6.14 Lab: Explore DHCP Troubleshooting

Candidate: COMPTIA COMPTIA ()
Time Spent: 01:01

Score: 0%

Task Summary

Required Actions and Questions

- ✗ *Q1*: What is the IP address of the ISP?
  Your answer:
  Correct answer: 198.28.2.254
- ✗ *Q2*: How many hops did it take to access the ISP
  Your answer:
  Correct answer: 4
- ✗ *Q3*: What is the name of the device accessed on the third hop?
  Your answer:
  Correct answer: CorpNet pfSense
- ✗ Fix the subnet mask on Exec
- ✗ Fix the gateway on Exec
- ✗ Enable the scope on the DHCP Server
- ✗ Fix the 003 Router option on the DHCP Server
- ✗ Configure Exec for DHCP

Explanation

Complete this lab as follows:

1. From CorpServer, check network connectivity.
   a. Right-click CorpServer and select **Launch Windows**.
   b. Mouse over the **Network** icon in the Notification Area.
   Note that the Notification Area appears normal (a computer icon is shown), which indicates a connection to the local network and the internet. When you mouse over the Network icon, you see the details of this status.
2. Access the Network & Internet settings.
   a. Right-click **Start** and then select **Settings**.
   b. Select **Network & Internet**.
   The Network Status diagram confirms that CorpServer is connected to the local network

and to the internet.

3. Ping the ISP to verify connectivity through the router and the internet.
   a. From the top left, select **Network Modeler**.
   b. Locate the IP address of the ISP Internet Router.
   c. From the top right, select **Questions** and answer question 1.
   d. Minimize the Lab Questions dialog.
   e. On CorpServer, Launch Windows.
   f. Right-click **Start** and select **Windows PowerShell (Admin)**.
   g. From the PowerShell prompt, type **ping**, followed by a space and the *ISP's IP address from Question 1*, and press **Enter**.
   Notice that the ping was successful, verifying a valid connection to the internet.
4. Use the **ipconfig** and **tracert** commands to find the devices used to access the ISP.
   a. From the PowerShell prompt, type **ipconfig /all** and press **Enter**.
   b. Locate and examine the *vEthernet (External)* configuration settings and note the following:
      - DHCP Enabled: No. This tells us that the server is configured with a static IP address and is not enabled for DHCP.
      - IPv4 Address: 192.168.0.10
      - Subnet Mask: 255.255.255.0. The server is using the default subnet mask for the Class C IP address range.
      - Default Gateway: 192.168.0.5. The router's internal interface is configured as the default gateway.
   c. From the PowerShell prompt, type **tracert *ISP_IPaddress*** to see the path to the ISP.
   d. From the top right, select **Questions** and answer question 2.
   e. From the top left, select **Network Modeler**.
   f. Answer Question 3.
   g. Minimize the Lab Questions dialog.
5. From Exec, check the status of the link and network activity lights.
   a. Right-click Exec and select **Launch Windows**.
   b. From the top left, select **Executive Office**.
   c. Above the workstation, select **Back** to switch to the back view of the workstation.
   The link and network activity lights on the network card are on and blinking. This indicates that there's a physical connection to the switch and there's activity on the connection. This points to a TCP/IP configuration problem.
6. Verify the connectivity on the Exec workstation.
   a. On the Exec monitor, select **Click to view Windows 11**.
   b. In the Notification Area, mouse over the **Network** icon.
   Notice that the pop-up indicates there is no internet access.
   c. Right-click **Start** and then select **Settings**.
   d. Select **Network & internet**.
   The Network & internet status diagram confirms that the Exec computer has no connection to the internet.
   e. Right-click **Start** and select **Terminal (Admin)**.
   f. From the Terminal prompt, type **ping Exec** and then press **Enter**.
   Notice that the ping was successful
   g. From the Terminal prompt, type **ping CorpServer** and then press **Enter**.
   Notice that the ping to CorpServer failed.
   h. From the PowerShell prompt, type **ipconfig /all** and then press **Enter**. From this command the following is shown for the Ethernet interface card:
      - DHCP Enabled: No
      - IPv4 Address: 192.168.0.62
      - Subnet Mask: 255.255.255.240
      - Default Gateway: 192.168.0.4

   This information provides the following clues to the problem:

      - The network is using DHCP, but this workstation is not enabled for DHCP.

- Given the workstation's current subnet mask, the workstation's IPv4 address and the default gateway are not on the same network.
- The subnet mask is not the default subnet mask for the Class C IP address range being used. With 255.255.255.240 as a subnet mask, the network would only include addresses from 192.168.0.48 to 192.168.0.63.
- In Step 4, you learned that CorpServer (192.168.0.10) had a default subnet mask for the Class C IP address range (255.255.255.0), which doesn't match Exec.

7. Fix the subnet mask for the Exec computer.
   a. From **Settings** > **Network & Internet**, select **Ethernet**.
   b. Under IP assignment, select **Edit**.
   c. Change the Subnet mask to: **255.255.255.0** and then select **Save**.
   d. From the Terminal prompt, type **ping CorpServer** and then press **Enter**.
   Notice the ping is now successful.
   e. Type **ping 198.28.2.254** (the ISP) and then press **Enter**.
   Notice the ping is still unsuccessful.
   f. Type **tracert 198.28.2.254** (the ISP) and then press **Enter**.
   The command times out, indicating that the gateway address on Exec is not configured correctly. The gateway address (router) on the network diagram is 192.168.0.5.
8. Fix the default gateway for the Exec computer.
   a. From **Settings** > **Network & Internet** > **Ethernet**.
   b. Under IP assignment, select **Edit**.
   c. Change the Default gateway to **192.168.0.5** and then select **Save**.
   d. From the Settings app, select **Network & Internet** again.
   The Status diagram now shows a connection to the internet.
   e. Close the Settings app.
   f. Notice that the network icon in the Notification Area is now showing a computer, indicating a connection to the internet.
   g. From the Terminal prompt, type **ping 198.28.2.254**.
   The ping is now successful.
   h. Type **tracert 198.28.2.254** and press **Enter**.
   The route taken to get to the ISP is now shown. Since there is now a valid connection to the internet, leave the static address for now and begin to troubleshoot the Office1 computer.
   i. Select **Network Modeler** to return to the network diagram.
9. From Office1, troubleshoot for network connectivity.
   a. Right-click Office1 and select **Launch Windows**.
   b. From the top left, select **Office 1**.
   c. Above the workstation, select **Back** to switch to the back view of the workstation.
   The link and network activity lights on the back of the workstation are on and blinking, indicating that there's a physical connection to the switch and there's activity on the connection. Once again, this points to a TCP/IP configuration problem.
   d. On the Office1 monitor, select **Click to view Windows 11**.
   e. In the Notification Area, mouse over the **Network** icon.
   Notice that the pop-up indicates there is no internet access.
   f. Right-click **Start** and select **Terminal (Admin)**.
   g. From the Terminal prompt, type **ipconfig /all** and then press **Enter**. Examine the information for the Ethernet network card and note the following:
      - DHCP Enabled: Yes. This tells us that the workstation is configured to use a DHCP server.
      - IPv4 Address: This address is in the APIPA range (169.254.0.1 to 169.254.255.254). This means that the workstation assigned itself an IP address instead of receiving one from the DHCP server. The workstation will only be able to communicate with other hosts on the local network that have also configured their own IP address through APIPA.
      - Subnet Mask: 255.255.0.0. This is the default subnet mask for the APIPA address.
      - Default Gateway: The address is blank. This means that communication is limited only to other workstations on the local network.
      - DHCP Server line is not shown. This means that the workstation was unable to contact the DHCP server.

- DNS Servers line is not shown for IPv4.

Since DHCP is enabled, the rest of the information should have come from the DHCP server. From this, you can conclude that there's an issue with the DHCP server.

h. Select **Network Modeler** to return to the network diagram.

10. From CorpDHCP, launch the DHCP console and activate the scope.
    a. Right-click CorpDHCP and select **Launch Windows**.
    b. From the Server Manager menu bar, select **Tools** > **DHCP**.
    c. Expand **CorpDHCP.CorpNet.local** > **IPv4**.
    Notice that the folder icon for *Scope [192.168.0.1] Subnet1* has a down arrow, indicating that the DHCP scope is not active.
    d. Right-click **Scope [192.168.0.1] Subnet1** and select **Activate**.
    e. Select **Network Modeler** to return to the network diagram.
11. From Office1, check to see if activating DHCP fixed the issue.
    a. Right-click Office1 and select **Launch Windows**.
    b. From the Terminal prompt, type **ipconfig /renew** and press **Enter**. This command will request new IP address information from the DHCP server.
    Notice that the networking icon in the Notification Area still indicates that Office1 has no connection to the internet.
    c. From the Terminal prompt, type **ipconfig /all** and press **Enter**.
    Notice that the line for the default gateway, DNS server, and DHCP server (along with the new IP address) is now within the DHCP scope for the local network.
    d. From the Terminal prompt, type **ping CorpServer** and press **Enter**
    The ping command is successful.
    e. From the Terminal prompt, type **ping 198.28.2.254** (the ISP) and press **Enter**.
    Although you can ping CorpServer, you are still unable to ping the ISP.
    f. Review the output from the **ipconfig** command.
    Notice that the default gateway does not match the default gateway used by CorpServer or Exec. Since this IP information is coming from the DHCP server, you need to check the DHCP scope.
    g. Select **Network Modeler** to return to the network diagram.
12. From CorpDHCP, reconfigure the settings for the DHCP scope.
    a. Right-click CorpDHCP and select **Launch Windows**.
    b. From the DHCP console, expand **Scope [192.168.0.1] Subnet1**.
    c. Right-click **Scope Options** and then select **Configure Options**.
    d. Highlight the **003 Router** line.
    e. Under IP address, select **192.168.0.2** and then click **Remove**.
    f. In the IP address field, change the address to **192.168.0.5** and then click **Add**.
    g. Select **OK**.
    h. Select **Network Modeler** to return to the network diagram.
13. From Office1, check to see if fixing the DHCP scope resolved the issue.
    a. Right-click Office1 and select **Launch Windows**.
    b. From the Terminal prompt, type **ipconfig /renew** and press **Enter**. This command requests new IP address information from the DHCP server.
    Notice that the networking icon in the Notification Area now indicates that Office1 has a connection to the internet.
    c. From the Terminal prompt, type **ipconfig /all** and press **Enter**.
    Notice that the line for the default gateway is now set to 192.168.0.5.
    d. From the Terminal prompt, type **ping 198.28.2.254** (the ISP) and press **Enter**.
    You can now ping the ISP.
    e. Select **Network Modeler** to return to the network diagram.
14. On Exec, reconfigure the Ethernet connection to use DHCP.
    a. Right-click Exec and select **Launch Windows**.
    b. Right-click **Start** and then select **Settings**.
    c. Select **Network & Internet**.
    d. Select **Ethernet**.
    e. Under IP assignment, select **Edit**.

f. Under Edit IP settings, select **Automatic (DCHP)** and then select **Save**.
g. From the Terminal prompt, type **ipconfig /all** and press **Enter**.
   Notice that the Ethernet card is now using DHCP (DHCP Enable: Yes).
h. Type **tracert 198.28.2.254** and press **Enter**.
   The command returns a path to the ISP through the gateway. The network is now fully functional, and your troubleshooting is complete.