

Cloud Computing Applications and Services

(Aplicações e Serviços de Computação em Nuvem)

Google Kubernetes Engine

University of Minho
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Bootstrap

- Create project
 - Associate billing account (check e-mail for coupon)
 - Each account has 50\$

Enable Kubernetes Engine API

(Side Bar -> Kubernetes Engine -> Enable)



Kubernetes Engine API

Google Enterprise API

Builds and manages container-based applications, powered by the open source Kubernetes technology.

ENABLE

TRY THIS API [↗](#)

OVERVIEW

DOCUMENTATION

Create a Service Account

(Side Bar -> AIM & 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



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 -> AIM & 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](#)

| | |
|--|--|
| <div>Role</div> <div>Compute Admin</div> <div>Full control of all Compute Engine resources.</div> | <div>IAM condition (optional) ?</div> <div>+ ADD IAM CONDITION</div> <div></div> |
| <div>Role</div> <div>Kubernetes Engine Admin</div> <div>Full management of Kubernetes Clusters and their Kubernetes API objects.</div> | <div>IAM condition (optional) ?</div> <div>+ ADD IAM CONDITION</div> <div></div> |
| <div>Role</div> <div>Service Account User</div> <div>Run operations as the service account.</div> | <div>IAM condition (optional) ?</div> <div>+ ADD IAM CONDITION</div> <div></div> |

+ ADD ANOTHER ROLE

CONTINUE

3 Grant users access to this service account (optional)

DONE

CANCEL

Create a Service Account

(Side Bar -> AIM & Admin -> Service accounts)

3 Grant users access to this service account

Add the group elements emails 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

Get Service Account Keys

(Side Bar -> AIM & Admin -> Service accounts)

- 1 Select your service account
- 2 On top select "KEYS"
- 3 Select "ADD KEY" -> "Create new key"
- 4 Select "JSON" -> "CREATE"

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

Important: This file has private credentials and cannot be added to your project's public github repository!

The screenshot shows the Google Cloud console interface for a service account named "sa-example". The "KEYS" tab is selected in the top navigation bar. Below the tabs, there is a warning message about the security risk of compromised keys and a link to learn more. Below that, there is a button labeled "ADD KEY" with a dropdown arrow. Below the button, there is a table with columns: Type, Status, Key, Key creation date, and Key expiration date. The table currently shows "No rows to display". A modal dialog is open in the foreground, titled "Create private key for 'sa-example'". The dialog contains a warning about the security of the private key and two options for the key type: "JSON" (selected and marked as "Recommended") and "P12" (marked as "For backward compatibility with code using the P12 format"). At the bottom right of the modal, there are "CANCEL" and "CREATE" buttons.

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 systems.
- Configure the Google Cloud CLI with the following command:

```
gcloud init
```


GKE Kubernetes Cluster

- Kubernetes cluster resources (e.g., master and worker nodes) are managed by Google
- 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**

