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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.

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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 stepby-step approach to setting up a private network in AWS using a VPC with subnets and internal routing.

overvlew:

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:

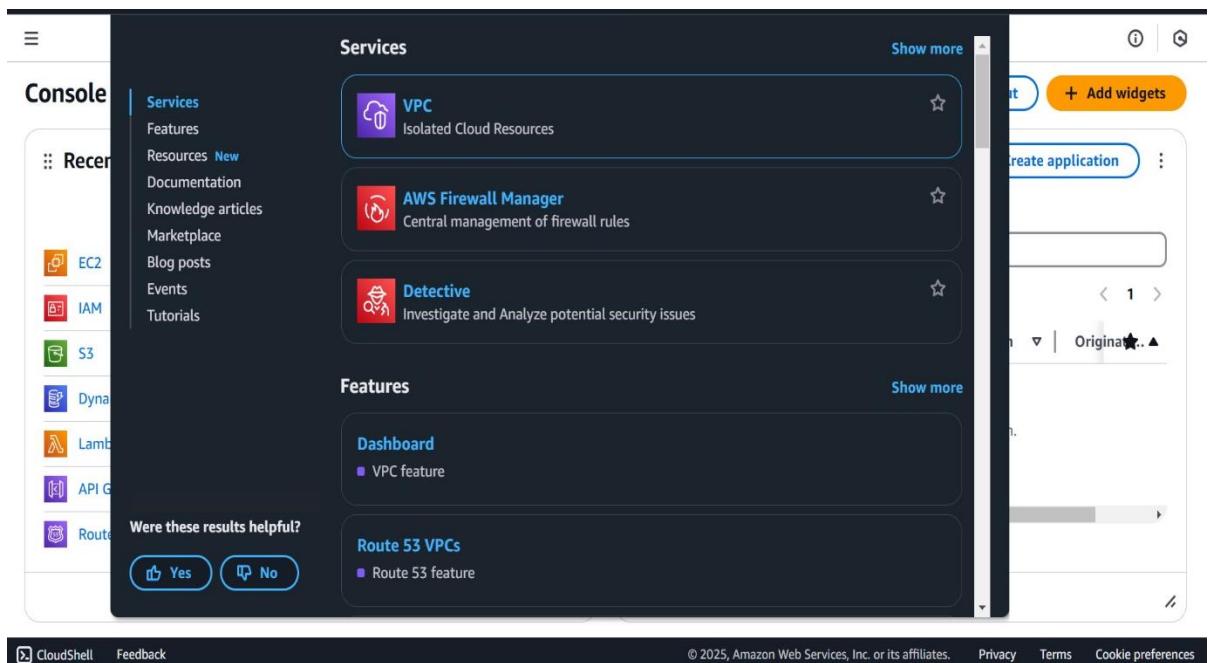
AWS CLI (Command Line Interface) plays a crucial role in automating and managing cloud resources efficiently. Some benefits include:

- **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

Service Health

Settings

Additional Information

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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.

my-sewhey

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

CloudShell Feedback

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[VPC](#) > [Your VPCs](#) > [vpc-0b4329a83cadd844e](#)

You successfully created vpc-0b4329a83cadd844e / my-sewhey

vpc-0b4329a83cadd844e / my-sewhey

[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-0bf34a39882a33a3

Default VPC

No

IPv4 CIDR

10.0.0.0/16

IPv6 CIDR (Network border group)

-

Network Address Usage metrics

Disabled

Route 53 Resolver DNS Firewall rule groups

-

Resource map Info

CIDRs

Flow logs

Tags

Integrations

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 'Create subnet' wizard in the AWS VPC console. The top navigation bar includes 'VPC > Subnets > Create subnet'. The main form has two sections: 'VPC' and 'Subnet settings'. In the 'VPC' section, the 'VPC ID' dropdown is set to 'vpc-0b4329a83cadd844e (my-sewey)'. Under 'Associated VPC CIDRs', the 'IPv4 CIDRs' field contains '10.0.0.0/16'. The 'Subnet settings' section is titled 'Specify the CIDR blocks and Availability Zone for the subnet.' It shows 'Subnet 1 of 1' with a 'Subnet name' field containing 'Create a tag with a key of 'Name' and a value that you specify.' At the bottom, there are links for 'CloudShell', 'Feedback', and copyright information: '© 2025, Amazon Web Services, Inc. or its affiliates.', 'Privacy', 'Terms', and 'Cookie preferences'.

VPC > Subnets > Create subnet

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_goo3

Add new tag
You can add 49 more tags.
Remove

Add new subnet

Cancel **Create subnet**

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VPC dashboard

Subnets (2) [Info](#) Last updated less than a minute ago Actions **Create subnet**

Subnet ID	Name	State	VPC
subnet-050a077de11355e3f	sub1	Available	vpc-0b4329a83cadd844e my...
subnet-075894cd5818cdc08	sub2	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' (which is selected), 'Internet gateways', 'Egress-only Internet gateways', 'DHCP option sets', 'Elastic IPs', 'Managed prefix lists', 'NAT gateways', and 'Peering connections'. Below that is a 'Security' section with 'Network ACLs'. At the bottom of the sidebar are 'CloudShell' and 'Feedback' buttons. The main content area is titled 'Route tables (1) Info' and shows a table with one row. The table columns are 'Name', 'Route table ID', 'Explicit subnet assoc...', 'Edge associations', and 'Main'. The single row contains 'rtb-0c1fc6fe0dbdd0e0f', 'rtb-0c1fc6fe0dbdd0e0f', '-', '-', and 'Yes'. There are 'Actions' and 'Create route table' buttons at the top right. A 'Select a route table' dialog box is open below the table.

The screenshot shows the 'Edit subnet associations' page. The URL is [VPC > Route tables > rtb-0c3772d7ee2841ee0 > Edit subnet associations](#). The title is 'Edit subnet associations'. It says 'Change which subnets are associated with this route table.' Below is a table titled 'Available subnets (2/2)' with two rows: 'sub1' and 'sub2'. The 'Selected subnets' section shows 'subnet-050a077de11355e3f / sub1' and 'subnet-075894cd5818cdc08 / sub2'. At the bottom are 'Cancel' and 'Save associations' buttons.

Step 4: Configure security groups

The screenshot shows the AWS VPC Route Tables page. At the top, a green success message says "You have successfully updated subnet associations for rtb-0c3772d7ee2841ee0 / my-route07." Below this, the title is "rtb-0c3772d7ee2841ee0 / my-route07". The "Details" section shows the Route table ID (rtb-0c3772d7ee2841ee0), Main status (No), Owner ID (vpc-0b4329a83cadd844e | my-sewey), and Explicit subnet associations (2 subnets). The "Routes" tab is selected, showing one route: Destination 10.0.0.0/16, Target local, Status Active, and Propagated No. The bottom of the page includes standard AWS footer links.

Step 5: Launch EC2 instances

Go to **EC2 instance**, click **create instance**

The screenshot shows the AWS Services page. The "Services" section is open, displaying the EC2 service (Virtual Servers in the Cloud) as the top feature. Other services listed include EC2 Image Builder (A managed service to automate build, customize and deploy OS images) and EC2 Global View (EC2 Global View provides a global dashboard and search functionality that lets you ...). The "Features" section shows the Dashboard (an EC2 feature) and AMIs. A "Were these results helpful?" poll is present at the bottom left. The bottom of the page includes standard AWS footer links.

The screenshot shows the AWS EC2 Instances page with the instance summary for i-0c838020364bbeae8. Key details include:

- Instance ID:** i-0c838020364bbeae8
- Public IPv4 address:** -
- Private IPv4 addresses:** 10.0.1.159
- Instance state:** Running
- Private IP DNS name (IPv4 only):** ip-10-0-1-159.ap-south-1.compute.internal
- Instance type:** t2.micro
- VPC ID:** vpc-0b4329a83cadd844e (my-sewey)
- Elastic IP addresses:** -
- AWS Compute Optimizer finding:** Opt-in to AWS Compute Optimizer for recommendations.

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.