

**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

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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 Vamsi Mogalipuri (Reg. No: 39120131) who carried out the project entitled “Custom VPC in AWS” under my supervision from February 2022 to April 2022.

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DECLARATION

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

Dr. S.Gowri, M.Tech., P.hD. is submitted in partial fulfillment of the requirements for the award of Bachelor of Technology Degree in Information Technology.

DATE:

PLACE: Chennai

SIGNATURE OF THE CANDIDATE

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.

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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 Completion

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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

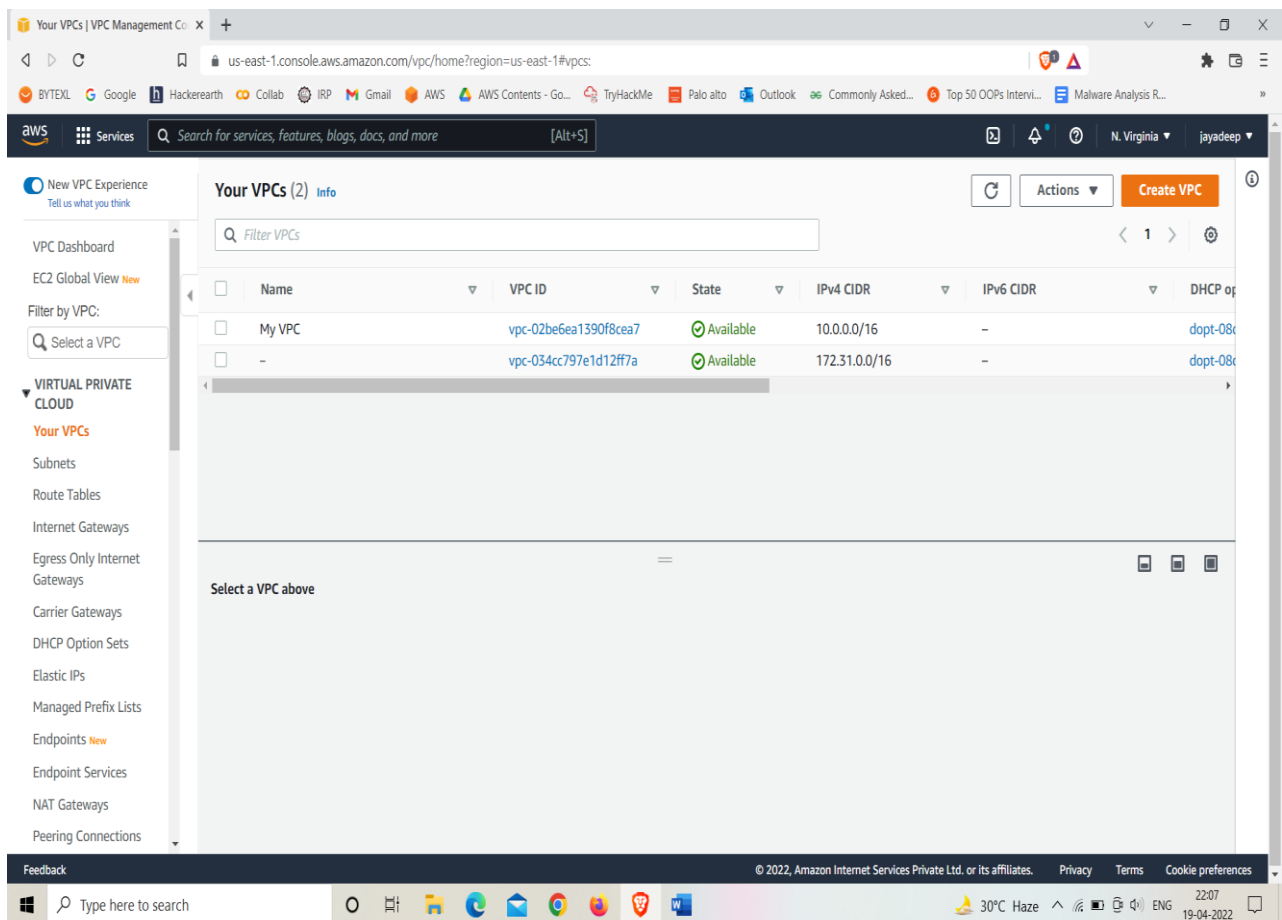
References

- Amazon Web Services.
- Wikipedia
- Geek for Geeks
- Star Certification group

CHAPTER 7

SCREEN SHOTS

7.1 Create VPC



7.2 Create Internet Gateway

The screenshot shows the AWS Management Console for the 'Internet gateways' section. The left sidebar contains navigation links for VPC Dashboard, EC2 Global View, and various VPC services. The main content area shows a table of internet gateways. Two gateways are listed: an unnamed gateway and 'My gateway'. Both are in an 'Attached' state. The 'My gateway' is associated with VPC 'vpc-02be6ea1390f8cea7 | My VPC'. A 'Create internet gateway' button is visible in the top right.

Name	Internet gateway ID	State	VPC ID	Owner
-	igw-0416e53eb6e6fecc8	Attached	vpc-034cc797e1d12ff7a	122604200423
My gateway	igw-0aaa2ceead84d8d75	Attached	vpc-02be6ea1390f8cea7 My VPC	122604200423

7.3 Create Subnets

The screenshot displays the AWS VPC Management Console interface. The left sidebar contains navigation links for VPC Dashboard, EC2 Global View, and various VPC services. The main content area shows the 'Subnets (2)' page for VPC: vpc-02be6ea1390f8cea7. It lists two subnets: 'Public subnet' (subnet-0be8b6201bd339b56) and 'Private subnet' (subnet-067ffc48f15efb404), both in an 'Available' state. The table includes columns for Name, Subnet ID, State, VPC, IPv4 CIDR, and IPv6 CIDR. Below the table, there is a 'Select a subnet' section with three 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	-

Select a subnet

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

New VPC Experience Tell us what you think

Route tables (3) Info

Filter route tables

☐	Name	Route table ID	Explicit subnet associat...	Edge associations	Main	VPC	Own...
☐	-	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 displays the AWS VPC Management Console interface. The left sidebar shows the navigation menu with categories like Elastic IPs, Managed Prefix Lists, Endpoints, and SECURITY. The main content area is titled 'Security Groups (1/10)' and includes a table of existing security groups. The 'My SG' group is selected, and the 'Inbound rules' tab is active, showing a list of inbound rules. A notification banner at the bottom of the console states: 'You can now check network connectivity with 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

The screenshot shows the AWS VPC Management Console interface for editing inbound rules. The breadcrumb navigation indicates the path: VPC > Security Groups > sg-016539e9400681fe1 - default > Edit inbound rules. The main heading is 'Edit inbound rules' with an 'Info' link. Below the heading, a note states: 'Inbound rules control the incoming traffic that's allowed to reach the instance.'

The 'Inbound rules' section contains a table with the following columns: Security group rule ID, Type, Protocol, Port range, Source, and Description - optional. The table lists two rules:

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

Below the table, there is an 'Add rule' button. At the bottom right of the console, there are three buttons: 'Cancel', 'Preview changes', and 'Save rules'.

7.7 Create Network ACLs

The screenshot displays the AWS Management Console for Network ACLs in the us-east-1 region. The left sidebar shows the navigation menu with categories like 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 is titled 'Network ACLs (1/2)' and includes a search bar and a table of existing Network ACLs.

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

Below the table, the details for the selected Network ACL 'acl-0c46ae5997f74da29 / My NT' are shown. The 'Details' tab is active, displaying the following information:

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

The bottom of the screenshot shows the Windows taskbar with the search bar, taskbar icons, and system tray information (30°C Haze, 22:52, 19-04-2022).

7.8 Edit Inbound Rules

VPC Management Console

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

VPC > Network ACLs > acl-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	Remove
*	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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Type here to search

30°C Haze 22:56 19-04-2022

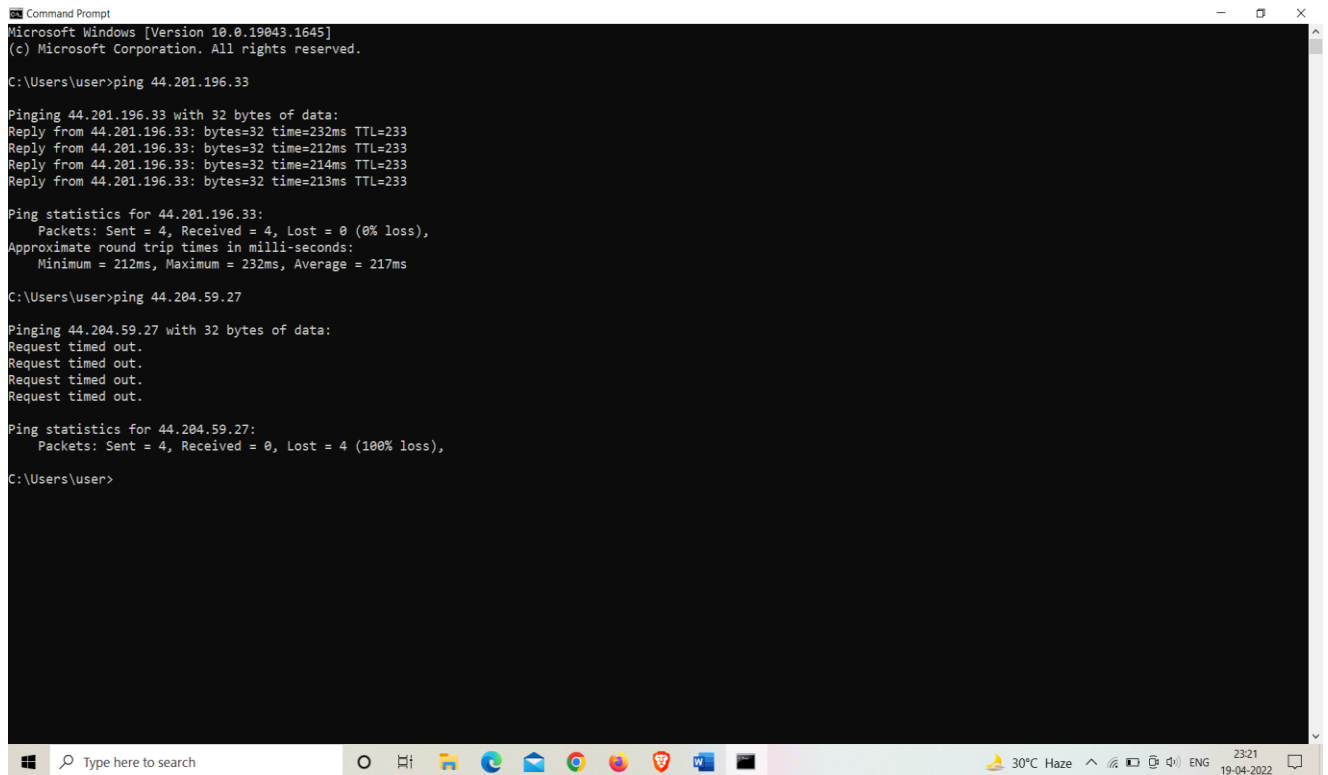
7.9 Create EC2

The screenshot displays the AWS Management Console for the EC2 service. The main content area shows a list of instances under the heading 'Instances (2)'. The instances listed are:

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 D
Ec2-Public	i-05ebb5c712cf02447	Running	t2.micro	2/2 checks passed	No alarms	us-east-1a	-
Ec2-Private	i-040591ee3f30af1fc	Running	t2.micro	2/2 checks passed	No alarms	us-east-1a	-

Below the table, there is a section titled 'Select an instance' with a search bar and a list of instance IDs. The left sidebar contains navigation links for 'EC2 Dashboard', 'EC2 Global View', 'Events', 'Tags', 'Limits', 'Instances', 'Instance Types', 'Launch Templates', 'Spot Requests', 'Savings Plans', 'Reserved Instances', 'Dedicated Hosts', 'Scheduled Instances', 'Capacity Reservations', 'Images', 'AMIs', and 'AMI Catalog'. The bottom of the screen shows a Windows taskbar with the search bar, taskbar icons, and system tray information including the date and time.

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>
```

The screenshot shows a Windows Command Prompt window with a black background and white text. The title bar reads 'Command Prompt'. The window displays the output of two ping commands. The first command, 'ping 44.201.196.33', shows successful results with four replies and a 0% loss. The second command, 'ping 44.204.59.27', shows four 'Request timed out' messages and a 100% loss. The Windows taskbar is visible at the bottom, showing the search bar, task view button, and several application icons. The system tray on the right indicates a temperature of 30°C, haze, and the date/time as 23:21 on 19-04-2022.