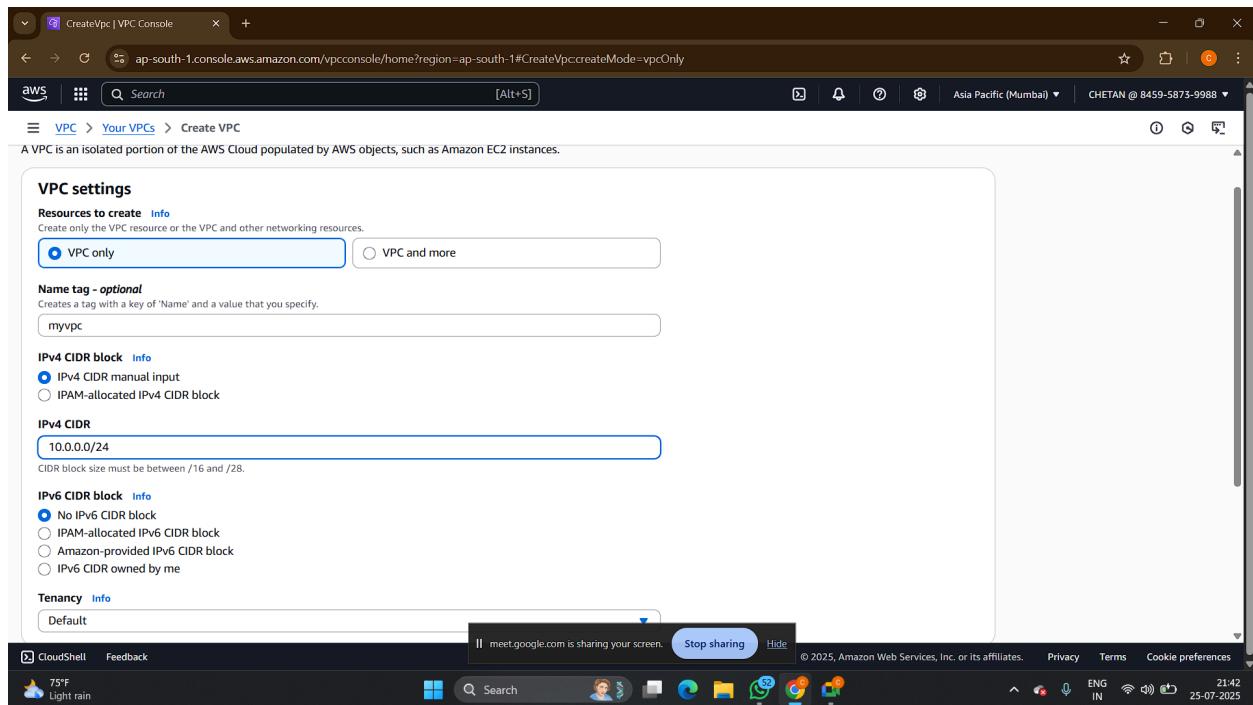


Cycle 08 AWS Homework - VPC

1. Create a Custom VPC

- Create a VPC with CIDR `10.1.0.0/24`.
- Create 3 subnets in different AZs using `/26` CIDRs (e.g., `10.1.0.0/26`, `10.1.0.64/26`, `10.1.0.128/26`).
- Create and attach an Internet Gateway (IGW) to the VPC.
- Create a Route Table, associate it with the subnets, and add a `0.0.0.0/0` route to the IGW.

Deliverable: Submit screenshots showing the VPC, all 3 subnets, IGW, and route table configuration.



The screenshot shows the 'Create subnet' page in the AWS VPC console. The 'VPC ID' dropdown is set to 'vpc-0e2fcad0098de093f (myvpc)'. Under 'Associated VPC CIDRs', the 'IPv4 CIDR' is listed as '10.0.0.0/24'. In the 'Subnet settings' section, the 'Subnet name' is 'mysubnet1'. The 'Availability Zone' dropdown shows 'Choose the zone in which your subnet will reside, or let Amazon choose one for you.' The status bar at the bottom indicates 'CloudShell Feedback' and shows system information like 'S&P 500 +0.25%', 'meet.google.com is sharing your screen.', and the date '25-07-2025'.

This screenshot shows the same 'Create subnet' page with more detailed configurations. The 'Subnet name' is 'mysubnet1'. The 'Availability Zone' is set to 'Asia Pacific (Mumbai) / ap-south-1'. The 'IPv4 VPC CIDR block' is '10.0.0.0/24'. In the 'Tags - optional' section, there is a single tag 'Name' with value 'mysubnet1'. The status bar at the bottom shows 'CloudShell Feedback', weather information '75°F Light rain', and the date '25-07-2025'.

The screenshot shows the AWS VPC Subnet creation interface. The subnet name is set to 'mysubnet2'. The availability zone is 'Asia Pacific (Mumbai) / ap-south-1b'. The IPv4 CIDR block is '10.0.0.0/24'. The IPv4 subnet CIDR block is '10.0.0.64/26'. A tag 'Name' is added with the value 'mysubnet2'. The interface includes sections for optional tags and a 'Create subnet' button.

The screenshot shows the AWS VPC Subnet creation interface. The subnet name is set to 'mysubnet3'. The availability zone is 'Asia Pacific (Mumbai) / ap-south-1c'. The IPv4 CIDR block is '10.0.0.0/24'. The IPv4 subnet CIDR block is '10.0.0.128/26'. A tag 'Name' is added with the value 'mysubnet3'. The interface includes sections for optional tags and a 'Create subnet' button.

Screenshot of the AWS VPC Subnets console page.

Subnets (6) Info

Last updated less than a minute ago

Actions | **Create subnet**

VPC	Block Public...	IPv4 CIDR	IPv6 CIDR	IPv6 CIDR association ID	Available IPv
vpc-00dcef4d69d6b4f5d	Off	172.31.32.0/20	-	-	4091
vpc-00dcef4d69d6b4f5d	Off	172.31.0.0/20	-	-	4091
vpc-0e2fcad0098de093f myvpc	Off	10.0.0.0/26	-	-	59
vpc-0e2fcad0098de093f myvpc	Off	10.0.0.64/26	-	-	59
vpc-0e2fcad0098de093f myvpc	Off	10.0.0.128/26	-	-	59
vpc-00dcef4d69d6b4f5d	Off	172.31.16.0/20	-	-	4091

Select a subnet

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Screenshot of the AWS VPC Create Route Table console page.

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.

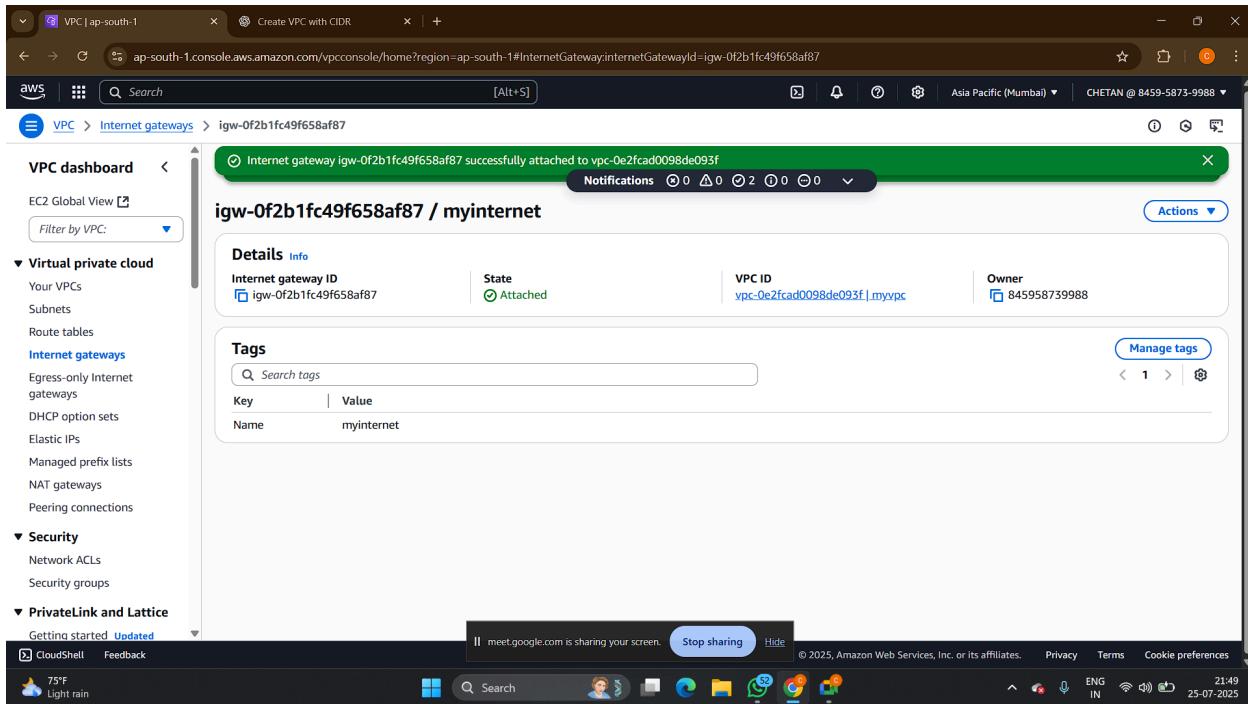
Key **Value - optional**

Add new tag
You can add 49 more tags.

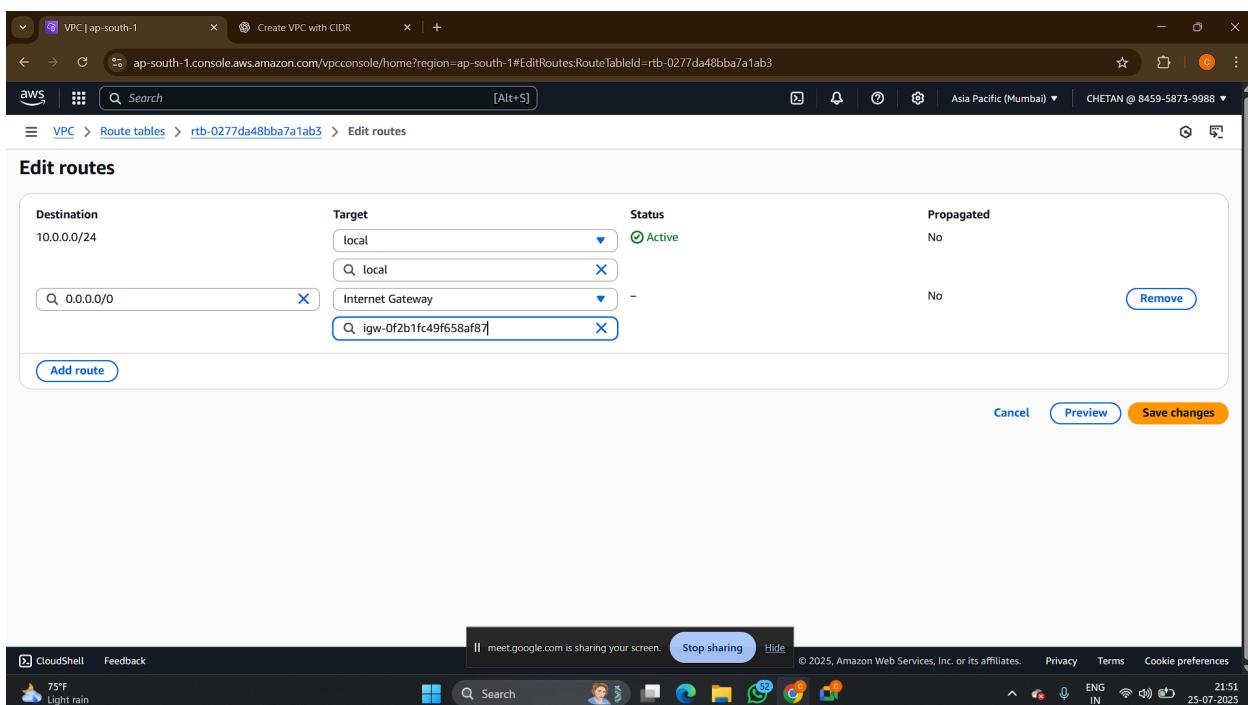
Create route table

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Screenshot of the AWS VPC console showing the Internet gateway details for 'igw-Of2b1fc49f658af87'. The gateway is successfully attached to VPC 'vpc-0e2fcad0098de093f' and is in the 'Attached' state. It has the tag 'Name: myinternet'. A notification bar at the top indicates the attachment was successful.



Screenshot of the AWS VPC console showing the 'Edit routes' page for Route Table 'rtb-0277da48bba7a1ab3'. The table lists two routes: one to 'local' target and one to an Internet Gateway (IGW) target. The IGW route is associated with the Internet gateway 'igw-Of2b1fc49f658af87'. The 'Save changes' button is visible at the bottom right.



The screenshot shows the AWS EC2 Instances launch wizard. The user has selected a t2.micro instance type and chosen a Canonical, Ubuntu 24.04 AMI. They have assigned a key pair named 'mykey' and selected a subnet named 'mysubnet2'. The 'Auto-assign public IP' option is enabled. A summary panel on the right indicates 1 instance will be launched. A note about the free tier is visible.

The screenshot shows the AWS VPC Subnets settings page. The user is editing the subnet 'mysubnet2'. The subnet ID is 'subnet-039908bd812a32172'. Under 'Auto-assign IP settings', the 'Enable auto-assign public IPv4 address' checkbox is checked. In the 'Resource-based name (RBN) settings' section, the 'IP name' option is selected. The interface includes standard AWS navigation and status bars at the bottom.

Instances | EC2 | ap-south-1 | EC2 Instance Connect | ap-south-1 | VPC | ap-south-1 | Example routing options - Amazon VPC | Create VPC with CIDR | CHETAN @ 8459-5873-9988 | Asia Pacific (Mumbai)

aws Search [Alt+S]

VPC > Route tables > rtb-0277da48bba7a1ab3

You have successfully updated subnet associations for rtb-0277da48bba7a1ab3 / myroutetable.

VPC dashboard

- EC2 Global View
- Filter by VPC

Virtual private cloud

- Your VPCs
- Subnets
- Route tables**
- Internet gateways
- Egress-only Internet gateways
- DHCP option sets
- Elastic IPs
- Managed prefix lists
- NAT gateways
- Peering connections

Security

- Network ACLs
- Security groups

PrivateLink and Lattice

Getting started Updated

- CloudShell Feedback

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Subnet associations

Name	Subnet ID	IPv4 CIDR	IPv6 CIDR
mysubnet2	subnet-039908bd812a52172	10.0.0.64/26	-

Subnets without explicit associations

Name	Subnet ID	IPv4 CIDR	IPv6 CIDR
mysubnet1	subnet-0f60babf614e774cb	10.0.0.0/26	-
mysubnet3	subnet-0d214461af78ff9f7c	10.0.0.128/26	-

Instances | EC2 | ap-south-1 | EC2 Instance Connect | ap-south-1 | VPC | ap-south-1 | Example routing options - Amazon VPC | Create VPC with CIDR | CHETAN @ 8459-5873-9988 | Asia Pacific (Mumbai)

aws Search [Alt+S]

EC2 > Instances

Instances (1/1) Info

Last updated less than a minute ago

Connect Instance state Actions Launch instances

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IP
myinstance	i-02c5588a110698563	Running	t2.micro	2/2 checks passed	View alarms +	ap-south-1b	-

i-02c5588a110698563 (myinstance)

Details Status and alarms Monitoring Security Networking Storage Tags

Instance summary

Instance details

AMI ID	Monitoring disabled	Platform details
ami-0f918f7e67a3323f0	-	Linux/UNIX
AMI name	Allowed image	Termination protection
ubuntu/images/hvm-ssd-gp3/ubuntu-noble-24.04-amd	-	Disabled

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```

System load: 0.09      Processes: 105
Usage of /: 25.3% of 6.71GB  Users logged in: 0
Memory usage: 21%          IPV4 address for enx0: 10.0.0.117
Swap usage: 0%

Expanded Security Maintenance for Applications is not enabled.

0 updates can be applied immediately.

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

The list of available updates is more than a week old.
To check for new updates run: sudo apt update

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

ubuntu@ip-10-0-0-117:~$
```

i-02c5588a110698563 (myinstance)
Public IPs: 13.127.27.77 Private IPs: 10.0.0.117

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2. Test Cross-VPC EFS Access

- Create two VPCs (VPC-A and VPC-B) in the same region.
- Create an EFS in VPC-A with mount targets in multiple AZs.
- Launch EC2 instances in each VPC.
- Set up VPC peering between VPC-A and VPC-B.
- Update route tables and security groups to allow NFS traffic (port 2049).
- Mount EFS on both instances using the DNS name provided by EFS.

Deliverable: Document steps taken, connection challenges (e.g., DNS resolution, SG blocking), and how issues were resolved.

PeeringConnections | VPC Instance details | EC2 | ap-south-1 EC2 Instance Connect | ap-south-1 EC2 Instance Connect | ap-south-1 VPC | ap-south-1 Create VPC with CIDR

aws Search [Alt+S]

VPC > Peering connections > pcx-03651eec7279d7f01 > Edit DNS settings

Edit DNS settings info

Summary

Peering connection ID pcx-03651eec7279d7f01	Name mypeer	Requester VPC vpc-0e2fcad0098de093f	Acceptor VPC vpc-0ed38298a18d1a4fa
--	----------------	--	---------------------------------------

Edit DNS settings

The settings below control how your peered VPCs will work with DNS resolution.

Requester DNS resolution

If enabled, the DNS hostname of an instance in the requester VPC resolves to its private IP address when queried from instances in the accepter VPC.

Allow accepter VPC ([vpc-0ed38298a18d1a4fa / myvp2](#)) to resolve DNS of requester VPC ([vpc-0e2fcad0098de093f / myvp1](#)) hosts to private IP.

Acceptor DNS resolution

If enabled, the DNS hostname of an instance in the accepter VPC resolves to its private IP address when queried from instances in the requester VPC.

Allow requester VPC ([vpc-0e2fcad0098de093f / myvp1](#)) to resolve DNS of accepter VPC ([vpc-0ed38298a18d1a4fa / myvp2](#)) hosts to private IP.

To use DNS resolution over peering you must enable 'DNS Hostname' on the [VPCs involved in peering](#). [Learn more](#)

AWS Command Line Interface command

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

Instances | EC2 | ap-south-1 x EC2 Instance Connect | ap-south-1 x VPC | ap-south-1 x Example routing options - Amazon VPC x Create VPC with CIDR x +

ap-south-1.console.aws.amazon.com/vpcconsole/home/?region=ap-south-1#CreateSubnet:

Search [Alt+S]

VPC Subnets Create subnet

Subnet 1 of 1

Subnet name
Create a tag with a key of "Name" and a value that you specify.

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.

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.

IPv4 subnet CIDR block
 64 IPs
< > ^ v

Tags - optional

Key	Value - optional
<input type="text" value="Name"/> <input type="button" value="X"/>	<input type="text" value="mysub4"/> <input type="button" value="X"/> <input type="button" value="Remove"/>

Add new tag You can add 49 more tags. Remove

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The screenshot shows the 'Create route table' page in the AWS VPC console. In the 'Route table settings' section, there is a 'Name - optional' field containing 'myrt2'. Below it, a 'VPC' dropdown is set to 'vpc-0ed38298a18d1a4fa (myvpc2)'. In the 'Tags' section, a single tag 'Name: myrt2' is listed. At the bottom right are 'Cancel' and 'Create route table' buttons.

The screenshot shows the 'Attach to VPC (igw-019129417fb070c59)' page in the AWS VPC console. It displays a success message: 'The following internet gateway was created: igw-019129417fb070c59 - myinternet2. You can now attach to a VPC to enable the VPC to communicate with the internet.' Below this, there is a 'Available VPCs' section with a dropdown menu showing 'vpc-0ed38298a18d1a4fa'. At the bottom right are 'Cancel' and 'Attach internet gateway' buttons.

The screenshot shows the 'Edit routes' page for a VPC route table. There are two entries:

Destination	Target	Status	Propagated
10.1.0.0/24	local	Active	No
0.0.0.0/0	Internet Gateway	-	No

Buttons at the bottom include 'Add route', 'Cancel', 'Preview', and 'Save changes'.

The screenshot shows the 'Launch an instance' page. On the left, under 'Network settings', it shows:

- VPC - required: myvpc2 (10.1.0.0/24)
- Subnet: mysub4 (subnet-0b9fc831912879b7, VPC: vpc-0ed38298a18d1a4fa, Owner: 845958739988, Availability Zone: ap-south-1b, Zone type: Availability Zone, IP addresses available: 59, CIDR: 10.1.0.64/26)
- Auto-assign public IP: Enabled
- Firewall (security groups): A security group will be added to all network interfaces. Name: launch-wizard-2
- Description: launchwizard-2 created 2025-07-25T16:23:45.074Z

On the right, the 'Summary' section shows:

- Number of instances: 1
- Software Image (AMI): Canonical, Ubuntu, 24.04, amd64
- Virtual server type (instance type): t2.micro
- Firewall (security group): New security group
- Storage (volumes): 1 volume(s) - 8 GiB

A tooltip for the 'Free tier' is shown: 'Free tier: In your first year of opening an AWS account, you get 750 hours per month of t2.micro instance usage (or t3.micro where applicable)'.

Buttons at the bottom include 'Cancel', 'Launch instance', and 'Preview code'.

The screenshot shows the 'Edit inbound rules' step of a launch wizard for an EC2 instance. It lists three existing rules:

Security group rule ID	Type	Protocol	Port range	Source	Description - optional
sgr-0abd935d5b6737a7f	HTTP	TCP	80	Custom	0.0.0.0/0
sgr-0843e52e5e9c395b0	SSH	TCP	22	Custom	0.0.0.0/0
-	NFS	TCP	2049	Anyw...	0.0.0.0/0

A blue 'Add rule' button is at the bottom left. A warning message at the bottom states: '⚠ Rules with source of 0.0.0.0/0 or ::/0 allow all IP addresses to access your instance. We recommend setting security group rules to allow access from known IP addresses only.' Below the message are 'Cancel', 'Preview changes', and 'Save rules' buttons.

The screenshot shows the 'Create file system' step of an EFS wizard. The left sidebar shows 'File systems' and 'Access points'. The main form has the following fields:

- Name - optional:** myefs
- Virtual Private Cloud (VPC):** vpc-0e2fcad0098de093f (myvpc)
- Recommended settings:** Throughput mode: Elastic; Transition into Infrequent Access (IA): 30 day(s) since last access; Transition into Archive: 90 day(s) since last access.

At the bottom are 'Cancel', 'Customize', and a large orange 'Create file system' button.

The screenshot shows the AWS EFS console with the URL ap-south-1.console.aws.amazon.com/efs/home?region=ap-south-1#/file-systems. The left sidebar is titled 'Elastic File System' and includes links for 'File systems', 'Access points', 'AWS Backup', 'AWS DataSync', 'AWS Transfer', and 'Documentation'. The main area is titled 'File systems (1)' and displays a table with one row. The table columns are: Name, File system ID, Encrypted, Total size, Size in Standard, Size in IA, Size in Archive, and Provisioned Throughput (MiB/s). The single entry is 'myefs' with File system ID 'fs-02cb672113d0f72d2', Encrypted status checked, and all other values at 0.

The screenshot shows the AWS VPC Peering Connections console with the URL ap-south-1.console.aws.amazon.com/vpcconsole/home?region=ap-south-1#CreatePeeringConnection. The left sidebar is titled 'VPC' and includes links for 'Peering connections', 'Create peering connection', 'Associations', and 'Status'. The main area is titled 'Create peering connection' and has sections for 'VPC ID (Requester)', 'VPC CIDs for vpc-0e2fcad0098de093f (myvpc)', 'Select another VPC to peer with', 'Region', and 'VPC ID (Acceptor)'. In the 'VPC ID (Requester)' section, 'vpc-0e2fcad0098de093f (myvpc)' is selected. In the 'VPC CIDs for vpc-0e2fcad0098de093f (myvpc)' section, there is a table with one row: CIDR '10.0.0.0/24' and Status 'Associated'. In the 'VPC ID (Acceptor)' section, 'vpc-0ed38298a18d1a4fa (myvpc2)' is selected. In the 'VPC CIDs for vpc-0ed38298a18d1a4fa (myvpc2)' section, there is a table with one row: CIDR '10.1.0.0/24' and Status 'Associated'.

Screenshot of the AWS VPC Peering connections console showing a pending acceptance request.

Peering connection details:

- Requester owner ID:** 845958739988
- Peer connection ID:** pxc-03651eec7279d7f01
- Status:** Pending Acceptance by 845958739988
- Expiration time:** Friday 1 August 2025 at 22:13:58 GMT+5:30
- Requester VPC:** vpc-0e2fcad0098de093f / myvpc
- Requester CIDRs:** 10.0.0.0/24
- Requester Region:** Mumbai (ap-south-1)
- Acceptor owner ID:** 845958739988
- Acceptor VPC:** vpc-0ed38298a18d1a4fa / myvpc2
- Acceptor CIDRs:** -
- Acceptor Region:** Mumbai (ap-south-1)

DNS settings: Requester VPC (vpc-0e2fcad0098de093f / myvpc) Info

Screenshot of the AWS VPC Route tables console showing a route table with explicit subnet associations.

Route table details:

- Route table ID:** rtb-01cac842e82f8e1e7
- VPC:** vpc-0ed38298a18d1a4fa | myvpc2
- Main:** No
- Owner ID:** 845958739988

Explicit subnet associations:

Name	Subnet ID	IPv4 CIDR	IPv6 CIDR
mysub4	subnet-0bb9fc831912879b7	10.1.0.64/26	-

Subnets without explicit associations: (0)

The following subnets have not been explicitly associated with any route tables and are therefore associated with the main route table:

Name	Subnet ID	IPv4 CIDR	IPv6 CIDR
------	-----------	-----------	-----------

No subnets without explicit associations

All your subnets are associated with a route table.

The screenshot shows the AWS EC2 Instances Connect interface. The instance ID is i-081aca4d3ca0e4a77. A warning message states: "Instance is not in public subnet. Associated subnet subnet-0bb5fc831912879b7 (mysub4) is not a public subnet. To use EC2 Instance Connect, your instance must be in a public subnet. To make the subnet a public subnet, add a route in the subnet route table to an internet gateway." Below this, there are two connection options: "Connect using a Public IP" (selected) and "Connect using a Private IP". The "Public IP" option shows the address 15.207.110.192. The "Username" field is set to "ubuntu". A note at the bottom says: "Note: In most cases, the default username, ubuntu, is correct. However, read your AMI usage instructions to check if the AMI owner has changed the default AMI username." The browser status bar indicates it's 22:16 on 25-07-2025.

This screenshot is identical to the one above, except the instance is now in a public subnet. The warning message is no longer present. The "Connect using a Public IP" option is still selected, showing the address 15.207.110.192. The "Username" field remains set to "ubuntu". The note at the bottom is also present. The browser status bar indicates it's 22:16 on 25-07-2025.

VPC details

VPC ID: [vpc-0e2fcad0098de093f](#)
Name: myvpc

DHCP settings

DHCP option set: [Info](#)
dopt-054b8349af0580a30

DNS settings

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

Network Address Usage metrics settings

Enable Network Address Usage metrics [Info](#)

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VPC details

VPC ID: [vpc-0ed38298a18d1a4fa](#)
Name: myvpc2

DHCP settings

DHCP option set: [Info](#)
dopt-054b8349af0580a30

DNS settings

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

Network Address Usage metrics settings

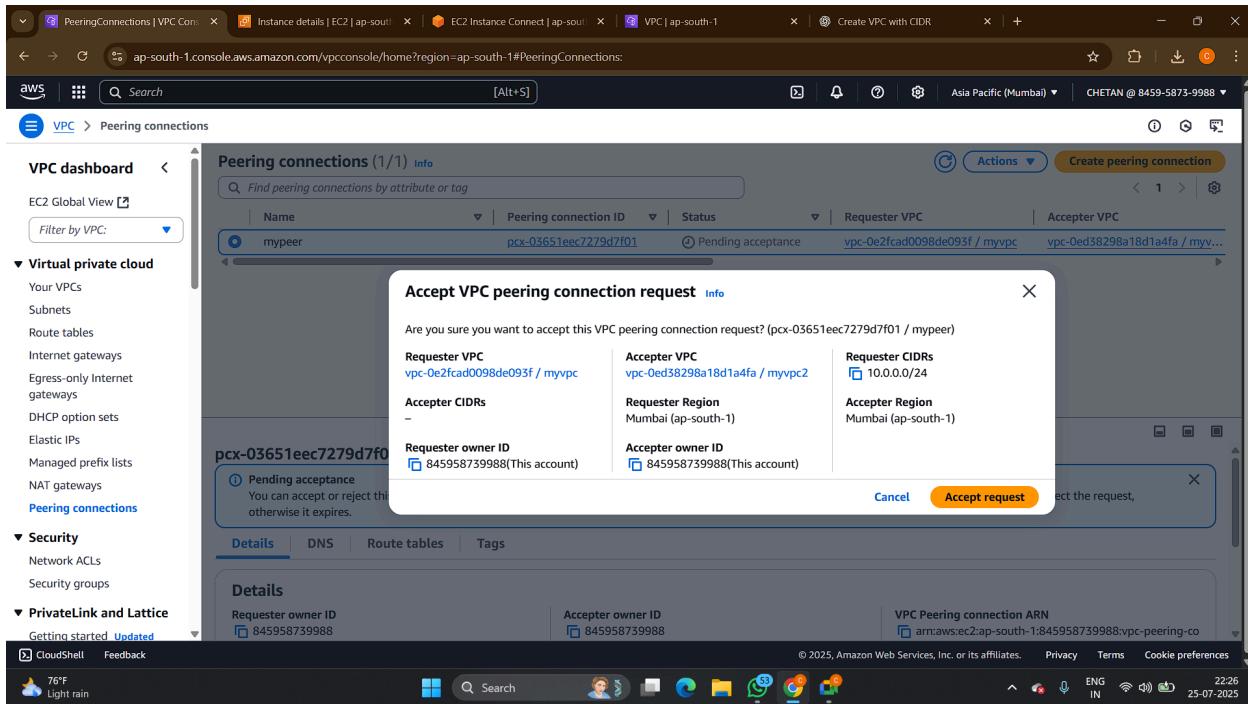
Enable Network Address Usage metrics [Info](#)

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3. Troubleshoot Load Balancer Issues

- Delete the default VPC.
- Attempt to create a Classic Load Balancer (fails, as Classic LB needs default VPC).
- Recreate the default VPC using AWS CLI or console option.
- Retry creating the Classic Load Balancer.

Deliverable: Write a brief report explaining the error encountered, why it happened, and how recreating the default VPC solved it.

Theoretical / Calculations

1. Subnetting Practice

A. Divide **192.168.100.0/24** into 4 equal subnets

- Each new subnet will be **/26** (64 IPs each).
- Subnet ranges:
 - **192.168.100.0/26**

- 192.168.100.64/26
- 192.168.100.128/26
- 192.168.100.192/26

B. Calculate usable IPs for a /28 subnet

- /28 = 16 IPs total
- Usable = 16 - 2 = 14 IPs

Deliverable: Submit handwritten work or IP calculator screenshots showing subnetting steps and usable IP calculation.

2. Security Group Rules for EFS

Inbound Rules

- Type: NFS
- Protocol: TCP
- Port: 2049
- Source: CIDR block of peer VPC or specific EC2 SG

Outbound Rules

- Allow all traffic (default) or at least:
 - Protocol: TCP
 - Port: 2049
 - Destination: EC2 SG or IP range in other VPC

Deliverable: Share the JSON or screenshot of SG rule configuration.