Troubleshooting a Network Issue

Objectives

After completing this lab, you should be able to:

- Analyze the customer scenario
- Troubleshoot the issue

Duration

This lab requires approximately **1 hour** to complete.

Scenario

Your role is a cloud support engineer at Amazon Web Services (AWS). During your shift, a consulting company has a networking issue within their AWS infrastructure. The following is the email and an attachment of their architecture:

Email from the customer

> Hello, Cloud Support!
>
> When I create an Apache server through the command line, I cannot ping it. I also get an error when I enter the IP address in the browser. Can you please help figure out what is blocking my connection?
>
> Thanks!
>
> Ana
> Contractor

Customer diagram

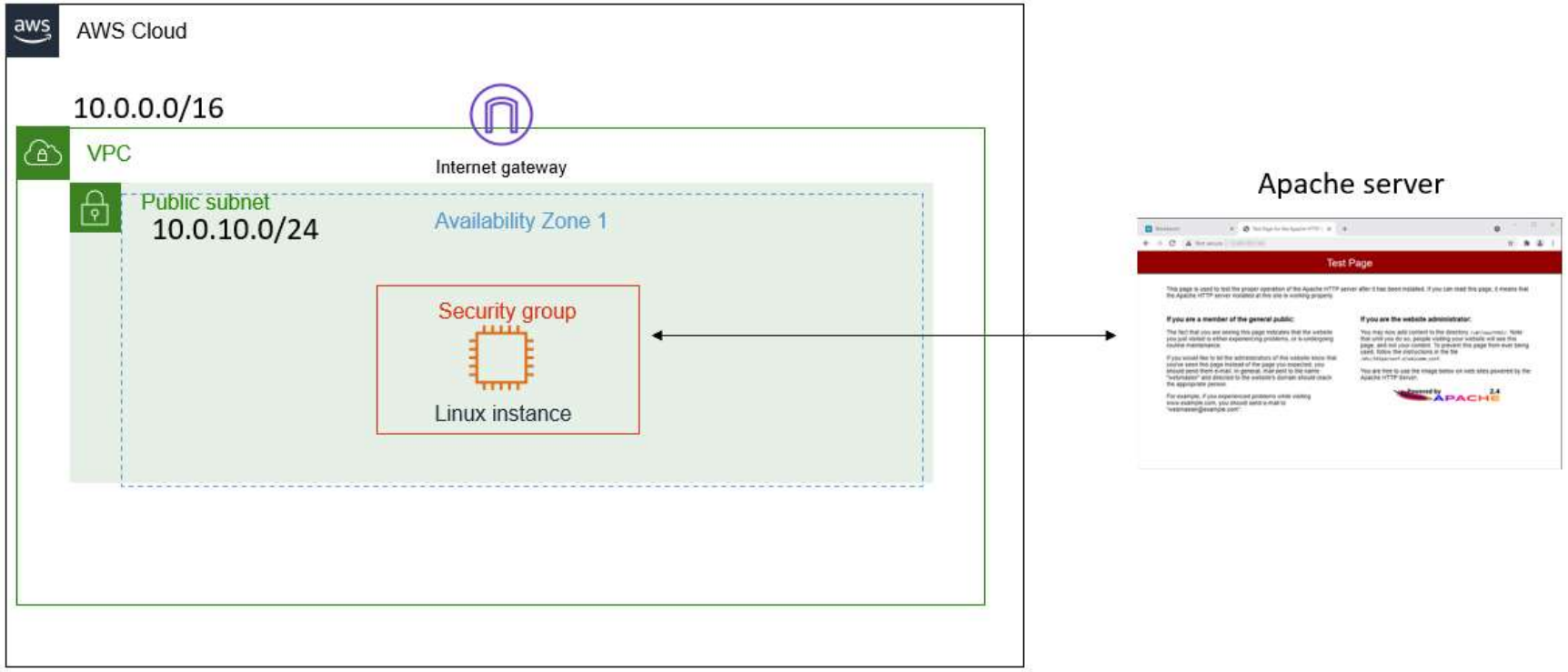

Figure: The customer's virtual private cloud (VPC) architecture.

AWS service restrictions

In this lab environment, access to AWS services and service actions might be restricted to the ones that you need to complete the lab instructions. You might encounter errors if you attempt to access other services or perform actions beyond the ones that this lab describes.

Accessing the AWS Management Console

1. At the top of these instructions, choose Start Lab to launch your lab.
   A **Start Lab** panel opens, and it displays the lab status.

   > **Tip**: If you need more time to complete the lab, choose the Start Lab button again to restart the timer for the environment.

2. Wait until you see the message *Lab status: ready*, then close the **Start Lab** panel by choosing the **X**.
3. At the top of these instructions, choose AWS.
   This opens the AWS Management Console in a new browser tab. The system will automatically log you in.

   > **Tip**: If a new browser tab does not open, a banner or icon is usually at the top of your browser with a message that your browser is preventing the site from opening pop-up windows. Choose the banner or icon and then choose **Allow pop ups**.

4. Arrange the AWS Management Console tab so that it displays along side these instructions. Ideally, you will be able to see both browser tabs at the same time so that you can follow the lab steps more easily.

Task 1: Use SSH to connect to an Amazon Linux EC2 instance

In this task, you will connect to a Amazon Linux EC2 instance. You will use an SSH utility to perform all of these operations. The following instructions vary slightly depending on whether you are using Windows or Mac/Linux.

Windows Users: Using SSH to Connect

💬 These instructions are specifically for Windows users. If you are using macOS or Linux, skip to the next section.

5. Select the Details drop-down menu above these instructions you are currently reading, and then select Show. A Credentials window will be presented.
6. Select the **Download PPK** button and save the **labsuser.ppk** file.
   Typically your browser will save it to the Downloads directory.
7. Make a note of the **PublicIP** address.
8. Then exit the Details panel by selecting the **X**.
9. Download **PuTTY** to SSH into the Amazon EC2 instance. If you do not have PuTTY installed on your computer, download it here.
10. Open **putty.exe**
11. Configure your PuTTY session by following the directions in the following link: Connect to your Linux instance using PuTTY
12. Windows Users: Select here to skip ahead to the next task.

macOS and Linux Users

These instructions are specifically for Mac/Linux users. If you are a Windows user, skip ahead to the next task.

13. Select the Details drop-down menu above these instructions you are currently reading, and then select Show. A Credentials window will be presented.
14. Select the **Download PEM** button and save the **labsuser.pem** file.
15. Make a note of the **PublicIP** address.
16. Then exit the Details panel by selecting the **X**.

17. Open a terminal window, and change directory `cd` to the directory where the *labsuser.pem* file was downloaded. For example, if the *labuser.pem* file was saved to your Downloads directory, run this command:

```
cd ~/Downloads
```

18. Change the permissions on the key to be read-only, by running this command:

```
chmod 400 labsuser.pem
```

19. Run the below command *(replace **<public-ip>** with the **PublicIP** address you copied earlier)*.
    Alternatively, return to the EC2 Console and select **Instances**. Check the box next to the instance you want to connect to and in the *Description* tab copy the **IPv4 Public IP** value.:

```
ssh -i labsuser.pem ec2-user@<public-ip>
```

20. Type `yes` when prompted to allow the first connection to this remote SSH server.
    Because you are using a key pair for authentication, you will not be prompted for a password.

Task 2: Install httpd

For this task, you install httpd prior to checking the customer's resources.

In the scenario, Ana, the customer requesting assistance, cannot reach her Apache server or get it to successfully load on a webpage from her virtual private cloud (VPC).

You have an exact replica of the customer's VPC and its resources to troubleshoot the issue.

> **Helpful hint**
>
> You may have to use **sudo** to complete this exercise if you are not root.

21. To check the status of the httpd service, enter the following **systemctl** command in the terminal window, and press Enter:

```
sudo systemctl status httpd.service
```

    After you run this command, you should see a result similar to the following, which indicates that the service is inactive:

```
[ec2-user@ip-10-0-10-155 ~]$ sudo systemctl status httpd.service
● httpd.service - The Apache HTTP Server
   Loaded: loaded (/usr/lib/systemd/system/httpd.service; disabled; vendor preset: disabled)
   Active: inactive (dead)
     Docs: man:httpd.service(8)
[ec2-user@ip-10-0-10-155 ~]$
```

Figure: The status shows that the httpd service is inactive because it has not been started yet. This output indicates that the httpd service is loaded (already installed) but is currently inactive.

22. To start the httpd service, enter the following command, and press Enter:

```
sudo systemctl start httpd.service
```

23. To check the status of the httpd service again, enter the following **systemctl** command, and press Enter:

```
sudo systemctl status httpd.service
```

After you run this command, you should see a result similar to the following, which indicates that the service is active:

```
[ec2-user@ip-10-0-10-155 ~]$ sudo systemctl start httpd.service
[ec2-user@ip-10-0-10-155 ~]$ sudo systemctl status httpd.service
● httpd.service - The Apache HTTP Server
   Loaded: loaded (/usr/lib/systemd/system/httpd.service; disabled; vendor preset: disabled)
   Active: active (running) since Mon 2021-11-01 22:34:27 UTC; 12s ago
     Docs: man:httpd.service(8)
 Main PID: 2586 (httpd)
   Status: "Total requests: 0; Idle/Busy workers 100/0;Requests/sec: 0; Bytes served/sec:   0 B/sec"
   CGroup: /system.slice/httpd.service
           ├─2586 /usr/sbin/httpd -DFOREGROUND
           ├─2587 /usr/sbin/httpd -DFOREGROUND
           ├─2589 /usr/sbin/httpd -DFOREGROUND
           ├─2594 /usr/sbin/httpd -DFOREGROUND
           ├─2596 /usr/sbin/httpd -DFOREGROUND
           └─2601 /usr/sbin/httpd -DFOREGROUND

Nov 01 22:34:27 ip-10-0-10-155.us-west-2.compute.internal systemd[1]: Starting The Apache HTTP Server...
Nov 01 22:34:27 ip-10-0-10-155.us-west-2.compute.internal systemd[1]: Started The Apache HTTP Server.
[ec2-user@ip-10-0-10-155 ~]$
```

Figure: The Apache HTTP Server should be in the Active status.

24. The httpd service is now running. Now check if it's working. In the following URL, replace with the public IP of your instance located in the details button in the Vocareum environment. Open a new browser tab, and enter the public IP of your instance with the following format:

```
http://<PUBLIC IP OF INSTANCE>
```

The following image shows the expected output; however, the page will not load at this point in the lab:

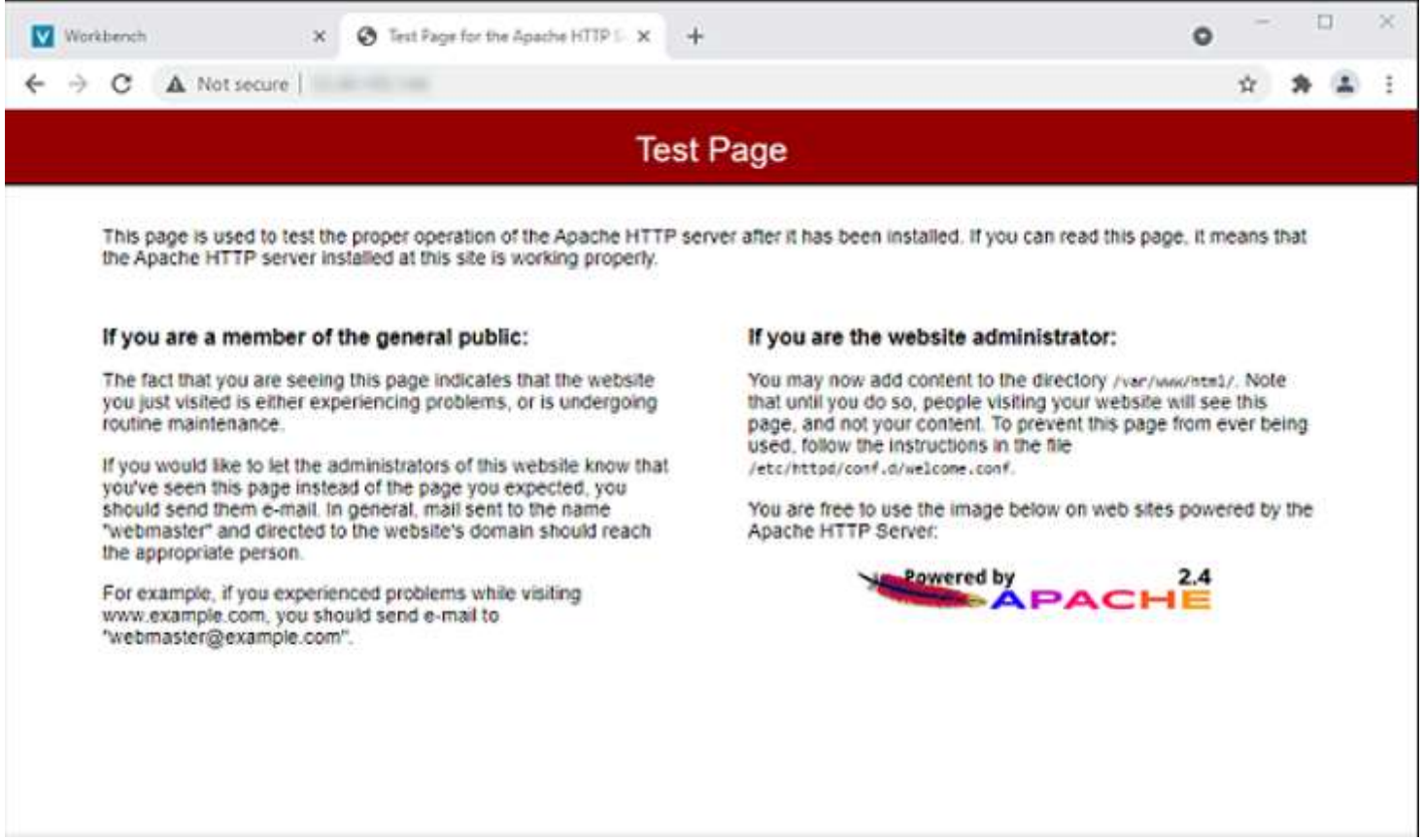

Figure: The test page of the Apache HTTP server when Apache is successfully installed

Task 3: Investigate the customer's VPC configuration

For this task, you will investigate the customer's VPC and their resources.

In the scenario, Ana, the customer requesting assistance, cannot reach her Apache server even though it is active. You have an exact replica of the customer's VPC and its resources. Keep the error that you received when trying to load Apache in the web browser in mind while troubleshooting this issue.

25. At the upper right of these instructions, choose **AWS**. The AWS Management Console opens in a new browser tab.
26. Once you are in the AWS console, in the **Recently visited services** section, you might see **VPC**. If you do, choose **VPC**. If you do not, navigate to the upper left, and choose the **Services** dropdown menu. Under the **Networking & Content Delivery** services, choose **VPC**.

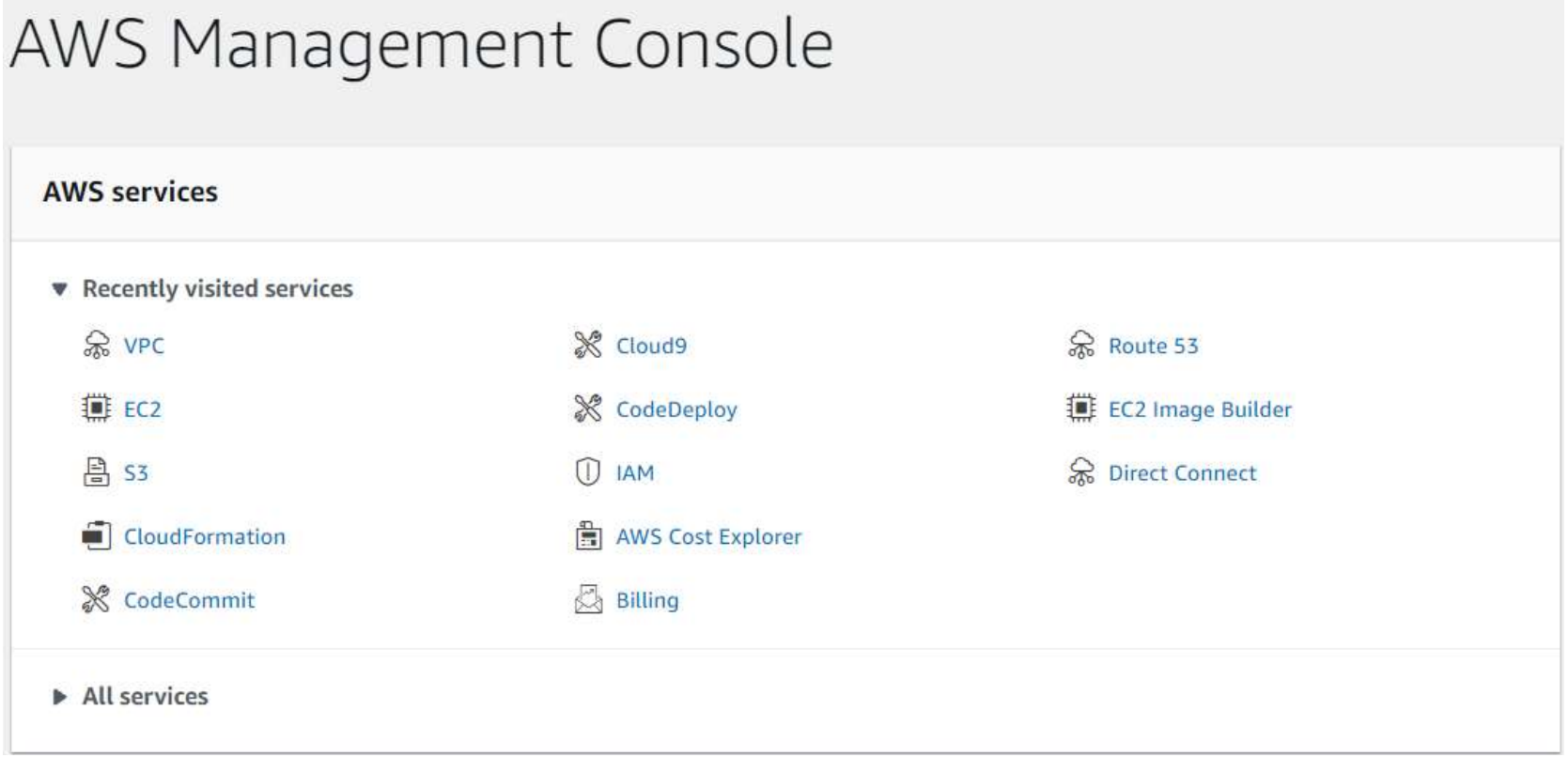

Figure: Recently visited services in the AWS console.

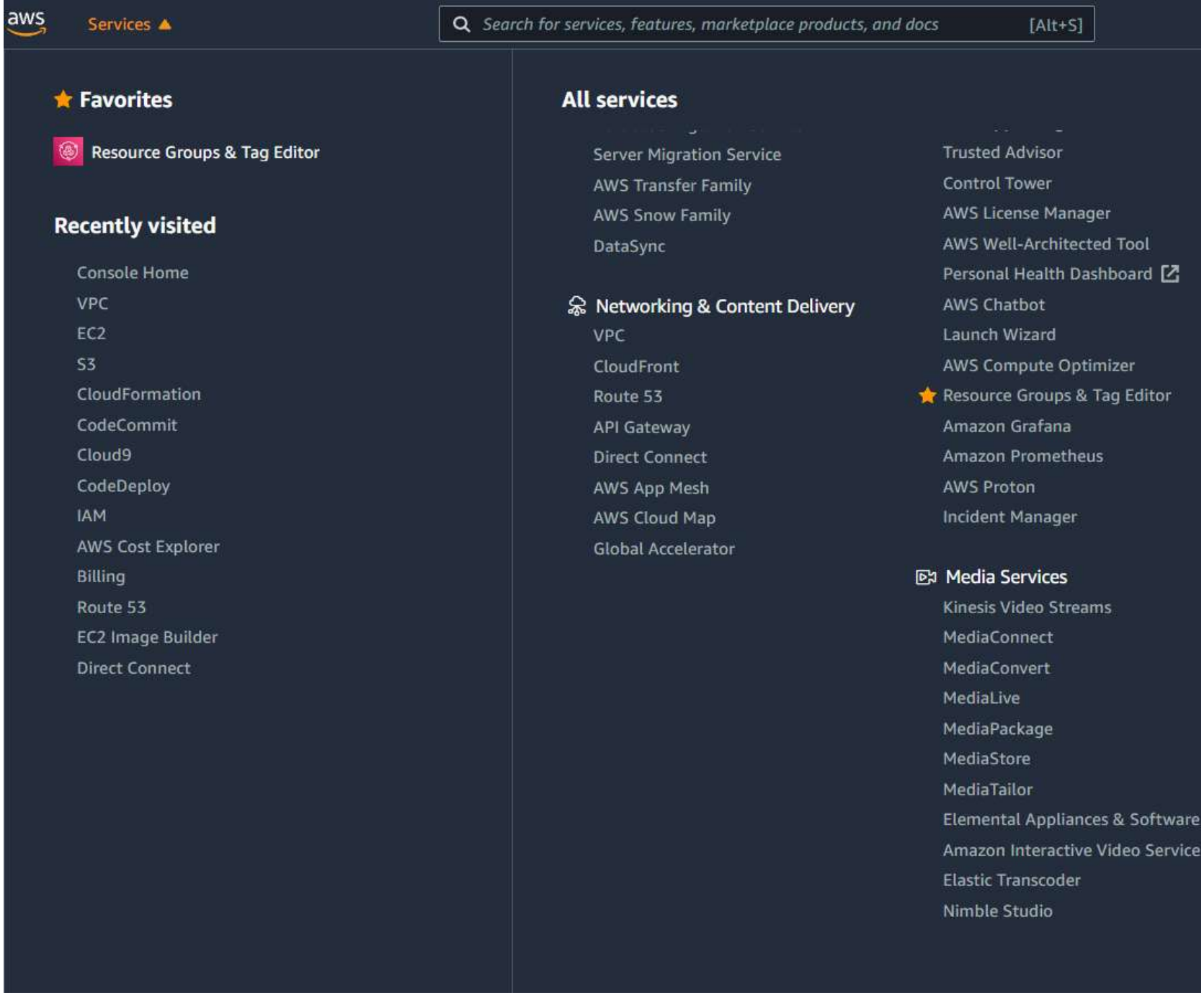

Figure: Services navigation dropdown list.

27. Use the left navigation pane and check each service within the VPC to confirm that each resource is configured correctly.

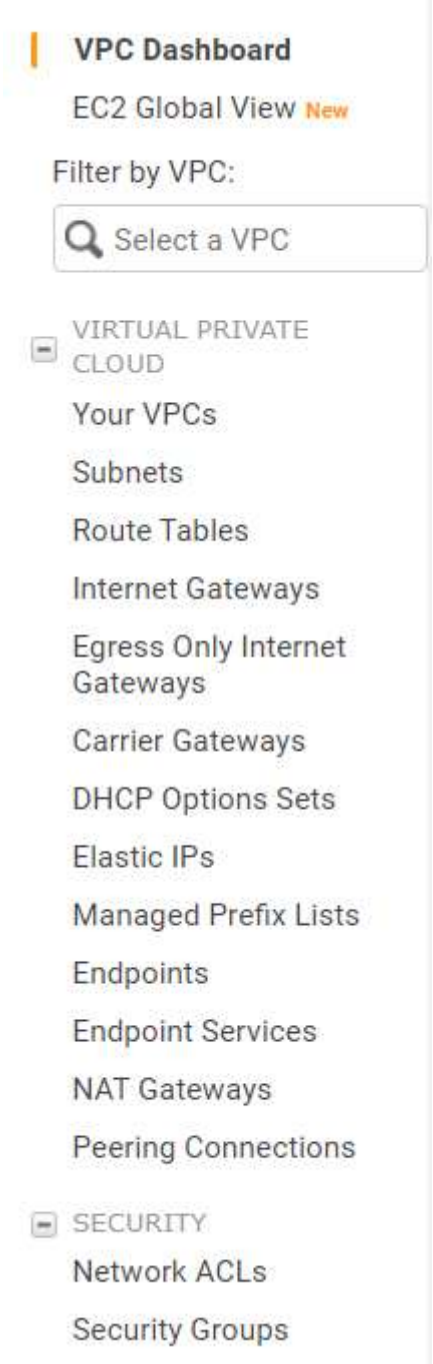

Figure: The left navigation pane of the VPC and its services.

- Subnets - Are the route tables associated to the correct subnets?
- Route Tables - Do the route tables have the correct routes?
- Internet Gateway - Is there an Internet Gateway and is it attached?
- Security Groups and network ACLs - Are the correct rules configured?

Hints

- Can you ping websites such as www.amazon.com? If so, you can get to the internet (the internet gateway and route table should work).
- Apache is a server that commonly uses HTTP/S as ports.

28. Once you have gone through each option in the previous step, such as routing, security, and resources. Confirm that the Apache HTTP server is working by testing the following URL into a browser by replacing with the public IP your your instance that can be found in the details drop down in Vocareum.

```
http://<PUBLIC IP OF INSTANCE>
```

If Apache is successfully installed, the following is the expected output:

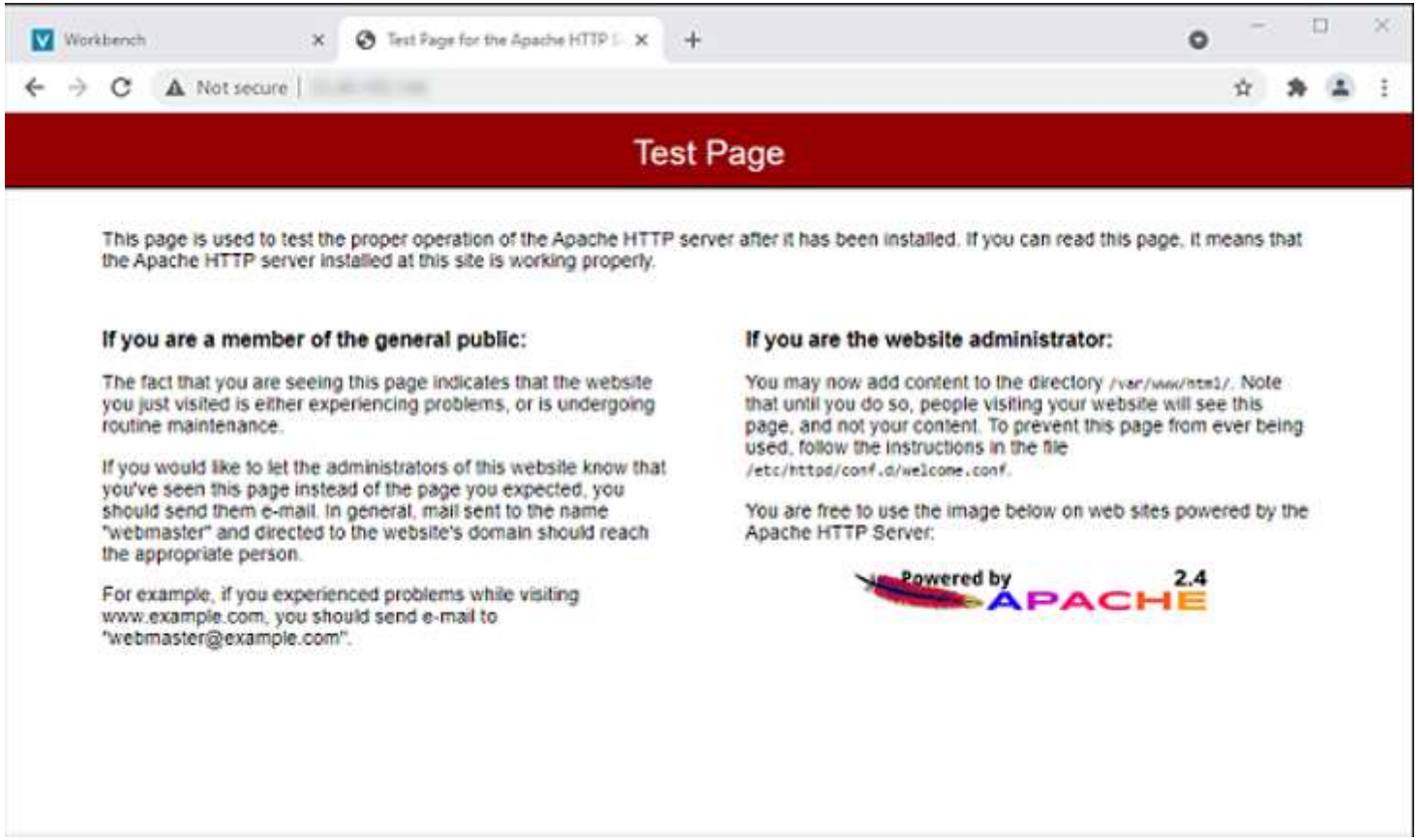

Figure: The test page of the Apache HTTP server when Apache is successfully installed.

Recap

▶ **In this lab**

Additional resources

- What is Amazon VPC?

Lab Complete 🎓

🏁 Congratulations! You have completed the lab.

29. Select End Lab at the top of this page and then select Yes to confirm that you want to end the lab.
    A panel will appear, indicating that "DELETE has been initiated... You may close this message box now."
30. Select the **X** in the top right corner to close the panel.

If you would like to share any suggestions or corrections, please provide the details in our AWS Training and Certification Contact Form.