

Lab 4 – Create AWS VPC with 2 EC2 (Due by: 09-10-2023)

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CLCM3102:Cloud Application Requirements and Specifications

Preparation:

I have understood the given task. Gone through the documentations for creating the architectural diagram, and created the architectural diagram for that.

Later launch the aws management console and created the vpc and ec2 instances.

Assumption:

I have created a VPC in the US-East region with two availability zones as us-east-1a and us-east-1b.

In each availability zones I have created public and private subnets.

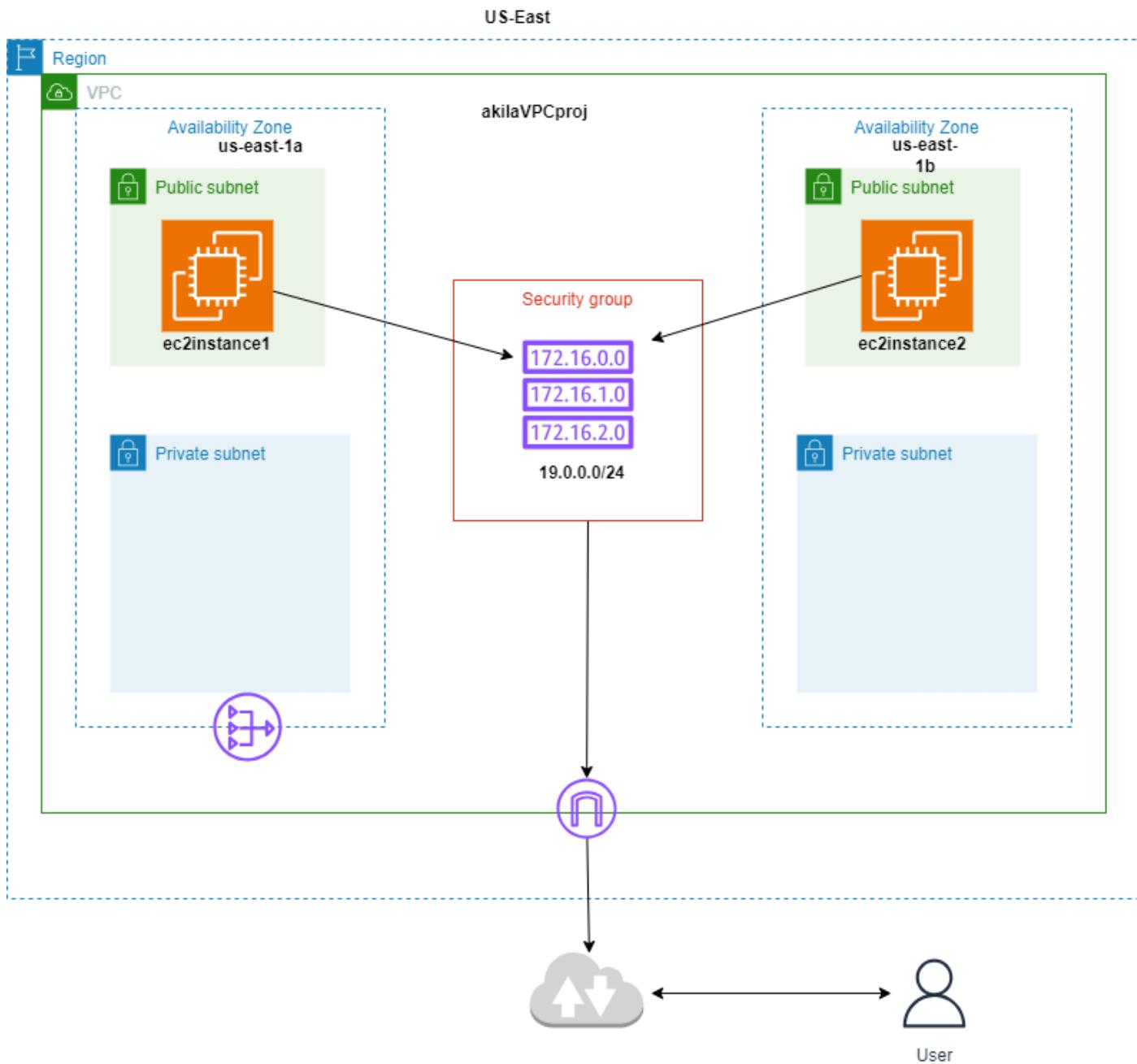
Inside the public subnets EC2 instances were created as ec2instance1 and ec2instance2.

And route to these I have used Route table. The IP address I have is 19.0.0.0/24

In my case I have assumed that some instances are available in private network. When the instances in the private subnet wants to access internet .NAT gateway is needed So I had my .nat gateway in the Availability zone 1.

And for the instances in VPC need a Internet gateway (IGW) to connect to the internet.

Architectural Diagram:



AWS Virtual Private Cloud (Amazon VPC):

It is a virtual network service provided by Amazon Web Services (AWS). It allows you to create and manage a logically isolated section of the AWS Cloud where you can launch AWS resources such as EC2 instances, databases, and other services. Consider VPC as your own private data center within the AWS cloud.

Key components of a VPC :

1. Subnets: Subnets are segments of a VPC's IP address range where you can place AWS resources. Each subnet is associated with an Availability Zone (AZ) to provide fault tolerance and high availability. we can create public subnets (accessible from the internet) and private subnets (not directly accessible from the internet).
2. Route Tables : Route tables define the routing for traffic within the VPC and between the VPC and external networks. Each subnet is associated with a route table. Route tables contain rules (routes) that determine where traffic should be directed.

3. Internet Gateway (IGW) : An Internet Gateway is a horizontally scalable, highly available AWS-managed component that allows communication between instances in your VPC and the internet. It enables resources in public subnets to have direct internet access.
4. NAT Gateway/NAT Instance : Network Address Translation (NAT) gateways or instances are used in private subnets to allow outbound internet traffic from instances without exposing their private IP addresses to the internet. NAT gateways are fully managed by AWS, while NAT instances require manual setup and management.
5. Security Groups : Security groups act as virtual firewalls for our instances. They control inbound and outbound traffic at the instance level and are associated with EC2 instances and other resources. Security groups are stateful, meaning if you allow inbound traffic from a specific IP address, related outbound traffic is automatically allowed.
6. Network Access Control Lists (NACLs) : NACLs are stateless network-level firewalls that control traffic at the subnet level. They define rules for allowing or denying traffic based on source and destination IP addresses and port ranges.
7. VPC Peering : VPC peering allows you to connect two VPCs to communicate with each other as if they were on the same network. It does not involve an internet gateway or VPN connection.
8. Virtual Private Network (VPN) Connections : You can establish VPN connections to extend your on-premises network to your VPC using hardware VPN devices or AWS Direct Connect.
9. Elastic Network Interfaces (ENIs) : ENIs are virtual network interfaces that can be attached to EC2 instances. They have their own private IP addresses, MAC addresses, and security group settings.
10. VPC Endpoints : VPC endpoints allow you to privately access AWS services such as S3, DynamoDB, and SNS without needing to go through the public internet. This enhances security and reduces data transfer costs.
11. Peering Connection and Transit Gateway (Optional) : For more complex network architectures, we can use peering connections and AWS Transit Gateway to connect multiple VPCs and on-premises networks in a hub-and-spoke model.

Screenshots:

Open the learns lab and start it. Once it is started click on the AWS to navigate to the Management console.

The screenshot shows the AWS Academy Learner Lab interface. On the left, there's a sidebar with links for Home, Modules, Discussions, Courses, Calendar, Inbox, History, Help, and a back arrow. The main area has tabs for AWS, Start Lab, End Lab, AWS Details, Readme, and Reset. A terminal window shows a command-line session. To the right, there's a sidebar titled "Learner Lab" with links to Environment Overview, Environment Navigation, Access the AWS Management Console, Region restriction, Service usage and other restrictions, Using the terminal in the browser, Running AWS CLI commands, Using the AWS SDK for Python, Preserving your budget, Accessing EC2 Instances, SSH Access to EC2 Instances, and SSH Access from Windows.

Creating VPC:

Search for Virtual Private Cloud (VPC) service and click create VPC.

The screenshot shows the AWS VPC dashboard. On the left, there's a sidebar with links for VPC dashboard, EC2 Global View, Filter by VPC, Virtual private cloud (with sub-links for Your VPCs, Subnets, Route tables, Internet gateways, Egress-only internet gateways, Carrier gateways, DHCP option sets, Elastic IPs, Managed prefix lists, Endpoints, Endpoint services, NAT gateways, Peering connections, and Security), and CloudShell. The main area shows a "Create VPC" button and a "Launch EC2 Instances" button. It displays "Service Health" and "Settings" sections. Below that is a "Resources by Region" section with tables for VPCs, Subnets, Route Tables, Internet Gateways, Egress-only Internet Gateways, and DHCP option sets. There's also an "Additional Information" section with links to VPC Documentation, All VPC Resources, Forums, and Report an issue. At the bottom is an "AWS Network Manager" section.

Give the name for your VPC and CIDR according to the requirement. CIDR notation combines the base address with a prefix length of 24. It is based on you requirement.

The screenshot shows the "Create VPC" wizard. It starts with a "VPC settings" step where you can choose to create "VPC only" or "VPC and more". You can set a name tag auto-generation (e.g., "akilaVPCproj") and define an IPv4 CIDR block (e.g., "19.0.0.0/24"). In the "Preview" step, you see a network diagram with a VPC containing four Subnets (us-east-1a, us-east-1b, akilaVPCproj-subnet-public1-us-east-1a, akilaVPCproj-subnet-private1-us-east-1a) and three Route tables (akilaVPCproj-rtb-public, akilaVPCproj-rtb-private, akilaVPCproj-rtb-prv). The "Resource creation" step follows, where you can select the availability zones for public and private subnets. In our case, we selected 2 in each category.

Select the availability zone ; public and private subnets required; In our case we selected 2 in each categories.

us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#CreateVpc:createMode=vpcWithResources

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aws Services Search [Alt+S] Preview

IPv6 CIDR block [Info](#)
 No IPv6 CIDR block
 Amazon-provided IPv6 CIDR block

Tenancy [Info](#)
 Default

Number of Availability Zones (AZs) [Info](#)
 Choose the number of AZs in which to provision subnets. We recommend at least two AZs for high availability.
 1 2 3

▶ Customize AZs

Number of public subnets [Info](#)
 The number of public subnets to add to your VPC. Use public subnets for web applications that need to be publicly accessible over the internet.
 0 2

Number of private subnets [Info](#)
 The number of private subnets to add to your VPC. Use private subnets to secure backend resources that don't need public access.
 0 2 4

▶ Customize subnets CIDR blocks

NAT gateways (0) [Info](#)

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NAT Gateway is a AWS service that acts as an intermediary between the private subnet and the internet. When instances in a private subnet want to access the internet, they send their requests to the NAT Gateway.

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aws Services Search [Alt+S] Preview

Number of private subnets [Info](#)
 The number of private subnets to add to your VPC. Use private subnets to secure backend resources that don't need public access.
 0 2 4

▶ Customize subnets CIDR blocks

NAT gateways (\$) [Info](#)
 Choose the number of Availability Zones (AZs) in which to create NAT gateways. Note that there is a charge for each NAT gateway
 None In 1 AZ 1 per AZ

VPC endpoints [Info](#)
 Endpoints can help reduce NAT gateway charges and improve security by accessing S3 directly from the VPC. By default, full access policy is used. You can customize this policy at any time.
 None S3 Gateway

DNS options [Info](#)
 Enable DNS hostnames
 Enable DNS resolution

▶ Additional tags

Create VPC

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us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#CreateVpcWizard:

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VPC > Your VPCs > Create VPC > Create VPC resources

Create VPC workflow

>Create subnet

23%

▼ Details

- ✓ Create VPC: [vpc-0b1430f270ea8ac4a](#)
- ✓ Enable DNS hostnames
- ✓ Enable DNS resolution
- ✓ Verifying VPC creation: [vpc-0b1430f270ea8ac4a](#)
- ✓ Create S3 endpoint: [vpce-02da1955ec2a77c78](#)
- ✓ Create subnet: [subnet-02a35efed0872419b](#)
- >Create subnet
- Create subnet
- Create subnet
- Create internet gateway
- Attach internet gateway to the VPC
- Create route table
- Create route
- Associate route table
- Associate route table
- Allocate elastic IP
- Create NAT gateway

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us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#CreateVpcWizard:

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Verifying VPC creation: [vpc-0b1430f270ea8ac4a](#)

Create S3 endpoint: [vpce-02da1955ec2a77c78](#)

Create subnet: [subnet-02a35efed0872419b](#)

Create subnet: [subnet-00897f4caa0f9a805](#)

Create subnet: [subnet-0506f6087c4145bb9](#)

Create subnet: [subnet-0fd175b8369ed08](#)

Create internet gateway: [igw-08ecbf61f650900d8](#)

Attach internet gateway to the VPC

Create route table: [rtb-0f2cc9c398b05579b](#)

Create route

Associate route table

Associate route table

Allocate elastic IP: [eipalloc-07f01d0920b224f0a](#)

Create NAT gateway: [nat-0b3ebd1d3ddebf5f6](#)

Wait for NAT Gateways to activate

Create route table: [rtb-025e4dc56d36bd4cf](#)

Create route

Associate route table

Create route table: [rtb-0e0bad415e62cc1e6](#)

Create route

Associate route table

Verifying route table creation

Associate S3 endpoint with private subnet route tables: [vpce-02da1955ec2a77c78](#)

View VPC

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Once VPC is created, click the main network ACL and click on the edit inbound rules.

The screenshot shows two consecutive pages from the AWS VPC console. The top page displays the details of a VPC (vpc-0b1430f270ea8ac4a) with its main network ACL (acl-07fc58b257a6e5edf) selected. The bottom page shows the detailed configuration of this specific Network ACL (acl-07fc58b257a6e5edf), including its inbound rules.

VPC Details:

- VPC ID: vpc-0b1430f270ea8ac4a
- State: Available
- Tenancy: Default
- Default VPC: No
- Network Address Usage metrics: Disabled
- DNS resolution: Enabled
- Main route table: rtb-0d81cf8e3d0ba9499
- IPv6 pool: -
- Route 53 Resolver DNS Firewall rule groups: Failed to load rule groups
- Owner ID: 969877014093

Network ACL Details:

- Network ACL ID: acl-07fc58b257a6e5edf
- Associated with: 4 Subnets
- Default: Yes
- VPC ID: vpc-0b1430f270ea8ac4a / akilaVPCproj-vpc
- Owner: 969877014093

Inbound Rules:

Rule number	Type	Protocol	Port range	Source	Allow/Deny
100	All traffic	All	All	0.0.0.0/0	Allow
*	All traffic	All	All	0.0.0.0/0	Deny

Edit the rules as type as follows : HTTP(80),SSH(22),Custom TCP and save the changes.

[us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#EditInboundRules:networkAclId=acl-07fc58b257a6e5edf](#)

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VPC > Network ACLs > acl-07fc58b257a6e5edf > Edit inbound rules

Edit inbound rules Info

Inbound rules control the incoming traffic that's allowed to reach the VPC.

Rule number	Type	Protocol	Port range	Source	Allow/Deny	Action
100	All traffic	All	All	0.0.0.0/0	Allow	Remove
101	Custom TCP	TCP (6)	0	0.0.0.0/0	Allow	Remove
102	HTTP (80)	TCP (6)	80	0.0.0.0/0	Allow	Remove
103	SSH (22)	TCP (6)	22	0.0.0.0/0	Allow	Remove
*	All traffic	All	All	0.0.0.0/0	Deny	Remove

[Add new rule](#) [Sort by rule number](#)

Cancel [Preview changes](#) [Save changes](#)

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[us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#NetworkAclDetails:networkAclId=acl-07fc58b257a6e5edf](#)

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You have successfully updated inbound rules for acl-07fc58b257a6e5edf

VPC dashboard EC2 Global View New

Filter by VPC: Select a VPC

Virtual private cloud Your VPCs New Subnets Route tables Internet gateways Egress-only internet gateways Carrier gateways DHCP option sets Elastic IPs Managed prefix lists Endpoints Endpoint services NAT gateways Peering connections Security

Details Info

Network ACL ID acl-07fc58b257a6e5edf	Associated with 4 Subnets	Default Yes	VPC ID vpc-0b1430f270ea8ac4a / akilaVPCproj-vpc
---	------------------------------	----------------	---

Inbound rules Outbound rules Subnet associations Tags

Inbound rules (5) Edit inbound rules

Rule number	Type	Protocol	Port range	Source	Allow/Deny
100	All traffic	All	All	0.0.0.0/0	Allow
101	Custom TCP	TCP (6)	0	0.0.0.0/0	Allow
102	HTTP (80)	TCP (6)	80	0.0.0.0/0	Allow
103	SSH (22)	TCP (6)	22	0.0.0.0/0	Allow
*	All traffic	All	All	0.0.0.0/0	Deny

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Creating EC2 instances

Now create the 2 EC2 instances in the created VPC. Now launch the EC2 instance by clicking the launch instance.

← → ⌂ us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#Home: BVC CTS IRCC Cloud others Get Ahead in Retail... All Bookmarks

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New EC2 Experience Tell us what you think X

EC2 Dashboard

- EC2 Global View
- Events
- Instances**
 - Instances
 - Instance Types
 - Launch Templates
 - Spot Requests
 - Savings Plans
 - Reserved Instances
 - Dedicated Hosts
 - Capacity Reservations
- Images**
 - AMIs
 - AMI Catalog
- Elastic Block Store**
 - Volumes
 - Snapshots

Resources

You are using the following Amazon EC2 resources in the US East (N. Virginia) Region:

Instances (running)	0	Auto Scaling Groups	0	Dedicated Hosts	0
Elastic IPs	2	Instances	0	Key pairs	2
Load balancers	0	Placement groups	0	Security groups	2
Snapshots	0	Volumes	0		

Account attributes

Default VPC vpc-050524e447eb30cd0

Settings

- Data protection and security [New](#)
- Zones
- EC2 Serial Console
- Default credit specification
- Console experiments

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Amazon GuardDuty Malware Protection
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Now name your EC2. Here I have named as ec2instance1 and select the OS

← → ⌂ us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#LaunchInstances: BVC CTS IRCC Cloud others Get Ahead in Retail... All Bookmarks

AWS Services Search [Alt+S]

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 Add additional tags

Application and OS Images (Amazon Machine Image) [Info](#)

An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance. Search or Browse for AMIs if you don't see what you are looking for below

Search our full catalog including 1000s of application and OS images

Quick Start

Summary

Number of instances [Info](#)
1

Software Image (AMI)
Amazon Linux 2023 AMI 2023.2.2...[read more](#)
ami-067d1e60475437da2

Virtual server type (instance type)
t2.micro

Firewall (security group)
New security group

Storage (volumes)
1 volume(s) - 8 GiB

Free tier: In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which

Cancel **Launch instance** Review commands

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The screenshot shows the AWS EC2 console with the URL <https://us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#LaunchInstances>. The search bar at the top has "Search" and the AWS logo. The navigation bar includes "Services" and "CloudShell". The main area shows a "Quick Start" section with various OS icons: Amazon Linux, macOS, Ubuntu, Windows, Red Hat, and SUSE. A search bar below says "Search our full catalog including 1000s of application and OS images". On the right, the "Summary" section is expanded, showing "Number of instances" set to 1, "Software Image (AMI)" as Amazon Linux 2023 AMI, "Virtual server type (instance type)" as t2.micro, and "Storage (volumes)" as 1 volume(s) - 8 GiB. A tooltip for the free tier indicates it includes 750 hours of t2.micro or t3.micro usage. At the bottom right are "Cancel", "Launch instance", and "Review commands" buttons.

Create the new key pair and instance type as t2.micro which is free tier.

The screenshot shows the AWS EC2 console with the same URL as the previous screenshot. The "Instance type" section is expanded, showing the t2.micro option selected. Below it, there's a note about additional costs for pre-installed software. The "Key pair (login)" section is expanded, showing "instance1key" selected. The "Network settings" section is also expanded. A tooltip for the free tier reappears. The "Launch instance" button is visible at the bottom right.

While creating key pair select the .ppk for windows machine and .pem for MAC machine

us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#LaunchInstances:

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Services Search [Alt+S]

Create key pair

Key pair name
Key pairs allow you to connect to your instance securely.

The name can include up to 255 ASCII characters. It can't include leading or trailing spaces.

Key pair type

- RSA RSA encrypted private and public key pair
- ED25519 ED25519 encrypted private and public key pair

Private key file format

- .pem For use with OpenSSH
- .ppk For use with PuTTY

Warning: When prompted, store the private key in a secure and accessible location on your computer. You will need it later to connect to your instance. [Learn more](#)

Cancel Create key pair

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Now edit the network settings. Choose the VPC name which we have created before. Select the public subnet inside the VPC. Enable the auto assign public IP then only it will be visible to others.

us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#LaunchInstances:

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Services Search [Alt+S]

Network settings

VPC - required Info
vpc-0b1430f270ea8ac4a (akilaVPCproj-vpc) 19.0.0.24

Subnet info
subnet-02a35efed0872419b akilaVPCproj-subnet-public1-us-east-1a VPC: vpc-0b1430f270ea8ac4a Owner: 969877014093 Availability Zone: us-east-1a IP addresses available: 10 CIDR: 19.0.0.0/28

Auto-assign public IP Info
Enable

Firewall (security groups) Info
A security group is a set of firewall rules that control the traffic for your instance. Add rules to allow specific traffic to reach your instance.
 Create security group
 Select existing security group

Security group name - required
instance-1

This security group will be added to all network interfaces. The name can't be edited after the security group is created. Max length is 255 characters. Valid characters: a-z, A-Z, 0-9, spaces, and _-./()#@[]+=&{|}\$

Description - required Info
launch-wizard-1 created 2023-10-08T01:33:19.604Z

Summary

Number of instances Info
1

Software Image (AMI)
Amazon Linux 2023 AMI 2023.2.2...read more ami-067d1e60475437da2

Virtual server type (instance type)
t2.micro

Firewall (security group)
New security group

Storage (volumes)
1 volume(s) - 8 GiB

Free tier: In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which

Cancel Launch instance Review commands

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Add the inbound rules as HTTP and anywhere. Then Launch the instance.

us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#LaunchInstances:

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Services Search [Alt+S]

Description - required info

launch-wizard-1 created 2023-10-08T01:33:19.604Z

Inbound Security Group Rules

Security group rule 1 (TCP, 22, 0.0.0.0/0)

Type Info Protocol Info Port range Info

ssh TCP 22

Source type Info Source Info Description - optional Info

Anywhere Add CIDR, prefix list or security e.g. SSH for admin desktop

0.0.0.0/0 X

Remove

Security group rule 2 (TCP, 80, 0.0.0.0/0)

Type Info Protocol Info Port range Info

HTTP TCP 80

Source type Info Source Info Description - optional Info

Anywhere Add CIDR, prefix list or security e.g. SSH for admin desktop

0.0.0.0/0 X

Remove

Rules with source of 0.0.0.0/0 allow all IP addresses to access your instance. We recommend setting security group rules to allow access from known IP addresses only.

Summary

Number of instances Info

1

Software Image (AMI)

Amazon Linux 2023 AMI 2023.2.2...read more ami-067d1e60475437da2

Virtual server type (instance type)

t2.micro

Firewall (security group)

New security group

Storage (volumes)

1 volume(s) - 8 GiB

Free tier: In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which

Cancel Launch instance Review commands

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us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#LaunchInstances:

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Services Search [Alt+S]

Advanced network configuration

Rules with source of 0.0.0.0/0 allow all IP addresses to access your instance. We recommend setting security group rules to allow access from known IP addresses only.

Add security group rule

Configure storage Info Advanced

1x 8 GiB gp3 Root volume (Not encrypted)

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

Add new volume

0 x File systems Edit

Advanced details Info

Summary

Number of instances Info

1

Software Image (AMI)

Amazon Linux 2023 AMI 2023.2.2...read more ami-067d1e60475437da2

Virtual server type (instance type)

t2.micro

Firewall (security group)

New security group

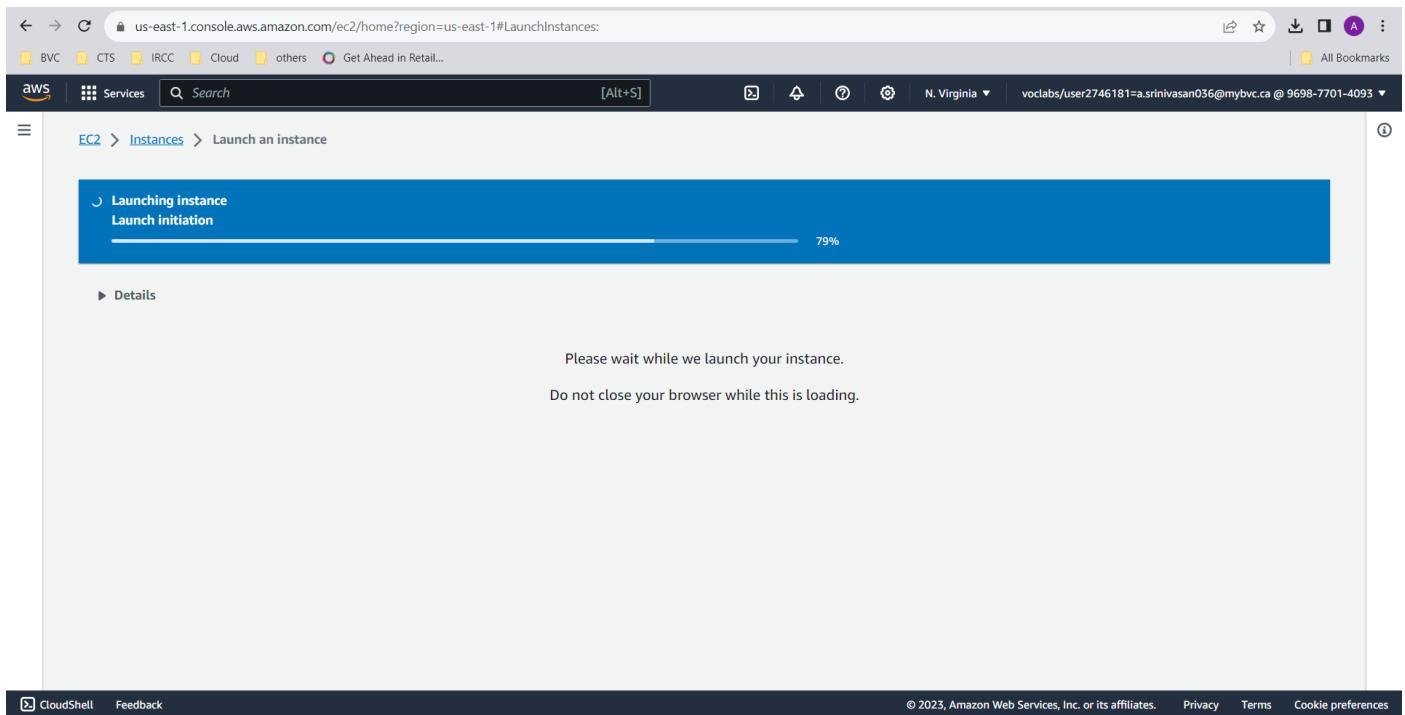
Storage (volumes)

1 volume(s) - 8 GiB

Free tier: In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which

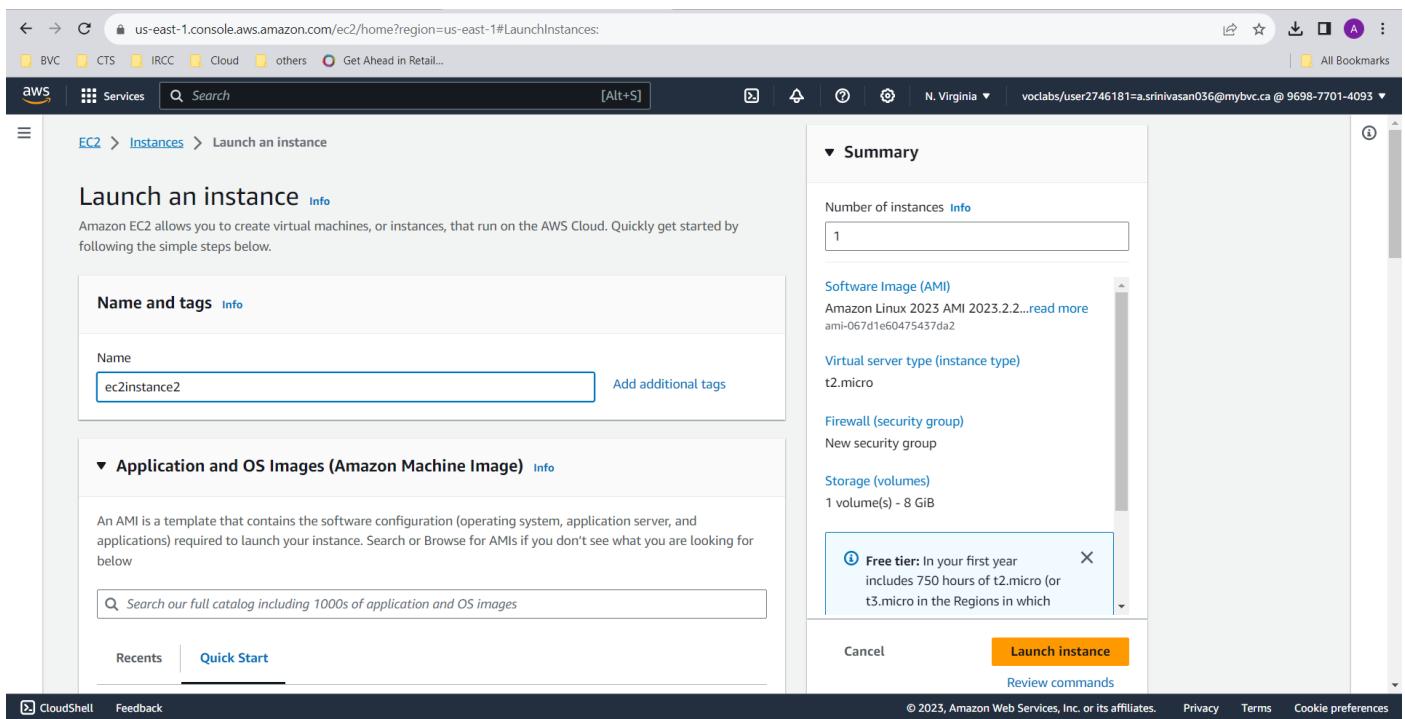
Cancel Launch instance Review commands

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Second EC2 Instance:

Now do the same process for the second instance. Here I have named it ec2instance2



The screenshot shows the AWS EC2 Launch Instances page. In the center, a modal window titled "Create key pair" is open. The "Key pair name" field contains "instancekey2". The "Key pair type" section has "RSA" selected. Below it, the "Private key file format" section has ".pem" selected. A warning message in a yellow box states: "⚠️ When prompted, store the private key in a secure and accessible location on your computer. You will need it later to connect to your instance. [Learn more](#)".

Summary

Number of instances [Info](#)
1

Software Image (AMI)
Amazon Linux 2023 AMI 2023.2.2...[read more](#)
ami-067d1e60475437da2

Virtual server type (instance type)
t2.micro

Firewall (security group)
New security group

Storage (volumes)
1 volume(s) - 8 GiB

Launch instance

The screenshot shows the AWS EC2 Launch Instances page. On the left, the "Instance type" section is expanded, showing the "t2.micro" option. The "Key pair (login)" section is also expanded, showing the "Select" button. The "Create key pair" modal window is open, with the "Key pair name" field set to "instancekey2". The "Key pair type" section shows "RSA" selected. The "Private key file format" section shows ".pem" selected. A warning message in a yellow box states: "⚠️ When prompted, store the private key in a secure and accessible location on your computer. You will need it later to connect to your instance. [Learn more](#)".

Now create the new key pair for this instance.

The screenshot shows the AWS EC2 Launch Instances wizard. The first step, 'Instance type', is selected. It shows a choice of 't2.micro' (Free tier eligible) and other options like 'All generations' and 'Compare instance types'. The second step, 'Key pair (login)', is also selected, showing a dropdown for 'instance2keypair' and a 'Create new key pair' button. The third step, 'Summary', is shown on the right, containing fields for 'Number of instances' (set to 1), 'Software Image (AMI)' (Amazon Linux 2023 AMI 2023.2.2...), 'Virtual server type (instance type)' (t2.micro), 'Firewall (security group)' (New security group), and 'Storage (volumes)' (1 volume(s) - 8 GiB). A tooltip for the 'Free tier' is visible, stating: 'Free tier: In your first year includes 750 hours of t2.micro (or t3.micro) in the Regions in which you launch instances.' At the bottom are 'Cancel', 'Launch instance' (in orange), and 'Review commands' buttons.

Select the created VPC and different subnet.

us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#LaunchInstances:

VPC - required Info
vpc-0b1430f270ea8ac4a (akilaVPCproj-vpc)
19.0.0.0/24

Subnet Info
subnet-00897f4caa0f9a805 akilaVPCproj-subnet-public2-us-east-1b
VPC: vpc-0b1430f270ea8ac4a Owner: 969877014093 Availability Zone: us-east-1b IP addresses available: 11 CIDR: 19.0.0.16/28

Create new subnet

Auto-assign public IP Info
Enable

Firewall (security groups) Info
A security group is a set of firewall rules that control the traffic for your instance. Add rules to allow specific traffic to reach your instance.
 Create security group
 Select existing security group

Security group name - required
ec2instance-2

This security group will be added to all network interfaces. The name can't be edited after the security group is created. Max length is 255 characters. Valid characters: a-z, A-Z, 0-9, spaces, and _-:/()#@[]+=&:;]\$*

Description - required Info
launch-wizard-1 created 2023-10-08T01:46:23.388Z

Inbound Security Group Rules

Number of instances Info
1

Software Image (AMI)
Amazon Linux 2023 AMI 2023.2.2...read more
ami-067d1e60475437da2

Virtual server type (instance type)
t2.micro

Firewall (security group)
New security group

Storage (volumes)
1 volume(s) - 8 GiB

Free tier: In your first year includes 750 hours of t2.micro (or t3.micro) in the Regions in which you launch this instance.

Cancel Launch instance Review commands

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Add the inbound rules as HTTP and anywhere. Then Launch the instance.

us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#LaunchInstances:

Description - required Info
launch-wizard-1 created 2023-10-08T01:46:23.388Z

Inbound Security Group Rules

Number of instances Info
1

Software Image (AMI)
Amazon Linux 2023 AMI 2023.2.2...read more
ami-067d1e60475437da2

Virtual server type (instance type)
t2.micro

Firewall (security group)
New security group

Storage (volumes)
1 volume(s) - 8 GiB

Free tier: In your first year includes 750 hours of t2.micro (or t3.micro) in the Regions in which you launch this instance.

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Rules with source of 0.0.0.0/0 allow all IP addresses to access your instance. We recommend setting a more restrictive rule.

us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#LaunchInstances:

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Services Search [Alt+S]

N. Virginia voclabs/user2746181=a.srinivasan036@mybvc.ca @ 9698-7701-4093

Summary

Rules with source of 0.0.0.0/0 allow all IP addresses to access your instance. We recommend setting security group rules to allow access from known IP addresses only.

Add security group rule Advanced network configuration

Configure storage Info Advanced

1x 8 GB gp3 Root volume (Not encrypted)

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

Add new volume

0 x File systems Edit

Advanced details Info

Number of instances 1

Software Image (AMI) Amazon Linux 2023 AMI 2023.2.2...read more ami-067d1e60475437da2

Virtual server type (instance type) t2.micro

Firewall (security group) New security group

Storage (volumes) 1 volume(s) - 8 GiB

Free tier: In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which

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us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#LaunchInstances:

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Services Search [Alt+S]

N. Virginia voclabs/user2746181=a.srinivasan036@mybvc.ca @ 9698-7701-4093

EC2 > Instances > Launch an instance

Launching instance Launch initiation 79%

Details

Please wait while we launch your instance.
Do not close your browser while this is loading.

Screenshot of the AWS EC2 Instances page showing two running t2.micro instances. The left sidebar includes links for EC2 Dashboard, Global View, Events, Instances (selected), Images, and Elastic Block Store.

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4
ec2instance2	i-022ac68435b280719	Running	t2.micro	-	No alarms	us-east-1b	ec2-44-212-1
ec2instance1	i-034559b1d4c8cd5f5	Running	t2.micro	2/2 checks passed	No alarms	us-east-1a	ec2-3-221-1

Select an instance

Now we have created the VPC and instances. Copy the public IPv4 DNS and open the putty and paste it to the Host name. Naviagte in the side Navbar SSH – Auth – credentials . Browse the downloaded .ppk file while creating key pair in EC2 instance.

Screenshot of the AWS EC2 Instance Details page for instance i-034559b1d4c8cd5f5. A Putty Configuration window is open, showing the connection details for the instance. The Public IP address is listed as ec2-3-221-149-230.compute-1.amazonaws.com.

Instance summary for i-034559b1d4c8cd5f5

- Category: Logging, Terminal, Keyboard, Bell, Features, Window, Appearance, Behaviour, Translation, Selection, Colours, Connection, Data, Proxy, SSH, Kex, Host keys, Cipher, Auth, Credentials, GSSAPI, TTY, X11, Tunnels.
- Hostname type: IP name: ip-19-0-0-10.ec2.internal
- Auto-assigned IP address: 3.221.149.230 [Public IP]
- IAM Role: -
- IMDSv2: Required

Putty Configuration

Basic options for your PuTTY session

- Specify the destination you want to connect to: Host Name (or IP address) : 3-221-149-230.compute-1.amazonaws.com Port : 22
- Connection type: SSH
- Load, save or delete a stored session: Default Settings, Load, Save, Delete
- Close window on exit: Always, Never, Only on clean exit

Private IPv4 addresses

Public IPv4 DNS copied

ec2-3-221-149-230.compute-1.amazonaws.com [open address]

Elastic IP addresses: -

AWS Compute Optimizer finding: Opt-in to AWS Compute Optimizer for recommendations. | Learn more

Auto Scaling Group name: -

Once the terminal opened give the login as "ec2-user".

Do the same process for the another ec2

Classification: General

us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#InstanceDetails:instanceId=i-00cd6e3424450eb3e

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EC2 Instances i-00cd6e3424450eb3e

Instance summary for i-00cd6e3424450eb3e (ec2instance2) [Info](#)

Updated less than a minute ago

Instance ID i-00cd6e3424450eb3e PutTY Configuration

Category:

- Logging
- Terminal
- Keyboard
- Bell
- Features
- Windows
- Appearance
- Behaviour
- Translation
- Selection
- Colours
- Connection
- Data
- Proxy
- SSH
 - Kex
 - Host keys
 - Cipher
 - Auth
 - Credentials
 - GSSAPI
 - TTY
 - X11
 - Tunnels

Credentials to authenticate with
Public-key authentication
Private key file for authentication: C:\Users\akila\Downloads\instance2keypair [Browse...]
Certificate to use with the private key (optional): [Browse...]
Plugin to provide authentication responses
Plugin command to run

Public IPv4 DNS copied

Private IPv4 addresses

Elastic IP addresses

AWS Compute Optimizer finding
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[Learn more](#)

Auto Scaling Group name

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Classification: General

us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#InstanceDetails:instanceId=i-00cd6e3424450eb3e

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EC2 - ec2-52-90-194-65.compute-1.amazonaws.com - PutTY

PuTTY Security Alert

The host key is not cached for this server:
ec2-52-90-194-65.compute-1.amazonaws.com (port 22)
You have no guarantee that the server is the computer you think it is.
The server's ssh-ed25519 key fingerprint is:
ssh-ed25519 255 SHA256:MYoUDkwUSwya0RkAuZiZD3j2Mid+k79Y/pm/dzrYJY
If you trust this host, press "Accept" to add the key to PuTTY's cache and carry on connecting.
If you want to carry on connecting just once, without adding the key to the cache, press "Connect Once".
If you do not trust this host, press "Cancel" to abandon the connection.

More info... Accept Connect Once Cancel

5 [Public IP] vpc-0b1430f270ea8ac4a (akilaVPCproj-vpc)

Private IPv4 addresses

Public IPv4 DNS copied

Private IPv4 addresses

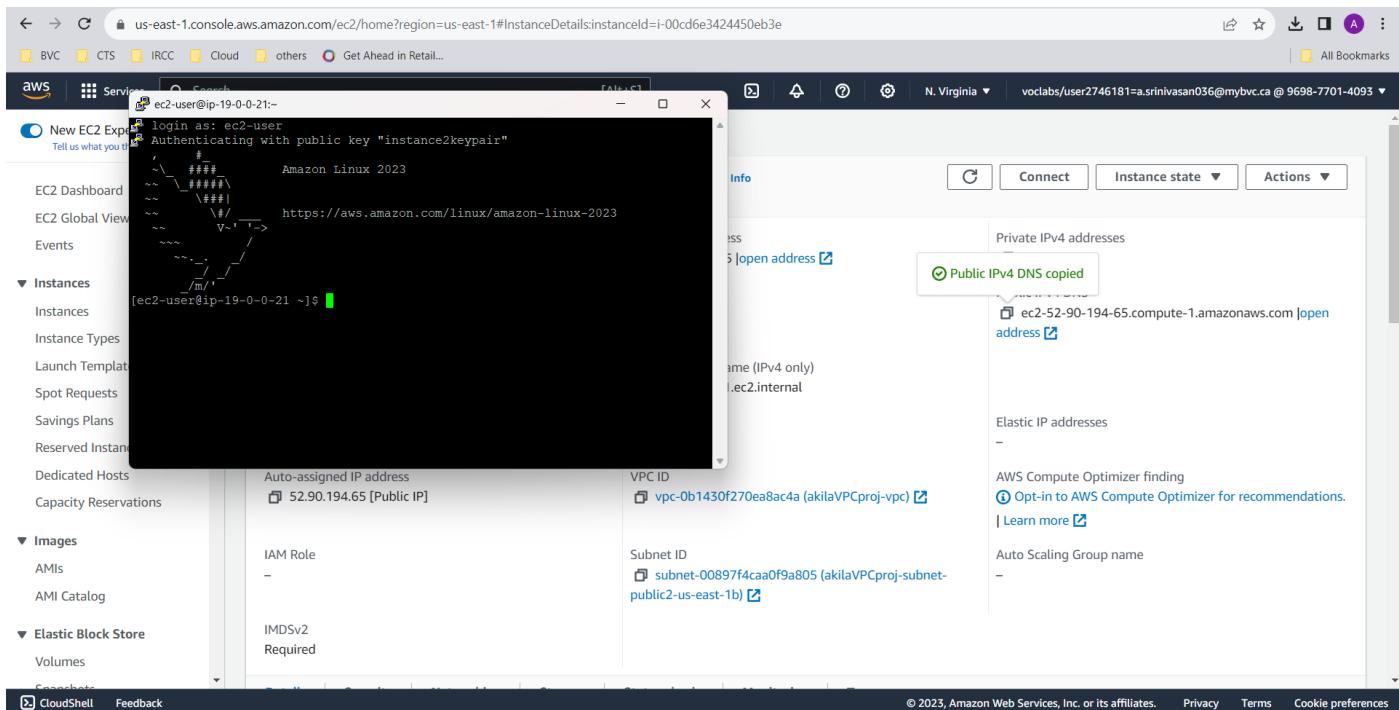
Elastic IP addresses

AWS Compute Optimizer finding
[Opt-in to AWS Compute Optimizer for recommendations.](#)
[Learn more](#)

Auto Scaling Group name

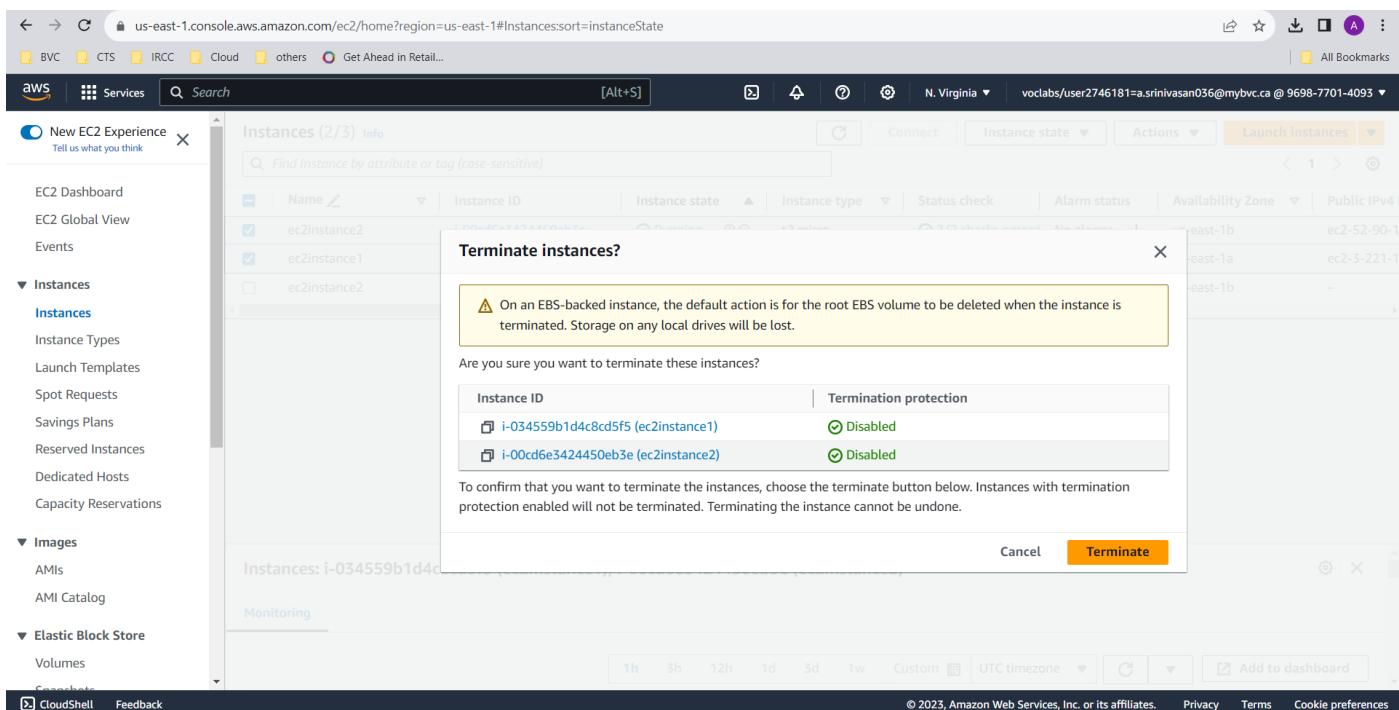
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Terminating VPC and EC2 instances:

After completing the task, terminate the EC2 instances which was created.



The screenshot shows the AWS EC2 Instances page. The left sidebar includes links for EC2 Dashboard, EC2 Global View, Events, Instances (selected), Instance Types, Launch Templates, Spot Requests, Savings Plans, Reserved Instances, Dedicated Hosts, Capacity Reservations, Images (AMIs, AMI Catalog), and Elastic Block Store (Volumes). The main content area has a search bar and filters for 'Instance state = running' and 'Clear filters'. A table header includes columns for Name, Instance ID, Instance state, Instance type, Status check, Alarm status, Availability Zone, and Public IPv4. Below the table, it says 'No instances' and 'You do not have any instances in this region'. A 'Launch instances' button is at the bottom.

Now to delete the VPC go the service and select the one which we have created and in the actions click the delete vpc option.

The screenshot shows the AWS VPC console. The left sidebar lists VPC dashboard, EC2 Global View (New), Virtual private cloud (Your VPCs New selected), Subnets, Route tables, Internet gateways, Egress-only internet gateways, Carrier gateways, DHCP option sets, Elastic IPs, Managed prefix lists, Endpoints, Endpoint services, NAT gateways, Peering connections, and Security. The main content shows a table titled 'Your VPCs (1/2) Info' with one entry: 'akilaVPCproj-vpc' (vpc-0b1430f270ea8ac4a). The 'Actions' menu for this VPC includes options like Create default VPC, Create flow log, Edit VPC settings, Edit CIDRs, Manage middlebox routes, Manage tags, and Delete VPC (which is highlighted with a blue border). Below the table, there's a detailed view of the selected VPC.

In order to delete the VPC we have to delete Network and .NAT gateways .

Delete VPC

Unable to delete

This VPC cannot be deleted until you complete the following actions.

Name	VPC ID	State
akilaVPCproj-vpc	vpc-0b1430f270ea8ac4a	Available

The VPC contains one or more in-use network interfaces

The following 1 network interfaces must be deleted before this VPC can be deleted:

Name	Resource ID	State
-	eni-06f8bc3c7a360d67c	In-use

The VPC contains one or more NAT gateways

The following 1 NAT gateways must be deleted before this VPC can be deleted:

Name	Resource ID	State
akilaVPCproj-nat-public1-us-east-1a	nat-0b3ebd1d3dde6f36	Available

Cancel

Delete the NAT gateway for that type “delete” in the popup and click delete buuton

NAT gateways (1/1) Info

Actions

Create NAT gateway

Name	NAT gateway ID	Connectivit...	State
akilaVPCproj-nat-p...	nat-0b3ebd1d3dde6f36	Public	Available

View details

Edit secondary IPv4 address associations

Manage tags

Delete NAT gateway

public I... 52.45.171.117 19.0.0.4

nat-0b3ebd1d3dde6f36 / akilaVPCproj-nat-public1-us-east-1a

Details

Secondary IPv4 addresses

Monitoring

Tags

Details

NAT gateway ID nat-0b3ebd1d3dde6f36

Connectivity type Public

State Available

State message -

us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#NatGateways:vpcId=vpc-0b1430f270ea8ac4a

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VPC dashboard EC2 Global View New Filter by VPC: Select a VPC

Virtual private cloud Your VPCs New Subnets Route tables Internet gateways Egress-only internet gateways Carrier gateways DHCP option sets Elastic IPs Managed prefix lists Endpoints Endpoint services NAT gateways Peering connections

NAT gateways (1/1) Info Filter NAT gateways VPC: vpc-0b1430f270ea8ac4a Clear

Name NAT gateway

akilaVPCproj-nat-p...	nat-0b3ebd1d
-----------------------	--------------

Delete NAT gateway

Will be deleted
The following NAT gateway will be deleted permanently and can't be recovered later.

Name	NAT gateway ID	State
akilaVPCproj-nat-public1-us-east-1a	nat-0b3ebd1d3ddebf36	Available

To confirm deletion, type **delete** in the field:
delete

Cancel Delete

Primary public IP... Primary priv. 52.45.171.117 19.0.0.4

Details Secondary IPv4 addresses M

NAT gateway ID: nat-0b3ebd1d3ddebf36 Connectivity type: Public State: Available State message:

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Do the same steps for delete VPC once the NAT gateway and network got deleted.

us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#NICvpcId=vpc-0b1430f270ea8ac4a

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EC2 Dashboard EC2 Global View Events Instances Instances Instance Types Launch Templates Spot Requests Savings Plans Reserved Instances Dedicated Hosts Capacity Reservations

Images AMIs AMI Catalog Elastic Block Store Volumes Snapshots

Network interfaces (1/1) Info Search VPC ID = vpc-0b1430f270ea8ac4a Clear filters

Name Network interface ID Subnet ID VPC ID

en-06f8bc3c7a360d67c	subnet-02a35efed0872419b	vpc-0b1430f270ea8ac4a
----------------------	--------------------------	-----------------------

Actions Attach Detach Delete Manage IP addresses Associate address Disassociate address Change termination behavior Change security groups Change source/dest. check Manage tags Manage prefixes Change description Create flow log Manage ENA Express

Network interface: en-06f8bc3c7a360d67c

Details Flow logs Tags

Network interface details

Network interface ID en-06f8bc3c7a360d67c	Name -	Description Interface for NAT Gateway nat-0b3ebd1d3ddebf36
Network interface status In-use	Interface type nat_gateway	Security groups -
VPC ID vpc-0b1430f270ea8ac4a	Subnet ID subnet-02a35efed0872419b	Availability Zone us-east-1a

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us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#vpcs:

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VPC dashboard EC2 Global View New Services Search [Alt+S]

Your VPCs (1/2) Info Delete VPC

Will be deleted

This VPC will be deleted permanently and cannot be recovered later:

Name	VPC ID	State
akilaVPCproj-vpc	vpc-0b1430f270ea8ac4a	Available

Will also be deleted

The following 12 resources will also be deleted permanently and cannot be recovered later:

Name	Resource ID	State
akilaVPCproj-igw	igw-08ecbf61f650900d8	Available
akilaVPCproj-rtb-private2-us-east-1b	rtb-0e0bad415eb2cc1e6	-
akilaVPCproj-rtb-private1-us-east-1a	rtb-025e4dc56d36bd4cf	-
akilaVPCproj-rtb-public	rtb-0f2cc9c398b05579b	-
-	sg-04f1e8449b1c356ce	-

To confirm deletion, type **delete** in the field:
delete

Cancel Delete

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us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#vpcs:

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VPC dashboard EC2 Global View New Services Search [Alt+S]

Your VPCs (1/2) Info Actions Create VPC

Deleting subnets... 64%

Details

Cancel Delete

Details

Name	VPC ID	State	IPv4 CIDR	IPv6 CIDR	DHCP option set	Main route table	Main network ACL
akilaVPCproj-vpc	vpc-0b1430f270ea8ac4a	Available	19.0.0.0/24	-	-	-	-

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us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#vpcs:

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VPC dashboard EC2 Global View New Services Search [Alt+S]

Your VPCs (1) Info Actions Create VPC

Name VPC ID State IPv4 CIDR IPv6 CIDR DHCP option set Main route table Main network ACL

Name	VPC ID	State	IPv4 CIDR	IPv6 CIDR	DHCP option set	Main route table	Main network ACL
-	vpc-050524e447eb30cd0	Available	172.31.0.0/16	-	-	-	-

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Once everything got deleted end the lab.

The screenshot shows the AWS Academy Learner Lab interface. On the left is a sidebar with navigation links: Home, Modules, Discussions, Courses, Calendar, Inbox, History, and Help. The main area has tabs for AWS, CTS, IRCC, Cloud, others, and Get Ahead in Retail... The top right shows a toolbar with icons for file operations and a bookmarks section labeled 'All Bookmarks'. A central modal dialog box asks 'Are you sure you want to end the lab?' with 'Yes' and 'No' buttons. The background shows a dark-themed dashboard with various metrics and links like 'Environment Overview', 'Environment Navigation', 'Access the AWS Management Console', etc.

Reference:

AWS official documentation, www.google.com, www.youtube.com