Installing and Configuring DHCP

In this hands-on project scenario, you are an IT administrator for a medium-sized company that uses a local area network (LAN). The company has recently expanded and added new computers to the network. Your task is to manage the IP addresses effectively. You have decided to use a Dynamic Host Configuration Protocol (DHCP).

A DHCP server significantly simplifies IP management by dynamically assigning IP addresses to new computers on the network, ensuring no duplicates, and optimizing network usage. This automation will help save time, enhance network reliability and efficiency, and reduce the risk of human error in manual IP configuration.

Objectives

After following this project guide, you will be able to:

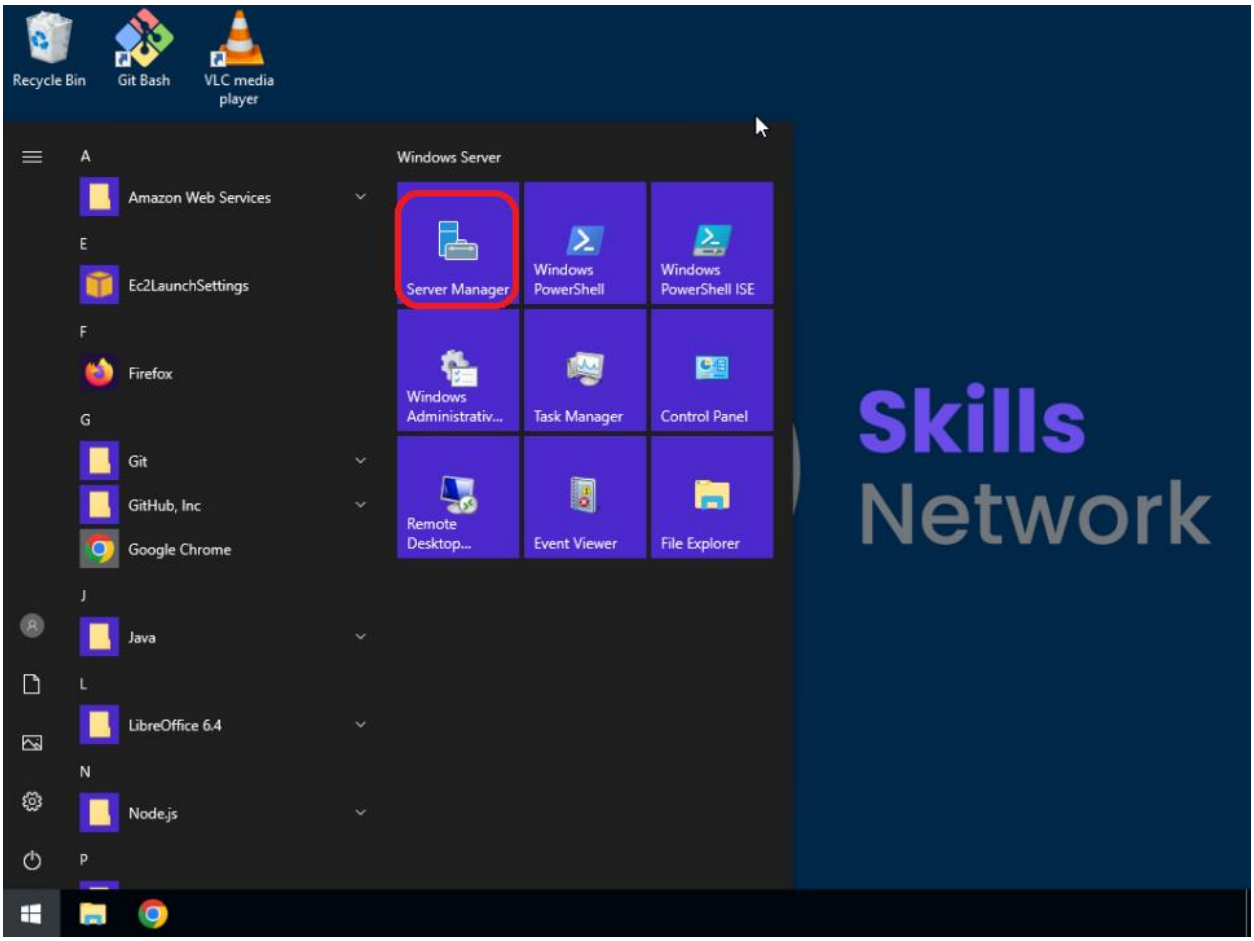
- Install the DHCP server role.
- Add a scope of IPv4 addresses between 192.168.1.2 and 192.168.1.254.
- Create an exclusion to ensure that the static IP addresses of your six printers are not distributed to other devices.

Phase 1: Installing and Configuring DHCP

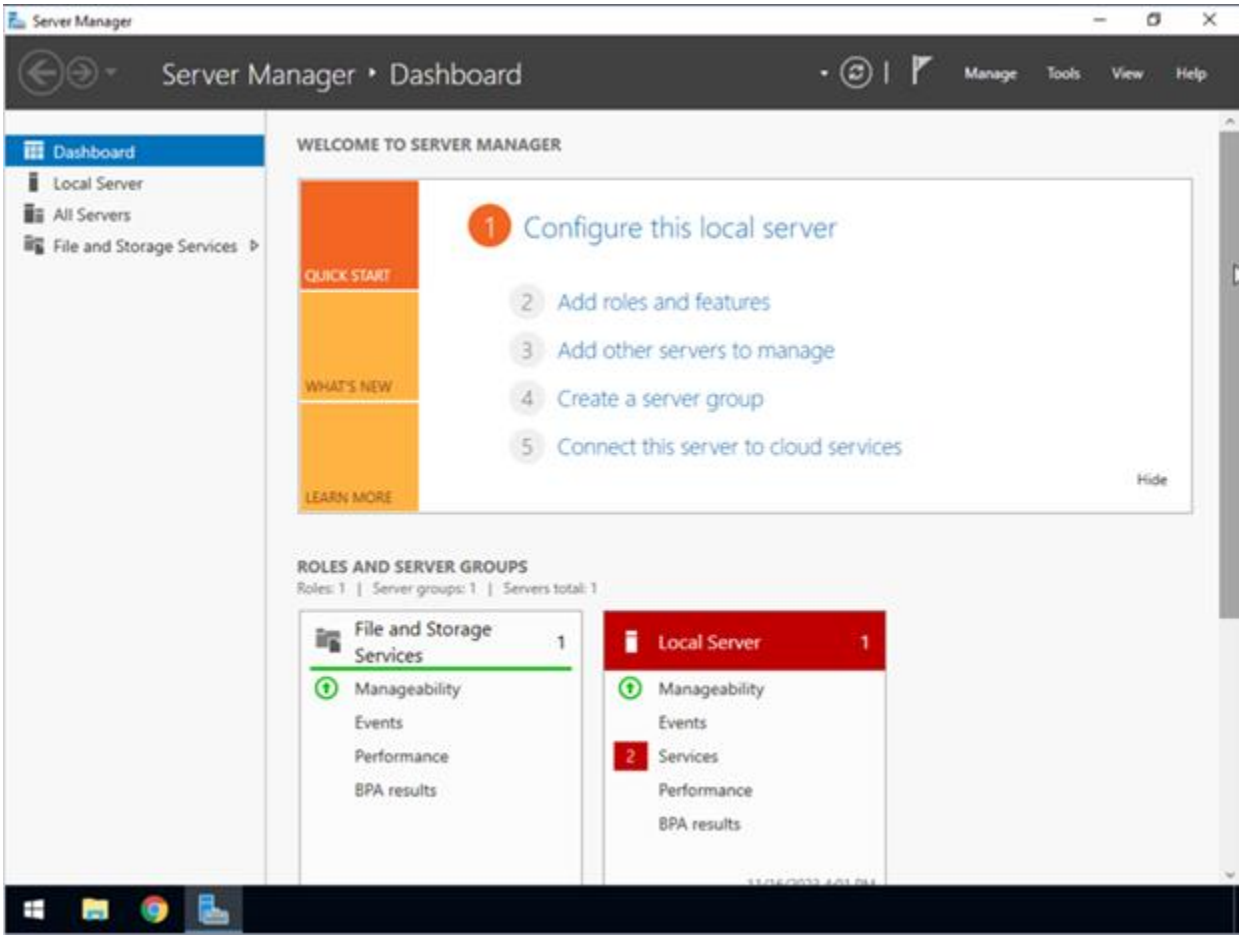
In this phase, you will install and configure the DHCP server.

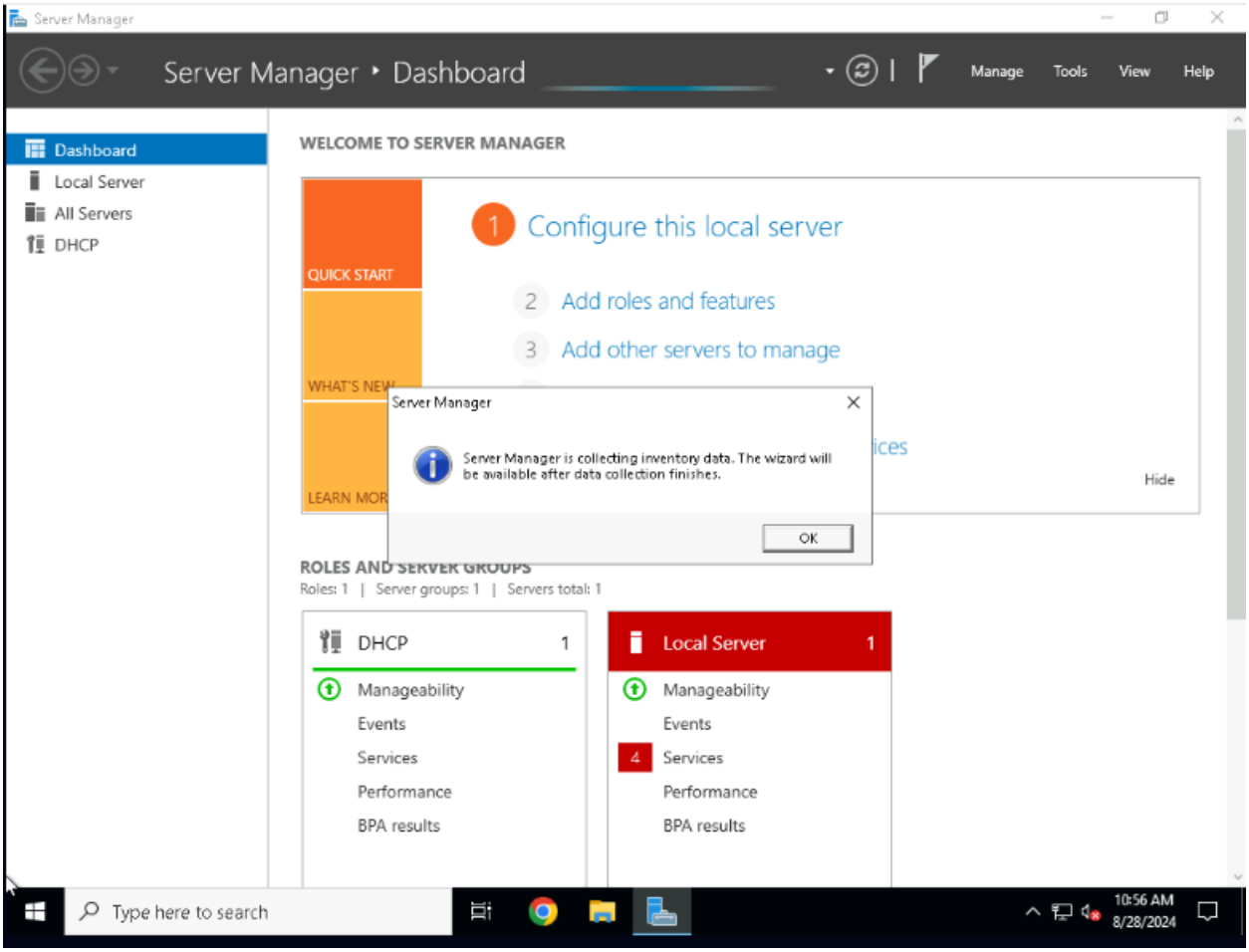
Task A: Install DHCP Server Role

1. Select the `Windows` key. Open `Server Manager` on your Windows Server.

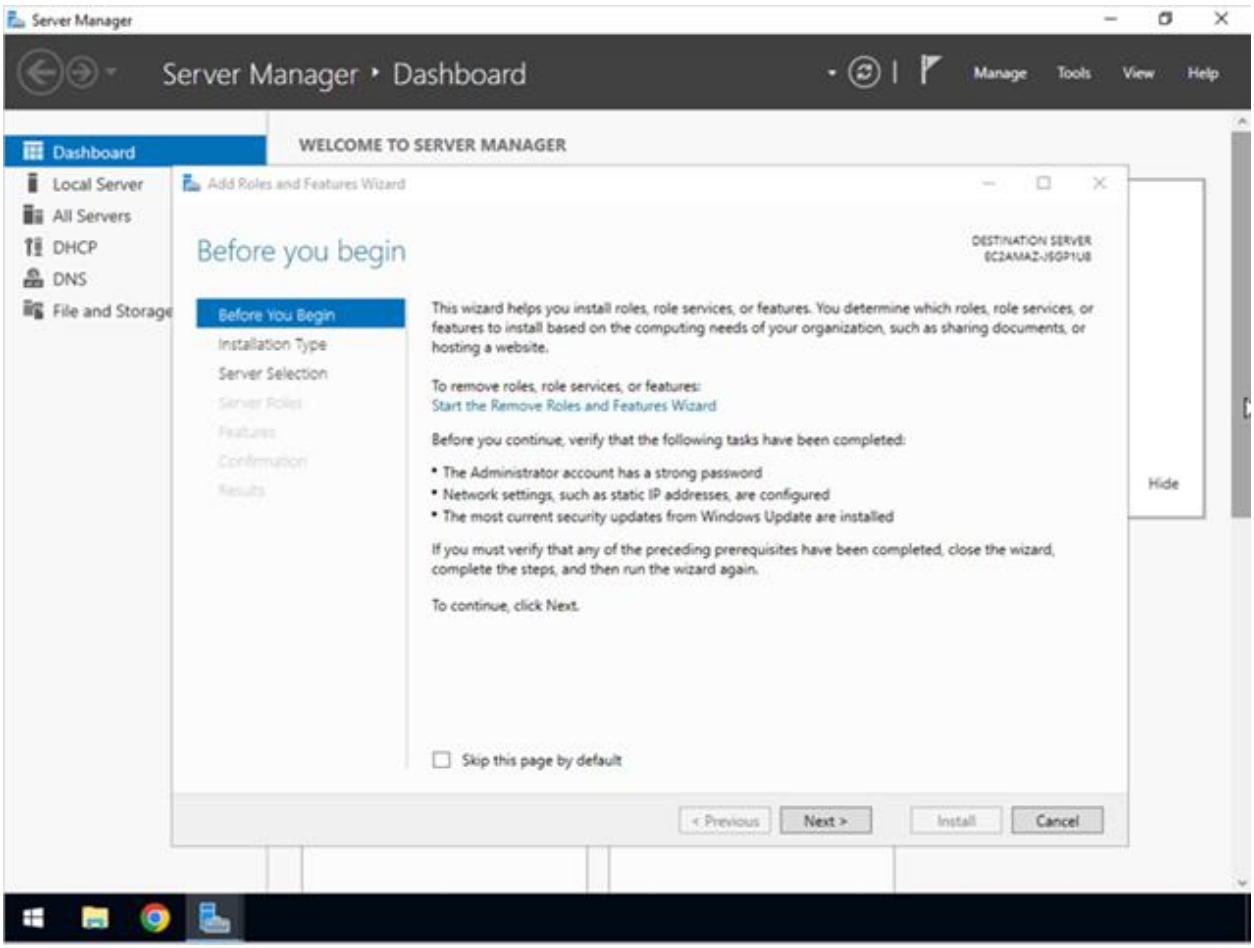


2. Select Add roles and features. Please try again if you get any pop up wizard stating as "The wizard will be available after data collection."

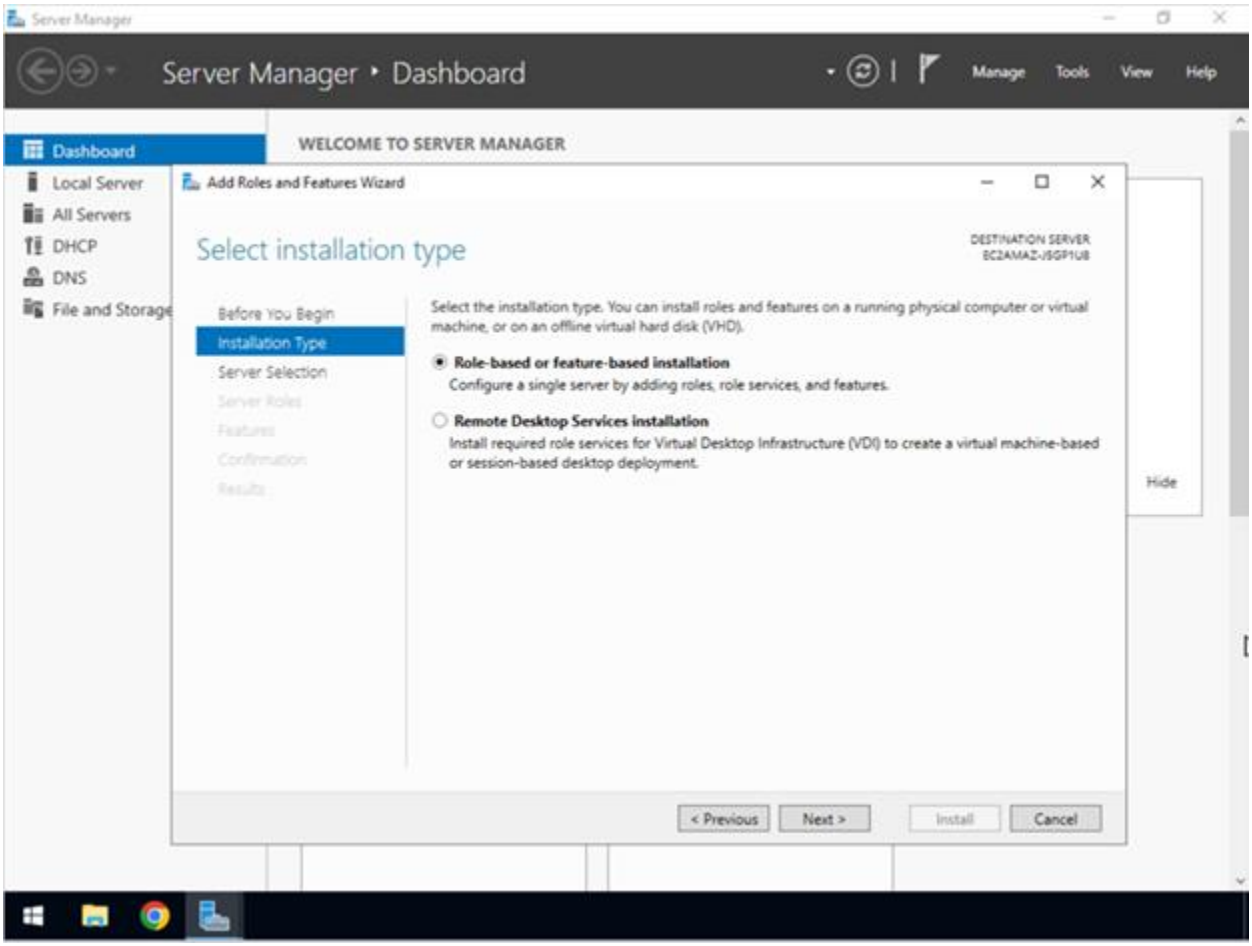

Server Manager
Server Manager • Dashboard
Manage
Tools
View
Help
Dashboard
Local Server
All Servers
File and Storage Services
WELCOME TO SERVER MANAGER
QUICK START
WHAT'S NEW
LEARN MORE
1 Configure this local server
2 Add roles and features
3 Add other servers to manage
4 Create a server group
5 Connect this server to cloud services
Hide
ROLES AND SERVER GROUPS
Roles: 1 | Server groups: 1 | Servers total: 1
File and Storage Services 1
Manageability
Events
Performance
BPA results
Local Server 1
Manageability
Events
2 Services
Performance
BPA results



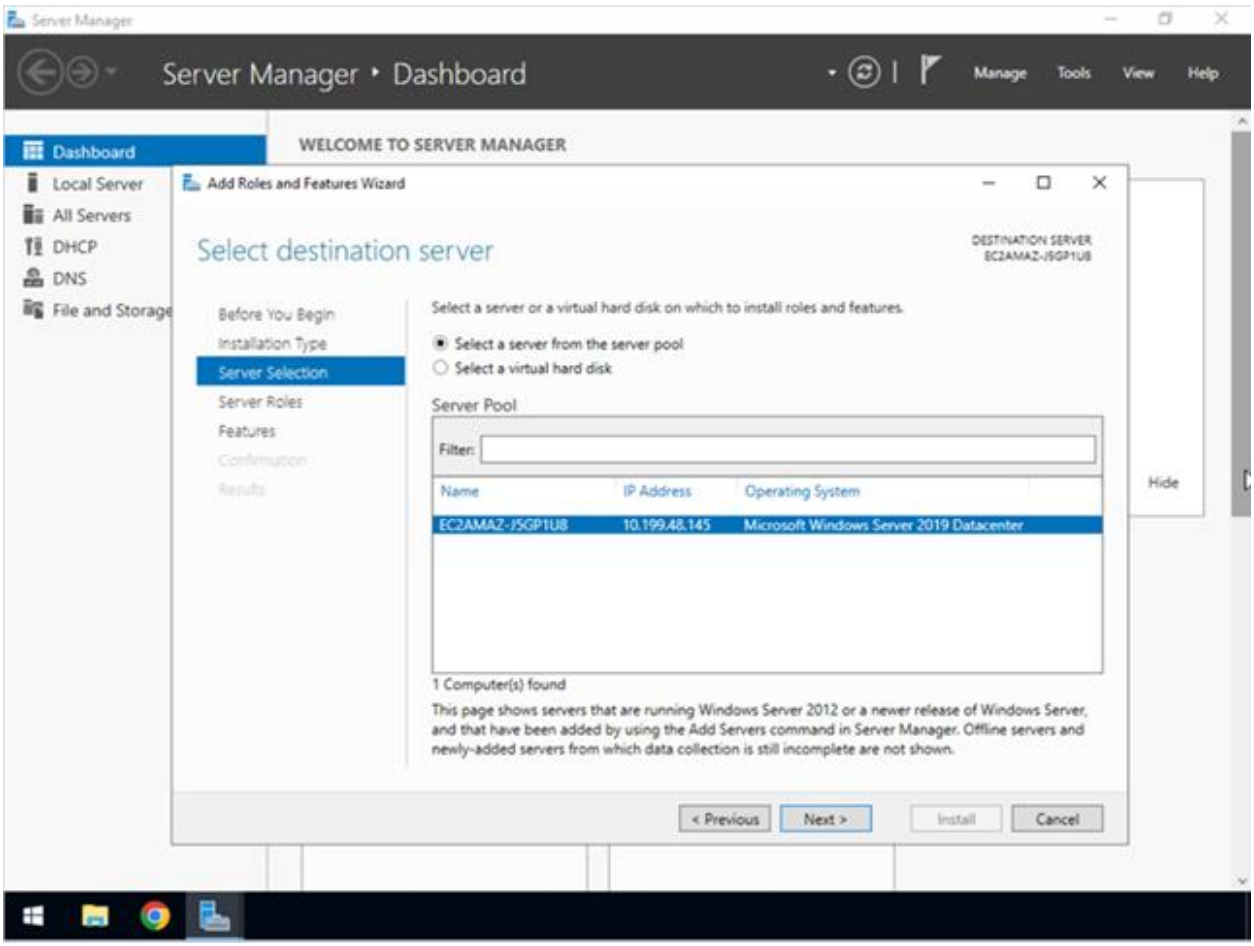
3. In the wizard that appears, click **Next**.



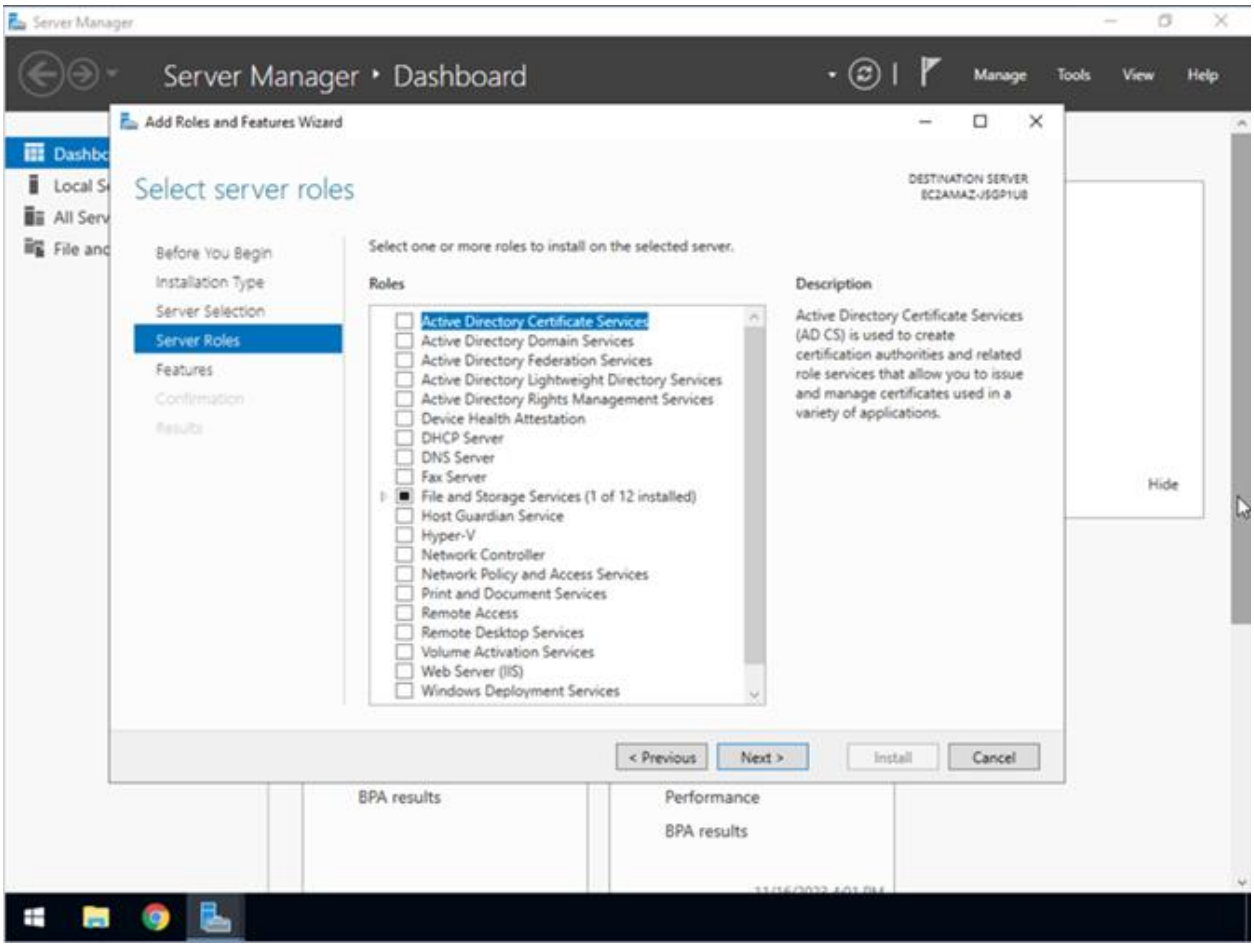
4. We will be configuring a single server by adding roles, role services, and features, so select `Role-based or feature-based installation` and click `Next`.



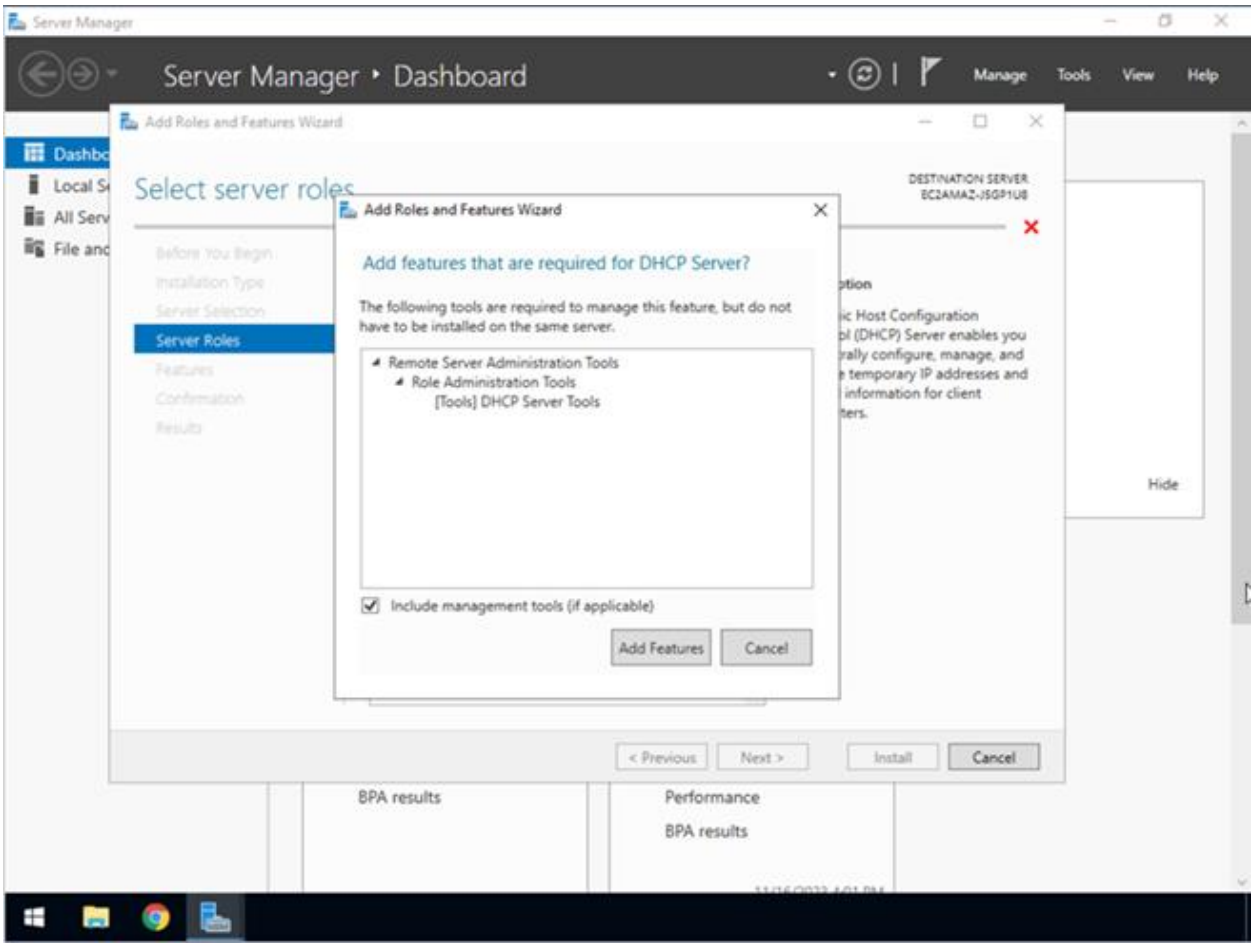
5. Select a server or a virtual hard disk where you want to install the roles and features. In this instance, there is only one option. Ensure that the server is selected and click **Next**.



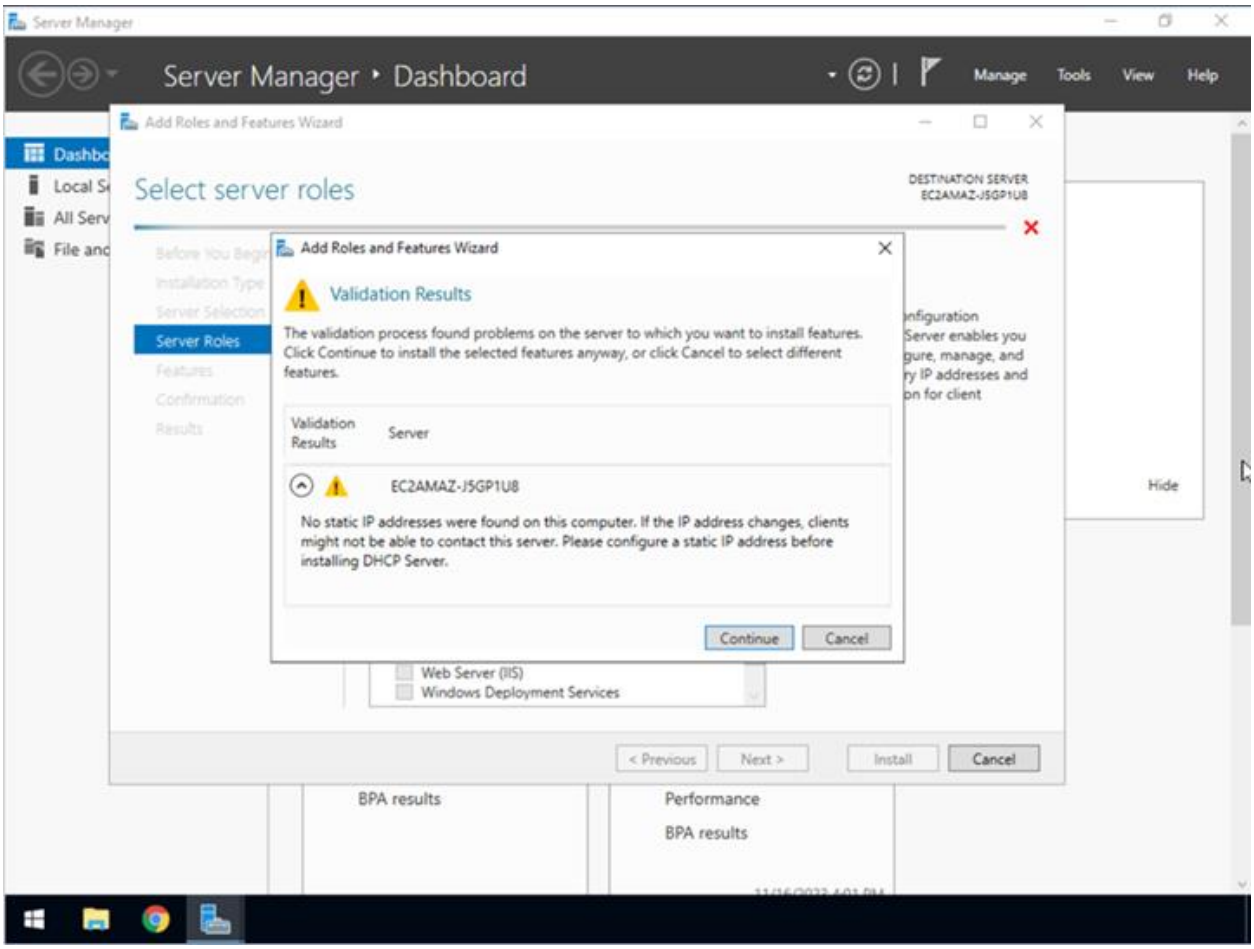
6. Check the box next to **DHCP Server**.



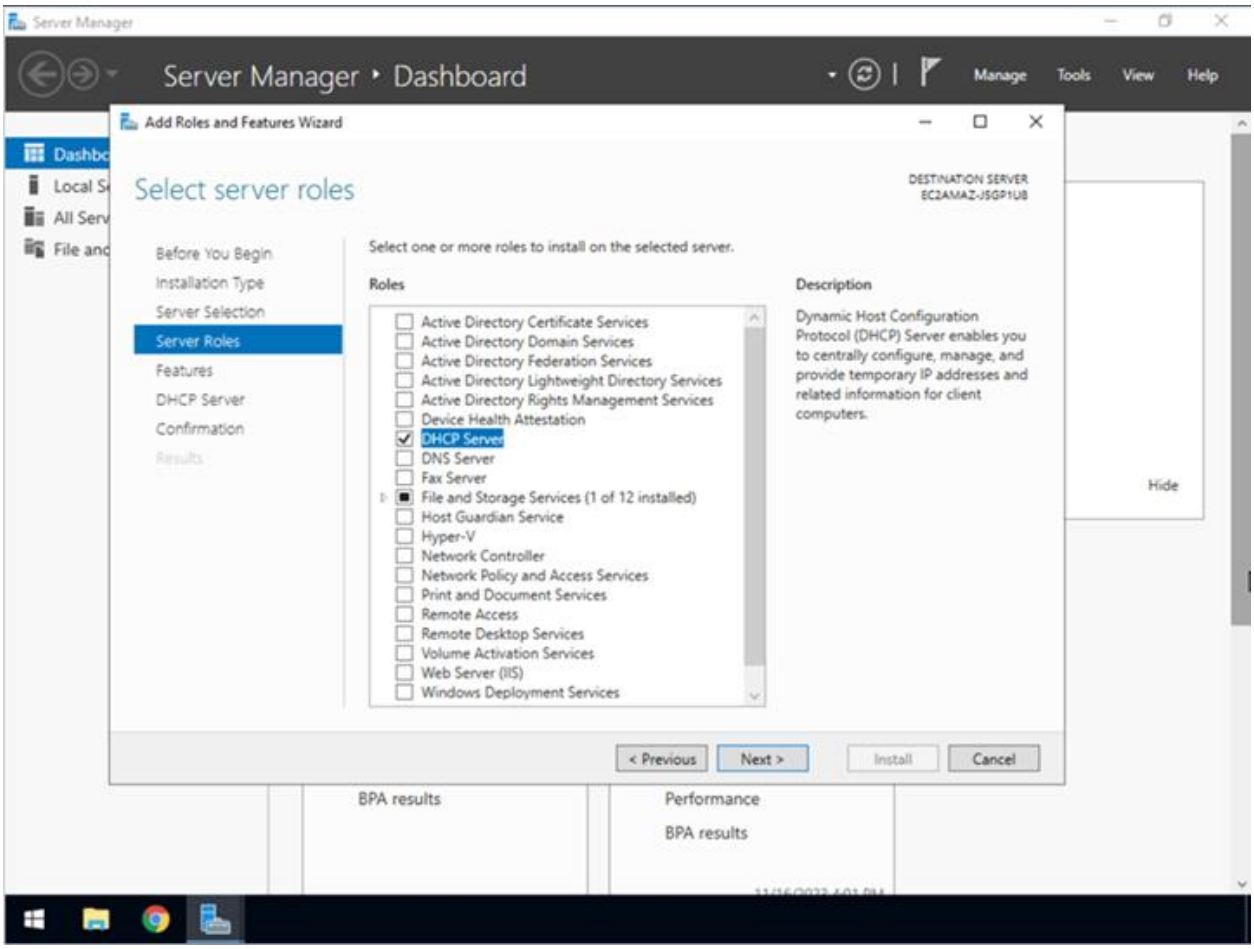
7. In the pop up wizard, Click **`Add Features`**.



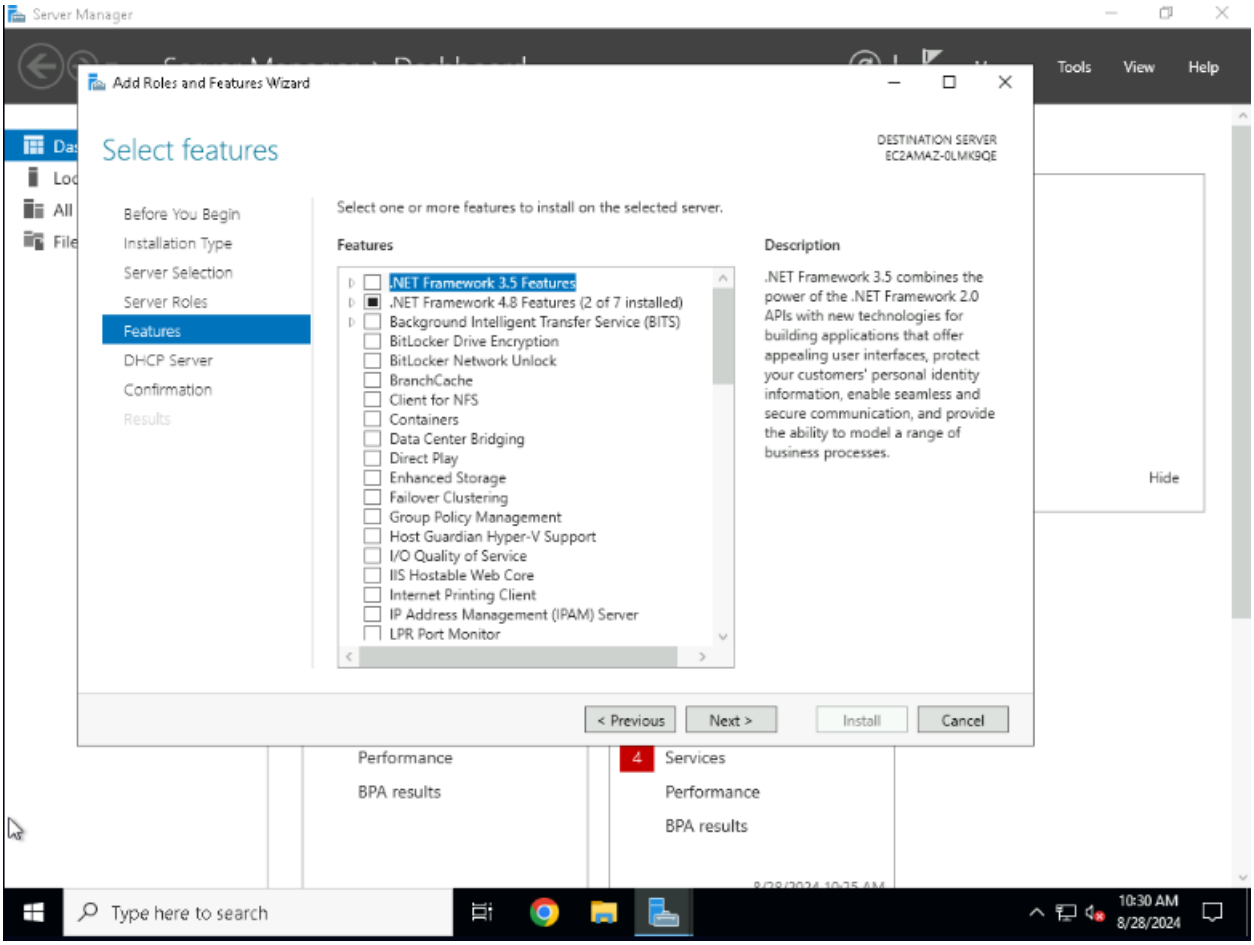
8. You may receive a **Validation Results** error because you are working in an educational environment. If you were working on a server with a dedicated, static IP address, this error would not appear. Select `Continue`.



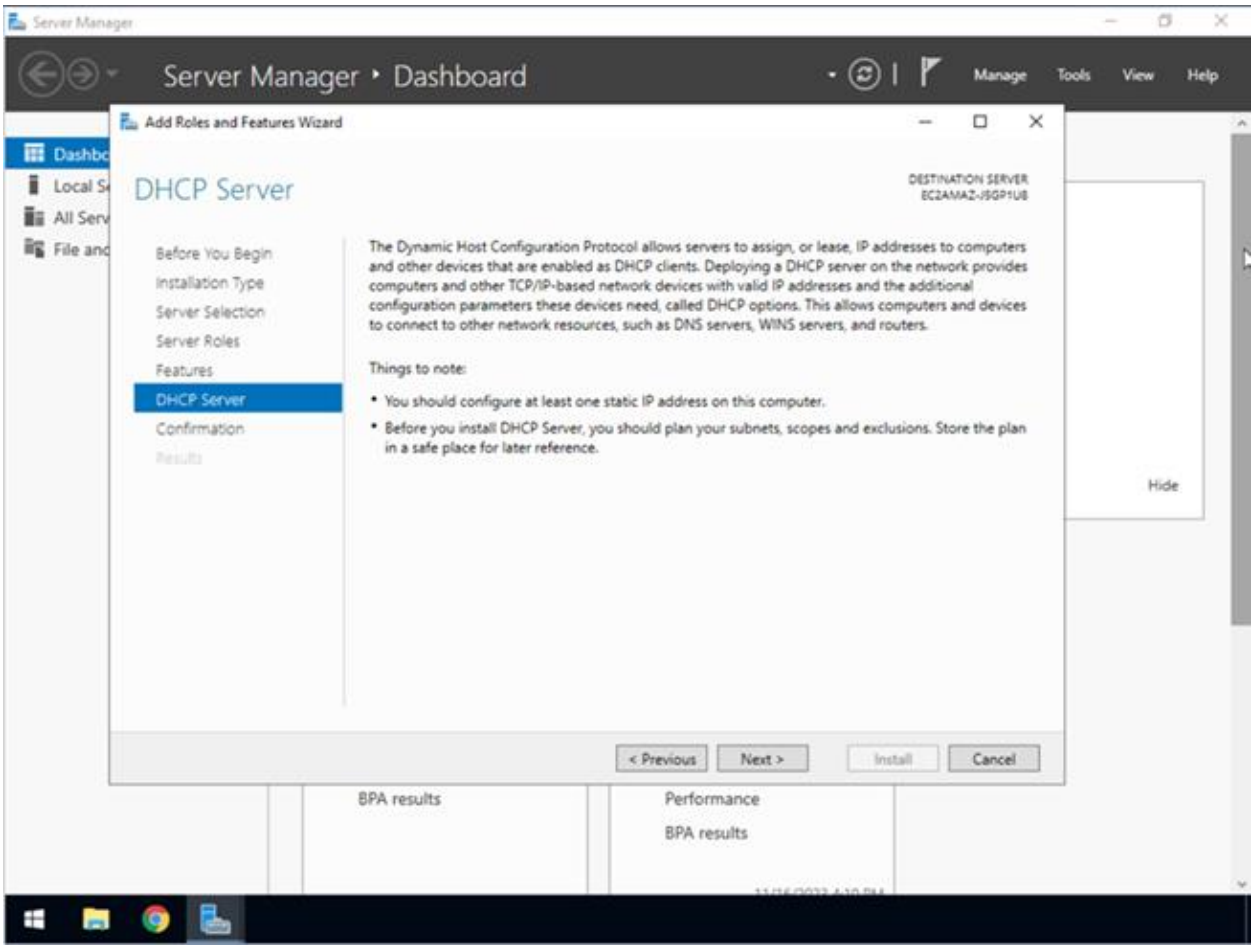
9. Select **Next**.



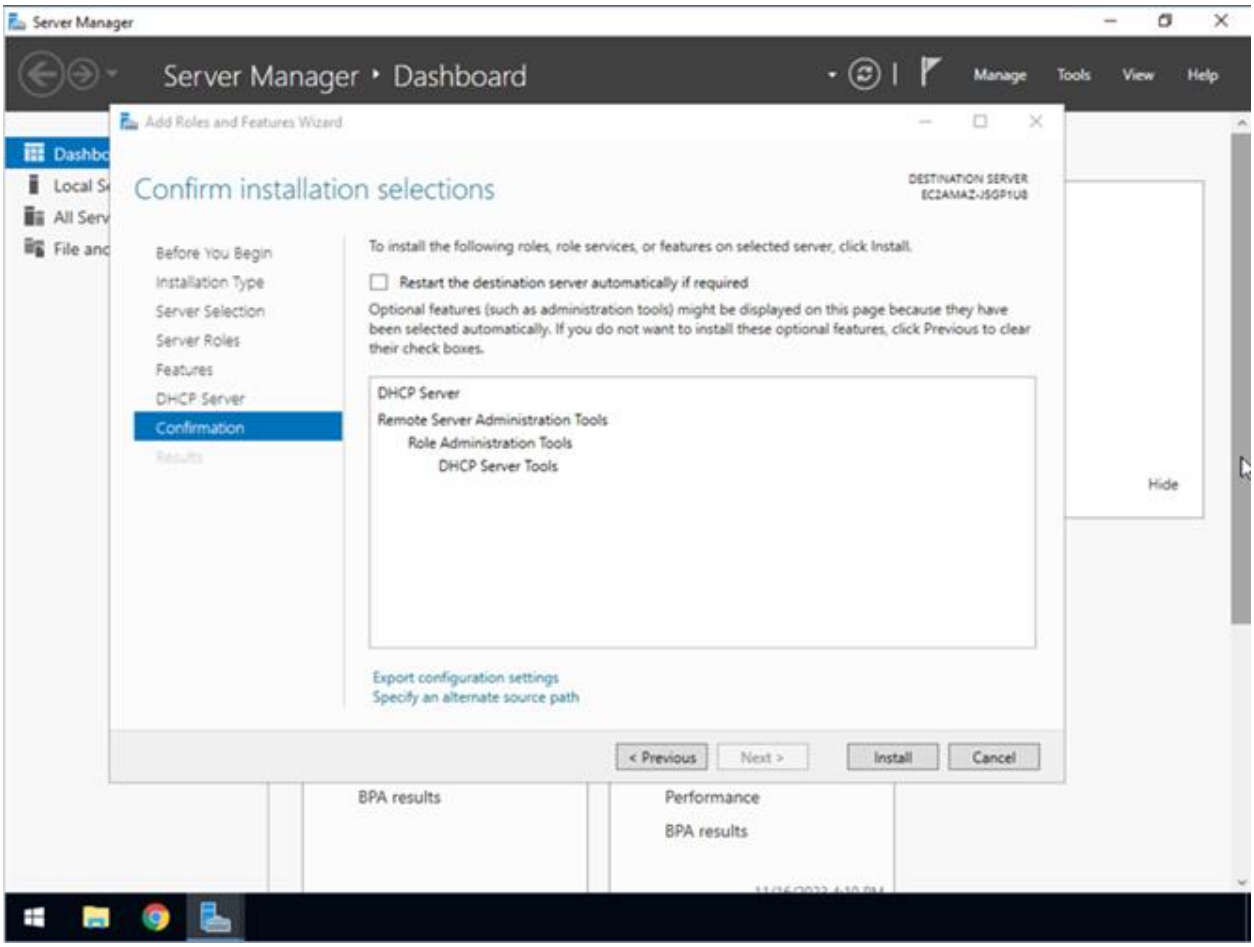
10. Next you will be asked to verify additional features that should be installed on the DHCP server. We will keep the default .NET Framework 4.8 Features because this provides important security features. Click **Next**.



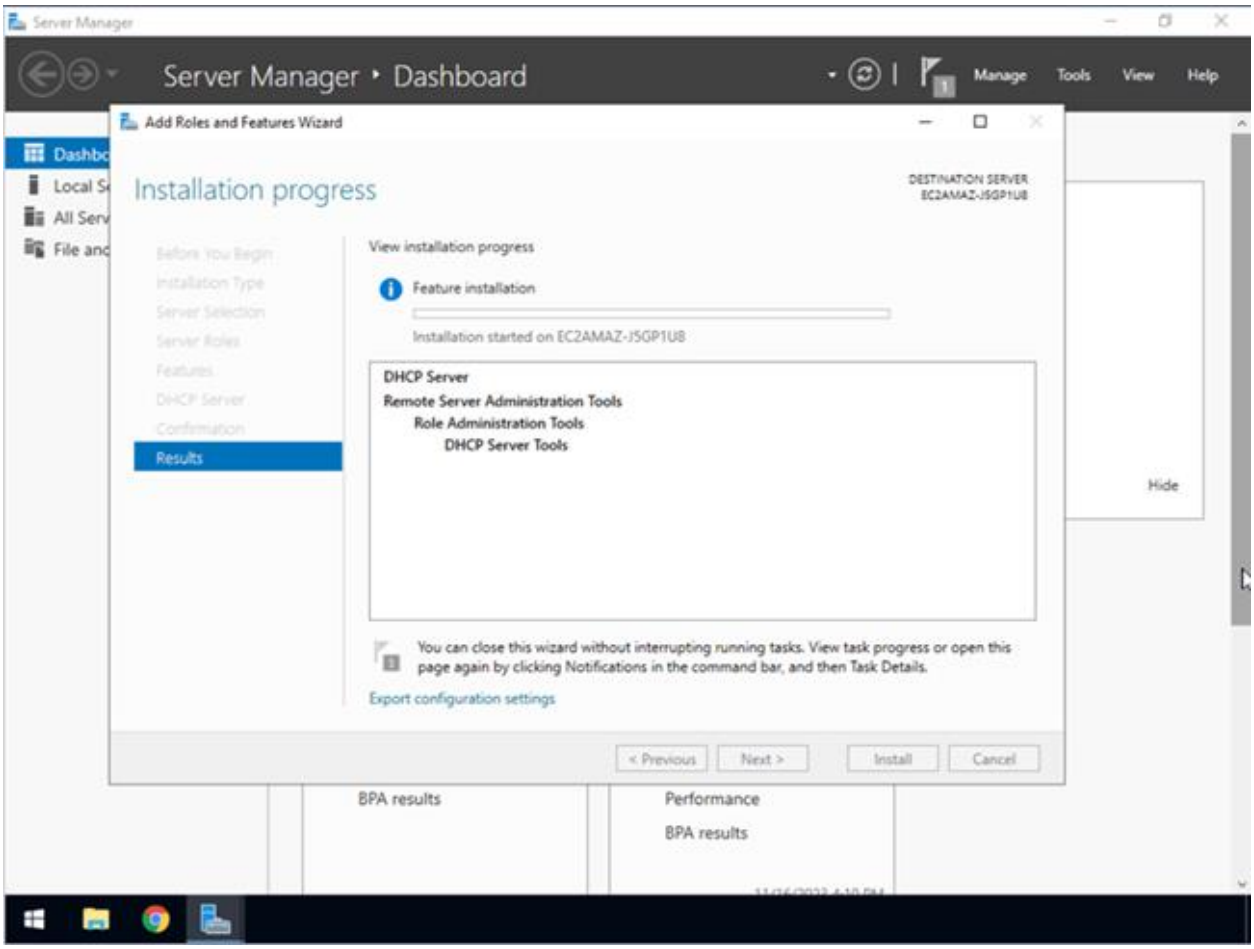
11. Select **Next**.



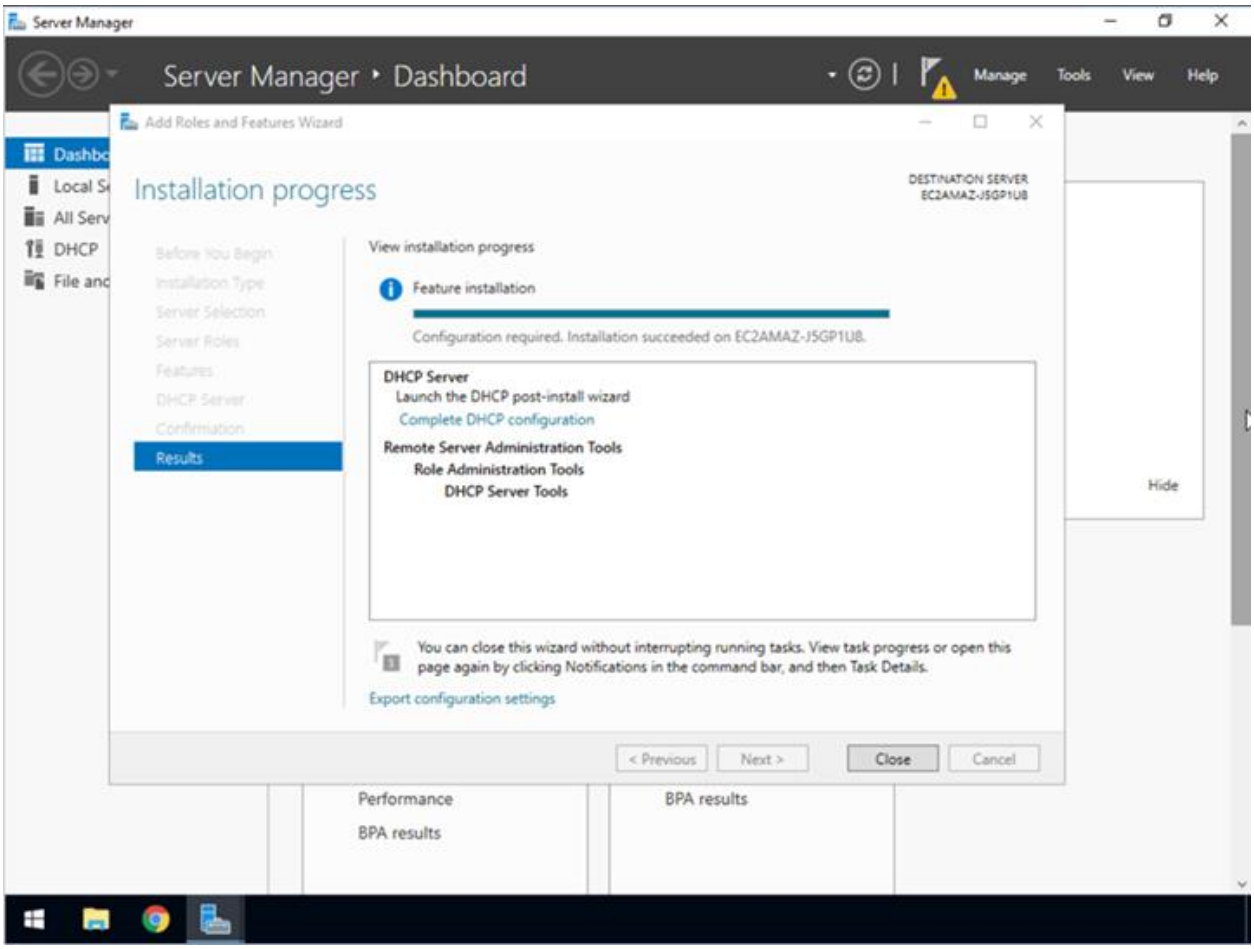
12. Confirm your installation selections and click **`Install`**.



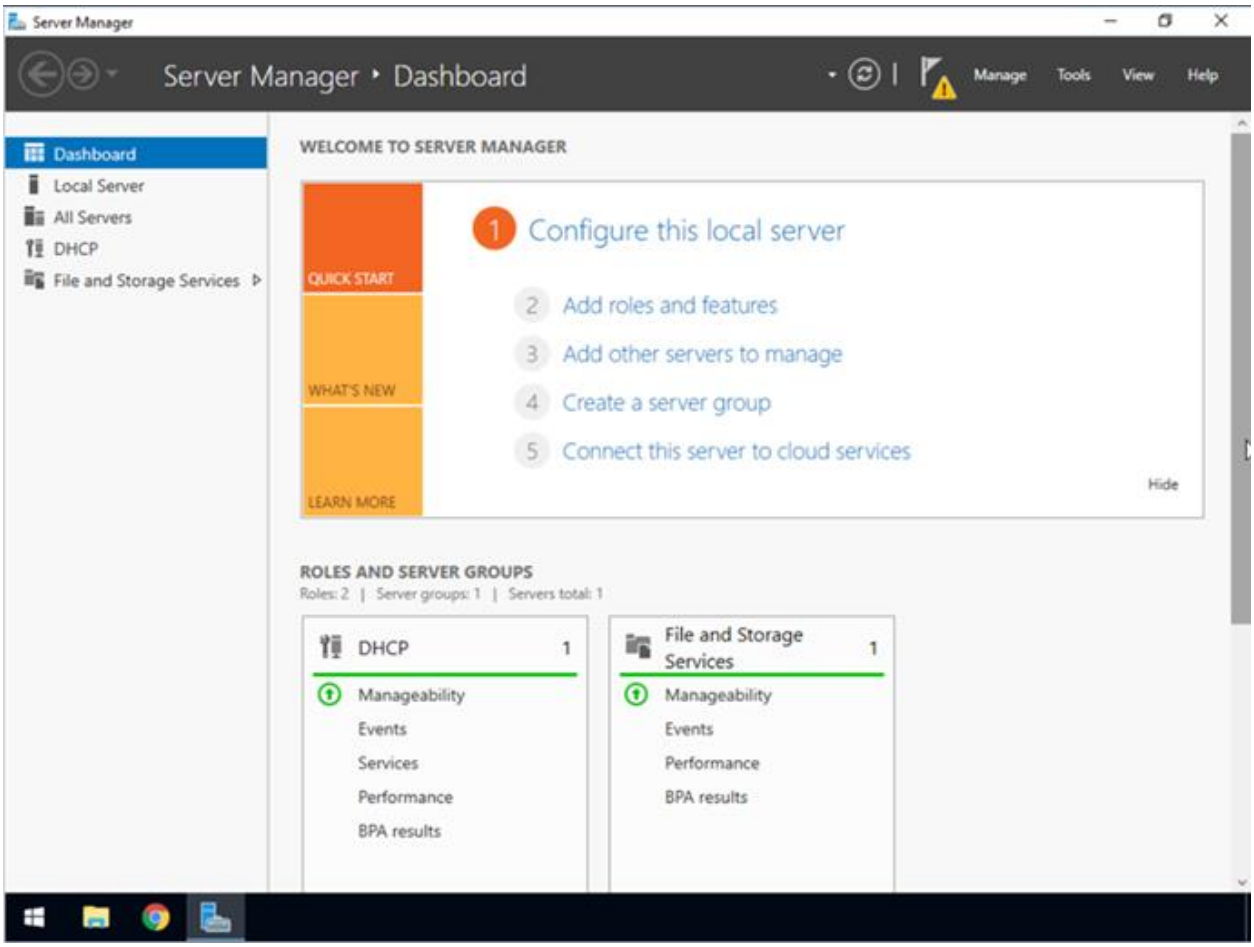
13. It could take a few minutes for the installation to complete.



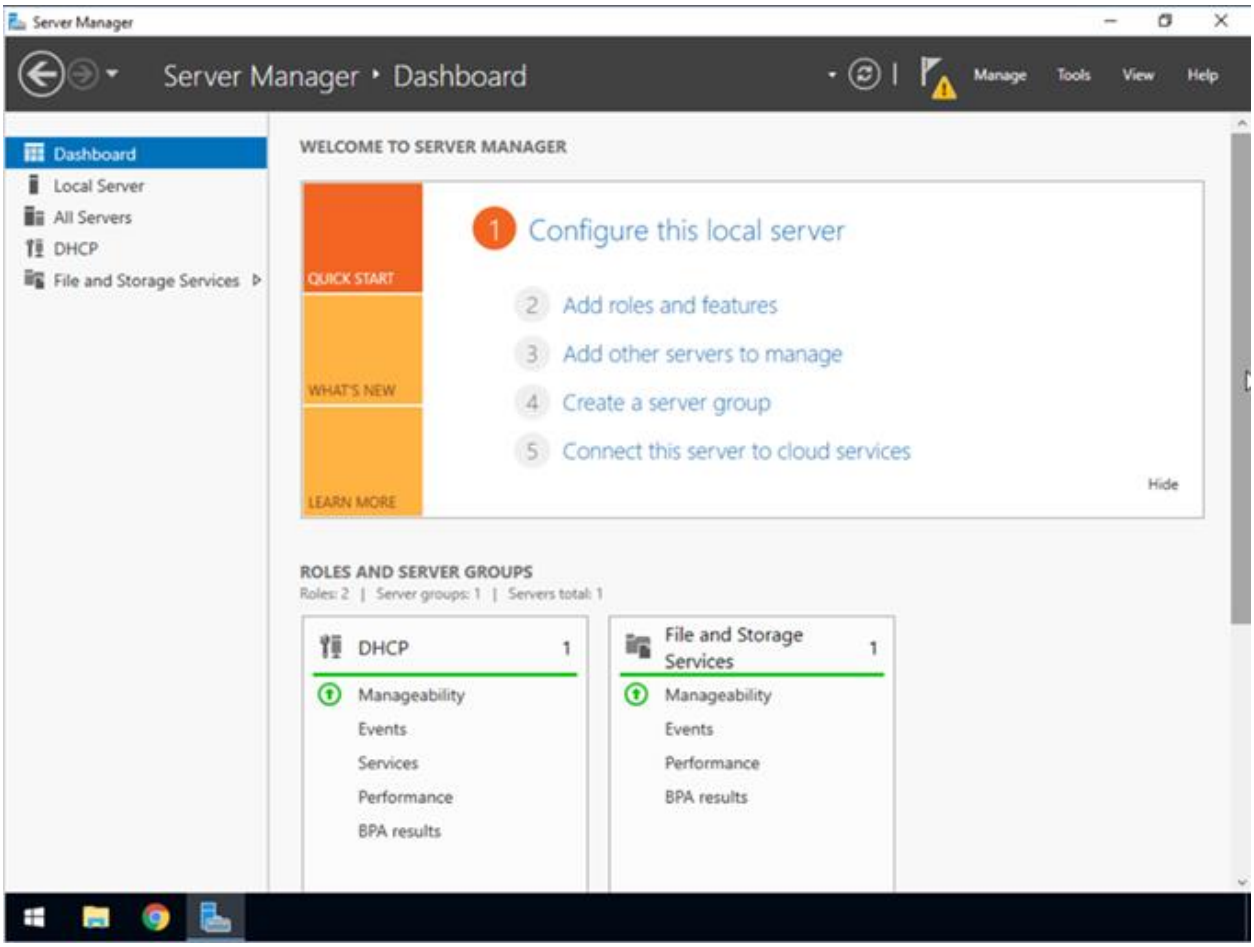
14. Upon completion, the status message will change to `Installation succeeded`. Click `Close`.



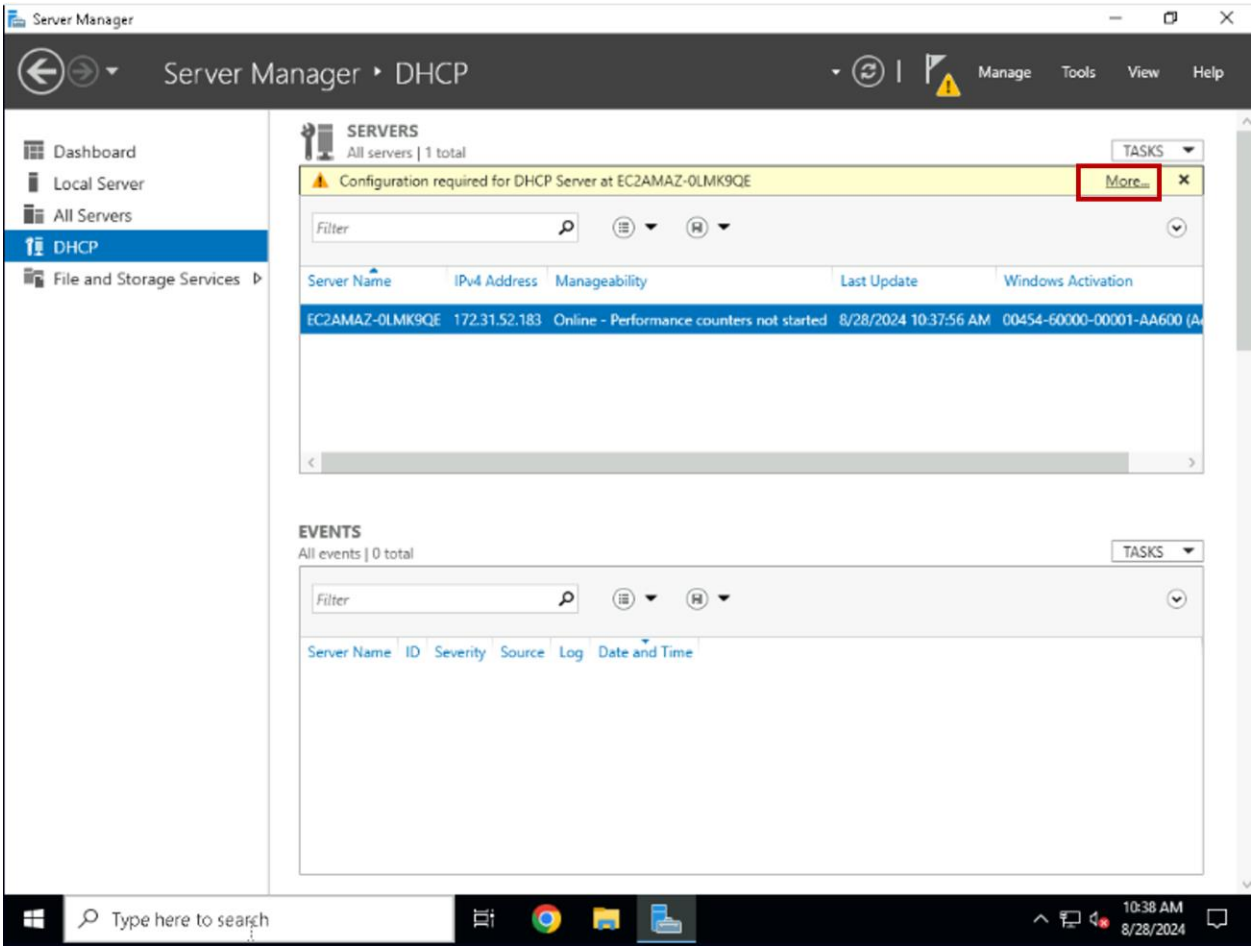
15. Now you can see the DHCP server listed under `Roles and Server Groups in the Server Manager` Dashboard.

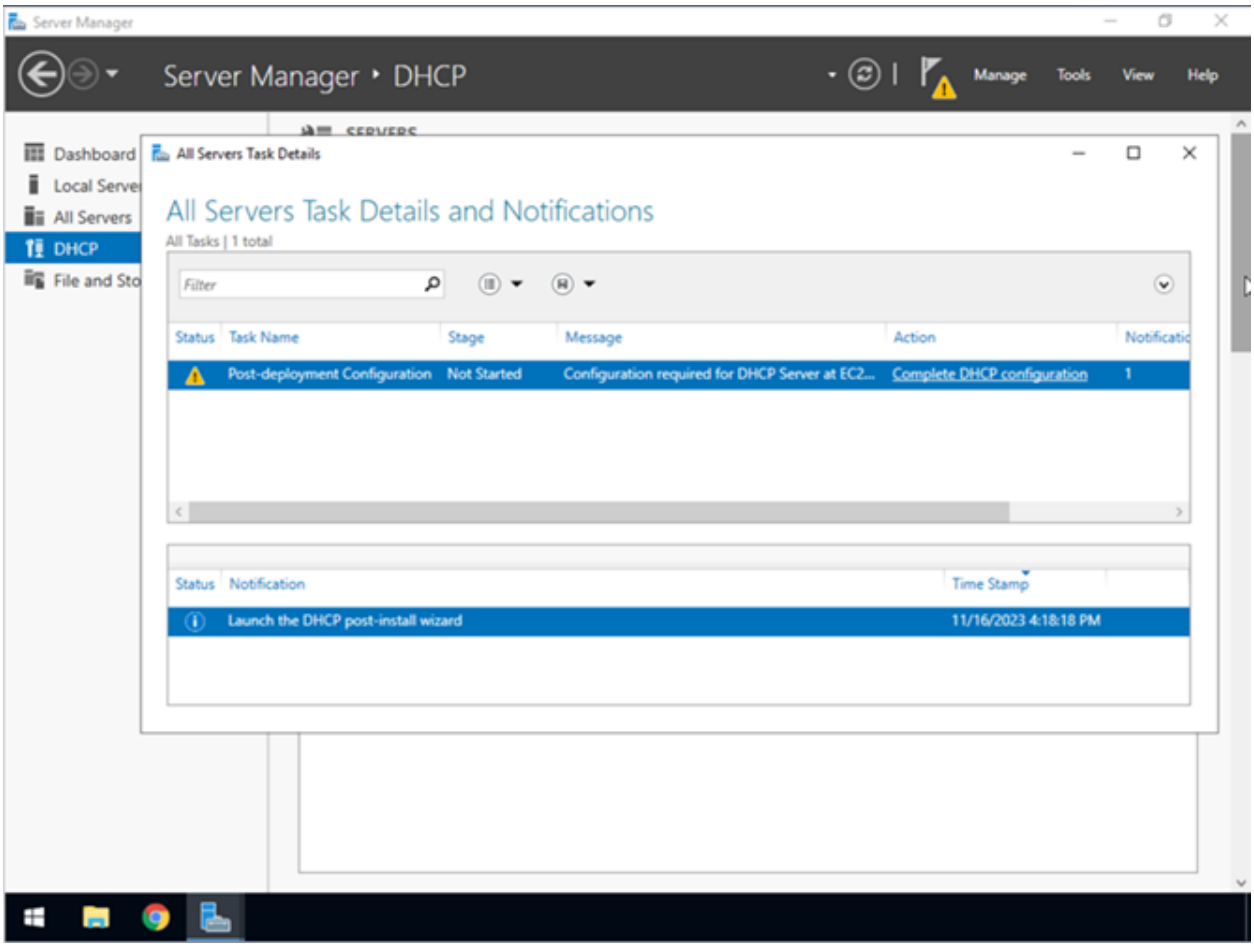


16. Click **DHCP** in your Server Manager.

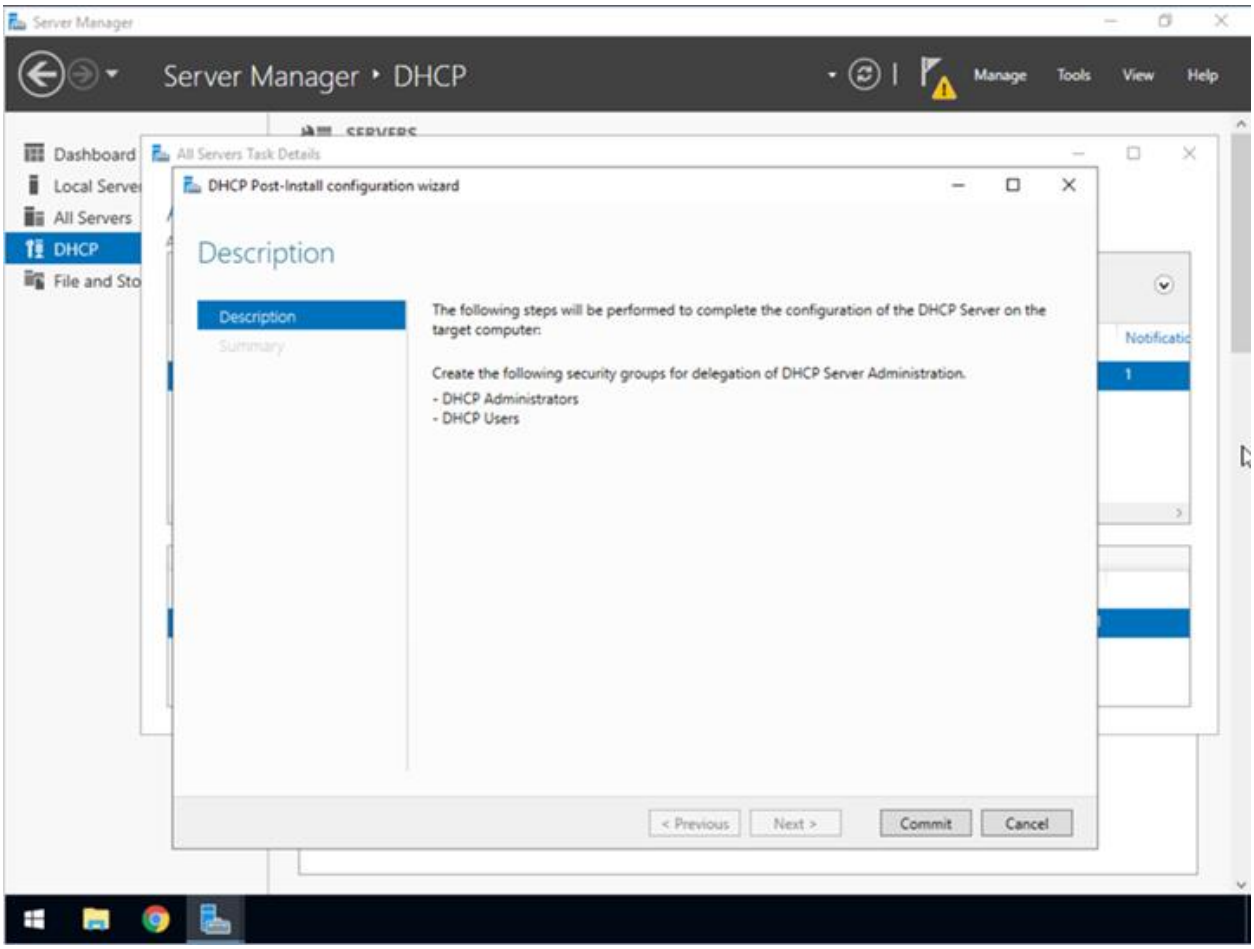


17. In the alert, click on **More**. In the pop up wizard you will see a status alert next to the DHCP server under Action section indicating that additional configuration is required. Click `Complete DHCP configuration`.

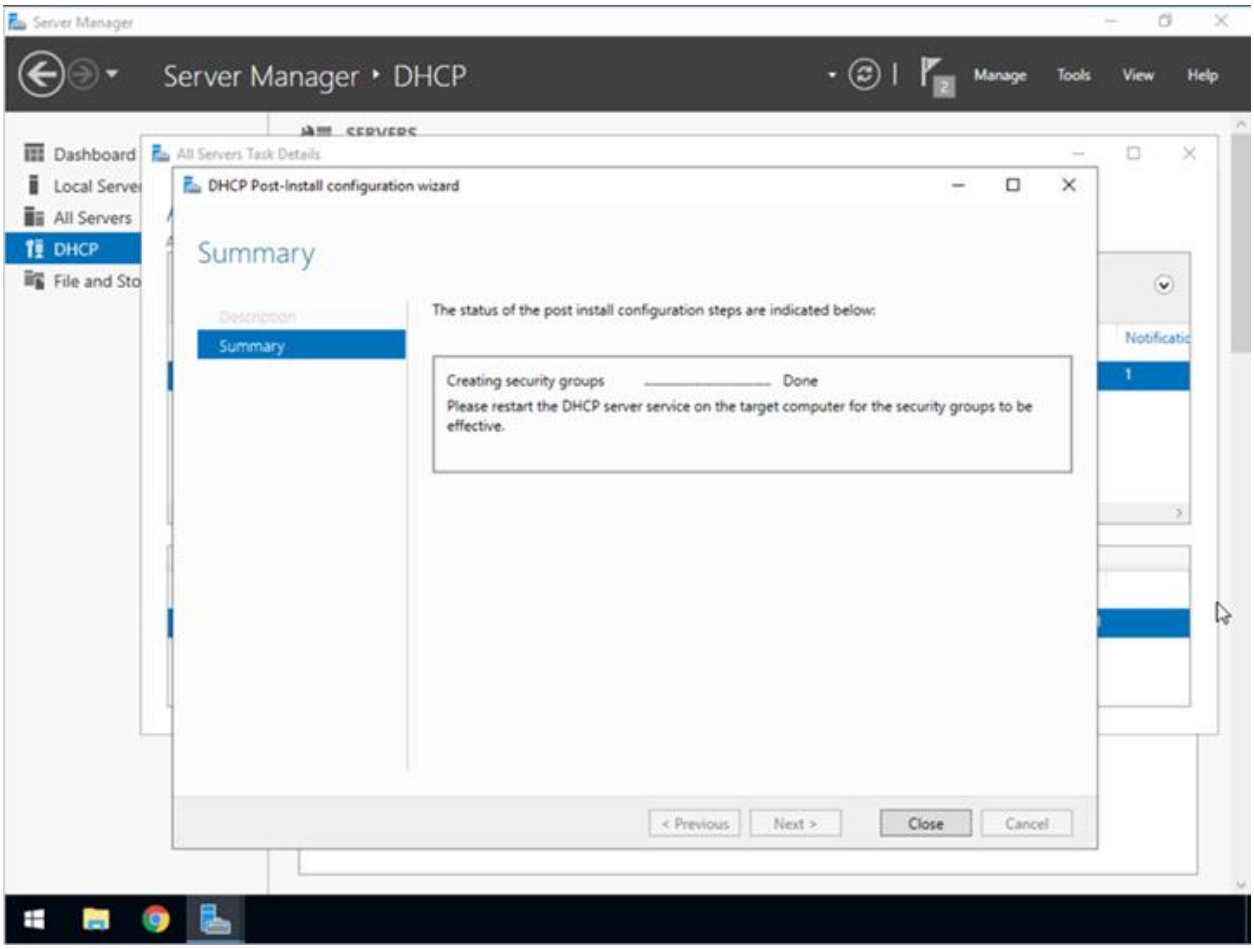

Server Manager
Server Manager • DHCP
Manage
Tools
View
Help
Dashboard
Local Server
All Servers
DHCP
File and Storage Services
SERVERS
All servers | 1 total
TASKS
Configuration required for DHCP Server at EC2AMAZ-0LMK9QE
More...
Filter
Server Name
IPv4 Address
Manageability
Last Update
Windows Activation
EC2AMAZ-0LMK9QE
172.31.52.183
Online - Performance counters not started
8/28/2024 10:37:56 AM
00454-60000-00001-AA600 (A
EVENTS
All events | 0 total
TASKS
Filter
Server Name
ID
Severity
Source
Log
Date and Time
Type here to search
10:38 AM
8/28/2024



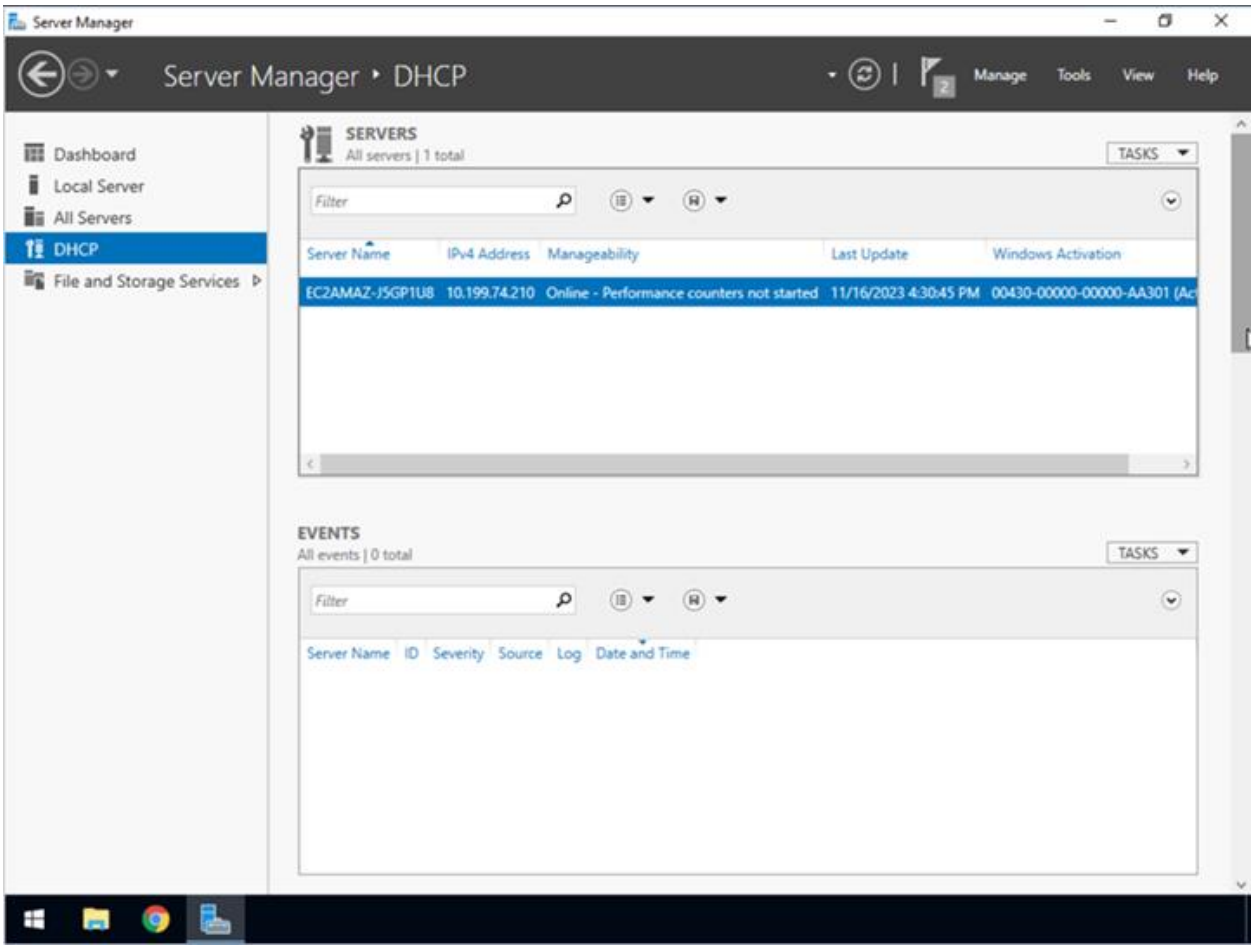
18. The configuration wizard shows that you need to create two security groups that are needed for administering a DHCP server. Select `Commit` to create the **DHCP Administrators and DHCP Users** groups.



19. When the post install configuration steps are completed, you can click `Close` and Click on **X** to close the pop up wizard.

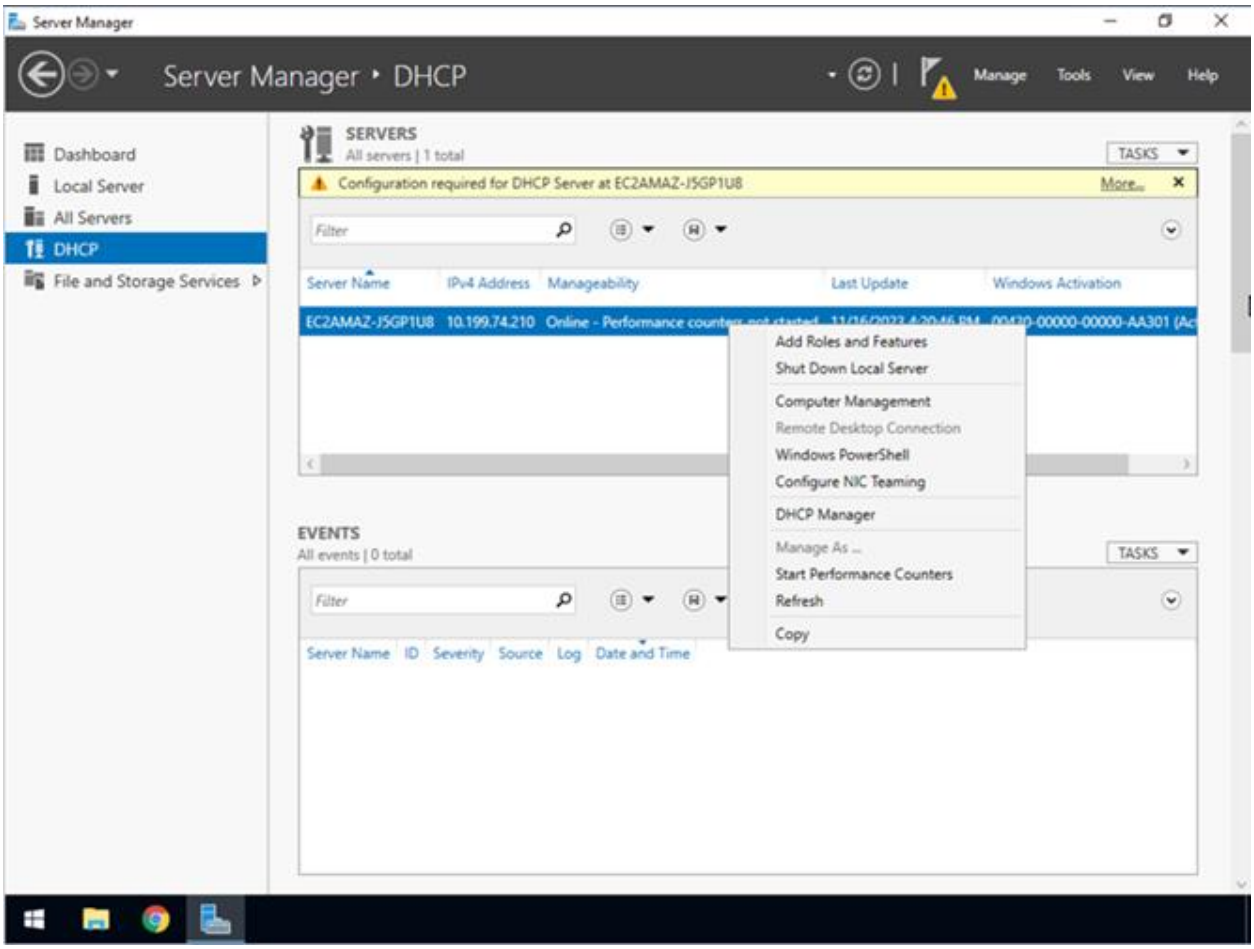


20. Here you will see that the alert has been removed.

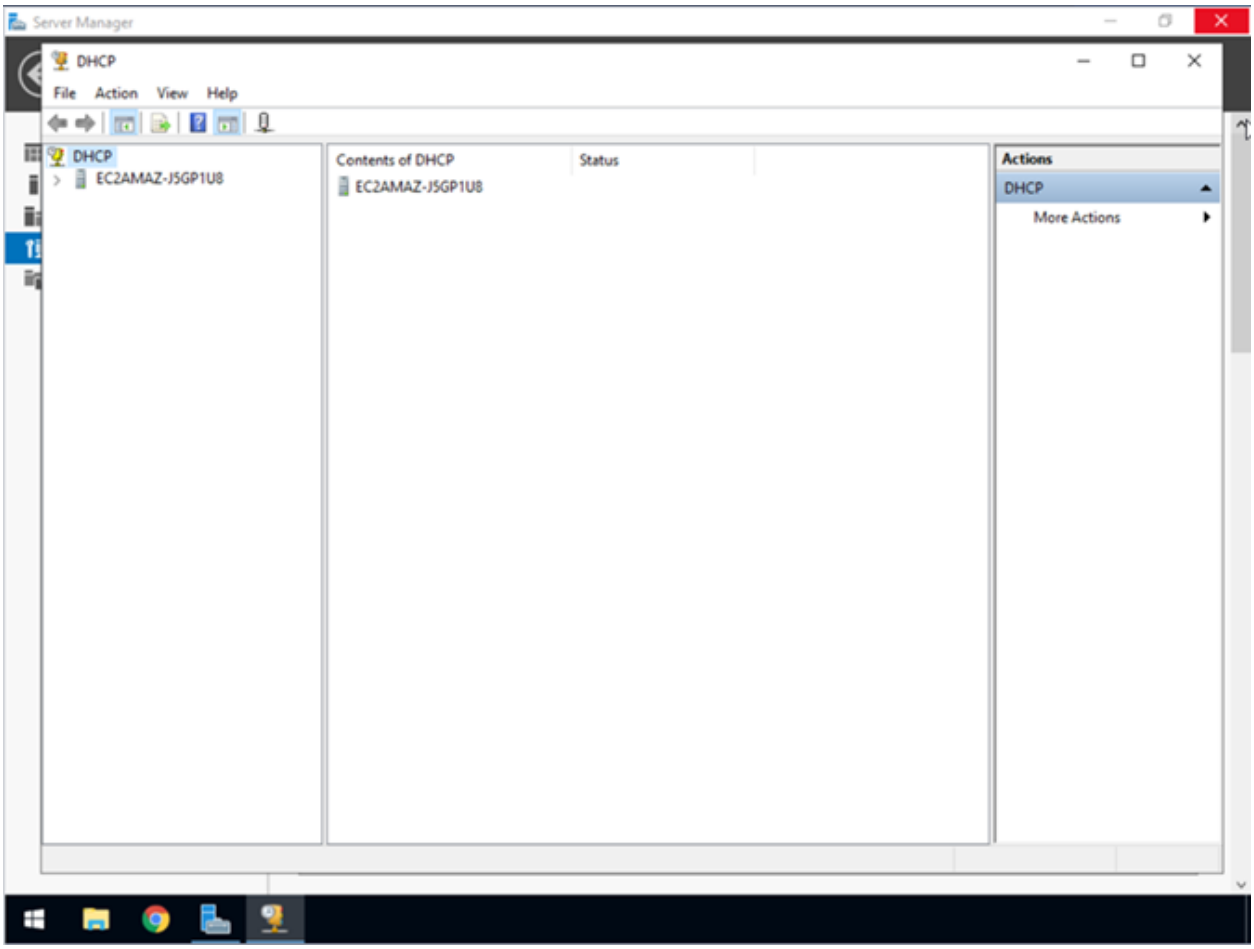


Task B: Create a Scope

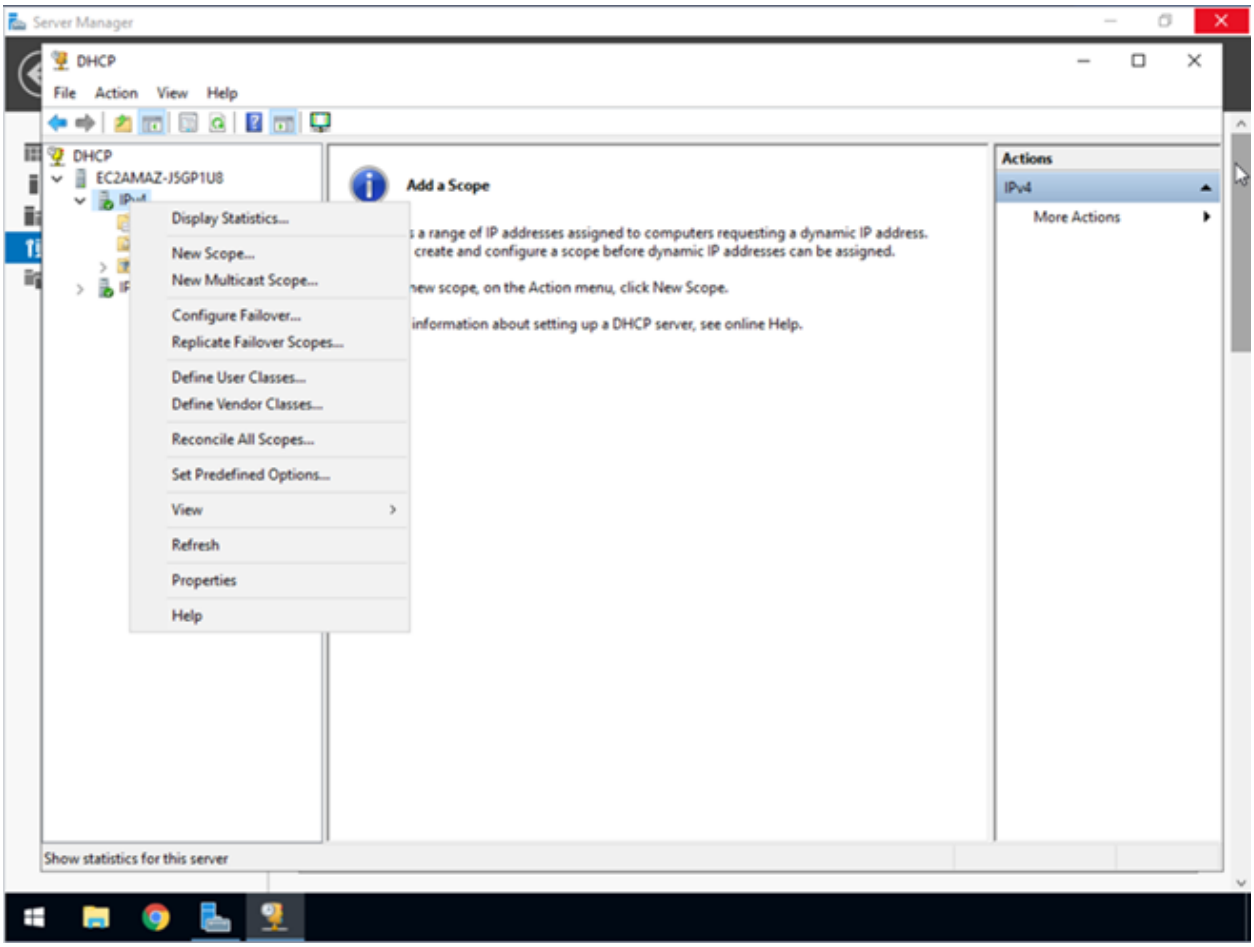
1. Right-click the DHCP server. Select **DHCP Manager**.



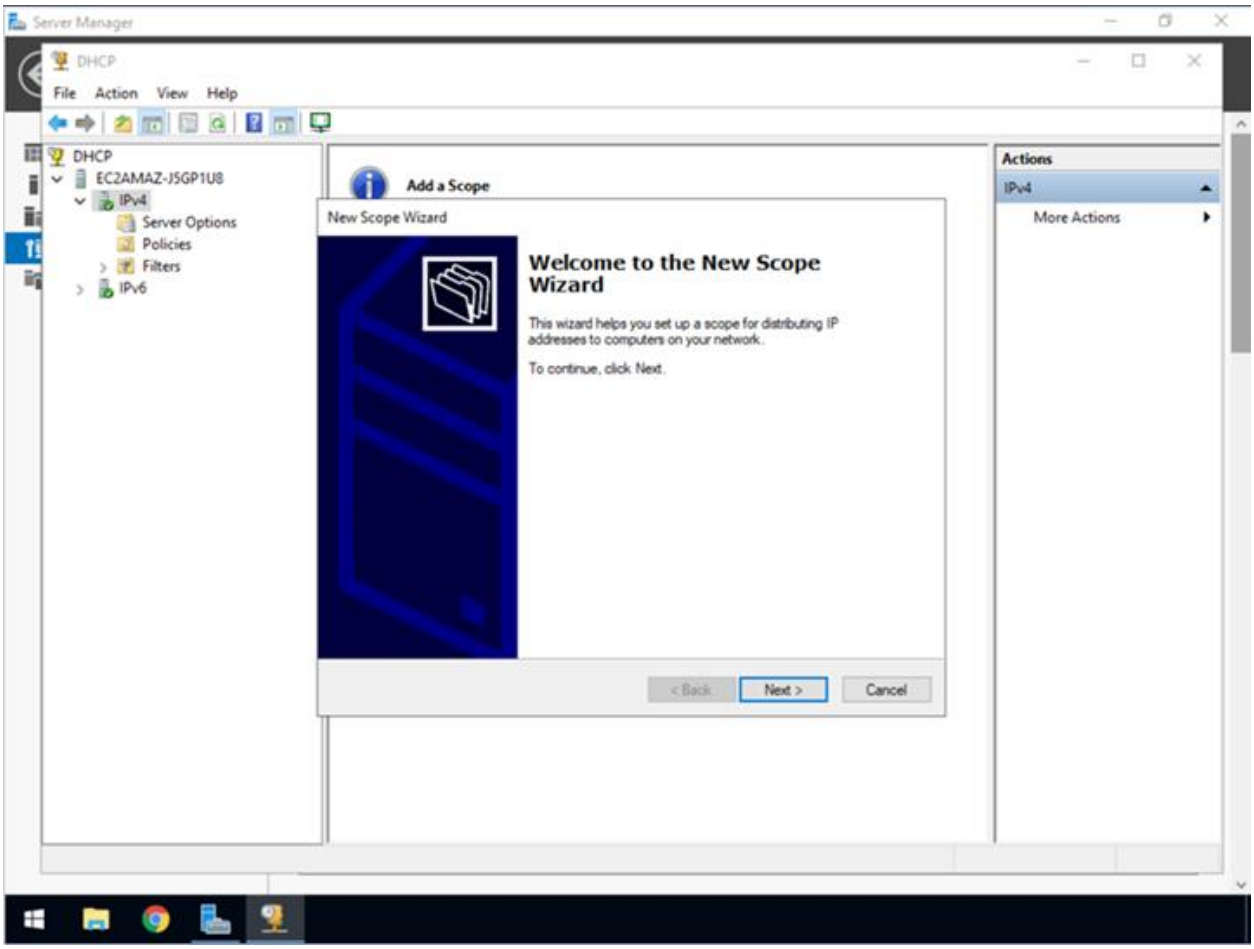
2. Click the server name.



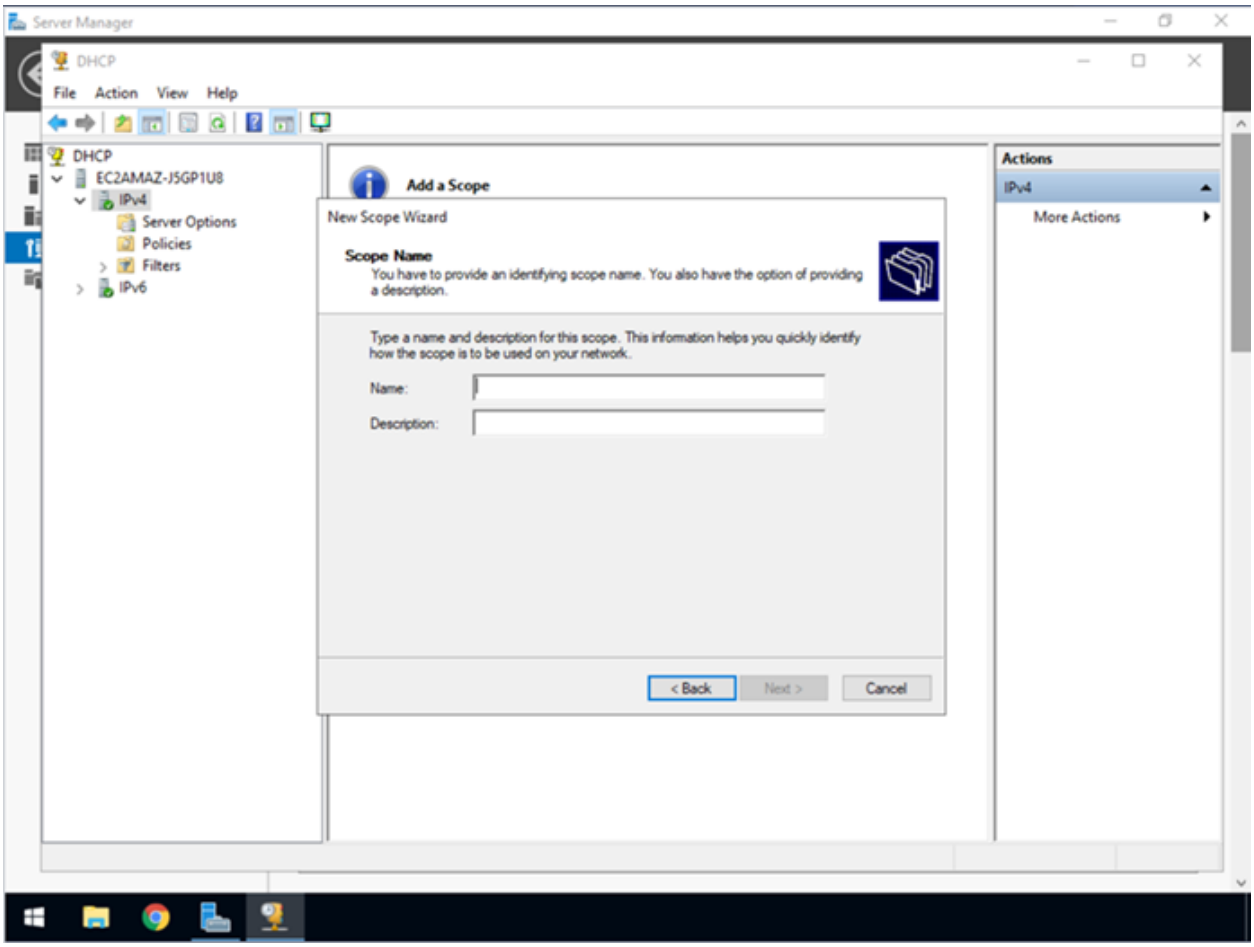
3. Right-click `IPv4` and select `New Scope`.



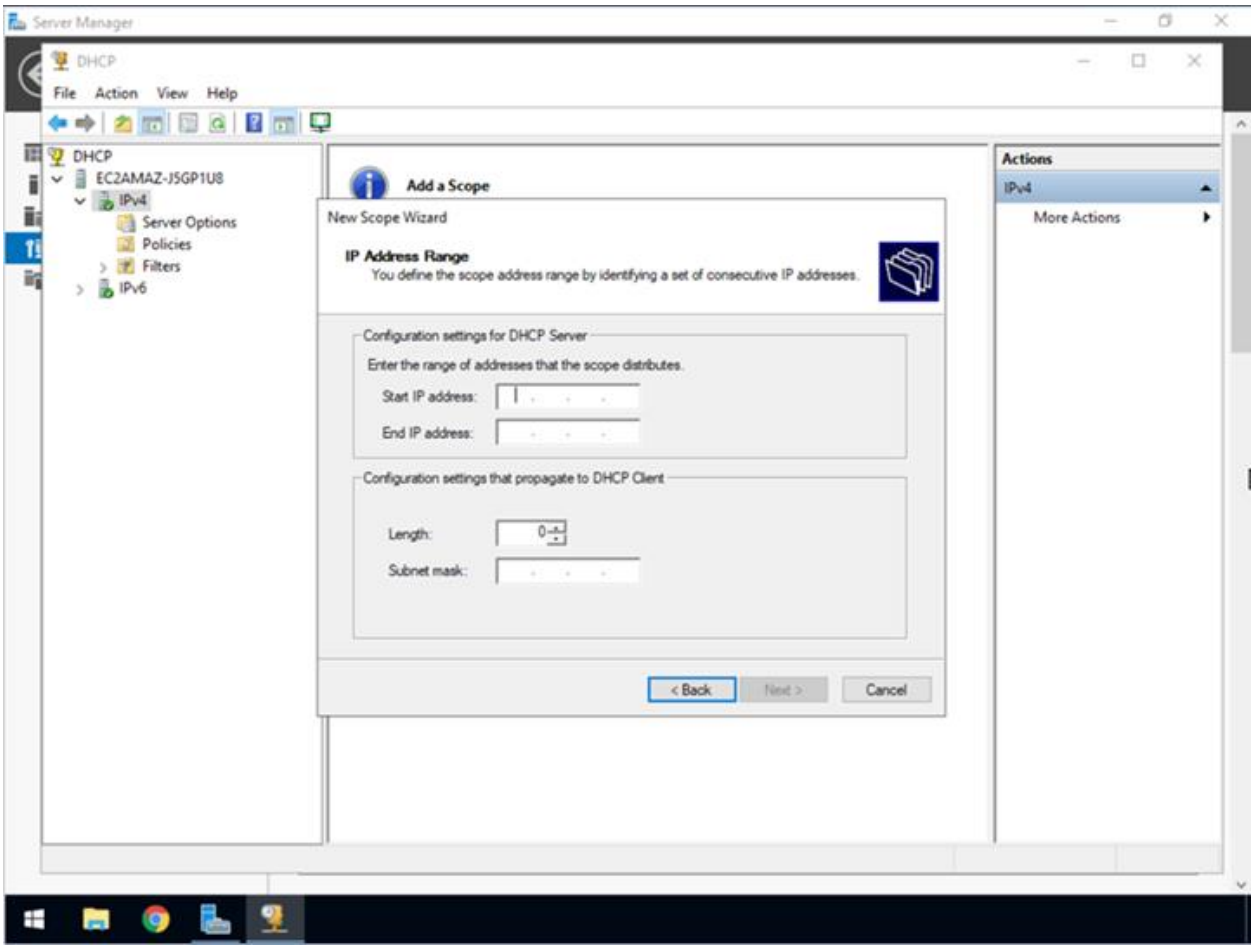
4. Click `Next` on the New Scope Wizard.

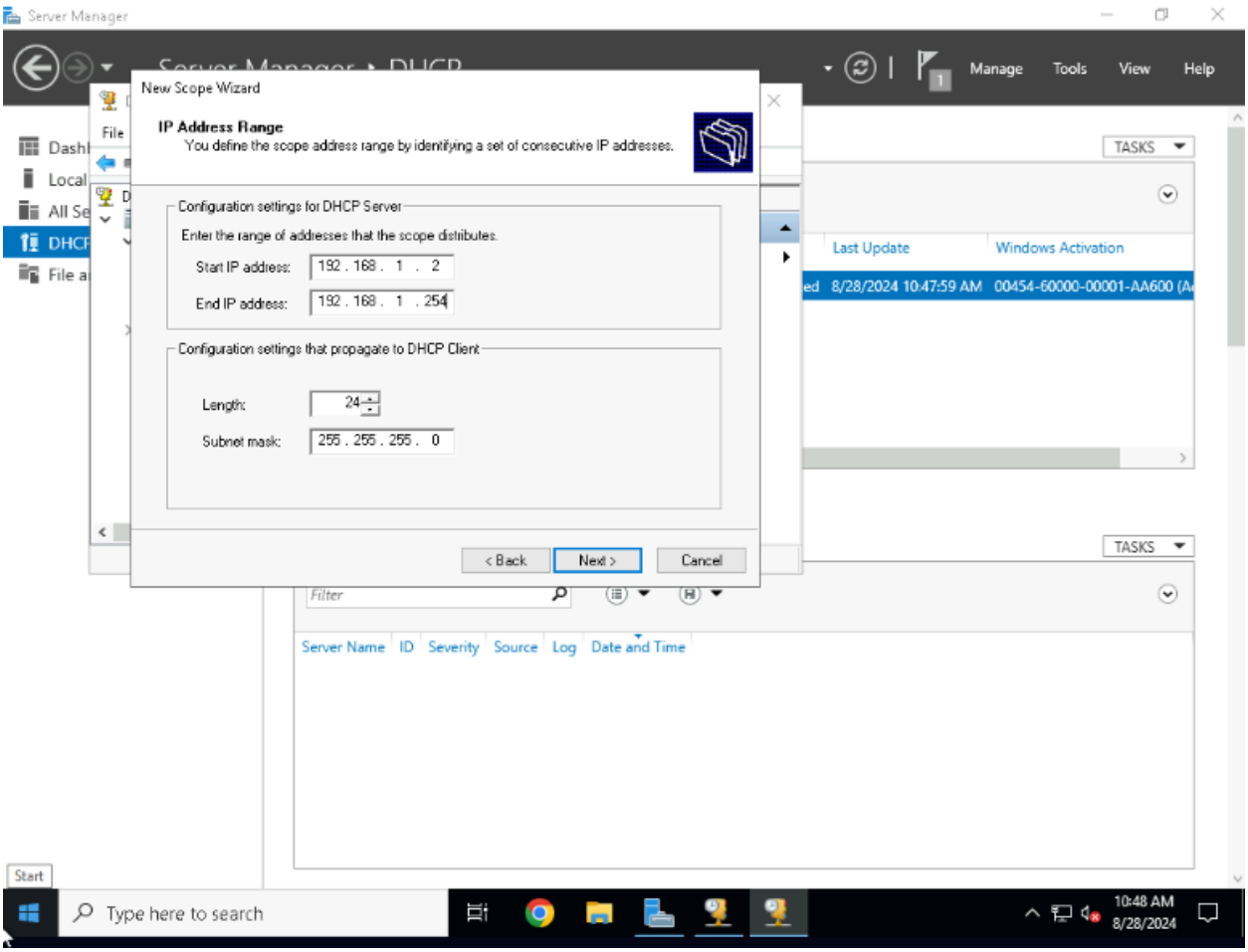


5. In the **New Scope Wizard**, provide a name for the scope, and specify the range of IP addresses you want the DHCP server to assign to clients. Type the name as `CompanyLAN` and click `Next`.



6. Set the range of IP addresses to be distributed by the DHCP server from 192.168.1.2 to 192.168.1.254, ensuring these addresses are within the same subnet as your network. Click **Next**.


Server Manager
DHCP
File Action View Help
DHCP
EC2AMAZ-J5GP1U8
IPv4
Server Options
Policies
Filters
IPv6
Add a Scope
New Scope Wizard
IP Address Range
You define the scope address range by identifying a set of consecutive IP addresses.
Configuration settings for DHCP Server
Enter the range of addresses that the scope distributes.
Start IP address:
End IP address:
Configuration settings that propagate to DHCP Client
Length:
Subnet mask:
< Back
Next >
Cancel
Actions
IPv4
More Actions

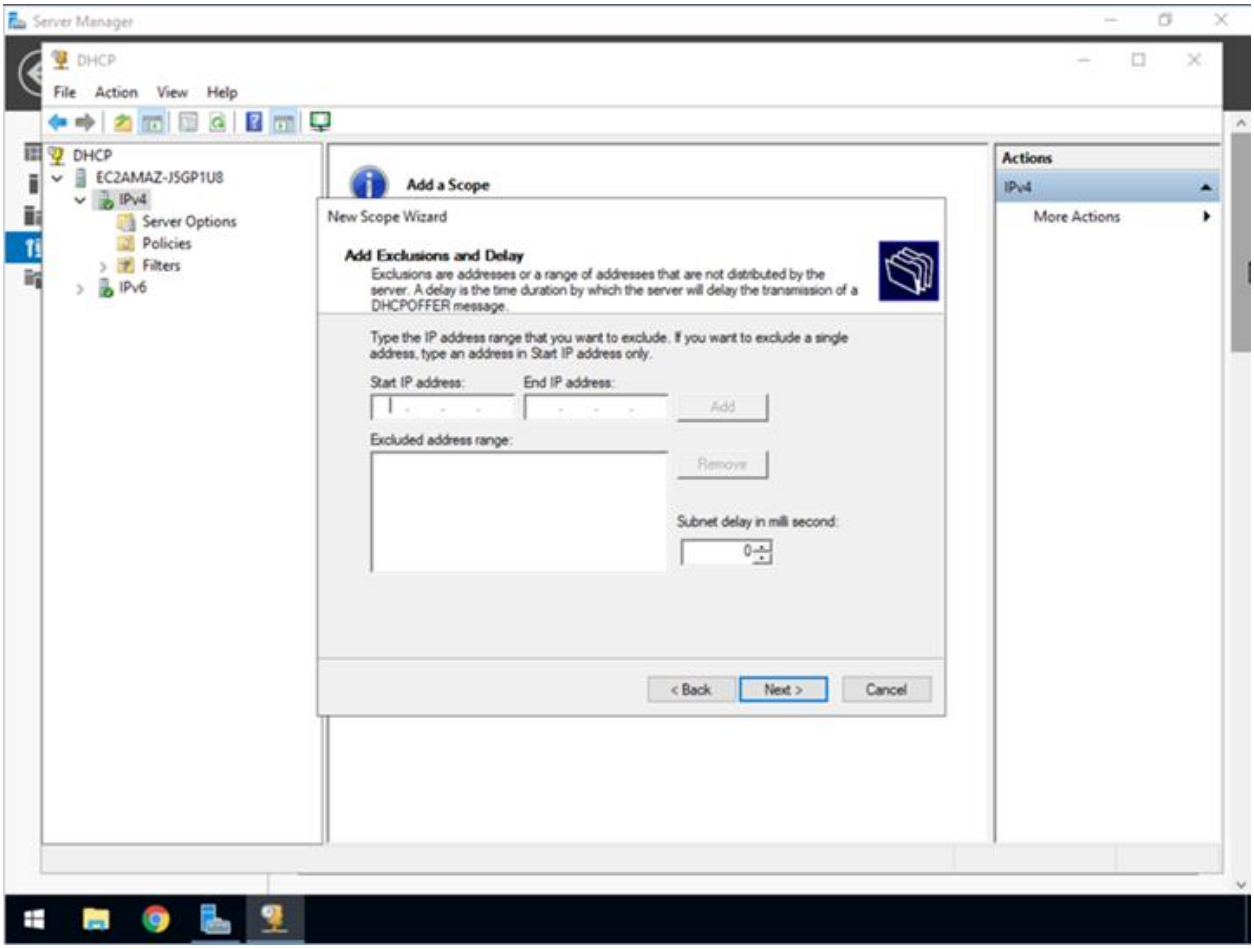


Because six of your printers have static IP addresses, you want to be sure to add these IP addresses as exclusions - preventing the DHCP server from assigning these addresses to other devices. The IP addresses are 192.168.1.30, 192.168.1.31, 192.168.1.32, 192.168.1.40, 192.168.1.41, and 192.168.1.56.

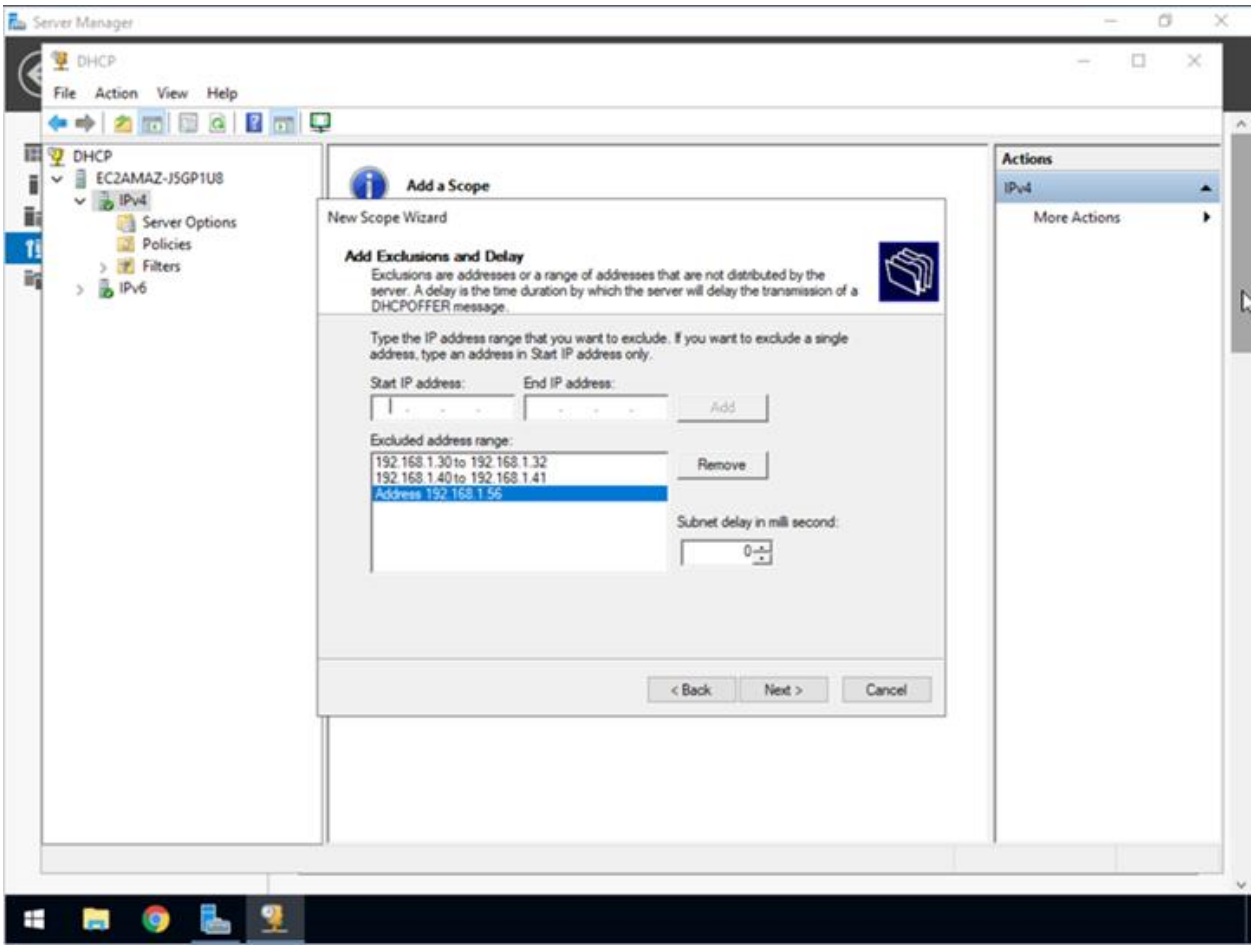
7. To exclude the IP addresses of the 3 printers, type in the static IP addresses of the printers.
    a. Type `192.168.1.30` in the Start IP address box.
    b. Type `192.168.1.32` in the End IP address box.
    c. Select `Add` to include them in the **Excluded address range**.
    d. Type `192.168.1.40` in the Start IP address box.
    e. Type `192.168.1.41` in the End IP address box.
    f. Select `Add` to include them in the **Excluded address range**.

g. Type `192.168.1.56` in the Start IP address box.

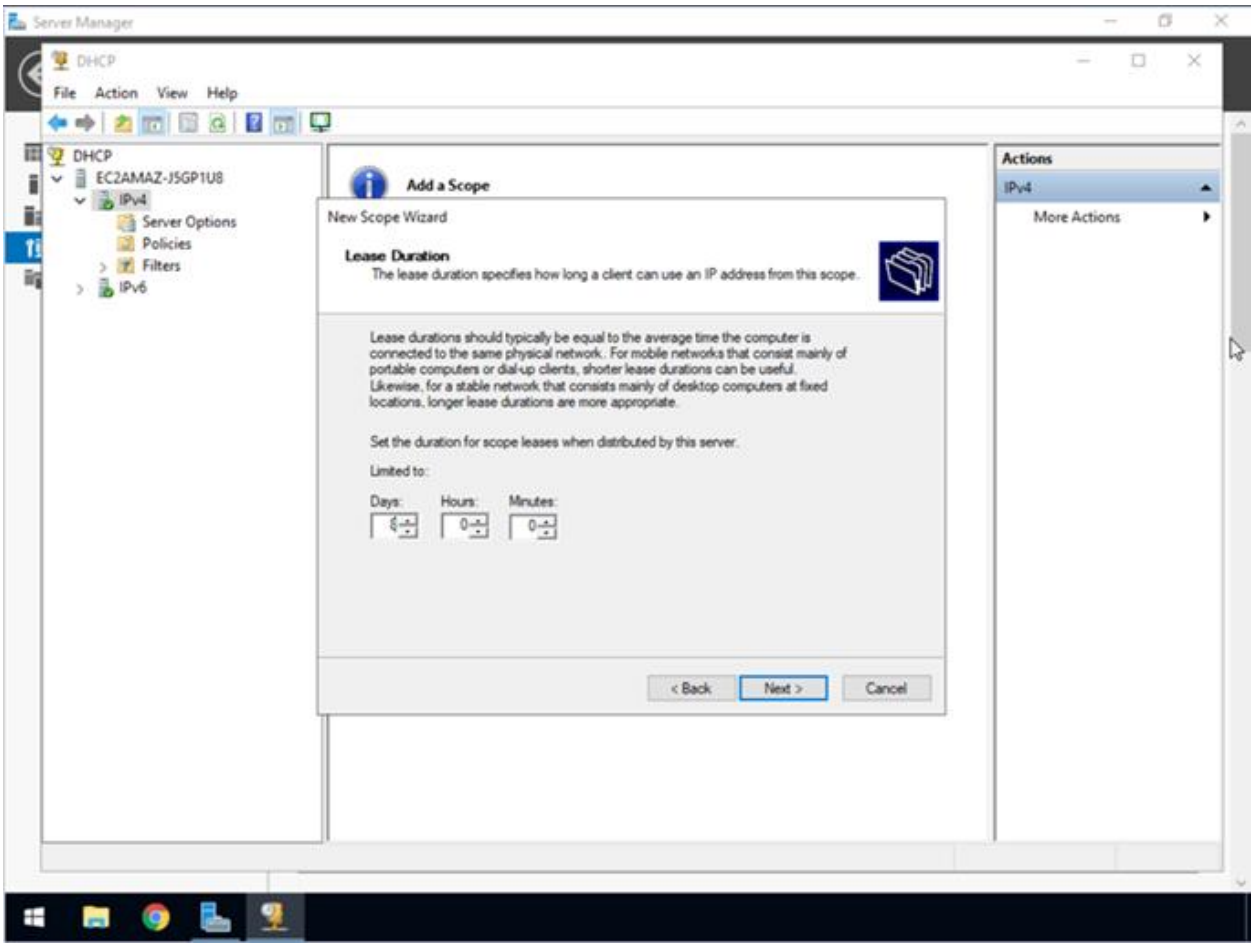
h. Select `Add` to include this in the **Excluded address range**.



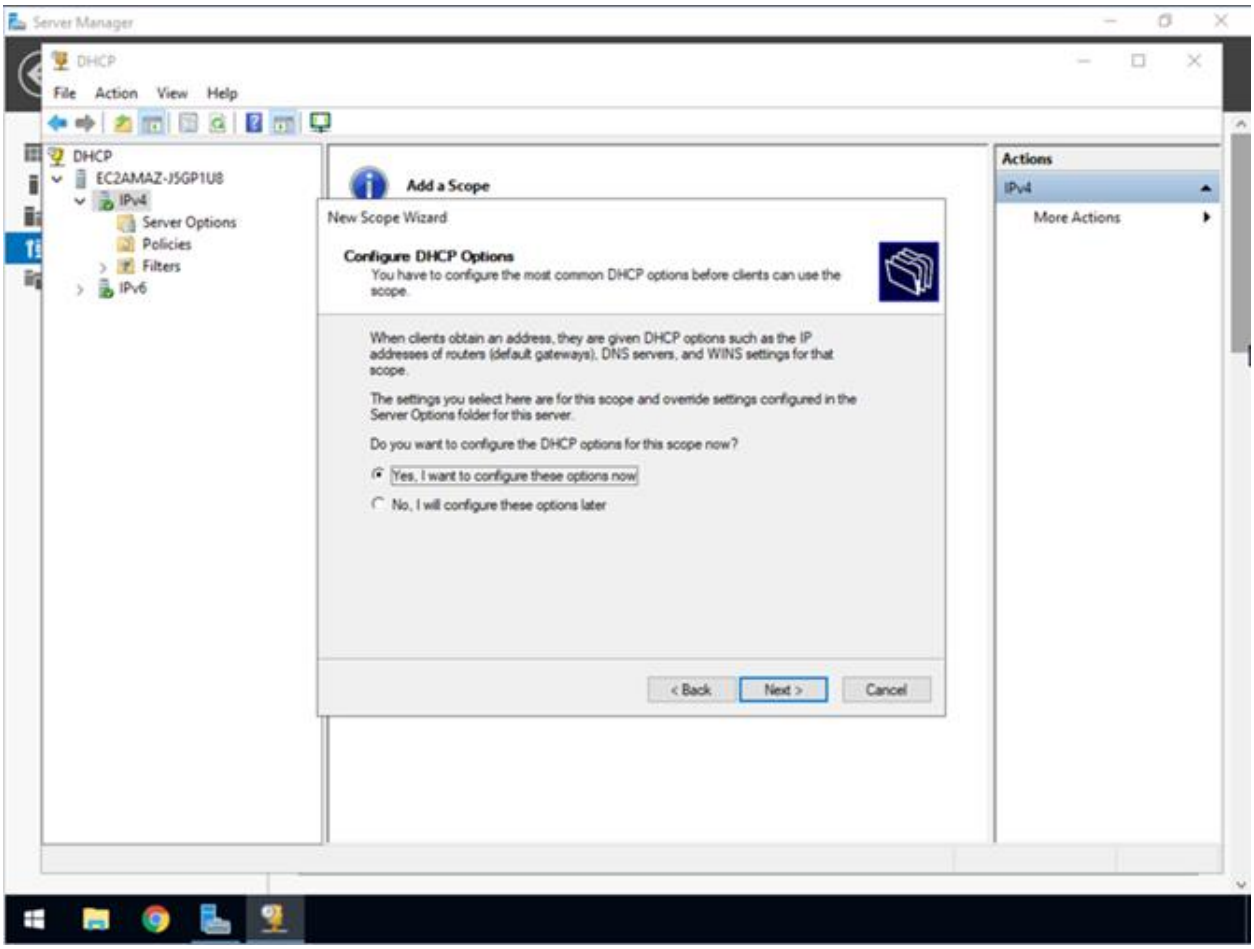
8. Click `Next`, to apply the exclusions – preventing the DHCP server from assigning these addresses to other devices.



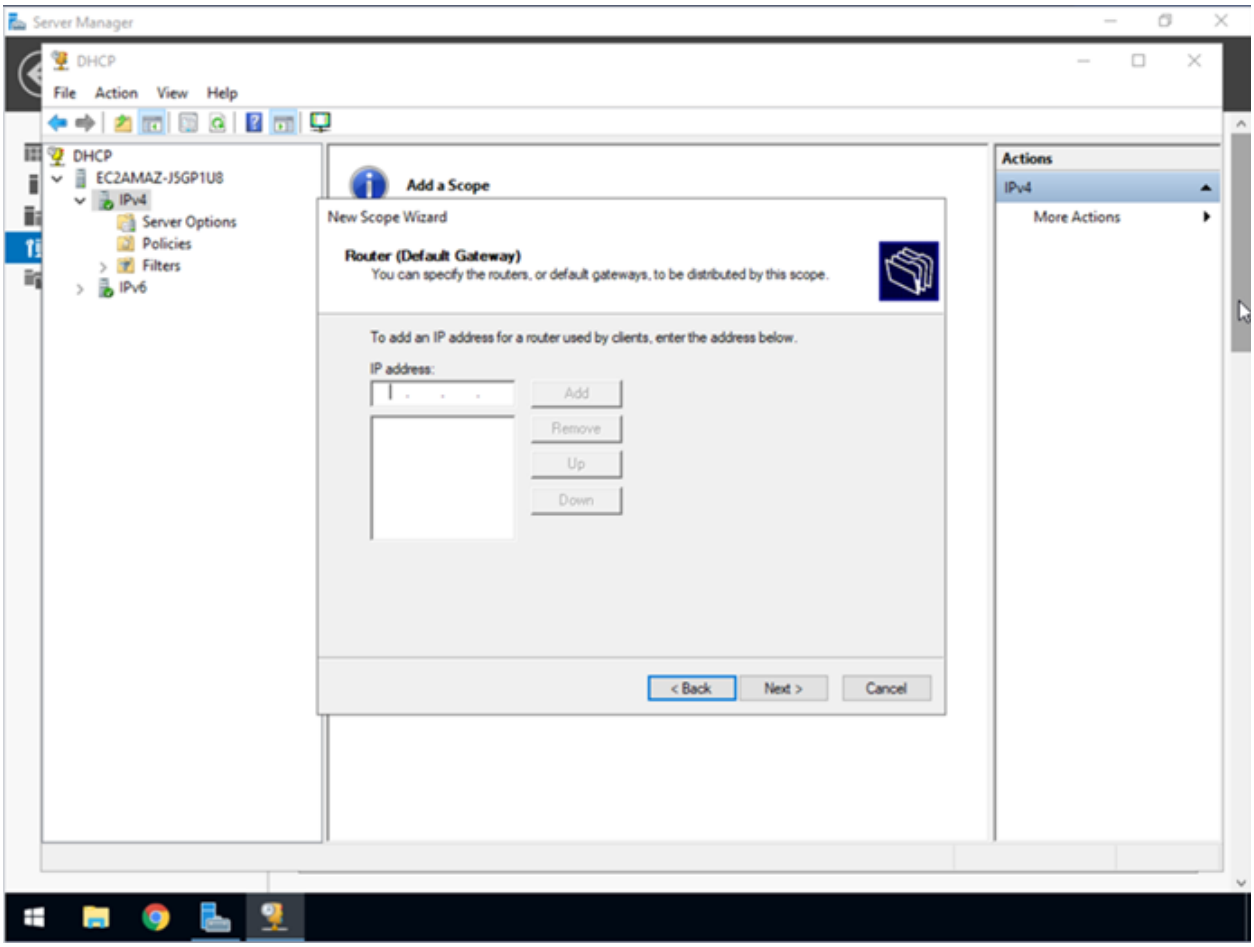
9. You will be asked to indicate how many days, hours, and minutes should pass before an IP address lease from this scope expires. We want a lease to expire every 24 hours. Set the limit to 1 days, 0 hours, and 0 minutes. Click **Next** to continue.



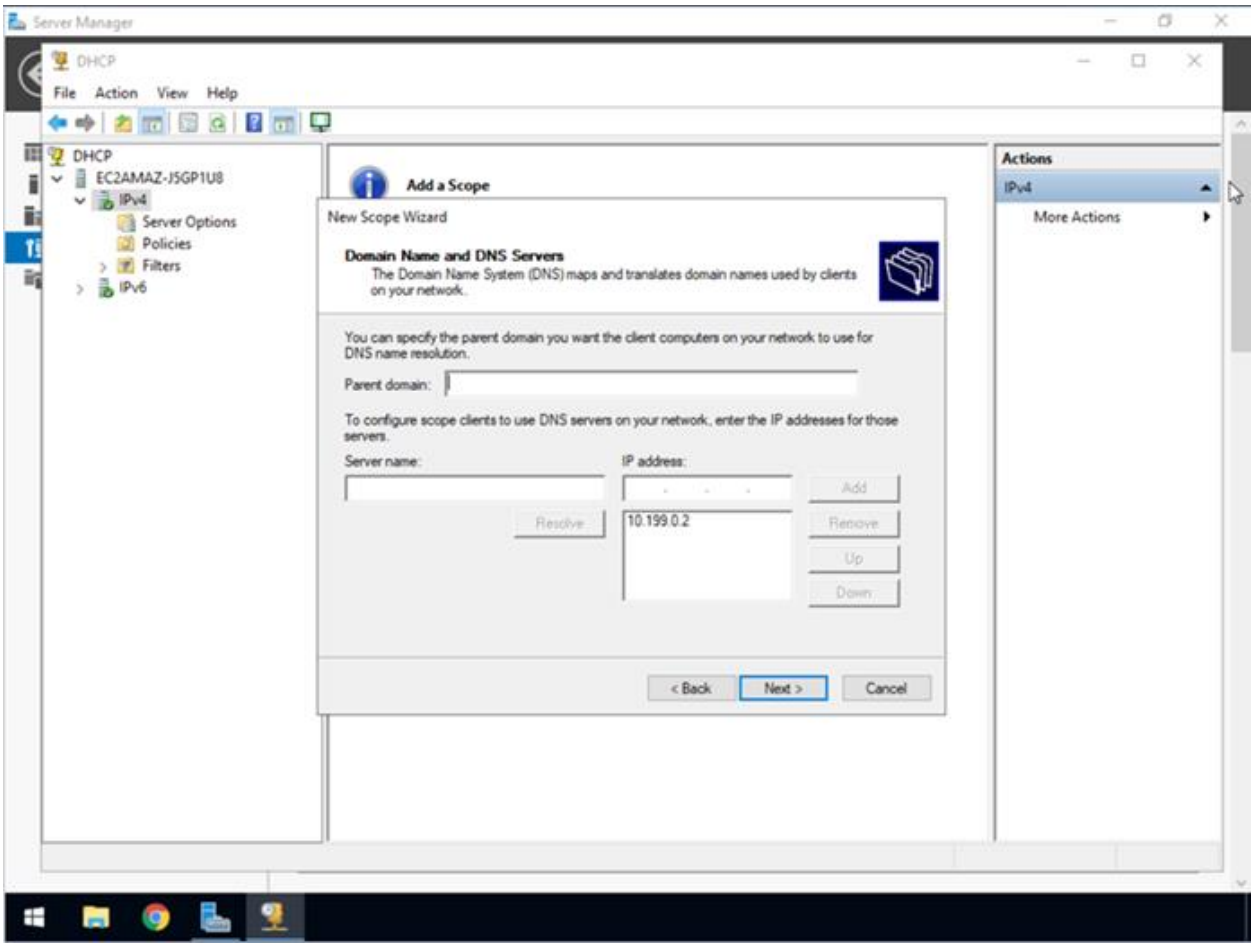
10. Click **`Yes, I want to configure these options now`** to maintain default settings for the most common DHCP options. Then, click **`Next`**.



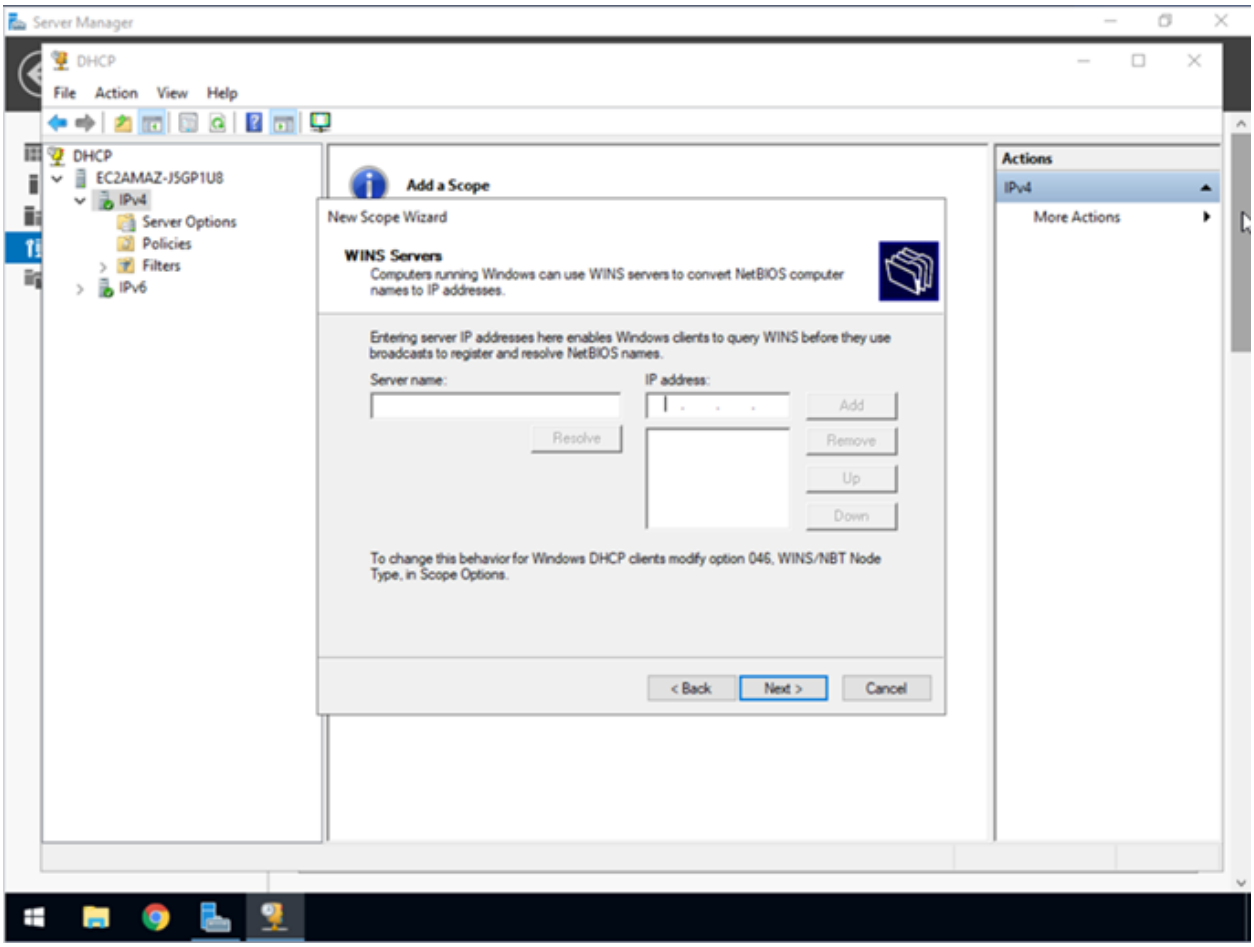
11. We will not be adding a default gateway at this time, so click **Next**.



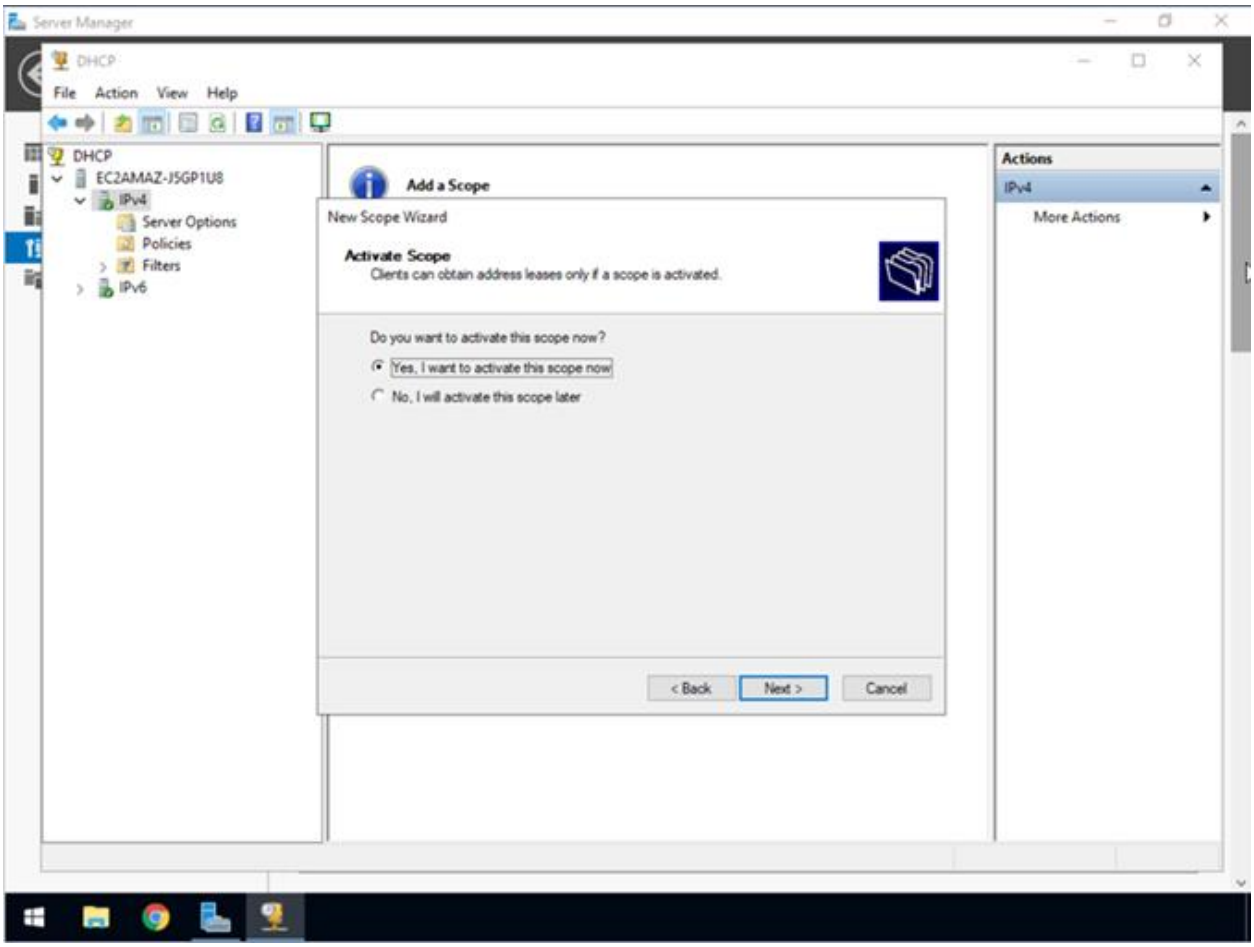
12. We will not be setting the Domain name and DNS servers at this time. Click **Next** to continue.



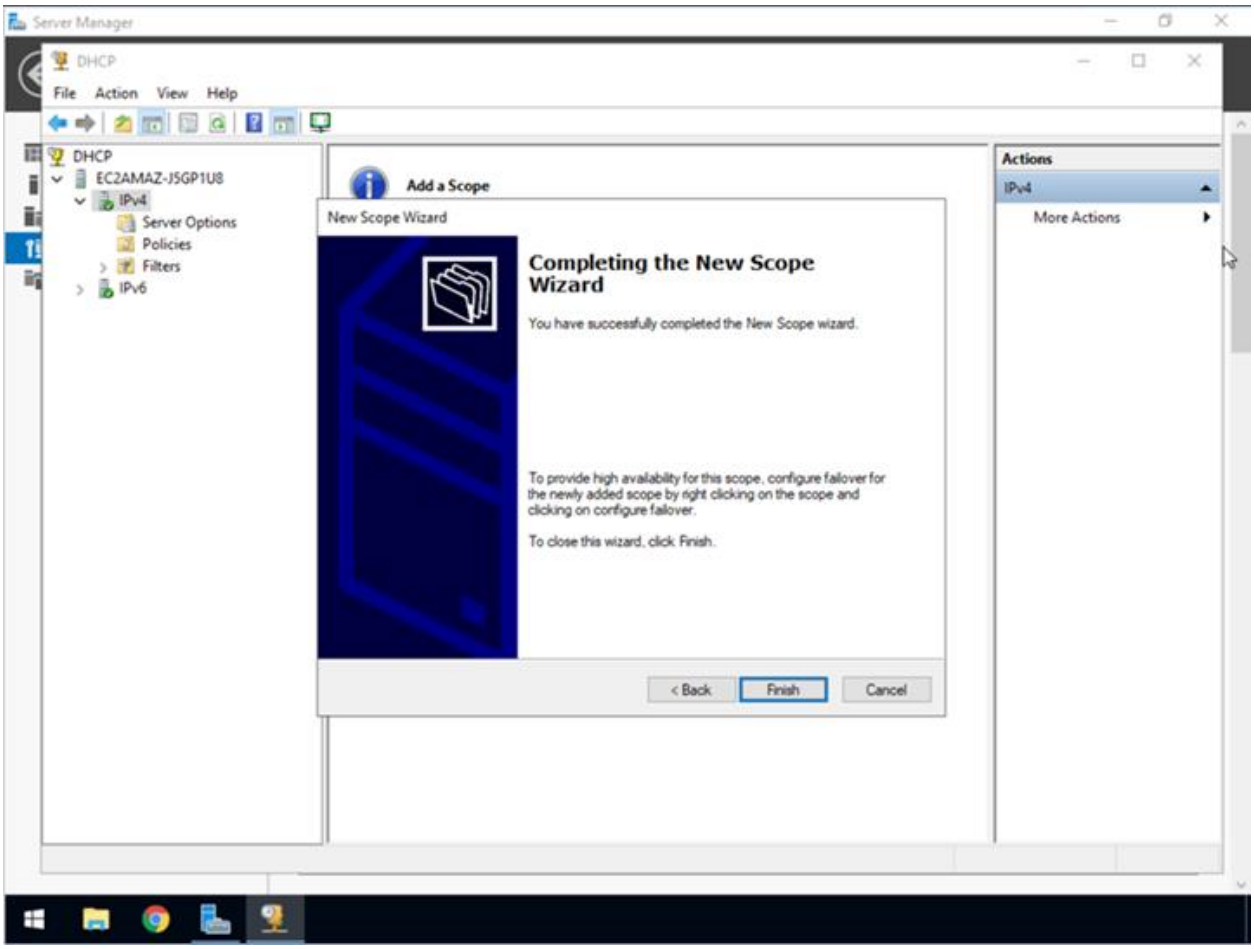
13. We will not be configuring WINS Servers at this time. Click **Next** to continue.



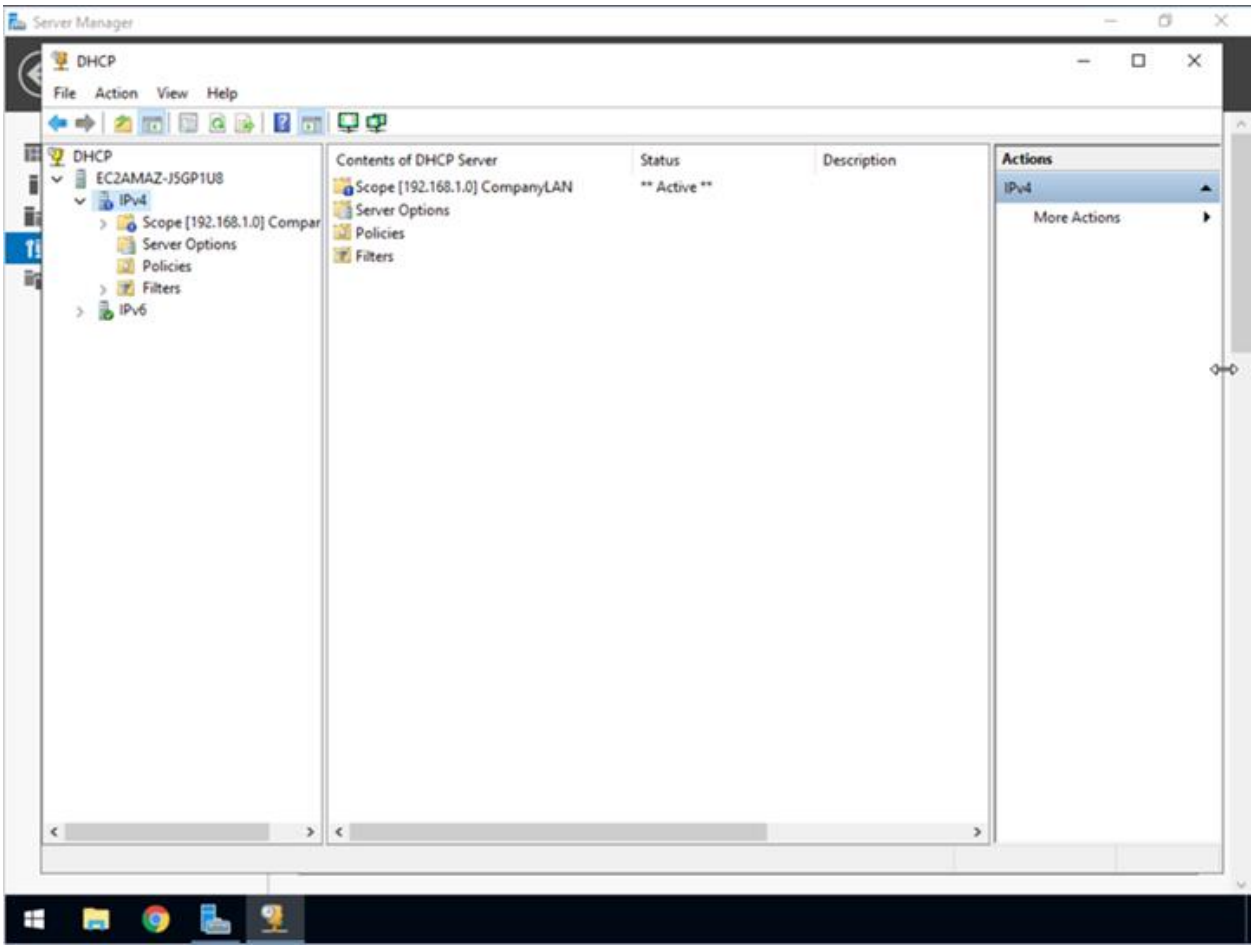
14. Click `Yes, I want to activate this scope now`. Once a scope has been activated, clients are allowed to obtain leases from the DHCP server. Click `Next`.



15. Click **`Finish`** to close the New Scope Wizard.



16. Now you will see an active scope listed under your DHCP server.



Summary:

This hands-on project guided you through the installation and configuration of a DHCP server role on a Windows Server, enabling dynamic IP address allocation and effective IP address management in a LAN environment.

Key Objectives and Outcomes:

1. **Installed the DHCP Server Role:**
    a. Accessed the Server Manager to install the DHCP server role.
    b. Handled validation errors typical of educational environments (e.g., lacking a dedicated static IP).
    c. Completed post-installation configuration by creating necessary security groups:

        i. **DHCP Administrators**
        ii. **DHCP Users**
2. **Configured the DHCP Server Scope:**
    a. **Scope Details:**
        i. Assigned the name **CompanyLAN**.
        ii. Defined an IP address range: `192.168.1.2` to `192.168.1.254`.
        iii. Ensured the range aligns with the network's subnet.
    b. **Excluded IP Addresses for Static Devices:**
        i. Excluded the following static IP addresses for six printers:
            1. `192.168.1.30–192.168.1.32`
            2. `192.168.1.40–192.168.1.41`
            3. `192.168.1.56`
    c. **Set IP Lease Duration:**
        i. Configured leases to expire every 24 hours (`1 day, 0 hours, 0 minutes`).
3. **Activated the Scope:**
    a. Configured the default settings for DHCP options (gateway, DNS, WINS not configured in this project).
    b. Activated the scope to allow DHCP clients to obtain IP address leases.

Takeaways:

1. **Efficiency and Automation:**

The DHCP server reduces manual IP address configuration, saving time and minimizing errors.

2. **Exclusions for Static Devices:**

Excluding specific IPs ensures static devices (e.g., printers) retain their designated addresses, preventing conflicts.

3. **Dynamic Network Management:**

DHCP enables scalability and flexibility, allowing seamless addition of devices to the network without manual adjustments.

By following this guide, you will gain practical experience in configuring DHCP, enabling you to manage IP addresses dynamically and improve network efficiency in a professional setting.