

Kubernetes Engine Course Exercises

Exercise references

Exercise 1 - Create a simple default cluster via CLI, view, describe, resize and delete the cluster.

(Cloud Shell or use SDK)

This exercise will walk thru the simple cluster creation process and validation that the cluster is online. The exercise assumes your SDK is setup properly for your environment. If your not sure then just use Cloud Shell.

1. Set environment variables as needed. (Configure these as your wish)

1a. Set your project

gcloud config set project myproject

1b. Remember to set zone or region

gcloud config set compute/zone us-east1-b

2. Enable API for containers.

#Note: If the API is not enabled in the project for containers run the following command.(This will take 3 plus minutes to come back)

gcloud services enable container.googleapis.com

3. Create the default cluster

by default, GKE deploys 3 standard nodes

gcloud container clusters create gkecluster1 --zone us-east1-b

#(Note: If the API is not enabled in the project for containers run the following command. This will take 3 plus minutes to come back)

gcloud services enable container.googleapis.com

4 Credentials need to be obtained so you can manage it locally through kubectl

Note this should come back with a Kubeconfig entry generated for....

gcloud container clusters get-credentials gkecluster1 --zone=us-east-b

5. Validate your Cluster is created.

#Note: This command will list not only the cluster your created but also any other clusters available.

gcloud container clusters list

6. Describe the cluster variables.

#Note: This command will provide extensive output on the configuration of your cluster.

gcloud container clusters describe gkecluster1 --zone us-east1-b

7. View the context of the cluster

kubectl config current-context

8. Resize the cluster from 3 nodes to 4 nodes.

#cluster size should work unless you reach a quota limit (Compute or API)

gcloud container clusters resize gkecluster1 --num-nodes 4 --zone us-east1-b

9. Validate the cluster has resized.

Note under “nodes” should be 4.

gcloud container clusters list

10. Delete the cluster

#Cluster should be deleted if not used to avoid additional charges.

gcloud container clusters delete gkecluster1 --zone=us-east1-b

11. Validate Cluster is now removed for GKE

gcloud container clusters list

END of Exercise 1

Exercise 2 - Create a Standard autoscaled cluster via Console and enable Stackdriver Monitoring.

In this exercise we want to create a new cluster that will be autoscaled with a minimum of 3 nodes and a maximum of 5 nodes. We also want to enable Stackdriver Monitoring.

Login to Cloud Console > Kubernetes Engine >> Select Standard Cluster

← Create a Kubernetes cluster

Cluster templates

Select a template with preconfigured setting, or customize a template to suit your needs

- ☐ Clone an existing cluster
Select one of your existing clusters to populate fields
- ☒ **Standard cluster**
Continuous integration, web serving, backends. Best choice for further customization or if you are not sure what to choose.
- ☐ Your first cluster
Experimenting with Kubernetes Engine, deploying your first application. Affordable choice to get started.

'Standard cluster' template (edited)

Continuous integration, web serving, backends. Best choice for further customization or if you are not sure what to choose.

Some fields can't be changed after the cluster is created. Hover over the help icons to learn more.

Dismiss

Name

standard-cluster-1

Location type

☒ Zonal
☐ Regional

Zone

us-central1-a

Master version

Try the new Release Channels feature instead of managing the master version directly.


Use Release Channels

Select "More Options"

We will need to scroll down under Machine Configuration to find the "More Options" selection

Machine type

n1-standard-1 (1 vCPU, 3.75 GB memory) ▼

	vCPU	Memory
	1	3.75 GB

⌵ CPU platform and GPU

Auto-upgrade: On

More options

Select Autoscaling and specify Minimum and Maximum nodes

Size

Number of nodes

3

☒ Enable autoscaling ?

Minimum number of nodes

3

Maximum number of nodes

5

Nodes

Image type ?

Container-Optimized OS (cos) (default)

Select Stackdriver Monitoring Legacy and then Select Create.

Legacy Stackdriver should be enabled so you can view in Stackdriver quickly.

Stackdriver

☒ Enable Stackdriver Kubernetes Engine Monitoring ?

Legacy Stackdriver

☒ Enable Legacy Stackdriver Monitoring service ?

☒ Enable Legacy Stackdriver Logging service ?

Additional features

☐ Enable Cloud TPU ?

☐ Enable Kubernetes alpha features in this cluster ?


Create

Reset

Equivalent [REST](#) or [command line](#)

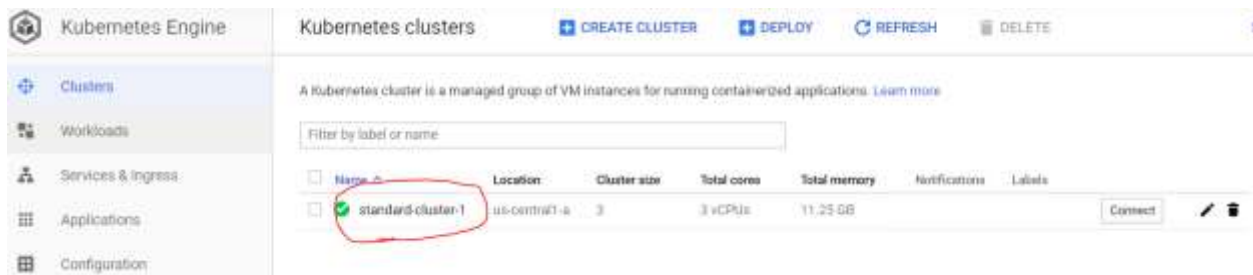
The creation process will bring you back to the Kubernetes Engine Dashboard and will show you the state of the cluster.

When the cluster is formed it will bring you show a green checkmark.



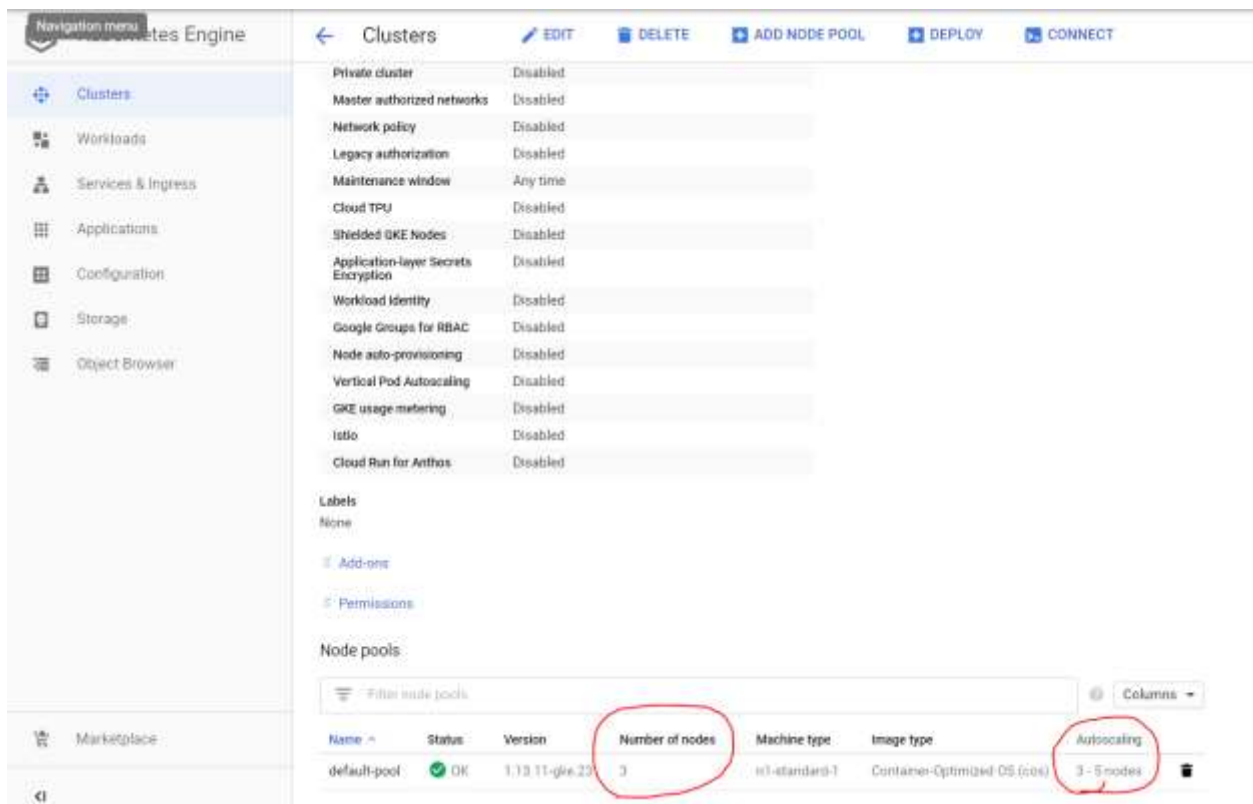
Kubernetes Engine							
Kubernetes clusters							
CREATE CLUSTER DEPLOY REFRESH DELETE							
A Kubernetes cluster is a managed group of VM instances for running containerized applications. Learn more							
Filter by label or name							
<input type="checkbox"/> Name	Location	Cluster size	Total cores	Total memory	Notifications	Labels	
<input checked="" type="checkbox"/> standard-cluster-1	us-central1-a	3	3 vCPUs	11.25 GB			Connect Edit Delete

Select the cluster that was just created by clicking the link.

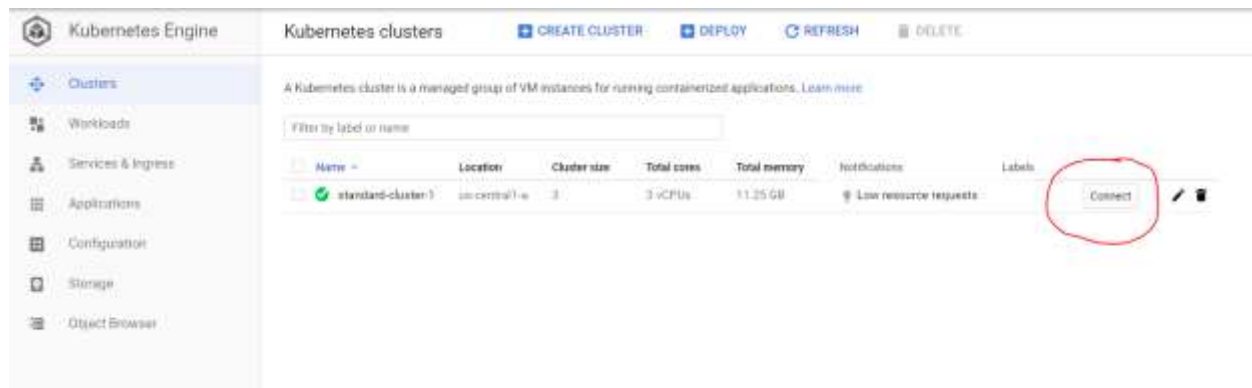


Next we need to verify the number nodes and review the configuration.

Validate Number of nodes and the autoscaling policy is set to 3-5 nodes.



Next, go back to previous menu by clicking the back arrow next to Clusters. We Will now connect to the cluster by selecting “Connect”



Select the “Run in Cloud Shell” button highlighted below to copy the command for use in Cloud Shell.

This will copy the command and bring up Cloud Shell at the same time

Connect to the cluster

You can connect to your cluster via command-line or using a dashboard.

Command-line access

Configure [kubectl](#) command line access by running the following command:

```
$ gcloud container clusters get-credentials standard-cluster-1 --zone us-central1-a --project gkeclass1
```

Run in Cloud Shell

Cloud Console dashboard

You can view the workloads running in your cluster in the Cloud Console [Workloads dashboard](#).

Open Workloads dashboard

OK

The Command has been pasted in the Cloud Shell. You will need to hit your enter button to proceed.

```
Welcome to Cloud Shell! Type "help" to get started.
Your Cloud Platform project in this session is set to gkeclass1.
Use "gcloud config set project [PROJECT ID]" to change to a different project.
jholbrook2019@cloudshell:~ (gkeclass1)$ gcloud container clusters get-credentials standard-cluster-1 --zone us-central1-a --project gkeclass1
```

The following output should be displayed about a kubeconfig being generated.

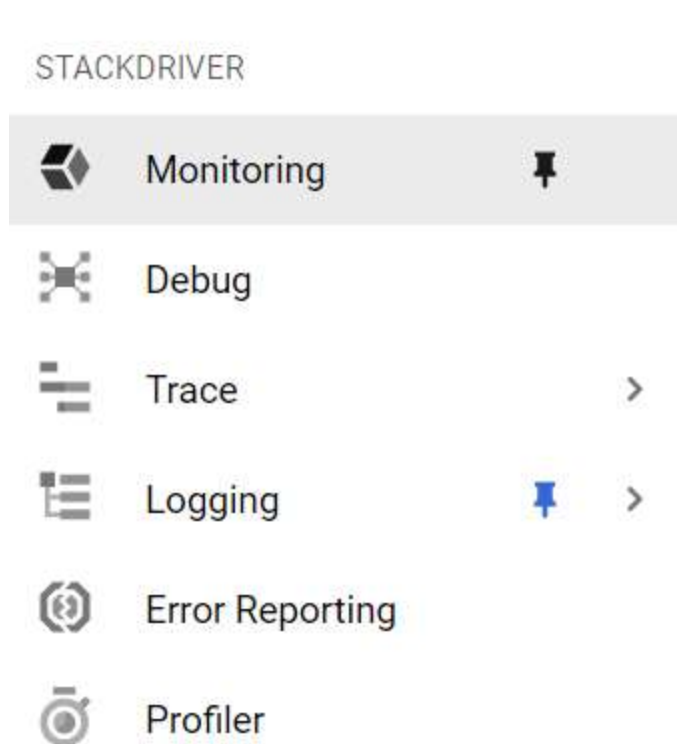
```
jholbrook2019@cloudshell:~ (gkeclass1)$ gcloud container clusters get-credentials standard-cluster-1 --zone us-central1-a --project gkeclass1
Fetching cluster endpoint and auth data.
kubeconfig entry generated for standard-cluster-1.
jholbrook2019@cloudshell:~ (gkeclass1)$
```

Feel free to run any of the previous exercise commands such as listing or describing clusters.

End of this Exercise.

Exercise Three - Stackdriver Monitoring

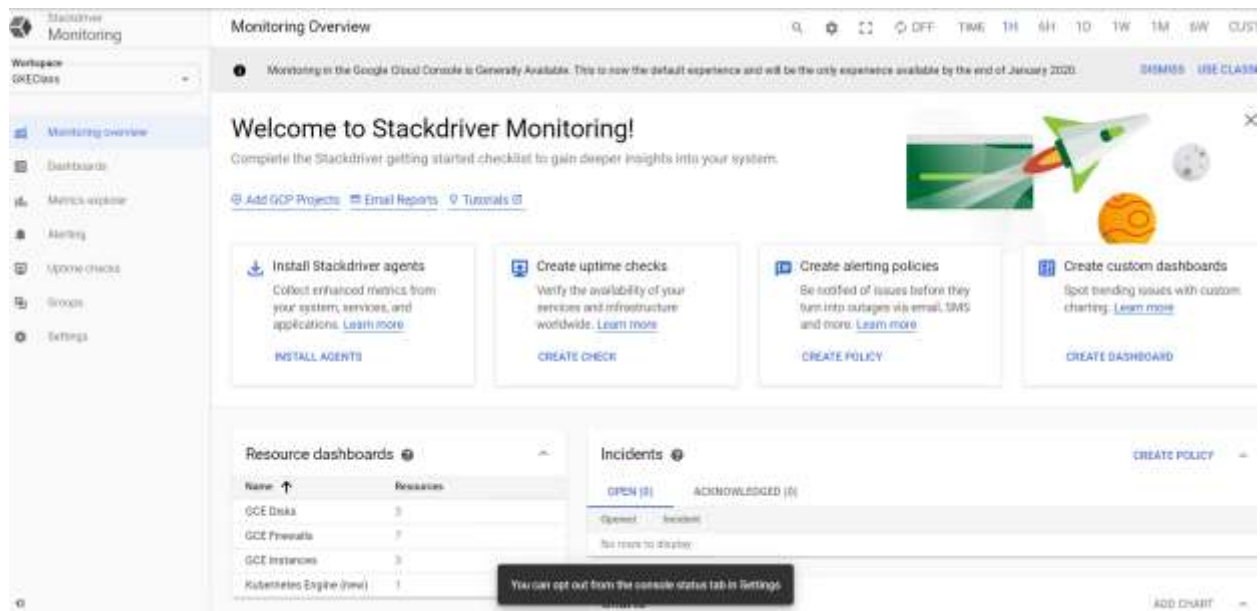
We want to validate the cluster we created shows up in Stackdriver and view the nodes in the cluster.



The first time you login to Stackdriver you will receive the following notice and will close once Stackdriver ready.



Next we want to proceed to the following menu once available.



You can view the cluster below by selecting the drop down arrow.

INFRASTRUCTURE WORKLOADS SERVICES									
Name	Type	Ready	Incidents	CPU Utilization		Memory Utilization			
<div> <div></div> <div>kubecluster1</div> </div>	Cluster	22 ✓	0 ✓	3.00	4.59%	11 GiB	24.75%		
<div> <div></div> <div>gke-kubecluster1-default-pool-3562ff67-85b3</div> </div>	Node	8 ✓	0 ✓	1.00	4.86%	3.6 GiB	18.41%		
<div> <div></div> <div>gke-kubecluster1-default-pool-3562ff67-ghrv</div> </div>	Node	8 ✓	0 ✓	1.00	5.07%	3.6 GiB	22.24%		
<div> <div></div> <div>gke-kubecluster1-default-pool-3562ff67-svfb</div> </div>	Node	6 ✓	0 ✓	1.00	3.79%	3.6 GiB	35.89%		

You can view additional information by selecting the additional node arrows.

For the purpose of this short course we end this exercise.