



St. JOSEPH'S
GROUP OF INSTITUTIONS
OMR, CHENNAI - 119



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:

A Virtual Private Cloud (VPC) is a logically isolated network within a public cloud that allows users to define and control a virtual networking environment. It provides the flexibility to create and manage private networks while still leveraging cloud computing resources.

IMPORTANCE:

- Isolation & Security - A VPC provides network isolation from other cloud users.
- Subnetting - Users can divide the VPC into multiple subnets to organize resources efficiently.
- Customizable IP Addressing - Users define their own IP address ranges using CIDR (Classless Inter-Domain Routing) notation.
- Internet Gateway & NAT Gateway - Internet Gateway (IGW) enables internet access for public subnets.

STEP BY STEP OVERVIEW:

Step 1: CREATE VPC

- Login into your AWS console and navigate to VPC dashboard and create your own VPC.
- Specify the name tag, IPv4 CIDR block (10.0.0.0/16), IPv6 CIDR (optional)
- Then click create.

The screenshot displays the AWS VPC console interface. At the top, a green notification bar states: "You successfully created vpc-08b45a9670bdd87aa / vpc-1". The breadcrumb navigation shows "VPC > Your VPCs > vpc-08b45a9670bdd87aa". The left sidebar contains navigation links for "Virtual private cloud" (Your VPCs, Subnets, Route tables, Internet gateways, Egress-only Internet gateways, Carrier gateways, DHCP option sets, Elastic IPs, Managed prefix lists, NAT gateways, Peering connections) and "Security" (Network ACLs, Security groups). The main content area is titled "vpc-08b45a9670bdd87aa / vpc-1" and includes a "Details" tab. The details section shows the VPC ID (vpc-08b45a9670bdd87aa), State (Available), DNS resolution (Enabled), Main network ACL (acl-085269597ec558fb2), and IPv6 CIDR (Network border group). Below this, there are tabs for "Resource map", "CIDRs", "Flow logs", "Tags", and "Integrations". The "Resource map" tab is active, showing a summary of the VPC resources: "VPC" (Your AWS virtual network), "Subnets (0)" (Subnets within this VPC), "Route tables (1)" (Route network traffic to resources), and "Network" (Connectivity). The bottom of the console shows the footer with copyright information and links for Privacy, Terms, and Cookie preferences.

Step 2: CREATE SUBNETS

- Click on create subnets and select the VPC you have just created.
- Create two subnets and specify the CIDR for both subnets 10.0.1.0/24 and 10.0.2.0/24 respectively.
- Give two different availability zone.

aws

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United States (N. Virginia)

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VPC

Subnets

Create subnet

1

Create subnet

Info

VPC

VPC ID

Create subnets in this VPC.

vpc-08b45a9670bdd87aa (vpc-1)

Associated VPC CIDRs

IPv4 CIDRs

10.0.0.0/16

Subnet settings

Specify the CIDR blocks and Availability Zone for the subnet.

Subnet 1 of 2

Subnet name

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

subnet-1

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.

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VPC

Subnets

Create subnet

1

Subnet 2 of 2

Subnet name

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

subnet-2

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.

US East (N. Virginia) / us-east-1b

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

10.0.2.0/24

256 IPs

< > ^ v

Tags - optional

Key

Value - optional

Q Name X

Q subnet-2 X

Remove

Add new tag

You can add 49 more tags.

Remove

CloudShell

Feedback

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VPC dashboard < EC2 Global View [?] Filter by VPC: Virtual private cloud

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

Subnets (2) Info Find resources by attribute or tag Subnet ID: subnet-0b2f5085e17c983db Subnet ID: subnet-0ca2308db1425f988 Clear filters

Last updated less than a minute ago Actions Create subnet

<input type="checkbox"/>	Name	Subnet ID	State	VPC	Block Public...	IPv4 CIDR
<input type="checkbox"/>	subnet-1	subnet-0b2f5085e17c983db	Available	vpc-08b45a9670bdd87aa vpc-1	Off	10.0.1.0/24
<input type="checkbox"/>	subnet-2	subnet-0ca2308db1425f988	Available	vpc-08b45a9670bdd87aa vpc-1	Off	10.0.2.0/24

Select a subnet

Step 3: CREATE ROUTE TABLE

- Go to route table- click on 'create route table'.
- Specify the name and select your VPC.
- Click create.

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VPC dashboard < EC2 Global View [?] Filter by VPC: Virtual private cloud

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

Route table rtb-0b25cf1fbacebbb07 sample was created successfully. Actions

rtb-0b25cf1fbacebbb07 / sample

Details info Route table ID: rtb-0b25cf1fbacebbb07 VPC: vpc-08b45a9670bdd87aa | vpc-1 Main: No Owner ID: 941377153200 Explicit subnet associations: Edge associations:

Routes (1) Filter routes Both Edit routes

Destination	Target	Status	Propagated
10.0.0.0/16	local	Active	No

Step 4: ASSOCIATE THE SUBNETS

- Edit the association by selecting both the subnets and save it.

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VPC dashboard < EC2 Global View [?] Filter by VPC: Virtual private cloud

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

Route table rtb-0b25cf1fbacebbb07 Edit subnet associations

Edit subnet associations Change which subnets are associated with this route table.

Available subnets (2/2) Filter subnet associations

<input checked="" type="checkbox"/>	Name	Subnet ID	IPv4 CIDR	IPv6 CIDR	Route table ID
<input checked="" type="checkbox"/>	subnet-1	subnet-0b2f5085e17c983db	10.0.1.0/24	-	Main (rtb-0b65ad6e1189c8d05)
<input checked="" type="checkbox"/>	subnet-2	subnet-0ca2308db1425f988	10.0.2.0/24	-	Main (rtb-0b65ad6e1189c8d05)

Selected subnets subnet-0b2f5085e17c983db / subnet-1 subnet-0ca2308db1425f988 / subnet-2 Cancel Save associations

- The default route will be automatically added.

rtb-0b25cf1fbacebbb07 / sample

Details

Route table ID rtb-0b25cf1fbacebbb07	Main No	Explicit subnet associations 2 subnets	Edge associations -
VPC vpc-08b45a9670bdd87aa vpc-1	Owner ID 941377153200		

Routes (1)

Destination	Target	Status	Propagated
10.0.0.0/16	local	Active	No

Step 4: LAUNCH EC2 INSTANCE

- Go to the EC2 dashboard and launch an EC2 instance by specifying the instance name, AMI and Instance Type.
- Under the 'network settings', select your VPC and select any subnet. Disable the auto==assign Public IP.

Network settings

VPC - required
vpc-08b45a9670bdd87aa (vpc-1)
10.0.0.0/16

Subnet
subnet-0b2f5085e17c983db
VPC: vpc-08b45a9670bdd87aa | Owner: 941377153200 | Availability Zone: us-east-1a | Zone type: Availability Zone | IP addresses available: 251 | CIDR: 10.0.1.0/24

Auto-assign public IP
Disable

Firewall (security groups)
Create security group (selected) | Select existing security group

Security group name - required
launch-wizard-9

Description - required
launch-wizard-9 created 2025-02-07T03:58:28.990Z

Summary

Number of instances
1

Software Image (AMI)
Amazon Linux 2023 AMI 2023.6.2...read more
ami-085ad6ae776d8f09c

Virtual server type (instance type)
t2.micro

Firewall (security group)
New security group

Storage (volumes)
1 volume(s) - 8 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 IP use.

Launch instance | **Preview code**

- To enable the internal communication, use security groups to allow inbound traffic only from internal sources.

Inbound Security Group Rules

▼ Security group rule 1 (TCP, 22, 0.0.0.0/0)

Remove

Type | Info

ssh ▼

Protocol | Info

TCP

Port range | Info

22

Source type | Info

Anywhere ▼

Source | Info

Q Add CIDR, prefix list or security group

0.0.0.0/0 X

Description - optional | Info

e.g. SSH for admin desktop

Add security group rule

► Advanced network configuration

Now, your private network is set up and the instance inside can communicate secretly.

CONCLUSION:

By completing this PoC, you will have an idea about:

- Setting up a private network.
- Creating a VPC that is isolated from other networks.
- Creating one or more subnets and with atleast one public subnet that communicate with the Internet.
- Setting up proper routing for the internal communication between the subnets.