

**PROFESSIONAL TRAINING REPORT at
Sathyabama Institute of Science and
Technology (Deemed to be University)**

Submitted in partial fulfillment of the requirements for the award of
Bachelor of Technology Degree in INFORMATION TECHNOLOGY By

**Sowmya sree . T
REG. NO. 39120118**



**DEPARTMENT OF INFORMATION
TECHNOLOGY**

SCHOOL OF COMPUTING

**SATHYABAMA INSTITUTE OF SCIENCE AND
TECHNOLOGY**

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APRIL 2022



SATHYABAMA
INSTITUTE OF SCIENCE AND TECHNOLOGY
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DEPARTMENT OF INFORMATION TECHNOLOGY

BONAFIDE CERTIFICATE

This is to certify that this Project Report is the bonafide work of Sowmya sree Thammina (Reg. No: 39120118) who carried out the project entitled “Custom VPC in AWS” under my supervision from February 2022 to April 2022.

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Submitted for Viva voce Examination held on

Internal Examiner

External Examiner

DECLARATION

I , **Sowmya sree Thammina** hereby declare that the project report entitled
“**Custom VPC in AWS**” done by me under the guidance of

Dr. J.Jabez is submitted in partial fulfillment of the requirements for the
award of Bachelor of Technology Degree in Information Technology.

DATE:

PLACE: Chennai
CANDIDATE

SIGNATURE OF THE

ACKNOWLEDGEMENT

I am pleased to acknowledge my sincere thanks to **Board of Management** of **SATHYABAMA** for their kind encouragement in doing this project and for completing it successfully. I am grateful to them.

I convey my thanks to **Dr. T. Sasikala M.E., Ph.D**, Dean, School of Computing,
Dr. R.Subhashini, M.E., Ph.D., Heads of the Department of Information Technology for providing me necessary support and details at the right time during the progressive reviews.

I would like to express my sincere and deep sense of gratitude to my Project Guide **DR. J.Jabez.**, for her valuable guidance, suggestions and constant encouragement paved way for the successful completion of my project work.

I wish to express my thanks to all Teaching and Non-teaching staff members of the **Department of Information Technology** who were helpful in many ways for the completion of the project.

TRAINING CERTIFICATE



**Award of
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Thammina Sowmya Sree

Has Successfully Completed

Star Cloud Computing

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12-04-2022
DATE

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ABSTRACT

Creating a Custom VPC in AWS: A virtual private cloud (VPC) is a secure, isolated private cloud hosted within a public cloud. VPC customers can run code, store data, host websites, and do anything else they could do in an ordinary private cloud, but the private cloud is hosted remotely by a public cloud provider. VPCs combine the scalability and convenience of public cloud computing with the data isolation of private cloud computing. Imagine a public cloud as a crowded restaurant, and a virtual private cloud as a reserved table in that crowded restaurant. Even though the restaurant is full of people, a table with a "Reserved" sign on it can only be accessed by the party who made the reservation. Similarly, a public cloud is crowded with various cloud customers accessing computing resources – but a VPC reserves some of those resources for use by only one customer. Amazon Virtual Private Cloud (Amazon VPC) enables you to launch AWS resources into a virtual network that you've defined. This virtual network closely resembles a traditional network that you'd operate in your own data center, with the benefits of using the scalable infrastructure of AWS. Amazon VPC enables you to build a virtual network in the AWS cloud - no VPNs, hardware, or physical datacenters required. You can define your own network space, and control how your network and the Amazon EC2 resources inside your network are exposed to the Internet. Amazon Web Services (AWS) is a comprehensive cloud computing platform that includes infrastructure as a service (IaaS) and platform as a service (PaaS) offerings. AWS services offer scalable solutions for compute, storage, databases, analytics, and more. AWS is architected to be the most flexible and secure cloud computing environment available today. Our core infrastructure is built to satisfy the security requirements for the military, global banks, and other high-sensitivity organizations. This is backed by a deep set of cloud security tools, with 230 security, compliance, and governance services and features. AWS supports 90 security standards and compliance certifications, and all 117 AWS services that store customer data offer the ability to encrypt that data.

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CHAPTER 1

INTRODUCTION:

1.1 OVER VIEW

Cloud computing today allows hardware and software products to co-exist remotely (in data centres) and at-scale. Together these products work to deliver specific services. Users typically can access, manage, and use the tools they require via a web-interface – and that's

true for AWS Platform services as well. This project is based on cloud computing. This project is performed in AWS platform. A virtual private cloud (VPC) is a secure, isolated private cloud hosted within a public cloud. Amazon Virtual Private Cloud (Amazon VPC) enables you to launch AWS resources into a virtual network that you've defined.

1.2 Background:

Amazon Web Services(AWS), offered by Amazon, is a comprehensive cloud computing platform that includes infrastructure as a service (IaaS) and platform as a service (PaaS) offerings. AWS services offer scalable solutions for compute, storage, databases, analytics, and more. With AWS, you can leverage the latest technologies to experiment and innovate more quickly. We are continually accelerating our pace of innovation to invent entirely new technologies you can use to transform your business. Amazon Web Services (AWS) is the world's most comprehensive and broadly adopted cloud platform, offering over 200 fully featured services from data centers globally. Millions of customers—including the fastest-growing startups, largest enterprises, and leading government agencies—are using AWS to lower costs, become more agile, and innovate faster.

A virtual private cloud (VPC) is a virtual network dedicated to your AWS account. It is logically isolated from other virtual networks in the AWS Cloud. You can launch your AWS resources, such as Amazon EC2 instances, into your VPC. You can specify an IP address range for the VPC, add subnets, associate security groups, and configure route tables. Amazon Virtual Private Cloud (Amazon VPC) enables you to launch AWS resources into a virtual network that you've defined. This virtual network closely resembles a traditional network that you'd operate in your own data center, with the benefits of using the scalable infrastructure of AWS.

CHAPTER 2

2.1 Aim

The primary Aim of this project was to create a Virtual Private Cloud(VPC) in AWS.

2.2 Scope Of the Project

The purpose of this project is to understand the resources of AWS and Introduce to the virtual private cloud. Create A vpc having public and private subnets with an EC2 instance lying on each subnet.

2.3 Objective

Getting maximum knowledge on cloud computing.

To be able to use AWS platform.

Learning about resources in AWS.

Creating a custom VPC using AWS resources.

To gain knowledge about virtual networking.

2.4 Hardware requirements

Processor: intel core i5

Speed: 1.19GHz

RAM: 8.0GB

Memory usage: 7.2kb

Keyboard: Standard Keyboard

Monitor: 15VGA color

2.5 Software Requirements

Operating System : Windows

Online Service : Amazon Web Services(AWS)

CHAPTER 3 Technologies Learnt

3.1 Amazon Web Services(AWS)

Amazon Web Services (AWS) is a comprehensive cloud computing platform that includes infrastructure as a service (IaaS) and platform as a service (PaaS) offerings. AWS services offer scalable solutions for compute, storage, databases, analytics, and more. With AWS, you can leverage the latest technologies to experiment and innovate more quickly. We are continually accelerating our pace of innovation to invent entirely new technologies you can use to transform your business. Amazon Web Services (AWS) is the world's most comprehensive and broadly adopted cloud platform, offering over 200 fully featured services from data centers globally. Millions of customers—including the fastest-growing startups, largest enterprises, and leading government agencies—are using AWS to lower costs, become more agile, and innovate faster.

AWS benefits their user by providing services at the low cost, which do not have any upfront cost. Amazon Web Service is easy to use and the user should not worry about the servers, security, and databases.

3.1.1 Advantages

- Easy to use.
- No Capacity Limits
- Provides Speed and Agility
- Secure and Reliable

3.1.2 Disadvantages

Limitations of Amazon EC2
Security Limitations
High Technical Support Fee
General and Computing Issues

CHAPTER 4 About The Project

4.1 Log in

Fistly We have to log in to the AWS with our mail ID.

4.2 Create Vpc

In services go to vpc-> Click on your VPCs on left and click on create VPC.
Give a name for VPC- here we give it as My VPC and give the IPV4 CIDR as 10.0.0.0/16.
Click on create VPC.

4.3 Create Internet Gateway

Click on the Internet Gateway which is present on the left side and then click on create

Give it a name and click on create.

Select the internet gateway which we have created and click on actions and click on Attach to VPC.

Now we can see that the internet gateway is attached to the VPC.

4.4 Create Subnets

Click on Subnets present on the left and click on create subnet.

Select the VPC and name the subnet as Public subnet and give the IPV4 CIDR block as 10.0.1.0/24.

Click on create. Now create another subnet named as Private subnet and give the IPV4 CIDR block as 10.0.2.0/24

Click on create.

4.5 Create Route Table

Now click on Route tables which is present on the left.

Edit the name for the route table which is already present here as Public RT.

Now click on create Route table.

Name it as Private RT and select the VPC and click on create.

Select the Public RT and then we can see the Routes at the bottom then click on Edit routes.

Click on Add route and give the Destination as 0.0.0.0/0 and the target as Internet gateway which we have created and click on save changes.

Internet gateway is attached.

Now click on Public RT and at the bottom click on Subnet associations.

Click on Edit subnet associations. Select Public subnet and click on save association.

Now select Private RT and click on subnet associations and then click on Edit subnet associations.

Select Private subnet and click on save associations.

4.6 Security Groups

Go to security groups present on the left side.

We can see a default security group is already created and we named it as My SG.

Select the security group and click on Inbound rules and then click on Edit inbound rules.

Click on Add rule and give the type as All traffic and source as My Ip so that only from your IP will be able to access these instances. Click on save rules.

4.7 Network ACLs

Now click on Network ACLs present on the left side under Security.

Default network ACL is created. Rename it as my NT

Select the network ACL and click on Inbound rules at the bottom and then click on Edit Inbound rules.

In the source remove the previous one and give your Ip address and click on save changes.

4.8 EC2 Instance

In the services go to EC2 and click on launch instance.

Edit its instance details by selecting my vpc in network and public subnet.

In the next step you will see the security group option. Select the existing one and click on the default security group shown and click on launch.

Create a keypair with a name my keypair and launch the instance.

Name it as EC2-Public.

Now create another instance with the same procedure but by selecting the private subnet in instance details and giving the existing keypair created before.

Name it as EC2-Private.

For both instances The status check should be moved to 2/2 checks Passed.

4.9 Command Prompt

Now open command Prompt.

Give the command as **ping 44.201.196.33**(Public IPV4 address of the public instance).

We can see the reply.

Now give the Public IPV4 of the private instance.

We can see the Request timed out.

CHAPTER 5

Result and conclusion

In this project, VPC is created with a private and public subnet and created route tables for them respectively and attached internet gateway to the public subnet. And launched EC2 instance and in the command prompt when given the public IPV4 address of the public instance and reply is shown and when given public IPV4 of the private instance and command prompt displayed request timed out. Ec2 is lying on the instance where the internet gateway is not attached. Thus we can conclude that we've successfully created VPC in AWS.

CHAPTER 6

References

Amazon Web Services.

Wikipedia

Geek for Geeks

Star Certification group

CHAPTER 7

SCREEN SHOTS

7.1 Create VPC

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

Search for services, features, blogs, docs, and more [Alt+S]

New VPC Experience
Tell us what you think

VPC Dashboard
EC2 Global View **New**

Filter by VPC:
Select a VPC

VIRTUAL PRIVATE CLOUD

- Your VPCs**
- Subnets
- Route Tables
- Internet Gateways
- Egress Only Internet Gateways
- Carrier Gateways
- DHCP Option Sets
- Elastic IPs
- Managed Prefix Lists
- Endpoints **New**
- Endpoint Services
- NAT Gateways
- Peering Connections

Your VPCs (2) Info

Filter VPCs

	Name	VPC ID	State	IPv4 CIDR	IPv6 CIDR	DHCP op
☐	My VPC	vpc-02be6ea1390f8cea7	Available	10.0.0.0/16	-	dopt-08
☐	-	vpc-034cc797e1d12ff7a	Available	172.31.0.0/16	-	dopt-08

Select a VPC above

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22:07
19-04-2022

7.2 Create Internet Gateway

Internet gateways | VPC Manager

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

Services Search for services, features, blogs, docs, and more [Alt+S]

New VPC Experience Tell us what you think

VPC Dashboard
EC2 Global View **New**

Filter by VPC:
Select a VPC

VIRTUAL PRIVATE CLOUD

- Your VPCs
- Subnets
- Route Tables
- Internet Gateways**
- Egress Only Internet Gateways
- Carrier Gateways
- DHCP Option Sets
- Elastic IPs
- Managed Prefix Lists
- Endpoints **New**
- Endpoint Services
- NAT Gateways
- Peering Connections

Internet gateways (2) Info

Filter internet gateways

☐	Name	Internet gateway ID	State	VPC ID	Owner
☐	-	igw-0416e53eb6e6fccc8	Attached	vpc-034cc797e1d12ff7a	122604200423
☐	My gateway	igw-0aaa2ceead84d8d75	Attached	vpc-02be6ea1390f8cea7 My VPC	122604200423

Select an internet gateway above

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22:11 19-04-2022

7.3 Create Subnets

The screenshot displays the AWS VPC Management Console interface. The left-hand navigation pane lists various VPC resources, with 'Subnets' highlighted under the 'VIRTUAL PRIVATE CLOUD' section. The main content area, titled 'Subnets (2) Info', shows a table of existing subnets. A search bar at the top allows filtering by VPC ID, which is currently set to 'vpc-02be6ea1390f8cea7'. The table lists two subnets: a 'Public subnet' with ID 'subnet-0be8b6201bd339b56' and a 'Private subnet' with ID 'subnet-067ffc48f15efb404'. Both subnets are in an 'Available' state and are associated with the VPC 'vpc-02be6ea1390f8cea7'. The 'Public subnet' has an IPv4 CIDR of '10.0.1.0/24', while the 'Private subnet' has an IPv4 CIDR of '10.0.2.0/24'. Below the table, there is a section titled 'Select a subnet' with three placeholder icons.

☐	Name	Subnet ID	State	VPC	IPv4 CIDR	IPv6 CIDR
☐	Public subnet	subnet-0be8b6201bd339b56	Available	vpc-02be6ea1390f8cea7 My ...	10.0.1.0/24	-
☐	Private subnet	subnet-067ffc48f15efb404	Available	vpc-02be6ea1390f8cea7 My ...	10.0.2.0/24	-

7.4 Create Route Tables

Route tables | VPC Management

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

Search for services, features, blogs, docs, and more [Alt+S]

N. Virginia jayadeep

You have successfully updated subnet associations for rtb-0b7f0c0cc7ae71a76 / Private RT.

Route tables (3) Info

Filter route tables

	Name	Route table ID	Explicit subnet associat...	Edge associations	Main	VPC	Ow...
☐	-	rtb-0b16a65c3f2610e22	-	-	Yes	vpc-034cc797e1d12ff7a	12260.
☐	Private RT	rtb-0b7f0c0cc7ae71a76	subnet-067ffc48f15efb...	-	No	vpc-02be6ea1390f8cea7 My ...	12260.
☐	Public RT	rtb-0edfe7e8be99ffb87	subnet-0be8b6201bd33...	-	Yes	vpc-02be6ea1390f8cea7 My ...	12260.

Select a route table

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22:38 19-04-2022

7.5 Create Security Groups

The screenshot shows the AWS VPC Management Console interface. The left sidebar contains navigation links for various AWS services, including Elastic IPs, Managed Prefix Lists, Endpoints, Endpoint Services, NAT Gateways, Peering Connections, SECURITY, NETWORK ANALYSIS, DNS FIREWALL, and NETWORK FIREWALL. The main content area displays a list of Security Groups (1/10). The 'My SG' group is selected, and the 'Inbound rules' tab is active. A message indicates that network connectivity can be checked with the Reachability Analyzer.

Name	Security group ID	Security group name	VPC ID	Description	Owner	Inbound rules
-	sg-01a9b897055422b80	default	vpc-034cc797e1d12ff7a	default VPC s...	122604200423	1 Per
-	sg-0312a79ac8cd3383c	windows-sg	vpc-034cc797e1d12ff7a	launch-wizar...	122604200423	2 Per
My SG	sg-016539e9400681fe1	default	vpc-02be6ea1390f8cea7	default VPC s...	122604200423	1 Per
-	sg-002302323afb69910	instance-sg-1	vpc-034cc797e1d12ff7a	Created by th...	122604200423	0 Per
-	sg-0d2f947357e13db41	efs-sg-1	vpc-034cc797e1d12ff7a	Created by th...	122604200423	1 Per
-	sg-047f0acf0b7937eb6	launch-wizard-1	vpc-034cc797e1d12ff7a	launch-wizar...	122604200423	7 Per

sg-016539e9400681fe1 - default

Details | **Inbound rules** | Outbound rules | Tags

You can now check network connectivity with Reachability Analyzer [Run Reachability Analyzer](#)

Inbound rules (1/1)

Filter security group rules

7.6 Edit Inbound Rules

VPC Management Console

us-east-1.console.aws.amazon.com/vpc/home?region=us-east-1#ModifyInboundSecurityGroupRules:securityGroupId=sg-016539e9400681fe1

Services Search for services, features, blogs, docs, and more [Alt+S]

N. Virginia jayadeep

VPC > Security Groups > sg-016539e9400681fe1 - default > Edit inbound rules

Edit inbound rules [Info](#)

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

Inbound rules [Info](#)

Security group rule ID	Type Info	Protocol Info	Port range Info	Source Info	Description - optional Info	
sg-0311b181c370f1c68	All traffic	All	All	Custom		Delete
-	All traffic	All	All	My IP	My Lab IP	Delete

[Add rule](#)

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

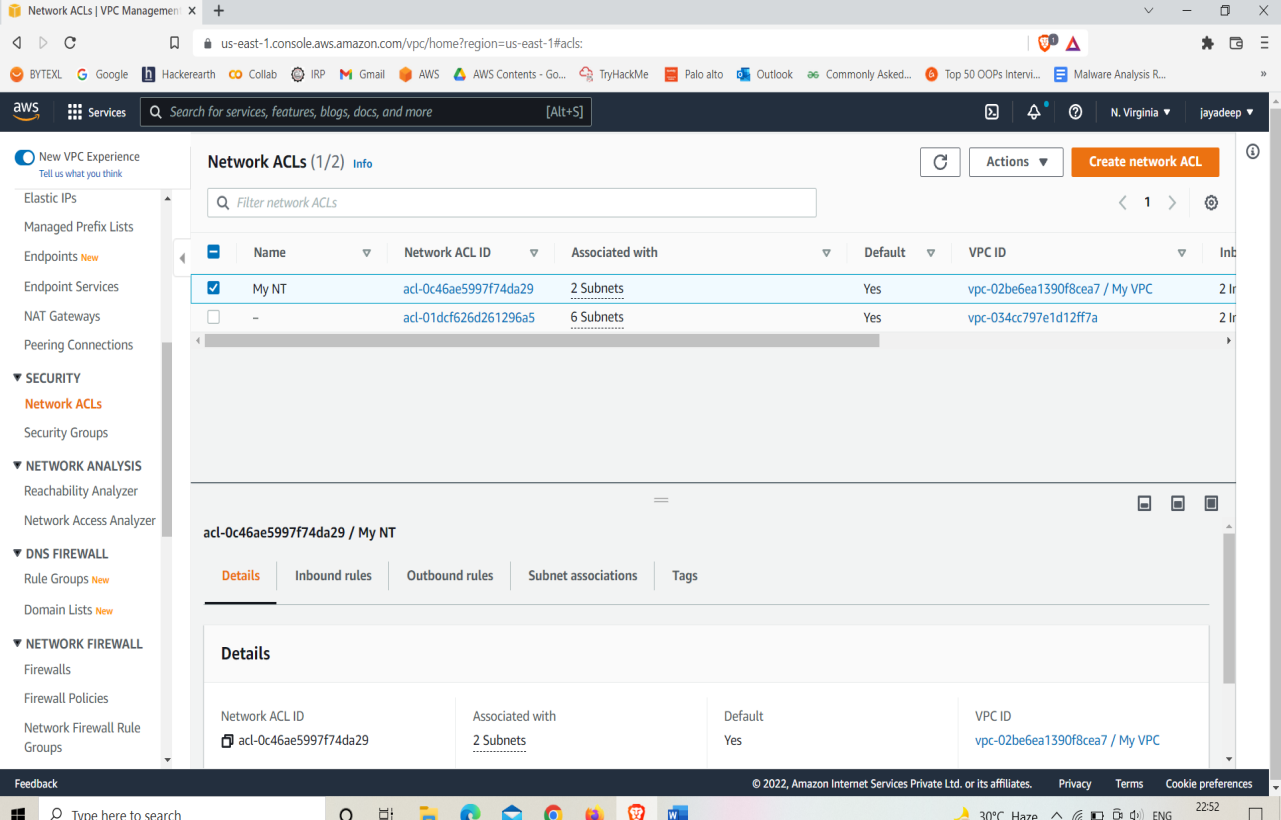
Feedback

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Type here to search

30°C Haze 22:48 19-04-2022

7.7 Create Network ACLs



The screenshot shows the AWS Management Console for Network ACLs in the us-east-1 region. The left sidebar contains navigation links for various AWS services, including Elastic IPs, Managed Prefix Lists, Endpoints, Endpoint Services, NAT Gateways, Peering Connections, SECURITY (Network ACLs, Security Groups), NETWORK ANALYSIS (Reachability Analyzer, Network Access Analyzer), DNS FIREWALL (Rule Groups, Domain Lists), and NETWORK FIREWALL (Firewalls, Firewall Policies, Network Firewall Rule Groups).

The main content area displays the 'Network ACLs (1/2)' page. It includes a search bar for filtering network ACLs and a table listing the available ACLs. The table has columns for Name, Network ACL ID, Associated with, Default, VPC ID, and an 'Info' icon. Two ACLs are listed: 'My NT' (ID: acl-0c46ae5997f74da29) and a default ACL (ID: acl-01dcf626d261296a5). The 'My NT' ACL is associated with 2 Subnets and is the default for VPC vpc-02be6ea1390f8cea7. The default ACL is associated with 6 Subnets and is the default for VPC vpc-034cc797e1d12ff7a.

Below the table, the details for the selected ACL 'acl-0c46ae5997f74da29 / My NT' are shown. The 'Details' tab is active, displaying the Network ACL ID, Associated with (2 Subnets), Default (Yes), and VPC ID (vpc-02be6ea1390f8cea7 / My VPC).

Name	Network ACL ID	Associated with	Default	VPC ID
My NT	acl-0c46ae5997f74da29	2 Subnets	Yes	vpc-02be6ea1390f8cea7 / My VPC
-	acl-01dcf626d261296a5	6 Subnets	Yes	vpc-034cc797e1d12ff7a

Details for acl-0c46ae5997f74da29 / My NT:

Network ACL ID	Associated with	Default	VPC ID
acl-0c46ae5997f74da29	2 Subnets	Yes	vpc-02be6ea1390f8cea7 / My VPC

7.8 Edit Inbound Rules

VPC Management Console

us-east-1.console.aws.amazon.com/vpc/home?region=us-east-1#EditInboundRules:networkAclId=ac1-0c46ae5997f74da29

VPC > Network ACLs > ac1-0c46ae5997f74da29 / My NT > Edit inbound rules

Edit inbound rules [Info](#)

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

Rule number Info	Type Info	Protocol Info	Port range Info	Source Info	Allow/Deny Info	
100	All traffic	All	All	45.249.79.60/32	Allow	<button>Remove</button>
*	All traffic	All	All	0.0.0.0/0	Deny	

Add new rule Sort by rule number

Cancel Preview changes Save changes

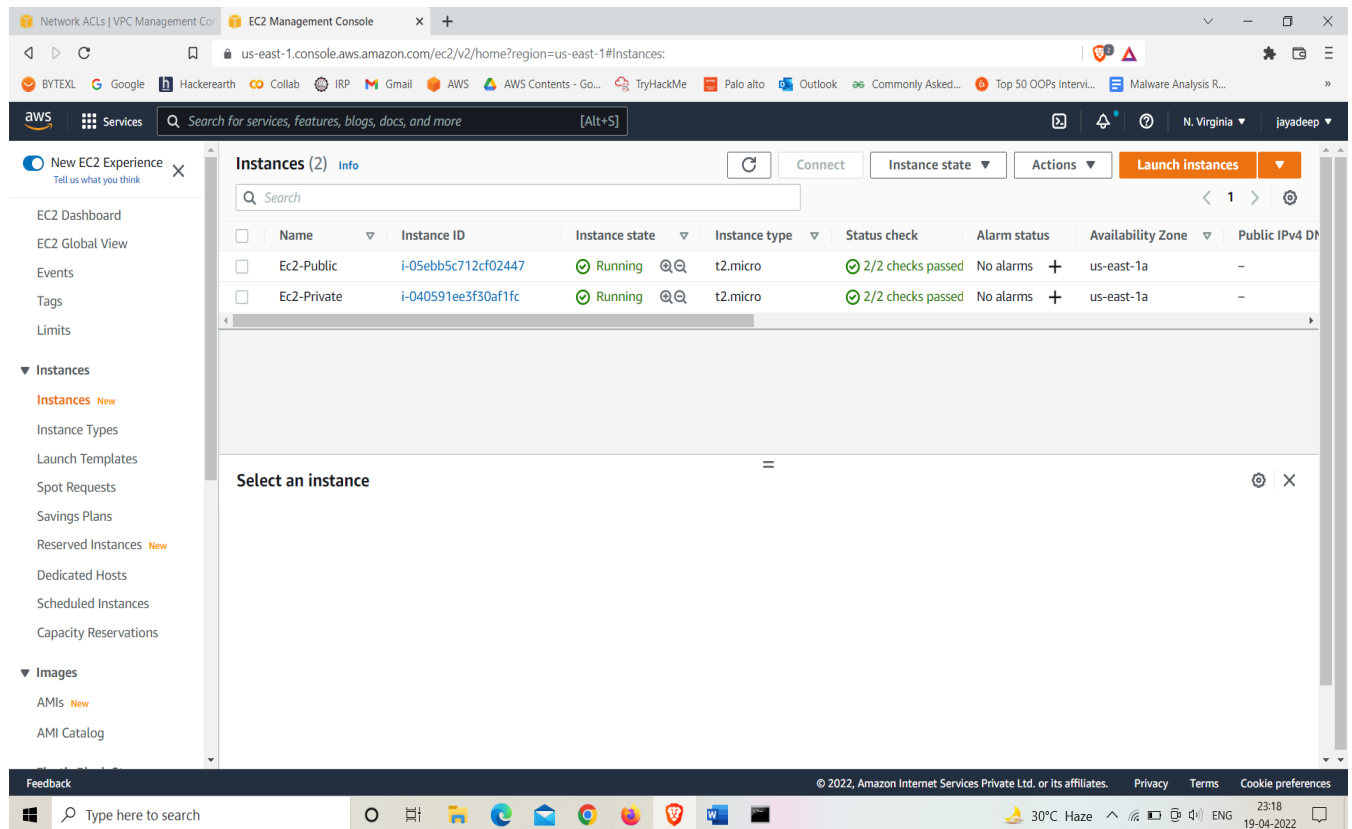
Feedback

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7.9 Create EC2



7.10 Command Prompt

```
Command Prompt
Microsoft Windows [Version 10.0.19043.1645]
(c) Microsoft Corporation. All rights reserved.

C:\Users\user>ping 44.201.196.33

Pinging 44.201.196.33 with 32 bytes of data:
Reply from 44.201.196.33: bytes=32 time=232ms TTL=233
Reply from 44.201.196.33: bytes=32 time=212ms TTL=233
Reply from 44.201.196.33: bytes=32 time=214ms TTL=233
Reply from 44.201.196.33: bytes=32 time=213ms TTL=233

Ping statistics for 44.201.196.33:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 212ms, Maximum = 232ms, Average = 217ms

C:\Users\user>ping 44.204.59.27

Pinging 44.204.59.27 with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 44.204.59.27:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\Users\user>
```