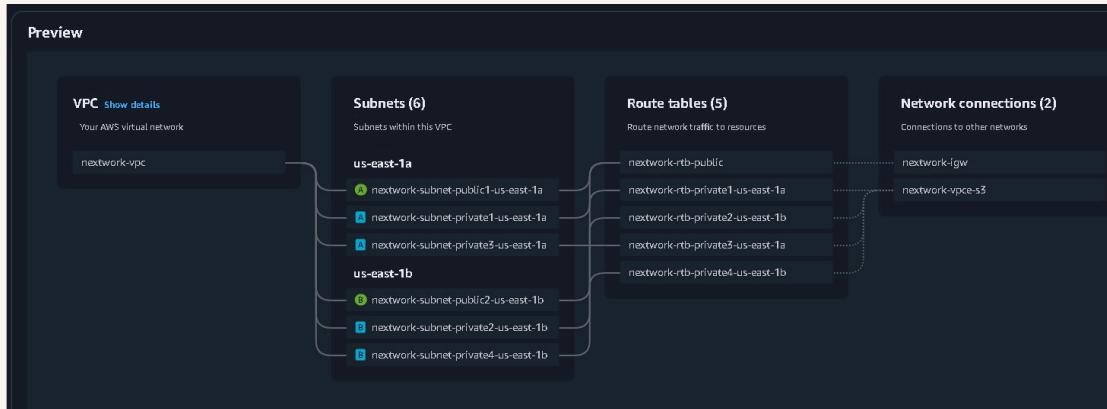


# Launching VPC Resources

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Antonio C





# Introducing Today's Project!

## What is Amazon VPC?

Amazon VPC lets you create isolated networks in AWS, giving you full control over subnets (public/private), routing, and internet access. It's useful for securely hosting EC2 instances, using NATs, route tables, and gateways

## How I used Amazon VPC in this project

- Launch an EC2 instance in your public subnet.
- Launch an EC2 instance in your private subnet.
- ⚡ Use the Amazon VPC's wizard to create VPCs at a lightning fast pace.

## One thing I didn't expect in this project was...

I did not expect the complexity of VPC's and subnets

## This project took me...

This project took me an hour to complete



# Setting Up Direct VM Access

To directly access your EC2 instance means connecting to it from the internet using its public IP or DNS, typically via SSH (for Linux) or RDP (for Windows), without needing a jump server or VPN—only possible if it's in a public subnet.

## SSH is a key method for directly accessing a VM

SSH (Secure Shell) is a network protocol that allows secure remote access to computers over an unsecured network. It's commonly used to manage servers like EC2 instances, using encrypted communication for authentication and data transfer.

## To enable direct access, I set up key pairs

The key pair type determines the algorithm used for generating the key pair's cryptographic keys. We use RSA (Rivest-Shamir-Adleman), which is one of the most common cryptographic algorithms used due to its strength and security. RSA is widely suppo

A private key's file format is usually PEM (.pem) for AWS EC2 instances. It contains the cryptographic key used for SSH access. If you downloaded your key pair from AWS, your private key was likely in .pem format.



# Launching a public server

I had to change my EC2 instance's networking settings by selecting my public subnet and my security group that I created beforehand

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Public IPv4 address	Private IPv4 addresses	VPC ID
-	10.0.1.152	vpc-0964d9faf72d8631b (NextWork VPC) <a href="#">Edit</a>
Public IPv4 DNS	Private IP DNS name (IPv4 only)	
-	ip-10-0-1-152.ec2.internal	
Subnet ID	IPv6 addresses	Secondary private IPv4 addresses
<a href="#">subnet-0dd35213af879156f (NextWork Private Subnet)</a> <a href="#">Edit</a>	-	-
Availability zone	Carrier IP addresses (ephemeral)	Outpost ID
<a href="#">us-east-1b</a> <a href="#">Edit</a>	-	-
Use RBN as guest OS hostname	Answer RBN DNS hostname IPv4	
<a href="#">Disabled</a> <a href="#">Edit</a>	Disabled	

▼ Network Interfaces (1) [Info](#)

<a href="#">Filter network interfaces</a>
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# Launching a private server

Your private server uses a different security group to control and limit access—allowing only trusted internal traffic (like from a public server or specific IPs), while your public server's group allows broader access like SSH or HTTP from the inter

My private server's security group's source is SSH has established a secure connection between you and the EC2 instance, all data transmitted (including your commands and the responses from the instance) is encrypted.

The screenshot shows the AWS Launch Wizard interface for creating a new Amazon Linux 2023 AMI t2.micro instance. The configuration includes:

- VPC - required**: Set to "vpc-06d409f5f72d8631b (NextWork VPC)" with subnet "subnet-0cd51215ff879156f".
- Subnet**: Set to "NextWork Private Subnet".
- Auto-assign public IP**: Set to "Disable".
- Firewall (security group)**: Set to "Create security group".
- Security group name - required**: Set to "Security group for NextWork Private Subnet".
- Description - required**: Set to "launch-wizard-1 created 2025-04-15T16:39:06.566Z".
- Inbound Security Group Rules**: One rule is defined: "Security group rule 1 (TCP, 22, sg-0bbdd41315476db2e)".
  - Type: ssh
  - Protocol: TCP
  - Port range: 22
  - Source type: Custom
  - Source: sg-0bbdd41315476db2e
  - Description: e.g. SSH for admin desktop
- Summary**: Shows 1 instance being launched.
- Software Image (AMI)**: Set to "Amazon Linux 2023 AMI 2025.7.2...".
- Virtual server type (instance type)**: Set to "t2.micro".
- Firewall (security group)**: Set to "New security group".
- Storage (volumes)**: 1 volume(s) - 8 GiB.
- Free tier**: A note states: "In your first year of opening an AWS account, you get 750 hours per month of t2.micro instance usage (or t3.micro where t2.micro isn't available) when used with free tier AMIs, 750 hours per month of public IPv4 address usage, 30 GiB of EBS storage, 2 million I/Os, 1 GB of snapshots, and 100 GB of bandwidth to the internet."
- Launch Instance** button.

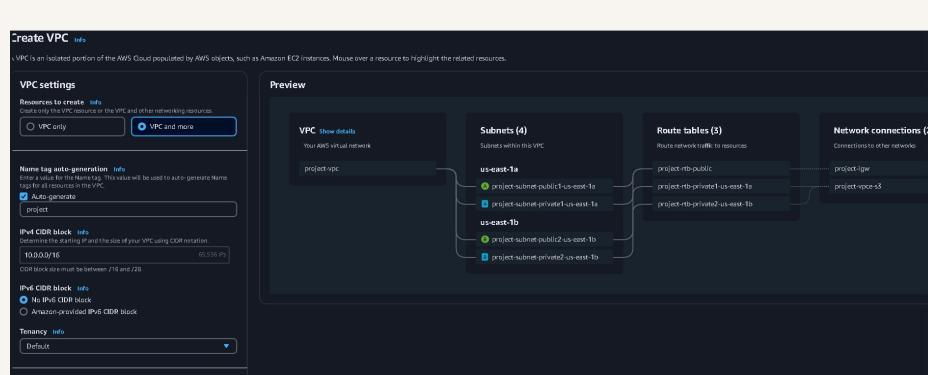


# Speeding up VPC creation

ChatGPT said: To set up a new VPC, I defined a CIDR block, created subnets (public, private), set up an Internet Gateway, route tables, and associated them accordingly. I configured security groups and optionally added a NAT for private subnet access

A VPC resource map is a visual diagram showing how your VPC components—like subnets, route tables, gateways, EC2 instances, and security groups—are connected. It helps you understand and troubleshoot your network architecture easily.

Your new VPC can have the same IPv4 CIDR block as the NextWork VPC because VPCs are isolated from each other by default. As long as they don't need to communicate, overlapping CIDR blocks won't cause conflicts.

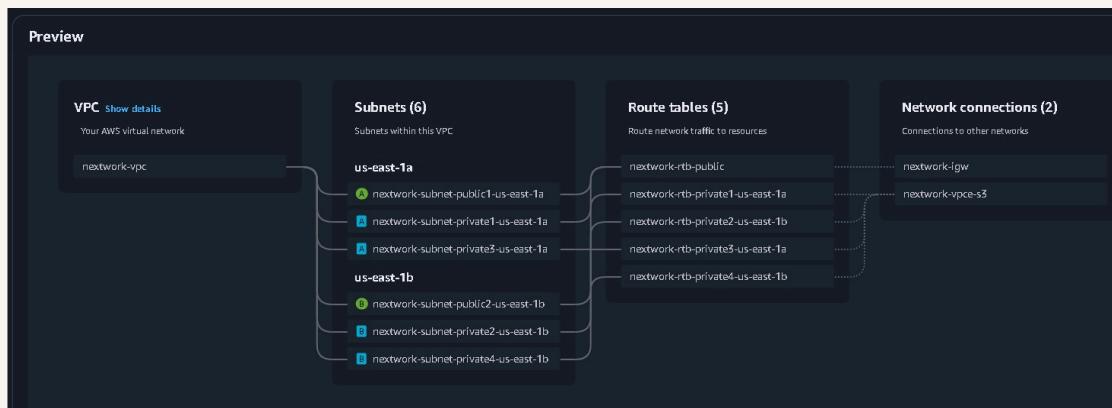


# Speeding up VPC creation

## Tips for using the VPC resource map

When setting up your VPC, the number of public subnets is often based on the number of Availability Zones (AZs) you choose. I had two options because my selected region has two AZs available, ensuring high availability across them.

NAT Gateways allow instances in private subnets to access the internet (e.g., for updates) without exposing them to incoming internet traffic. They route outbound traffic while blocking unsolicited inbound connections, enhancing security.





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