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VPC Endpoints

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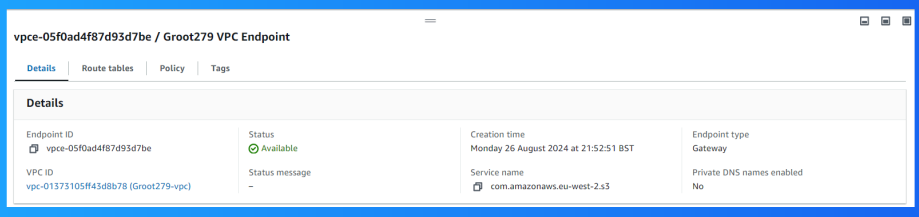

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Introducing Today's Project!

What is Amazon VPC?

AWS VPC is an AWS networking service provided by AWS that allows us to isolate our resources from the public internet, set up secure connections between our resources, and control traffic flow security.

How I used Amazon VPC in this project

We used Amazon VPC in this project to set up a VPC endpoint, specifically an S3 Gateway. This provides our VPC with direct access to another AWS service.

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

N/a

This project took me...

45 mins

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In the first part of my project...

Step 1 - Architecture set up

In this step, we are setting up the foundations of this project, i.e. launching a VPC, EC2 instance, and S3 bucket so that we can set up an endpoint architecture and test that setup in the last step of this project.

Step 2 - Connect to EC2 instance

The command I ran was 'aws s3 ls'. It lists the contents of an Amazon S3 bucket or a specific directory within a bucket. Displays the names, sizes, and last modified dates of the objects.

Step 3 - Set up access keys

In this step, we will set up an access key so that our EC2 instance can access the AWS environment. Access keys are almost like "login details" for EC2 instances/applications to interact with AWS services.

Step 4 - Interact with S3 bucket

in this step, we apply our access key credentials to our EC2 instance, and then we use AWS CLI and our EC2 instance to access Amazon S3

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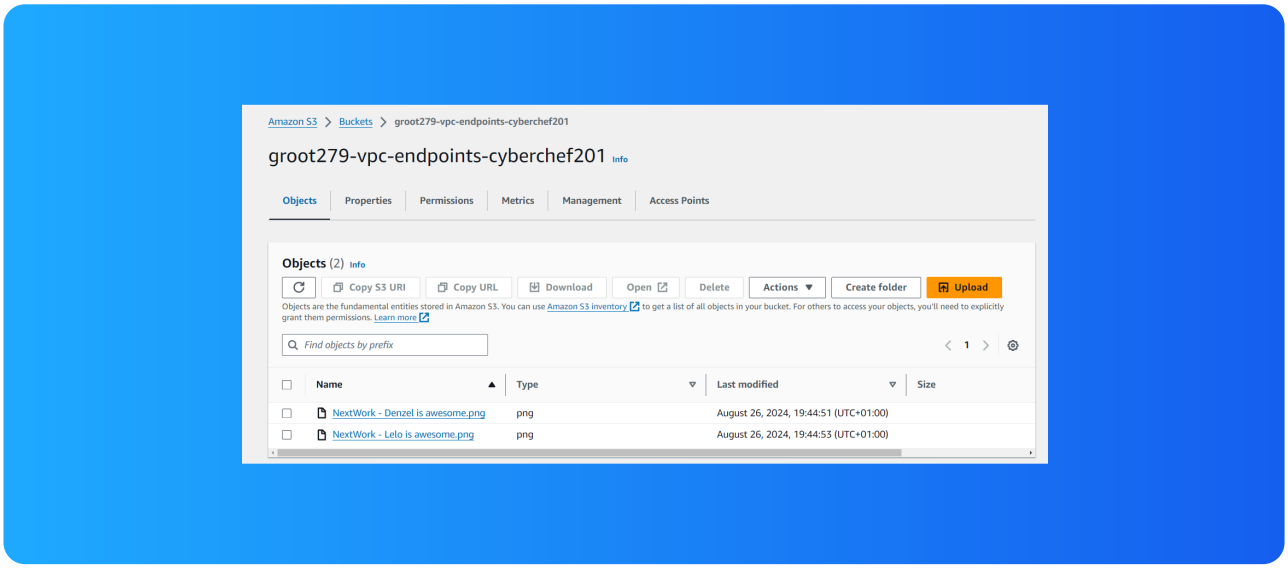
Architecture set up

I started my project by launching three critical resources - a VPC, an EC2 instance and an S3 bucket.

In this step, I connect directly to the EC2 instance using the EC2 instance connect. Connecting to instances will help us access S3 and run commands later in this project.



Access keys

Credentials

To set up my EC2 instance to interact with my AWS environment, I configured the AWS access key ID, secret access key matching that key ID, default region type and then the default output format.

Access keys are a pair of secret credentials that are used to authenticate your identity and gain access to AWS services. They consist of an access key ID and a secret access key.

Secret Access keys are like passwords in the context of access keys/credentials for our EC2 instance to get access to our AWS services/environments

Best practice

Although I'm using access keys in this project, a best practice alternative is to use IAM admin roles instead; this means the necessary permission will be attached to an IAM role, and then the role will be associated with the relevant resources.

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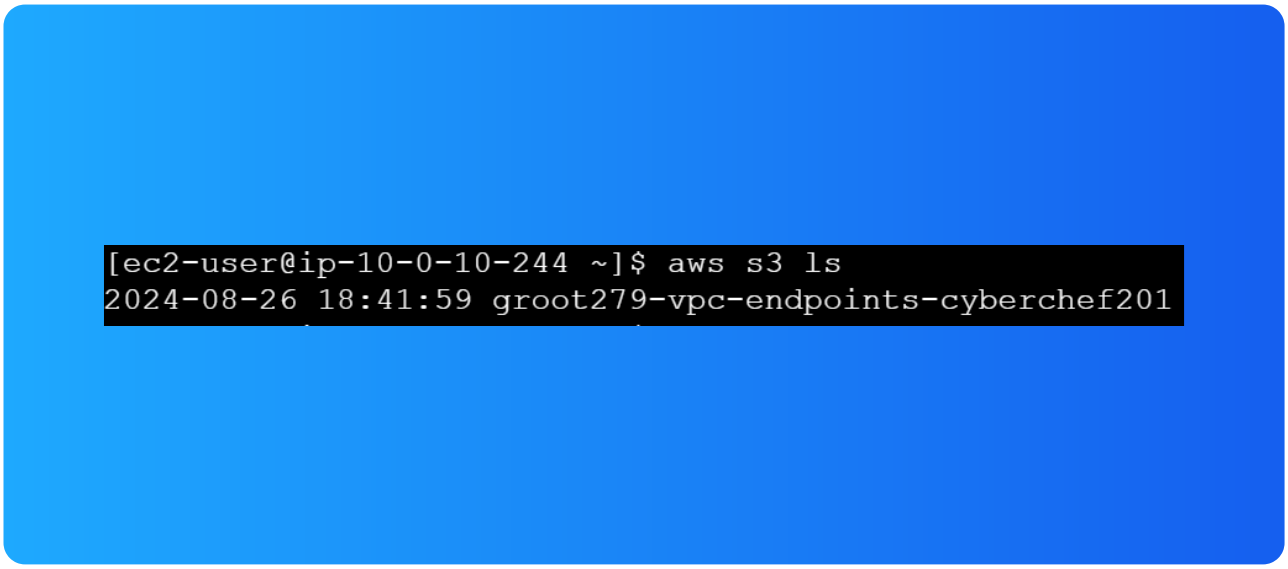
Connecting to my S3 bucket

The command I ran was 'aws s3 ls'. It lists the contents of an Amazon S3 bucket or a specific directory within a bucket. Displays the names, sizes, and last modified dates of the objects.

The terminal responded with a list of my account's S3 buckets. This indicated that our access keys were set up correctly. The access keys I set up correctly give my EC2 instance access to my AWS account and environment.



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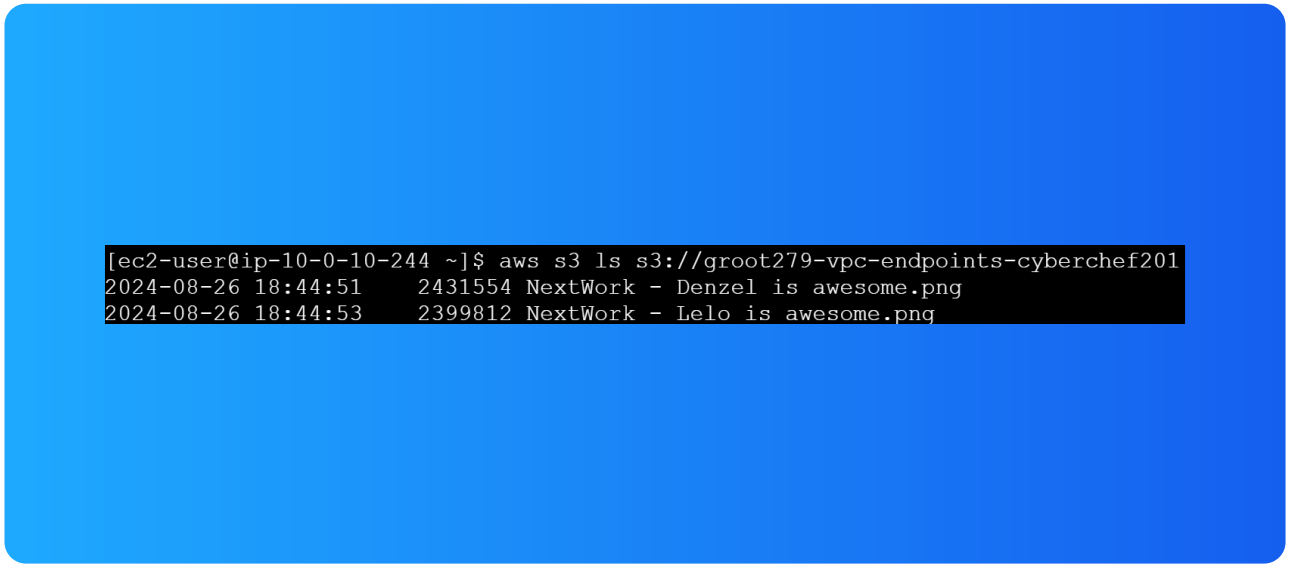
Connecting to my S3 bucket

I also tested the command 'aws s3 ls s3://groot279-vpc-endpoints-cyberchef201', which returned a list of all the objects inside that s3 bucket.



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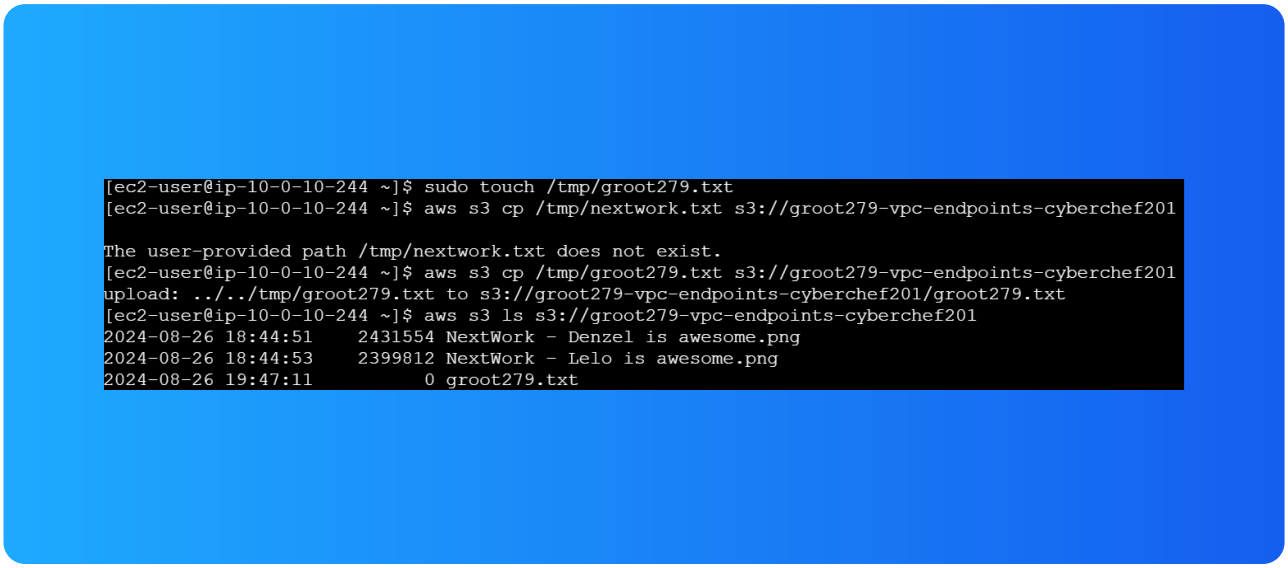
Uploading objects to S3

To upload a new file to my bucket, I first ran the command 'sudo touch /tmp/Groot279.txt'. This command creates an empty file name groot279.txt and saves it locally in the EC2 instance.

The second command I ran was 'aws s3 cp /tmp/nextwork.txt s3://nextwork-vpc-endpoints-yourname' This command will copy the file I created i.e.groot279.txt and upload that to my S3 bucket

The third command I ran was 'aws s3 ls s3://groot279-vpc-endpoints-cyberchef201', which validated that a new file was created and updated into our s3 bucket



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In the second part of my project...

Step 5 - Set up a Gateway

In this step we are setting up a vpc endpoint so that communication between our vpc (especially S3) and other services is direct and secure

Step 6 - Bucket policies

In this step, we are testing our endpoint connection by blocking off all traffic to our s3 bucket except for traffic coming from our endpoint

Step 7 - Update route tables

In this step, we test our endpoint connection between our bucket and Ec2 instance.

Step 8 - Validate endpoint conection

In this step, we will validate our VPC endpoint setup one more time and use endpoint policies to restrict my Ec2 instance's access to my AWS environment.

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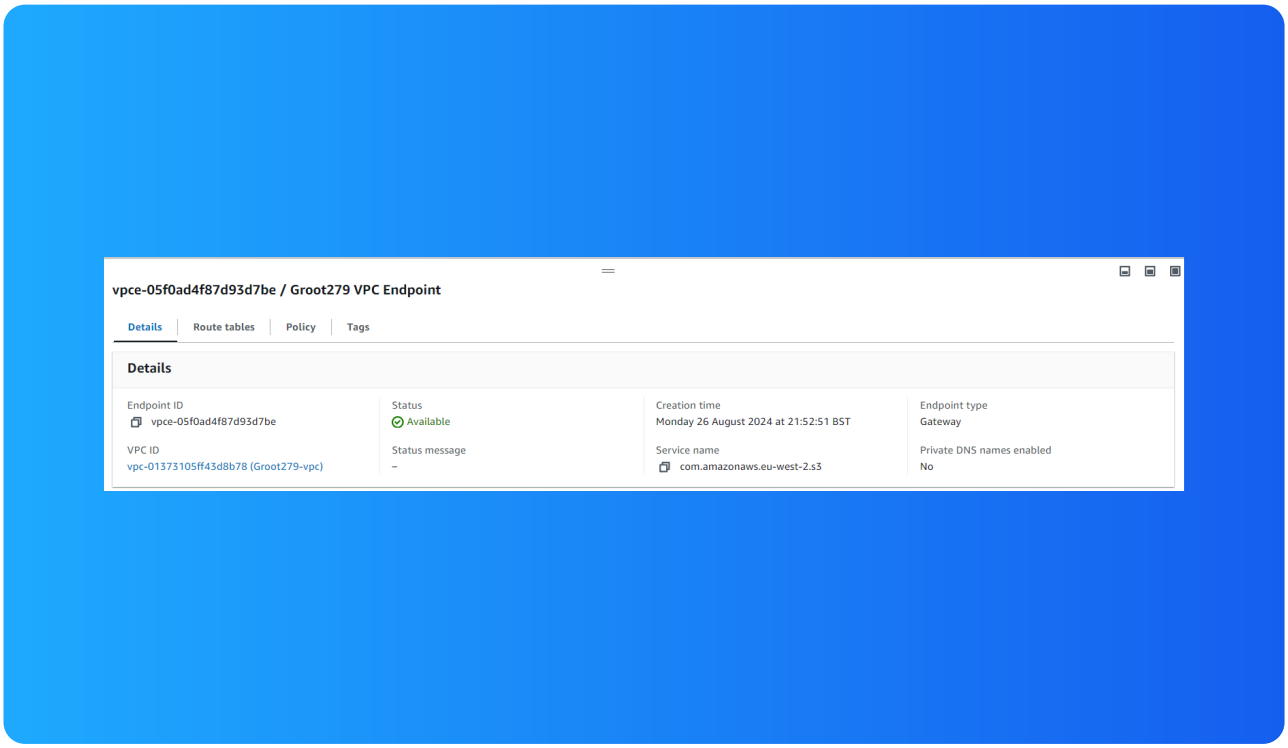
Setting up a Gateway

I set up an S3 Gateway, an endpoint designed explicitly for Amazon s3. s3 Gateway work by updating the route table of associated subnets. So, s3 bound traffic goes through the gateway instead of the internet.

What are endpoints?

An endpoint in AWS is a service that allows private connections between your VPC and other AWS services without sending traffic over the Internet.



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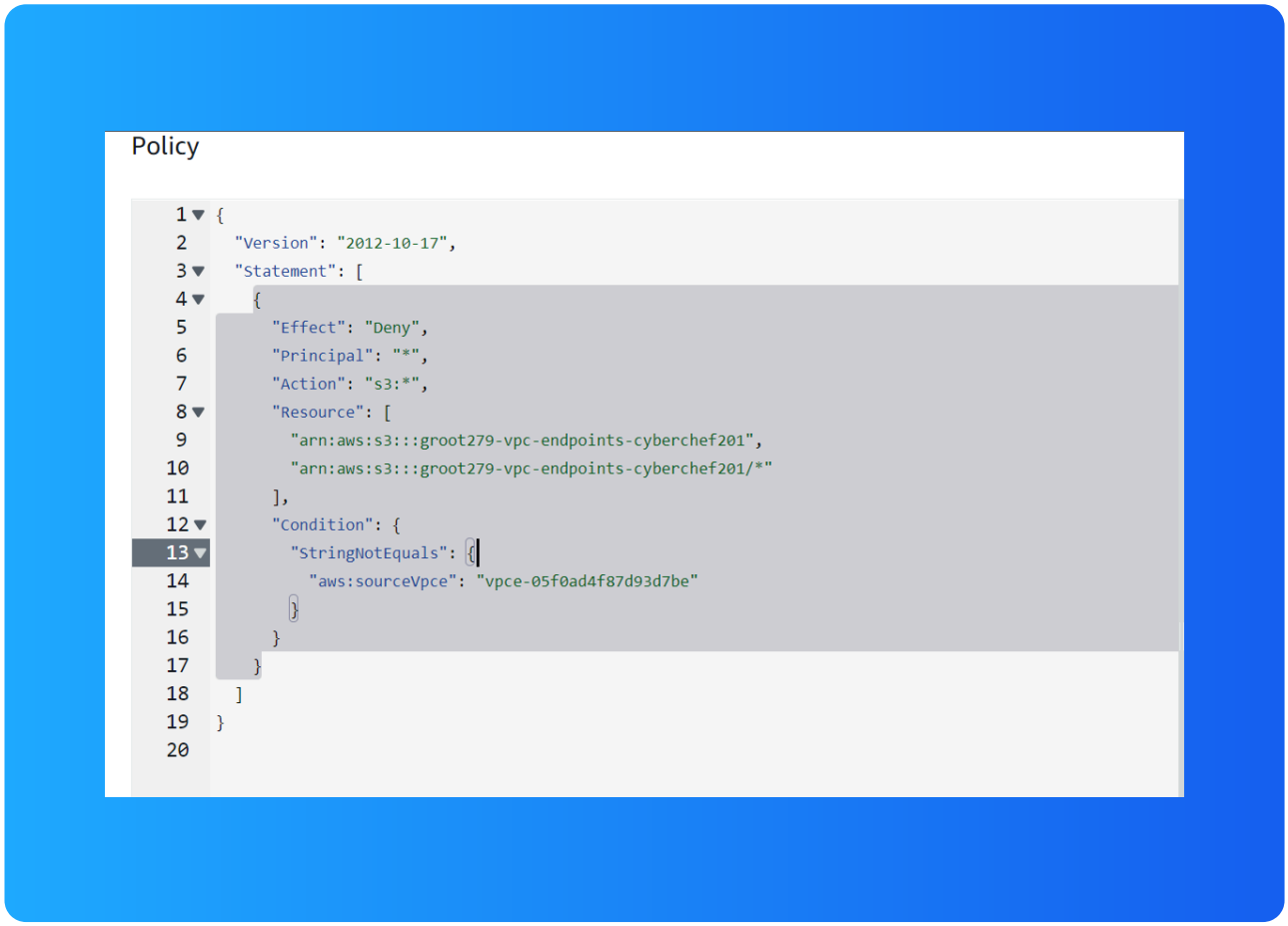
Bucket policies

A bucket policy is a type of policy that specifies the permissions and access controls for an Amazon S3 bucket. It defines who can access the bucket and what actions they can perform on objects within it.

My bucket policy will deny traffic from all sources except for traffic coming my VPC endpoint.



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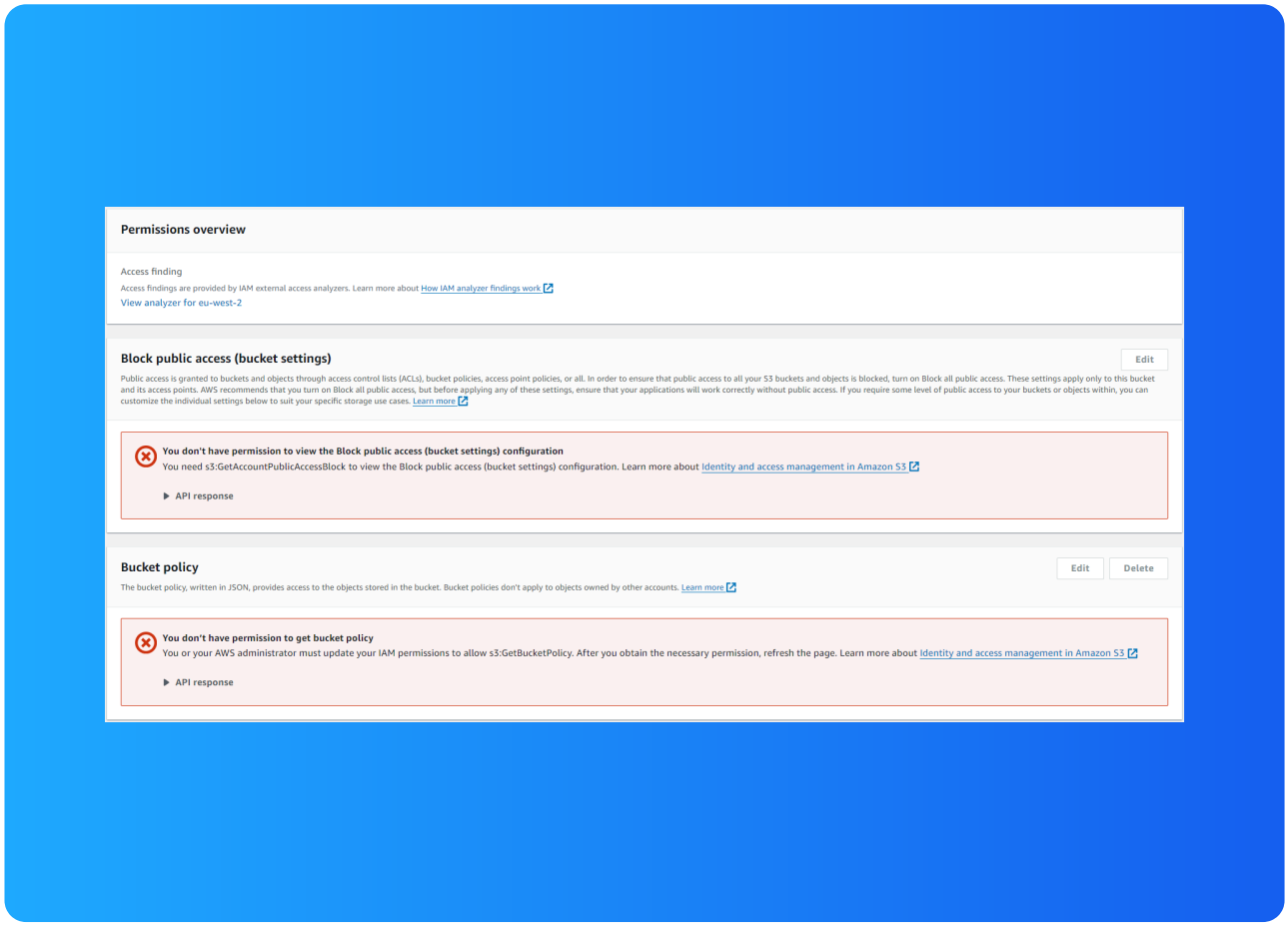
Bucket policies

Right after saving my bucket policy, my S3 bucket page showed 'denied access' warnings. This was because my policy has been updated from 'Allow' to 'deny'

I also had to update my route table because my route table, by default, didn't provide a route for traffic in my public subnet to the VPC endpoint.



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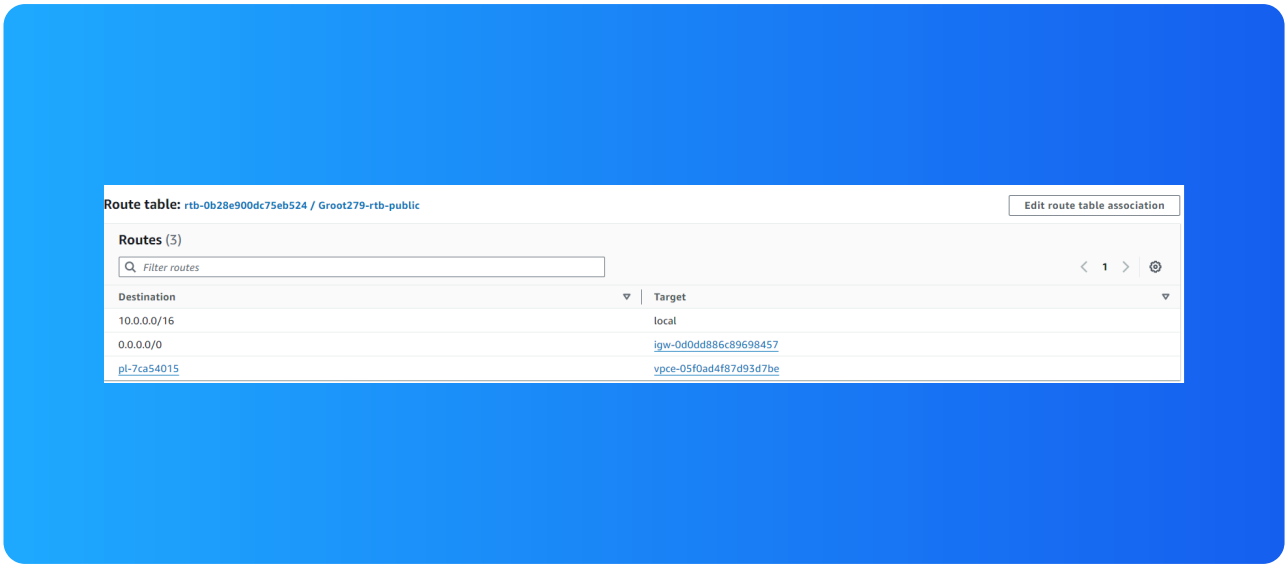
Route table updates

To update my route table, I visited the endpoints page of my vpc console, and we modified the route table from there to associate our vpc's public subnet.

After updating my public subnet's route table, My EC2 instance could connect with my S3 bucket, and access was no longer denied!



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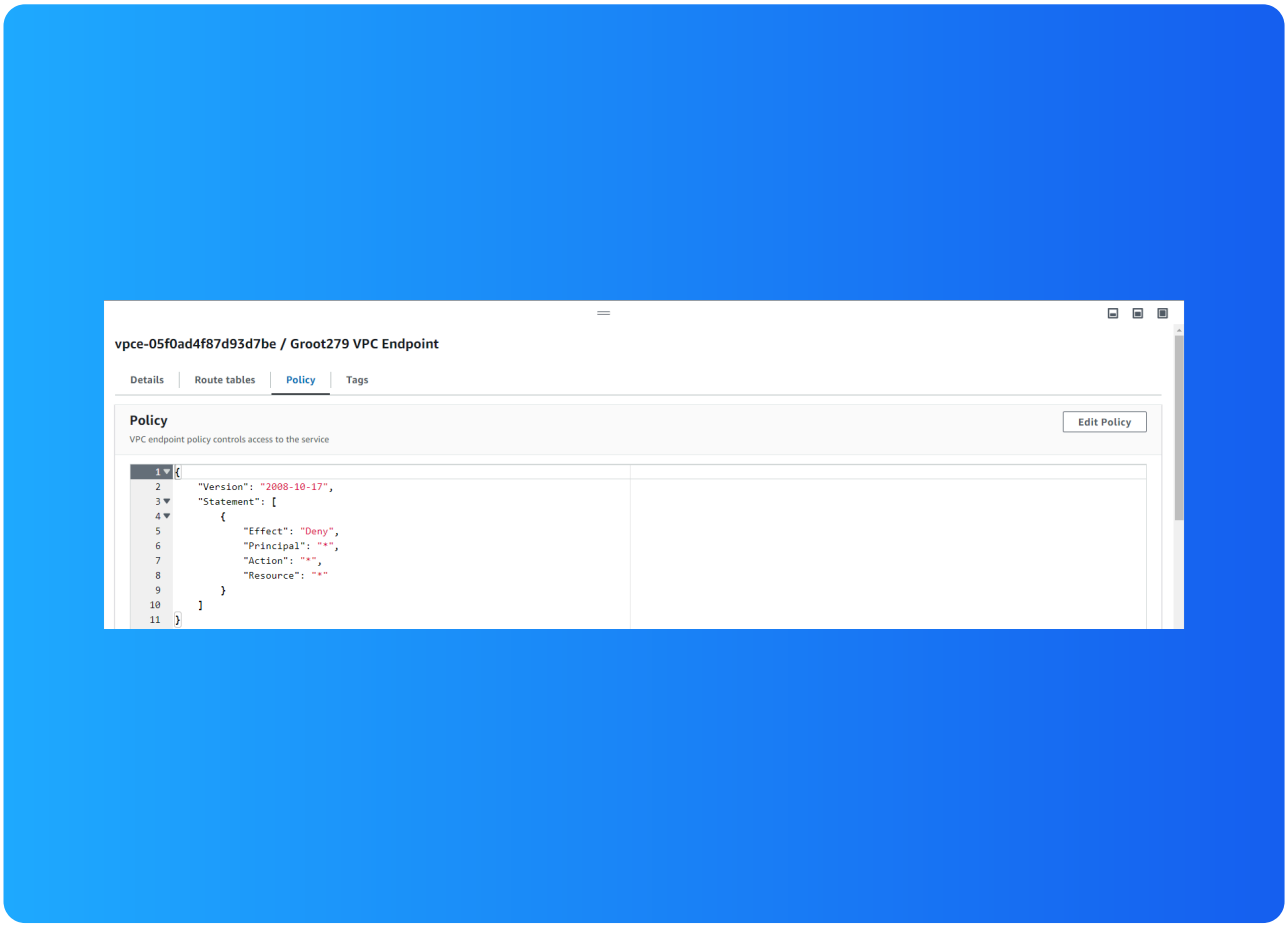
Endpoint policies

An endpoint policy is a type of policy designed to specify the range of resources permitted by the endpoint.

I updated my endpoint's policy by changing the effect from Allow to Deny; I could see the effect of this right away because my EC2 instance was again denied access to S3 when I tried to run another 'aws S3' command.



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