will be used.
Get:1 http://packages.cloud.google.com/apt cloud-sdk/main amd64 kubectl amd64 1:505.0.0-0 [75.2 MB]
Fetched 75.2 MB in 1s (71.6 MB/s)
Selecting previously unselected package kubectl.
(Reading database ... 110579 files and directories currently installed.)
Preparing to unpack .../kubectl_1%3a505.0.0-0_amd64.deb ...
Unpacking kubectl (1:505.0.0-0) ...
Setting up kubectl (1:505.0.0-0) ...
vijay_1bf28e8a_ed99_431d_a5a3_a7@gke-instance:~$
```

3. Verify the installation:

```
kubectl version --client
```

```
vijay_1bf28e8a_ed99_431d_a5a3_a7@gke-instance:~$ kubectl version --client
Client Version: v1.30.8-dispatcher
Kustomize Version: v5.0.4-0.20230601165947-6ce0bf390ce3
vijay_1bf28e8a_ed99_431d_a5a3_a7@gke-instance:~$
```

Step 6: Install Required Plugins

1. Install the GKE authentication plugin:

```
sudo apt-get install google-cloud-sdk-gke-gcloud-auth-plugin
```

```

vijay_1bf28e8a_ed99_431d_a5a3_a7@gke-instance:~$ sudo apt-get install google-cloud-sdk-gke-gcloud-auth-plugin
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  google-cloud-cli-gke-gcloud-auth-plugin
The following NEW packages will be installed:
  google-cloud-cli-gke-gcloud-auth-plugin google-cloud-sdk-gke-gcloud-auth-plugin
0 upgraded, 2 newly installed, 0 to remove and 6 not upgraded.
Need to get 3233 kB of archives.
After this operation, 11.1 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://packages.cloud.google.com/apt cloud-sdk/main amd64 google-cloud-cli-gke-gcloud-auth-plugin amd64 505.0.0-0 [3228 kB]
Get:2 http://packages.cloud.google.com/apt cloud-sdk/main all google-cloud-sdk-gke-gcloud-auth-plugin all 467.0.0-0 [5018 B]
Fetched 3233 kB in 0s (13.2 MB/s)
Selecting previously unselected package google-cloud-cli-gke-gcloud-auth-plugin.
(Reading database ... 110594 files and directories currently installed.)
Preparing to unpack .../google-cloud-cli-gke-gcloud-auth-plugin_505.0.0-0_amd64.deb ...
Unpacking google-cloud-cli-gke-gcloud-auth-plugin (505.0.0-0) ...
Selecting previously unselected package google-cloud-sdk-gke-gcloud-auth-plugin.
Preparing to unpack .../google-cloud-sdk-gke-gcloud-auth-plugin_467.0.0-0_all.deb ...
Unpacking google-cloud-sdk-gke-gcloud-auth-plugin (467.0.0-0) ...
Setting up google-cloud-cli-gke-gcloud-auth-plugin (505.0.0-0) ...
Setting up google-cloud-sdk-gke-gcloud-auth-plugin (467.0.0-0) ...
vijay_1bf28e8a_ed99_431d_a5a3_a7@gke-instance:~$

```

2. Verify the plugin installation:

```
gke-gcloud-auth-plugin --version
```

```

vijay_1bf28e8a_ed99_431d_a5a3_a7@gke-instance:~$ gke-gcloud-auth-plugin --version
Kubernetes v1.28.2-alpha+2291a60496d419da95186fa76128c72fa8e3410d
vijay_1bf28e8a_ed99_431d_a5a3_a7@gke-instance:~$

```

3. Update the `kubect1` configuration:

```
gcloud container clusters get-credentials my-cluster --zone us-central1-a --project mavericsy-1732863913796
```

Note: Ensure that you change your `project id`

```

vijay_1bf28e8a_ed99_431d_a5a3_a7@gke-instance:~$ gcloud container clusters get-credentials my-cluster --zone us-central1-a --project mavericsy-1732863913796
Fetching cluster endpoint and auth data.
kubeconfig entry generated for my-cluster.
vijay_1bf28e8a_ed99_431d_a5a3_a7@gke-instance:~$

```

Verification

1. List all available namespaces:

```
kubect1 get namespaces
```

```
vijay_1bf28e8a_ed99_431d_a5a3_a7@gke-instance:~$ kubectl get namespaces
NAME                STATUS    AGE
default             Active   26m
gke-managed-cim     Active   26m
gke-managed-system  Active   26m
gmp-public          Active   25m
gmp-system          Active   25m
kube-node-lease     Active   26m
kube-public         Active   26m
kube-system         Active   26m
vijay_1bf28e8a_ed99_431d_a5a3_a7@gke-instance:~$
```

2. Ensure you can interact with the cluster resources.
-