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Placement Empowerment Program

Cloud Computing and DevOps Centre

Set Up a Private Network in the Cloud Create a Virtual Private Cloud (VPC) with subnets for your instances. Configure routing for internal communication between subnets.

Name: Jeffersen Godfrey A M

Department: CSE

INTRODUCTION:

In modern cloud computing, securing network infrastructure is crucial for businesses and organizations. AWS Virtual Private Cloud (VPC) allows users to create a logically isolated network within the AWS cloud, enabling them to define and control their network environment. This document outlines a step-by-step approach to setting up a private network in AWS using a VPC with subnets and internal routing.

OVERVIEW:

A Virtual Private Cloud (VPC) is a dedicated cloud network that allows users to launch AWS resources in an isolated and controlled environment. This setup includes:

- Creating a VPC with a specific CIDR block.
- Configuring public and private subnets.
- Setting up route tables to enable internal communication.
- Implementing security groups to restrict traffic.
- Deploying EC2 instances to test connectivity.

OBJECTIVE:

The primary objective of this task is to establish a private network in AWS that allows secure internal communication between instances while restricting internet access to certain subnets. The key goals include:

- Creating a VPC with subnets.
- Configuring routing and network access controls.
- Deploying and verifying EC2 instance connectivity.

IMPORTANCE OF AWS CLI IN CLOUD NETWORKING:

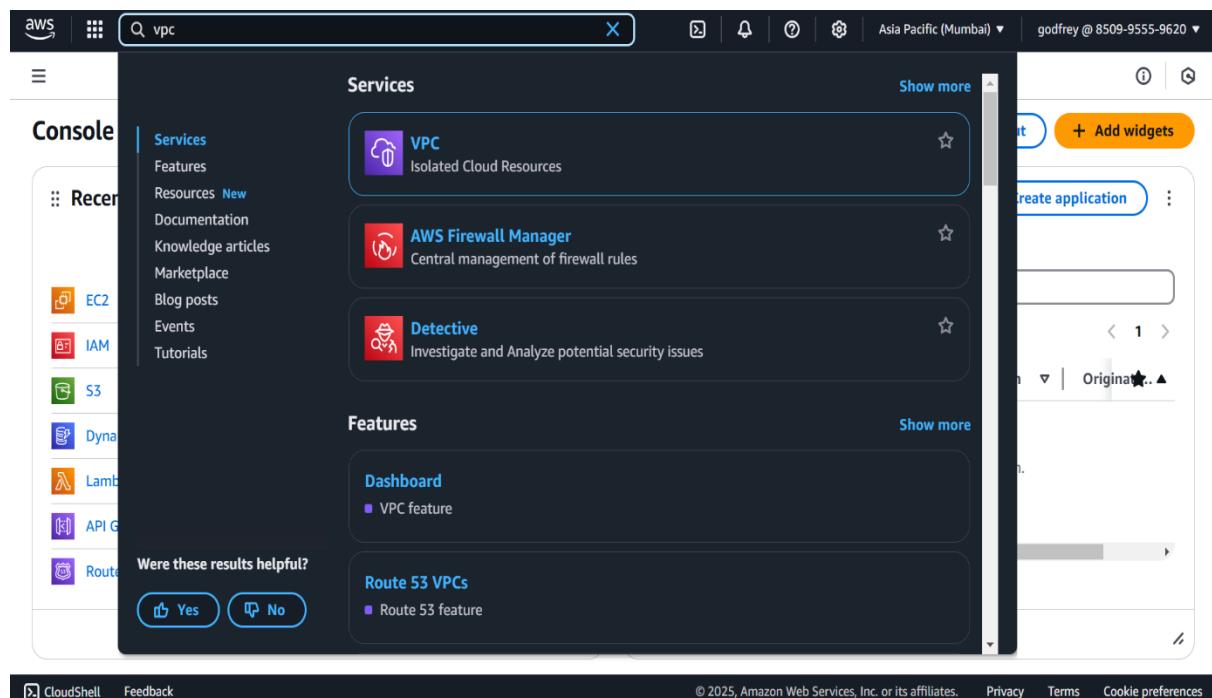
AWS CLI (Command Line Interface) plays a crucial role in automating and managing cloud resources efficiently. Some benefits include:

- **Speed and Automation:** Enables quick setup of VPCs, subnets, and other resources.
- **Scripting Capabilities:** Allows the execution of scripts to create and configure networks.
- **Remote Management:** Helps manage cloud resources without needing a graphical interface.

- **Cost Efficiency:** Reduces human errors and improves operational efficiency

STEP-BY-STEP PROCEDURE:

Step 1: Login to AWS console and create a virtual private cloud.



VPC dashboard

Create VPC **Launch EC2 Instances**

Note: Your Instances will launch in the Asia Pacific region.

Resources by Region

You are using the following Amazon VPC resources

| | | | |
|-----------------------------------|----------------|---|-----------------|
| VPCs | Asia Pacific 1 | NAT Gateways | Asia Pacific 0 |
| Subnets | Asia Pacific 3 | VPC Peering Connections | Asia Pacific 0 |
| Route Tables | Asia Pacific 1 | Network ACLs | Asia Pacific 1 |
| Internet Gateways | Asia Pacific 1 | Security Groups | Asia Pacific 29 |

Service Health

[View complete service health details](#)

Settings

[Block Public Access](#)

[Zones](#)

[Console Experiments](#)

Additional Information

[VPC Documentation](#)

[All VPC Resources](#)

[Forums](#)

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VPC > [Your VPCs](#) > Create VPC

Create VPC Info

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

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

IPv4 CIDR block [Info](#)

IPv4 CIDR manual input IPAM-allocated IPv4 CIDR block

IPv4 CIDR

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

IPv6 CIDR block [Info](#)

IPv6 CIDR manual input IPAM-allocated IPv6 CIDR block

CloudShell [Feedback](#)

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VPC dashboard

Actions

Details [Info](#)

| | | | |
|---|---|---|---|
| VPC ID vpc-0b4329a83cadd844e | State Available | Block Public Access Off | DNS hostnames Disabled |
| DNS resolution Enabled | Tenancy default | DHCP option set dopt-023619f75753173c6 | Main route table rtb-00f77b642565d005d |
| Main network ACL acl-00bf34a39882a33a3 | 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 850995559620 |

Resource map [Info](#)

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Step 2: Create public and private subnet.

Go to subnet and click create subnet.

The screenshot shows the AWS VPC Create Subnet interface. At the top, there's a navigation bar with the AWS logo, a search bar, and various icons. Below it, the breadcrumb navigation shows 'VPC > Subnets > Create subnet'. The main form is titled 'Create subnet' with an 'Info' link. It has two sections: 'VPC' and 'Subnet settings'. The 'VPC' section includes fields for 'VPC ID' (set to 'vpc-0b4329a83cadd844e (my-sewey)') and 'Associated VPC CIDRs' (set to '10.0.0.0/16'). The 'Subnet settings' section is expanded, showing 'Subnet 1 of 1'. Under 'Subnet name', there's a placeholder 'Create a tag with a key of 'Name' and a value that you specify.' At the bottom of the page, there are links for 'CloudShell', 'Feedback', and 'Cookie preferences', along with copyright information: '© 2025, Amazon Web Services, Inc. or its affiliates.' and links for 'Privacy', 'Terms', and 'Cookie preferences'.

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
10.0.0.0/20 4,096 IPs
< > ^ v

Tags - optional

| Key | Value - optional |
|------|------------------|
| Name | let_go03 |

Add new tag Remove You can add 49 more tags.

Add new subnet

Cancel Create subnet

You have successfully created 2 subnets: subnet-050a077de11355e3f, subnet-075894cd5818cdc08

Subnets (2) [Info](#) Last updated less than a minute ago

| Name | Subnet ID | State | VPC |
|------|--|-----------|--|
| sub1 | subnet-050a077de11355e3f | Available | vpc-0b4329a83cadd844e my-... |
| sub2 | subnet-075894cd5818cdc08 | Available | vpc-0b4329a83cadd844e my-... |

Select a subnet

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Step 3: Configure route tables

Navigate to **route tables** and click **create route tables**.

The screenshot shows the AWS VPC dashboard. On the left, there's a sidebar with navigation links like 'Your VPCs', 'Subnets', 'Route tables', 'Internet gateways', etc. The main area is titled 'Route tables (1) Info' and shows a single route table named 'rtb-0c1fc6fe0dbdd0e0f'. The table has columns for Name, Route table ID, Explicit subnet associations, Edge associations, and Main. A status bar at the top right indicates it was last updated 27 minutes ago.

This screenshot shows the 'Edit subnet associations' page for the route table 'rtb-0c3772d7ee2841ee0'. The title is 'Edit subnet associations' and it says 'Change which subnets are associated with this route table.' Below is a table titled 'Available subnets (2/2)' with two entries: 'sub1' and 'sub2'. Both are selected and have their details shown: 'subnet-050a077de11355e3f' with CIDR '10.0.1.0/24' and 'subnet-075894cd5818cdc08' with CIDR '10.0.2.0/24'. These are mapped to the 'Main' route table ID. At the bottom, there's a 'Selected subnets' section containing the same two subnet entries with 'X' icons to remove them. There are 'Cancel' and 'Save associations' buttons at the bottom right.

A screenshot of the AWS CloudShell interface, showing a terminal window with a command prompt and some output text.

Step 4: Configure security groups

You have successfully updated subnet associations for rtb-0c3772d7ee2841ee0 / my-route07.

rtb-0c3772d7ee2841ee0 / my-route07

Details **Info**

| | | | |
|--|--------------------------|---|------------------------|
| Route table ID rtb-0c3772d7ee2841ee0 | Main No | Explicit subnet associations 2 subnets | Edge associations - |
| VPC vpc-0b4329a83cadd844e my-sweyey | Owner ID 850995559620 | | |

Routes **Subnet associations** **Edge associations** **Route propagation** **Tags**

Routes (1)

| Destination | Target | Status | Propagated |
|-------------|--------|--------|------------|
| 10.0.0.0/16 | local | Active | No |

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Step 5: Launch EC2 instances

Go to EC2 instance, click create instance

Services

- EC2** Virtual Servers in the Cloud
- EC2 Image Builder** A managed service to automate build, customize and deploy OS images
- EC2 Global View** EC2 Global View provides a global dashboard and search functionality that lets you ...

Features

- Dashboard** EC2 feature

Were these results helpful?

Yes No

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The screenshot shows the AWS EC2 Instances page. The left sidebar shows navigation options like Dashboard, EC2 Global View, Events, Instances, Launch Templates, Spot Requests, Savings Plans, Reserved Instances, Dedicated Hosts, Capacity Reservations, Images, AMIs, and AMI Catalog. The main content area displays the 'Instance summary for i-0c838020364bbeae8 (jeff078)'. The instance is listed as 'Running' in a 't2.micro' instance type. It has a private IP address of 10.0.1.159 and a private DNS name of ip-10-0-1-159.ap-south-1.compute.internal. The VPC ID is vpc-0b4329a83cadd844e. The instance is in a private subnet.

Step 6: Test internal communication

```
ssh -i your-key.pem ec2-user@PRIVATE_INSTANCE_IP
```

EXPECTED OUTCOME:

After completing these steps, you will achieve:

- 1) A secure VPC setup with private and public subnets.
- 2) Internal communication between instances in a controlled environment.
- 3) A strong understanding of AWS networking principles.
- 4) A private subnet isolated from internet access.