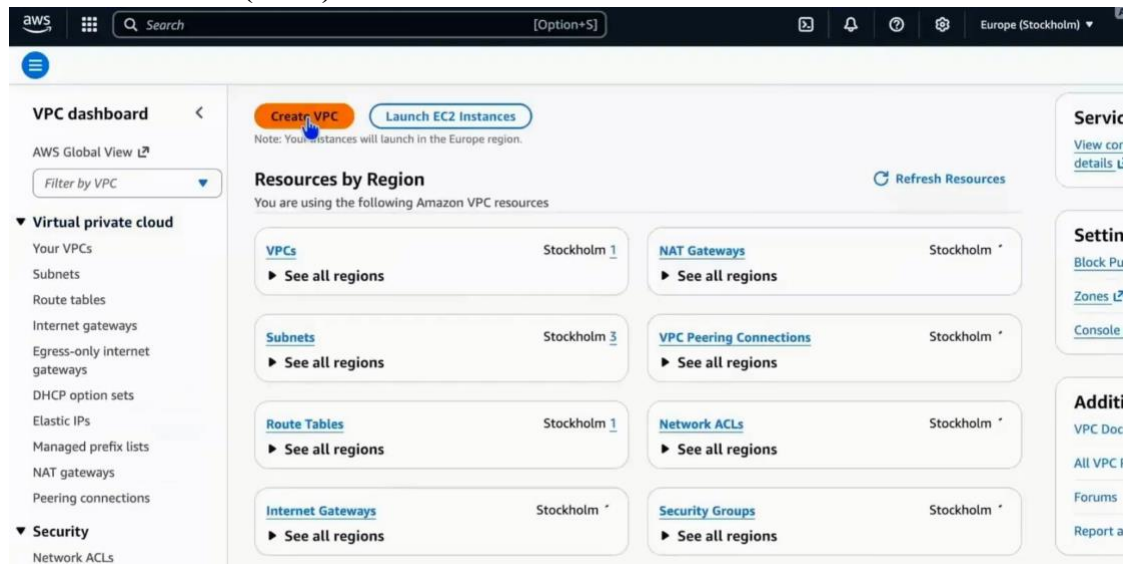


Designing and Configuring a Virtual LAN with Public and Private Subnets using AWS

Objective

The objective of this project is to design and configure a Virtual Private Cloud (VPC) in AWS with both public and private subnets. This setup ensures secure communication between instances and demonstrates subnet connectivity, isolation, and internet accessibility for the public subnet.

VPC Dashboard (Start)



Open the VPC Dashboard to begin creating the VPC.

Create VPC (VPC and more)

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 auto-generation [Info](#)
Enter a value for the Name tag. This value will be used to auto-generate Name tags for all resources in the VPC.

☒ Auto-generate
my

IPv4 CIDR block [Info](#)
Determine the starting IP and the size of your VPC using CIDR notation.

10.0.0.0/16 65,536 IPs
CIDR block size must be between /16 and /28.

IPv6 CIDR block [Info](#)
☒ No IPv6 CIDR block
☐ Amazon-provided IPv6 CIDR block

Tenancy [Info](#)
Default

Preview

VPC [Show details](#)
Your AWS virtual network

my-vpc

Subnets (4)
Subnets within this VPC

eu-north-1a

- my-subnet-public1-eu-north-1a
- my-subnet-private1-eu-north-1a

eu-north-1b

- my-subnet-public2-eu-north-1b
- my-subnet-private2-eu-north-1b

Choose 'VPC and more' to let AWS create subnets and routing automatically.

VPC CIDR and Name Tag

Tenancy [Info](#)
Default

Number of Availability Zones (AZs) [Info](#)
Choose the number of AZs in which to provision subnets. We recommend at least two AZs for high availability.

1 | 2 | 3

► **Customize AZs**

Number of public subnets [Info](#)
The number of public subnets to add to your VPC. Use public subnets for web applications that need to be publicly accessible over the internet.

0 | 1

Number of private subnets [Info](#)
The number of private subnets to add to your VPC. Use private subnets to secure backend resources that don't need public access.

0 | 1 | 2

► **Customize subnets CIDR blocks**

NAT gateways (\$) [Info](#)
Choose the number of Availability Zones (AZs) in which to create NAT gateways. Note that there is a charge for each NAT gateway

None | In 1 AZ | 1 per AZ

Preview

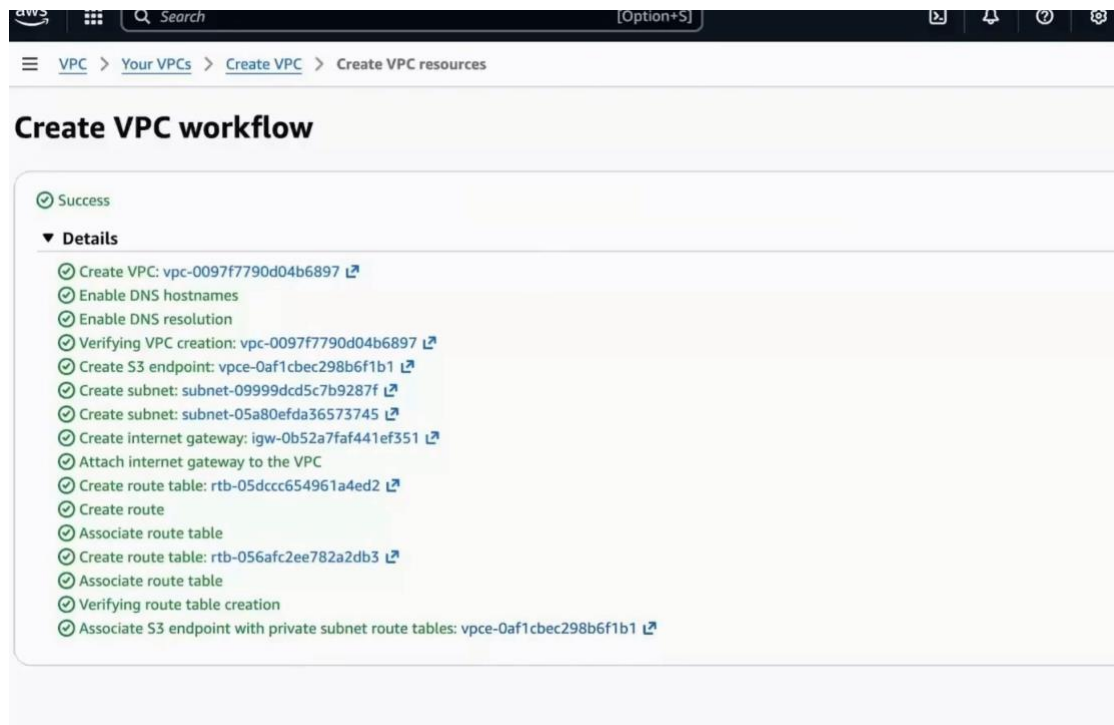
VPC [Show details](#)
Your AWS virtual network

my-vpc

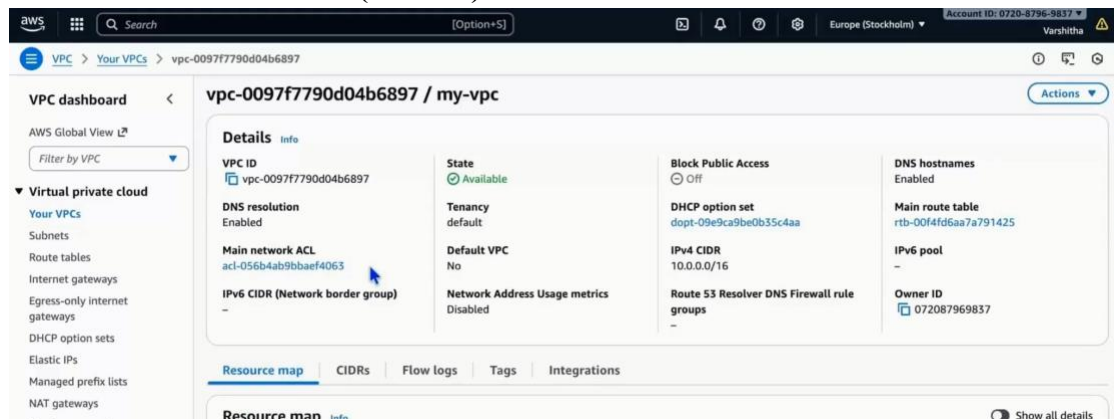
Set the VPC name and IPv4 CIDR block (e.g., 10.0.0.0/16).

Choose AZs and Subnet Counts

Select number of availability zones and number of public/private subnets.



VPC Creation Workflow (Success)



VPC Details (my-vpc)

Verify VPC details: VPC ID, DNS, CIDR and route table references.

Subnets List

The screenshot shows the AWS VPC console interface. On the left, the 'VPC dashboard' sidebar is visible with a search bar and a list of VPC resources. The 'Subnets' resource is selected. The main panel displays a table of subnets under the heading 'Subnets (5)'. The table has columns for Name, Subnet ID, State, VPC, Block Public..., and IP. Five subnets are listed, all with a state of 'Available'. Below the table, there is a 'Select a subnet' button.

Name	Subnet ID	State	VPC	Block Public...	IP
-	subnet-00f59e1219002f218	Available	vpc-04c424b1e61df21cc	Off	1'
my-subnet-public1-eu-north-1a	subnet-09999dcd5c7b9287f	Available	vpc-0097f7790d04b6897 my-...	Off	10
-	subnet-06746047d13fef1be	Available	vpc-04c424b1e61df21cc	Off	1'
my-subnet-private1-eu-north-1a	subnet-05a80efda36573745	Available	vpc-0097f7790d04b6897 my-...	Off	10
-	subnet-024ccca5cb89134a	Available	vpc-04c424b1e61df21cc	Off	1'

View the created subnets: public and private subnets listed under the VPC.

Internet Gateways (Attached)

The screenshot shows the AWS VPC console interface. On the left, the 'VPC dashboard' sidebar is visible with a search bar and a list of VPC resources. The 'Internet gateways' resource is selected. The main panel displays a table of internet gateways under the heading 'Internet gateways (2)'. The table has columns for Name, Internet gateway ID, State, VPC ID, and Owner. Two internet gateways are listed, both with a state of 'Attached'. Below the table, there is a 'Select an internet gateway above' button.

Name	Internet gateway ID	State	VPC ID	Owner
-	igw-005386f7b42c8bba1	Attached	vpc-04c424b1e61df21cc	0720879f
my-igw	igw-0b52a7faf441ef351	Attached	vpc-0097f7790d04b6897 my-vpc	0720879f

Confirm the Internet Gateway is created and attached to the VPC.

Route Tables

The screenshot shows the AWS VPC console's 'Route tables' page. On the left, the 'VPC dashboard' sidebar is visible with a 'Filter by VPC' dropdown and a list of VPC resources including 'Virtual private cloud', 'Your VPCs', 'Subnets', 'Route tables' (selected), 'Internet gateways', 'Egress-only internet gateways', 'DHCP option sets', 'Elastic IPs', 'Managed prefix lists', 'NAT gateways', and 'Peering connections'. The main content area is titled 'Route tables (4) Info' and includes a search bar 'Find route tables by attribute or tag'. Below the search bar is a table with the following columns: 'Name', 'Route table ID', 'Explicit subnet associ...', and 'Edge association'. The table lists four route tables: 'my-rtb-private1-eu-north-1a' (ID: rtb-056afc2ee782a2db3, associated with subnet-05a80efda36573...), an unnamed private route table (ID: rtb-0e2bce5cf8638bfc1), another unnamed private route table (ID: rtb-00f4fd6aa7a791425), and 'my-rtb-public' (ID: rtb-05dccc654961a4ed2, associated with subnet-09999dcd5c7b92...). Below the table is a 'Select a route table' section.

Name	Route table ID	Explicit subnet associ...	Edge association
<input type="checkbox"/> my-rtb-private1-eu-north-1a	rtb-056afc2ee782a2db3	subnet-05a80efda36573...	-
<input type="checkbox"/> -	rtb-0e2bce5cf8638bfc1	-	-
<input type="checkbox"/> -	rtb-00f4fd6aa7a791425	-	-
<input type="checkbox"/> my-rtb-public	rtb-05dccc654961a4ed2	subnet-09999dcd5c7b92...	-

Check public and private route tables and their subnet associations.

Launch EC2

The screenshot shows the 'Launch an instance' page in the AWS Management Console. The breadcrumb navigation is 'EC2 > Instances > Launch an instance'. The 'Name and tags' section has a text input for 'Name' containing 'VPC-Ec2' and a link to 'Add additional tags'. The 'Application and OS Images (Amazon Machine Image) Info' section includes a search bar 'Search our full catalog including 1000s of application and OS images'. Below the search bar are tabs for 'Recents' and 'Quick Start'. The 'Quick Start' tab is active, showing a carousel of AMI cards for 'Amazon Linux', 'macOS', 'Ubuntu', 'Windows', 'Red Hat', 'SUSE Linux', and 'Debian'. A hand cursor is hovering over the 'macOS' card. To the right of the carousel is a 'Browse more AMIs' link. Below the carousel, the 'Amazon Machine Image (AMI)' section displays details for the 'Amazon Linux 2023 kernel-6.1 AMI', including the AMI ID 'ami-0c7d68785ec07306c', architecture 'x86_64', and virtualization type 'hvm'. A 'Free tier eligible' badge is also present. On the right side of the page, a 'Summary' sidebar shows 'Number of instances' as '1' and lists configuration options for 'Software Image', 'Virtual server type', 'Firewall', and 'Storage'.

▼ Network settings Info

VPC - required Info

vpc-0097f7790d04b6897 (my-vpc)
10.0.0.0/16

Subnet Info

subnet-09999dcd5c7b9287f my-subnet-public1-eu-north-1a
VPC: vpc-0097f7790d04b6897 Owner: 072087969837
Availability Zone: eu-north-1a (eu-n1-az1) Zone type: Availability Zone
IP addresses available: 4091 CIDR: 10.0.0.0/20

Create new subnet ↗

EC2 > Instances > Launch an instance

It seems like you may be new to launching instances in EC2. Take a walkthrough to learn about EC2, how to launch instances and about best practices

Take a walkthrough Do not show me this message again.

Launch an instance Info

Amazon EC2 allows you to create virtual machines, or instances, that run on the AWS Cloud. Quickly get started by following the simple steps below.

Name and tags Info

Name

VPC-EC2Pvt

Add additional tags

▼ Application and OS Images (Amazon Machine Image) Info

An AMI contains the operating system, application server, and applications for your instance. If you don't see a suitable AMI below, use the search field or choose **Browse more AMIs**.

Search our full catalog including 1000s of application and OS images

Recents Quick Start

▼ Summary

Number of instances1

Software ImageAmazon Linux 2ami-0c7d68785e

Virtual server type3.micro

Firewall (security group)New security group

Storage (volumes)1 volume(s) - 8

Cancel

EC2 > Instances > Launch an instance

VPC - required Info

vpc-0097f7790d04b6897 (my-vpc)
10.0.0.0/16

Subnet Info

subnet-05a80efda36573745 my-subnet-private1-eu-north-1a
VPC: vpc-0097f7790d04b6897 Owner: 072087969837
Availability Zone: eu-north-1a (eu-n1-az1) Zone type: Availability Zone
IP addresses available: 4091 CIDR: 10.0.128.0/20

Create new subnet ↗

Auto-assign public IP Info

Enable

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 group

Select 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 alphanumeric, hyphen, underscore, and equals.

Instances (4) info

Last updated less than a minute ago

Refresh

Connect

Instance state

Actions

Launch instances

All states

< 1 >

Settings

<input type="checkbox"/>	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone
<input type="checkbox"/>		i-074b10c0c4dc5046f	Running	t3.micro	3/3 checks passed	View alarms +	eu-north-1a
<input type="checkbox"/>	nida-ec2-lab	i-04daca2c062b9c1aa	Running	t3.micro	3/3 checks passed	View alarms +	eu-north-1a
<input type="checkbox"/>	VPC-Ec2	i-0482c7bb9975d956f	Running	t3.micro	Initializing	View alarms +	eu-north-1a
<input type="checkbox"/>	VPC-EC2Pvt	i-0e62b4ba1823beadc	Running	t3.micro	-	View alarms +	eu-north-1a

Select Public Instance & Connect

Instances (1/4) info

Find Instance by attribute or tag (case-sensitive)

All states

Instance state (client) !=running

Clear filters

< 1 >

⚙️

<input type="checkbox"/>	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone
<input type="checkbox"/>	nida-ec2-lab	i-04daca2c062b9c1aa	Running	t3.micro	3/3 checks passed	View alarms +	eu-north-1a
<input checked="" type="checkbox"/>	VPC-EC2	i-0482c7bb9975d956f	Running	t3.micro	3/3 checks passed	View alarms +	eu-north-1a
<input type="checkbox"/>	VPC-EC2Pvt	i-0e62b4ba1823beadc	Running	t3.micro	3/3 checks passed	View alarms +	eu-north-1a

i-0482c7bb9975d956f (VPC-EC2)

⚙️

⌵

Details

Status and alarms

Monitoring

Security

Networking

Storage

Tags

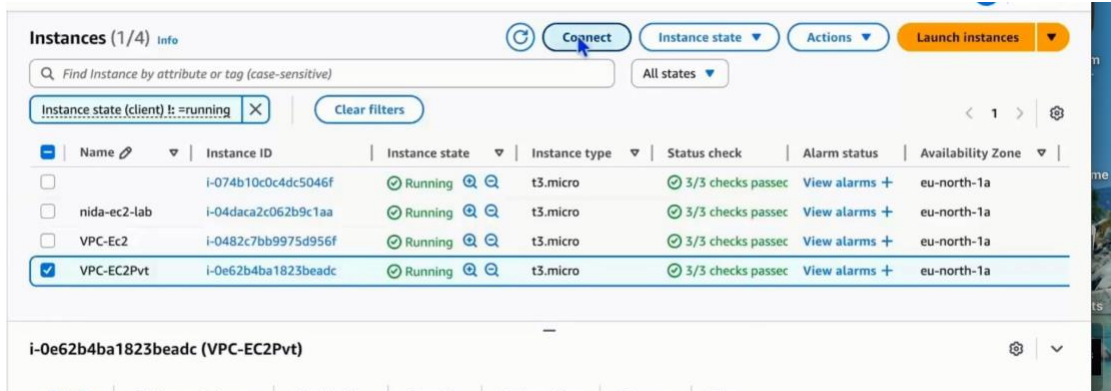
Ping Test from Public Instance

```
#  
--\##### Amazon Linux 2023  
--\#####  
--\###|  
--\#/  
--v~'-'-> https://aws.amazon.com/linux/amazon-linux-2023  
  
---  
--.-.  
_m/'
```

Last login: Wed Nov 12 13:28:37 2025 from 13.48.4.202
[ec2-user@ip-10-0-9-30 ~]\$ ping google.com
PING google.com (142.251.38.110) 56(84) bytes of data:
64 bytes from lcarna-ac-in-f14.1e100.net (142.251.38.110): icmp_seq=1 ttl=119 time=3.27 ms
64 bytes from lcarna-ac-in-f14.1e100.net (142.251.38.110): icmp_seq=2 ttl=119 time=3.27 ms
64 bytes from lcarna-ac-in-f14.1e100.net (142.251.38.110): icmp_seq=3 ttl=119 time=3.28 ms
64 bytes from lcarna-ac-in-f14.1e100.net (142.251.38.110): icmp_seq=4 ttl=119 time=3.27 ms
64 bytes from lcarna-ac-in-f14.1e100.net (142.251.38.110): icmp_seq=5 ttl=119 time=3.27 ms
64 bytes from lcarna-ac-in-f14.1e100.net (142.251.38.110): icmp_seq=6 ttl=119 time=3.26 ms
64 bytes from lcarna-ac-in-f14.1e100.net (142.251.38.110): icmp_seq=7 ttl=119 time=3.27 ms
64 bytes from lcarna-ac-in-f14.1e100.net (142.251.38.110): icmp_seq=8 ttl=119 time=3.27 ms
64 bytes from lcarna-ac-in-f14.1e100.net (142.251.38.110): icmp_seq=9 ttl=119 time=3.27 ms
64 bytes from lcarna-ac-in-f14.1e100.net (142.251.38.110): icmp_seq=10 ttl=119 time=3.27 ms
64 bytes from lcarna-ac-in-f14.1e100.net (142.251.38.110): icmp_seq=11 ttl=119 time=3.28 ms
64 bytes from lcarna-ac-in-f14.1e100.net (142.251.38.110): icmp_seq=12 ttl=119 time=3.26 ms
64 bytes from lcarna-ac-in-f14.1e100.net (142.251.38.110): icmp_seq=13 ttl=119 time=3.27 ms

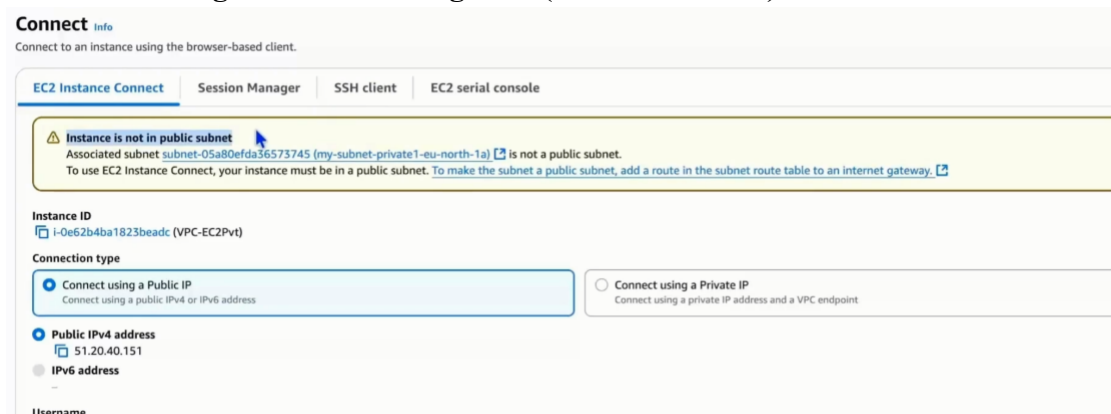
Ping google.com from the public instance to verify internet access.

Select Private Instance & Connect Attempt



Attempt to connect to the private instance — shows instance is not in public subnet.

Network Settings while launching EC2 (subnet selection)



This instance is in a private subnet — hence, it cannot be accessed directly from the internet

Conclusion

A Virtual LAN (VPC) with public and private subnets is now created and validated. The public subnet provides internet access via the Internet Gateway (verified by the ping test), while the private subnet remains isolated (connect attempts show it is not public). This setup demonstrates secure separation of internet-facing and internal resources in AWS.