

Cloud Computing Applications and Services

(Aplicações e Serviços de Computação em Nuvem)

Google Kubernetes Engine

University of Minho

2025-2026

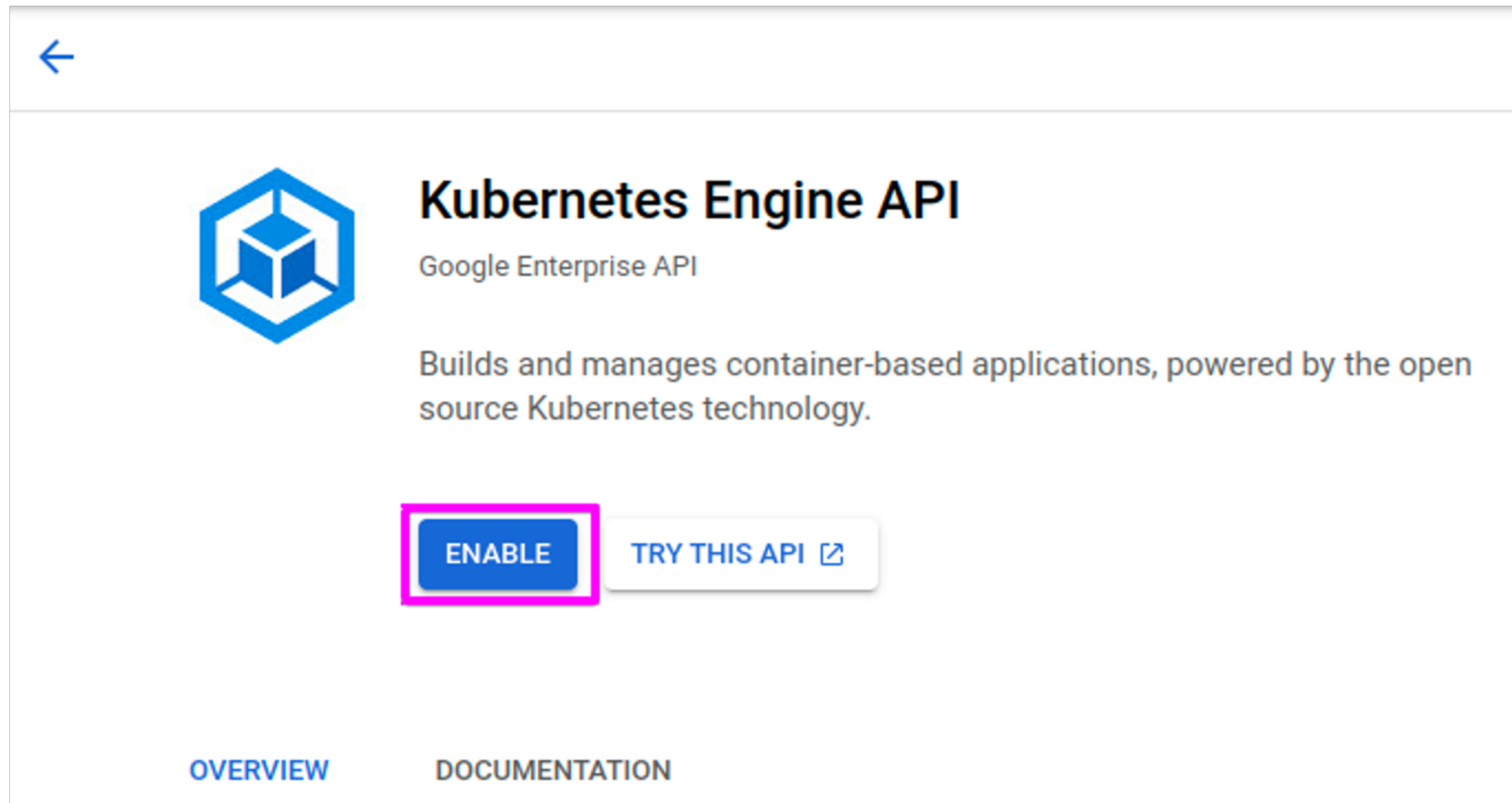


Bootstrap

- Access Google Cloud Console: <https://console.cloud.google.com/>
- Create a project
 - Associate billing account (check e-mail for coupon)
 - Each account has 50\$

Enable Kubernetes Engine API

(Side bar → Kubernetes Engine → Enable)



Create a Service Account

(Side bar → IAM & Admin → Service accounts)

+ CREATE SERVICE ACCOUNT

1 Service account details

Fill the *Service account name* and click on “*Create and continue*”

1

Service account details

Service account name

sa-example

Display name for this service account

Service account ID *

sa-example

X ↺

Email address: sa-example@ascn2223.iam.gserviceaccount.com 📄

Service account description

Describe what this service account will do

CREATE AND CONTINUE

2

Grant this service account access to project (optional)

3

Grant users access to this service account (optional)

DONE

CANCEL

Create a Service Account

(Side bar → IAM & Admin → Service accounts)

2 Grant this service account access to project

Grant the following Roles to the service account:

- Compute Admin
- Kubernetes Engine Admin
- Service Account User

✓

Service account details

2

Grant this service account access to project (optional)

Grant this service account access to ASCN2223 so that it has permission to complete specific actions on the resources in your project. [Learn more](#)

Role

Compute Admin

Full control of all Compute Engine resources.

IAM condition (optional) ?

+ ADD IAM CONDITION

Role

Kubernetes Engine Admin

Full management of Kubernetes Clusters and their Kubernetes API objects.

IAM condition (optional) ?

+ ADD IAM CONDITION

Role

Service Account User

Run operations as the service account.

IAM condition (optional) ?

+ ADD IAM CONDITION

+ ADD ANOTHER ROLE

CONTINUE

3

Grant users access to this service account (optional)

DONE

CANCEL

Create a Service Account

(Side bar → IAM & Admin → Service accounts)

3 Grant users access to this service account

Add the email of each element of the group to both “*Service account users role*” and “*Service account admins role*”

✓ Service account details

✓ Grant this service account access to project (optional)

3 Grant users access to this service account (optional)

Grant access to users or groups that need to perform actions as this service account. [Learn more](#)

Service account users role

studentA@gmail.com × studentB@gmail.com × ?

studentC@gmail.com ×

Grant users the permissions to deploy jobs and VMs with this service account

Service account admins role

studentA@gmail.com × studentB@gmail.com × ?

studentC@gmail.com ×

Grant users the permission to administer this service account

DONE

CANCEL

2025-2026

CLOUD COMPUTING APPLICATIONS AND SERVICES

GOOGLE KUBERNETES ENGINE

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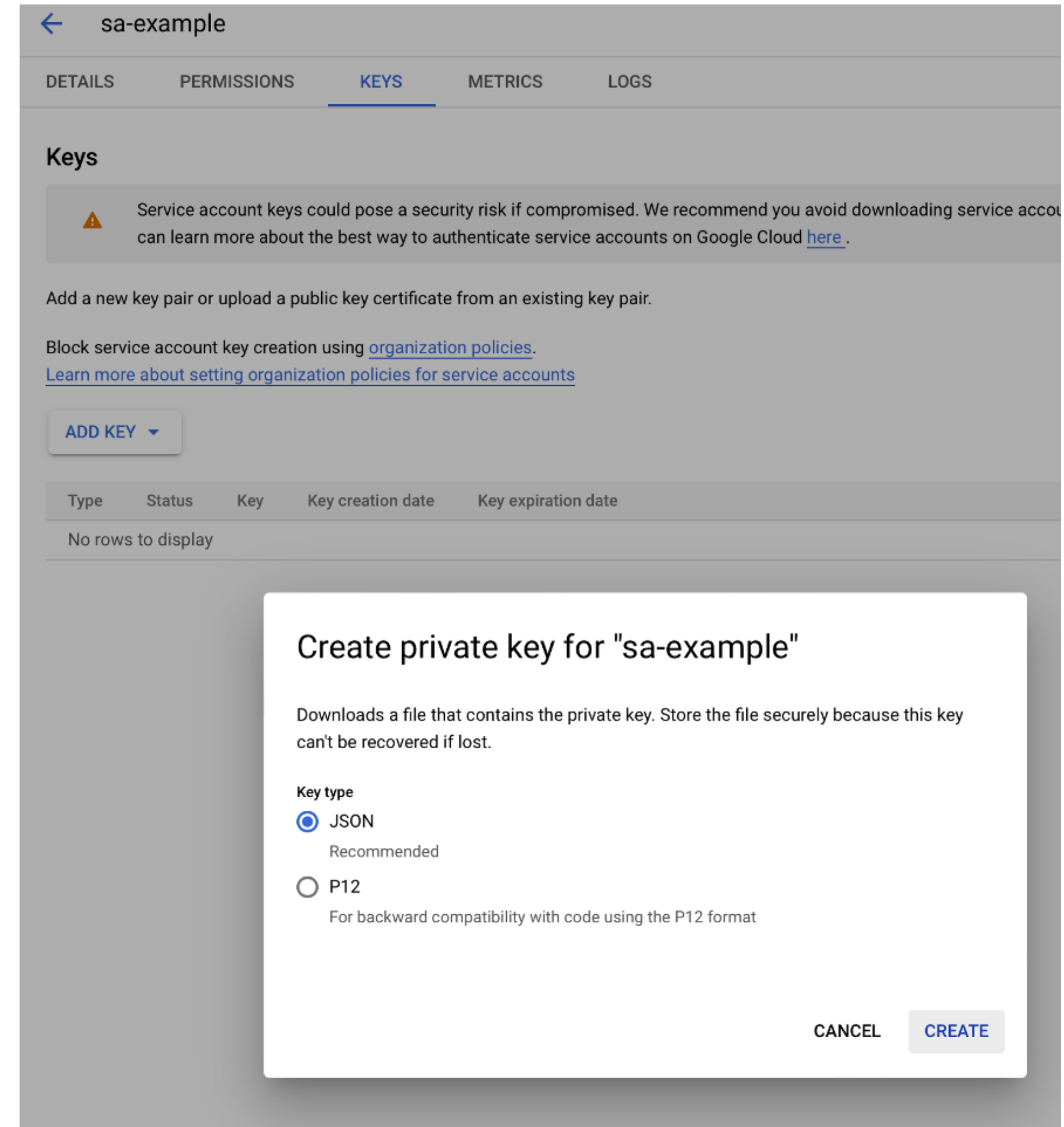
Get Service Account Keys

(Side bar → IAM & Admin → Service accounts)

- 1 Select your service account
- 2 On top select “Keys”
- 3 Select “ADD KEY” → “Create new key”
- 3 Select “JSON” → “CREATE”

Note: The downloaded file should be used as the credential file by the `GKE_cluster_create` playbook.

Important: This file has **private** credentials and **should not** be added to your project’s GitHub repository.



Install and Configure Google Cloud CLI

- The Google Cloud CLI must be installed and configured on the machine where the Ansible playbooks will run.
- Access the link <https://cloud.google.com/sdk/docs/install> and follow the installation instructions for the corresponding operating system.
- Configure the Google Cloud CLI with the following command:

```
gcloud init
```


GKE - Kubernetes Cluster

- Kubernetes cluster resources (e.g., control plane and nodes) are managed by Google Cloud.
- GKE has access to other Google services (e.g., load balancing, storage, monitoring, ...).
- Users can interact directly with the cluster through the gcloud CLI tool (e.g., create, configure, destroy cluster).
- gcloud CLI installs and configures kubectl so that users can deploy K8s objects at the GKE cluster (e.g., pods, services, ...).
- Ansible gcp_container_cluster module can be used to interact with gcloud CLI.

GKE - Kubernetes Cluster

