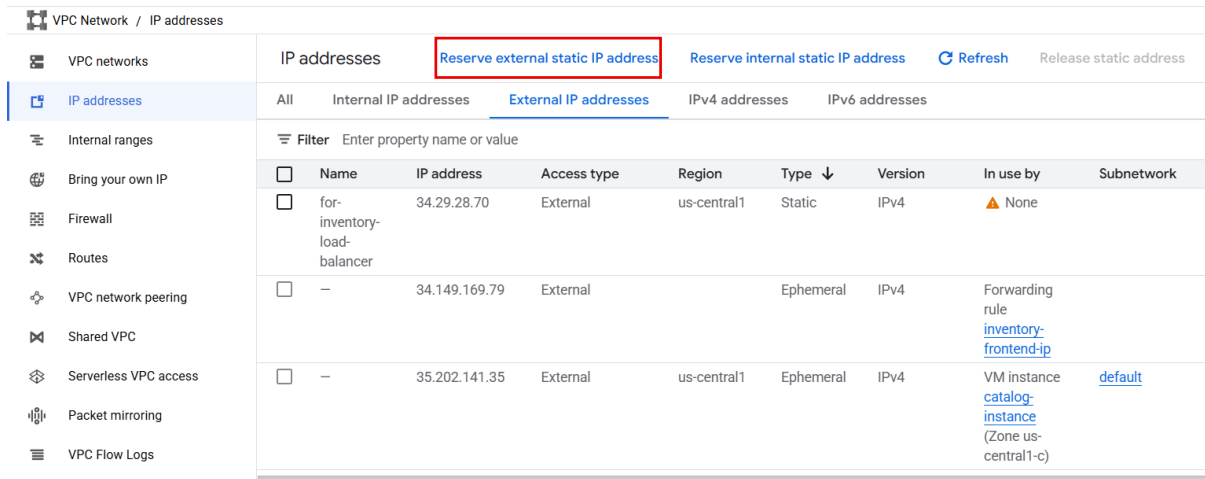


Connecting Catalog VM to Load Balancer

1. To work with this lab, first, you need to have a Virtual Machine on which the Catalog application should be running.
2. Now, if you don't know or remember how to provision it, then you can refer to **Module 2: Compute, Lab 6: Publish catalog app**.
3. Once you are done setting up your VM, then you need to go to VPC and there you are going to reserve an External static IP address.
4. Go to IP addresses and click on Reserve external static IP address.



VPC Network / IP addresses

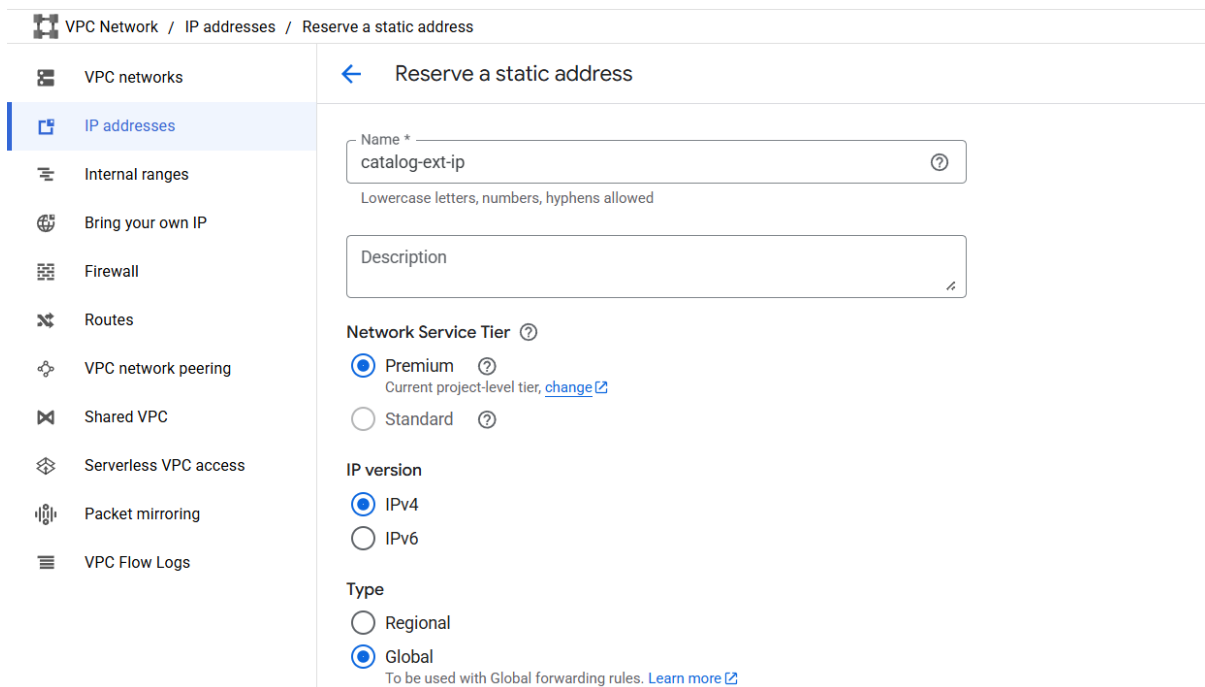
IP addresses [Reserve external static IP address](#) [Reserve internal static IP address](#) [Refresh](#) [Release static address](#)

All Internal IP addresses External IP addresses IPv4 addresses IPv6 addresses

Filter Enter property name or value

<input type="checkbox"/>	Name	IP address	Access type	Region	Type ↓	Version	In use by	Subnetwork
<input type="checkbox"/>	for-inventory-load-balancer	34.29.28.70	External	us-central1	Static	IPv4	None	
<input type="checkbox"/>	—	34.149.169.79	External		Ephemeral	IPv4	Forwarding rule inventory-frontend-ip	
<input type="checkbox"/>	—	35.202.141.35	External	us-central1	Ephemeral	IPv4	VM instance catalog-instance (Zone us-central1-c)	default

5. Here you need to give it a name, choose network service tier as Premium and choose Global as your region type then just click on Reserve.



VPC Network / IP addresses / Reserve a static address

← Reserve a static address

Name *
catalog-ext-ip ?
Lowercase letters, numbers, hyphens allowed

Description

Network Service Tier ?
☒ Premium ?
Current project-level tier, [change](#)
☐ Standard ?

IP version
☒ IPv4
☐ IPv6

Type
☐ Regional
☒ Global
To be used with Global forwarding rules. [Learn more](#)

6. After that, search for **Network Endpoint Group** and navigate to it. Here you will see that you already have one endpoint.

7. This was created when you launched your first Load Balancer in the last lab. Now we are going to create a new one for our Virtual Machine. Click on Create Network endpoint group.

Network endpoint group							
Create network endpoint group Refresh Delete							
Filter Enter property name or value							
<input type="checkbox"/>	Name ↑	Type	Network endpoints	Scope	Subnet	VPC network	In use by
<input type="checkbox"/>	inventory-serverless-network-endpoint-group	Serverless NEG	0	Regional (us-central1)	N/A	N/A	inventory-backend- ▼

8. First, you need to give it a name then for Network endpoint group type choose Zonal NEG. For the endpoint type, choose GCE_VM_IP_PORT, the network should be the default, and for the subnetwork, go to your VM and look for the region and zone where your VM is created in.
9. In the end, just create your network endpoints.

Compute Engine

Overview

Security risk overview

Virtual machines

Migrate to Virtual Machin...

VM instances

Instance templates

Sole-tenant nodes

Machine images

TPUs

Committed use discounts

Reservations

Storage

Marketplace

Release Notes

Create a network endpoint group

You can create a serverless NEG when [creating an HTTP\(S\) Load Balancer](#) .

Name *

catalog-neg

Lowercase letters, numbers, hyphens allowed

Network endpoint group type

Zonal NEG

Endpoints type

GCE_VM_IP_PORT

Network *

default

Subnetwork *

default (10.128.0.0/20, us-central1)

Zone *

us-central1-c

Zone is permanent

Default port *

8080

Network endpoints

You can add network endpoints after you create the network endpoint group

Create

Cancel

10. Here you can see that our Network endpoint group is created but it is empty as of now we are manually going to add network to it. So, click on it and go inside of it.

Network endpoint group							
Create network endpoint group Refresh Delete							
Filter Enter property name or value							
<input type="checkbox"/>	Name ↑	Type	Network endpoints	Scope	Subnet	VPC network	In use by
<input type="checkbox"/>	catalog-neg	Zonal NEG	0	Zonal (us-central1-c)	default	default	
<input type="checkbox"/>	inventory-serverless-network-endpoint-group	Serverless NEG	0	Regional (us-central1)	N/A	N/A	inventory-backend ▼

11. Now you need to click on Add network endpoint.

[←](#)
Network endpoint group details
[Delete](#)

catalog-neg

Network endpoints	0
Network endpoint group type	Network Endpoint Group (Zonal)
Network endpoints type	GCE_VM_IP
Scope	Zonal (us-central1-c)
Subnet	default
In use by	Not used yet
Creation time	May 20, 2025, 1:48:40 PM UTC+05:30

Network endpoints in this group

Network endpoints represent your services (applications, load balancing) and diverse infrastructure (VM instances, containers etc) in a standard manner regardless of their location. [Learn more](#)

Add network endpoint

Remove endpoint

Filter Filter by instance, IP or port

<input type="checkbox"/>	IP address	Host VM
No rows to display		

[Equivalent REST](#)

12. Then you need to choose your VM from the list. If you only have one VM running, then you will find only one. Also, because we created our endpoint group in the same region and zone as our VM.

13. Select it and click on create.

You are adding a network endpoint to the network endpoint group catalog-neg
(Zone: us-central1-c, Subnet: default)

VM Instance *
catalog-instance

Add instance's internal IP addresses as network endpoints

Network Interface

Name	nic0
Zone	us-central1-c
Subnet	default

✓ Check primary IP addresses & alias IP range in 'nic0'



Use Google Container Engine (GKE) to deploy your application. NEGs and HTTP(S) load balancer will be created automatically. [Learn more](#)



Create

Cancel

Equivalent command line

Equivalent REST

- Our prerequisite is done, and now we are going to create our **Load Balancer**. Using the search bar, navigate to the load balancer.
- Here you can see your previous Load balancer as well but we need to create a new one. So, click on Create load balancer.

Load balancing [+ Create load balancer](#) [Refresh](#) [Delete](#) [Learn](#)

[Load balancers](#) [Backends](#) [Frontends](#) [Service LB policies](#)

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

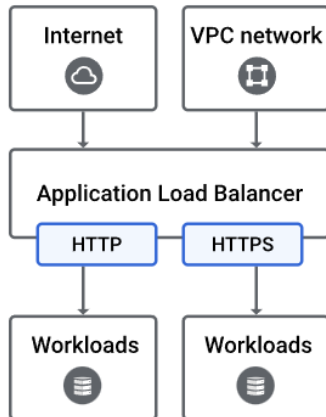
Filter Enter property name or value

<input type="checkbox"/>	Name	Load balancer type	Access type	Protocols	Region	Backends	Actions
<input type="checkbox"/>	inventory-demo-load-balancer	Application	External	HTTP		✓ 1 backend service (0 instance groups, 1 network endpoint group)	⋮

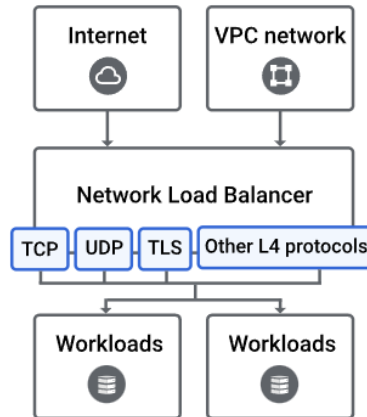
- Now for the type choose Application Load Balancer and keep all other settings to default. Just click on configure.

1 Type of load balancer

- ☒ **Application Load Balancer (HTTP/HTTPS)**
Choose an Application Load Balancer when you need a flexible feature set for your applications with HTTP and HTTPS traffic.



- ☐ **Network Load Balancer (TCP/UDP/SSL)**
Choose a Network Load Balancer when you need TLS offloading at scale, support for UDP, and exposing IP addresses to your applications.



Next

17. In the next step, first give a name to your load balancer, then give a name to the frontend IP and port.

18. After that you need to choose Protocol as HTTP, in the IP version IPv4 and for the IP address choose the catalog external IP which we create earlier.

Load Balancer name *
catalog-load-balancer

Lowercase, no spaces.

☒ Frontend configuration

☐ Backend configuration

☐ Routing rules

☐ Review and finalize (optional)

New Frontend IP and port

Name
catalog-frontend-ip

Lowercase, no spaces.

Description

Protocol
HTTP

Select HTTPS to support clients that support HTTP/2. The load balancer automatically offers HTTP/2 as part of the TLS handshake.

Network Service Tier
Premium

Global HTTP(S) load balancing only supports the Premium Network Service tier.
[Learn more](#)

IP version
IPv4

IP address
catalog-ext-ip

Port *
80

Application load balancing supports all TCP ports. [Learn more](#)

19. Now move to the backend configuration, and here you need to create a backend service.

← Create global external Application Load Balancer

Load Balancer name *
catalog-load-balancer ⓘ
Lowercase, no spaces.

Frontend configuration

Backend configuration

Routing rules

Review and finalize (optional)

Backend configuration

Create or select a backend service for incoming traffic. You can add multiple backend services and backend buckets to serve different types of content.

Backend services & backend buckets

Filter |Type to filter

☐ inventory-backend-service

Backend service

Create a backend service

Create a backend bucket

Cancel OK

20. First, we will give a name to our backend service, then for the backend type choose Zonal network endpoint group.

Name *
catalog-backend-service ⓘ
Lowercase, no spaces.

Description

Backend type
Zonal network endpoint group ▼

Protocol
HTTP ▼ ⓘ

Timeout *
30 seconds ⓘ

IP address selection policy
Only IPv4 ▼ ⓘ

21. Now we are going to choose our **Network Endpoint Group** as you can see below.

Backends

Regions

us-central1

^

New backend

Network endpoint group *

catalog-neg-2

Balancing mode ?

☒ Rate

☐ Custom metrics

Maximum RPS *

50

RPS

Scope

per endpoint

Capacity *

100

% ?

Backend preference level

None ?

22. We also need to disable the Cloud CDN service.

Cloud CDN ?

☐ Enable Cloud CDN



Cloud CDN is a paid product that accelerates web content and applications. [Learn more about features and pricing.](#)

23. We need to create a health check for that click on create a health check. It will open a new pane.

Health check *

Filter Type to filter

No matches for ""

Create a health check

24. Give a name to the health check and for the protocol choose HTTP then for the port type 8080 (because on this port our catalog app is running), then just scroll down to bottom.

Name *
catalog-health-check

Lowercase, no spaces.

Description

Protocol
HTTP

Port *
8080

Port specification
Fixed port

Proxy protocol
NONE

Request path *
/

25. For the health criteria, give the same as you can see below in the snapshot. Click on create.

Health criteria

Define how health is determined: how often to check, how long to wait for a response, and how many successful or failed attempts are decisive

Check interval * 40 seconds ?	Timeout * 25 seconds ?
Healthy threshold * 2 consecutive successes ?	
Unhealthy threshold * 2 consecutive failures ?	

26. Once the health check is created then just create your backend as well. In the snapshot you can see that our frontend and backend is created now we just need to create our Load balancer. So, just scroll down and create it.

← Create global external Application Load Balancer

Load Balancer name *
Lowercase, no spaces.

Frontend configuration

Backend configuration

Routing rules

Review and finalize (optional)

Backend configuration

Create or select a backend service for incoming traffic. You can add multiple backend services and backend buckets to serve different types of content.

Backend services & backend buckets
catalog-backend-service

Cross-project backend services & backend buckets

Backend services

Name	Region	Instance groups/Network endpoint groups	Actions
catalog-backend-service	us-central1	1 network endpoint group	

27. Here you can see that our load balancer is created. Now we need to wait for some time to check the connectivity.

Load balancing [+ Create load balancer](#) [Refresh](#) [Delete](#) [Learn](#)

[Load balancers](#) [Backends](#) [Frontends](#) [Service LB policies](#)

Filter Enter property name or value

	Name	Load balancer type	Access type	Protocols	Region	Backends	Actions
<input type="checkbox"/>	catalog-load-balancer	Application	External	HTTP		✓ 1 backend service (0 instance groups, 1 network endpoint group)	⋮
<input type="checkbox"/>	inventory-demo-load-balancer	Application	External	HTTP		✓ 1 backend service (0 instance groups, 1 network endpoint group)	⋮

To view or delete load balancing resources like forwarding rules and target proxies, go to the [load balancing components view](#).

28. After some time, you can see that our catalog website is reachable through the Load balancer frontend IP.



Our Books:

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Exhalation	Ted Chiang	556	50.99	Add to shopping cart
Traffic Secrets	Russell Brunson	306	18.97	Add to shopping cart
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