



# Testing VPC Connectivity



Roshan Thomas

```
aws [■■■ Services Q Search [Alt+S]
`C
` 10.0.1.25 ping statistics ---
407 packets transmitted, 97 received, 76.1671% packet loss, time 42221ms
rtt min/avg/max/mdev = 0.399/0.512/1.646/0.139 ms
tcpdump -i p2p-eth0 -n -v -e curl example.com
!DOCTYPE html>
<html>
<head>
<title>Example Domain</title>
<meta charset="utf-8" />
<meta http-equiv="Content-type" content="text/html; charset=utf-8" />
<meta name="viewport" content="width=device-width, initial-scale=1" />
<style type="text/css">
body {
background-color: #f0f0f2;
margin: 0;
padding: 0;
font-family: -apple-system, system-ui, BlinkMacSystemFont, "Segoe UI", "Open Sans", Helvetica, Arial, sans-serif;
}
div {
width: 600px;
margin: 0 auto;
padding: 2em;
background-color: #fdfdff;
border: 1px solid #e0e0e0;
box-shadow: 2px 3px 7px 2px rgba(0,0,0,0.02);
}
a:link, a:visited {
color: #888888;
text-decoration: none;
}
@media (max-width: 700px) {
div {
margin: 0 auto;
width: auto;
}
```



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# Introducing Today's Project!

## What is Amazon VPC?

Amazon VPC lets you create a private network within AWS, providing a secure, isolated environment for EC2 instances. It allows you to control network traffic and access resources within your VPC.

## How I used Amazon VPC in this project

Used Amazon VPC to create a secure network for deploying EC2 instances, set up public/private subnets, configured security groups, and managed routing to control traffic and enable instance communication with the internet.

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

I didn't expect to troubleshoot inbound ICMP traffic blockages on both the network ACL and security group for your NextWork Private Server, underscoring the need to check all security layers for proper connectivity.

## This project took me...

It took me 2 hours and 47 mins.

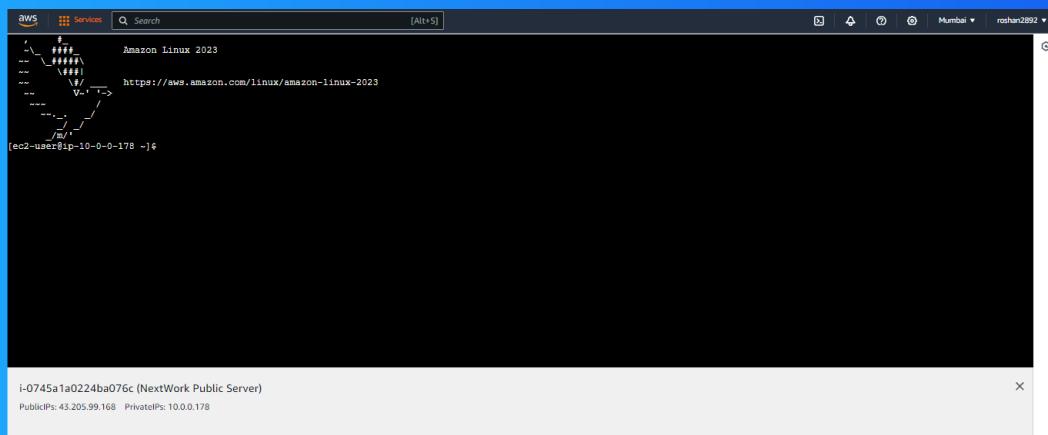
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# Connecting to an EC2 Instance

Connectivity means the ability of different parts of a network to communicate and interact with each other, as well as with external networks. It's like the highways and bridges that allow information to flow smoothly between devices and systems.

My first connectivity test was whether I could connect to the NextWork Public Server.





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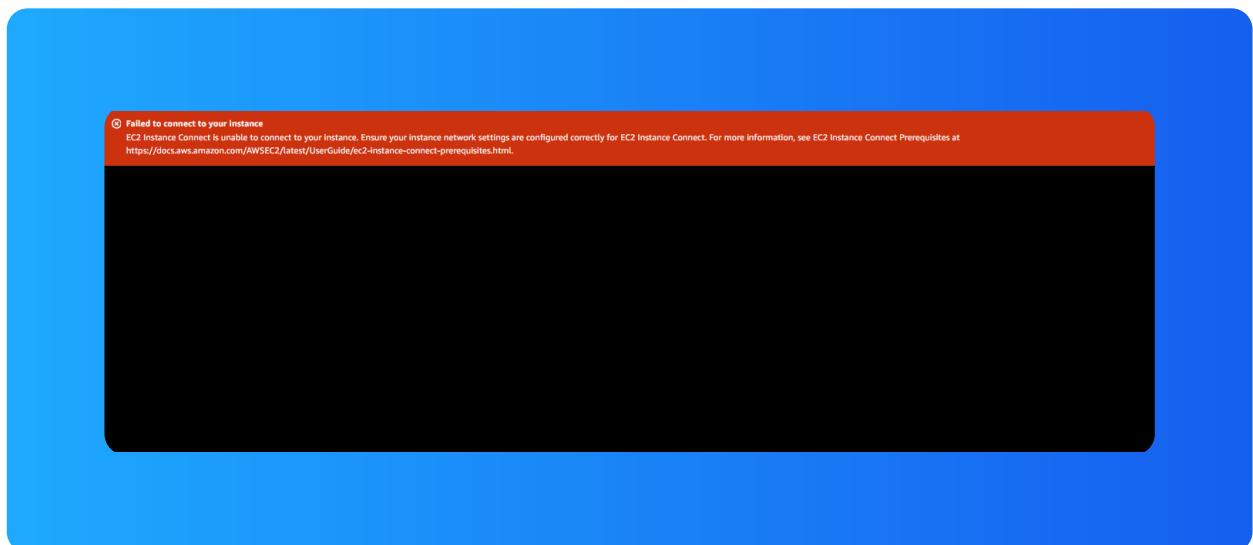
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# EC2 Instance Connect

EC2 Instance Connect simplifies SSH connections to EC2 instances, eliminating key pair management. It provides secure access to instances for tasks like troubleshooting and management.

My first connection attempt failed because the security group blocked SSH traffic. It only allowed HTTP traffic.

I fixed the error by adding a new inbound rule to the security group associated with NextWork Public Server, allowing SSH traffic from any IPv4 address. This enabled EC2 Instance Connect to successfully connect to the server.



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# Connectivity Between Servers

Ping is a network tool used to test connectivity between devices. I used it to test connectivity between my NextWork Public Server and NextWork Private Server.

The ping command I ran was ping ip-10.0.1.86, where ip-10.0.1.86 is the private IP address of my NextWork Private Server.

The first ping returned a single line, indicating a failed connection. This meant there was a problem with the connection between the two servers, likely due to blocked ICMP traffic on the private server or its network.

A screenshot of a terminal window on an Amazon Linux 2023 system. The window title is "Amazon Linux 2023". The URL "https://aws.amazon.com/linux/amazon-linux-2023" is visible at the top. The terminal output shows a failed ping attempt:

```
[ec2-user@ip-10-0-0-178 ~]$ ping 10.0.1.25
PING 10.0.1.25 (10.0.1.25) 56(84) bytes of data.
```

At the bottom of the terminal window, a footer bar displays the server information: "i-0745a1a0224ba076c (NextWork Public Server)" and "Public IPs: 43.205.99.168 Private IPs: 10.0.0.178".

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# Troubleshooting Connectivity

I troubleshooted this by checking the network ACLs and security groups for NextWork Private Server, finding that inbound ICMP traffic was blocked. I updated both to allow ICMP from the public subnet, enabling successful server communication.

```
(ec2-user@ip-10-0-1-25 ~) % ping 10.0.1.25
PING 10.0.1.25 (10.0.1.25) 56(84) bytes of data.
64 bytes from 10.0.1.251 icmp_seq=311 ttl=127 time=0.433 ms
64 bytes from 10.0.1.251 icmp_seq=312 ttl=127 time=0.581 ms
64 bytes from 10.0.1.251 icmp_seq=313 ttl=127 time=0.485 ms
64 bytes from 10.0.1.251 icmp_seq=314 ttl=127 time=0.516 ms
64 bytes from 10.0.1.251 icmp_seq=315 ttl=127 time=0.507 ms
64 bytes from 10.0.1.251 icmp_seq=316 ttl=127 time=0.502 ms
64 bytes from 10.0.1.251 icmp_seq=317 ttl=127 time=0.451 ms
64 bytes from 10.0.1.251 icmp_seq=318 ttl=127 time=0.483 ms
64 bytes from 10.0.1.251 icmp_seq=319 ttl=127 time=0.416 ms
64 bytes from 10.0.1.251 icmp_seq=320 ttl=127 time=0.486 ms
64 bytes from 10.0.1.251 icmp_seq=321 ttl=127 time=1.65 ms
64 bytes from 10.0.1.251 icmp_seq=322 ttl=127 time=0.840 ms
64 bytes from 10.0.1.251 icmp_seq=323 ttl=127 time=0.495 ms
64 bytes from 10.0.1.251 icmp_seq=324 ttl=127 time=0.421 ms
64 bytes from 10.0.1.251 icmp_seq=325 ttl=127 time=0.423 ms
64 bytes from 10.0.1.251 icmp_seq=326 ttl=127 time=0.487 ms
64 bytes from 10.0.1.251 icmp_seq=327 ttl=127 time=0.517 ms
64 bytes from 10.0.1.251 icmp_seq=328 ttl=127 time=0.486 ms
64 bytes from 10.0.1.251 icmp_seq=329 ttl=127 time=0.539 ms
64 bytes from 10.0.1.251 icmp_seq=330 ttl=127 time=0.545 ms
64 bytes from 10.0.1.251 icmp_seq=331 ttl=127 time=0.455 ms
64 bytes from 10.0.1.251 icmp_seq=332 ttl=127 time=0.493 ms
64 bytes from 10.0.1.251 icmp_seq=333 ttl=127 time=0.520 ms
64 bytes from 10.0.1.251 icmp_seq=334 ttl=127 time=0.442 ms
64 bytes from 10.0.1.251 icmp_seq=335 ttl=127 time=0.518 ms
64 bytes from 10.0.1.251 icmp_seq=336 ttl=127 time=0.489 ms
64 bytes from 10.0.1.251 icmp_seq=337 ttl=127 time=0.461 ms
```

i-0745a1a0224ba076c (NextWork Public Server)  
PublicIPs: 43.205.99.168 PrivateIPs: 10.0.0.178



# Connectivity to the Internet

Curl is a network tool used to transfer data to or from a server. It goes beyond just checking connectivity - you can use curl to download data from websites or upload data to other servers on the internet.

I used curl to test the connectivity between my NextWork Public Server and the internet. By fetching data from external websites, I confirmed that the server's internet access and network settings were properly configured.

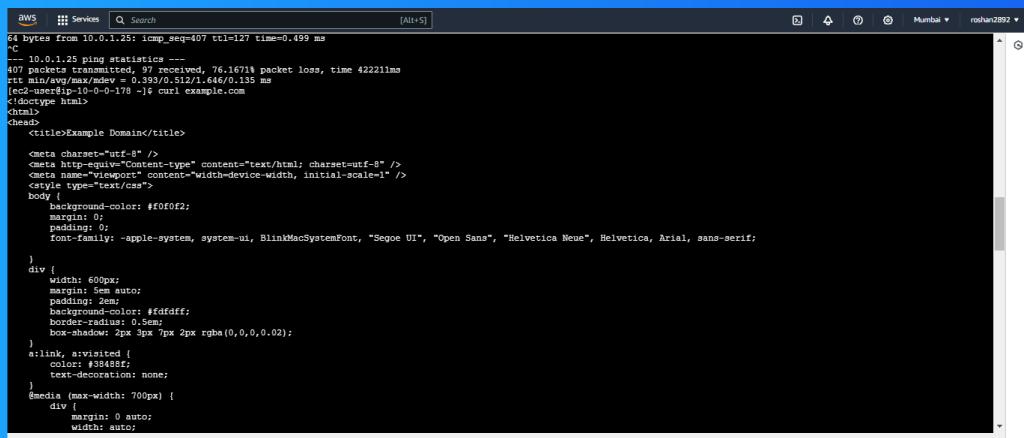
## Ping vs Curl

Ping and curl are different because ping tests basic connectivity via ICMP messages, while curl transfers data over HTTP. Ping checks if there's a connection, whereas curl fetches or uploads data to websites or servers.



# Connectivity to the Internet

I ran the curl command `curl https://learn.nextwork.org/projects/aws-host-a-website-on-s3`, which returned the webpage's HTML content, confirming that my Public Server could access the internet and fetch data from external sites.



```
aws Services Search [Alt+S]
64 bytes from 10.0.1.25: icmp_seq=407 ttl=127 time=0.499 ms
...
10.0.1.25 ping statistics ---
407 packets transmitted, 97 received, 76.1671% packet loss, time 42221ms
rtt min/avg/max/mdev = 0.393/0.512/1.646/0.135 ms
root@user@ip-10-0-0-178:~$ curl example.com
<!DOCTYPE html>
<html>
<head>
<title>Example Domain</title>
<meta charset="utf-8" />
<meta http-equiv="Content-type" content="text/html; charset=utf-8" />
<meta name="viewport" content="Width=device-width, initial-scale=1" />
<style type="text/css">
body {
    background-color: #f0f0f2;
    margin: 0;
    padding: 0;
    font-family: -apple-system, system-ui, BlinkMacSystemFont, "Segoe UI", "Open Sans", Helvetica, Arial, sans-serif;
}
div {
    width: 600px;
    margin: 0 auto;
    background-color: #fafdff;
    border-radius: 0.5em;
    box-shadow: 2px 3px 7px 2px rgba(0,0,0,0.02);
}
a:link, a:visited {
    color: #38485f;
    text-decoration: none;
}
@media (max-width: 700px) {
    div {
        margin: 0 auto;
        width: auto;
    }
}
```



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