

School of Computer Science, Engineering and Applications (SCSEA)
B.C.A. TY (CCSA)
Subject: Advanced Cloud Computing (P)

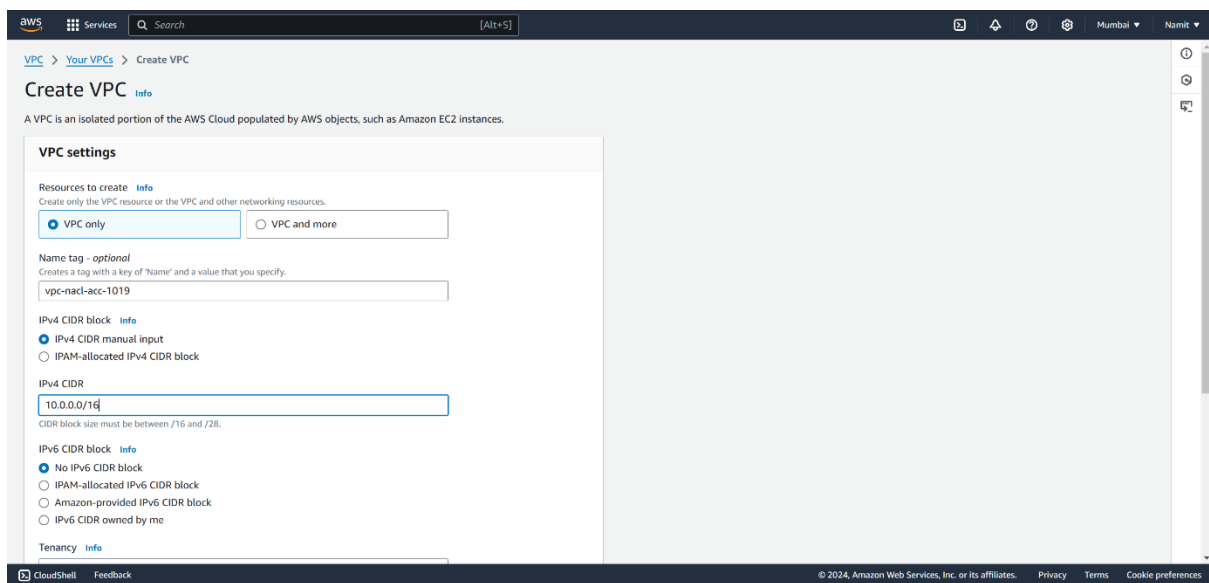
Name of the Student: Namit Agarwal

PRN: 20220801019

Title of Practical: Configuring Layered Security in an AWS VPC(NACL)

1. Create a VPC

- Give name tag
- IPv4 CIDR block – 10.0.0.0/16



Create VPC

A VPC is an isolated portion of the AWS Cloud populated by AWS objects, such as Amazon EC2 instances.

VPC settings

Resources to create [Info](#)
Create only the VPC resource or the VPC and other networking resources.
☒ VPC only ☐ VPC and more

Name tag - optional [Info](#)
Creates a tag with a key of 'Name' and a value that you specify.
vpc-nacl-1019

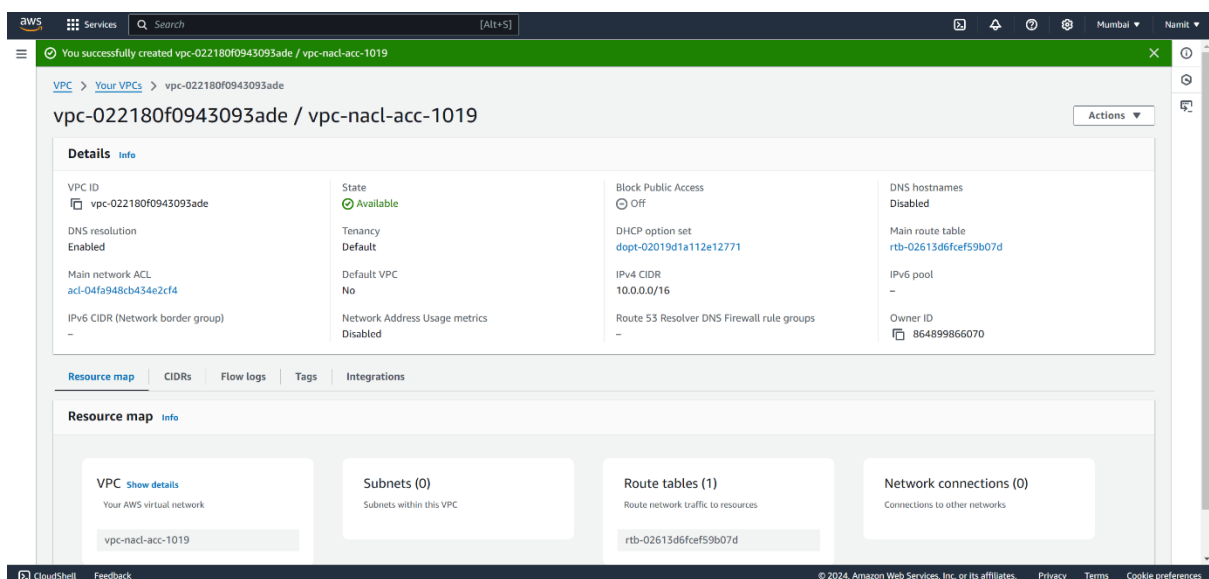
IPv4 CIDR block [Info](#)
☒ IPv4 CIDR manual input
☐ IPAM-allocated IPv4 CIDR block

IPv4 CIDR
10.0.0.0/16
CIDR block size must be between /16 and /28.

IPv6 CIDR block [Info](#)
☒ No IPv6 CIDR block
☐ IPAM-allocated IPv6 CIDR block
☐ Amazon-provided IPv6 CIDR block
☐ IPv6 CIDR owned by me

Tenancy [Info](#)
-

2. Create VPC



You successfully created vpc-022180f0943093ade / vpc-nacl-acc-1019

vpc-022180f0943093ade / vpc-nacl-acc-1019

Details [Info](#)

VPC ID vpc-022180f0943093ade	State Available	Block Public Access Off	DNS hostnames Disabled
DNS resolution Enabled	Tenancy Default	DHCP option set dopt-02019d1a112e12771	Main route table rtb-02613d6fce59b07d
Main network ACL acl-04fa948cb434e2cf4	Default VPC No	IPv4 CIDR 10.0.0.0/16	IPv6 pool -
IPv6 CIDR (Network border group) -	Network Address Usage metrics Disabled	Route 53 Resolver DNS Firewall rule groups -	Owner ID 864899866070

Resource map [Info](#)

VPC [Show details](#)
Your AWS virtual network
vpc-nacl-acc-1019

Subnets (0)
Subnets within this VPC

Route tables (1)
Route network traffic to resources
rtb-02613d6fce59b07d

Network connections (0)
Connections to other networks

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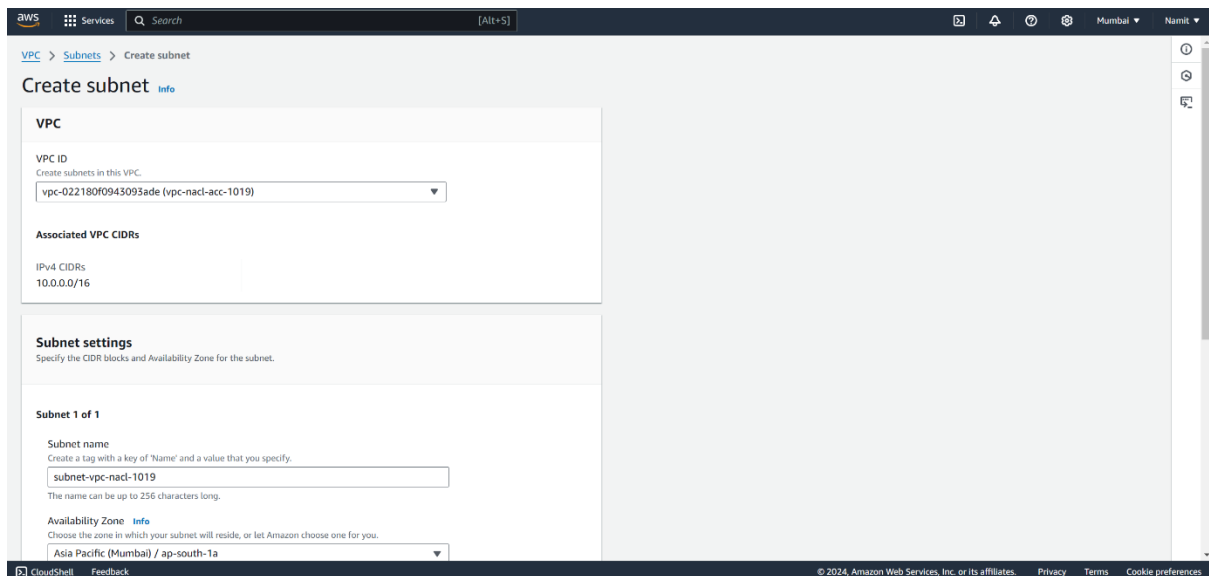
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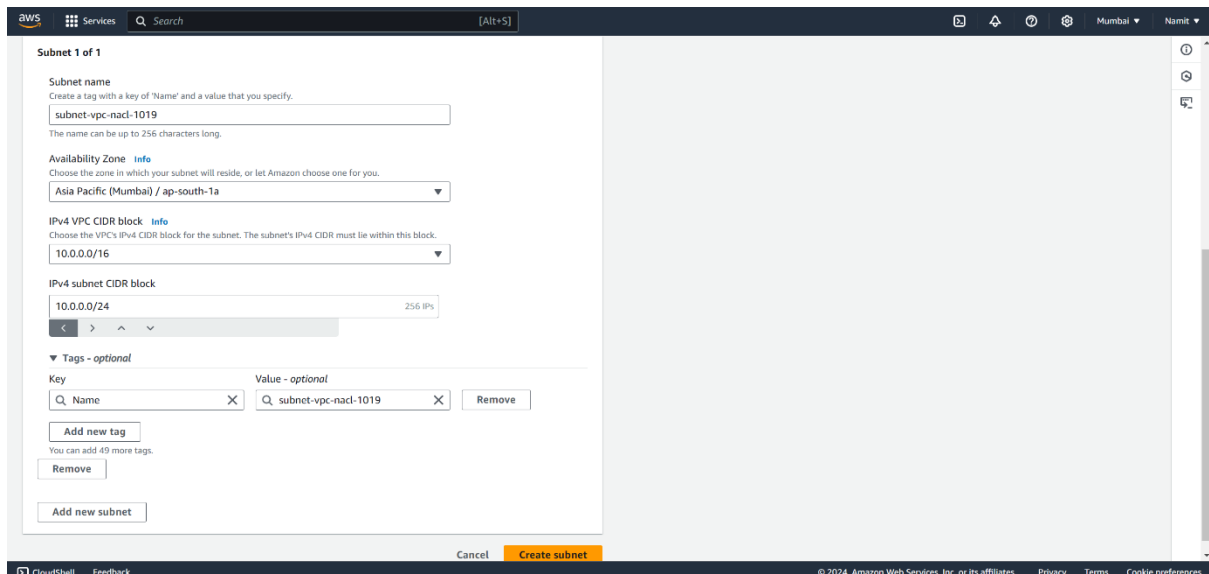
3. Now we create subnet

- Select vpc that we created above
- Give subnet name



The screenshot shows the AWS Management Console 'Create subnet' page. The 'VPC' section shows 'VPC ID' as 'vpc-022180f0943093ade (vpc-nacl-1019)'. The 'Subnet settings' section shows 'Subnet name' as 'subnet-vpc-nacl-1019' and 'Availability Zone' as 'Asia Pacific (Mumbai) / ap-south-1a'. The 'IPv4 CIDRs' section shows '10.0.0/16'.

- Select availability zone
- IPv4 subnet CIDR block – 10.0.0.0/24



The screenshot shows the AWS Management Console 'Create subnet' page. The 'Subnet name' is 'subnet-vpc-nacl-1019'. The 'Availability Zone' is 'Asia Pacific (Mumbai) / ap-south-1a'. The 'IPv4 VPC CIDR block' is '10.0.0/16'. The 'IPv4 subnet CIDR block' is '10.0.0/24'. The 'Tags' section shows a tag with key 'Name' and value 'subnet-vpc-nacl-1019'.

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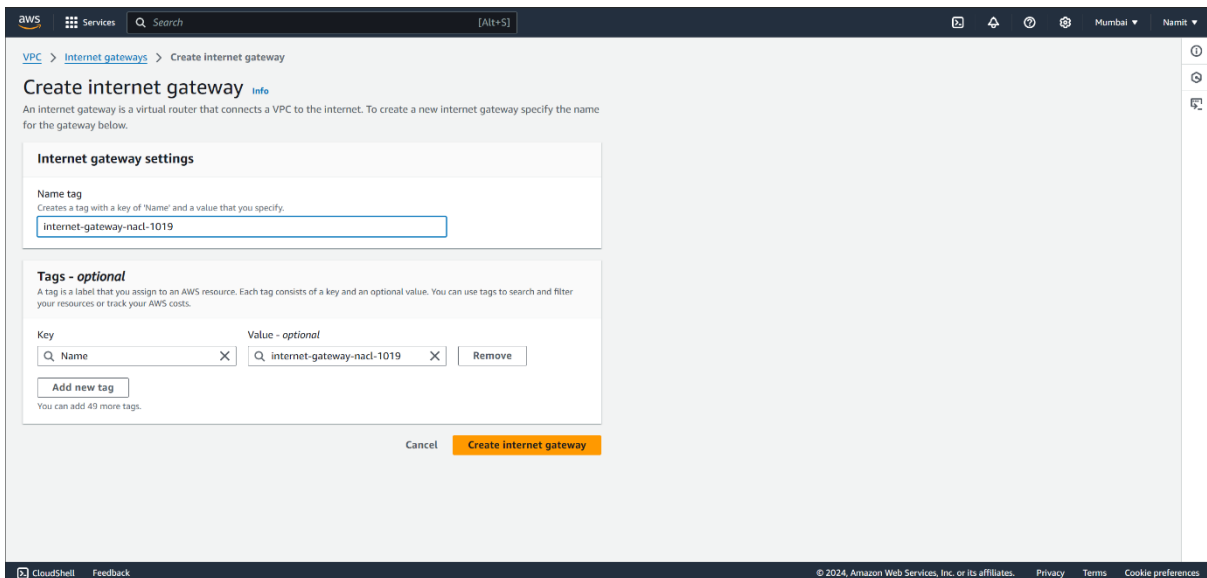
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4. Now create internet gateway

- Give name tag



Create internet gateway [Info](#)

An internet gateway is a virtual router that connects a VPC to the internet. To create a new internet gateway specify the name for the gateway below.

Internet gateway settings

Name tag
Creates a tag with a key of 'Name' and a value that you specify.

internet-gateway-nacl-1019

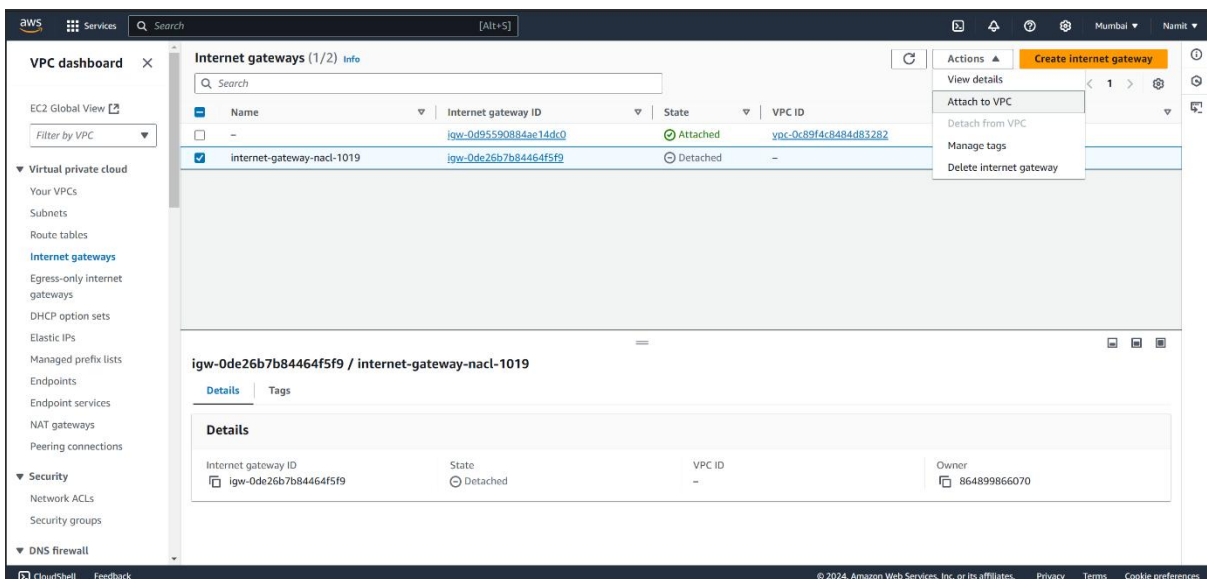
Tags - optional
A tag is a label that you assign to an AWS resource. Each tag consists of a key and an optional value. You can use tags to search and filter your resources or track your AWS costs.

Key: Name Value - optional: internet-gateway-nacl-1019

[Add new tag](#) (You can add 49 more tags.)

[Cancel](#) [Create internet gateway](#)

- Attach it to vpc that we created



Internet gateways (1/2) [Info](#)

Name	Internet gateway ID	State	VPC ID
-	igw-0d95590884ae14dc0	Attached	vpc-0c89f4c8484d83282
internet-gateway-nacl-1019	igw-0de26b7b84464f5f9	Detached	-

igw-0de26b7b84464f5f9 / internet-gateway-nacl-1019

Details

Internet gateway ID	State	VPC ID	Owner
igw-0de26b7b84464f5f9	Detached	-	864899866070

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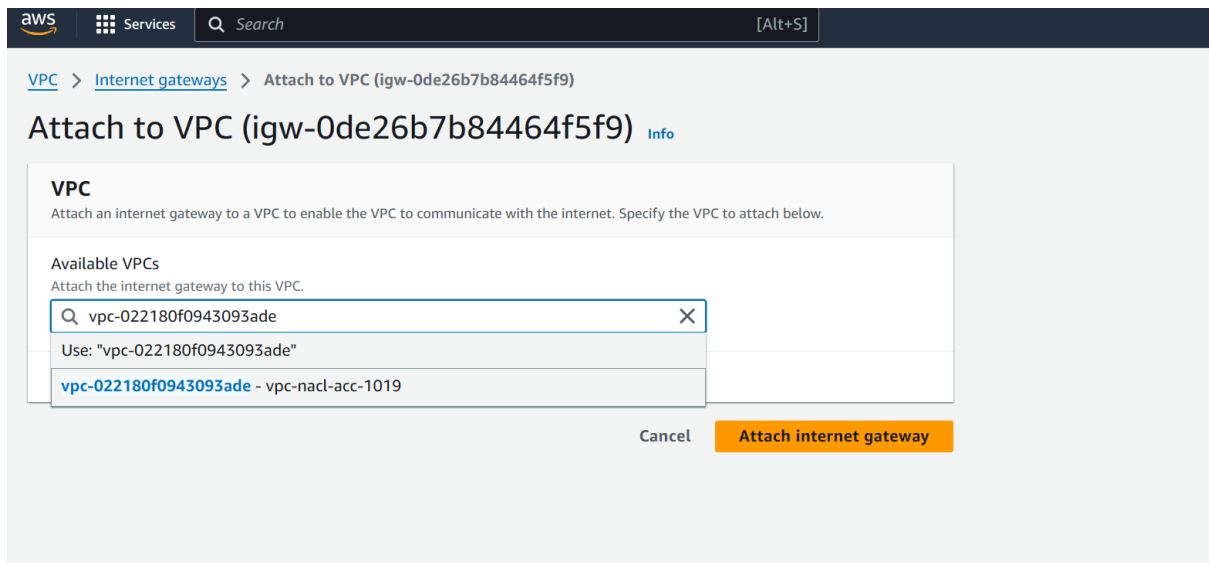
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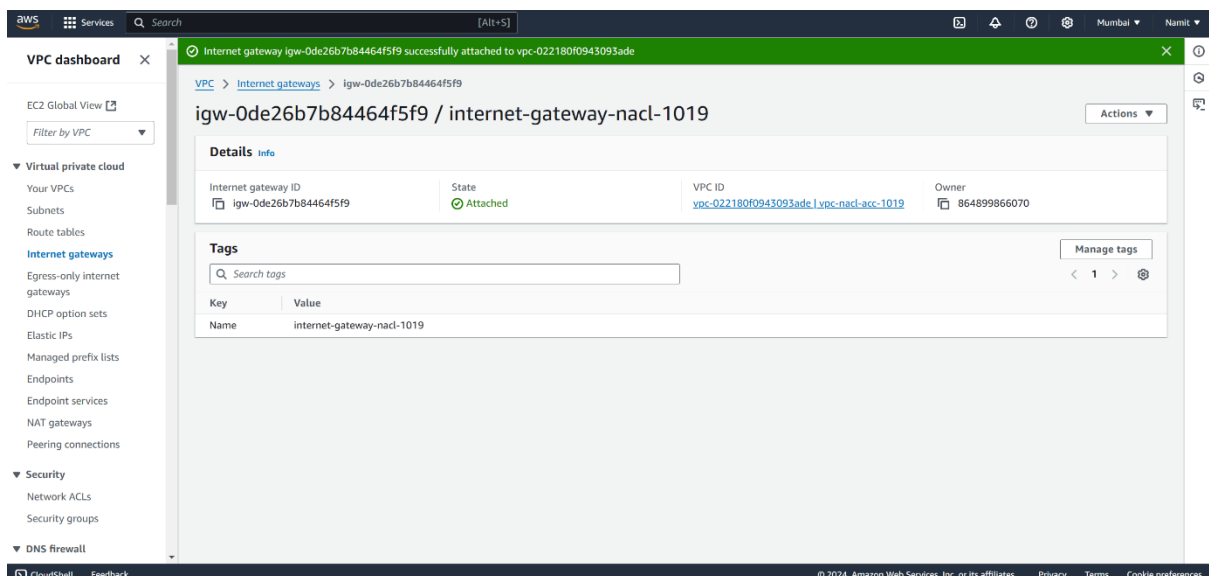
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The screenshot shows the AWS console interface for attaching an internet gateway to a VPC. The breadcrumb navigation is VPC > Internet gateways > Attach to VPC (igw-0de26b7b84464f5f9). The main heading is 'Attach to VPC (igw-0de26b7b84464f5f9) Info'. Below this, there is a section titled 'VPC' with the instruction: 'Attach an internet gateway to a VPC to enable the VPC to communicate with the internet. Specify the VPC to attach below.' Underneath, 'Available VPCs' are listed with the instruction 'Attach the internet gateway to this VPC.' A search bar contains 'vpc-022180f0943093ade'. Below the search bar, a list of VPCs is shown, with 'vpc-022180f0943093ade - vpc-nacl-acc-1019' selected. At the bottom right, there are two buttons: 'Cancel' and 'Attach internet gateway'.



The screenshot shows the AWS console interface after successfully attaching an internet gateway to a VPC. A green banner at the top states: 'Internet gateway igw-0de26b7b84464f5f9 successfully attached to vpc-022180f0943093ade'. The breadcrumb navigation is VPC > Internet gateways > igw-0de26b7b84464f5f9. The main heading is 'igw-0de26b7b84464f5f9 / internet-gateway-nacl-1019'. Below this, there is a 'Details' section with the following information: Internet gateway ID: igw-0de26b7b84464f5f9, State: Attached, VPC ID: vpc-022180f0943093ade | vpc-nacl-acc-1019, and Owner: 864899866070. There is also a 'Tags' section with a search bar and a table showing a single tag: Key: Name, Value: internet-gateway-nacl-1019. The left sidebar shows the 'VPC dashboard' with various navigation options like 'Your VPCs', 'Subnets', 'Route tables', 'Internet gateways', etc.

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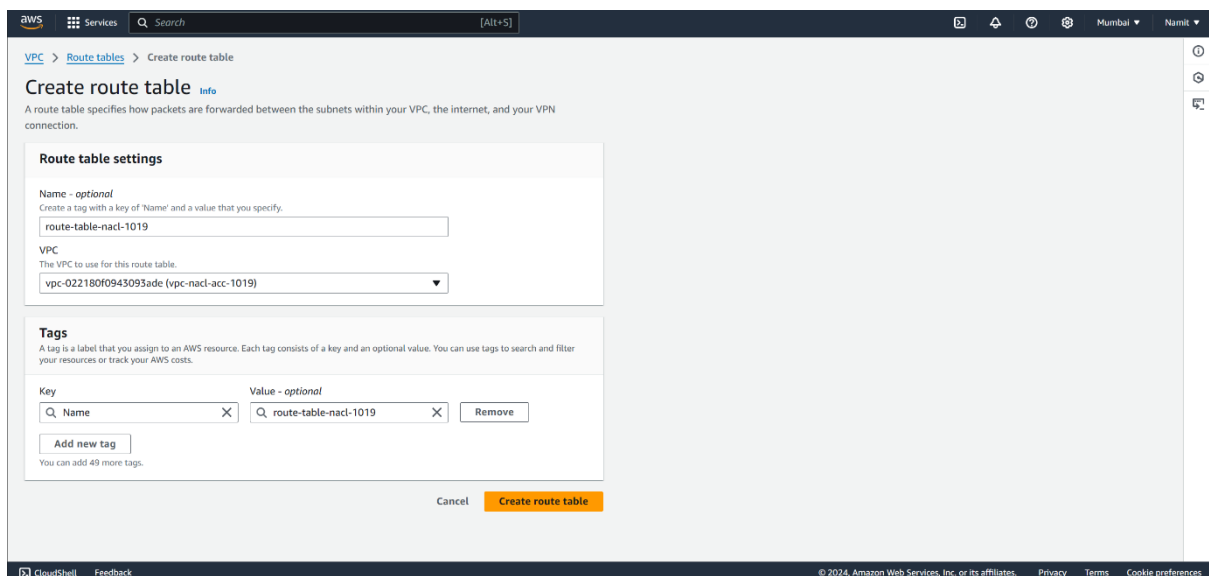
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5. Create route table

- Give name
- Select vpc



Create route table [Info](#)

A route table specifies how packets are forwarded between the subnets within your VPC, the internet, and your VPN connection.

Route table settings

Name - optional
Create a tag with a key of 'Name' and a value that you specify.

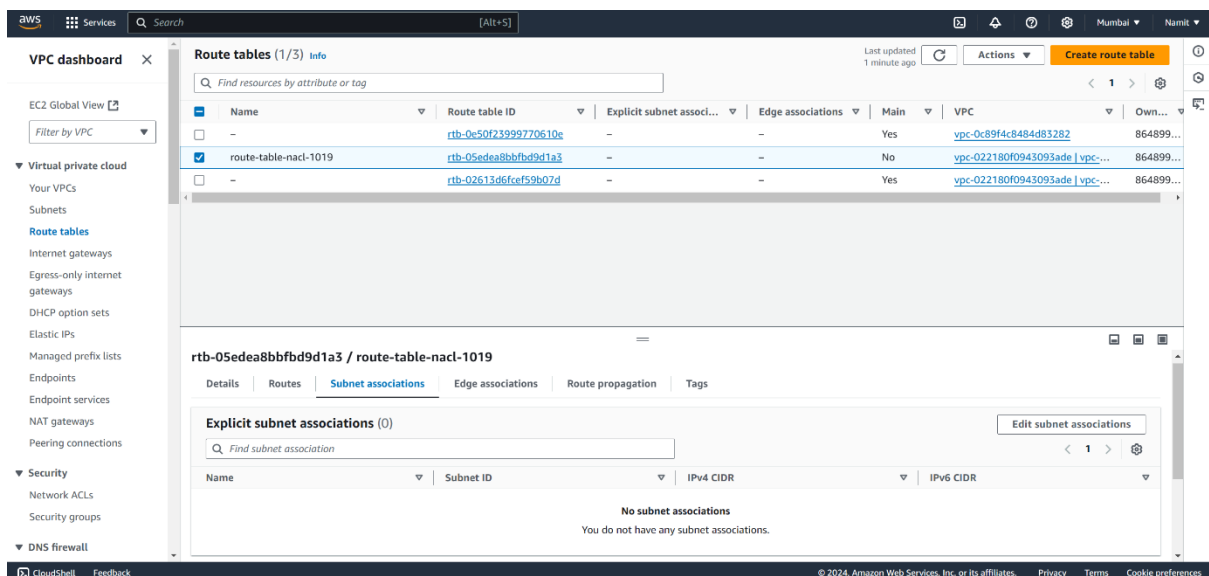
VPC
The VPC to use for this route table.

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

You can add 49 more tags.

- Edit subnet association



Route tables (1/3) [Info](#)

Last updated 1 minute ago

<input type="checkbox"/>	Name	Route table ID	Explicit subnet associ...	Edge associations	Main	VPC	Own...
<input type="checkbox"/>	-	rtb-0e50f23999770610e	-	-	Yes	vpc-0c89f4c8484d83282	864899...
<input checked="" type="checkbox"/>	route-table-nacl-1019	rtb-05ede88bbfd9d1a3	-	-	No	vpc-022180f0943093ade vpc-...	864899...
<input type="checkbox"/>	-	rtb-02613d6fce59b07d	-	-	Yes	vpc-022180f0943093ade vpc-...	864899...

rtb-05ede88bbfd9d1a3 / route-table-nacl-1019

[Details](#) [Routes](#) [Subnet associations](#) [Edge associations](#) [Route propagation](#) [Tags](#)

Explicit subnet associations (0)

Name	Subnet ID	IPv4 CIDR	IPv6 CIDR
No subnet associations You do not have any subnet associations.			

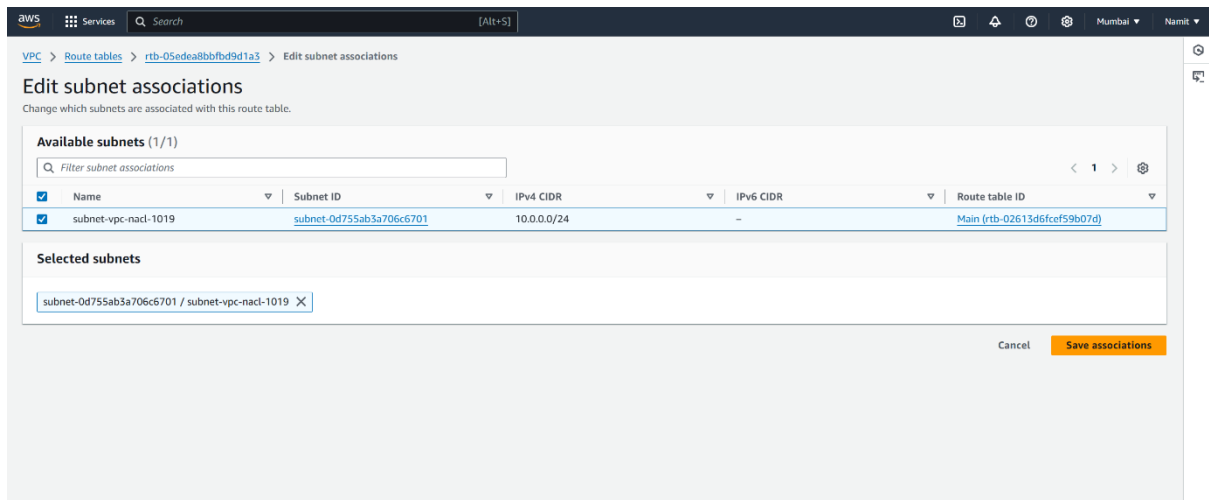
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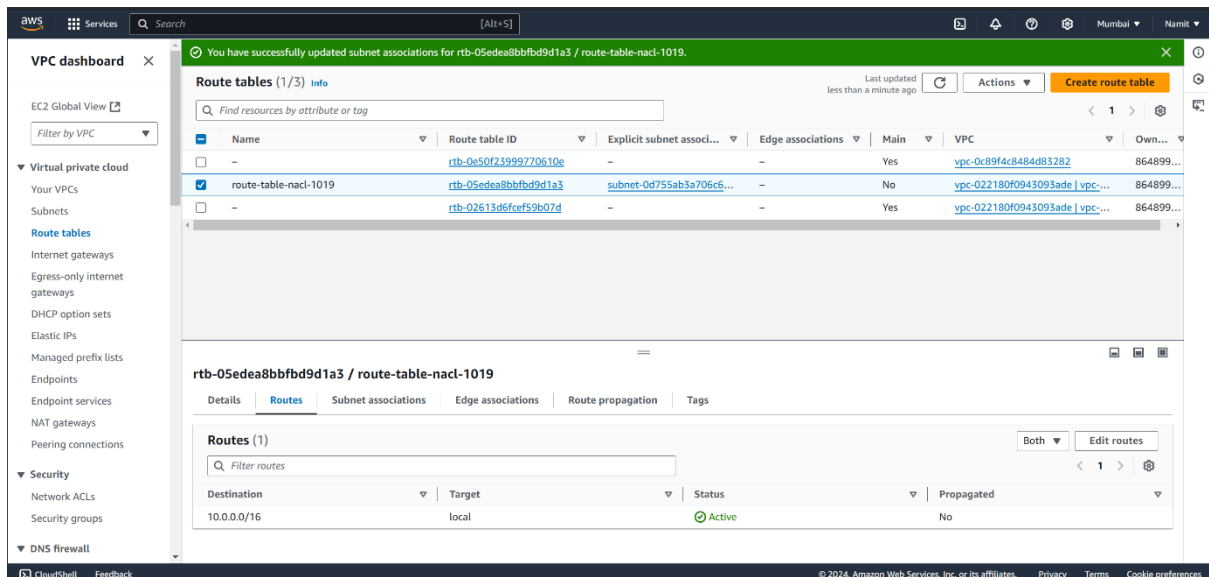
Title of Practical: Configuring Layered Security in an AWS VPC(NACL)

- Select subnet that we created above



The screenshot shows the 'Edit subnet associations' page in the AWS console. The breadcrumb trail is 'VPC > Route tables > rtb-05edea8bbfd9d1a3 > Edit subnet associations'. The page title is 'Edit subnet associations' with a subtitle 'Change which subnets are associated with this route table.' Below this, there's a section 'Available subnets (1/1)' with a search bar and a table. The table has columns: Name, Subnet ID, IPv4 CIDR, IPv6 CIDR, and Route table ID. One subnet is listed: 'subnet-vpc-nacl-1019' with Subnet ID 'subnet-0d755ab3a706c6701', IPv4 CIDR '10.0.0.0/24', and Route table ID 'Main (rtb-02613d6fcef59b07d)'. Below the table is a 'Selected subnets' section with a text input containing 'subnet-0d755ab3a706c6701 / subnet-vpc-nacl-1019'. At the bottom right are 'Cancel' and 'Save associations' buttons.

- Now edit routes



The screenshot shows the 'Route tables' page in the AWS console. A green notification banner at the top says 'You have successfully updated subnet associations for rtb-05edea8bbfd9d1a3 / route-table-nacl-1019.' The page title is 'Route tables (1/3)' with an 'Info' link. Below the title is a search bar and a table. The table has columns: Name, Route table ID, Explicit subnet associ..., Edge associations, Main, VPC, and Own... One route table is selected: 'route-table-nacl-1019' with Route table ID 'rtb-05edea8bbfd9d1a3', Explicit subnet associ... 'subnet-0d755ab3a706c6...', and Main 'No'. Below the table is a section for 'rtb-05edea8bbfd9d1a3 / route-table-nacl-1019' with tabs: Details, Routes, Subnet associations, Edge associations, Route propagation, and Tags. The 'Routes' tab is active, showing a table with columns: Destination, Target, Status, and Propagated. One route is listed: '10.0.0.0/16' with Target 'local', Status 'Active', and Propagated 'No'. At the bottom right of the routes table are 'Both' and 'Edit routes' buttons.

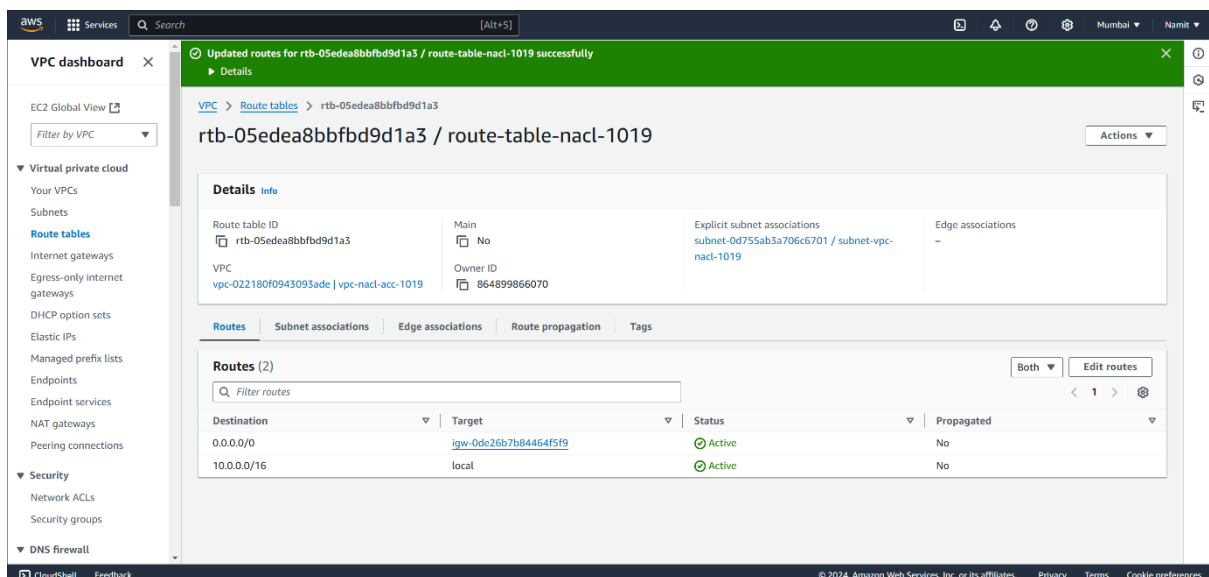
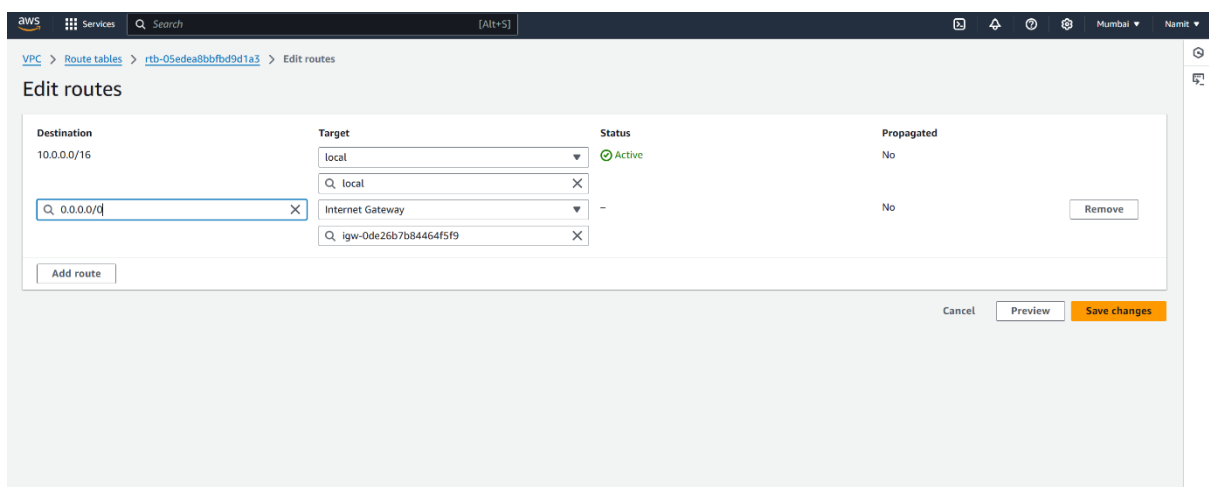
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- Add route select destination 0.0.0.0/0 , target – internet gateway (select the one we created)



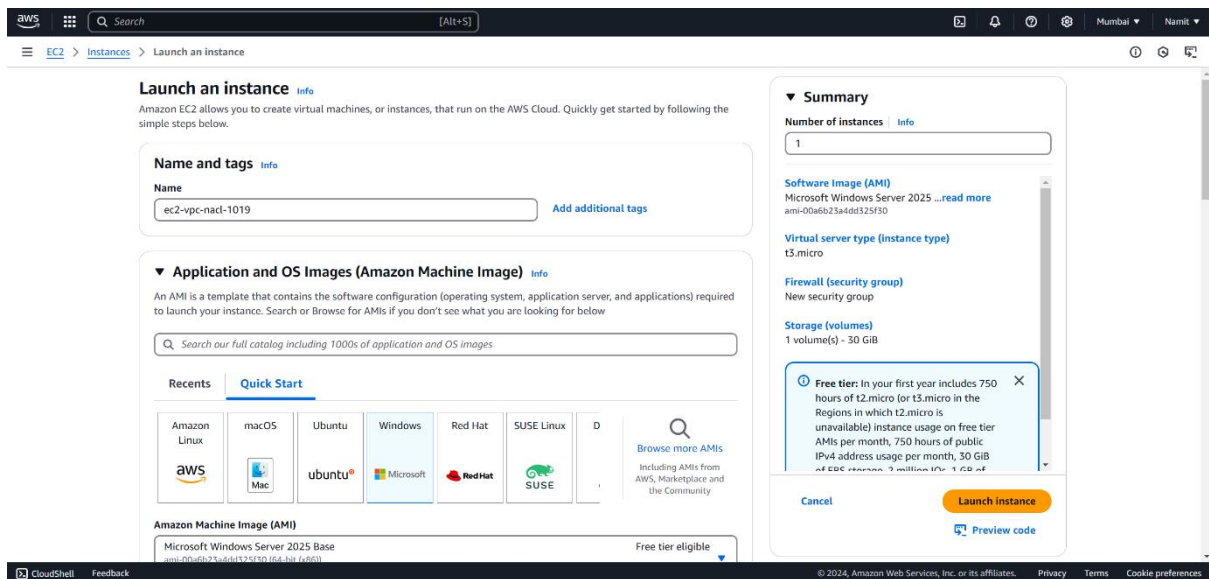
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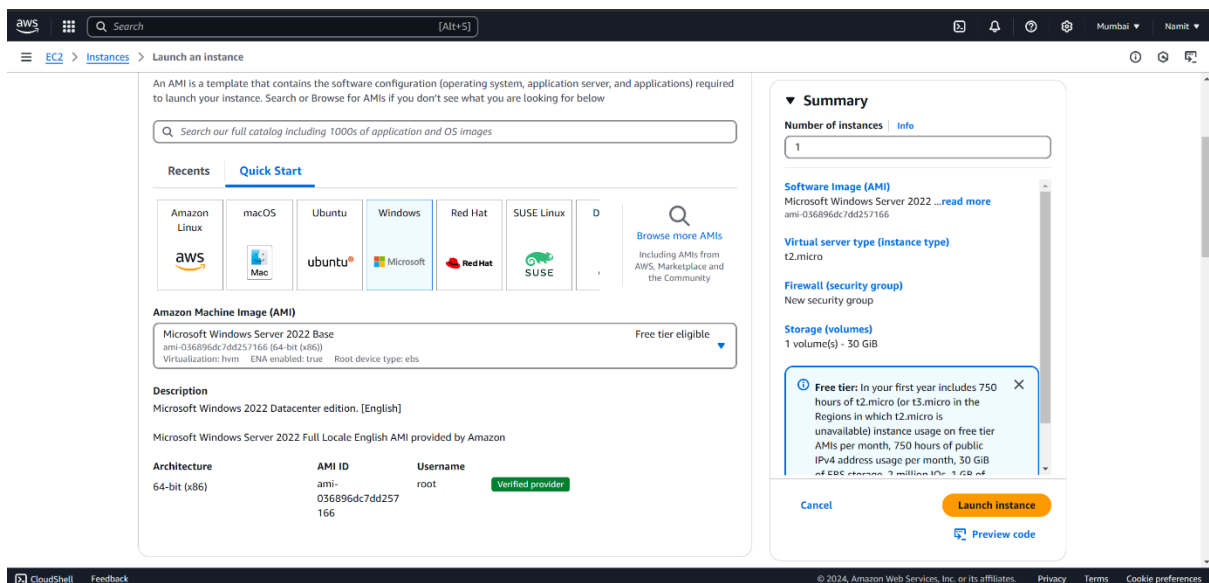
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Title of Practical: Configuring Layered Security in an AWS VPC(NACL)

6. Now launch an EC2 instance



- Select Windows Server 2022 base as AMI





Name of the Student: Namit Agarwal **PRN:** 20220801019

Title of Practical: Configuring Layered Security in an AWS VPC(NACL)

- EC2 > Instances > Launch an instance

166

▼ Instance type [Info](#) | [Get advice](#)

Instance type

t2.micro

Family: t2 1 vCPU 1 GiB Memory Current generation: true

On-Demand Linux base pricing: 0.0124 USD per Hour

On-Demand Windows base pricing: 0.017 USD per Hour

On-Demand RHEL base pricing: 0.0268 USD per Hour

On-Demand Ubuntu Pro base pricing: 0.0142 USD per Hour

On-Demand SUSE base pricing: 0.0124 USD per Hour

Free tier eligible

☐ All generations

[Compare instance types](#)

Additional costs apply for AMIs with pre-installed software

▼ 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

KP-CCSA-TY-1019

↕

[Create new key pair](#)

For Windows instances, you use a key pair to decrypt the administrator password. You then use the decrypted password to connect to your instance.

▼ Network settings [Info](#)

Network

[Info](#)

▼ Summary

Number of instances [Info](#)

1

Software Image (AMI)

Microsoft Windows Server 2022 ...[read more](#)
ami-03689f6dc76d257166

Virtual server type (instance type)

t2.micro

Firewall (security group)

New security group

Storage (volumes)

1 volume(s) - 30 GiB

❗ Free tier: In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is unavailable) instance usage on free tier AMIs per month, 750 hours of public IPv4 address usage per month, 30 GiB of EBS storage. 3 million for 1 GiB of

×

[Cancel](#)

[Launch instance](#)

[Preview code](#)

CloudShell Feedback

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- Search

MumbaiNamit

EC2InstancesLaunch an instance

▼ Network settingsInfo

VPC - requiredInfo
vpc-02218f0f943093ade (vpc-nacI-acC-1019)
10.0.0.0/16

Subnet Info

subnet-0d755ab3a706c6701 subnet-vpc-nacI-1019

VPC: vpc-02218f0f943093ade Owner: B648f99B66070
Availability Zone: ap-south-la Zone type: Availability Zone
IP addresses available: 251 CIDR: 10.0.0.0/24

Auto-assign public IP Info
Enable

Additional charges applywhen 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 groupSelect existing security group

Security group name - required
launch-wizard-4
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 are a-z, A-Z, 0-9, spaces, and _-/!@#%^&*~`{|}[]
Description - requiredInfo
launch-wizard-4 created 2024-11-24T14:52:55.15Z

Inbound Security Group Rules
▼ Security group rule 1 (TCP; 3389, 0.0.0.0/0)

Summary

Number of instances Info
1

Software Image (AMI)
Microsoft Windows Server 2022...read more
ami-03689dc7dd257166

Virtual server type (instance type)
t2.micro

Firewall (security group)
New security group

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

Free tier: In your first year includes 750 hours of t2.micro or t3.micro in the Regions in which t2.micro is unavailable) instance usage on free tier AMIs per month, 750 hours of public IPv4 address usage per month, 30 GiB of EBS storage, 3 million IOPS.

Cancel Launch instance Preview code

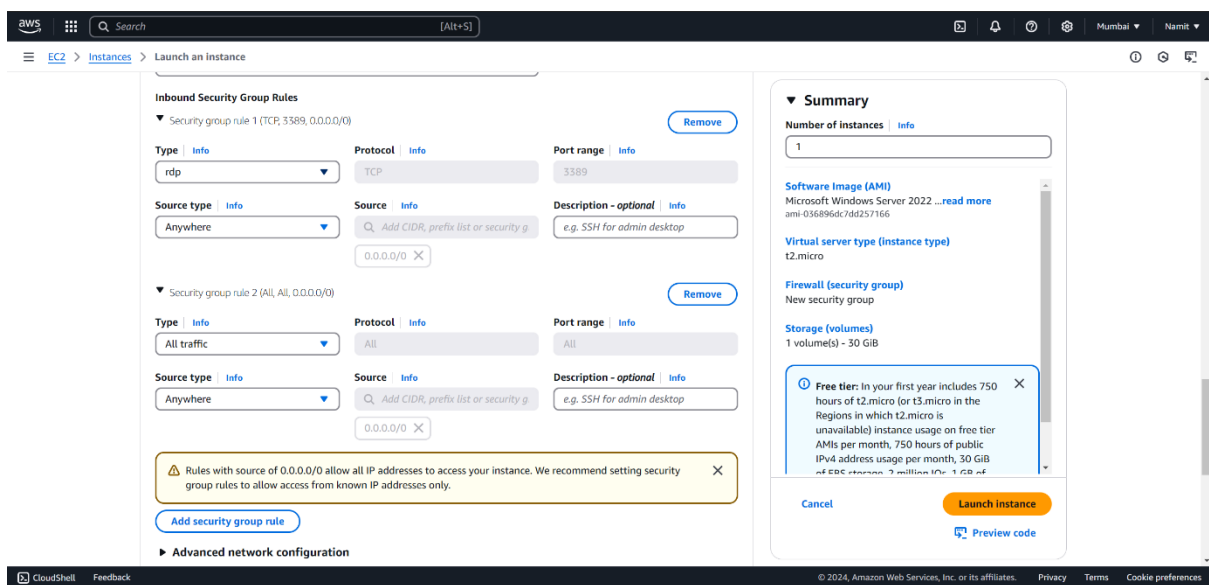
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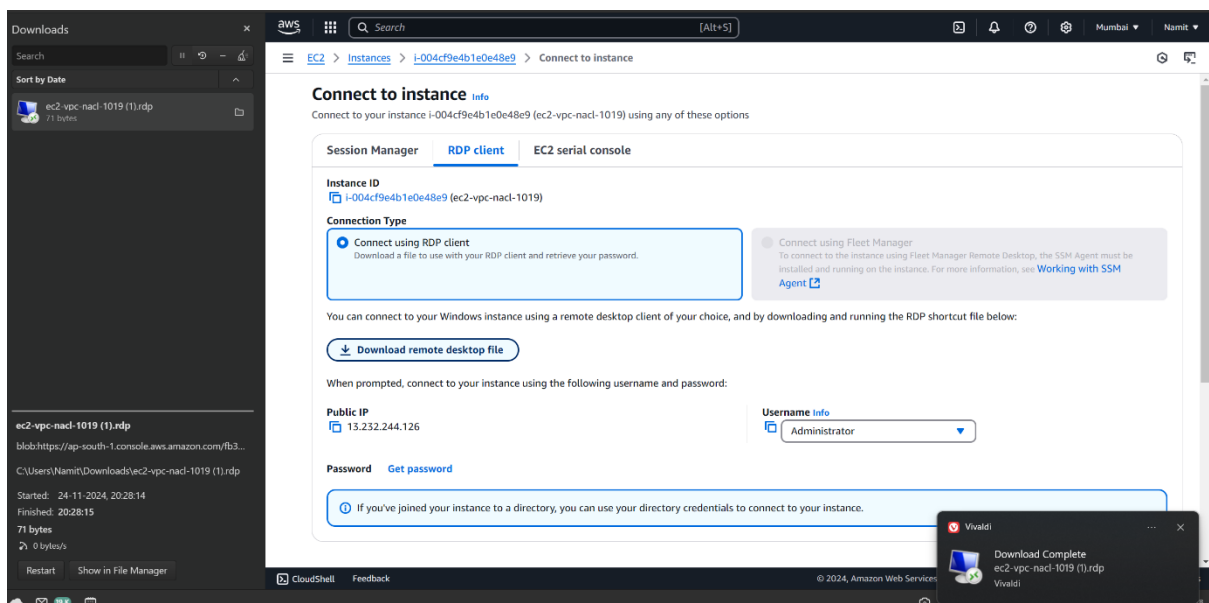
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Title of Practical: Configuring Layered Security in an AWS VPC(NACL)

- Add security group rules
- All traffic and Anywhere
- Then launch instance



7. Download the rdp file



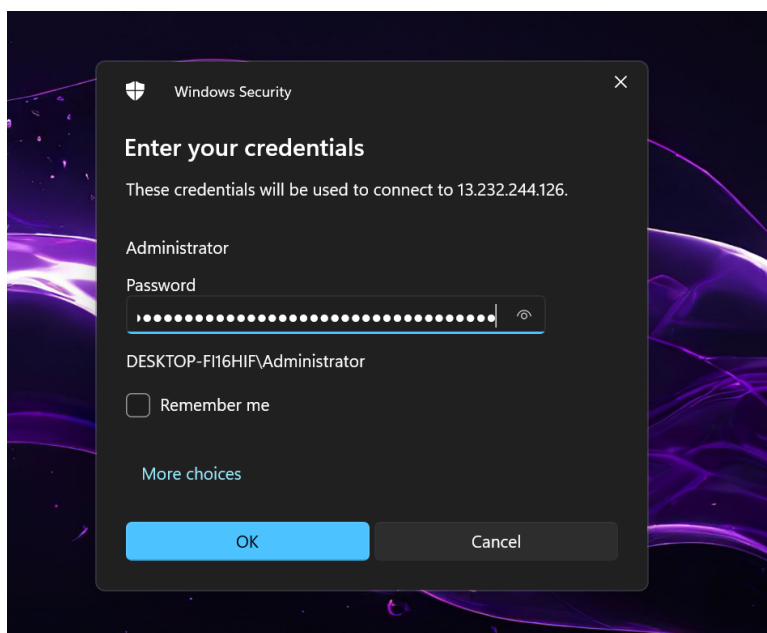
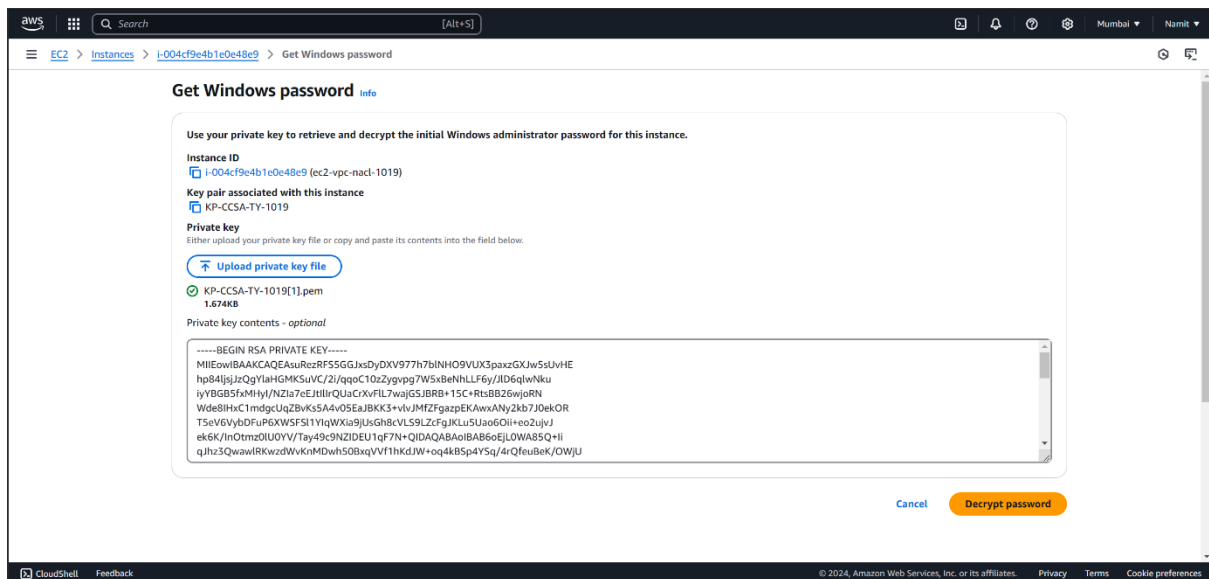
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8. Decrypt and get the password



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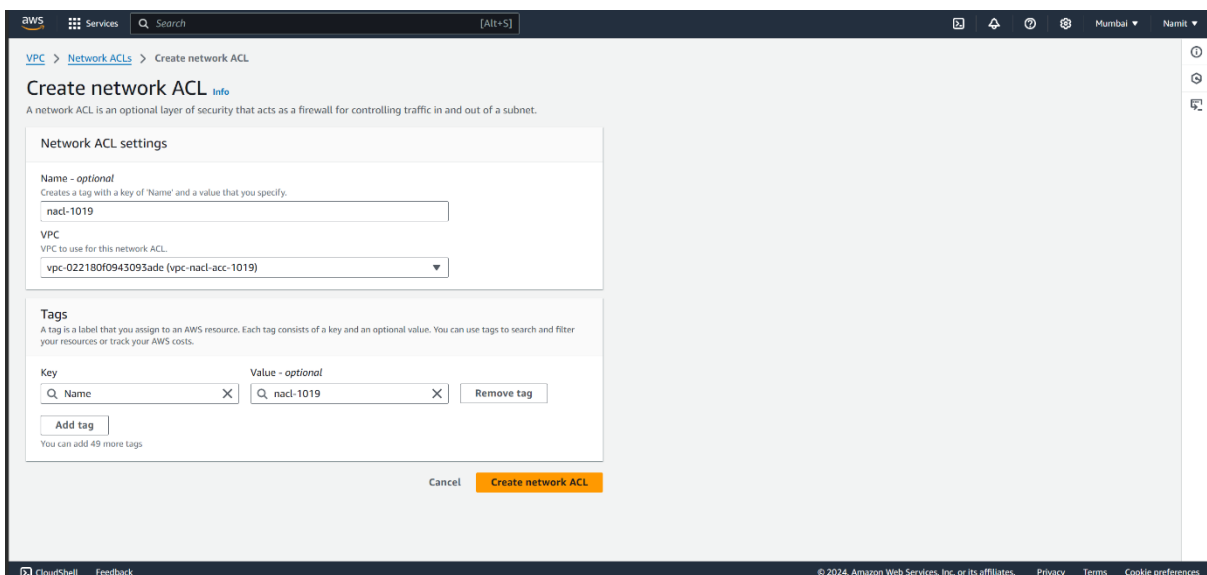
Name of the Student: Namit Agarwal

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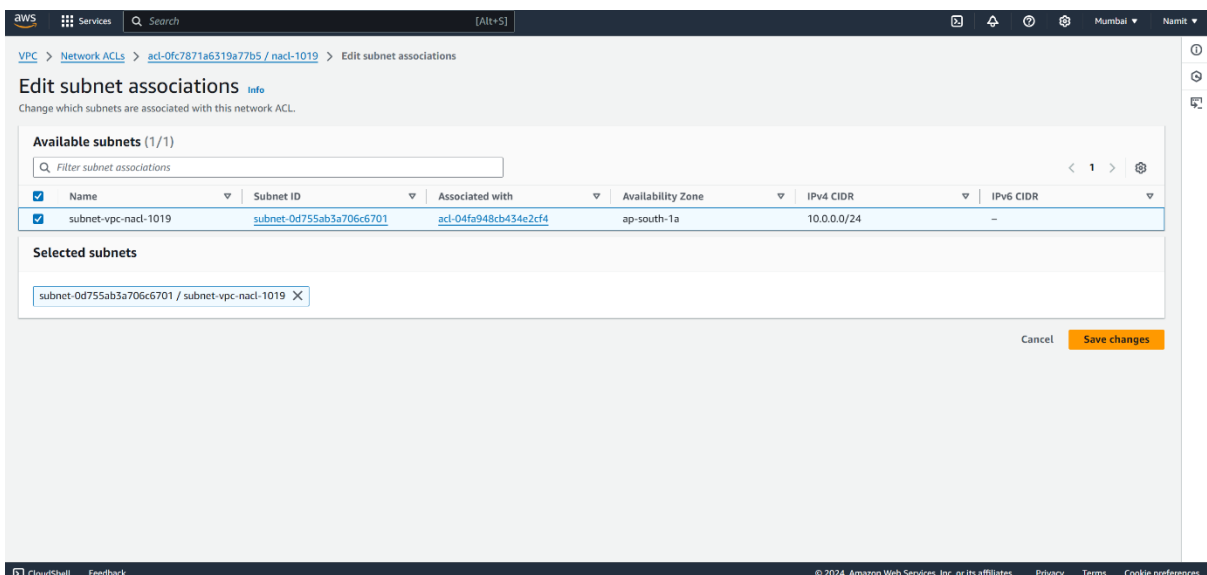
9. Now lets configure NACL

- Create network ACL select the vpc we created



The screenshot shows the 'Create network ACL' page in the AWS Management Console. The 'Network ACL settings' section includes a 'Name - optional' field with the value 'nACL-1019' and a 'VPC' dropdown menu showing 'vpc-022180f0943093adc (vpc-nACL-acc-1019)'. The 'Tags' section shows a key 'Name' with a value 'nACL-1019'. At the bottom, there are 'Cancel' and 'Create network ACL' buttons.

- Edit its subnet association and select the subnet we created



The screenshot shows the 'Edit subnet associations' page in the AWS Management Console. The 'Available subnets (1/1)' section shows a table with one subnet: 'subnet-vpc-nACL-1019' with ID 'subnet-0d755ab3a706c6701', associated with 'acl-04fa948cb434e2cf4' in the 'ap-south-1a' availability zone with IPv4 CIDR '10.0.0.0/24'. The 'Selected subnets' section shows the same subnet selected. At the bottom, there are 'Cancel' and 'Save changes' buttons.

Name	Subnet ID	Associated with	Availability Zone	IPv4 CIDR	IPv6 CIDR
subnet-vpc-nACL-1019	subnet-0d755ab3a706c6701	acl-04fa948cb434e2cf4	ap-south-1a	10.0.0.0/24	-

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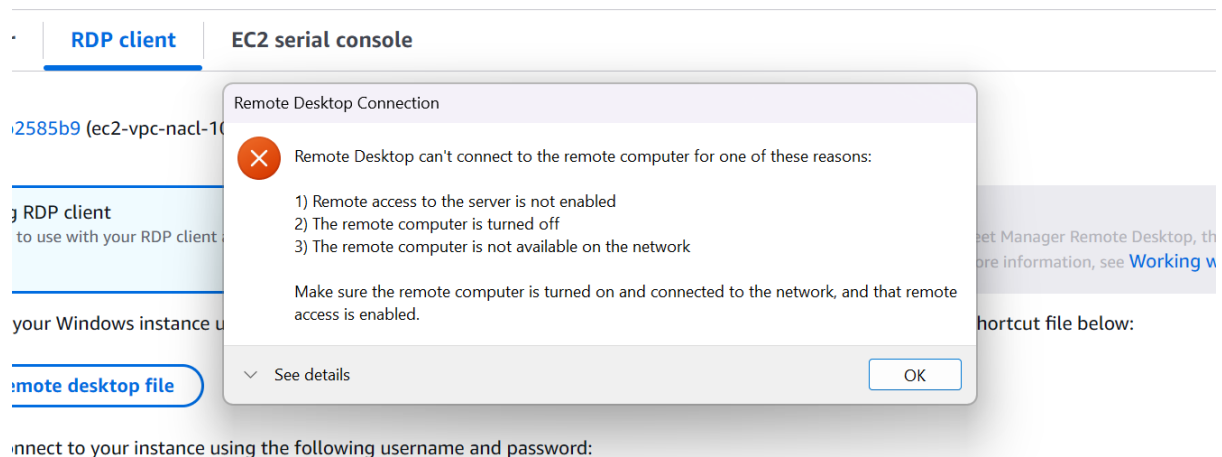
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Title of Practical: Configuring Layered Security in an AWS VPC(NACL)

- Now because by default access is denied we won't be able to connect to our rdp

ce-f069b51034102363b5 (ec2-vpc-nacl-1019) using any of these options



connect to your instance using the following username and password:

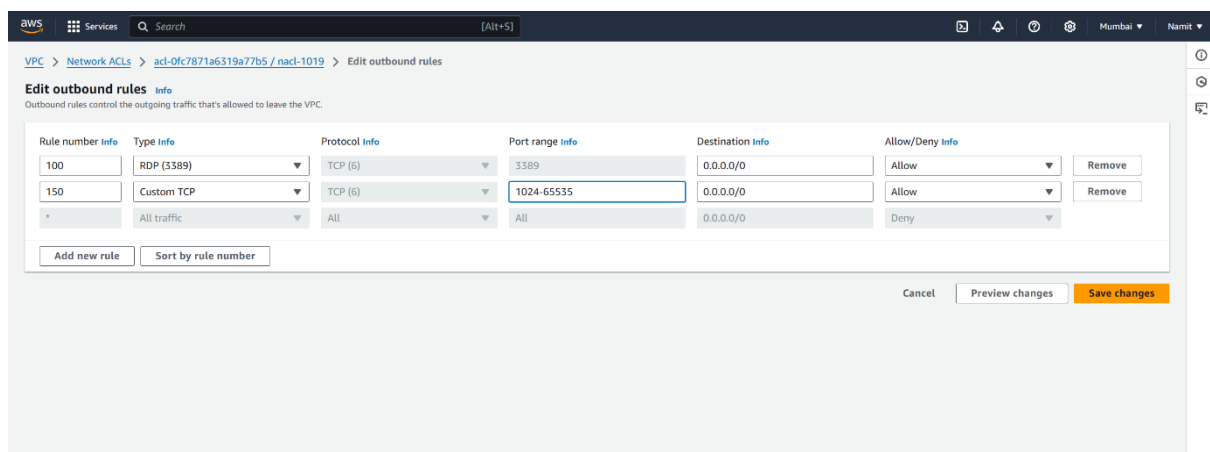
Username Info



Administrator

10. Let's add outbound rules

- RDP and custom tcp – range – 1024-65535



Rule number	Type	Protocol	Port range	Destination	Allow/Deny
100	RDP (3389)	TCP (6)	3389	0.0.0.0/0	Allow
150	Custom TCP	TCP (6)	1024-65535	0.0.0.0/0	Allow
*	All traffic	All	All	0.0.0.0/0	Deny

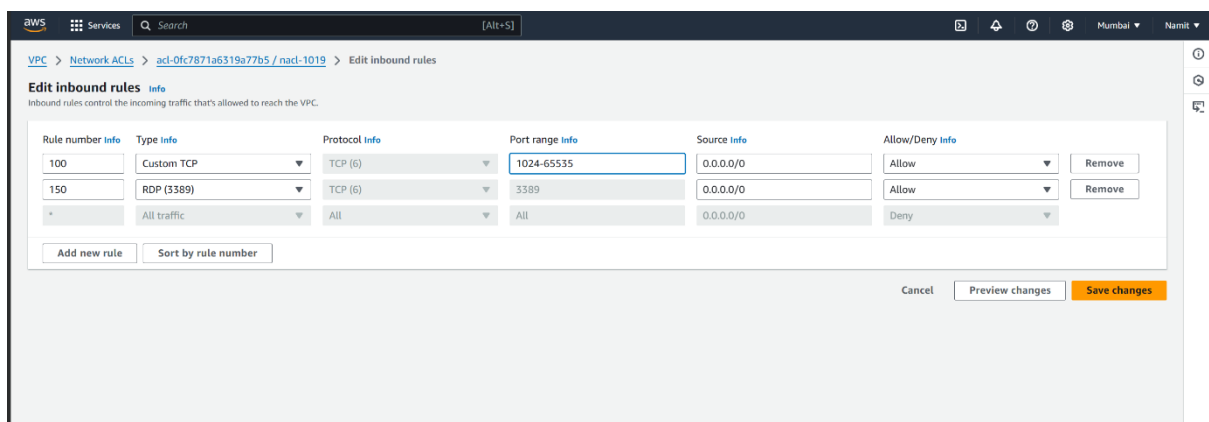
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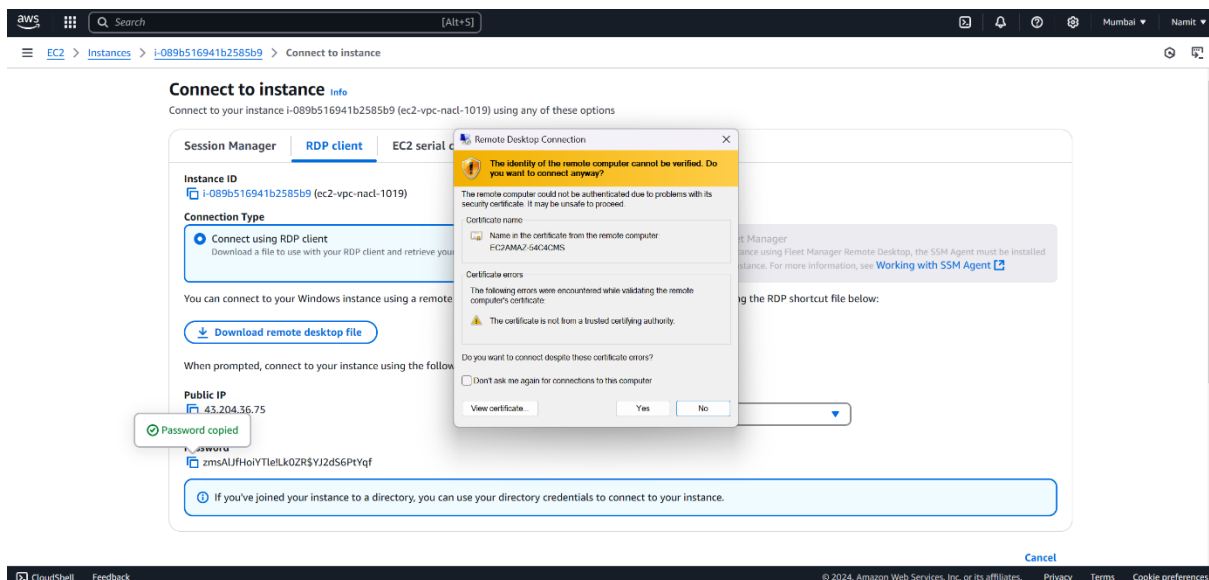
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Title of Practical: Configuring Layered Security in an AWS VPC(NACL)

1. add inbound rules
 - RDP and custom tcp – range – 1024-65535
- 2.



- Now try to connect



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- We are able to connect to our EC2

