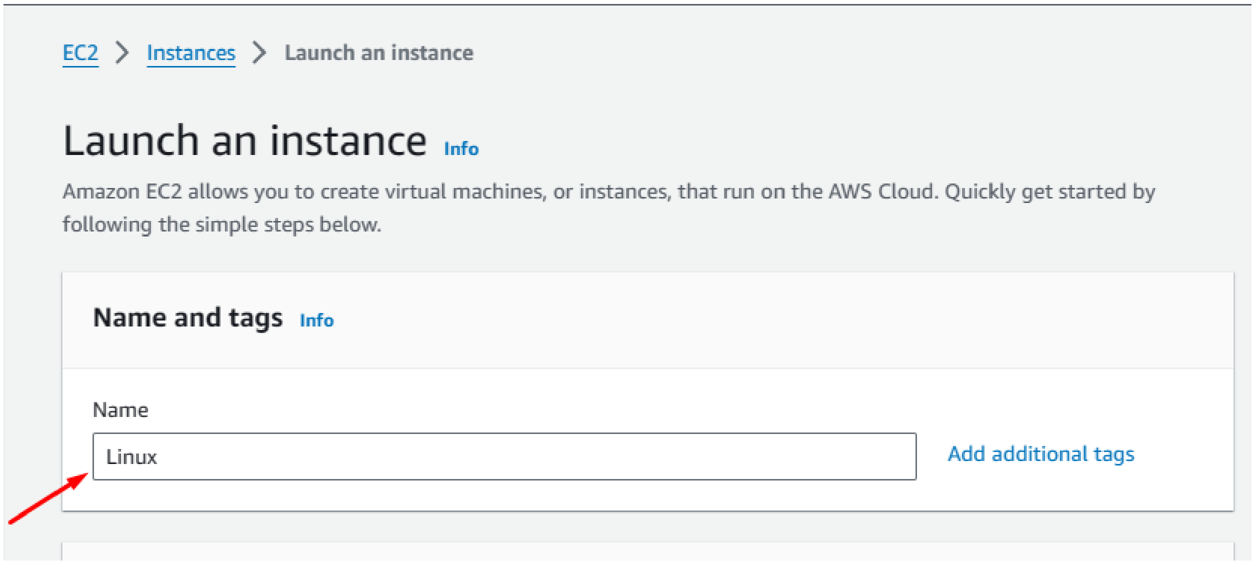
Module 5 – EC2

EC2.

- How to Launch EC2 Linux Machine.
  - click on Launch Instance, Give the name say – Linux.



EC2 > Instances > Launch an instance

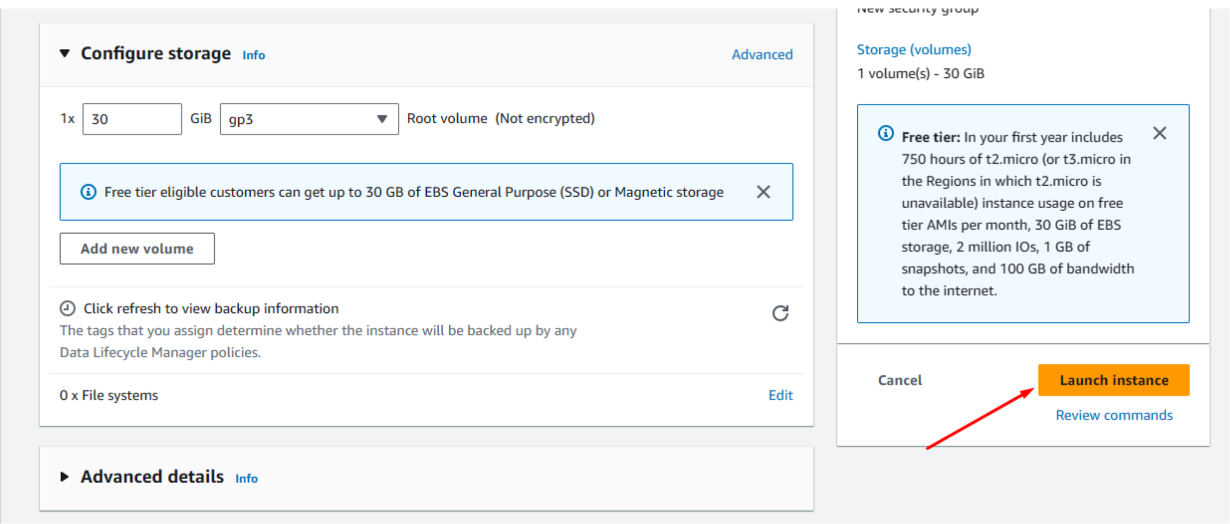
Launch an instance Info

Amazon EC2 allows you to create virtual machines, or instances, that run on the AWS Cloud. Quickly get started by following the simple steps below.

Name and tags Info

Name: Linux

  - Now the next part is to select the AMI as we are creating the instance for Linux, so let select Amazon 2023 this comes under free tier.
  - Instance Type – Select T2.micro.
  - Create the KeyPair name and download the file in .pem format.
  - Networking Setting – Select the VPC then its subnet. Make sure to keep Auto assign Public IP on. So that we can connect to the EC2 instance.
  - Security Group – Put port 22 open.
  - Next is how much space we want our instance.



▼ Configure storage Info

1x 30 GiB gp3 ▼ Root volume (Not encrypted)

ⓘ Free tier eligible customers can get up to 30 GB of EBS General Purpose (SSD) or Magnetic storage ✕

Click refresh to view backup information

The tags that you assign determine whether the instance will be backed up by any Data Lifecycle Manager policies.

0 x File systems

New security group

Storage (volumes)

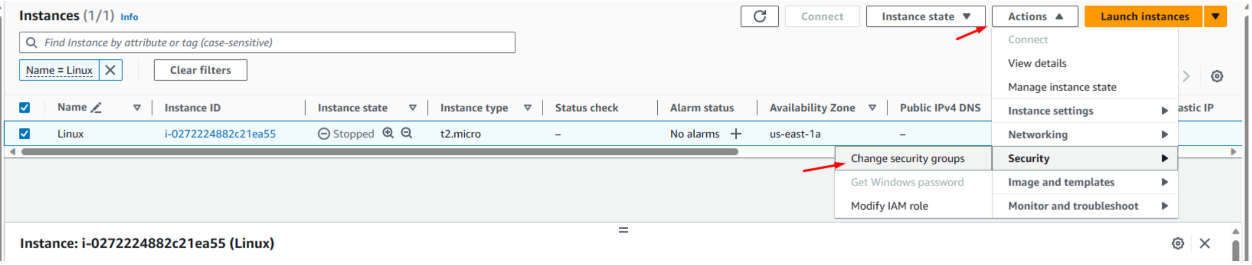
1 volume(s) - 30 GiB

ⓘ **Free tier:** In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is unavailable) instance usage on free tier AMIs per month, 30 GiB of EBS storage, 2 million IOs, 1 GB of snapshots, and 100 GB of bandwidth to the internet. ✕

  - Click on Launch Instance.

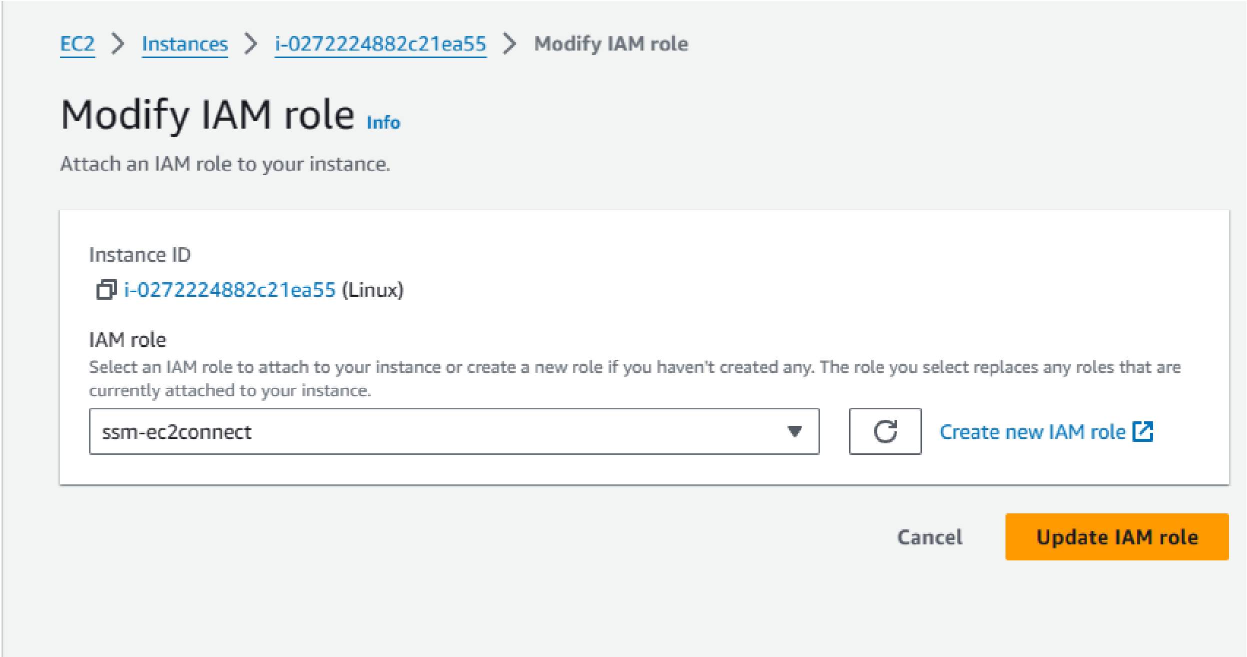
- How to Launch Windows Instance.
  - Follow all the steps from EC2 Linux instance. The only change will come while selecting the AMI id.
  - So, for windows we must select Windows AMI.

- How to attach IAM roles to EC2 instance.
  - Select the instance in which we are planning to add the role.
  - Go to Action, Security and click on Modify IAM role.



☑	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	astic IP
☑	Linux	i-0272224882c21ea55	Stopped	t2.micro	–	No alarms	us-east-1a	–	

Instance: i-0272224882c21ea55 (Linux)



Modify IAM role

Attach an IAM role to your instance.

Instance ID

i-0272224882c21ea55 (Linux)

IAM role

Select an IAM role to attach to your instance or create a new role if you haven't created any. The role you select replaces any roles that are currently attached to your instance.

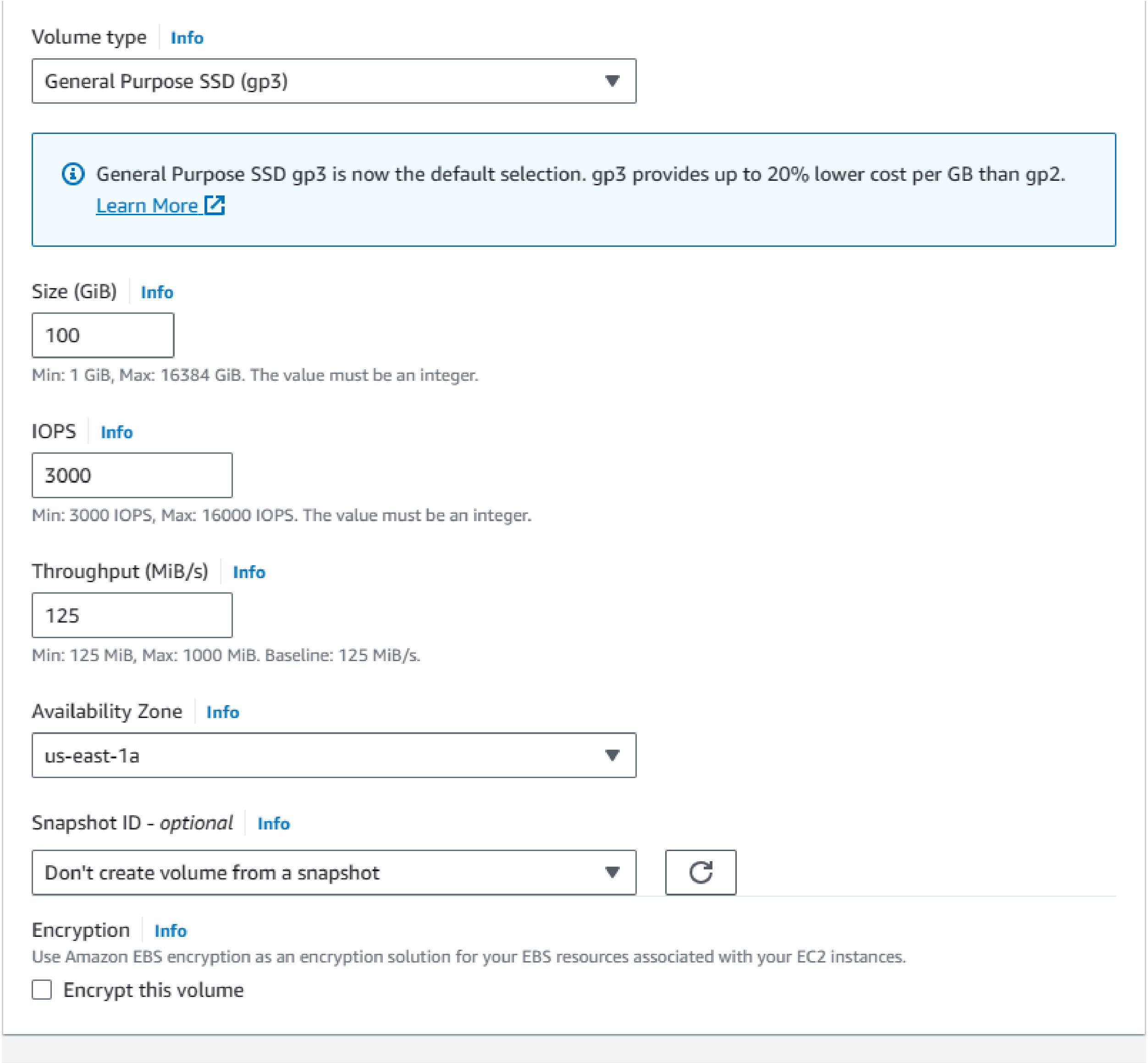
ssm-ec2connect

  - We have added the role to the instance.

- How to Extend EBS volume in Linux and Windows server.

- Adding the Volume in Linux Server.

  - Click on Create Volume. We will be adding 100 GB partitions.



Volume type
General Purpose SSD (gp3)

General Purpose SSD gp3 is now the default selection. gp3 provides up to 20% lower cost per GB than gp2.
Learn More

Size (GiB)
100
Min: 1 GiB, Max: 16384 GiB. The value must be an integer.

IOPS
3000
Min: 3000 IOPS, Max: 16000 IOPS. The value must be an integer.

Throughput (MiB/s)
125
Min: 125 MiB, Max: 1000 MiB. Baseline: 125 MiB/s.

Availability Zone
us-east-1a

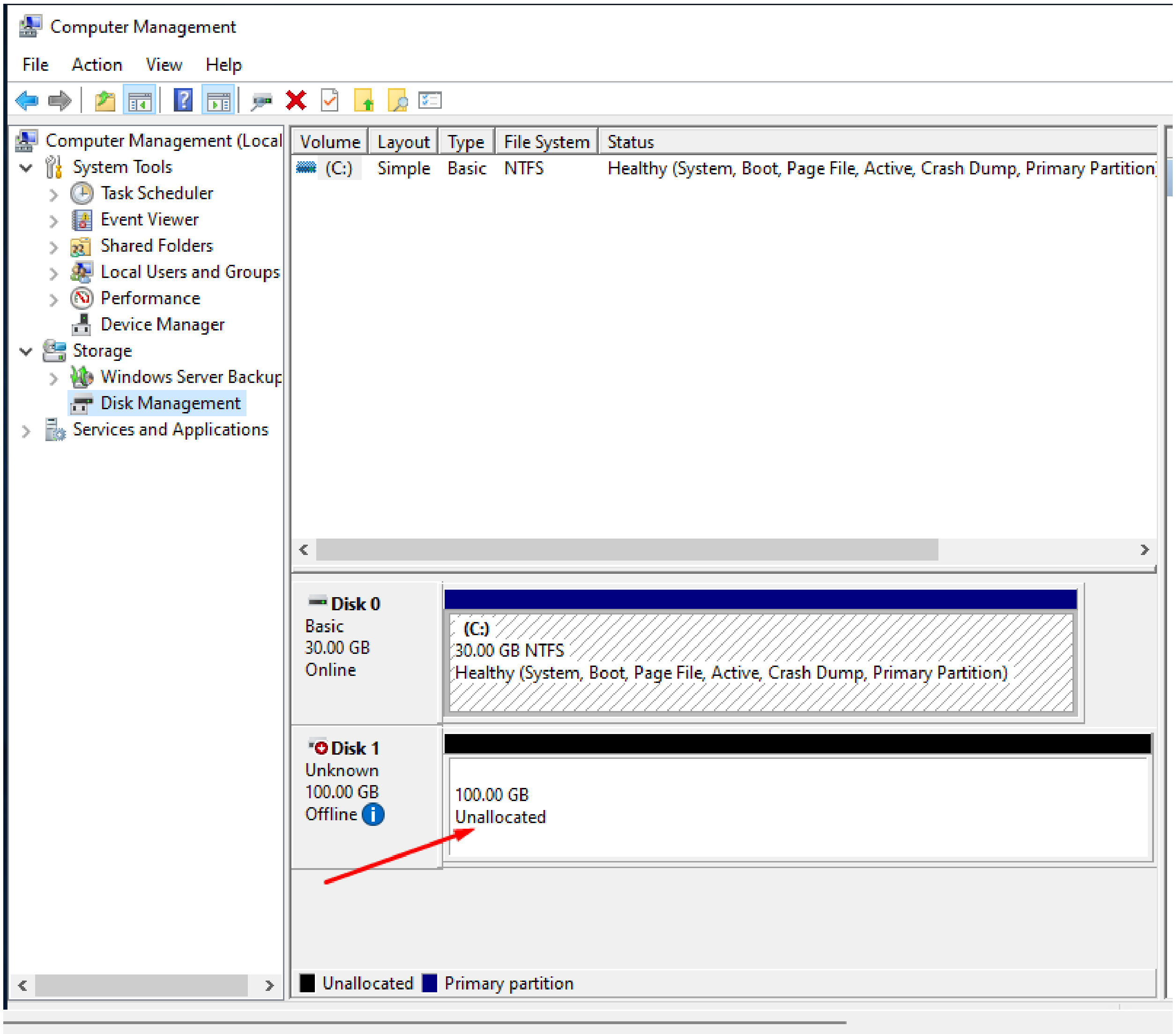
Snapshot ID - *optional*
Don't create volume from a snapshot

Encryption
Use Amazon EBS encryption as an encryption solution for your EBS resources associated with your EC2 instances.
□ Encrypt this volume

- Click on Create Volume
- Now as we can see Volume has been created but it's not assigned to any EC2 instance.
- Select the create volume, go to Action, and click on Attach volume.
- Select the instance ID where we want to attach.
- Now SSH to EC2 server. So that we can Extend the drive and add the mount point.
- Run below command with root permissions.
    - Lsblk
    - file -s /dev/xvdf (If the command output shows "/dev/xvdf: data", it means your volume is empty.)
    - mkfs -t ext4 /dev/xvdf
    - mkdir /newvolume
    - mount /dev/xvdf /newvolume/
    - df -h to check if we can see the partition mounted on /newvolume.
    - Now we have to make the mount point entry permanent.

- Vim /etc/fstab – add below line and save the file
- /dev/xvdf   /newvolume   ext4   defaults,nofail   0   0
- Reboot the server.

- Adding volume to Windows Servers.
  - Create the volume in the same way, we did it for Linux Server.
  - Take the RDP.
  - Go to Computer Management → Disk Management.
  - In the bottom we can see 100 GB as unallocated. So let allocate this and mount as D drive.



Volume	Layout	Type	File System	Status
(C:)	Simple	Basic	NTFS	Healthy (System, Boot, Page File, Active, Crash Dump, Primary Partition

Disk 0
Basic
30.00 GB
Online

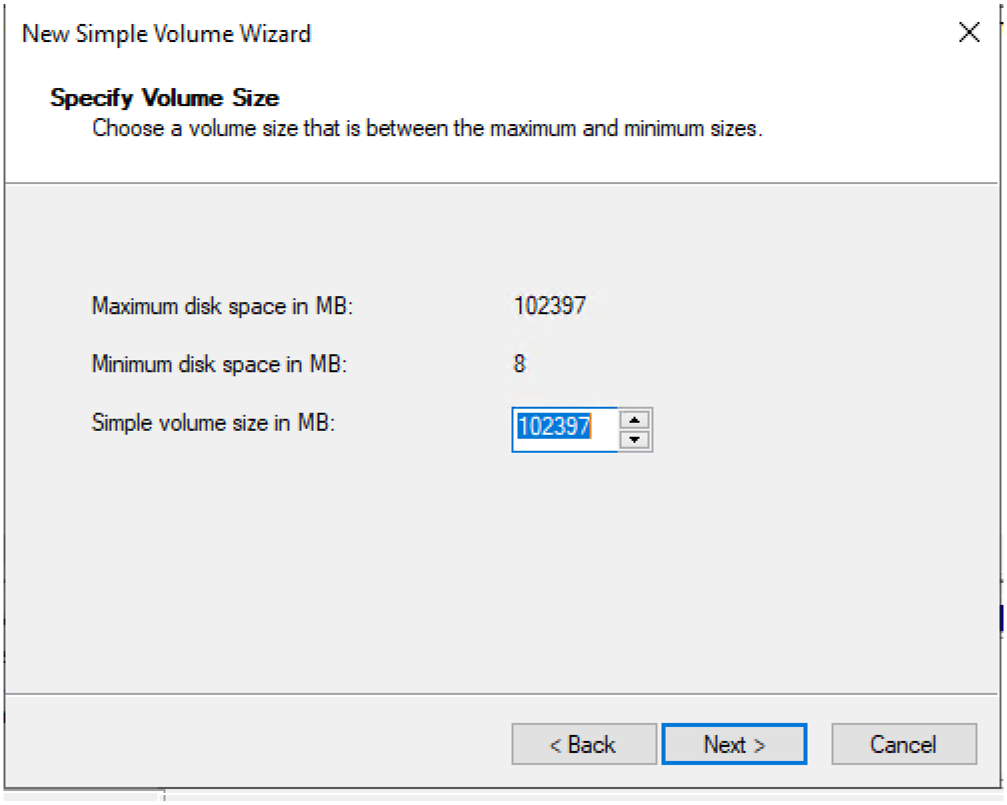
(C:)
30.00 GB NTFS
Healthy (System, Boot, Page File, Active, Crash Dump, Primary Partition)

Disk 1
Unknown
100.00 GB
Offline

100.00 GB
Unallocated

- Right click and make it online first.
- again right click and Initialize Disk.
- Right click again and click on New Simple Volume.
- Click Next.

- Specify the size that we want to use, so keep here default as we are going to use whole 100 GB.



New Simple Volume Wizard

Specify Volume Size

Choose a volume size that is between the maximum and minimum sizes.

Maximum disk space in MB: 102397

Minimum disk space in MB: 8

Simple volume size in MB: 102397

- Assign the drive letter.
- Then format the partition and click on Finish.
- Now we can see a new D drive with 100 GB of Space.

- How to create Image and Share with Different Account and different region.
  - Select the instance go to Action → Image and templates → Create image.

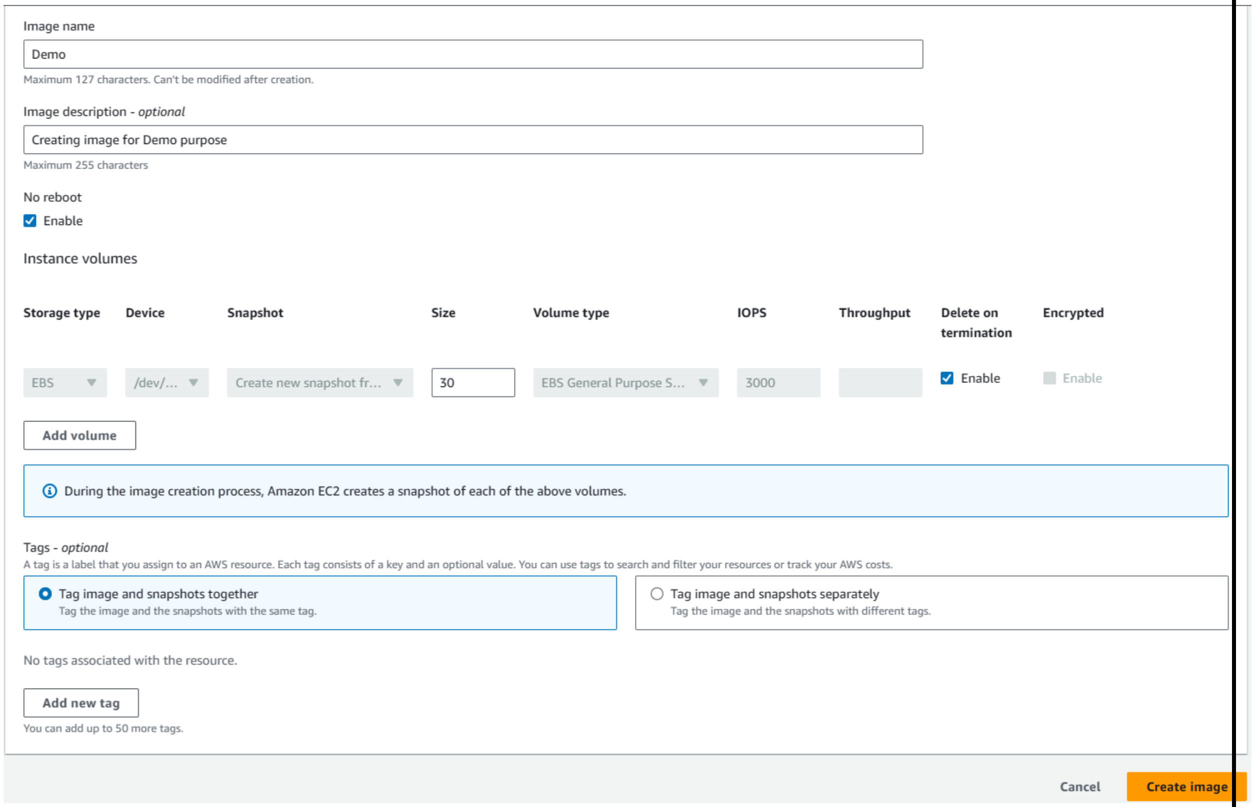


Image name

Demo

Maximum 127 characters. Can't be modified after creation.

Image description - *optional*

Creating image for Demo purpose

Maximum 255 characters

No reboot

☑ Enable

Instance volumes

Storage type	Device	Snapshot	Size	Volume type	IOPS	Throughput	Delete on termination	Encrypted
EBS ▼	/dev/... ▼	Create new snapshot fr... ▼	30	EBS General Purpose S... ▼	3000		☑ Enable	□ Enable

ⓘ During the image creation process, Amazon EC2 creates a snapshot of each of the above volumes.

Tags - *optional*

A tag is a label that you assign to an AWS resource. Each tag consists of a key and an optional value. You can use tags to search and filter your resources or track your AWS costs.

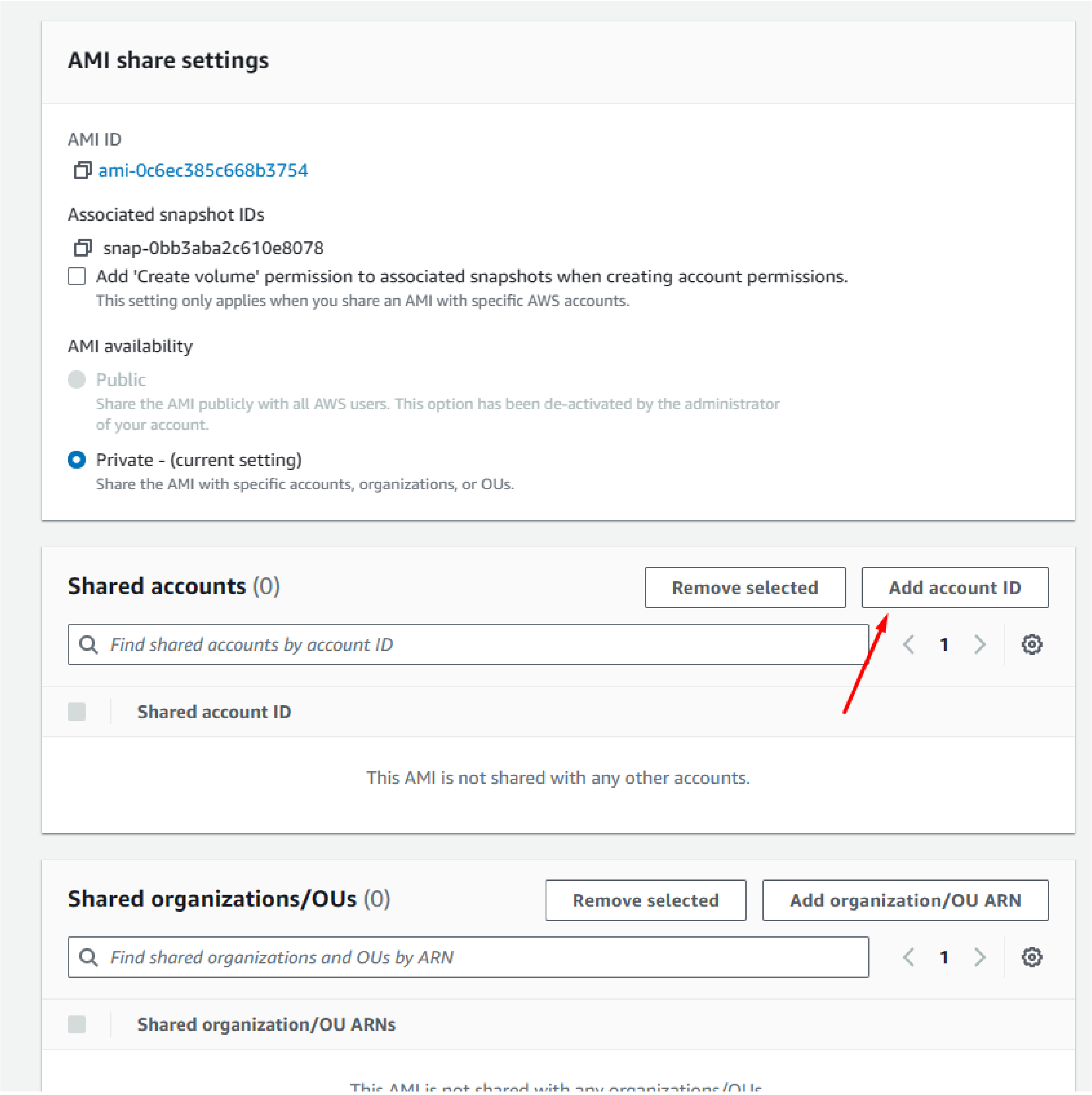
● Tag image and snapshots together
Tag the image and the snapshots with the same tag.

○ Tag image and snapshots separately
Tag the image and the snapshots with different tags.

No tags associated with the resource.

You can add up to 50 more tags.

- Once the image is available then Select the image and click on Edit AMI permissions.
- Provide the account number where we have to share the image.



AMI share settings

AMI ID

ami-0c6ec385c668b3754

Associated snapshot IDs

snap-0bb3aba2c610e8078

□ Add 'Create volume' permission to associated snapshots when creating account permissions.
This setting only applies when you share an AMI with specific AWS accounts.

AMI availability

○ Public
Share the AMI publicly with all AWS users. This option has been de-activated by the administrator of your account.

● Private - (current setting)
Share the AMI with specific accounts, organizations, or OUs.

Shared accounts (0)

Shared account ID

This AMI is not shared with any other accounts.

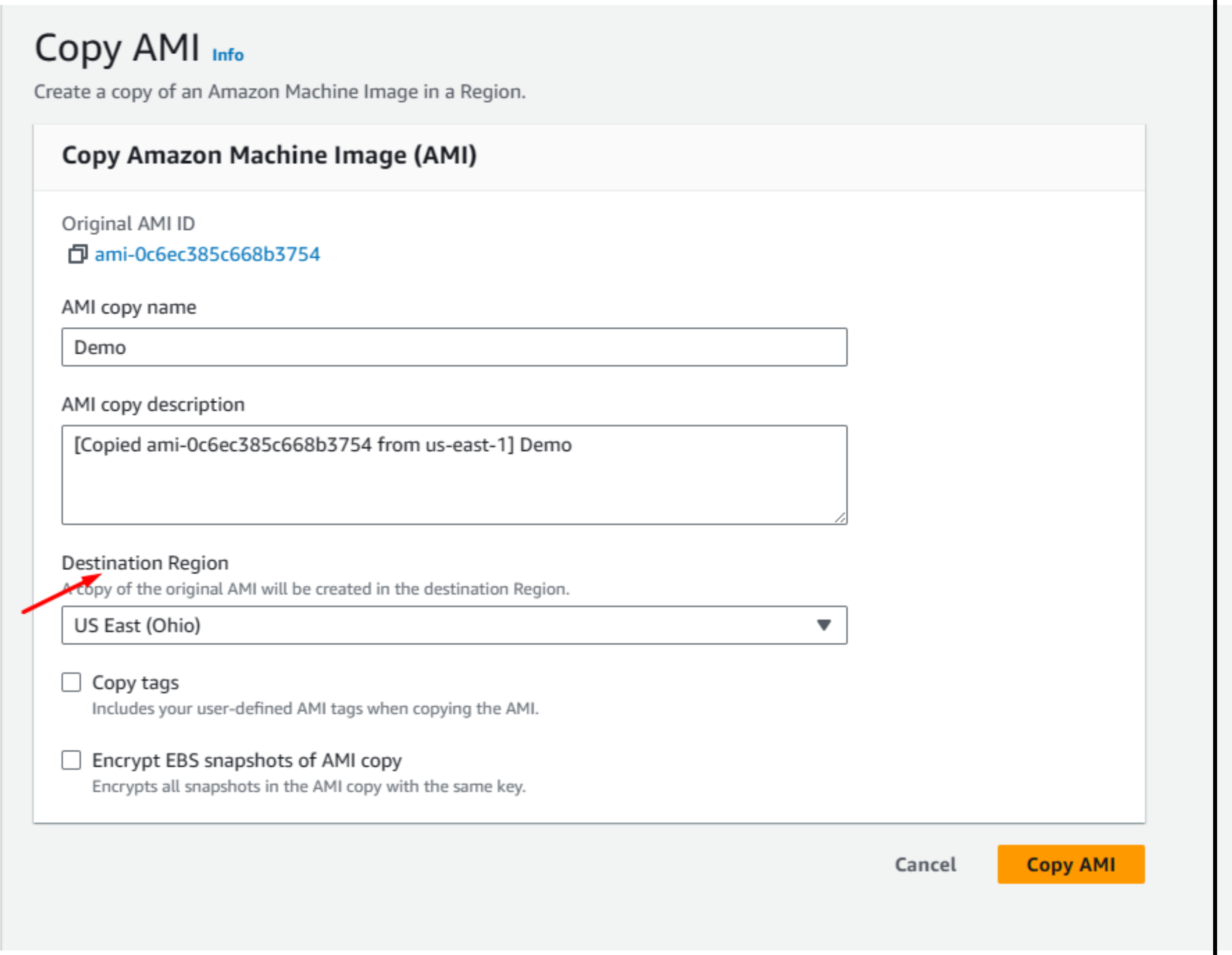
Shared organizations/OUs (0)

Shared organization/OU ARNs

This AMI is not shared with any organizations/OUs

Remove selected
Add account ID
Find shared accounts by account ID
1
Remove selected
Add organization/OU ARN
Find shared organizations and OUs by ARN
1

- Now share the image within different regions.
  - Again, select the image click on Action and Copy AMI.
  - Specify the Destination Region, here we copy this image with Ohio region.


Copy AMI
Info
Create a copy of an Amazon Machine Image in a Region.
Copy Amazon Machine Image (AMI)

Original AMI ID
ami-0c6ec385c668b3754

AMI copy name
Demo

AMI copy description
[Copied ami-0c6ec385c668b3754 from us-east-1] Demo

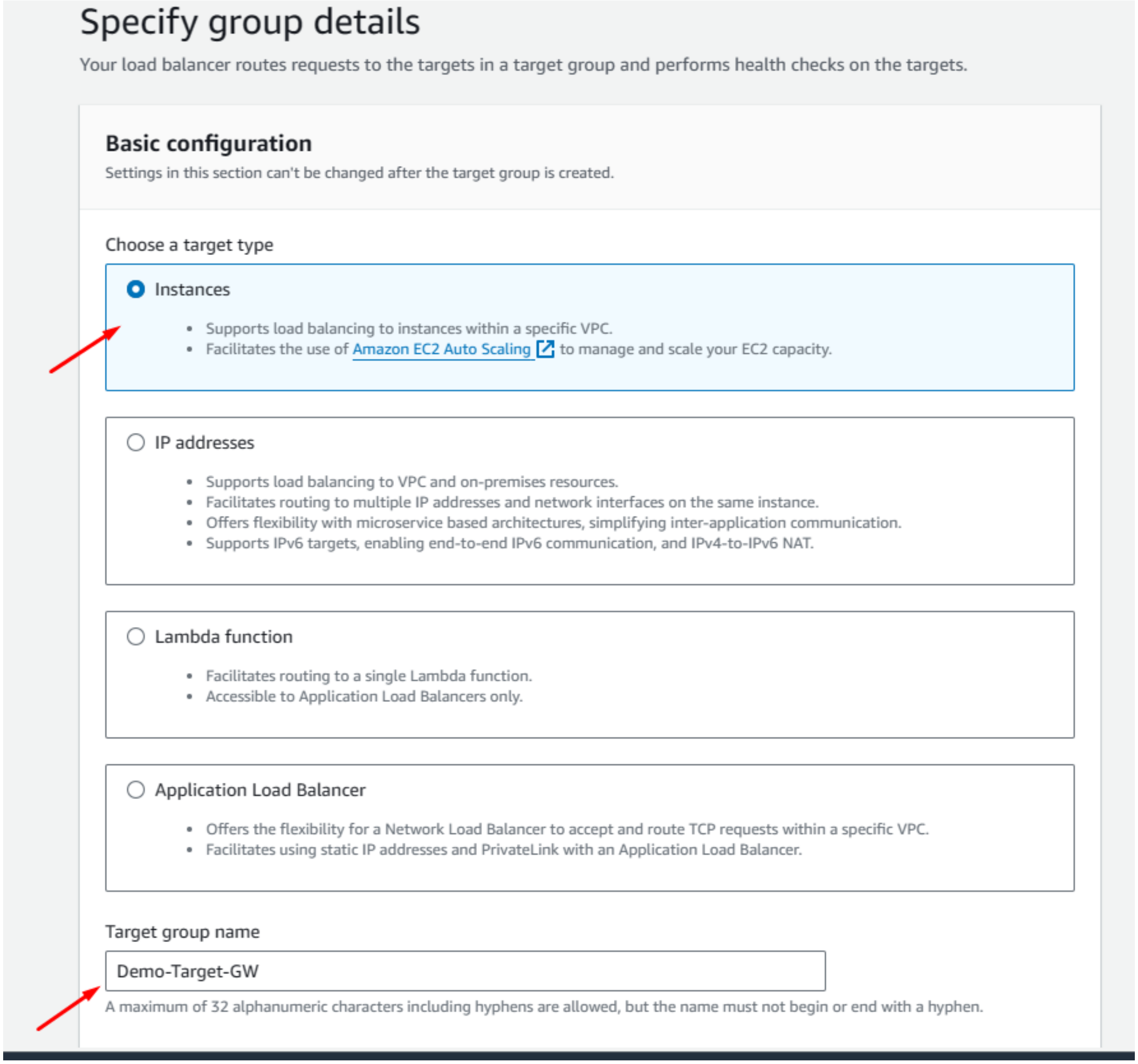
Destination Region
A copy of the original AMI will be created in the destination Region.
US East (Ohio)

☐ Copy tags
Includes your user-defined AMI tags when copying the AMI.

☐ Encrypt EBS snapshots of AMI copy
Encrypts all snapshots in the AMI copy with the same key.

  - Click on Copy AMI. Go to Ohia region and verify if we can see the image.

- Application Load Balancer.
  - To setup application LB, first let's create 2 EC2 instances and install Apache web server on it.
  - Now we have to create the Target Group first.
  - Click on Create target Group.
  - As we are using instance as backend, let select the instance which we just now created and write the name for Target group.



Specify group details

Your load balancer routes requests to the targets in a target group and performs health checks on the targets.

Basic configuration

Settings in this section can't be changed after the target group is created.

Choose a target type

● Instances

- Supports load balancing to instances within a specific VPC.
- Facilitates the use of Amazon EC2 Auto Scaling to manage and scale your EC2 capacity.

○ IP addresses

- Supports load balancing to VPC and on-premises resources.
- Facilitates routing to multiple IP addresses and network interfaces on the same instance.
- Offers flexibility with microservice based architectures, simplifying inter-application communication.
- Supports IPv6 targets, enabling end-to-end IPv6 communication, and IPv4-to-IPv6 NAT.

○ Lambda function

- Facilitates routing to a single Lambda function.
- Accessible to Application Load Balancers only.

○ Application Load Balancer

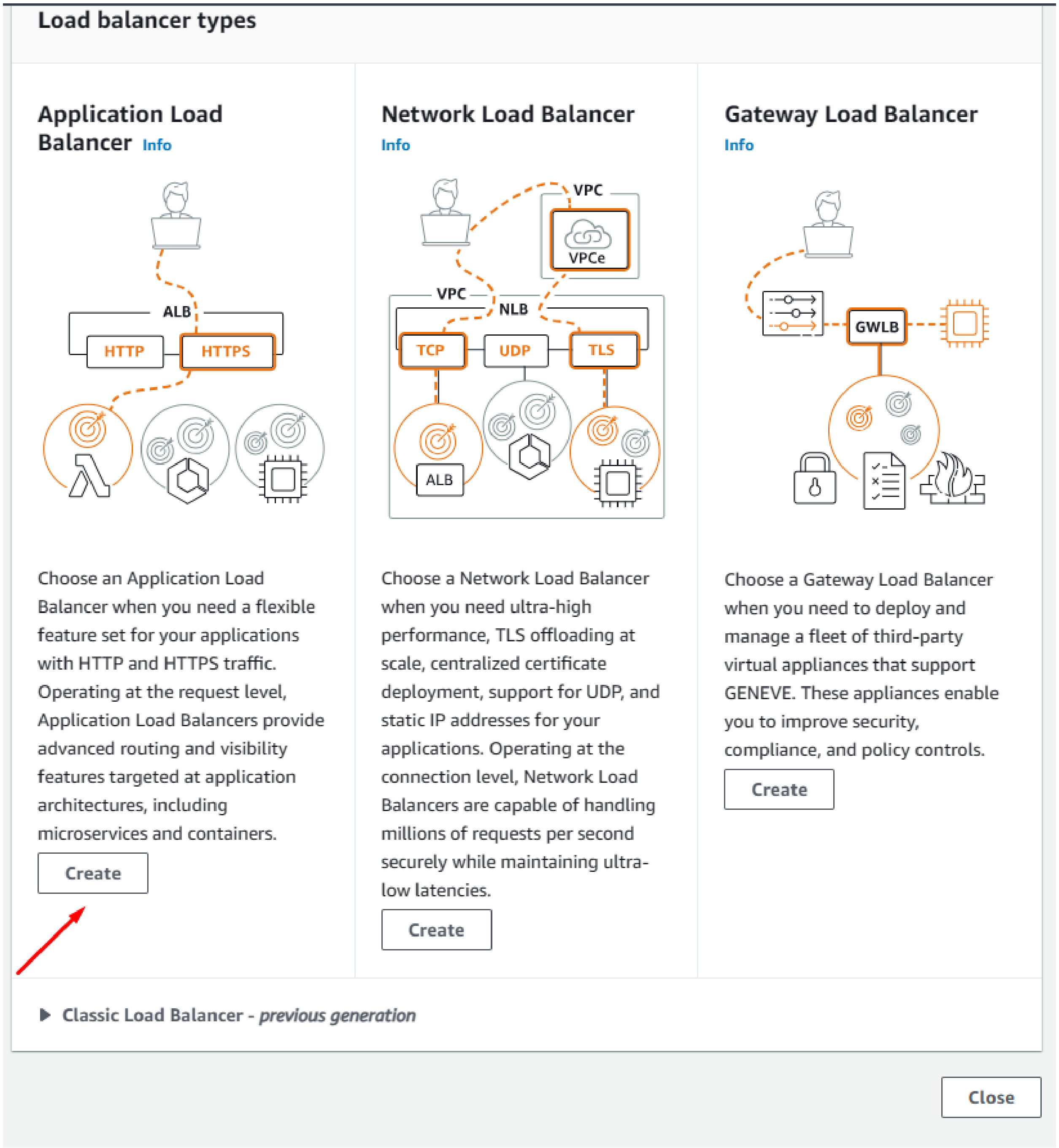
- Offers the flexibility for a Network Load Balancer to accept and route TCP requests within a specific VPC.
- Facilitates using static IP addresses and PrivateLink with an Application Load Balancer.

Target group name

Demo-Target-GW

A maximum of 32 alphanumeric characters including hyphens are allowed, but the name must not begin or end with a hyphen.

- Will keep all the setting as default, as we don’t have certificate so we will be using port 80 with is http.
- Click Next and Click on Create Target Group.
- Now we can see both the instances are registered in the Target Group.
- Now let’s configure Application LB.



Load balancer types

Application Load Balancer Info

Choose an Application Load Balancer when you need a flexible feature set for your applications with HTTP and HTTPS traffic. Operating at the request level, Application Load Balancers provide advanced routing and visibility features targeted at application architectures, including microservices and containers.

Create

Network Load Balancer Info

Choose a Network Load Balancer when you need ultra-high performance, TLS offloading at scale, centralized certificate deployment, support for UDP, and static IP addresses for your applications. Operating at the connection level, Network Load Balancers are capable of handling millions of requests per second securely while maintaining ultra-low latencies.

Create

Gateway Load Balancer Info

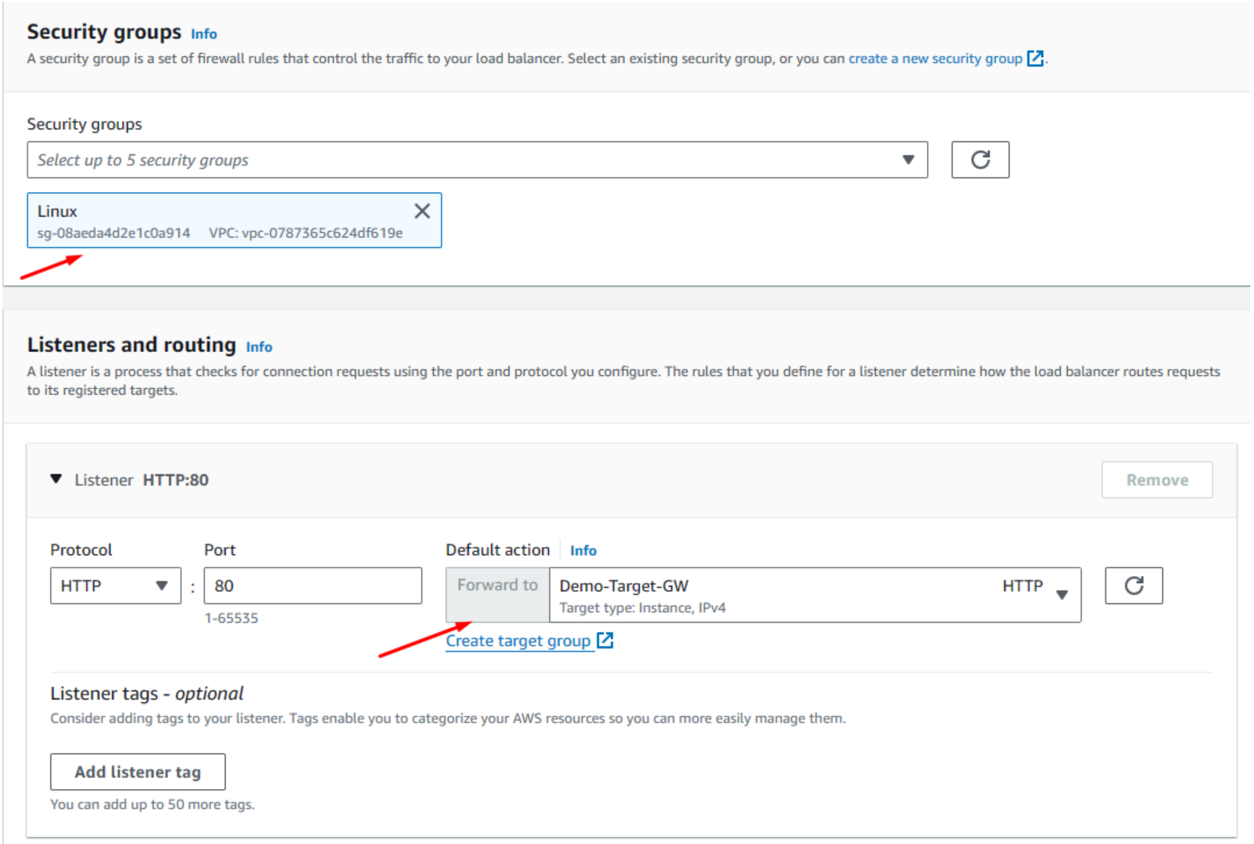
Choose a Gateway Load Balancer when you need to deploy and manage a fleet of third-party virtual appliances that support GENEVE. These appliances enable you to improve security, compliance, and policy controls.

Create

▶ Classic Load Balancer - *previous generation*

Close

- Specify the name.
- Next part is to select the VPN which will be part of LB.
- Now select the SG and the target group which we have created just now.



Security groups Info

A security group is a set of firewall rules that control the traffic to your load balancer. Select an existing security group, or you can create a new security group.

Security groups

Select up to 5 security groups

Linux
sg-08aeda4d2e1c0a914 VPC: vpc-0787365c624df619e

Listeners and routing Info

A listener is a process that checks for connection requests using the port and protocol you configure. The rules that you define for a listener determine how the load balancer routes requests to its registered targets.

Listener HTTP:80 Remove

Protocol: HTTP

Port: 80 (1-65535)

Default action Info: Forward to Demo-Target-GW HTTP
Target type: Instance, IPv4

Create target group

Listener tags - *optional*

Consider adding tags to your listener. Tags enable you to categorize your AWS resources so you can more easily manage them.

Add listener tag

You can add up to 50 more tags.

- Keep all the settings same and click on Create Load Balancer.
- Get the DNS name and put it in the browser to see if the LB is working fine or not.