

LAB 2.2

Create a VM without public ip then:

- SSH into this vm and update system packages.

```
sudo apt update && sudo apt upgrade -y
```

- Setup Nginx Web Server and test your setup.

```
sudo apt install nginx -y  
sudo systemctl enable --now nginx
```

Filter Enter property name or value

<input type="checkbox"/>	Status	Name ↑	Zone	Recommendations	In use by	Internal IP	External IP	Connect
<input type="checkbox"/>	✓	vm-noip	us-east1-b			10.0.1.4 (nic0)		SSH ▾

The screenshot shows a terminal window titled "SSH-in-browser" with the following content:

```
Welcome to Ubuntu 22.04 LTS (GNU/Linux 5.15.0-1010-gcp x86_64)  
  
* Documentation:  https://help.ubuntu.com  
* Management:    https://landscape.canonical.com  
* Support:        https://ubuntu.com/advantage  
  
System information as of Fri Jun 24 12:57:29 UTC 2022  
  
System load:  0.0048828125   Processes:      102  
Usage of /:   18.2% of 9.52GB   Users logged in: 1  
Memory usage: 11%           IPv4 address for ens4: 10.0.1.4  
Swap usage:   0%  
  
0 updates can be applied immediately.  
  
Last login: Fri Jun 24 12:55:05 2022 from 35.235.240.64  
mohamedanwer006@vm-noip:~$  
mohamedanwer006@vm-noip:~$  
mohamedanwer006@vm-noip:~$  
mohamedanwer006@vm-noip:~$  
mohamedanwer006@vm-noip:~$ sudo apt update  
Hit:1 http://us-east1.gce.archive.ubuntu.com/ubuntu jammy InRelease  
Get:2 http://us-east1.gce.archive.ubuntu.com/ubuntu jammy-updates InRelease [109 kB]  
Get:3 http://us-east1.gce.archive.ubuntu.com/ubuntu jammy-backports InRelease [99.8 kB]  
Get:4 http://security.ubuntu.com/ubuntu jammy-security InRelease [110 kB]  
Get:5 http://us-east1.gce.archive.ubuntu.com/ubuntu jammy/universe amd64 Packages [14.1 MB]  
Get:6 http://us-east1.gce.archive.ubuntu.com/ubuntu jammy/universe Translation-en [5652 kB]  
Get:7 http://us-east1.gce.archive.ubuntu.com/ubuntu jammy/universe amd64 c-n-f Metadata [286 kB]  
Get:8 http://us-east1.gce.archive.ubuntu.com/ubuntu jammy/multiverse amd64 Packages [217 kB]  
Get:9 http://us-east1.gce.archive.ubuntu.com/ubuntu jammy/multiverse Translation-en [112 kB]  
Get:10 http://us-east1.gce.archive.ubuntu.com/ubuntu jammy/multiverse amd64 c-n-f Metadata [8372 B]  
Get:11 http://us-east1.gce.archive.ubuntu.com/ubuntu jammy-updates/main amd64 Packages [323 kB]  
Get:12 http://us-east1.gce.archive.ubuntu.com/ubuntu jammy-updates/main Translation-en [78.1 kB]  
Get:13 http://us-east1.gce.archive.ubuntu.com/ubuntu jammy-updates/main amd64 c-n-f Metadata [5552 B]  
Get:14 http://us-east1.gce.archive.ubuntu.com/ubuntu jammy-updates/restricted amd64 Packages [194 kB]
```

```

% Committed us
Migrate for Co
Storage
Marketplace
Release Note
<|

mohamedanwer006@vm-noip:~$ sudo echo "<h1>Welcome t0 ITI </h1> <h2> mohamed anwar</h2>" > /var/www/html/index.h
tml
-bash: /var/www/html/index.html: Permission denied
mohamedanwer006@vm-noip:~$ sudo echo "<h1>Welcome t0 ITI </h1> <h2> mohamed anwar</h2>" > /var/www/html/index.h
tml
-bash: /var/www/html/index.html: Permission denied
mohamedanwer006@vm-noip:~$ sudo su
root@vm-noip:/home/mohamedanwer006# echo "<h1>Welcome t0 ITI </h1> <h2> mohamed anwar</h2>" > /var/www/html/ind
ex.html
root@vm-noip:/home/mohamedanwer006# exit
exit
mohamedanwer006@vm-noip:~$ curl localhost
<h1>Welcome t0 ITI </h1> <h2> mohamed anwar</h2>
mohamedanwer006@vm-noip:~$

```

- Create a custom image from this VM named "custom-img-nginx".

Images [\[+\] CREATE IMAGE](#) [REFRESH](#) [DELETE](#) [HELP ASSISTANT](#) [SHOW INFO PANEL](#) [LEA](#)

An image is a replica of a disk that contains the applications and operating system needed to start a VM. You can create custom images or use public images pre-configured with Linux or Windows OSes. [Learn more](#)

[IMAGES](#) [IMAGE IMPORT HISTORY](#) [IMAGE EXPORT HISTORY](#)

[Filter](#) Enter property name or value [?](#) [Show deprecated images](#) [III](#)

<input type="checkbox"/>	Status	Name	Location	Archive size ?	Disk size	Created by	Family	Creation time	Actions
<input type="checkbox"/>	✓	image-1	us	987.11 MB	10 GB	stellar-river-354117		Jun 24, 2022, 3:41:14 PM UTC+02:00	⋮
<input type="checkbox"/>	✓	c0-deeplearning-common-cpu-v20220526-debian-10	asia, eu, us	—	50 GB	Debian	common-cpu-debian-10	May 26, 2022, 8:26:00 PM UTC+02:00	⋮

3.Create MIG (min 3 and max 5) of a template using the custom image "custom-img-nginx".

[Filter](#) Enter property name or value [?](#) [III](#)

<input type="checkbox"/>	Status	Name	Instances	Template	Group type	Creation time	Recommendation	Autoscaling	Zone
<input type="checkbox"/>	✓	mig-nginx	3	nginx-templates	Managed	Jun 24, 2022, 7:57:00 PM UTC+02:00		On: Target CPU utilization 60%	us-east1-b

[Filter](#) Enter property name or value [?](#)

<input type="checkbox"/>	Status	Name	Zone	Recommendations	In use by	Internal IP	External IP	Connect	
<input type="checkbox"/>	✓	mig-nginx-2v0x	us-east1-b		mig-nginx	10.0.1.8 (nic0)		SSH	⋮
<input type="checkbox"/>	✓	mig-nginx-fw9d	us-east1-b		mig-nginx	10.0.1.7 (nic0)		SSH	⋮
<input type="checkbox"/>	✓	mig-nginx-z51d	us-east1-b		mig-nginx	10.0.1.6 (nic0)		SSH	⋮

4.Create a Global (or Regional) HTTP Load balancer to access your MIGs Nginx setup.

load balancer

Anwer-gcp Search Products, resources, docs (/)

Load balancer details EDIT DELETE

Ip-nginx

Faster web performance and improved web protection with Cloud CDN and Cloud Armor. [Learn more](#)

DETAILS MONITORING CACHING

Frontend

Protocol ↑	IP:Port	Certificate	SSL Policy	Network Tier ?
HTTP	34.149.14.21:80	-		Premium

Routing rules

Hosts ↑	Paths	Backend
All unmatched (default)	All unmatched (default)	Ip-backend

Backend

Backend services

Firewall rules

<input type="checkbox"/>	Name	Type	Targets	Filters	Protocols / ports	Action	Network ↑	Logs	Hit count ?	
<input type="checkbox"/>	my-custom-f	Ingress	Apply to all	IP ranges: 0.0.0.0/0	tcp:22, 80, 443	Allow	custom-vpc	Off	—	

Load balancer details - Ne X 34.149.14.21 X Speed Dial X | +

< > ↺ [VPN] ⚠ Not secure http://34.149.14.21/

ITI cloud K8S ask partitioning - Chan... https://www.yout... MichaelCade/90Da... EX200 Exam - Fre...

Welcome to ITI

mohamed anwar

5. Try to configure IAP at the load balancer level to protect your ingress access. Is it possible to have IAP enabled for HTTP resources?

← Configuration REFRESH

Backend service ip-backend

Your settings need to meet the IAP [configuration requirements](#) . Use the [tutorial](#) to review the issues below, and update your configuration.

Your firewall is incompatible with the load balancer

To use the HTTPS load balancer, add the following firewall rule to allow traffic from the load balancer to the backend service ip-backend.

Source IP range130.211.0.0/22, 35.191.0.0/16

Allowed protocols and portstcp:80

! Add the above rule to correct this error

EDIT FIREWALL

Some IPs can bypass IAP

The following firewall rules allow some IP addresses to bypass IAP's access controls and connect directly to backend service ip-backend.

Anwer-gcp

Search Products, resources, docs (/)

5 ?

Identity-Aware Proxy

+ ON-PREM CONNECTORS SETUP

Premium

SHOW IT

Identity-Aware Proxy (IAP) lets you manage who has access to services hosted on App Engine, Compute Engine, or an HTTPS Load Balancer. [Learn more](#)

To get started with IAP, add an [App Engine app](#), a [Compute Engine instance](#) or configure an [HTTPS Load Balancer](#) .

HTTPS RESOURCES

SSH AND TCP RESOURCES

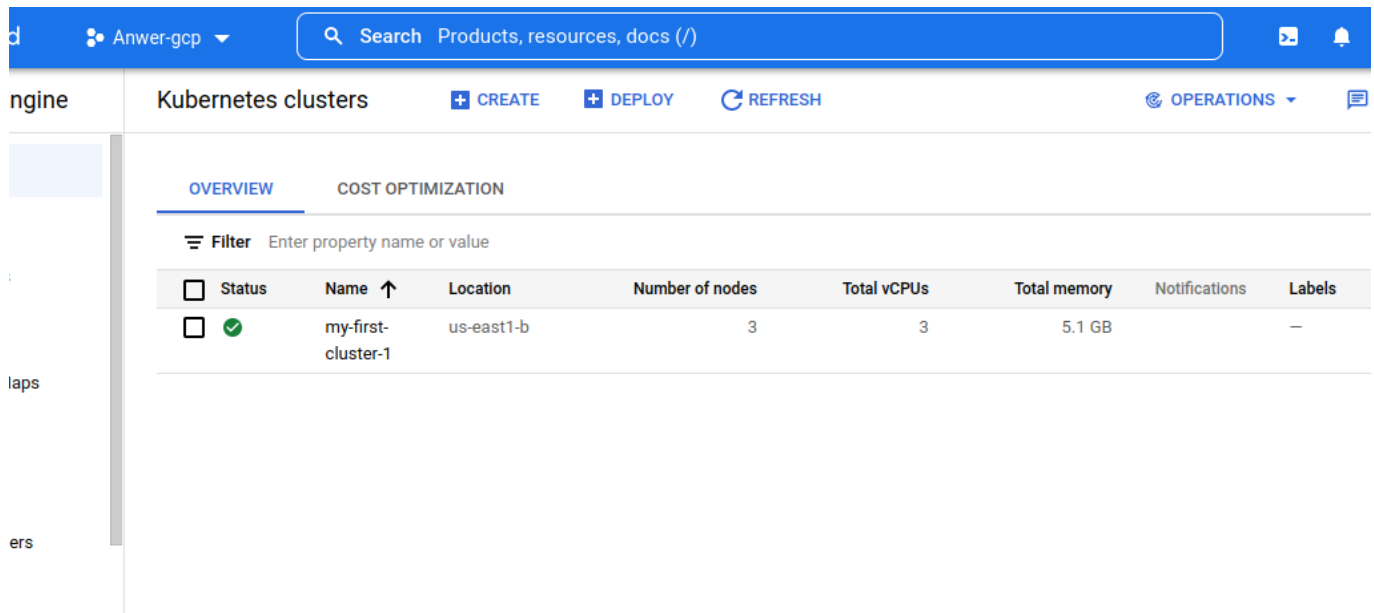
Filter Enter property name or value

<input type="checkbox"/>	Resource	IAP ?	Method	Published ?	Status ?	
<input type="checkbox"/>	▼ All Web Services					
<input type="checkbox"/>	▼ Backend Services ?					
<input type="checkbox"/>	ip-backend	<input checked="" type="checkbox"/>	IAM	Global HTTP(S) Load Balancer: ip-nginx	✓ OK	⋮

Lab 3.1

1.Create a private GKE cluster.

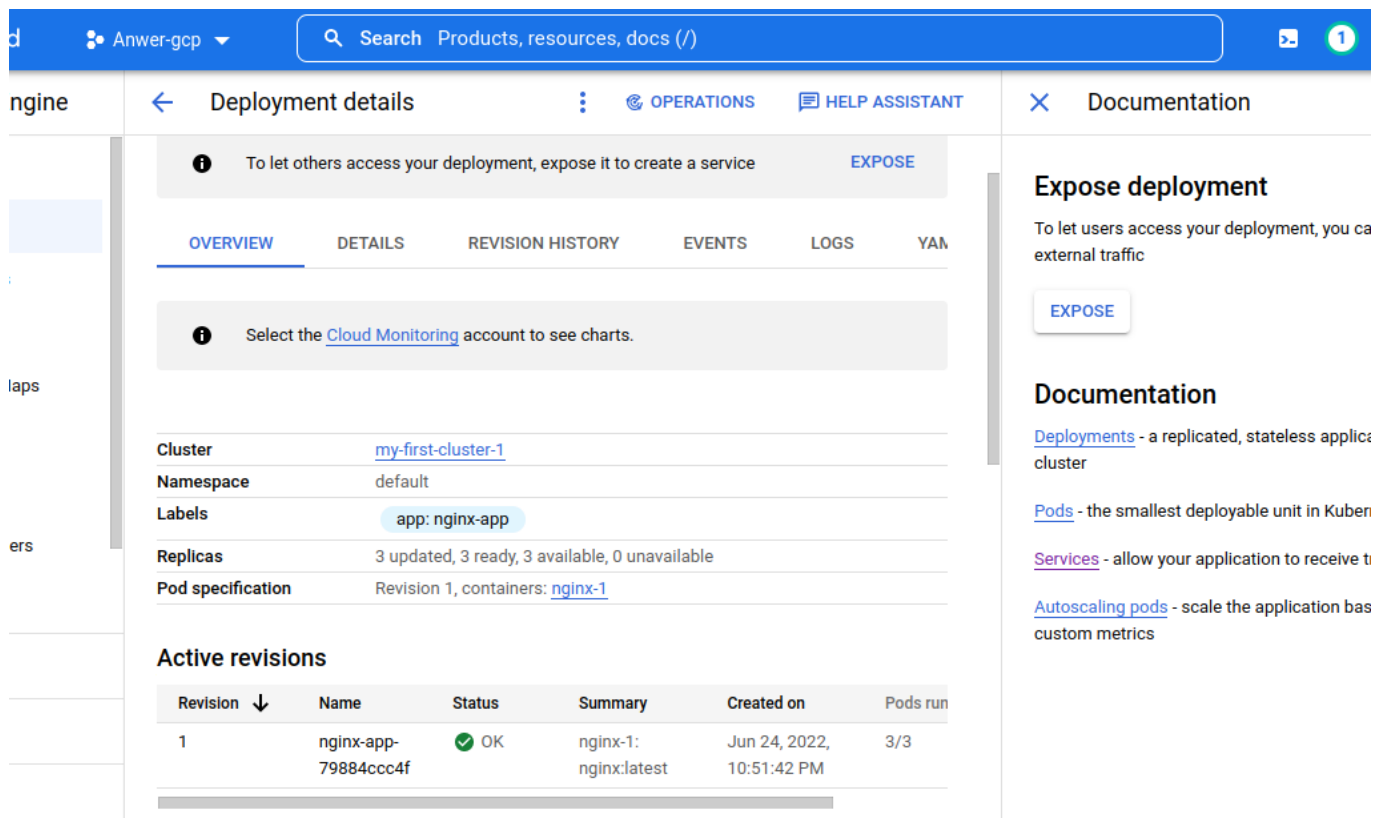
4 / 8



Google Cloud Platform console showing the Kubernetes clusters page. The 'Overview' tab is selected, displaying a table with one cluster named 'my-first-cluster-1' in the 'us-east1-b' location, with 3 nodes, 3 vCPUs, and 5.1 GB of memory. The cluster status is 'OK'.

Status	Name	Location	Number of nodes	Total vCPUs	Total memory	Notifications	Labels
OK	my-first-cluster-1	us-east1-b	3	3	5.1 GB		

2. Deploy Nginx as a deployment using latest Nginx docker image on Docker Hub.



Google Cloud Platform console showing the 'Deployment details' page for a deployment named 'nginx-app-79884ccc4f'. The 'Overview' tab is selected, showing details like Cluster (my-first-cluster-1), Namespace (default), Labels (app: nginx-app), Replicas (3 updated, 3 ready, 3 available, 0 unavailable), and Pod specification (Revision 1, containers: nginx-1). The 'Active revisions' table shows one revision with status 'OK'.

Revision	Name	Status	Summary	Created on	Pods run
1	nginx-app-79884ccc4f	OK	nginx-1: nginx:latest	Jun 24, 2022, 10:51:42 PM	3/3

3. Expose your Nginx deployment using Kubernetes LoadBalancer Service.

The screenshot shows a Kubernetes dashboard interface. On the left, there is a sidebar with a search bar and a list of resources. The main panel displays details for a Load Balancer service named 'nginx-app' in the 'default' namespace. The 'Type' is 'LoadBalancer' and the 'External endpoints' are '34.139.186.173:80'. Below this, the 'Load Balancer' section shows the 'Cluster IP' as '10.172.14.50', the 'Load balancer IP' as '34.139.186.173', and the 'Load balancer' as 'abb38545146aa4144a8ec2e2695d8b24'. The 'Deployments' section shows a table with one deployment named 'nginx-app' in a 'Running' state with 3/3 pods.

Cluster	my-first-cluster-1
Namespace	default
Labels	app: nginx-app
Type	LoadBalancer
External endpoints	34.139.186.173:80

Load Balancer

Cluster IP	10.172.14.50
Load balancer IP	34.139.186.173
Load balancer	abb38545146aa4144a8ec2e2695d8b24

Deployments

Name	Status	Pods
nginx-app	OK	3/3

Below the dashboard, a browser window shows the nginx welcome page at <http://34.139.186.173/>. The page has a dark background with the text 'Welcome to nginx!' in large white letters. Below this, it says 'If you see this page, the nginx web server is successfully installed and working. Further configuration is required.' and 'For online documentation and support please refer to nginx.org. Commercial support is available at nginx.com. Thank you for using nginx.'

4.What is the type of GCP Load Balancer that is created for your LB service?

Network (target pool-based)

5.Use kubectl to view container logs.

```

mohamed@DevOps:~$ kubectl logs nginx-app-79884ccc4f-cvjwl
/docker-entrypoint.sh: /docker-entrypoint.d/ is not empty, will attempt to perform configuration
/docker-entrypoint.sh: Looking for shell scripts in /docker-entrypoint.d/
/docker-entrypoint.sh: Launching /docker-entrypoint.d/10-listen-on-ipv6-by-default.sh
10-listen-on-ipv6-by-default.sh: info: Getting the checksum of /etc/nginx/conf.d/default.conf
10-listen-on-ipv6-by-default.sh: info: Enabled listen on IPv6 in /etc/nginx/conf.d/default.conf
/docker-entrypoint.sh: Launching /docker-entrypoint.d/20-envsubst-on-templates.sh
/docker-entrypoint.sh: Launching /docker-entrypoint.d/30-tune-worker-processes.sh
/docker-entrypoint.sh: Configuration complete; ready for start up
2022/06/24 20:51:50 [notice] #1: using the "epoll" event method
2022/06/24 20:51:50 [notice] #1: nginx/1.23.0
2022/06/24 20:51:50 [notice] #1: built by gcc 10.2.1 20210110 (Debian 10.2.1-6)
2022/06/24 20:51:50 [notice] #1: OS: Linux 5.10.109+
2022/06/24 20:51:50 [notice] #1: getrlimit(RLIMIT_NOFILE): 1048576:1048576
2022/06/24 20:51:50 [notice] #1: start worker processes
2022/06/24 20:51:50 [notice] #1: start worker process 31
10.0.1.9 - - [24/Jun/2022:20:58:09 +0000] "GET / HTTP/1.1" 200 615 "-" "Mozilla/5.0 (X11; Linux x86_64) AppleWebKit/537.36 (KHTML, like Gecko) Ch
53" "-"
2022/06/24 20:58:11 [error] 31#31: *1 open() "/usr/share/nginx/html/favicon.ico" failed (2: No such file or directory), client: 10.0.1.9, server:
, host: "34.139.186.173", referer: "http://34.139.186.173/"
10.0.1.9 - - [24/Jun/2022:20:58:11 +0000] "GET /favicon.ico HTTP/1.1" 404 555 "http://34.139.186.173/" "Mozilla/5.0 (X11; Linux x86_64) AppleWebK
115 Safari/537.36 OPR/88.0.4412.53" "-"
10.0.1.9 - - [24/Jun/2022:21:39:29 +0000] "GET / HTTP/1.0" 200 615 "-" "masscan/1.3 (https://github.com/robertdavidgraham/masscan)" "-"
2022/06/24 22:20:49 [error] 31#31: *4 open() "/usr/share/nginx/html/config/getuser" failed (2: No such file or directory), client: 10.0.1.11, ser
dex=0 HTTP/1.1", host: "34.139.186.173:80"
10.0.1.11 - - [24/Jun/2022:22:20:49 +0000] "GET /config/getuser?index=0 HTTP/1.1" 404 153 "-" "Mozilla/5.0 (X11; Ubuntu; Linux x86_64; rv:76.0) G
10.0.1.9 - - [24/Jun/2022:22:24:28 +0000] "GET / HTTP/1.1" 200 615 "-" "python-requests/2.28.0" "-"

```

6. Use cloud logging service to view container logs. [hint: search about cloud logging service for gke]

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Query Recent (13) Saved (0) Suggested (9) Library [Clear query](#) [Save](#) [Stream logs](#) [Run query](#)

[Last 1 hour](#) [Kubernetes Container](#) [stdout](#) [Severity](#) [Show query](#)

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[SEVERITY](#)

[Info](#) 13

[LOG NAME](#)

[stdout](#) [Clear x](#)

[PROJECT ID](#)

[stellar-river-354117](#) 13

[LOCATION](#)

[Histogram](#)

[Jun 24, 11:58 PM](#) [12:30 AM](#) [Jun 25, 12:59 AM](#)

[Query results](#) 13 log entries [Download](#) [Edit](#)

SEVERITY	TIMESTAMP	EET	SUMMARY	EDIT
> i	2022-06-25 00:38:04.341 EET	nginx-1	10.0.1.9 - - [24/Jun/2022:22:38:04 +0000] "GET / HTTP/1.0" 200 615 "-" "massc-	Edit
> i	2022-06-25 00:39:10.312 EET	nginx-1	10.0.1.11 - - [24/Jun/2022:22:39:10 +0000] "\x03\x00\x00/*\x00\x00\x00\x00\x00Cooki-	Edit
> i	2022-06-25 00:44:43.520 EET	nginx-1	10.0.1.9 - - [24/Jun/2022:22:44:43 +0000] "GET / HTTP/1.1" 200 615 "-" "Mozilla/5.0 (X1-	Edit
> i	2022-06-25 00:44:45.939 EET	nginx-1	10.0.1.9 - - [24/Jun/2022:22:44:45 +0000] "GET / HTTP/1.1" 304 0 "-" "Mozilla/5.0 (X11;-	Edit
> i	2022-06-25 00:49:45.147 EET	nginx-1	10.0.1.9 - - [24/Jun/2022:22:49:45 +0000] "GET / HTTP/1.1" 304 0 "-" "Mozilla/5.0 (X11;-	Edit
> i	2022-06-25 00:49:46.719 EET	nginx-1	10.0.1.9 - - [24/Jun/2022:22:49:46 +0000] "GET / HTTP/1.1" 304 0 "-" "Mozilla/5.0 (X11;-	Edit
> i	2022-06-25 00:49:47.641 EET	nginx-1	10.0.1.9 - - [24/Jun/2022:22:49:47 +0000] "GET / HTTP/1.1" 200 615 "-" "Mozilla/5.0 (X1-	Edit
> i	2022-06-25 00:49:53.337 EET	nginx-1	10.0.1.9 - - [24/Jun/2022:22:49:53 +0000] "GET / HTTP/1.1" 200 615 "-" "Mozilla/5.0 (X1-	Edit

[To view more results, expand the time range for this query.](#) [Extend time by 1 hour](#) [Edit time](#)

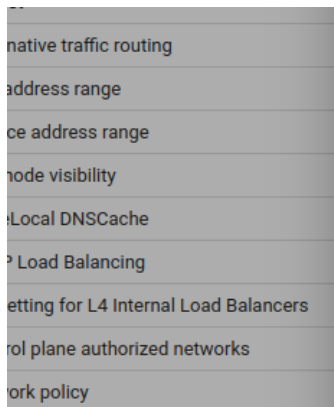
8. Create an autopilot GKE cluster with public control plane.

[OVERVIEW](#) [COST OPTIMIZATION](#)

[Filter](#) Enter property name or value

<input type="checkbox"/>	Status	Name ↑	Location	Mode	Number of nodes	Total vCPUs	Total memory	Notific
<input checked="" type="checkbox"/>	✓	autopilot-cluster-1	us-east1	Autopilot		0	0 GB	

9. Enforce the cluster's control plane to accept only connections from your local machine.



New authorized network

Name

Example: Corporate Office

Network *

154.183.85.246/32

Use [CIDR notation](#). Example: 198.51.100.0/24

CANCEL DONE

10. Install kubectl on local machine and use it to connect to the cluster.

```

mohamed@DevOps:~$ gcloud container clusters get-credentials autopilot-cluster-1 --zone us-east1
Fetching cluster endpoint and auth data.
kubeconfig entry generated for autopilot-cluster-1.

mohamed@DevOps:~$ kubectl get config
error: the server doesn't have a resource type "config".

mohamed@DevOps:~$ kubectl get po
No resources found in default namespace.

mohamed@DevOps:~$ kubectl get ns
NAME                STATUS    AGE
default             Active   11m
kube-node-lease     Active   11m
kube-public         Active   11m
kube-system         Active   11m

mohamed@DevOps:~$

```

10. Install kubectl on local machine and use it to connect