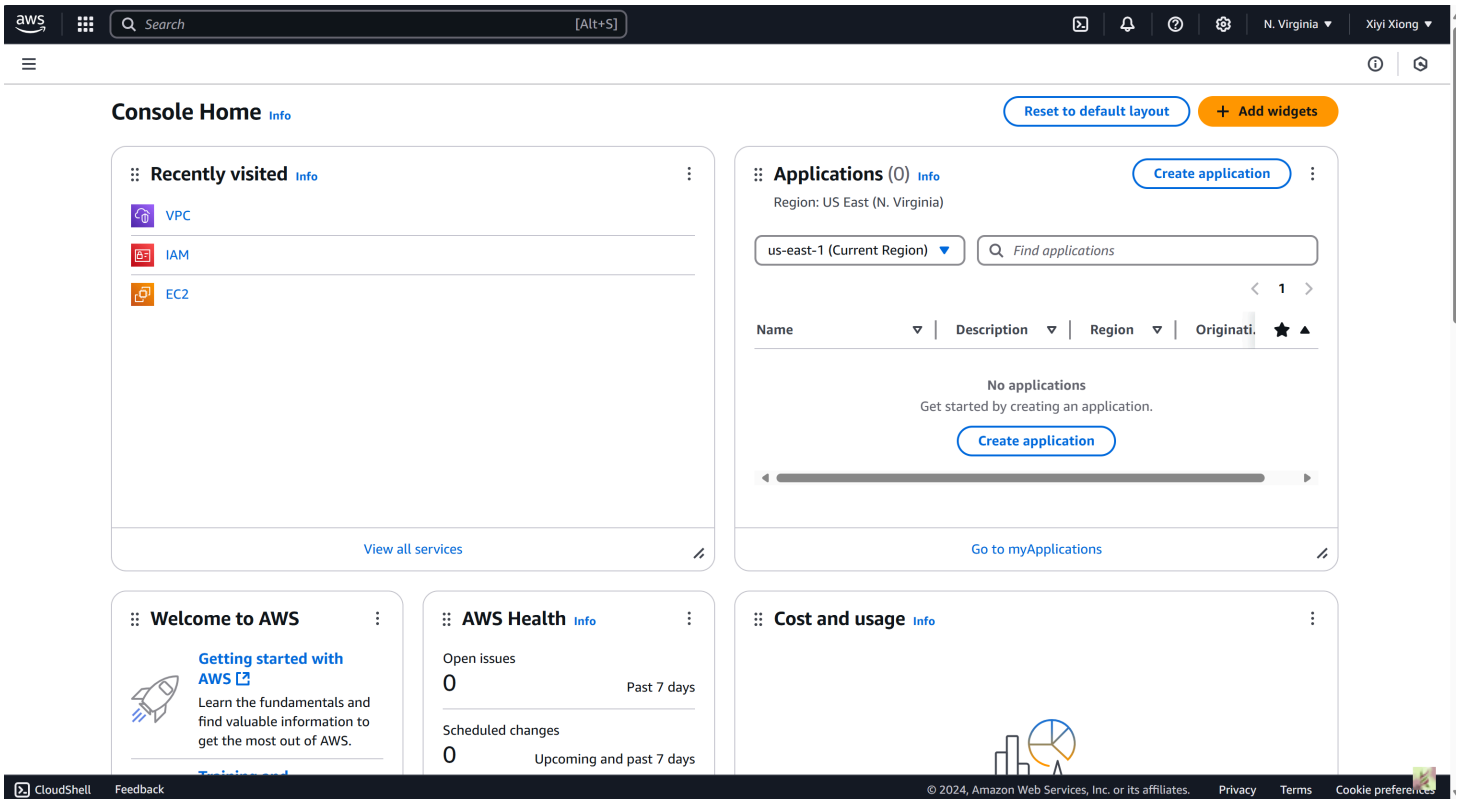
Part A

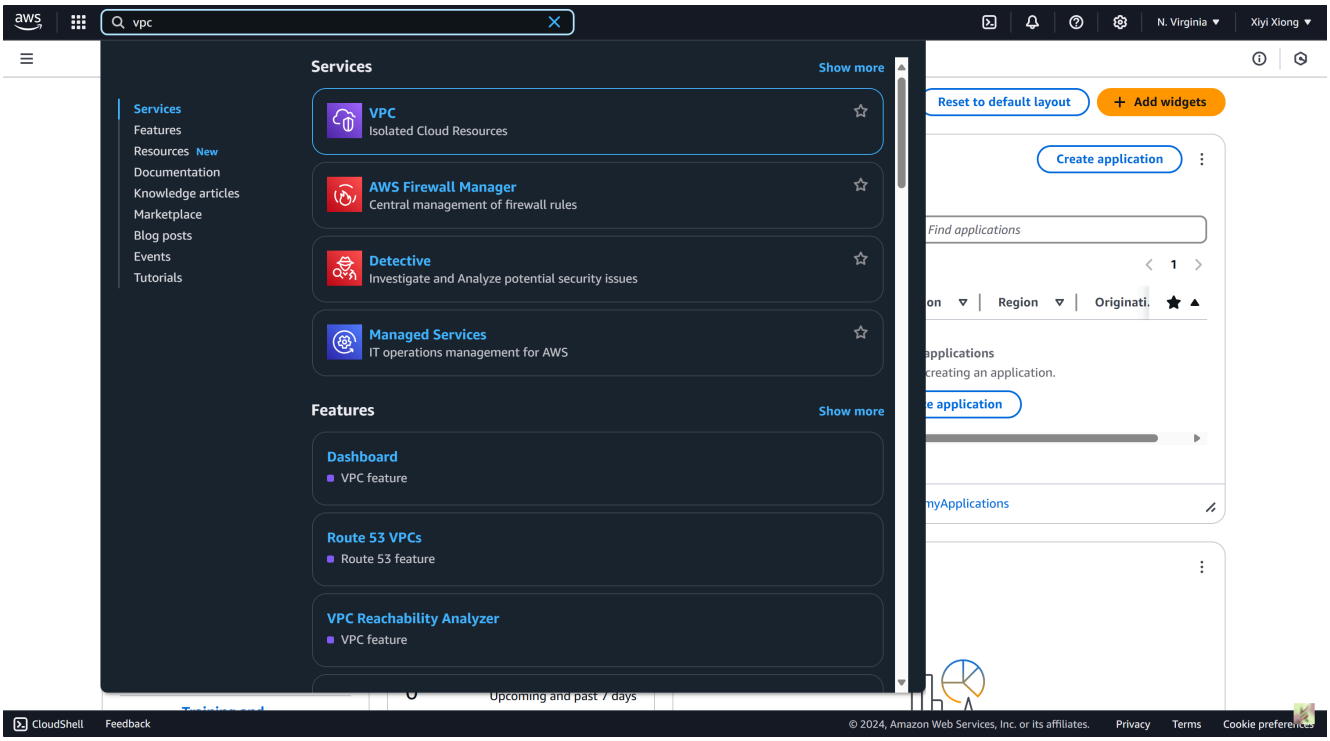
1. Log in to the AWS Management Console



2. AWS VPC Setup

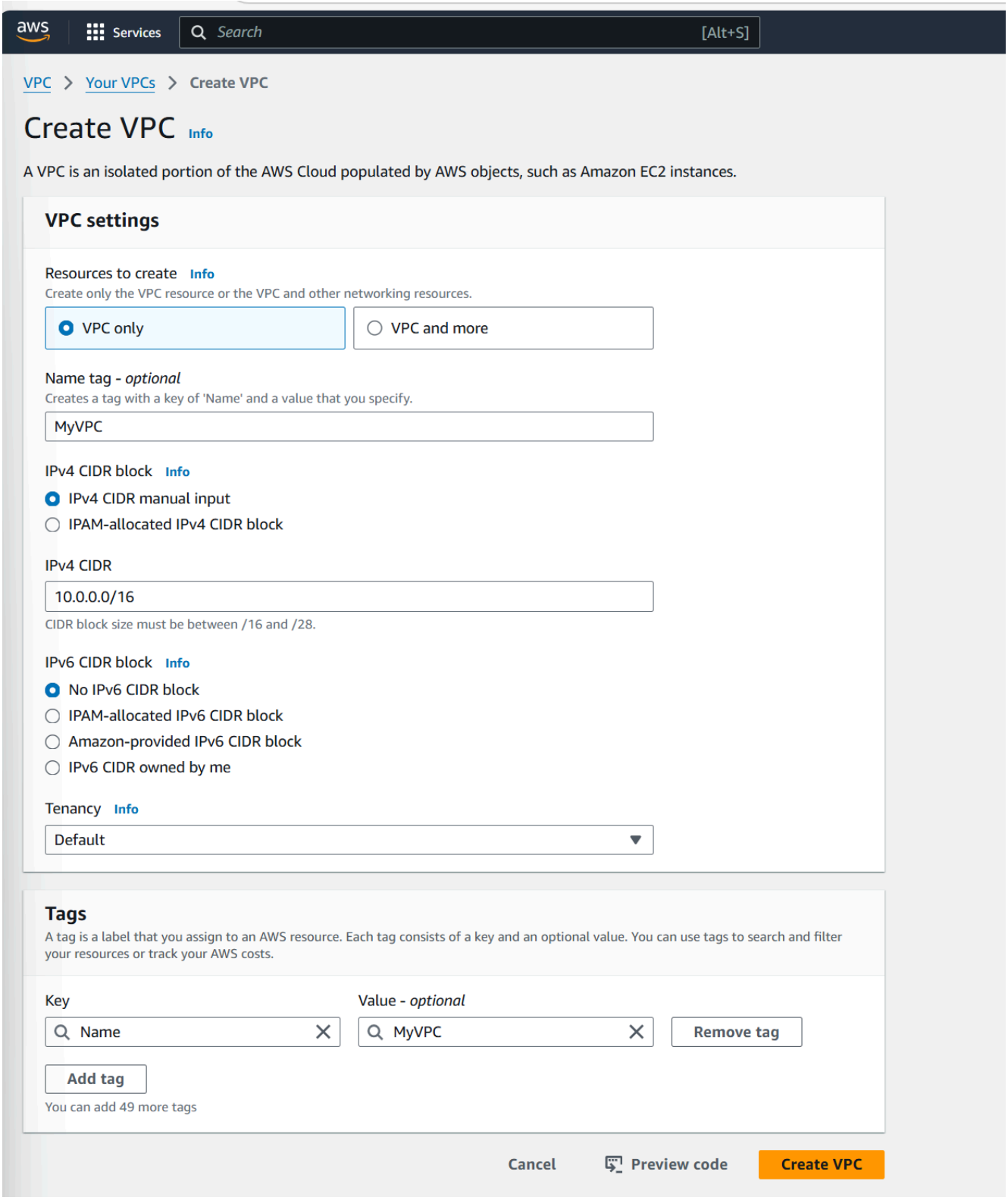
2.1 Create a New VPC

1. **Go to the VPC service**:
    - In the AWS Console, search for "VPC" in the top search bar and select it.

- 

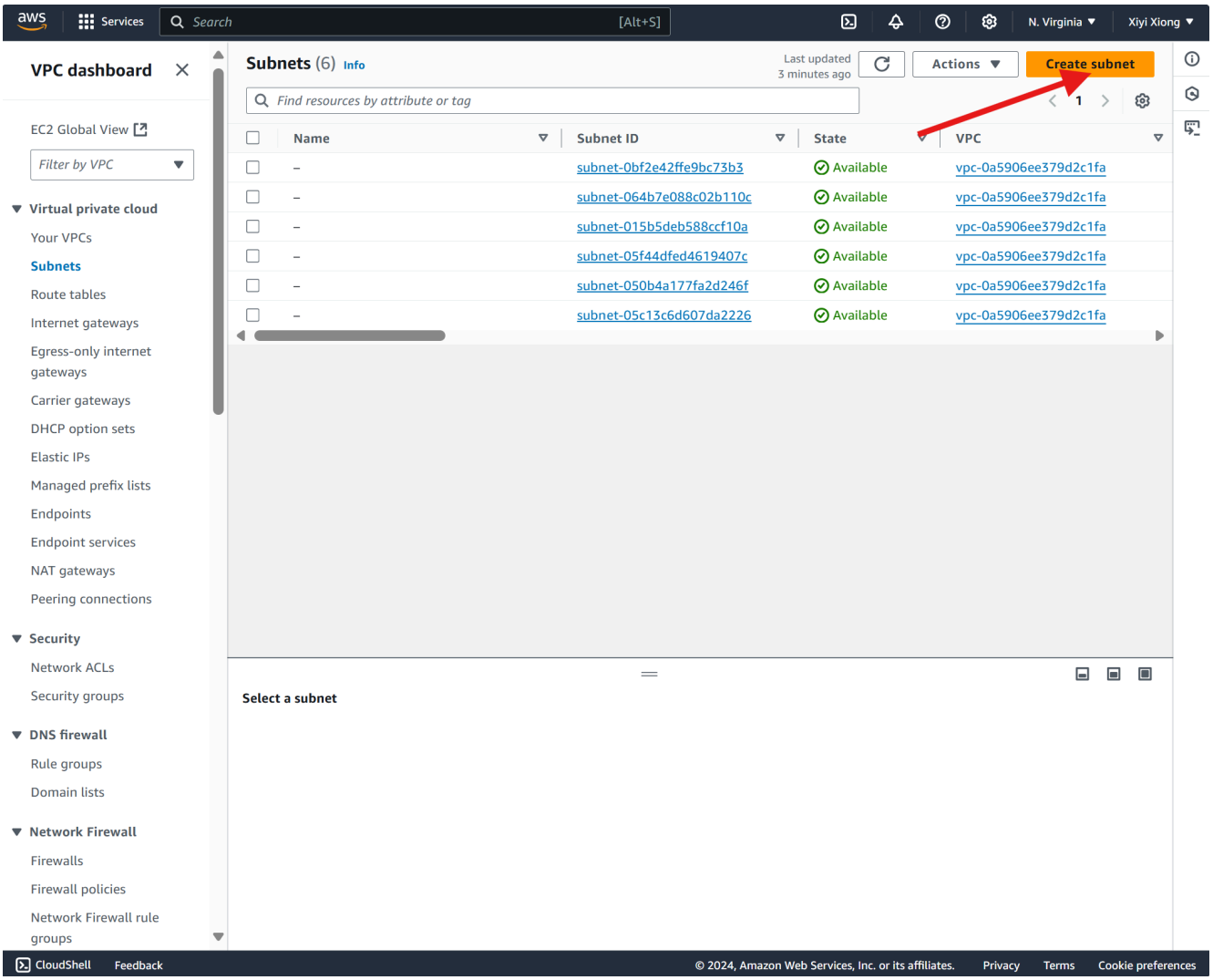
- Click "Your VPCs" > "Create VPC."

2. **Configure the VPC**:
   - **Name tag**: `MyVPC`.
   - **IPv4 CIDR block**: `10.0.0.0/16`.
   - **Tenancy**: Select `default`.
   - Click **Create VPC**.



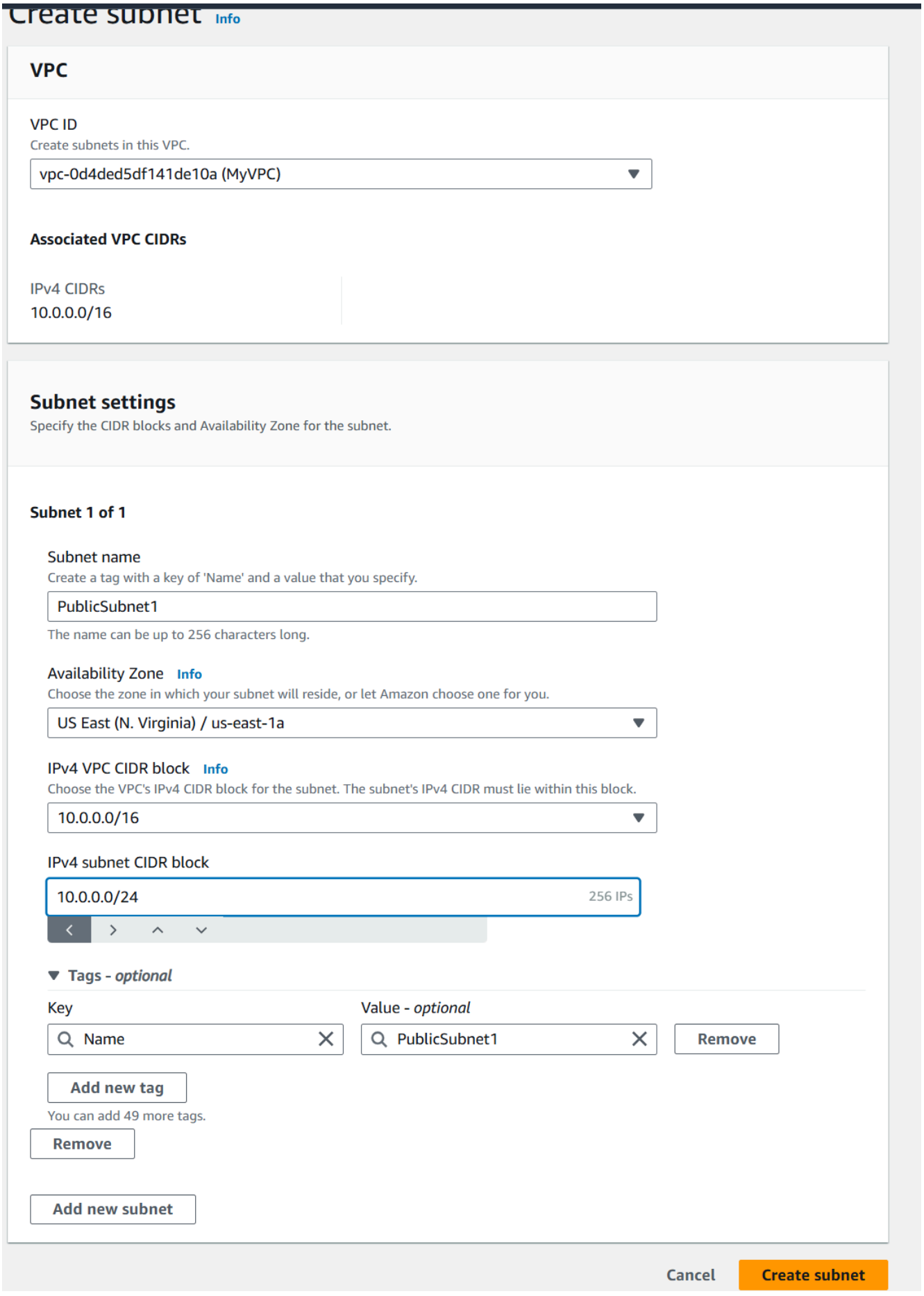
2.2 Create Subnets

1. **Create Public Subnets**:
    - In the VPC Dashboard, click "Subnets" > "Create subnet."

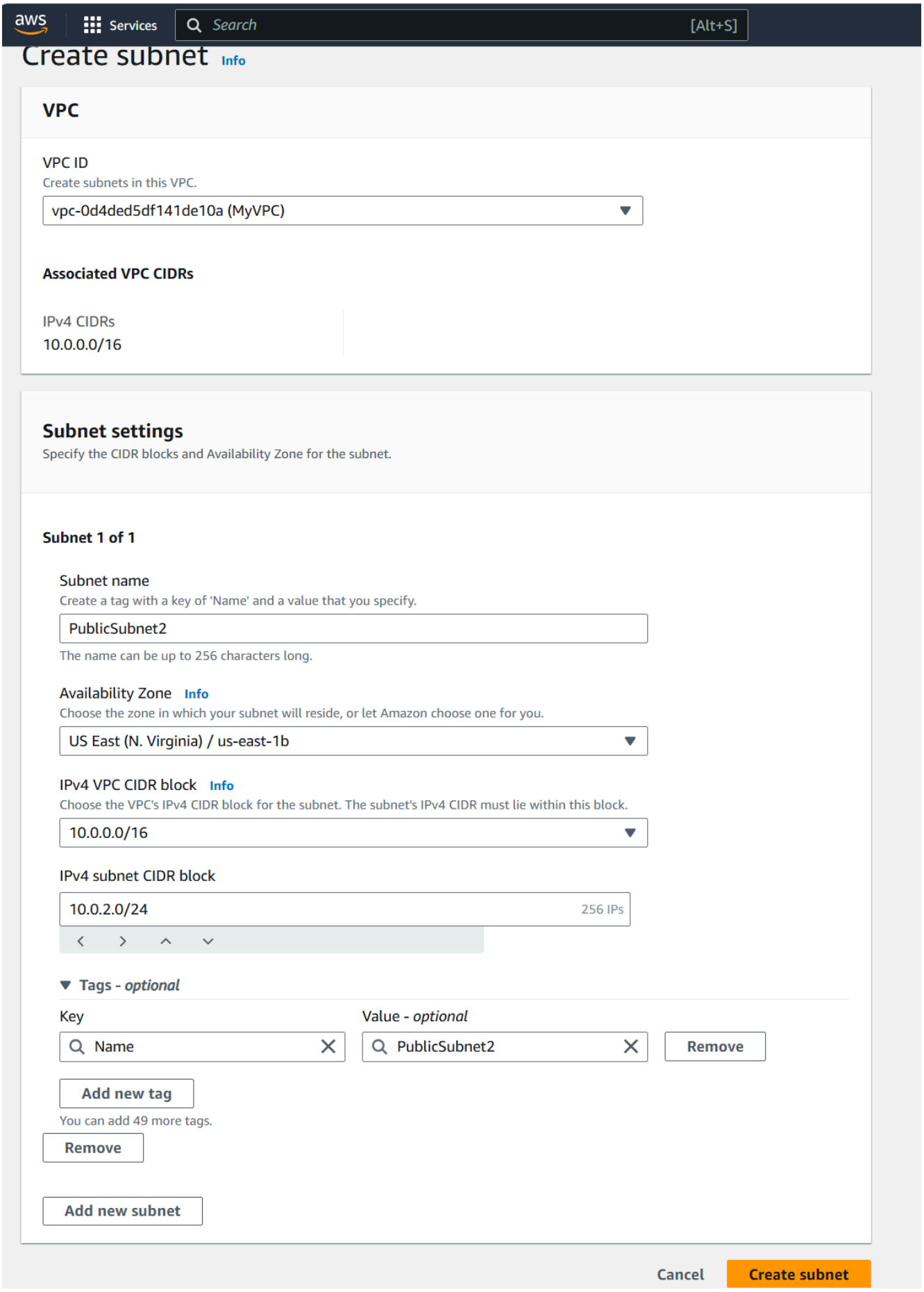
- 

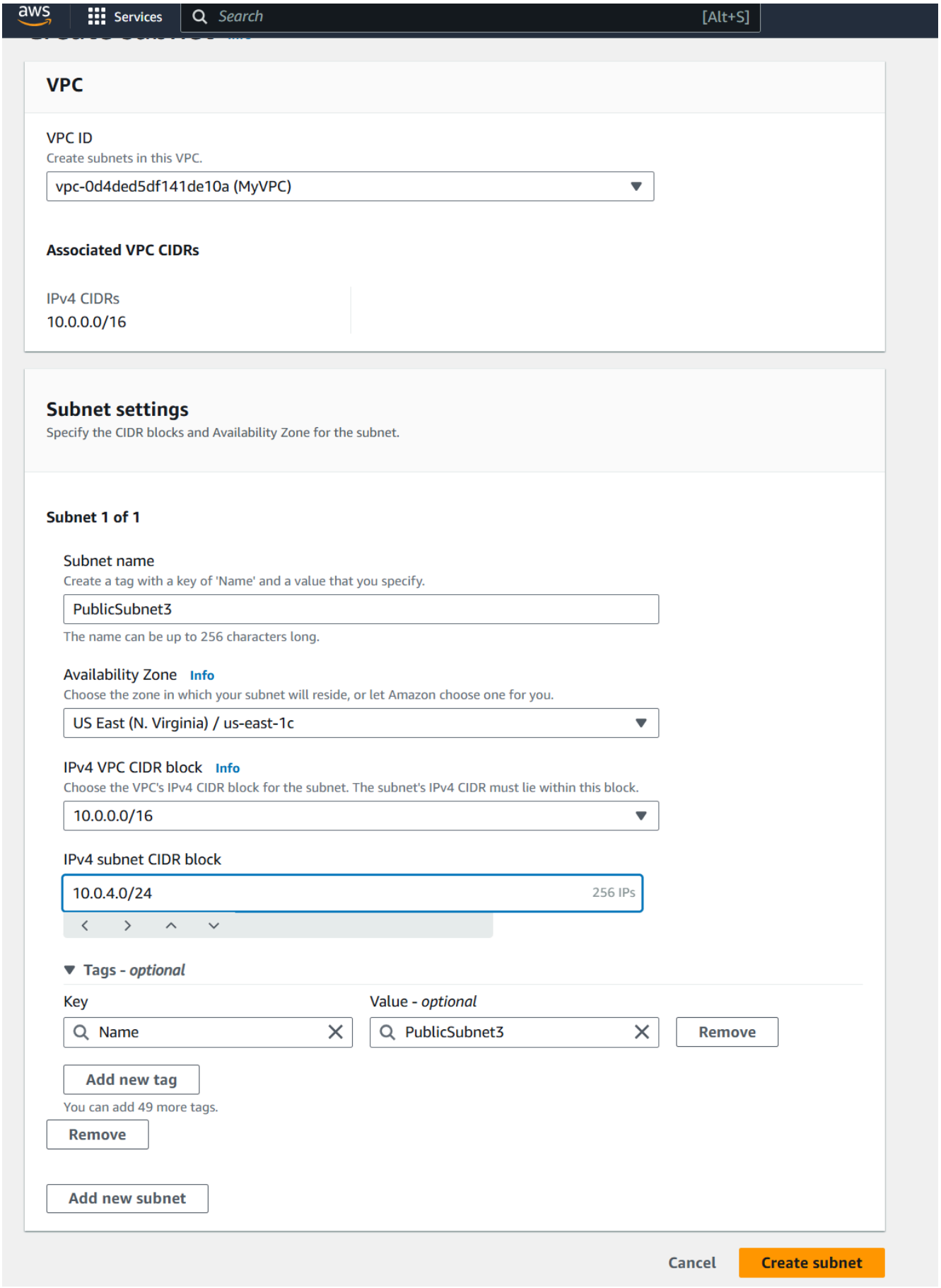
- Fill in the following details:
  - **Name tag**: `PublicSubnet1` .
  - **VPC**: Select `MyVPC` .
  - **Availability Zone**: Choose `Zone-X` → select `us-east-1a` .
  - **IPv4 CIDR block**: `10.0.0.0/24` .
- Click **Create**.

- Create subnet Info



- Repeat the steps to create two more public subnets (`10.0.2.0/24` and `10.0.4.0/24`).

- 
aws
Services
Search
[Alt+S]
Create subnet Info
VPC
VPC ID
Create subnets in this VPC.
vpc-0d4ded5df141de10a (MyVPC)
Associated VPC CIDRs
IPv4 CIDRs
10.0.0.0/16
Subnet settings
Specify the CIDR blocks and Availability Zone for the subnet.
Subnet 1 of 1
Subnet name
Create a tag with a key of 'Name' and a value that you specify.
PublicSubnet2
The name can be up to 256 characters long.
Availability Zone Info
Choose the zone in which your subnet will reside, or let Amazon choose one for you.
US East (N. Virginia) / us-east-1b
IPv4 VPC CIDR block Info
Choose the VPC's IPv4 CIDR block for the subnet. The subnet's IPv4 CIDR must lie within this block.
10.0.0.0/16
IPv4 subnet CIDR block
10.0.2.0/24
256 IPs
Tags - optional
Key
Value - optional
Name
PublicSubnet2
Remove
Add new tag
You can add 49 more tags.
Remove
Add new subnet
Cancel
Create subnet

- 

2. **Create Private Subnets**:
   - Follow the same steps to create two private subnets (`10.0.1.0/24` and `10.0.3.0/24`).

- **VPC**

VPC ID
Create subnets in this VPC.
vpc-0d4ded5df141de10a (MyVPC)

Associated VPC CIDRs

IPv4 CIDRs
10.0.0.0/16

Subnet settings
Specify the CIDR blocks and Availability Zone for the subnet.

Subnet 1 of 1

Subnet name
Create a tag with a key of 'Name' and a value that you specify.
PrivateSubnet1
The name can be up to 256 characters long.

Availability Zone Info
Choose the zone in which your subnet will reside, or let Amazon choose one for you.
US East (N. Virginia) / us-east-1a

IPv4 VPC CIDR block Info
Choose the VPC's IPv4 CIDR block for the subnet. The subnet's IPv4 CIDR must lie within this block.
10.0.0.0/16

IPv4 subnet CIDR block
10.0.1.0/24 256 IPs

▼ Tags - *optional*

Key	Value - *optional*	
Name	PrivateSubnet1	Remove

Add new tag
You can add 49 more tags.
Remove

Add new subnet

Cancel Create subnet

- **VPC**

VPC ID
Create subnets in this VPC.
vpc-0d4ded5df141de10a (MyVPC)

Associated VPC CIDRs

IPv4 CIDRs
10.0.0.0/16

Subnet settings
Specify the CIDR blocks and Availability Zone for the subnet.

Subnet 1 of 1

Subnet name
Create a tag with a key of 'Name' and a value that you specify.
PrivateSubnet2
The name can be up to 256 characters long.

Availability Zone Info
Choose the zone in which your subnet will reside, or let Amazon choose one for you.
US East (N. Virginia) / us-east-1b

IPv4 VPC CIDR block Info
Choose the VPC's IPv4 CIDR block for the subnet. The subnet's IPv4 CIDR must lie within this block.
10.0.0.0/16

IPv4 subnet CIDR block
10.0.3.0/24 256 IPs

▼ Tags - *optional*

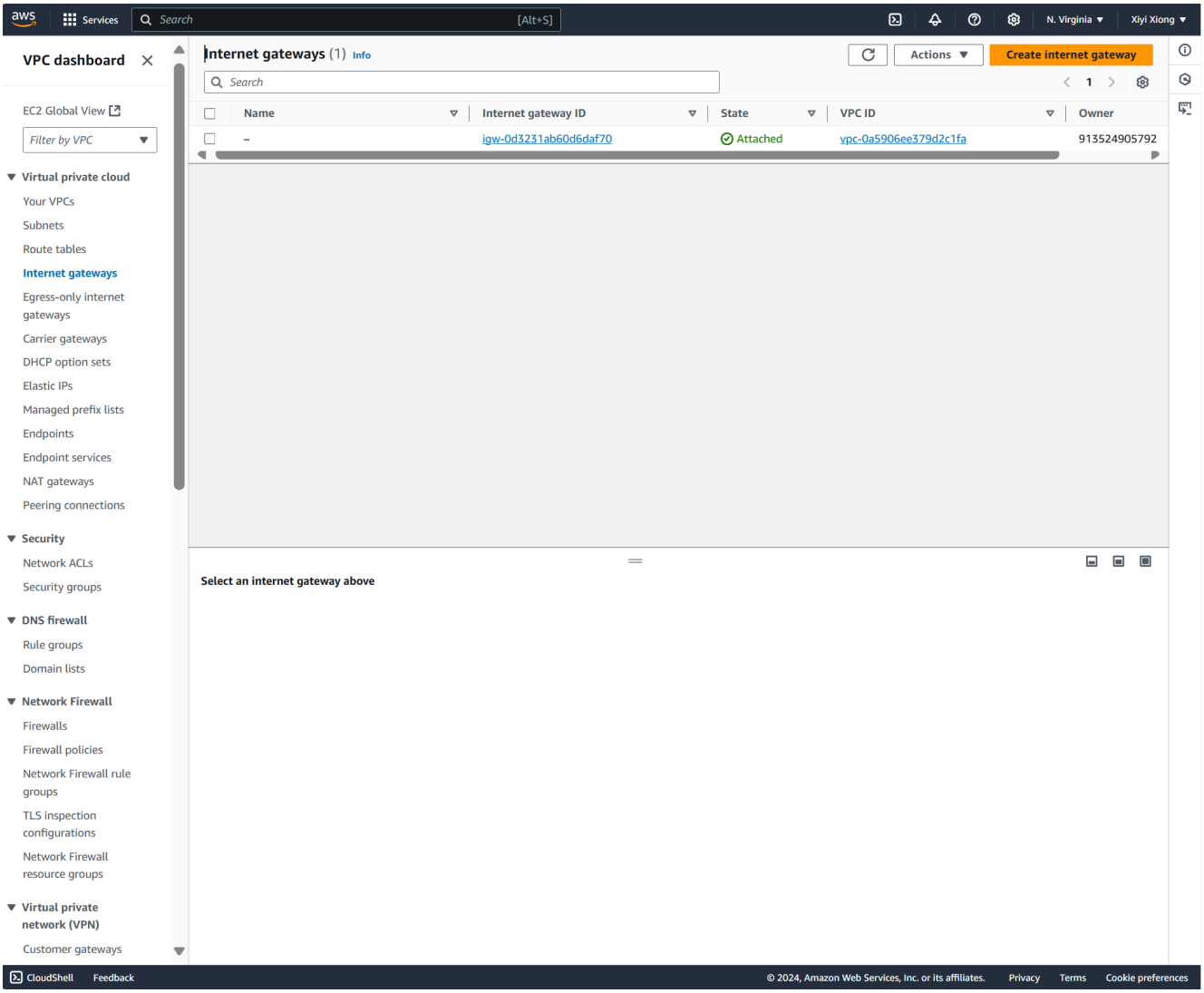
Key	Value - *optional*	
Name	PrivateSubnet2	Remove

Add new tag
You can add 49 more tags.
Remove

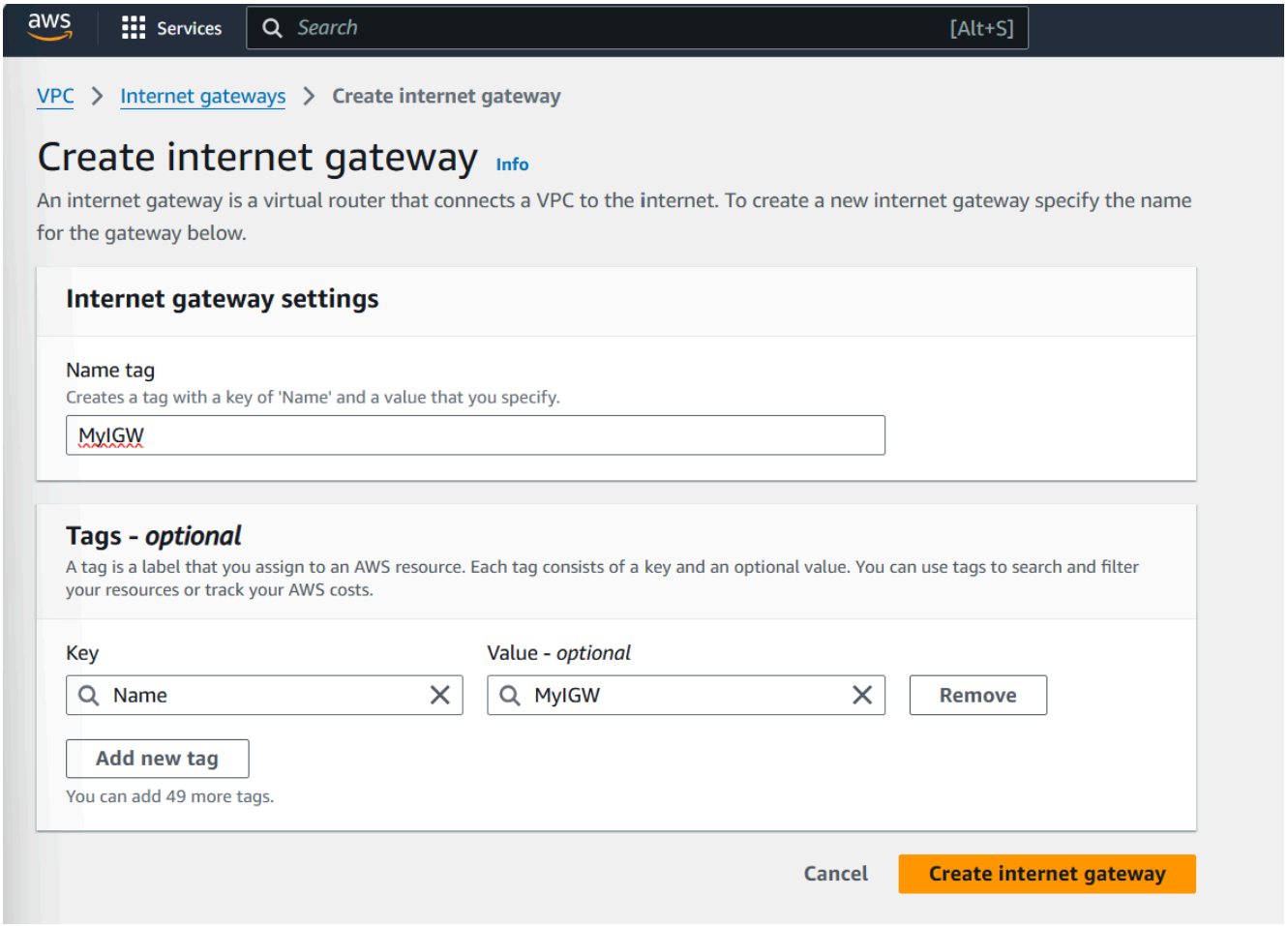
Add new subnet

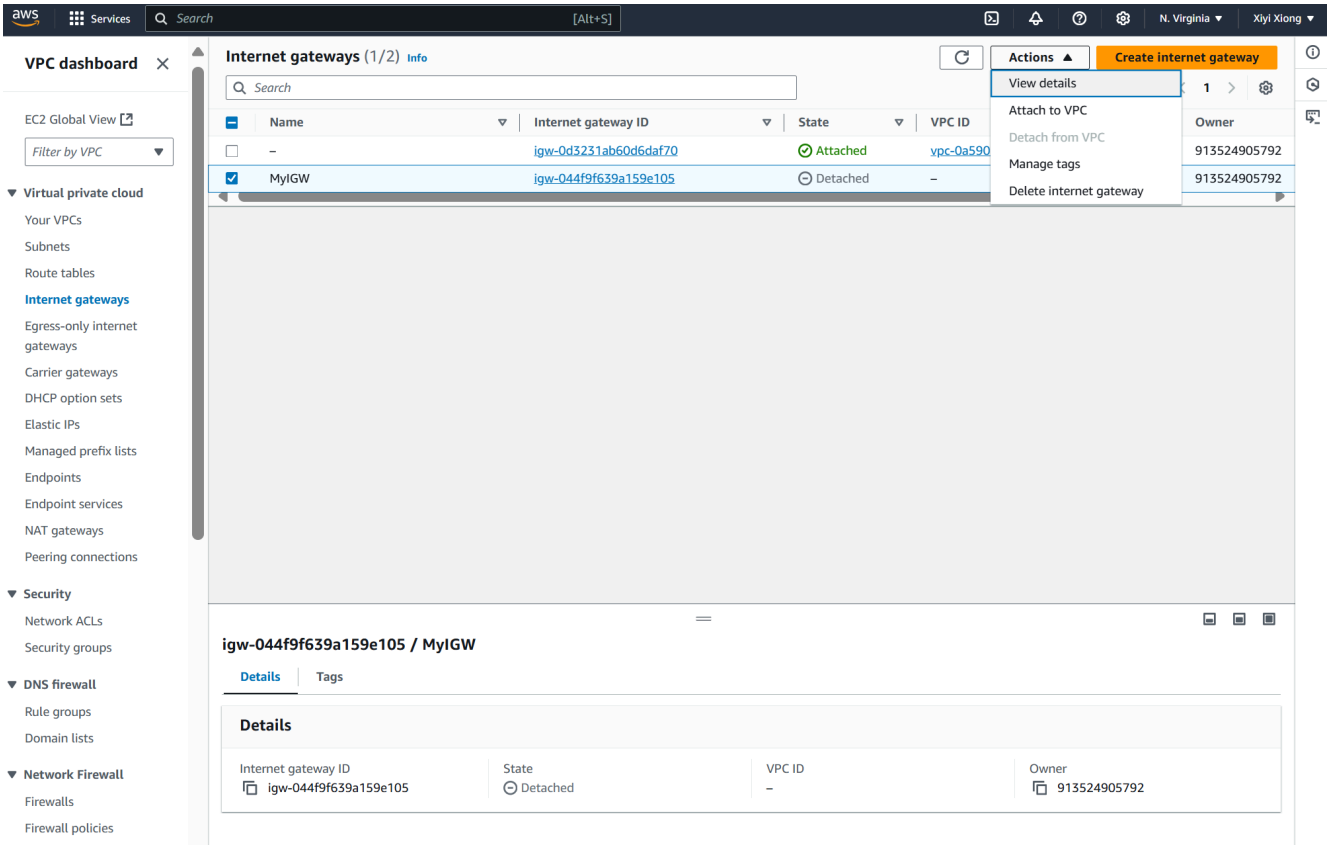
Cancel Create subnet

2.3 Configure an Internet Gateway

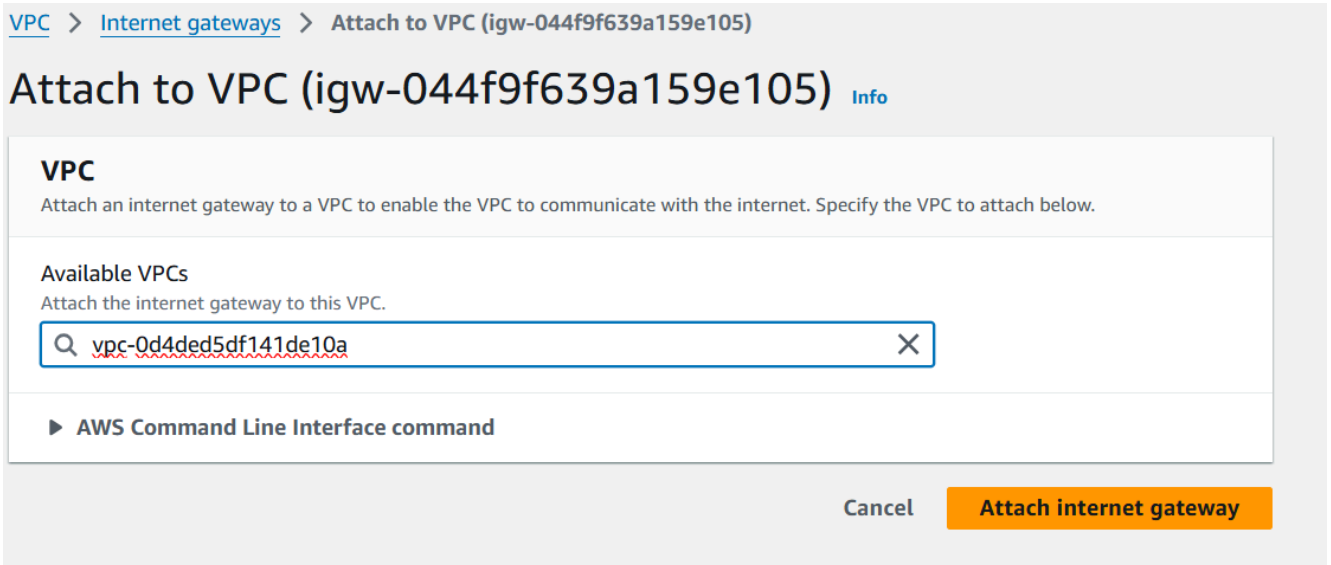
1. **Create an Internet Gateway**:
   - Click "Internet Gateways" > "Create internet gateway."
   - 

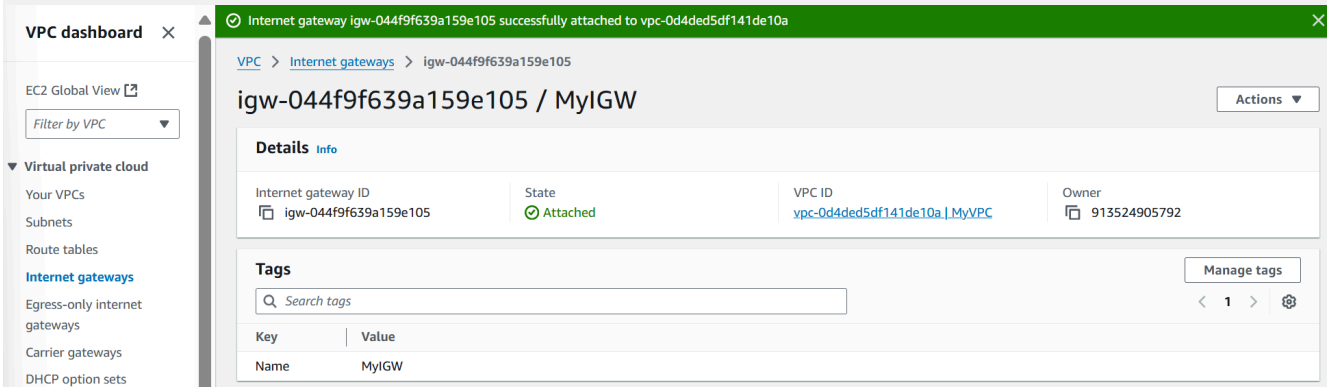
   - **Name tag**: `MyIGW`.
   - Click **Create Internet Gateway**.

- 

2. **Attach to the VPC**:
   - Select the newly created `MyIGW`.
   - 

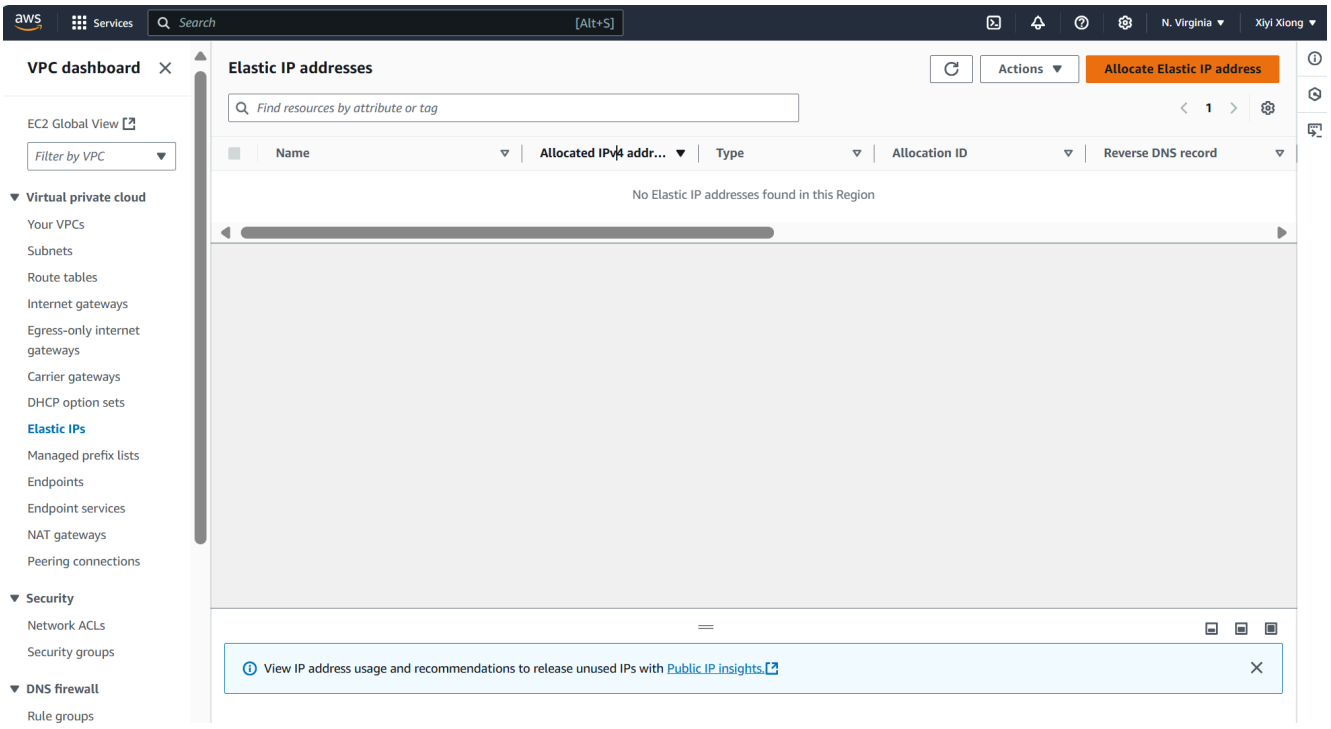
   - Click "Actions" > "Attach to VPC," choose `MyVPC`, and click **Attach**.

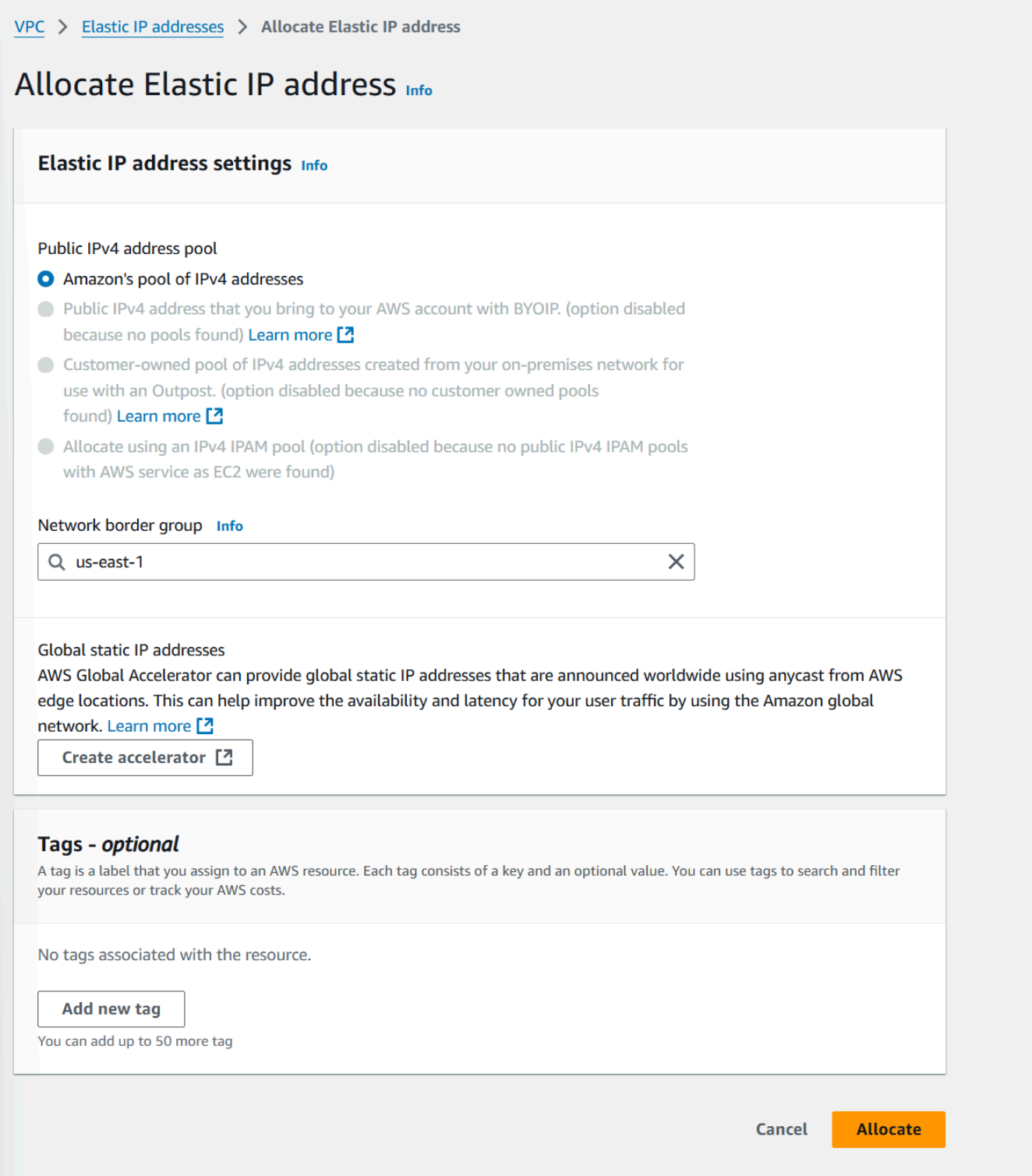
- 

- 

-

2.4 Set Up a NAT Gateway

1. **Allocate an Elastic IP**:
   - Go to "Elastic IPs" > "Allocate Elastic IP address."
   - 

- Click **Allocate**.
- 

2. **Create a NAT Gateway**:
   - Go to "NAT Gateways" > "Create NAT Gateway."
   - **Name tag**: `MyNATGateway` .
   - **Subnet**: Select a public subnet (`PublicSubnet1`).
   - **Elastic IP allocation ID**: Select the allocated Elastic IP.
   - Click **Create NAT Gateway**.

- VPC > NAT gateways > Create NAT gateway

Create NAT gateway Info

A highly available, managed Network Address Translation (NAT) service that instances in private subnets can use to connect to services in other VPCs, on-premises networks, or the internet.

NAT gateway settings

Name - *optional*
Create a tag with a key of 'Name' and a value that you specify.
MyNATGateway
The name can be up to 256 characters long.

Subnet
Select a subnet in which to create the NAT gateway.
subnet-0a8acc38e62a22fea (PublicSubnet1)

Connectivity type
Select a connectivity type for the NAT gateway.
- (•) Public
- ( ) Private

Elastic IP allocation ID Info
Assign an Elastic IP address to the NAT gateway.
eipalloc-0f918983ee77fd435 | Allocate Elastic IP

▶ Additional settings Info

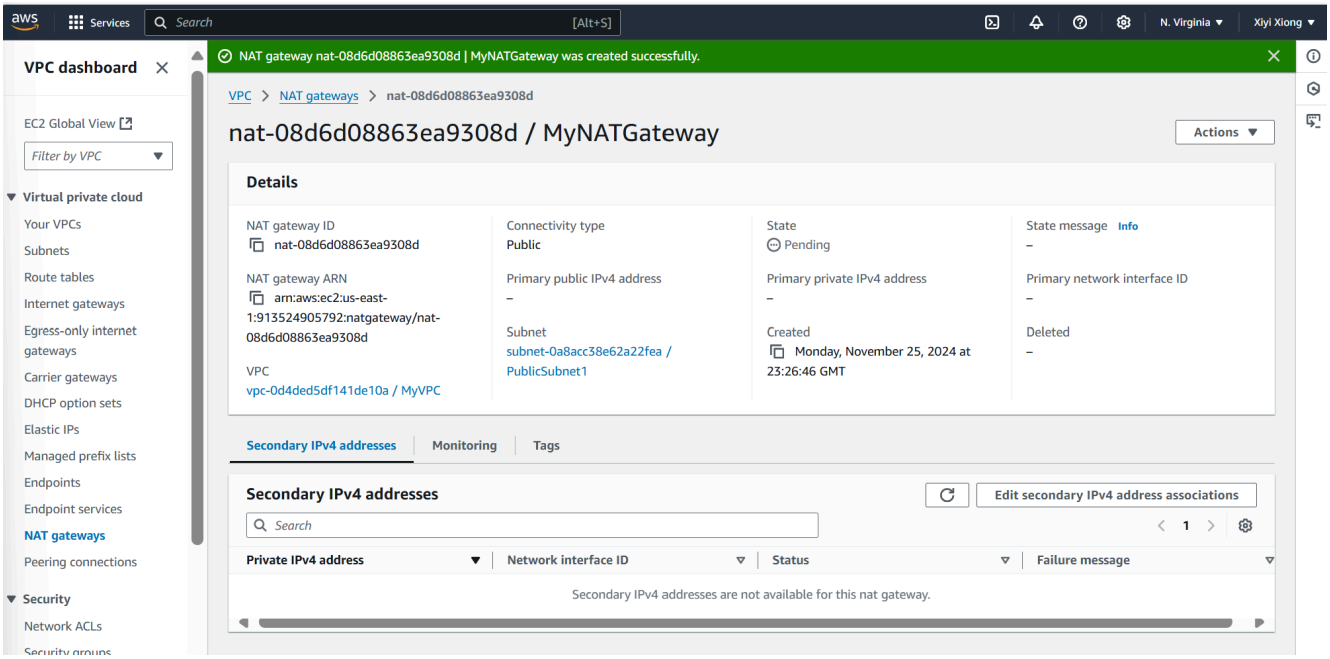
Tags

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.

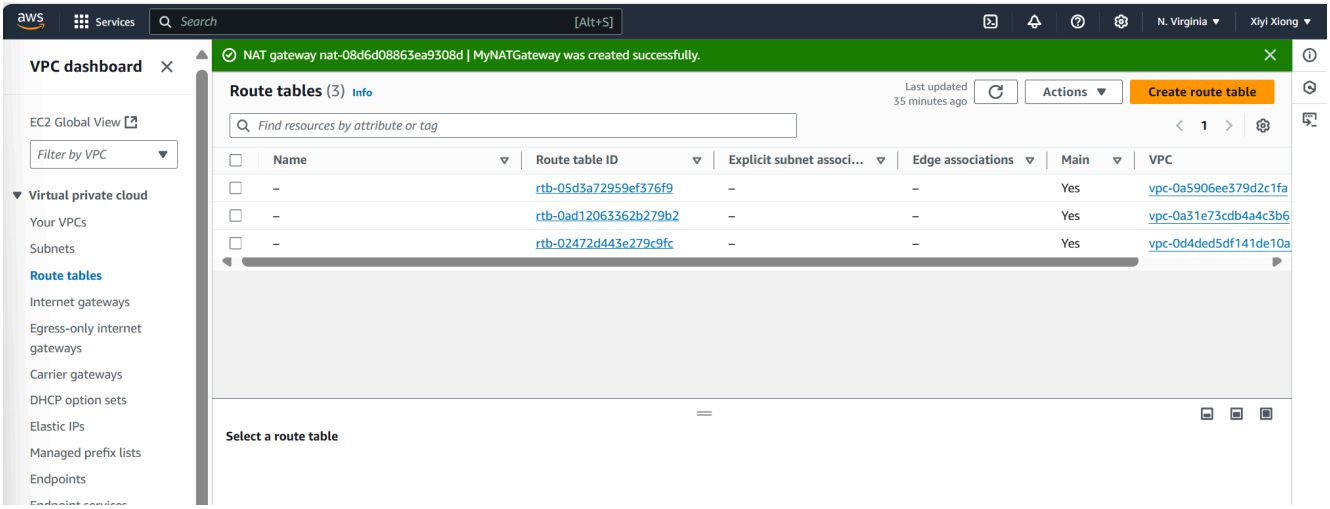
Key	Value - *optional*	
Name	MyNATGateway	Remove

Add new tag
You can add 49 more tags.

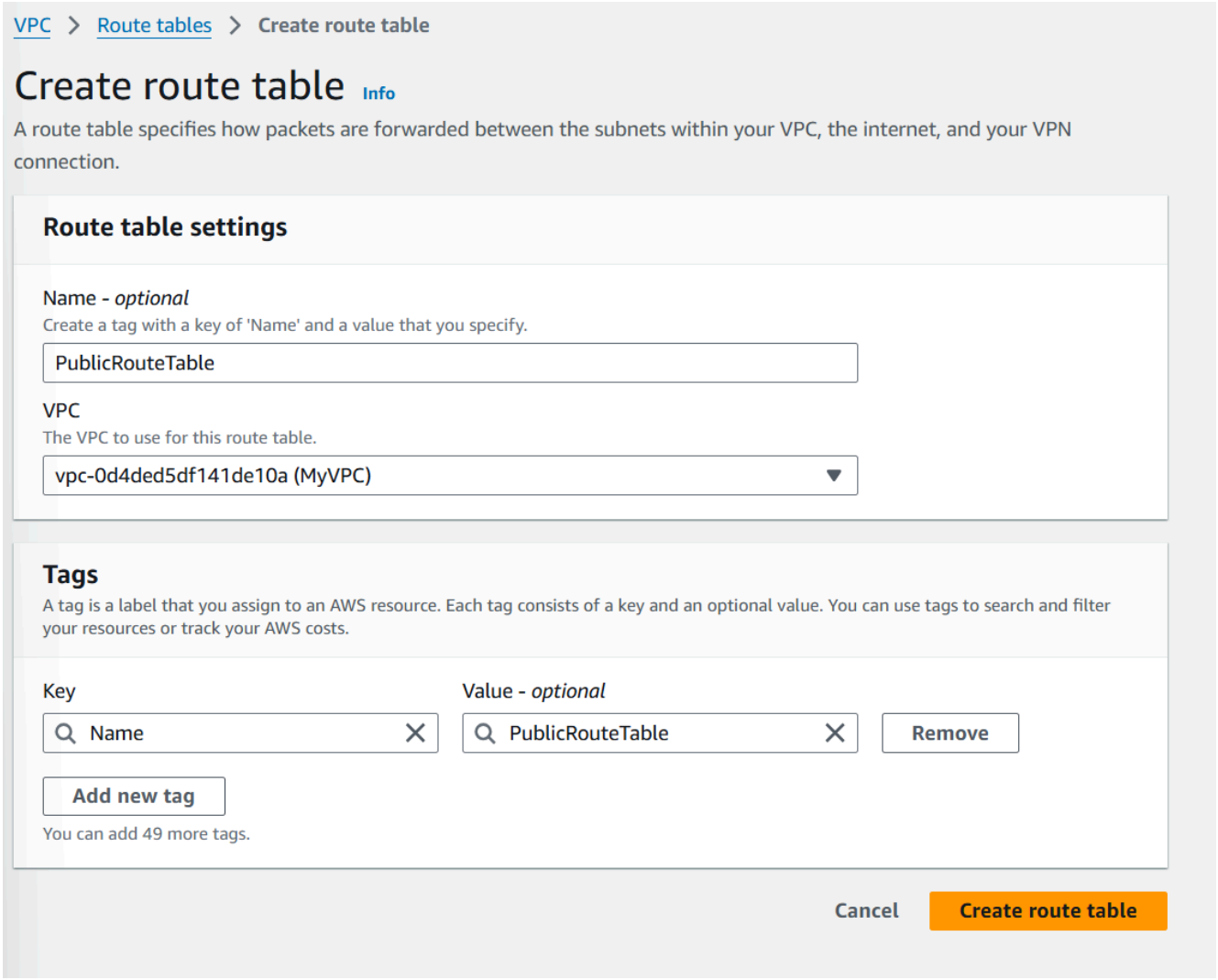
Cancel | Create NAT gateway

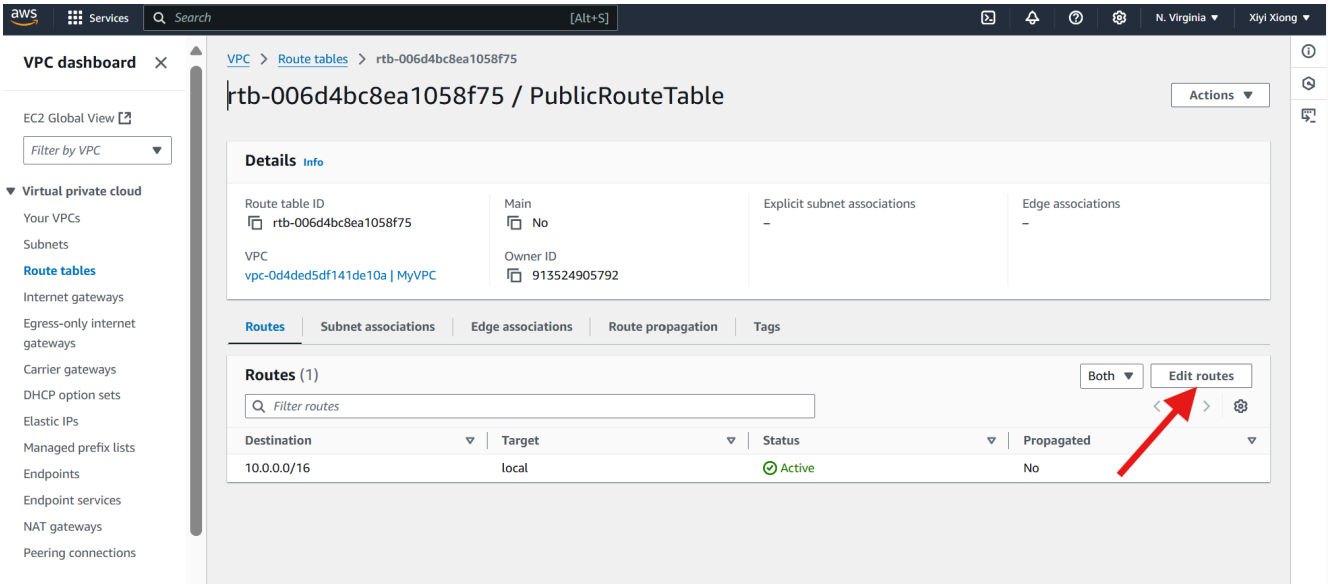
- 

2.5 Configure Route Tables

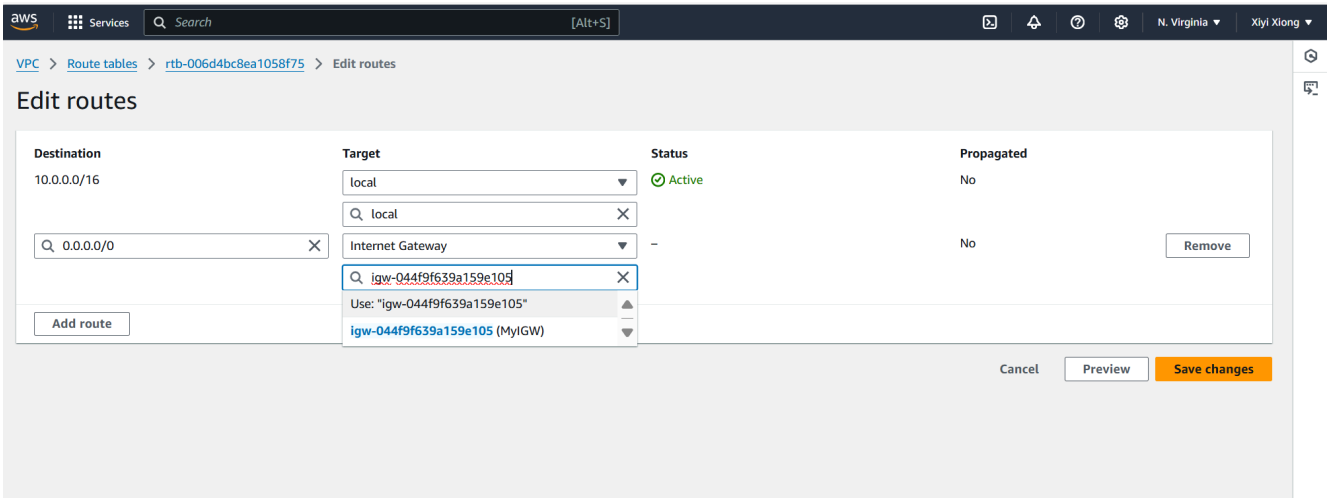
1. **Public Subnet Route Table**:
   - Click "Route Tables" > "Create route table."
   - 

   - **Name tag**: `PublicRouteTable` .
   - **VPC**: Select `MyVPC` .
   - Click **Create.**

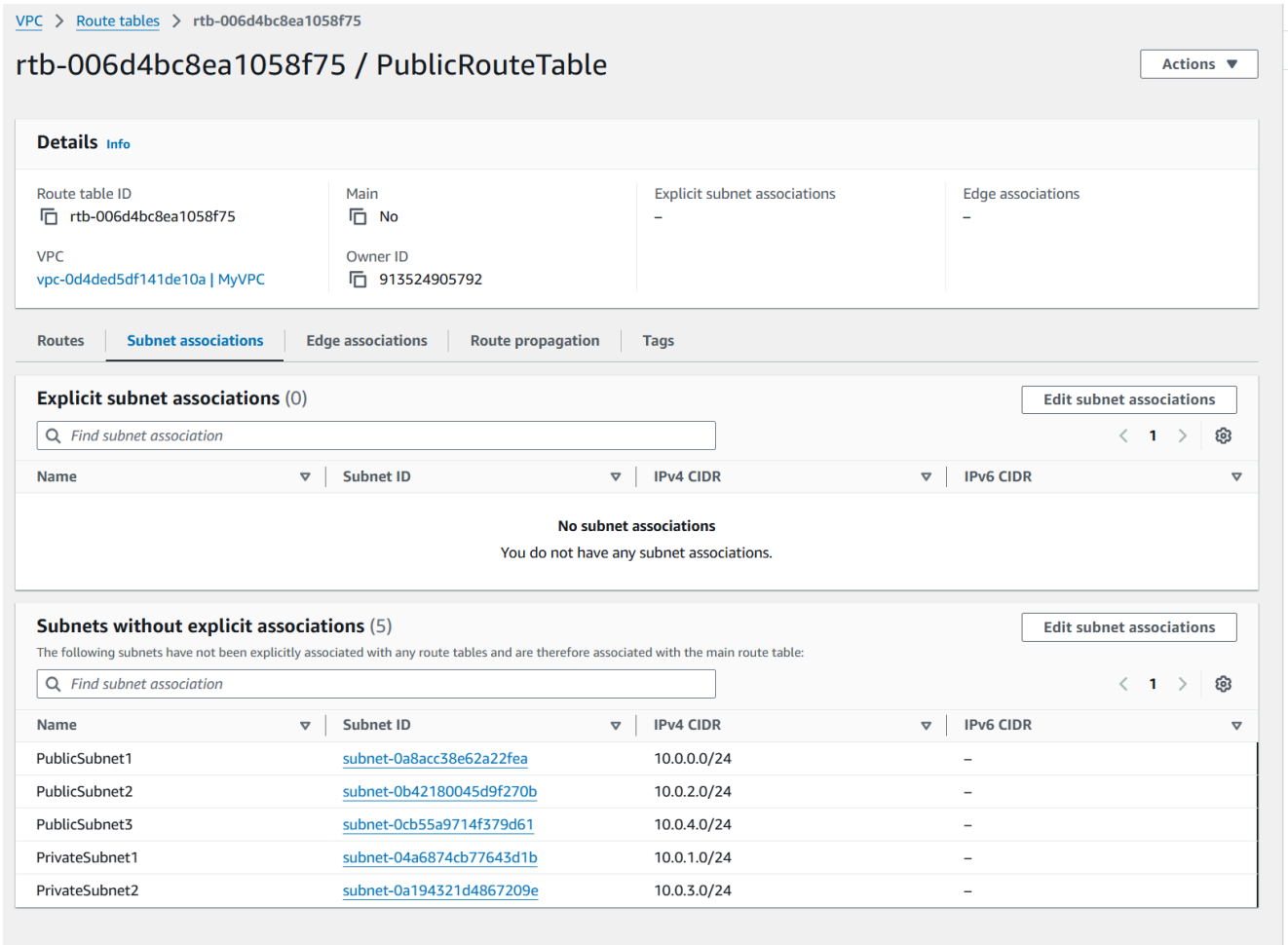


2. **Edit Routes**:
   - Select `PublicRouteTable` .
   - Go to "Routes" > "Edit routes."
   -


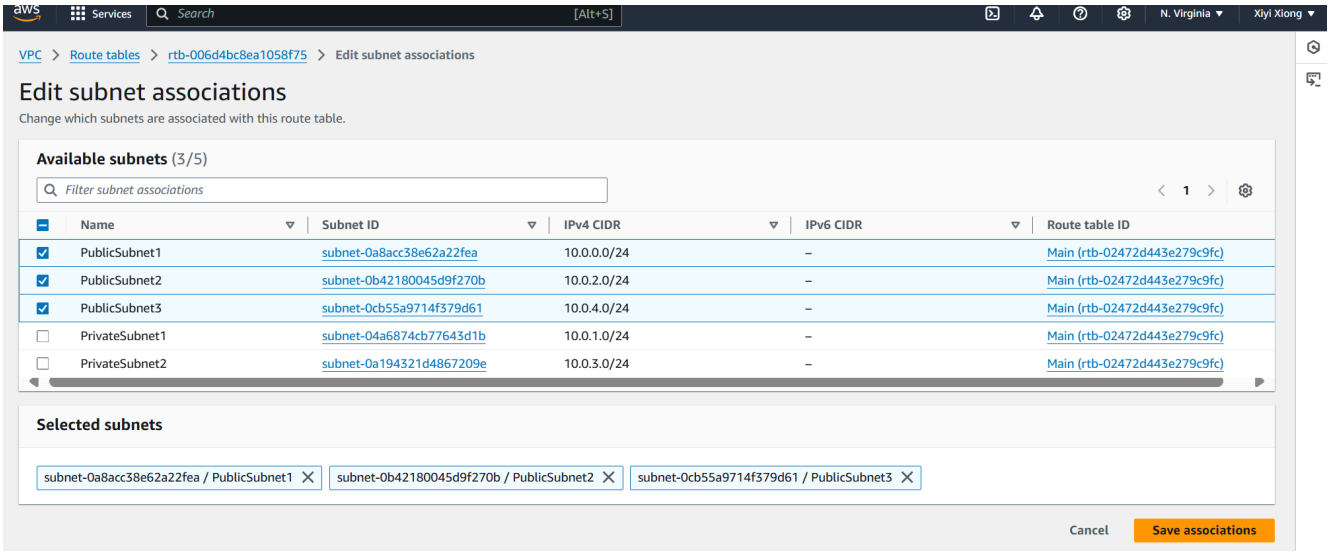
   - Add the following route:
     - **Destination**: `0.0.0.0/0`
     - **Target**: Internet Gateway (`MyIGW`).

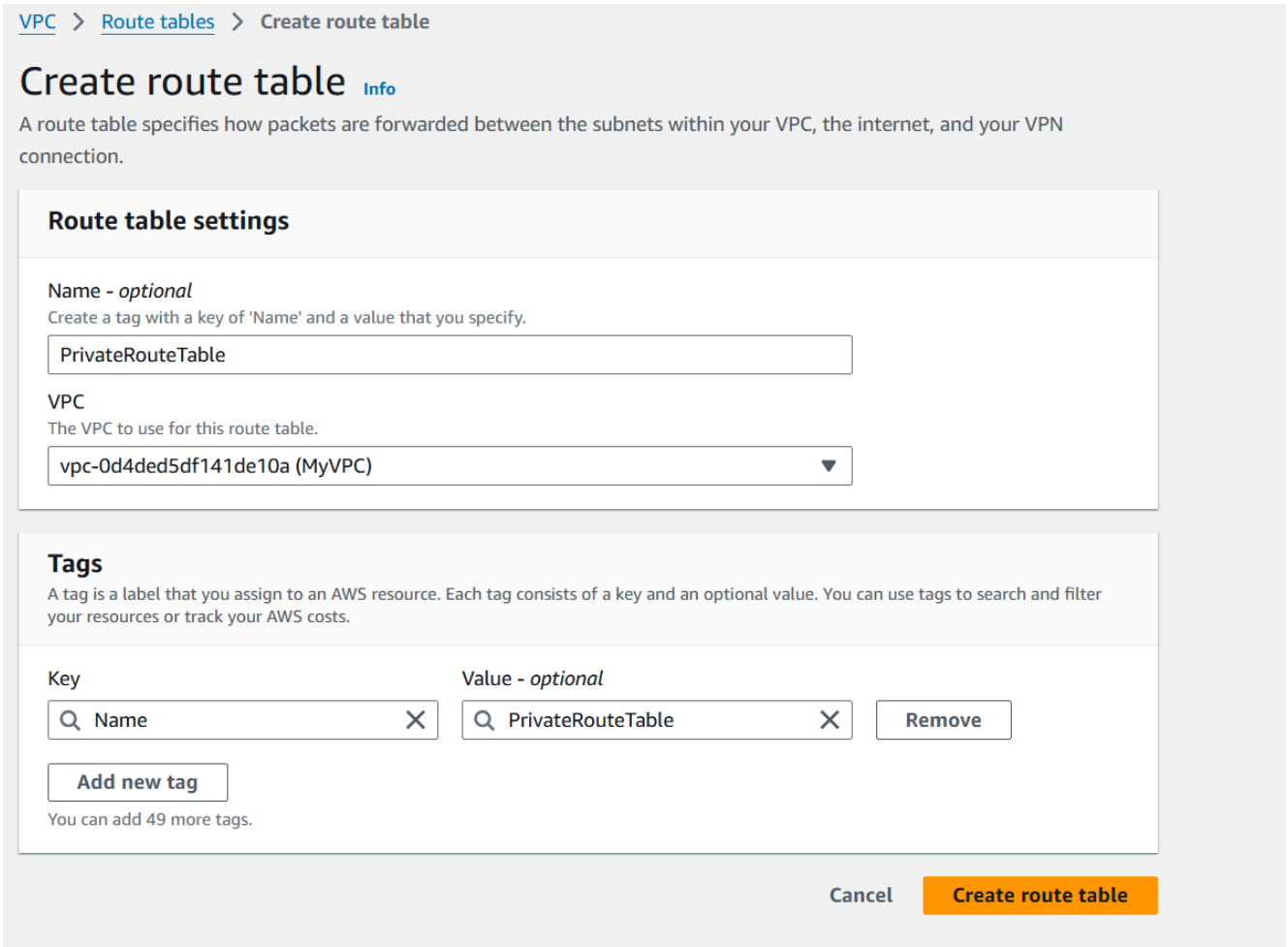
- Click **Save routes.**
- 

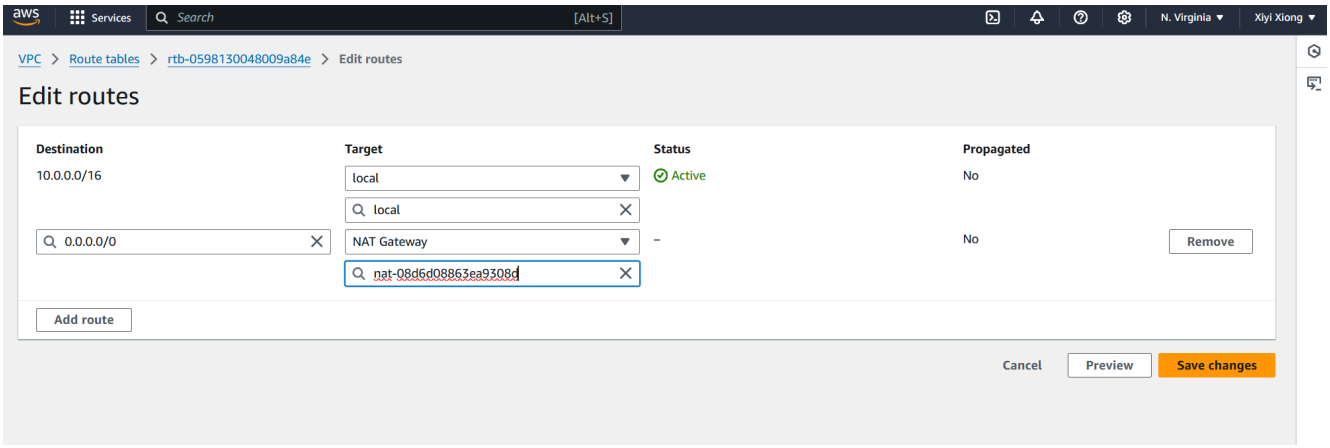
3. **Associate Subnets**:

- Click "Subnet associations" > "Edit subnet associations."
- 

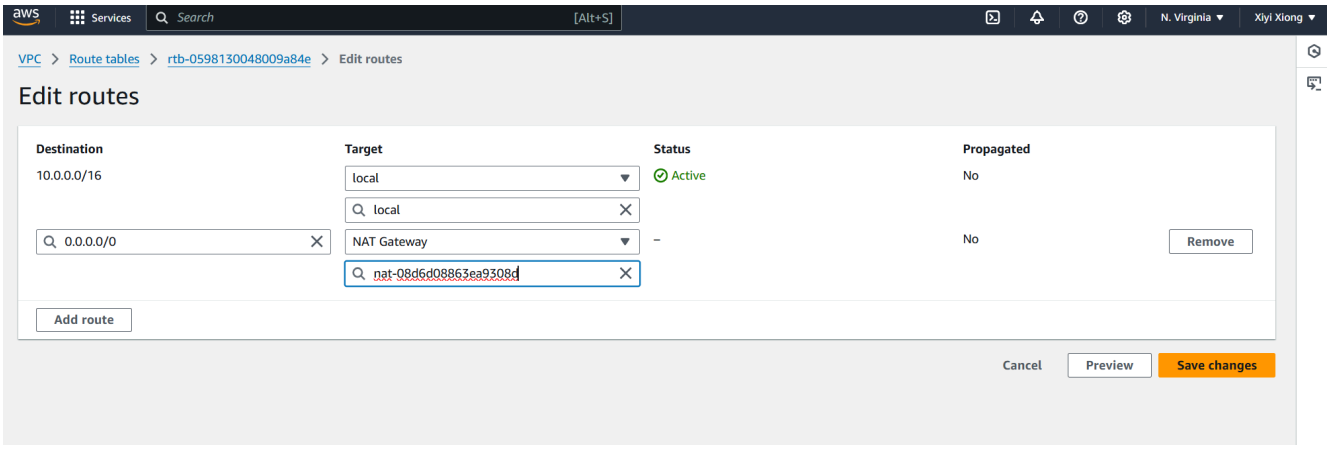
- Select all public subnets and click **Save.**

- 

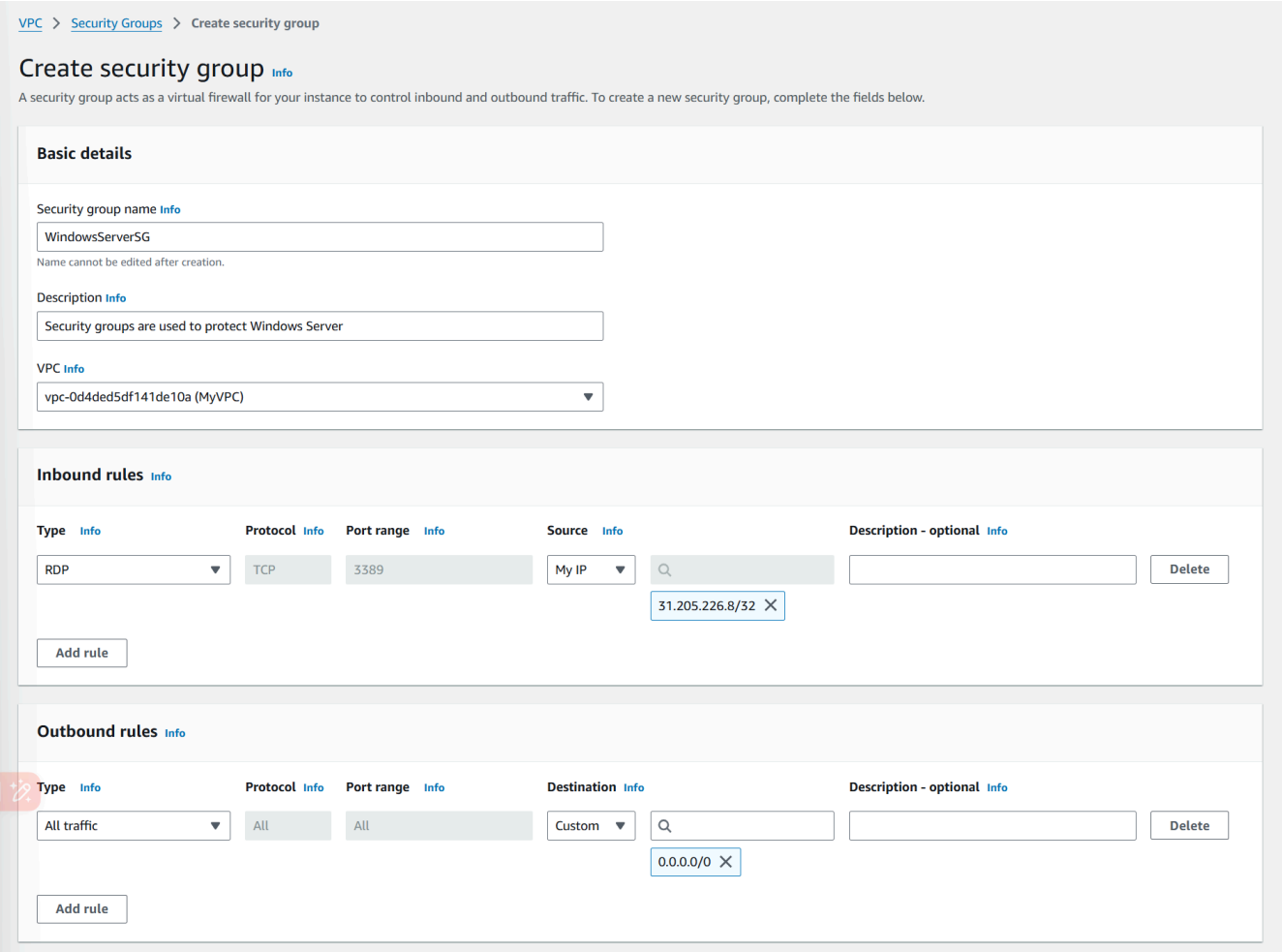
4. **Private Subnet Route Table**:
   - Create another route table (`PrivateRouteTable`) and configure routes to use the NAT Gateway as the target.
   - 

- 

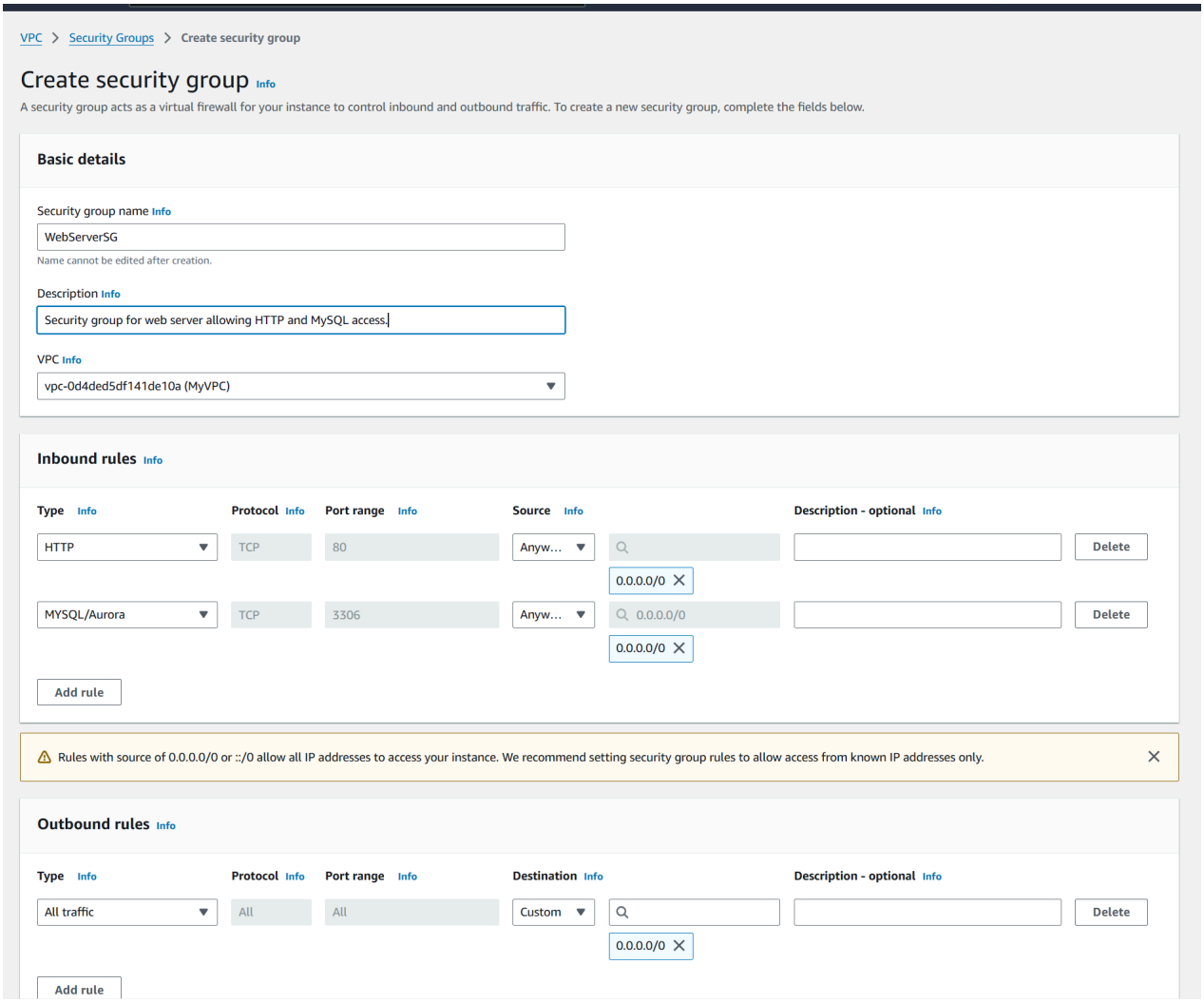
2.6 Configure Security Groups

1. **Windows Server Security Group**:
   - Click "Security Groups" > "Create security group."
   - 

   - Fill in the following:
     - **Group name**: `WindowsServerSG`.
     - **VPC**: Select `MyVPC`.
   - Add an inbound rule:
     - **Type**: RDP
     - **Protocol**: TCP
     - **Port Range**: 3389
     - **Source**: MY IP.
   - Click **Create.**



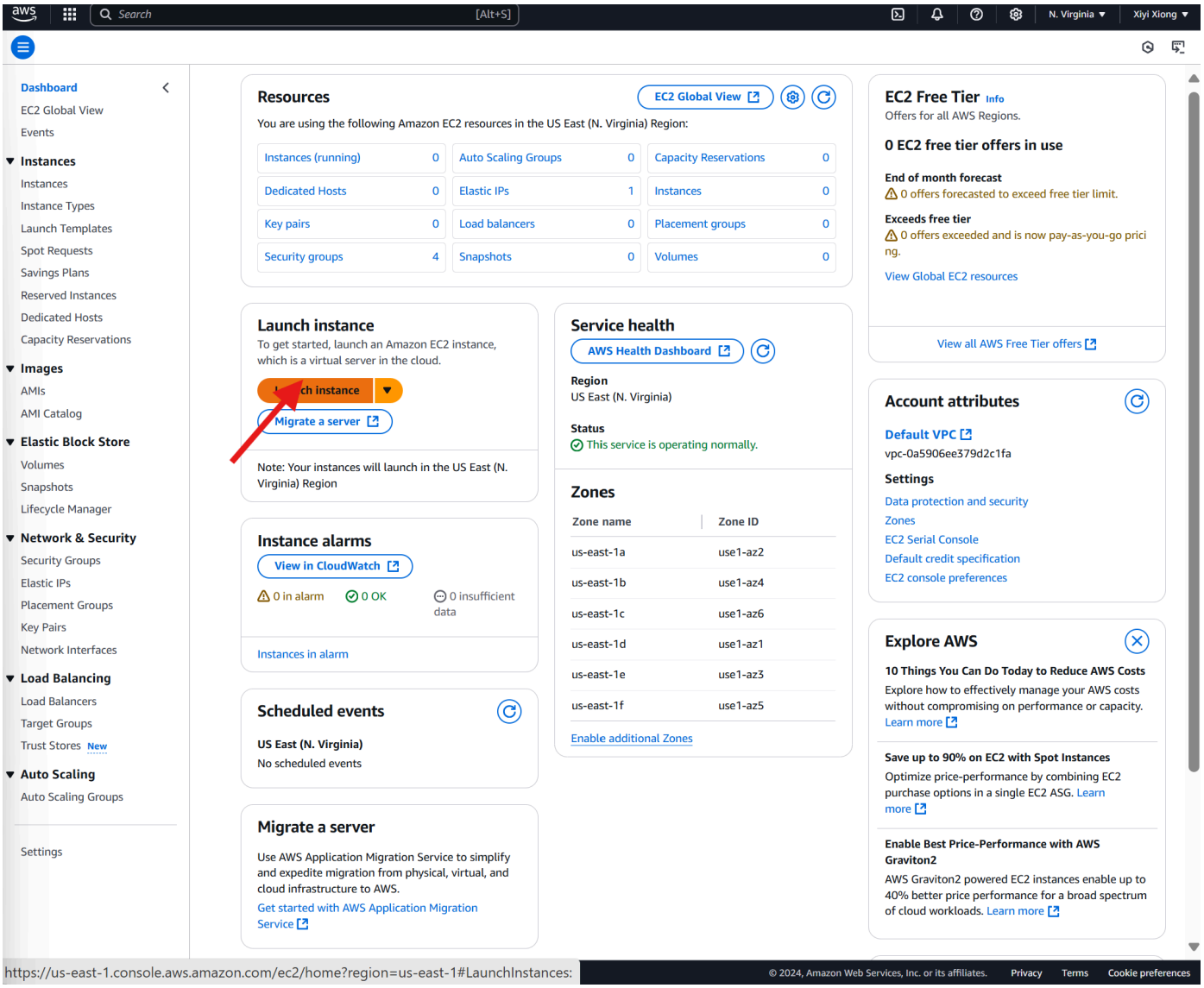
2. **Web Service Security Group**:
    - Create another security group (`WebServerSG`).
    - Add inbound rules for:
        - **HTTP**: Port 80.
        - **MySQL/Aurora**: Port 3306.
        - Adjust **Source** to `0.0.0.0/0` or a specific IP range.



2.7. Launch EC2 Instances

Creating EC2 Instances

1. Open the **EC2 Dashboard** and click **Launch Instances**.



2. Choose an appropriate AMI:
    - Windows Server 2016 for the Windows Server instance.
    - Amazon Linux for the Apache/MySQL/PHP server.
3. Assign the following resources to the instances:
    - **Windows Server Instance**:
        - Subnet: `PublicSubnet2`
        - Security Group: `WindowsServerSG`

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

WindowsServerInstances

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

AMI from catalog | Recents | Quick Start

Name Verified provider Free tier eligible

Microsoft Windows Server 2016 Base

Description

Microsoft Windows 2016 Datacenter edition. [English]

Microsoft Windows Server 2016 with Desktop Experience Locale English AMI provided by Amazon

Image ID

ami-029e3dc669a519be5

Username

root

Browse more AMIs

Including AMIs from AWS, Marketplace and the Community

Catalog	Published	Architecture	Virtualization	Root device type	ENA Enabled
Quick Start AMIs	2024-11-14T01:51:57.000Z	x86_64	hvm	ebs	Yes

Instance type Info | Get advice

Instance type

t2.micro — Free tier eligible

Family: t2 1 vCPU 1 GiB Memory Current generation: true
On-Demand Windows base pricing: 0.0162 USD per Hour
On-Demand Ubuntu Pro base pricing: 0.0134 USD per Hour
On-Demand SUSE base pricing: 0.0116 USD per Hour
On-Demand RHEL base pricing: 0.026 USD per Hour
On-Demand Linux base pricing: 0.0116 USD per Hour

All generations

Compare instance types

Additional costs apply for AMIs with pre-installed software

Summary

Number of instances Info

1

Software Image (AMI)
Microsoft Windows Server 2016 ...read more
ami-029e3dc669a519be5

Virtual server type (instance type)
t2.micro

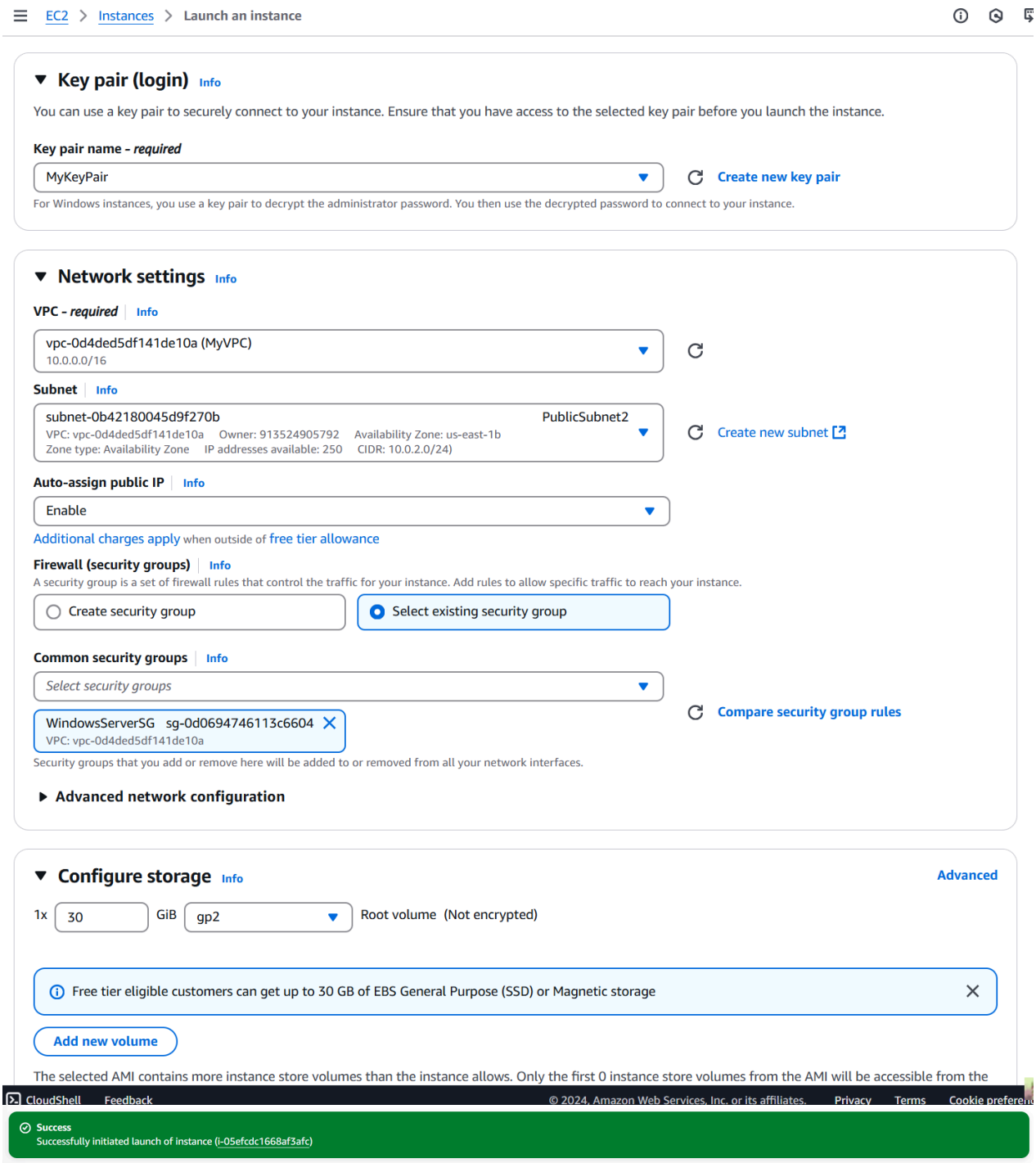
Firewall (security group)
WindowsServerSG

Storage (volumes)
1 volume(s) - 30 GiB

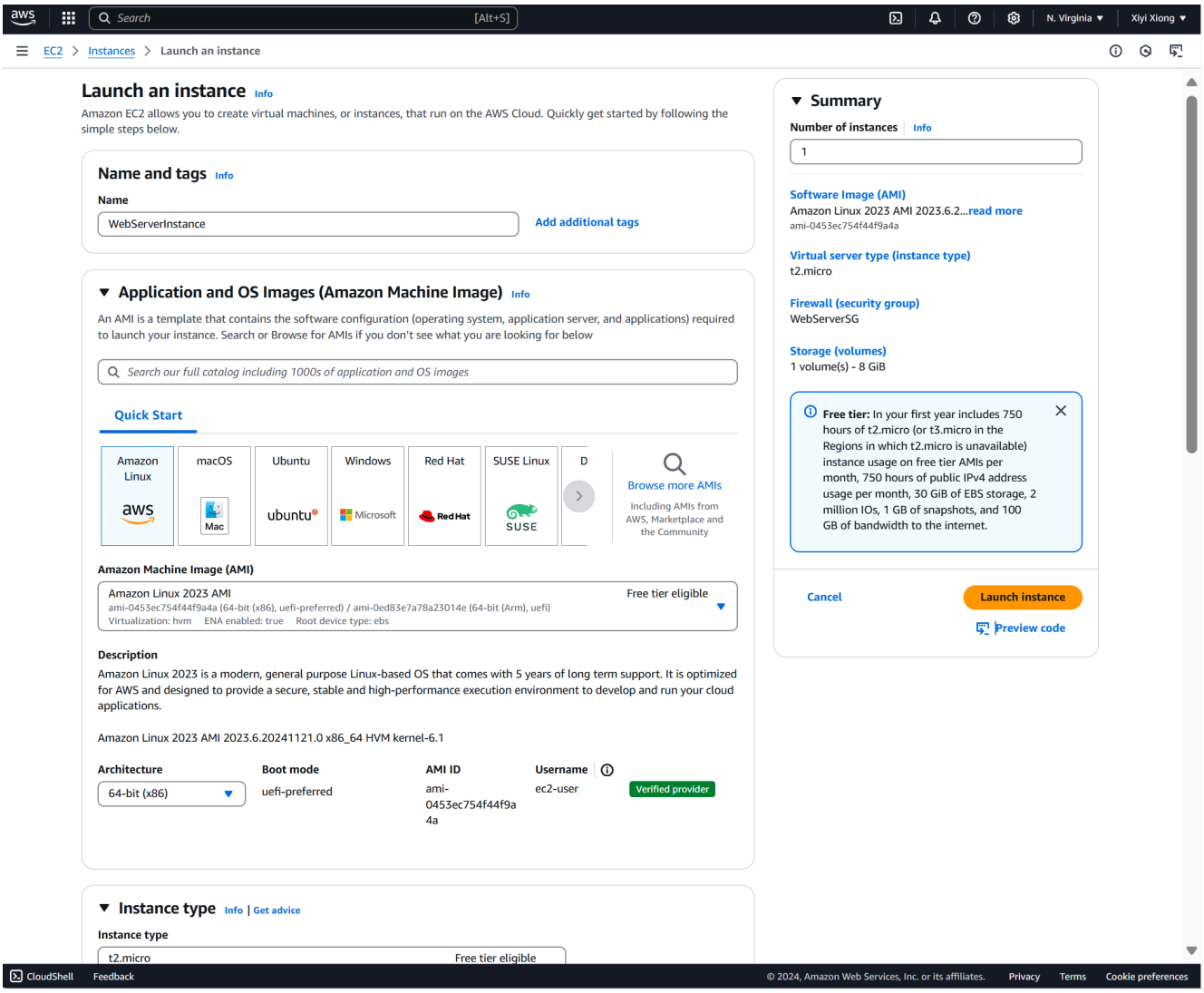
Free tier: In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is unavailable) instance usage on free tier AMIs per month, 750 hours of public IPv4 address usage per month, 30 GiB of EBS storage, 2 million IOs, 1 GB of snapshots, and 100 GB of bandwidth to the internet.

Cancel | Launch instance

Preview code

- 

- **Apache/MySQL/PHP Instance**:
  - Subnet: `PublicSubnet3`
  - Security Group: `WebServerSG`


Search [Alt+S]
N. Virginia
Xiyi Xiong
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
WebServerInstance
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
Amazon Linux
macOS
Ubuntu
Windows
Red Hat
SUSE Linux
Browse more AMIs
Including AMIs from AWS, Marketplace and the Community
Amazon Machine Image (AMI)
Amazon Linux 2023 AMI
ami-0453ec754f44f9a4a (64-bit (x86), uefi-preferred) / ami-0ed83e7a78a23014e (64-bit (Arm), uefi)
Virtualization: hvm ENA enabled: true Root device type: ebs
Free tier eligible
Description
Amazon Linux 2023 is a modern, general purpose Linux-based OS that comes with 5 years of long term support. It is optimized for AWS and designed to provide a secure, stable and high-performance execution environment to develop and run your cloud applications.
Amazon Linux 2023 AMI 2023.6.20241121.0 x86_64 HVM kernel-6.1
Architecture
64-bit (x86)
Boot mode
uefi-preferred
AMI ID
ami-0453ec754f44f9a4a
Username
ec2-user
Verified provider
Instance type Info | Get advice
Instance type
t2.micro
Free tier eligible
Summary
Number of instances Info
1
Software Image (AMI)
Amazon Linux 2023 AMI 2023.6.2...read more
ami-0453ec754f44f9a4a
Virtual server type (instance type)
t2.micro
Firewall (security group)
WebServerSG
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 t2.micro is unavailable) instance usage on free tier AMIs per month, 750 hours of public IPv4 address usage per month, 30 GiB of EBS storage, 2 million IOs, 1 GB of snapshots, and 100 GB of bandwidth to the internet.
Cancel
Launch instance
Preview code
CloudShell
Feedback
© 2024, Amazon Web Services, Inc. or its affiliates.
Privacy
Terms
Cookie preferences

On-Demand Windows base pricing: 0.0162 USD per Hour
On-Demand Ubuntu Pro base pricing: 0.0134 USD per Hour
On-Demand SUSE base pricing: 0.0116 USD per Hour
On-Demand RHEL base pricing: 0.026 USD per Hour
On-Demand Linux base pricing: 0.0116 USD per Hour

Additional costs apply for AMIs with pre-installed software

All generations

Compare instance types

Key pair (login) Info

You can use a key pair to securely connect to your instance. Ensure that you have access to the selected key pair before you launch the instance.

Key pair name - *required*

MyKeyPair

Create new key pair

Network settings Info

VPC - *required* Info

vpc-0d4ded5df141de10a (MyVPC)
10.0.0.0/16

Subnet Info

subnet-0cb55a9714f379d61 PublicSubnet3
VPC: vpc-0d4ded5df141de10a Owner: 913524905792
Availability Zone: us-east-1c Zone type: Availability Zone
IP addresses available: 251 CIDR: 10.0.4.0/24)

Create new subnet

Auto-assign public IP Info

Enable

Additional charges apply when outside of free tier allowance

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

Common security groups Info

Select security groups

WebServerSG sg-07e6957efc734179b
VPC: vpc-0d4ded5df141de10a

Compare security group rules

Security groups that you add or remove here will be added to or removed from all your network interfaces.

▶ Advanced network configuration

Configure storage Info

Advanced

1x 8 GiB gp2 Root volume (Not encrypted)

Summary

Number of instances Info

1

Software Image (AMI)
Amazon Linux 2023 AMI 2023.6.2...read more
ami-0453ec754f44f9a4a

Virtual server type (instance type)
t2.micro

Firewall (security group)
WebServerSG

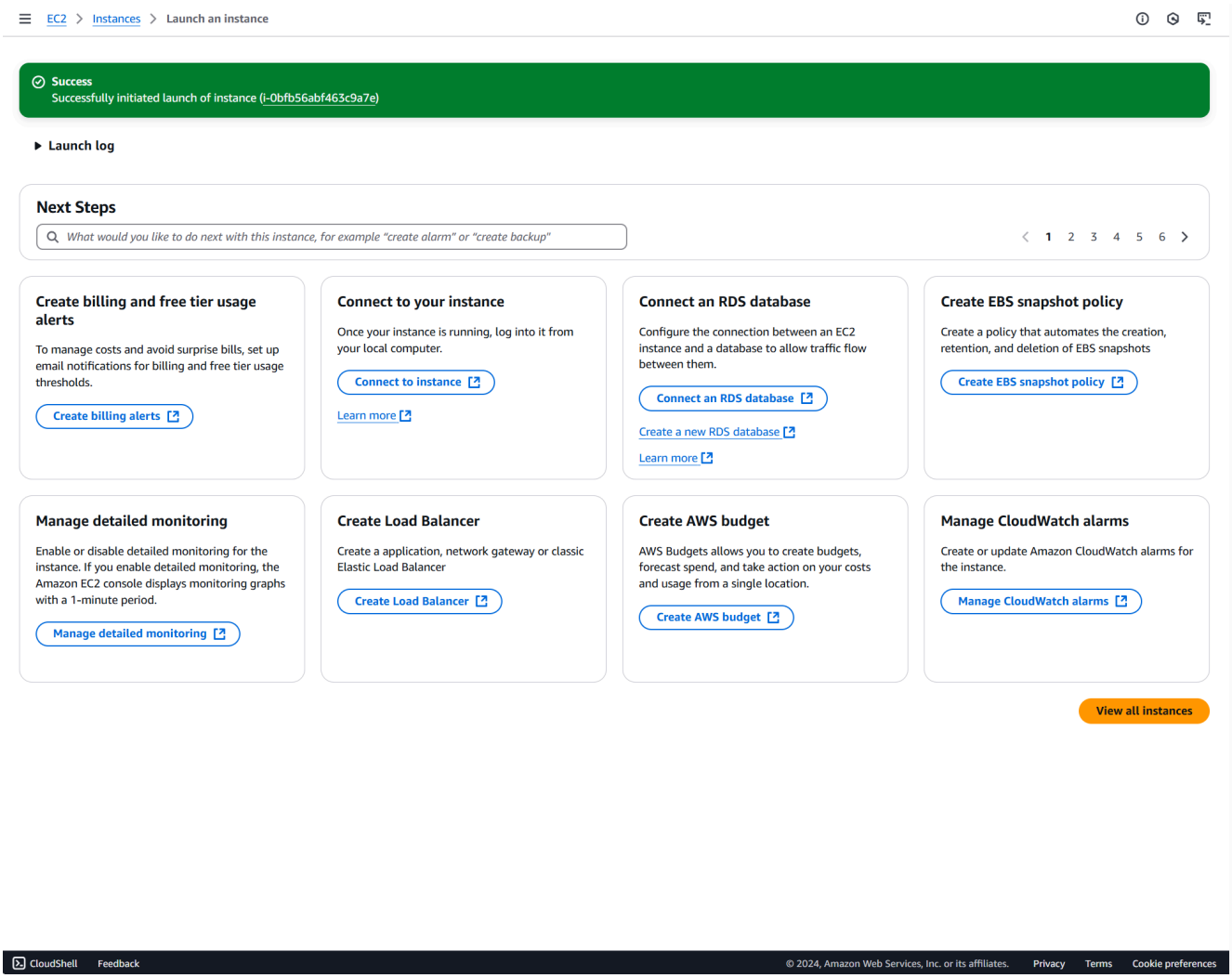
Storage (volumes)
1 volume(s) - 8 GiB

Free tier: In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is unavailable) instance usage on free tier AMIs per month, 750 hours of public IPv4 address usage per month, 30 GiB of EBS storage, 2 million IOs, 1 GB of snapshots, and 100 GB of bandwidth to the internet.

Cancel

Launch instance

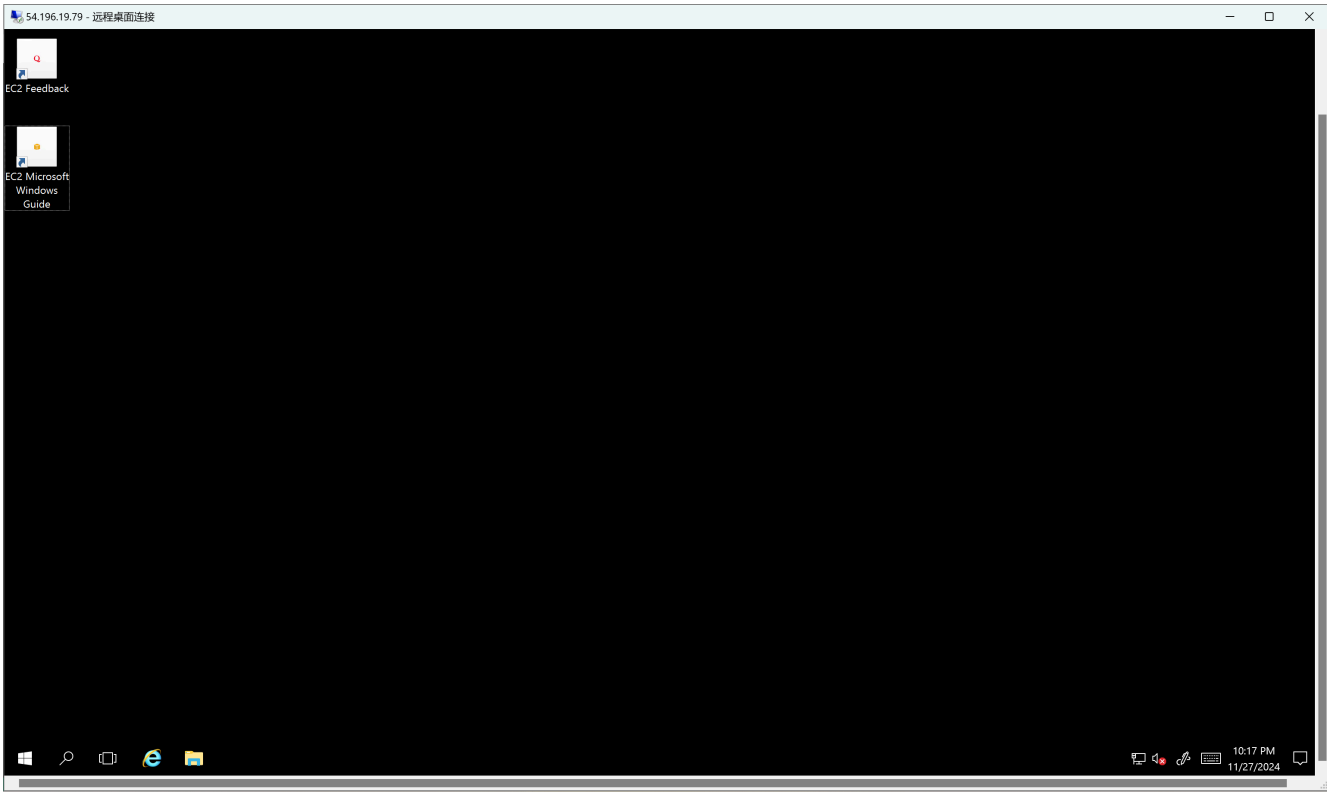
Preview code



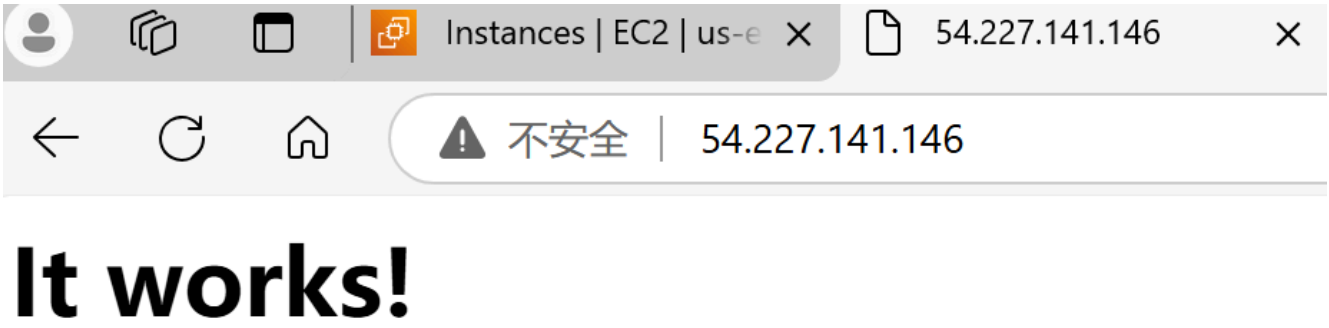
4. Configure the instances and launch them. Wait for the instances to enter the running state.

3. Validation

1. **Windows Server Instance**:
   - Use RDP to connect to the Windows Server instance and verify the connection is successful.
   - Example Screenshot:



2. **Apache/MySQL/PHP Instance**:
   - Open a browser and visit the public IP address of the instance to check if the Apache server is running (default page).
   - Example Screenshot:



3. **Communication test results between instances**

```
C:\Users\Administrator>ping 10.0.4.123

Pinging 10.0.4.123 with 32 bytes of data:
Reply from 10.0.4.123: bytes=32 time=2ms TTL=127
Reply from 10.0.4.123: bytes=32 time=1ms TTL=127
Reply from 10.0.4.123: bytes=32 time=1ms TTL=127
Reply from 10.0.4.123: bytes=32 time=1ms TTL=127

Ping statistics for 10.0.4.123:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 2ms, Average = 1ms
```