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VPC Peering

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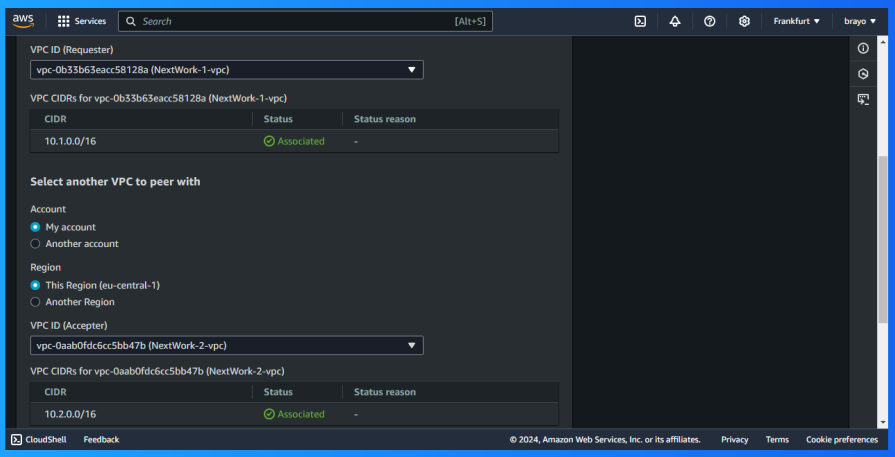

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Introducing Today's Project!

What is Amazon VPC?

Amazon VPC is a service that lets you create a private network within the AWS cloud. It's useful for securely managing resources, controlling traffic, and ensuring isolation and security for your applications.

How I used Amazon VPC in this project

used Amazon VPC to create isolated networks for my EC2 instances, ensuring secure communication between them via VPC peering, configured route tables to allow traffic between VPCs and ensured the instances were connected to public subnets for access.

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

One thing I didn't expect in this project was encountering the error related to EC2 Instance Connect due to the lack of a public IPv4 address.It required me to set up an Elastic IP address to resolve the issue and successfully connect to the instance

This project took me...

This project took me 1.5 hours to complete, including the time spent setting up the VPCs, configuring peering connections, adjusting security groups, and troubleshooting the EC2 Instance Connect issue by assigning an Elastic IP address

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In the first part of my project...

Step 1 - Set up my VPC

Creating two VPCs from scratch!

Step 2 - Create a Peering Connection

Setting up a connection link between the 2 VPCs , ie. bridge them together with a peering connection.

Step 3 - Update Route Tables

To enable traffic between VPC 1 and VPC 2, update their route tables: In VPC 1's route table, add a route for VPC 2's CIDR block, targeting the peering connection. In VPC 2's route table, add a route for VPC 1's CIDR block, targeting the peering co..

Step 4 - Launch EC2 Instances

Launch an EC2 instance in each VPC, so we can use them to test your VPC peering connection later.

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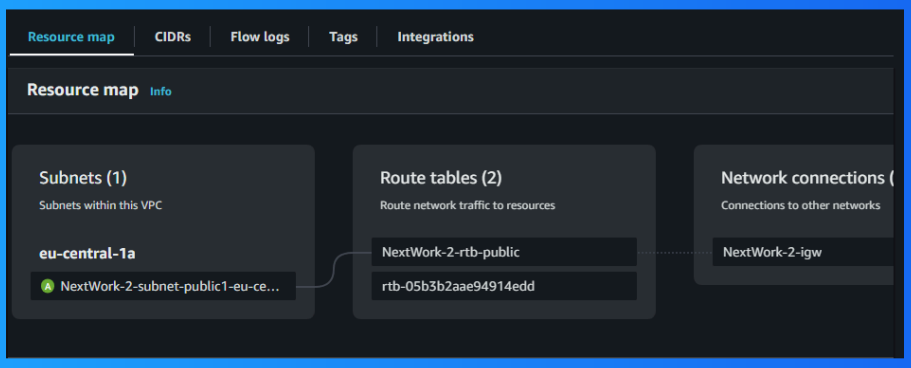
Multi-VPC Architecture

I started my project by launching two Amazon VPCs, each with a single public subnet. In total, I created two subnets, one in each VPC.

The CIDR blocks for VPCs 1 and 2 are unique to avoid overlapping IP addresses between the VPCs. They have to be unique because overlapping IP ranges would create routing conflicts, which could lead to connectivity between the VPCs.

I also launched 2 EC2 instances

I didn't set up key pairs for these EC2 instances as they were not required for this specific project, which focused on setting up VPC peering and routing traffic between the VPCs, rather than managing direct SSH access to the instances.



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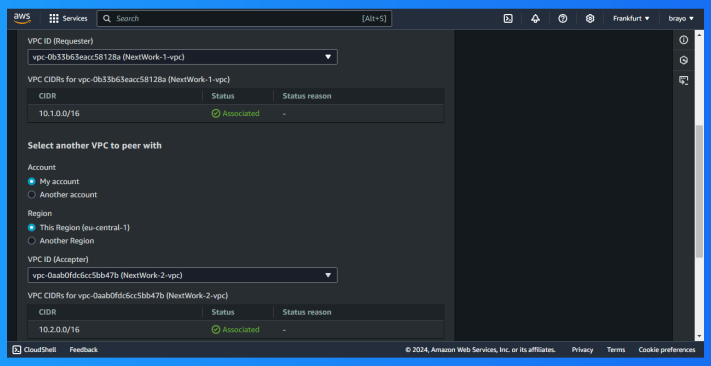
VPC Peering

VPC peering connection is a networking connection between two VPCs that allows them to communicate with each other using private IP addresses, enables resources in different VPCs to securely exchange traffic, as if they were within the same network.

VPCs would use peering connections to enable secure communication between them, allowing resources in different VPCs to exchange data privately without using the public internet while maintaining isolation and security.

The difference between a Requester and an Accepter in a peering connection is that the Requester is the VPC that initiates the peering request, while the Accepter is the VPC that receives and approves the request.



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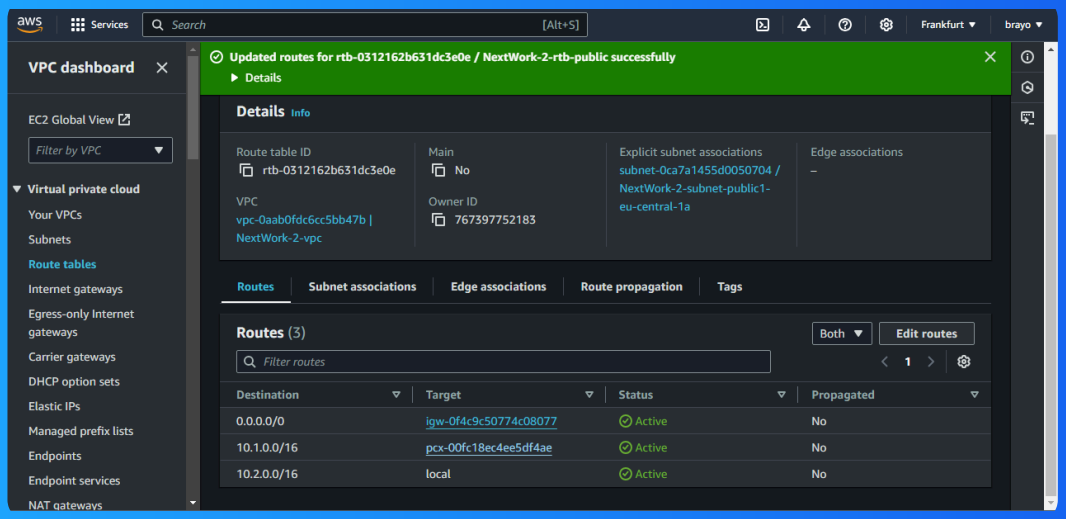
Updating route tables

After accepting a peering connection, my VPCs' route tables need to be updated because traffic between the VPCs needs explicit routes to know how to reach the other VPC's CIDR block which rely on this these routes to communicate

My VPCs' new routes have a destination of the CIDR block of the opposite VPC (e.g., 10.2.0.0/16 for VPC 1 and 10.1.0.0/16 for VPC 2). The routes' target was the peering connection between the VPCs.



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In the second part of my project...

Step 5 - Use EC2 Instance Connect

To test our VPC peering connection, we'll need to get one of our EC2 instances to try talk to the other.. . In this step, we're going to:. Use EC2 Instance Connect to connect to your first EC2 instance.. Fix a connection error!

Step 6 - Connect to EC2 Instance 1

Use EC2 Instance Connect to connect to Instance 1 (one more time)!. Fix (another) error.

Step 7 - Test VPC Peering

Get Instance 1 to send test messages to Instance 2.. Solve connection errors until Instance 2 is able to send messages back.

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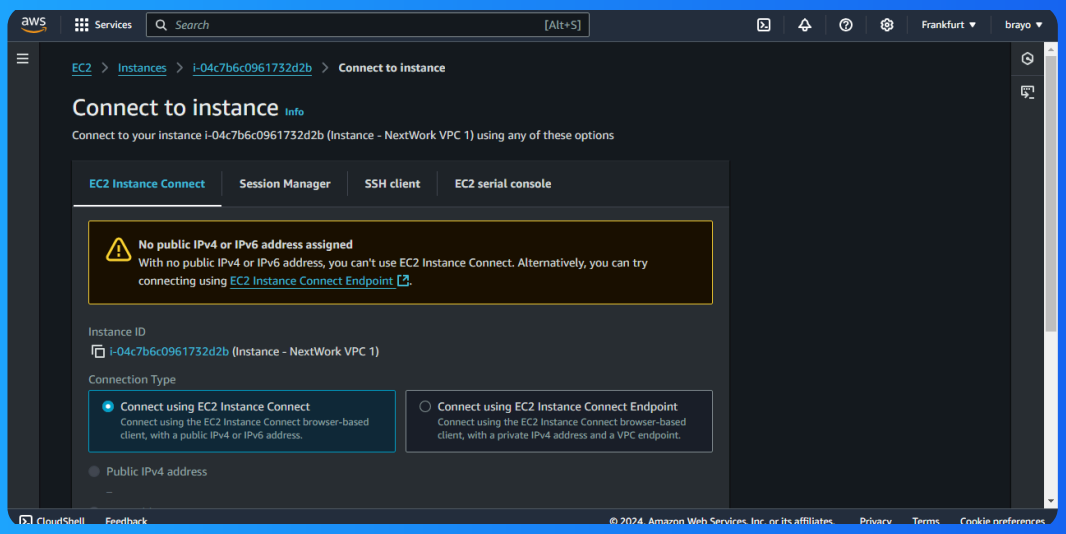
Troubleshooting Instance Connect

Next, I used EC2 Instance Connect to securely connect to my EC2 instances without needing to manage SSH keys manually, simplifying the connection process and enhancing security by leveraging temporary credentials.

I was stopped from using EC2 Instance Connect as my EC2 instance did not have a public IPv4 address assigned due to the "Auto-assign IP address" option being disabled.



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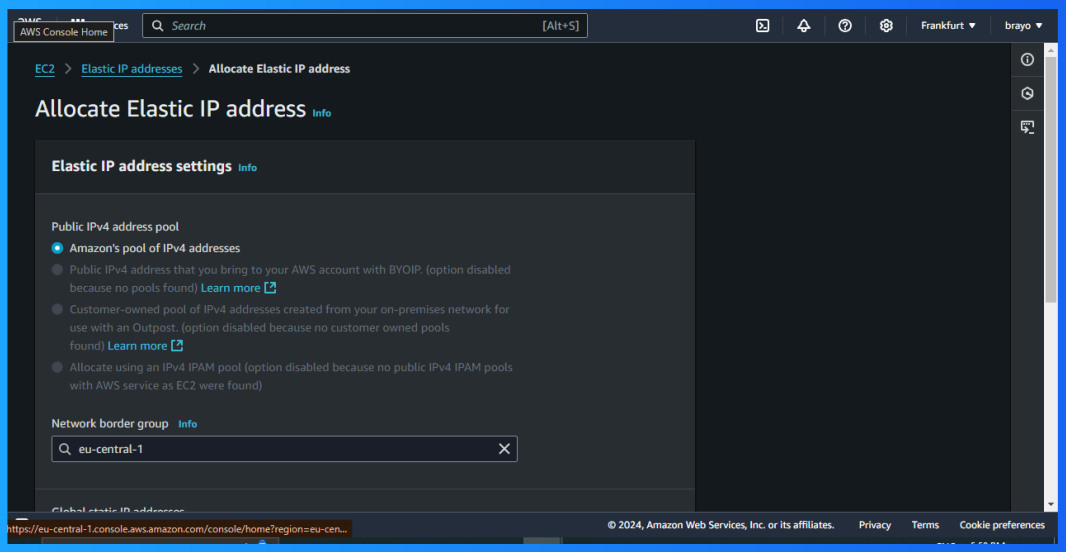
Elastic IP addresses

To resolve this error, I set up Elastic IP addresses. Elastic IP addresses are static IPv4 addresses allocated to your AWS account that can be assigned to EC2 instances, ensuring they maintain a permanent public IP address even after restarts.

Associating an Elastic IP address resolved the error because it provided a static public IP for the EC2 instance, allowing EC2 Instance Connect to establish a connection, as the instance now had a public IPv4 address.



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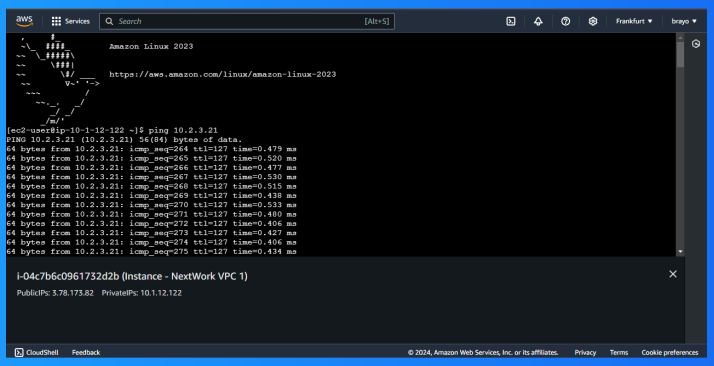
Troubleshooting ping issues

To test VPC peering, I ran the command ping to check connectivity between instances in different VPCs by using their private IP addresses.

A successful ping test would validate my VPC peering connection because it confirms that the instances in different VPCs can communicate with each other over the private network, indicating that routing and peering are correctly set up.

I had to update my second EC2 instance's security group because the instance needed to accept incoming traffic from the first EC2 instance. I added a new rule that allowed inbound ICMP traffic (for ping tests) from the security group of the first EC2



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