Exercise 1 - Preparing System for Windows Deployment Services (WDS)

WDS (Windows Deployment Services) is a server feature that makes it easier to install desktop operating systems like Windows 11 and prior versions on new hardware without the use of CD or DVD media and with minimal user interaction. installation.

When a WDS client boots with a network interface card that supports the PreBoot Execute (PXE) specification, a Windows operating system can be installed remotely.

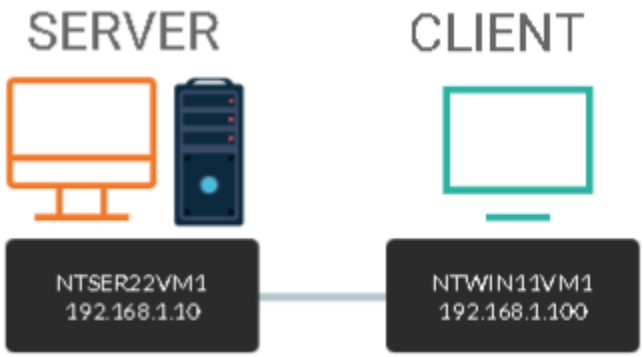
The client connects to the WDS server, which runs the Trivial File Transfer Protocol \s(TFTP) service and hosts the Windows 11 boot files and installs images.

Following the successful establishment of a network connection between the WDS client and server, the operating system setup proceeds nearly hands-free, with only a few systems prompts to complete the installation procedure.

In this exercise,

1. We will prepare the system requirements for a successful configuration of Windows Deployment Service

Topology



DOMAIN = networktute.com

NTSER22VM1 = Windows Server 2022 – Domain Controller

NTWIN11VM1 = Windows 11 – Domain Member

Prerequisite

- *VMware Workstation 16 Pro*
    - When making this tutorial, we used the “Windows Server 2019” VM Template and “Windows 10 & later” VM Template. Since VMware didn’t have the updated templates.
- *Microsoft Windows Server 2022*
- *Microsoft Windows 11*

Task 1:

An IP address is required for a machine to connect to a server. An IP address can be manually input or assigned to a device dynamically. An IP address must be dynamically assigned by a Dynamic Host Configuration Protocol (DHCP) server to computers that do not run any operating system.

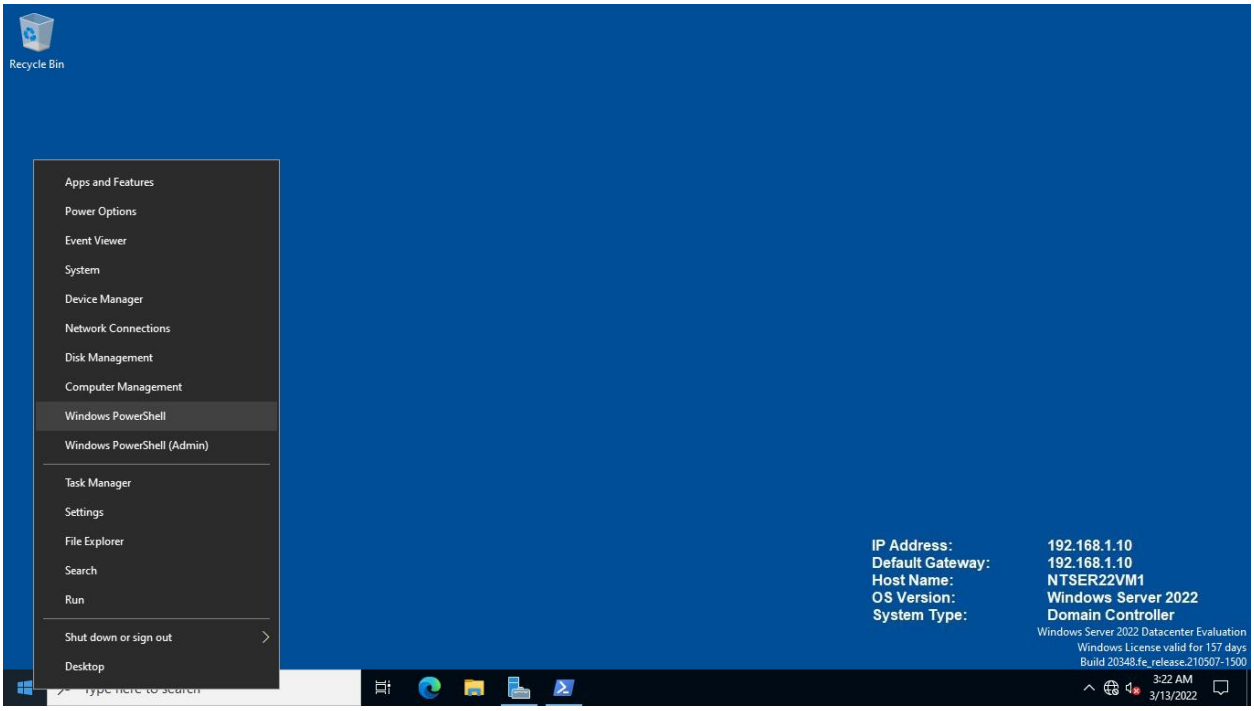
DHCP is a Windows Server feature that distributes IP addresses and subnet masks to devices with a Network Interface Card (NIC).

Now let’s, install a DHCP server to ensure that a new computer is assigned an IP to enable it to connect to WDS.

Step 1:

Ensure you are connected to **NTSER22VM1**

When signed in, right-click the **Start** icon and select **Windows PowerShell**.

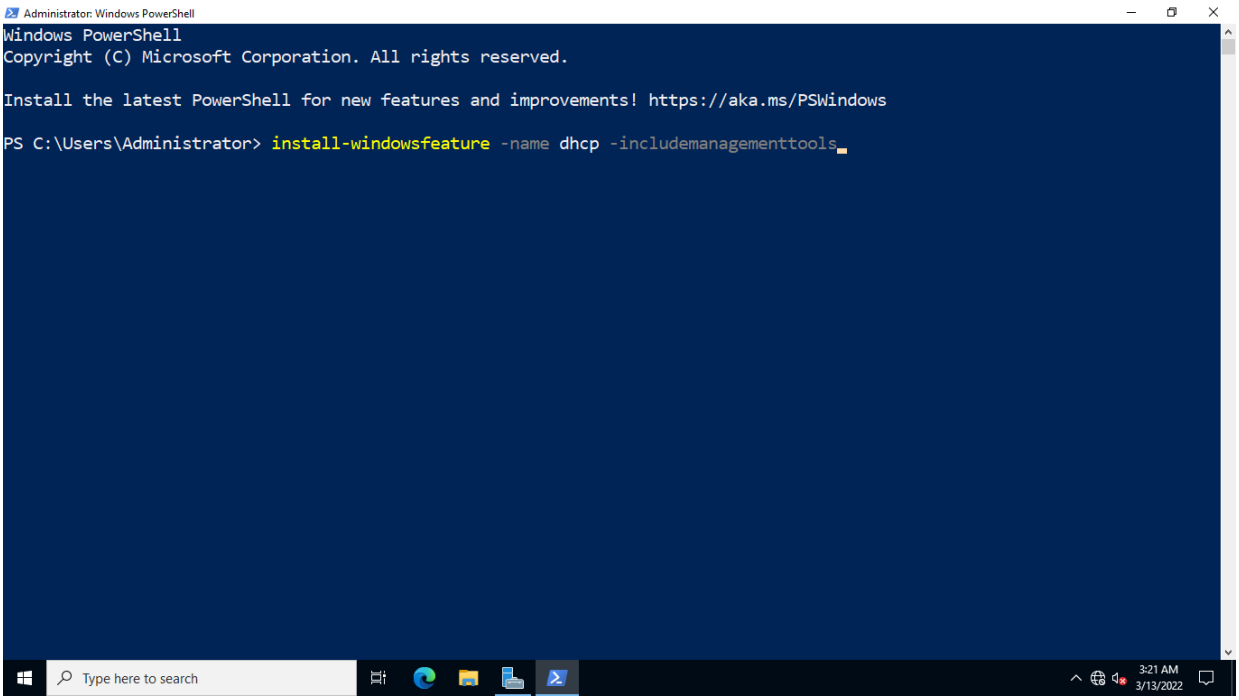


Step 2:

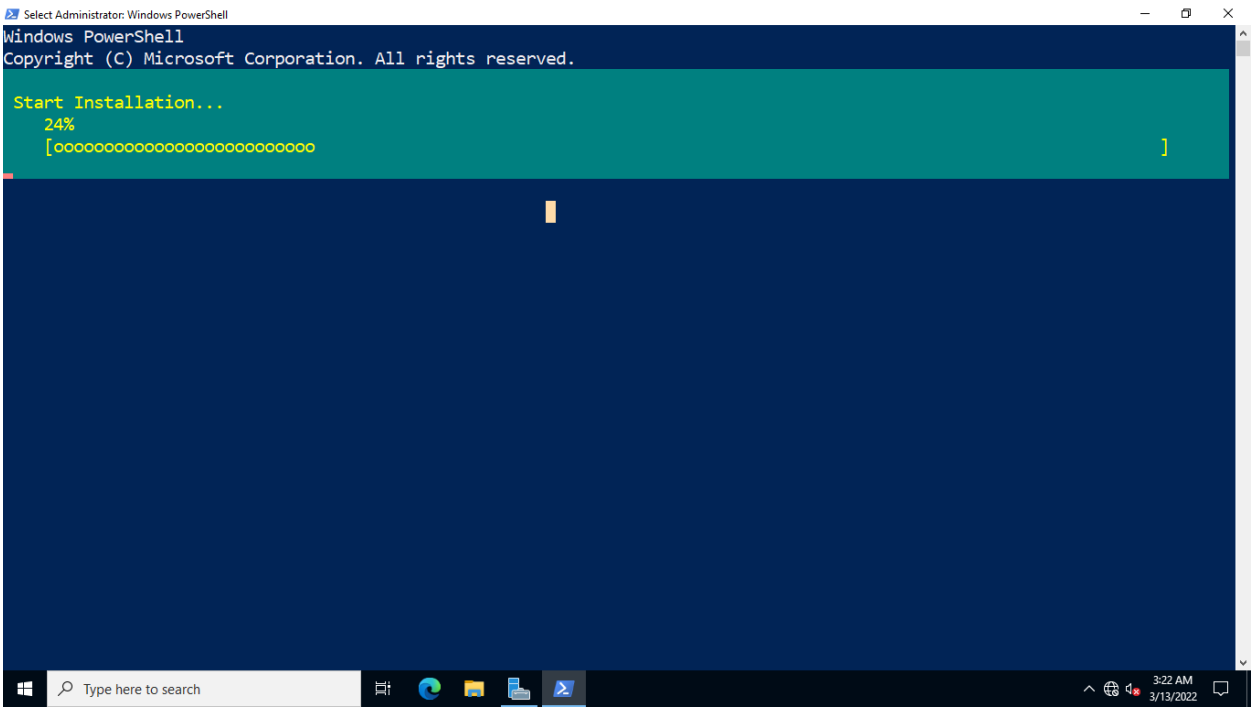
To install a **DHCP** server, type the following command:

```
install-windowsfeature -name dhcp -includemanagementtools
```

Press **Enter.**

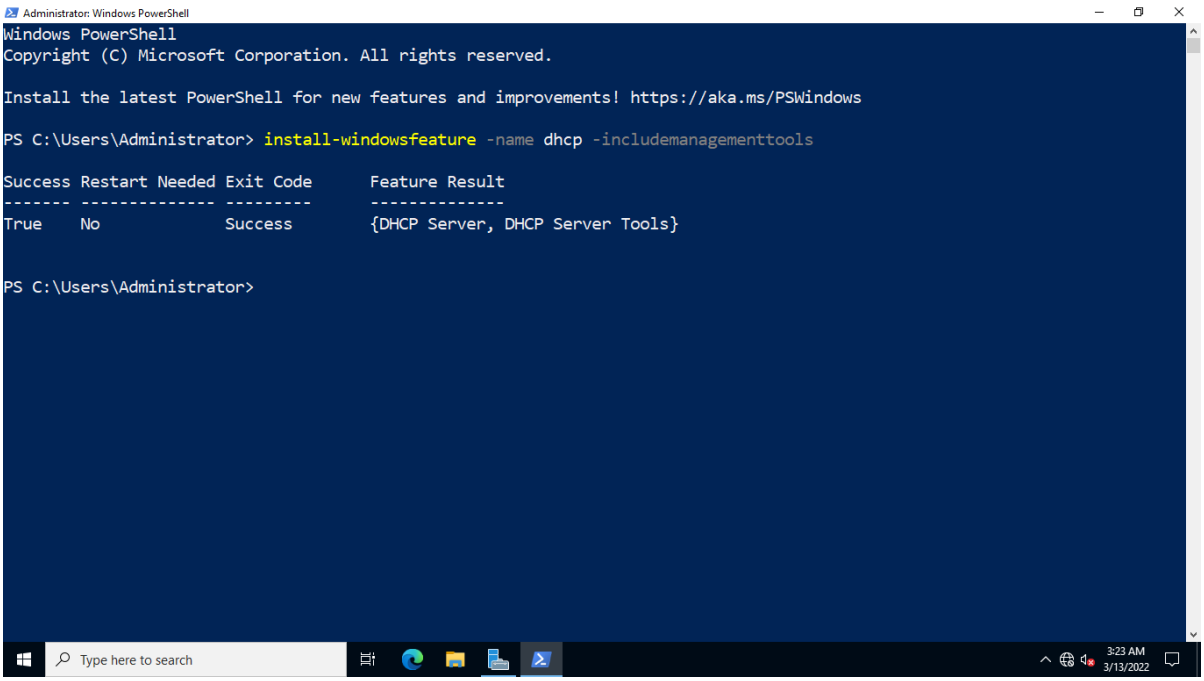


Please wait while the **DHCP** feature is being installed.



Step 3:

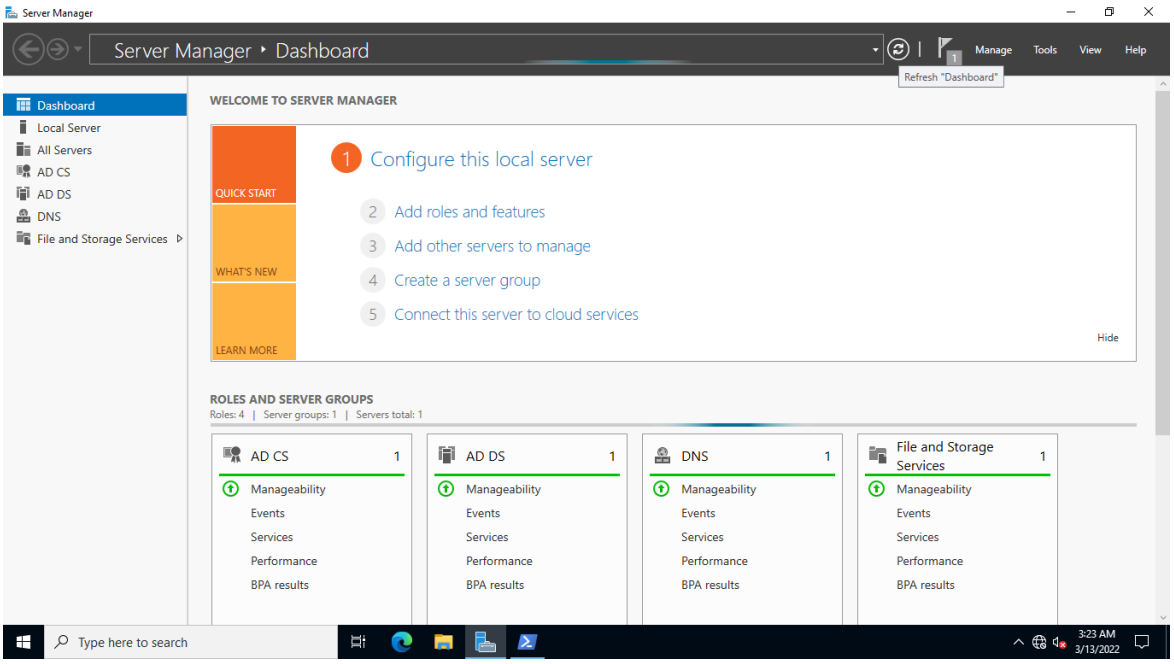
Once you get the confirmation that **DHCP** is successfully installed, close the **Windows PowerShell** window.



Step 4:

Ensure that the **Server Manager Dashboard** is displayed.

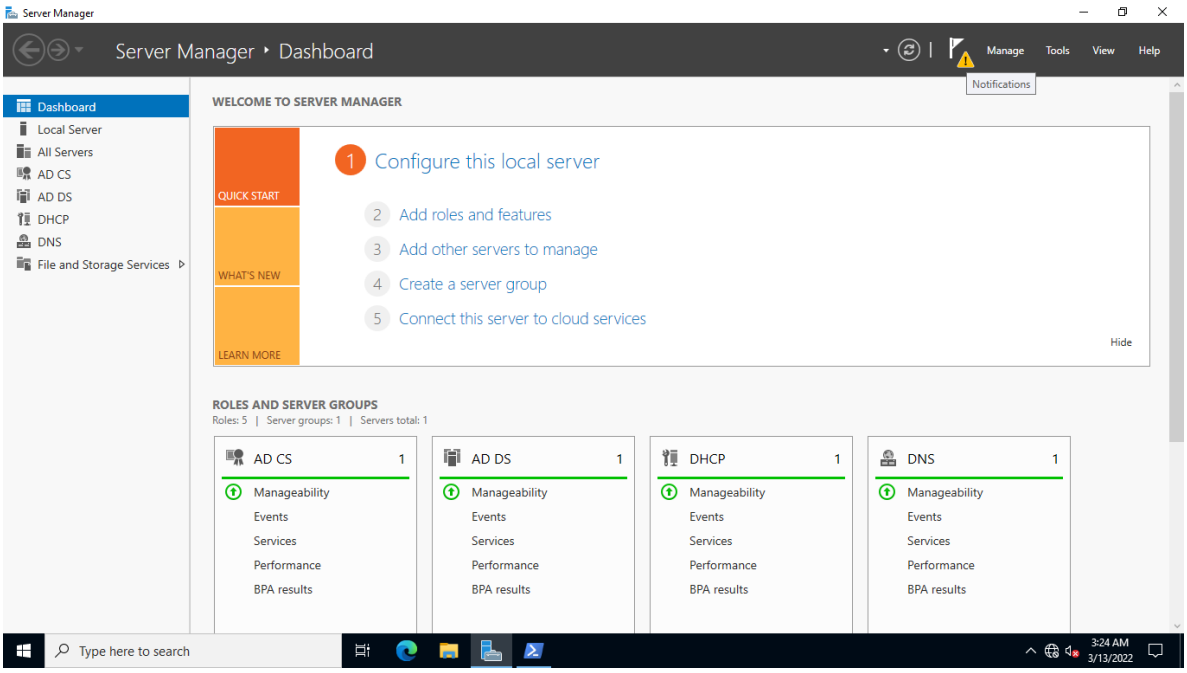
Click the **Refresh "Dashboard"** icon at the top.



Step 5:

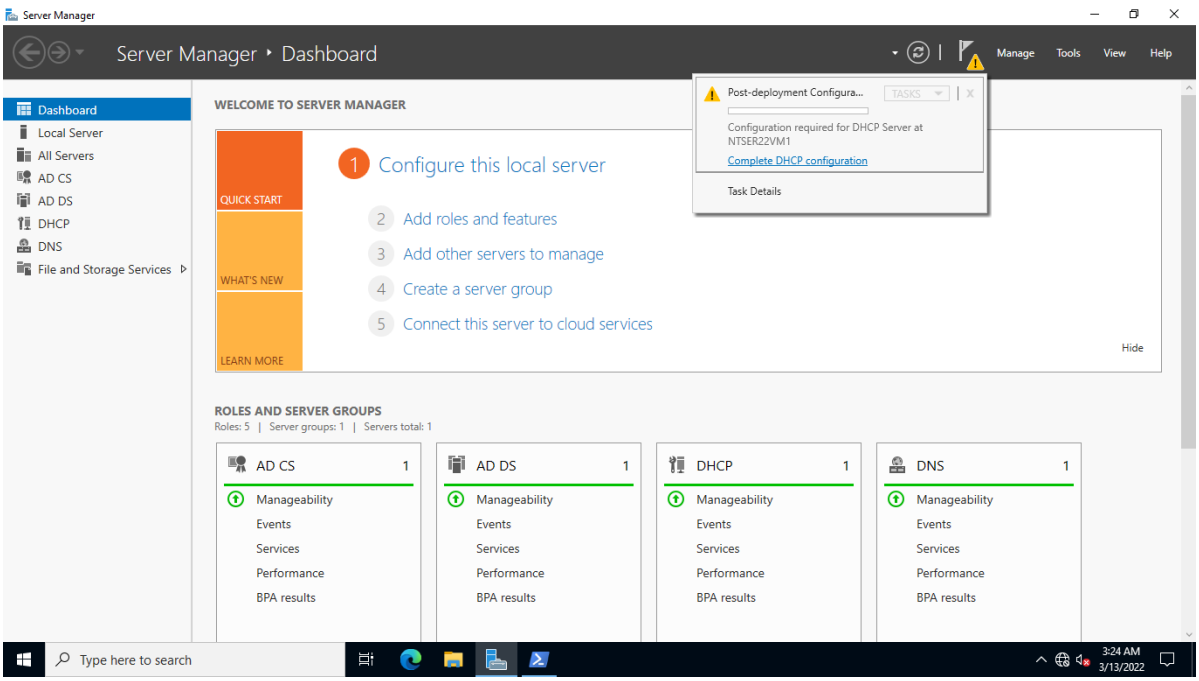
Notice that an exclamation mark in a yellow triangle appears next to the notifications flag in the menu.

Click the **Notifications** icon.



Step 6:

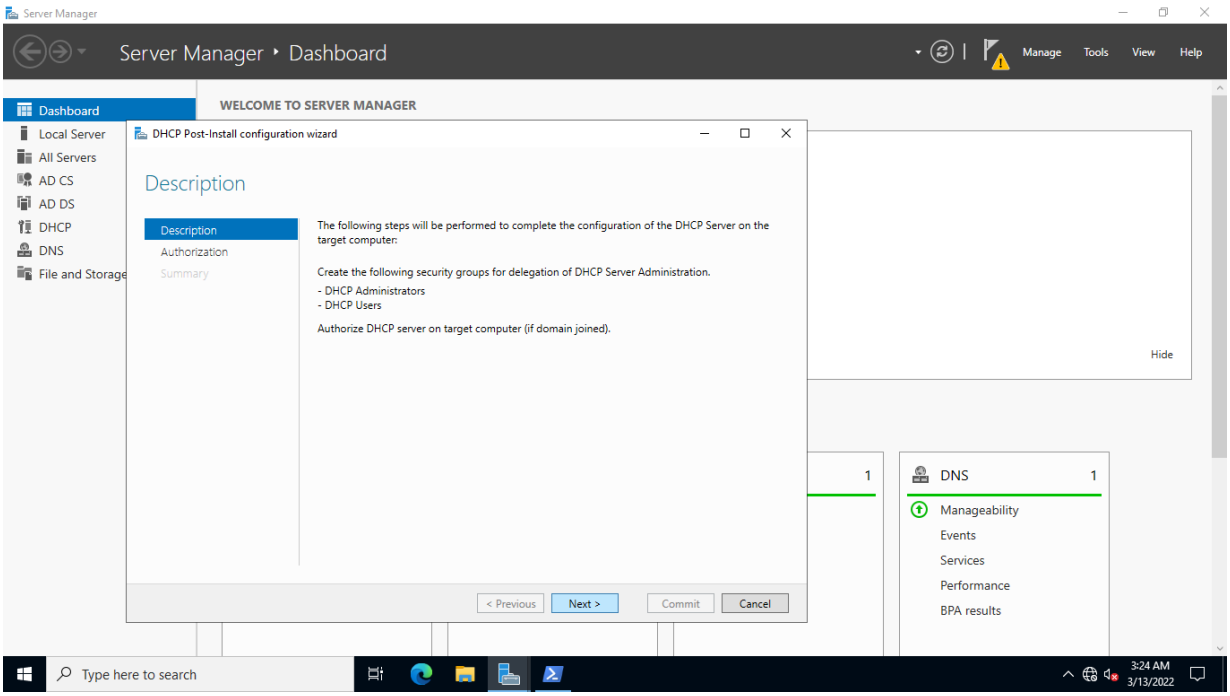
On the **Post-deployment Configuration** dialog box displayed, click the **Complete DHCP configuration** weblink.



Step 7:

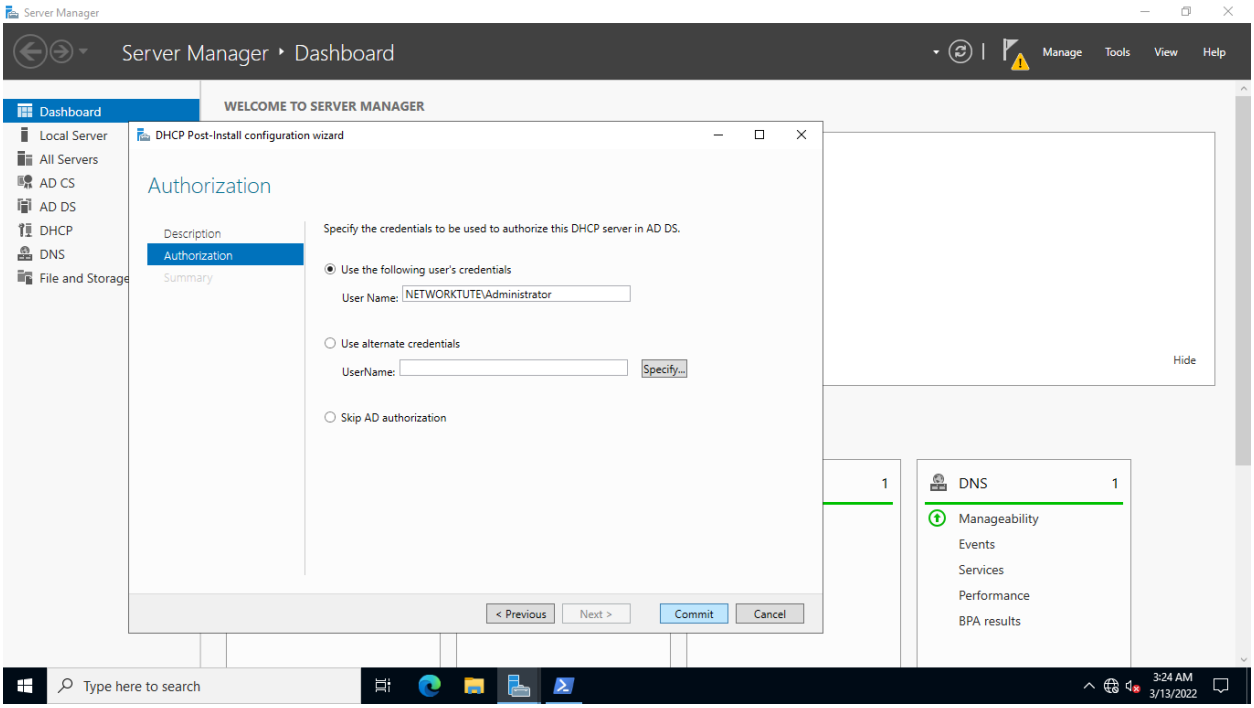
On the **DHCP Post-Install configuration wizard**, the **Description** page is displayed.

Click **Next**.



Step 8:

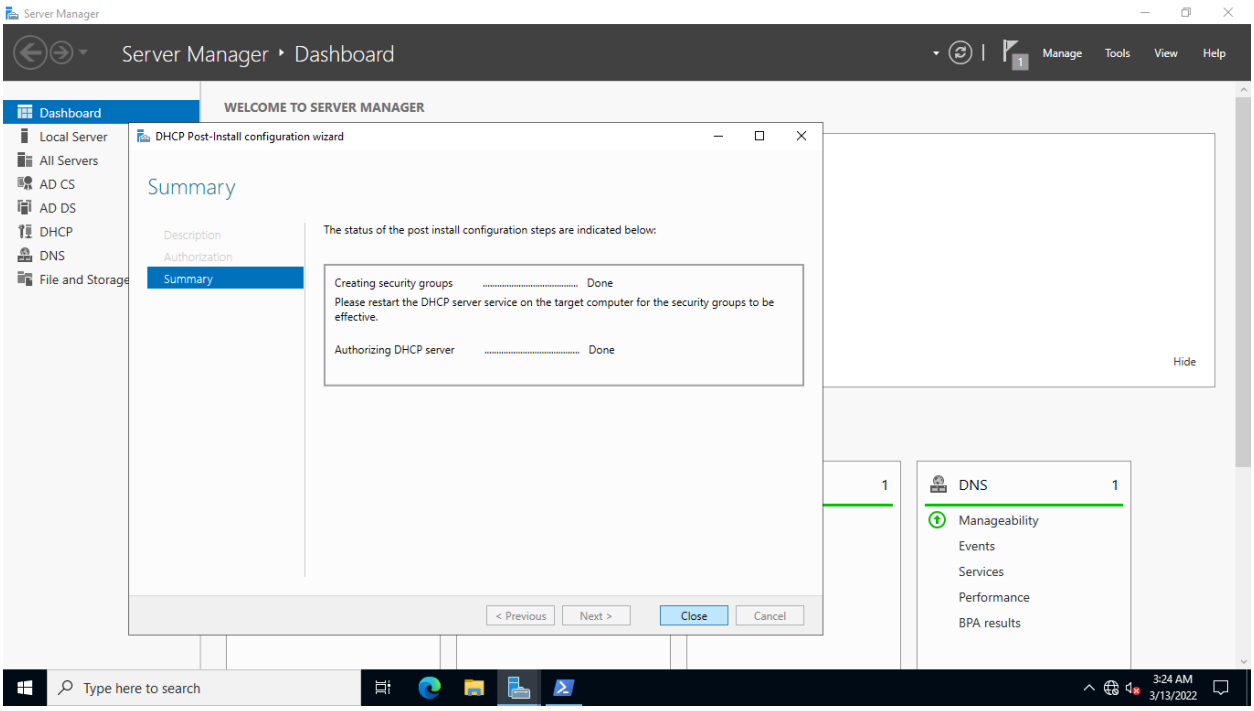
On the **Authorization** page, click **Commit**.



Step 9:

On the **Summary** page, notice it lists the status of the post-install configuration steps.

Click **Close**



Task 2:

To be able to lease IP addresses to requesting machines, a DHCP server must be a member of the Active Directory Domain Network.

Therefore, a DHCP server must be authorized by the Active Directory Domain Server to run in the network.

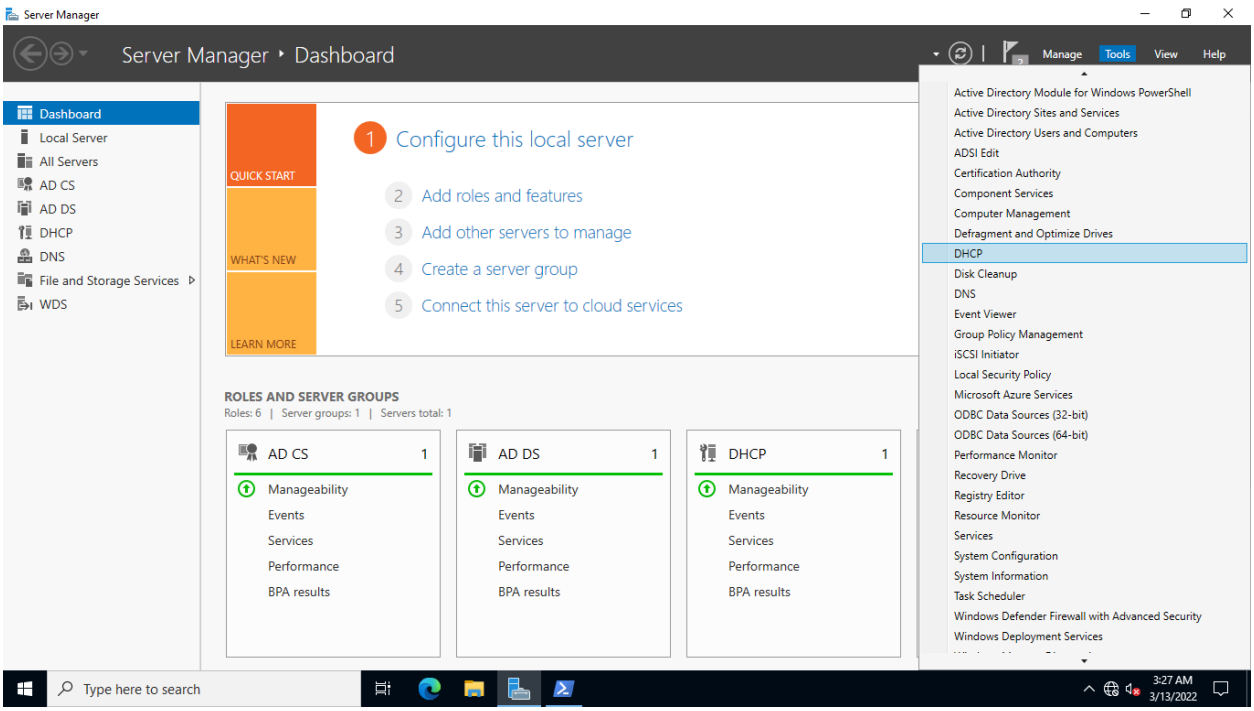
If the server is a domain joined computer, the authorization of a DHCP server can happen automatically.

Now let's, we will verify the authorization status of **NTSER22VM1** to run DHCP services in the lab

Step 1:

Ensure you are connected to **NTSER22VM1** with the Server Manager window open.

On the **Server Manager** > **Dashboard** window, click the **Tools** menu and select **DHCP.**



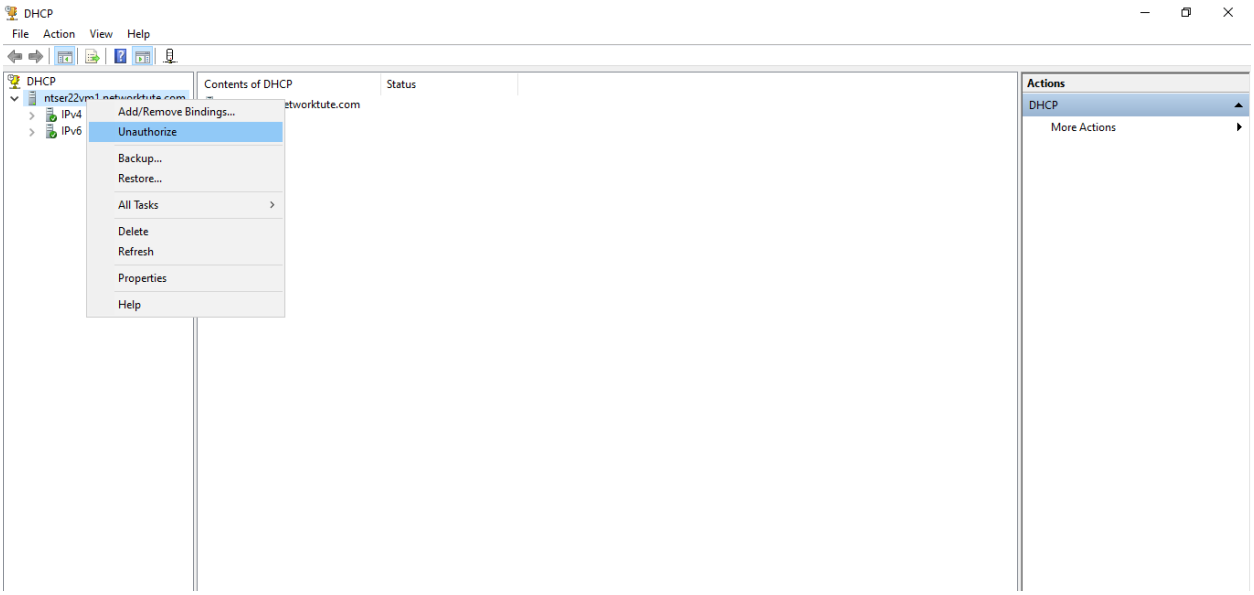
Step 2:

On the **DHCP** window, expand **ntser22vm1**.

Right-click **ntser22vm1** and notice that **Unauthorize** is displayed.

This indicates that **ntser22vm1** has already been authorized to provide the **DHCP** service.

Click outside of the shortcut menu to dismiss it.



Task 3:

A DHCP scope is a pool of IP addresses that a DHCP server can lease out when a DHCP client makes a request.

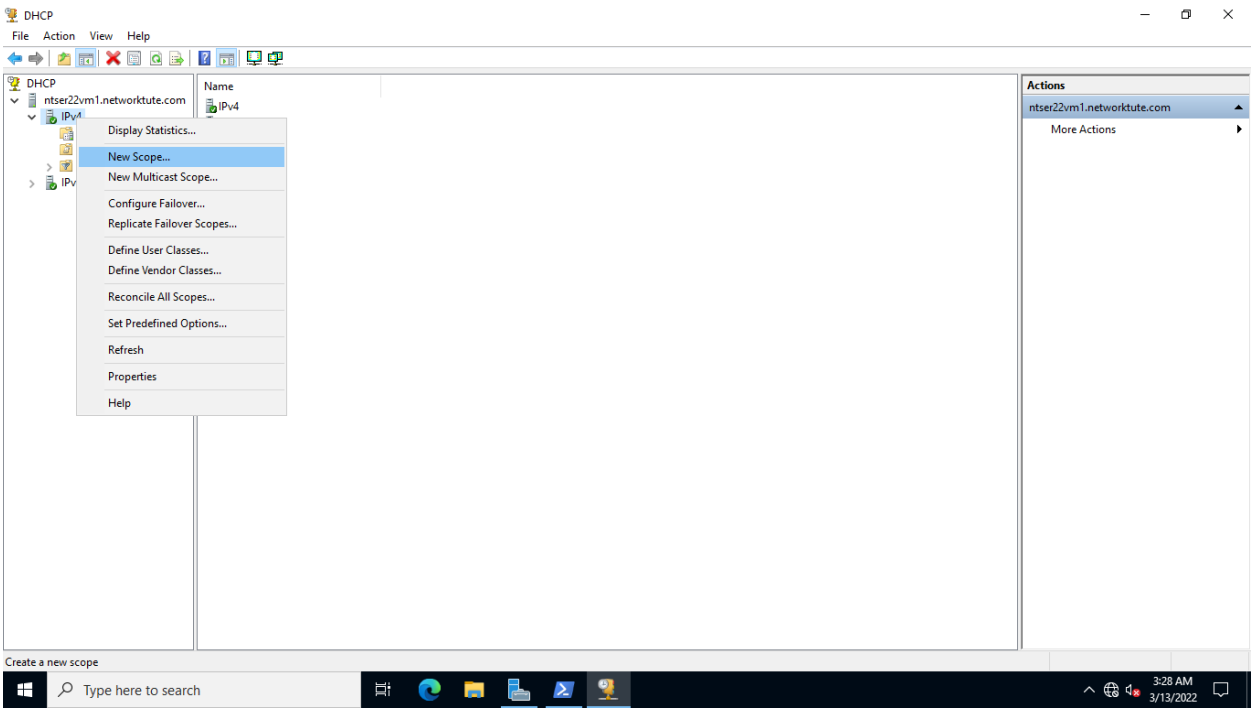
Now let's, we will create a scope of IP addresses based on the current lab network setup.

Step 1:

Ensure the **DHCP** window is open on **NTSER22VM1** and **ntser22vm1** is expanded.

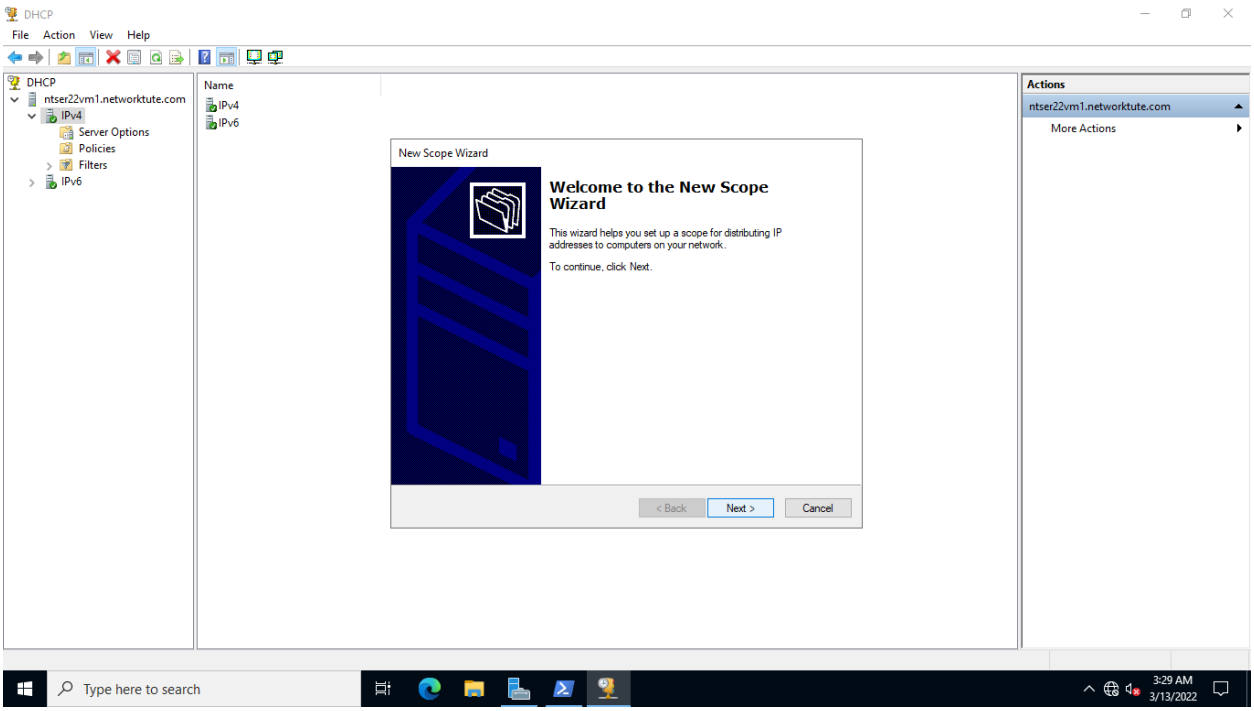
Expand **IPv4**.

Right-click **IPv4** and select **New Scope**.



Step 2:

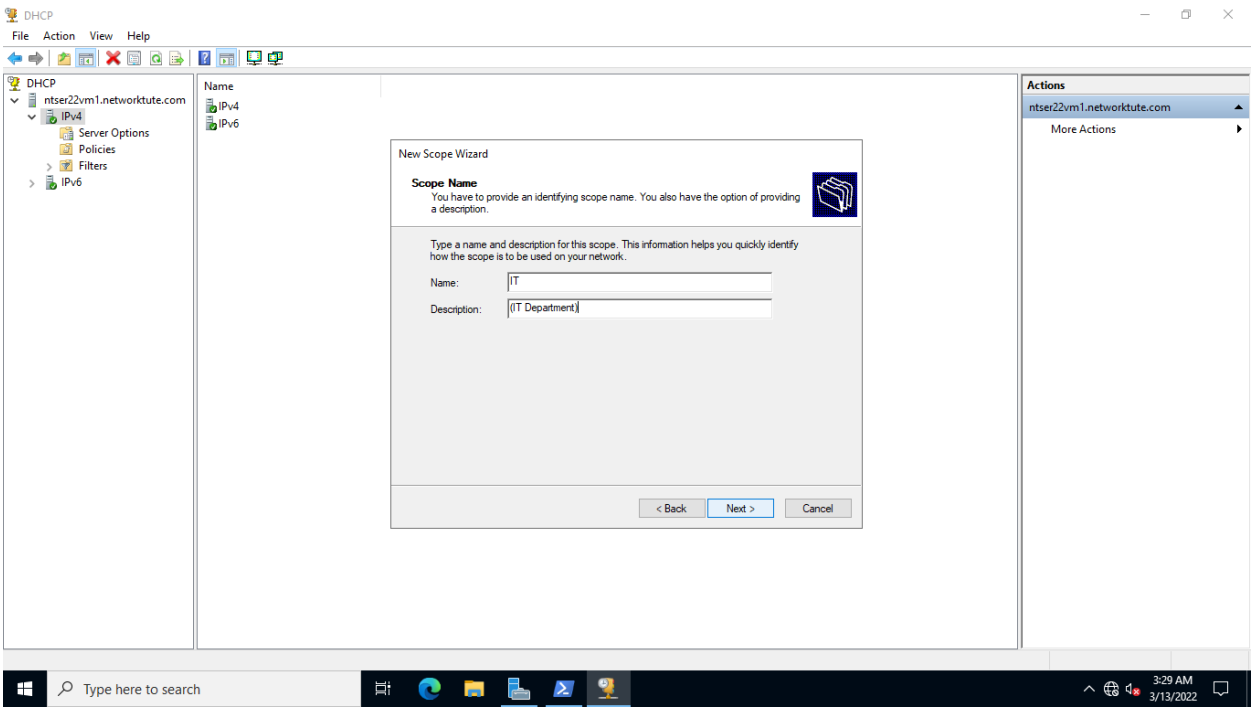
The **New Scope Wizard** is displayed. On the **Welcome to the New Scope Wizard** page, click **Next.**



Step 3:

On the **Scope Name** page, click in the **Name** textbox and type: ***IT***

Click **Next.**



Step 4:

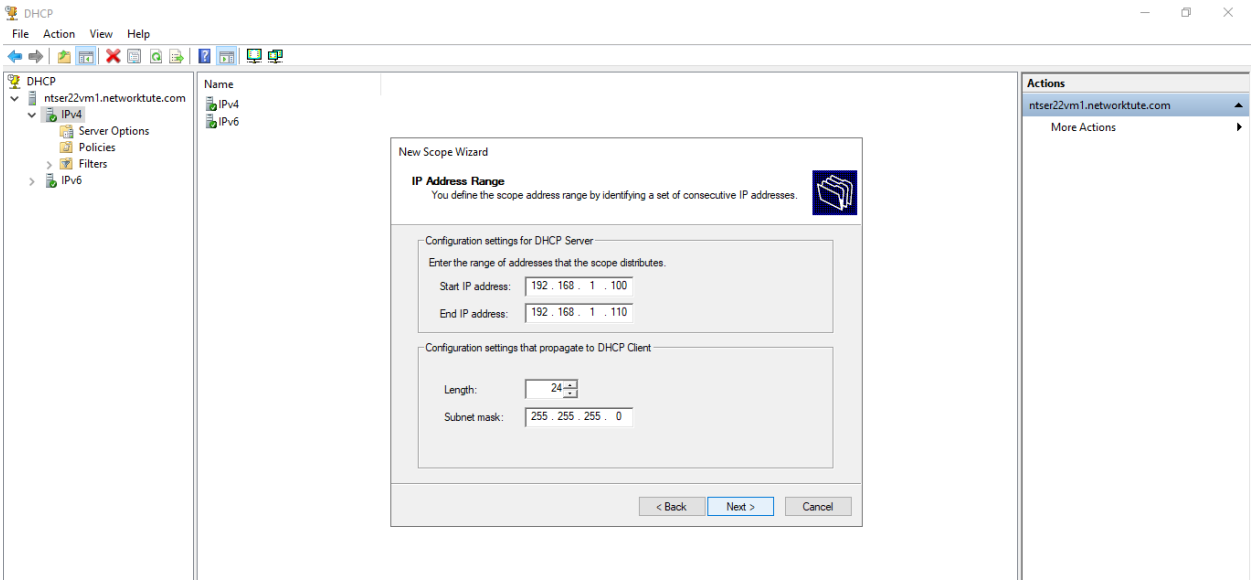
On the **IP Address Range** page, in the **Start IP address** box, type:

192.168.1.100

In the **End IP address** box, type:

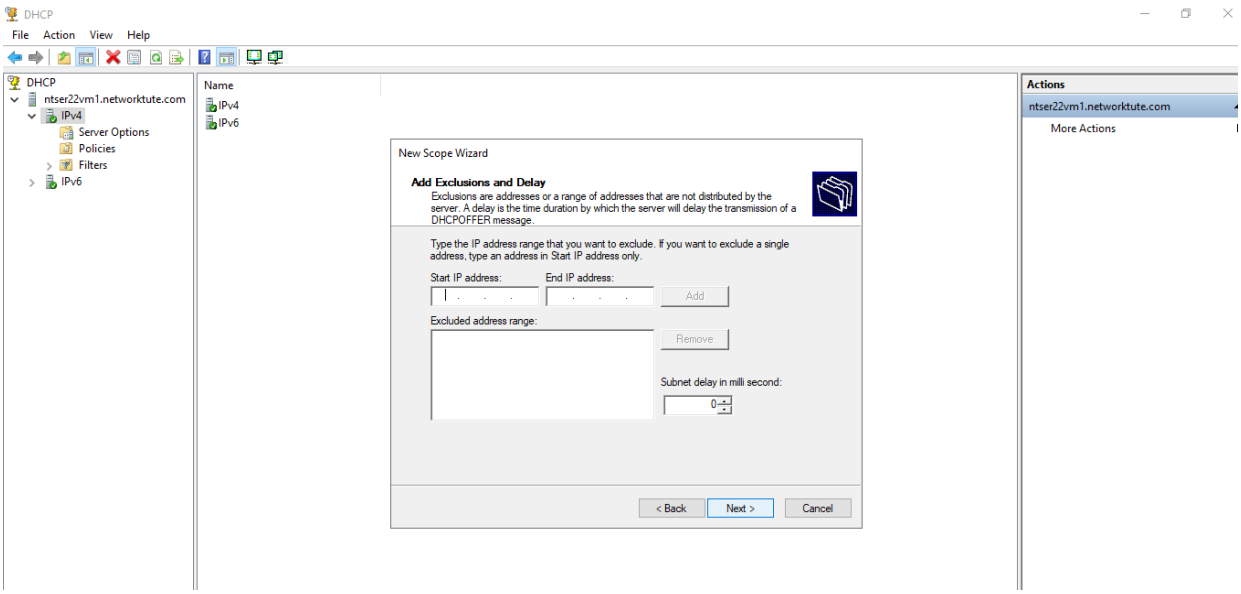
192.168.1.110

Notice that the **Length** and **Subnet mask** fields are automatically filled in with the relevant values. Click **Next**.



Step 5:

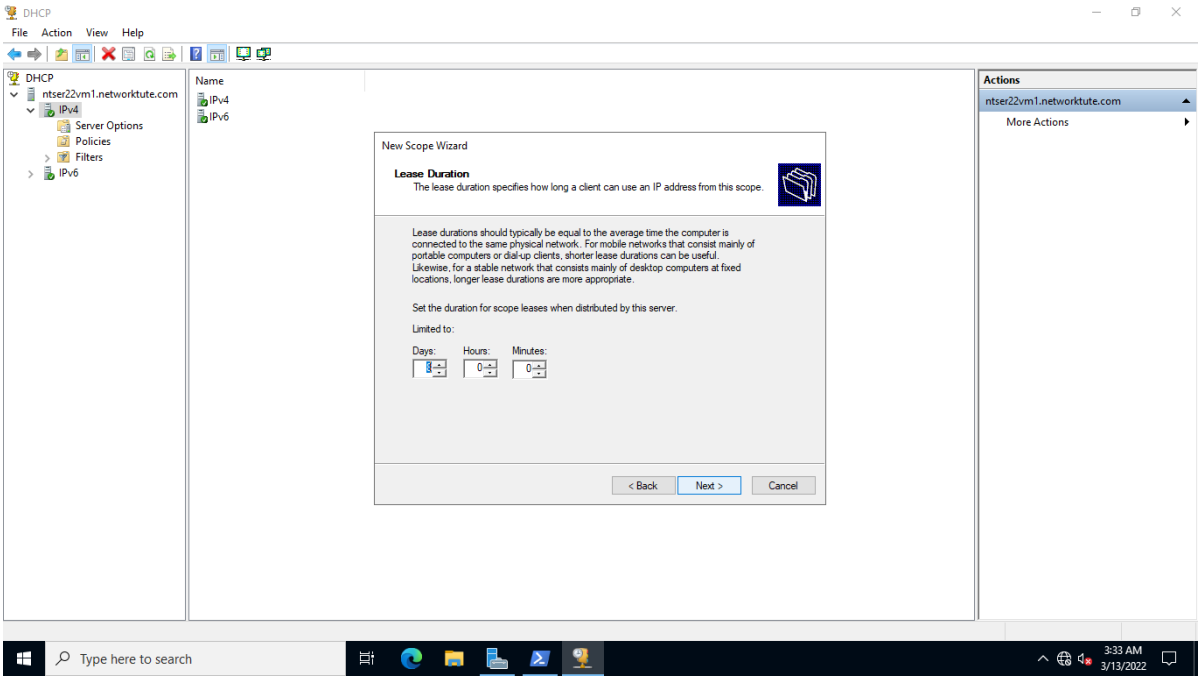
On the **Add Exclusions and Delay** page, click **Next**.



Step 6:

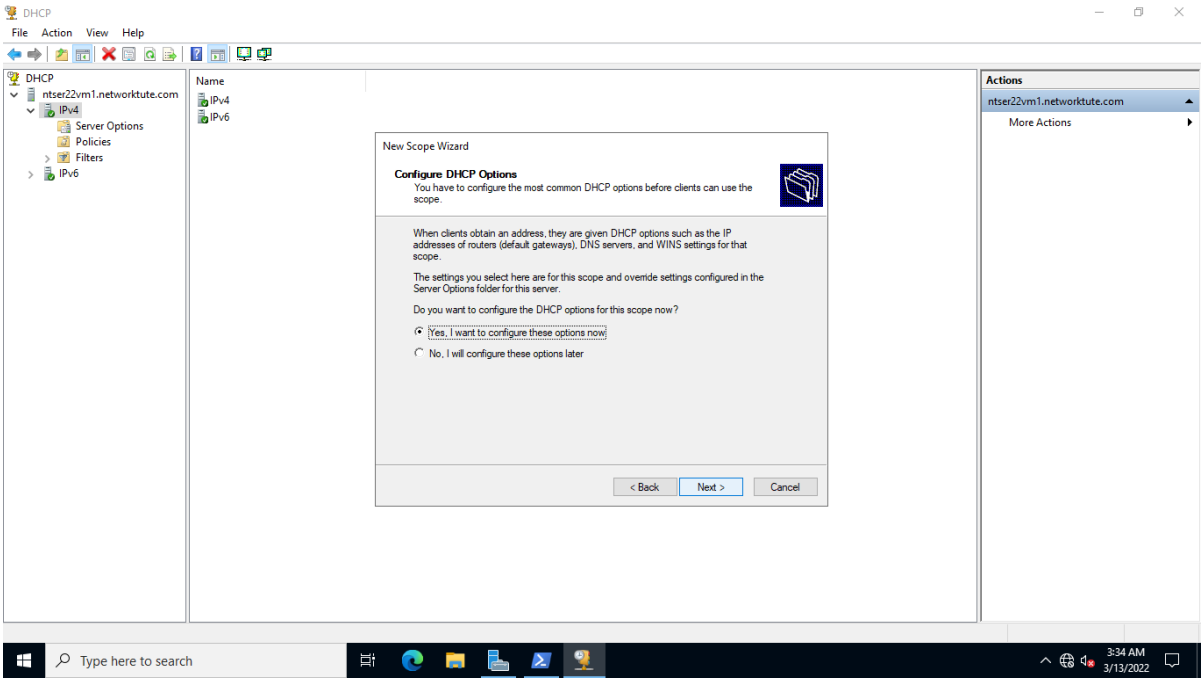
On the **Lease Duration** page, keep the default settings.

Click **Next**.



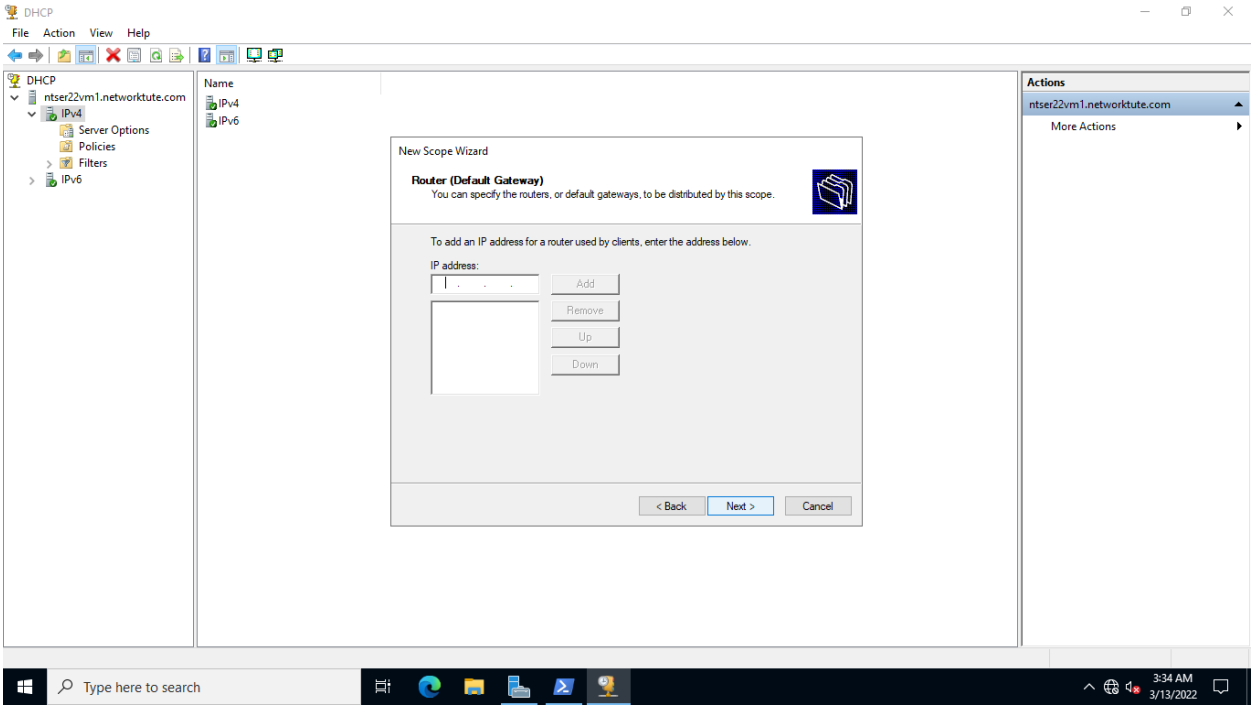
Step 7:

On the **Configure DHCP Options** page, ensure that **Yes, I want to configure these options now** is selected. Click **Next**.



Step 8:

On the **Router** (**Default Gateway**) page, click **Next**.

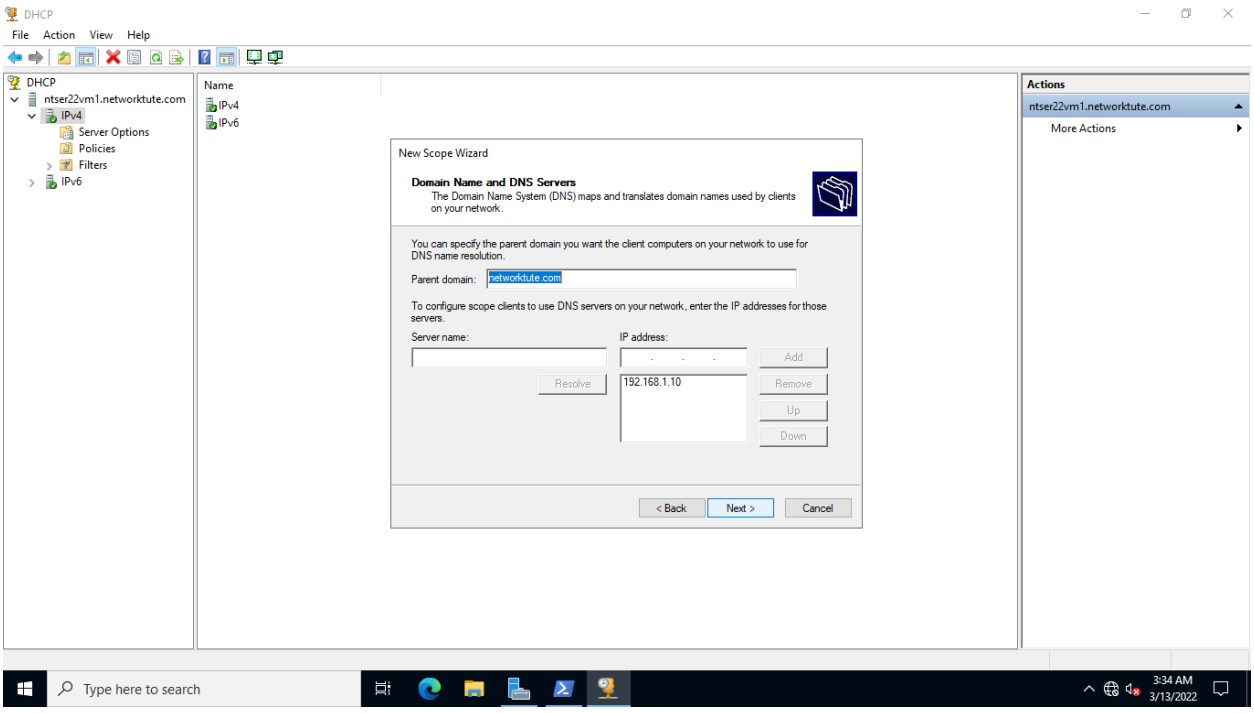


Step 9:

On the **Domain Name and DNS Servers** page, notice the **Parent domain** is specified as **networktute.com** for the client computers on the network to use for DNS name resolution.

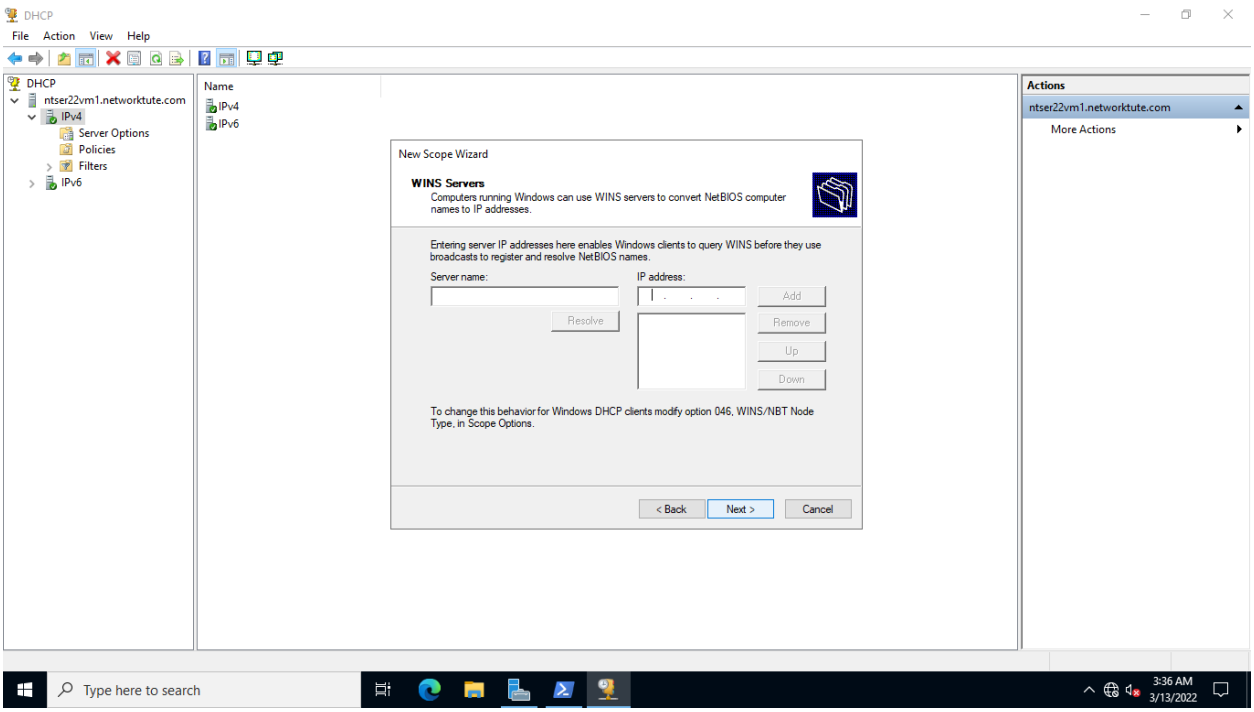
The **IP address** applied is **192.168.1.10**

Click **Next**.



Step 10:

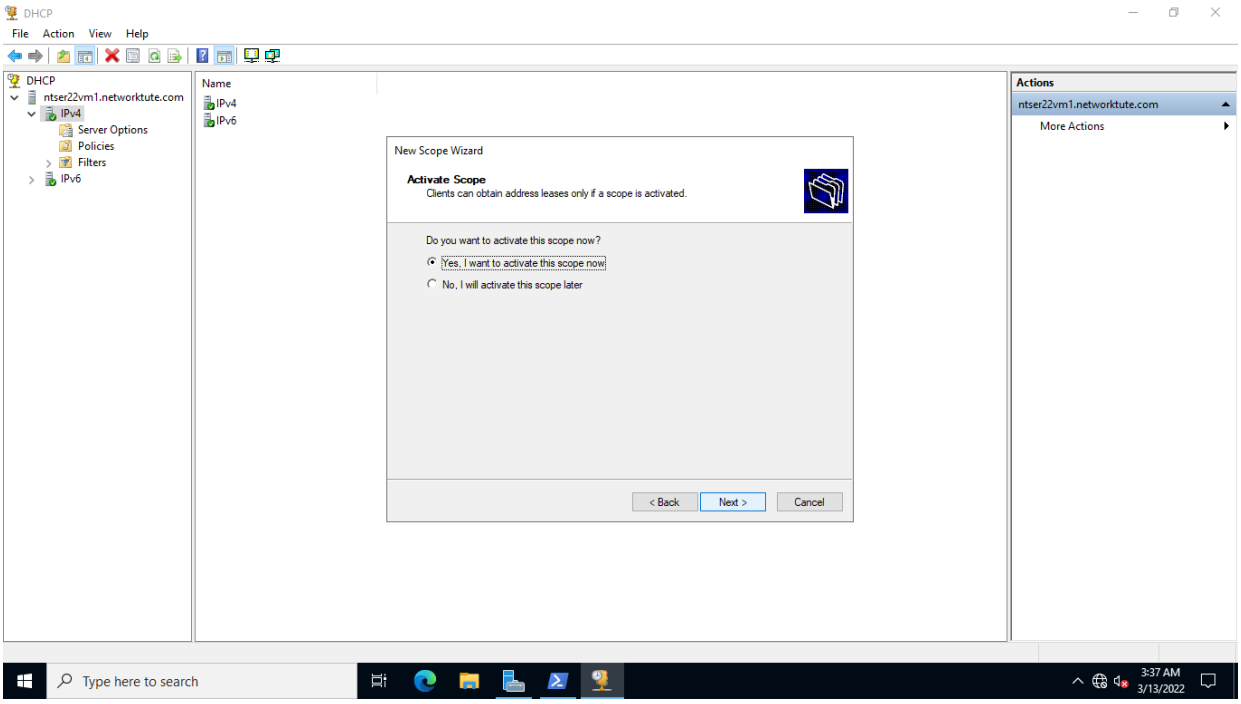
On the **WINS Servers** page, click **Next**.



Step 11:

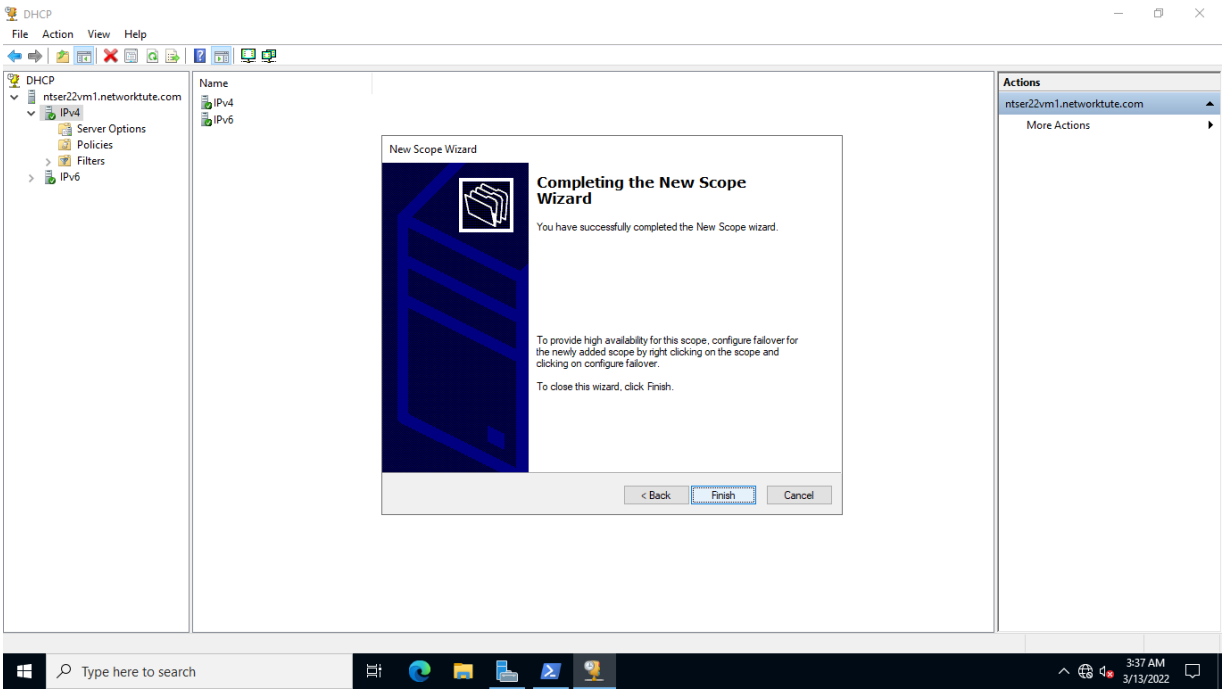
On the **Activate Scope** page, ensure that **Yes, I want to activate the scope now** is selected.

Click **Next**.



Step 12:

On the **Completing the New Scope Wizard** page, click **Finish**.



Task 4:

A DHCP server must support two types of protocols - DHCP and BOOTP.

- DHCP assigns IP addresses to intelligent clients, such as hard-drive-equipped computers.
- BOOTP assigns IP to diskless clients such as network printers.

Now let's, we will enable both DHCP and BOOTP protocols on **NTSER22VM1**

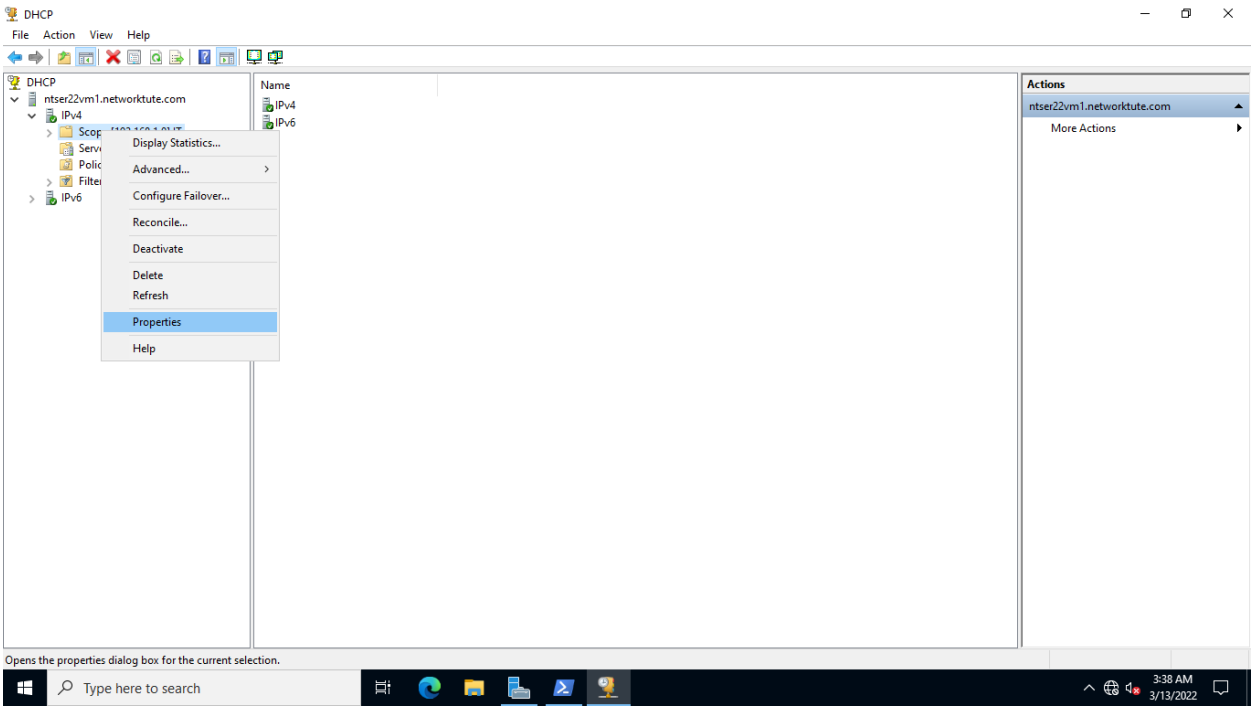
Step 1:

Ensure you are connected to **NTSER22VM1** and the **Server Manager** > **Dashboard** > **Tools** > **DHCP** window is open

Also ensure **DHCP** > **ntser22vm1** >**IPv4** is expanded.

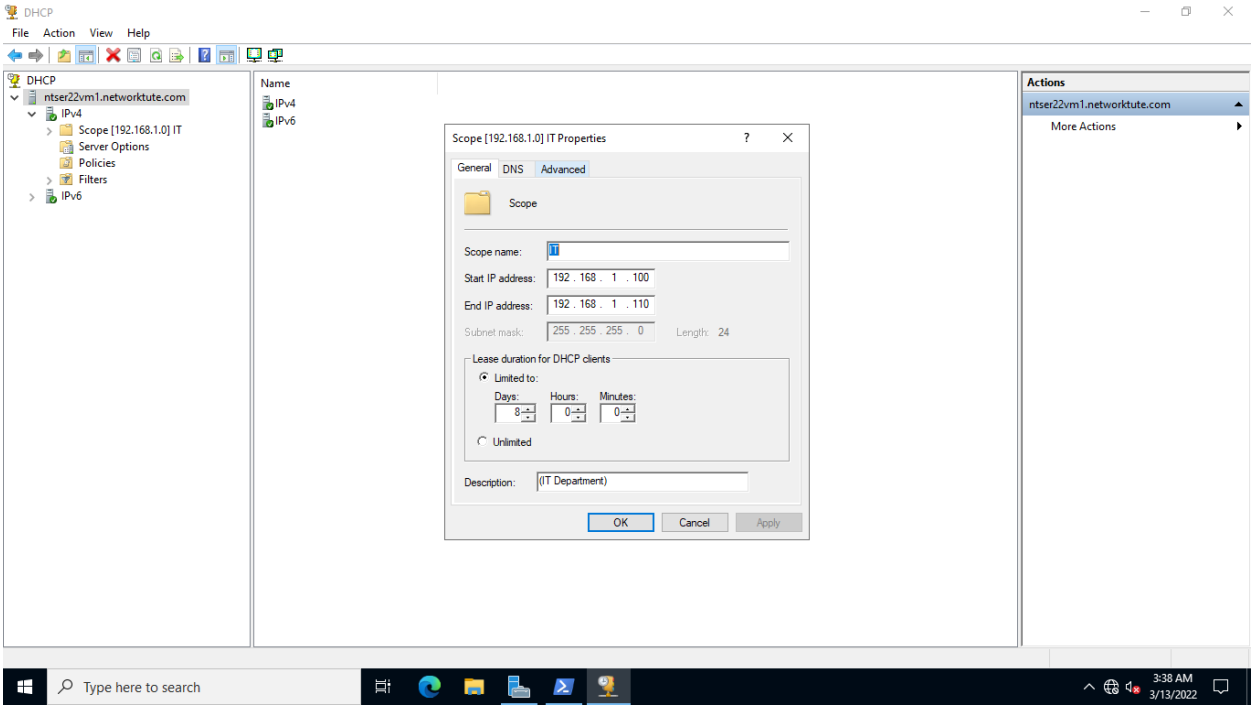
Notice that the newly defined scope **[192.168.1.0] IT** is now listed.

Notice that the newly defined Scope **[192.168.1.0] IT** is now listed.



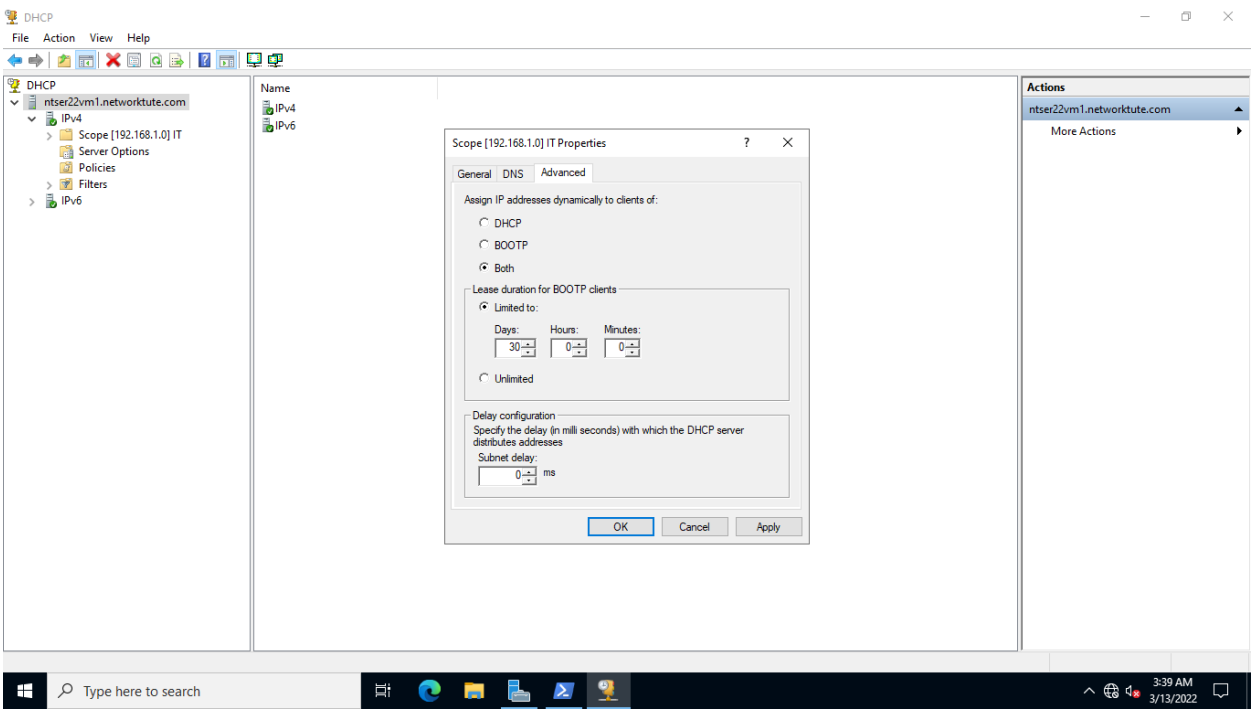
Step 2:

On the Scope **[192.168.1.0] IT Properties** dialog box, click the **Advanced** tab.



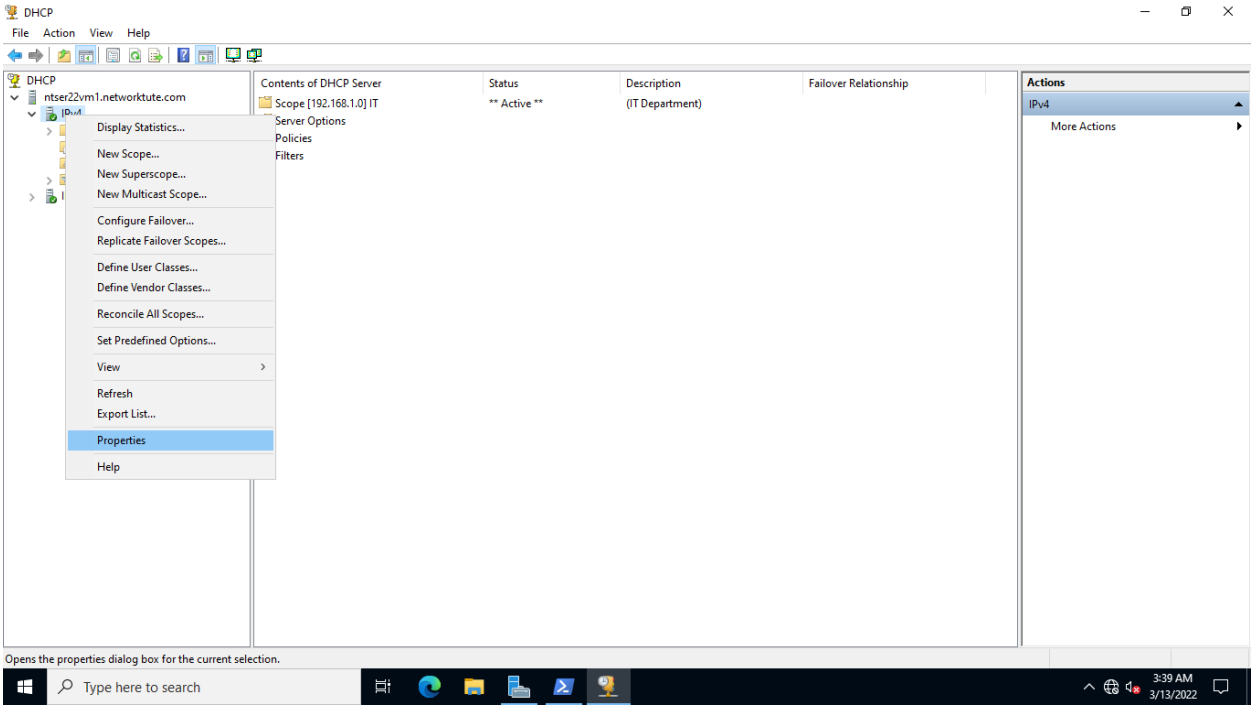
Step 3:

On the **Advanced** tab, under the **Assign IP addresses dynamically to clients** of section, select **Both**. Click **OK.**



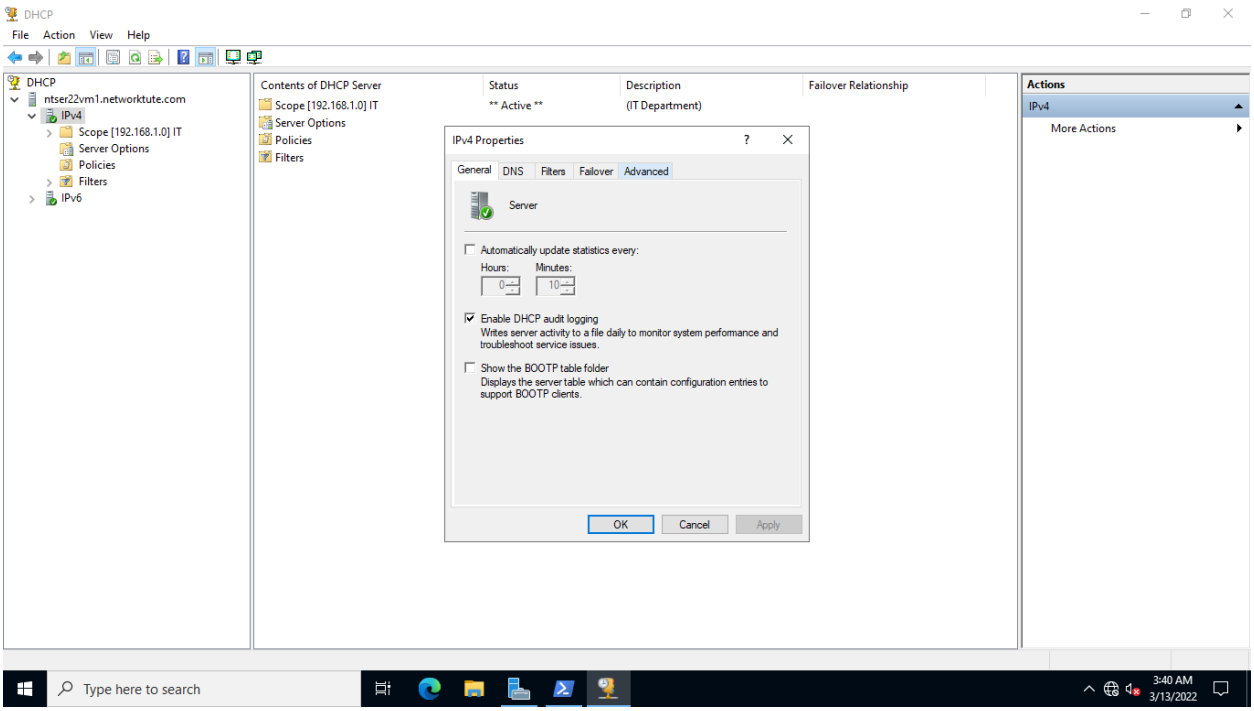
Step 4:

Back on the **DHCP** window, right-click **IPv4** and select **Properties.**



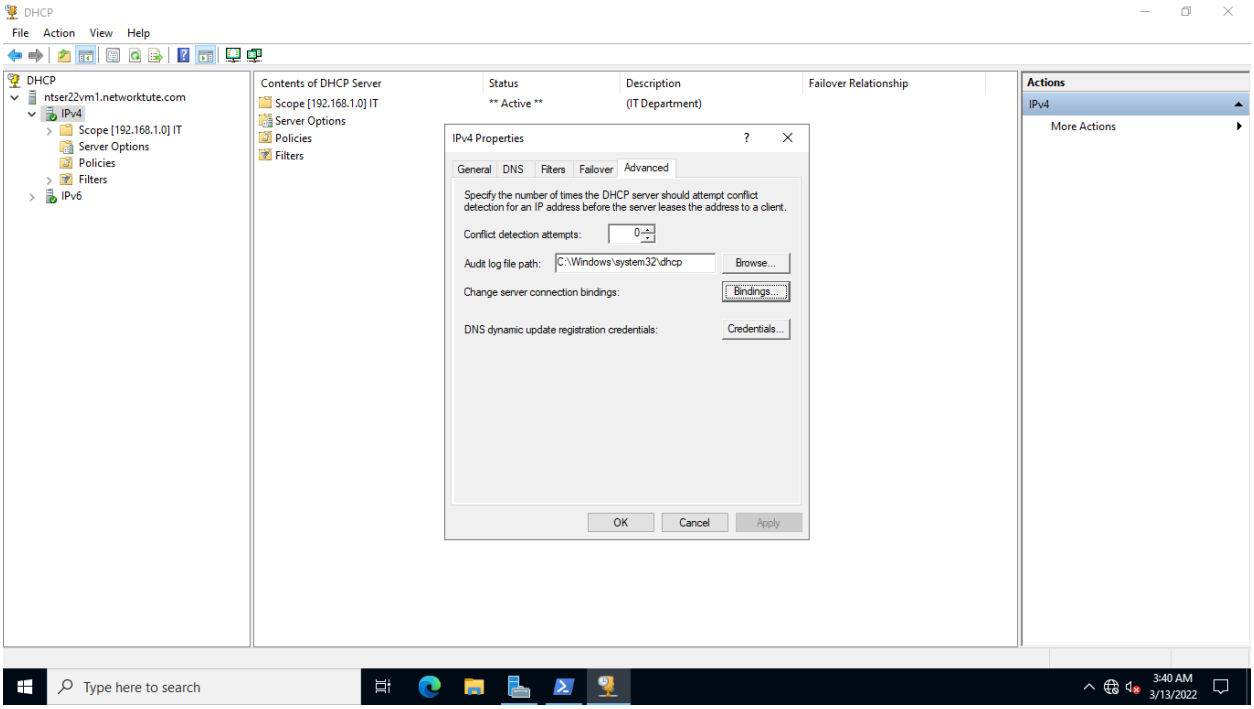
Step 5:

On the **IPv4 Properties** dialog box, click the **Advanced** tab.



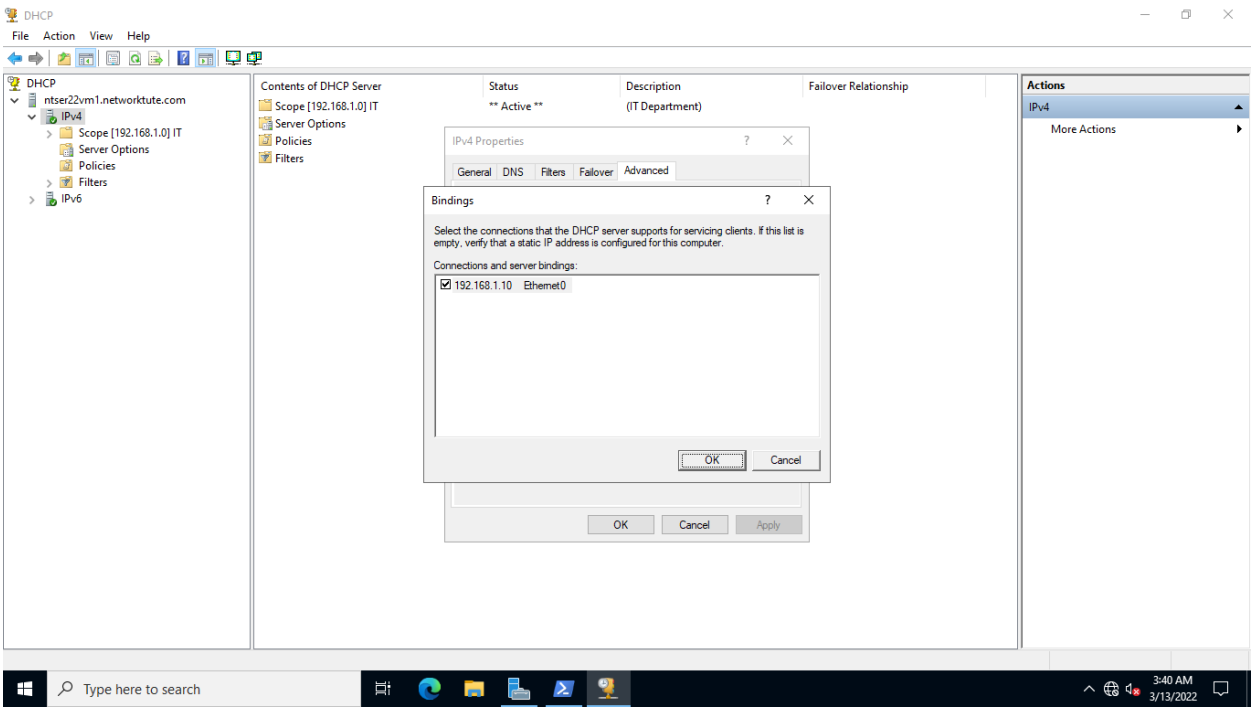
Step 6:

On the **Advanced** tab, click **Bindings**



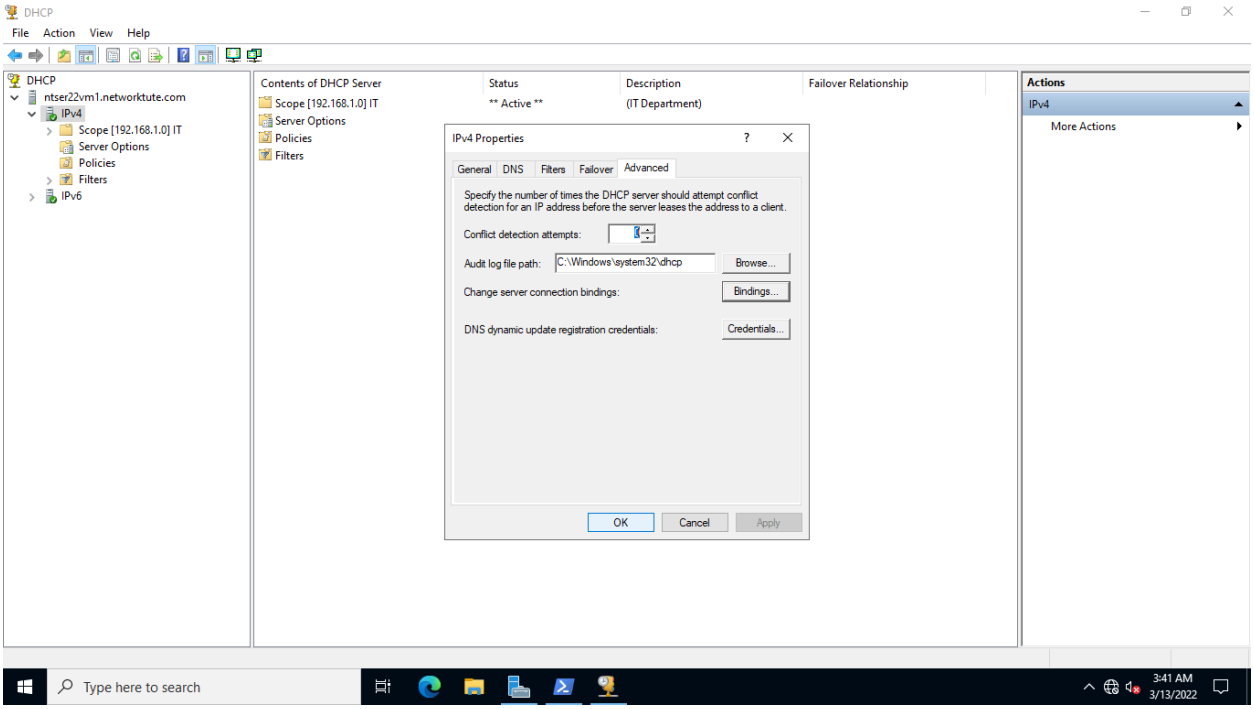
Step 7:

On the **Bindings** dialog box, ensure that the **192.168.1.2 Ethernet 0** checkbox is ticked. Click **OK** to save changes.



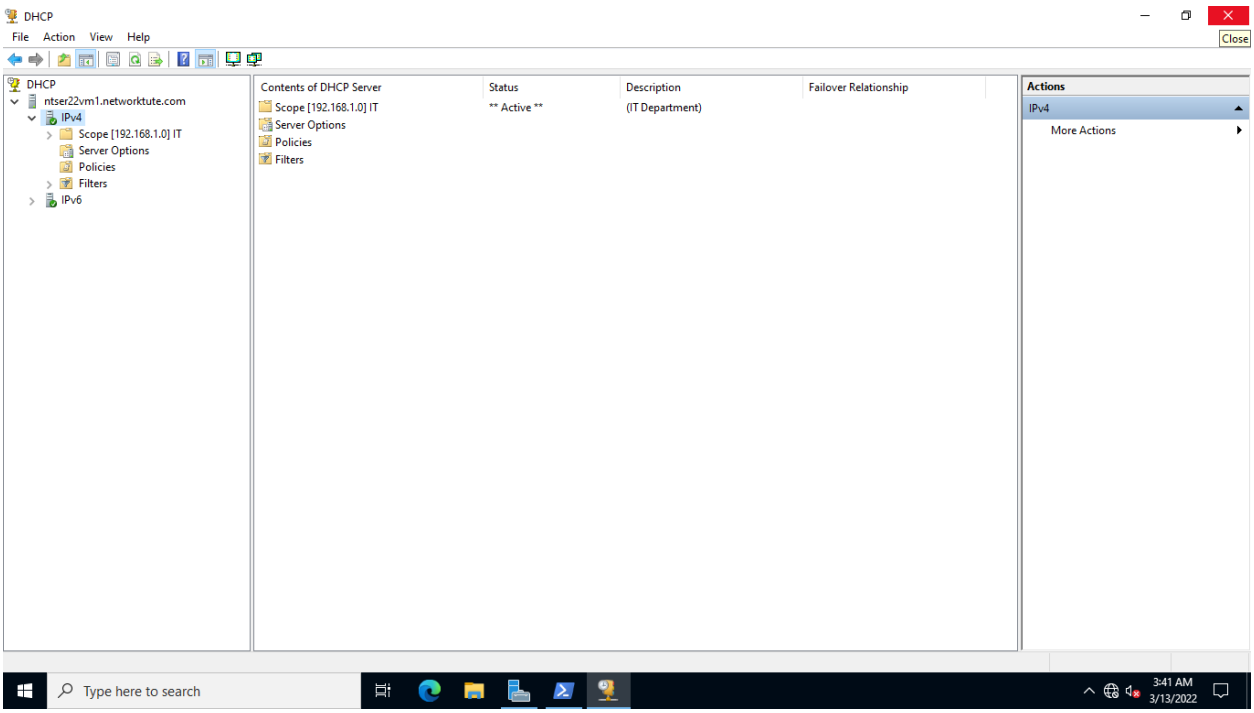
Step 8:

On the **IPv4 Properties** dialog box, click **OK**.



Step 9:

Close the **DHCP** window.



Task 5:

A WDS server must have two images: an install image, which contains the operating system support files, and a boot image, which contains the startup files needed to run a bare-metal computer and install Windows.

For this lab, these images are pre-installed on **NTSER22VM1**.

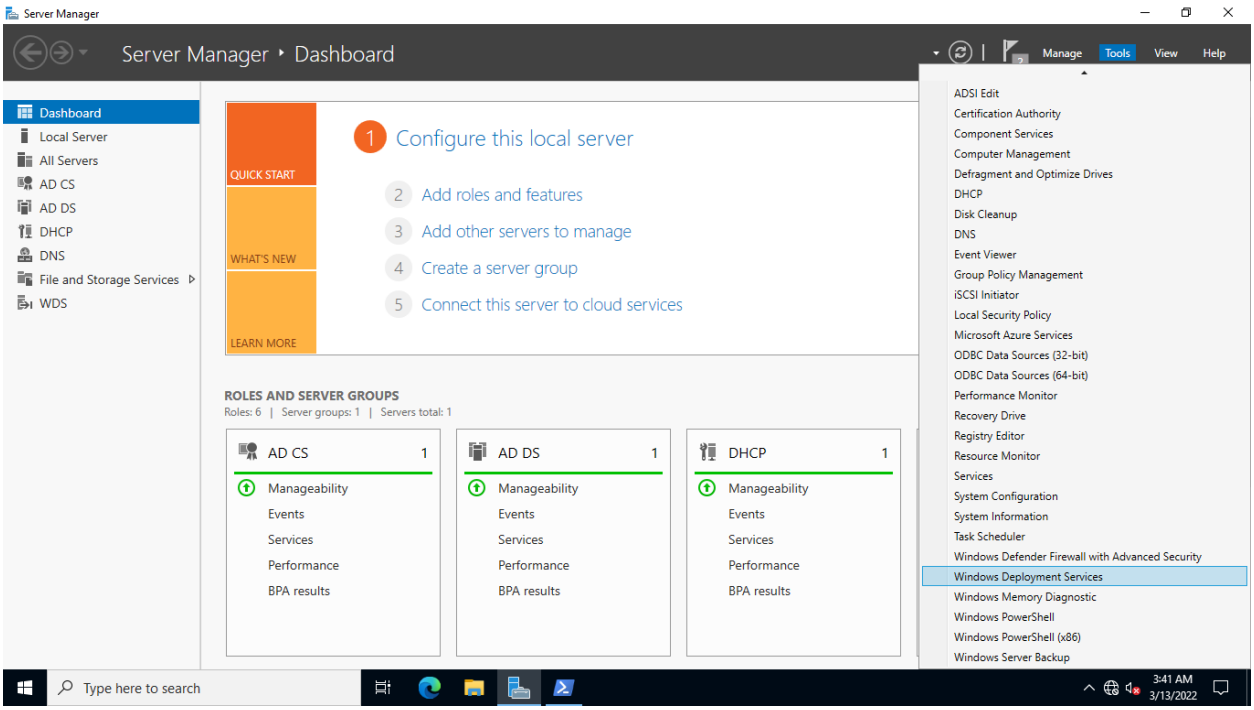
You must configure the PXE response on the DHCP server to guarantee that WDS responds to client requests for remote OS installation.

Now let's, we will configure the PXE response on the **NTSER22VM1** server.

Step 1:

Ensure you are connected to **NTSER22VM1** with the **Server Manager** window open.

Click **Tools** and select **Windows Deployment Services**.

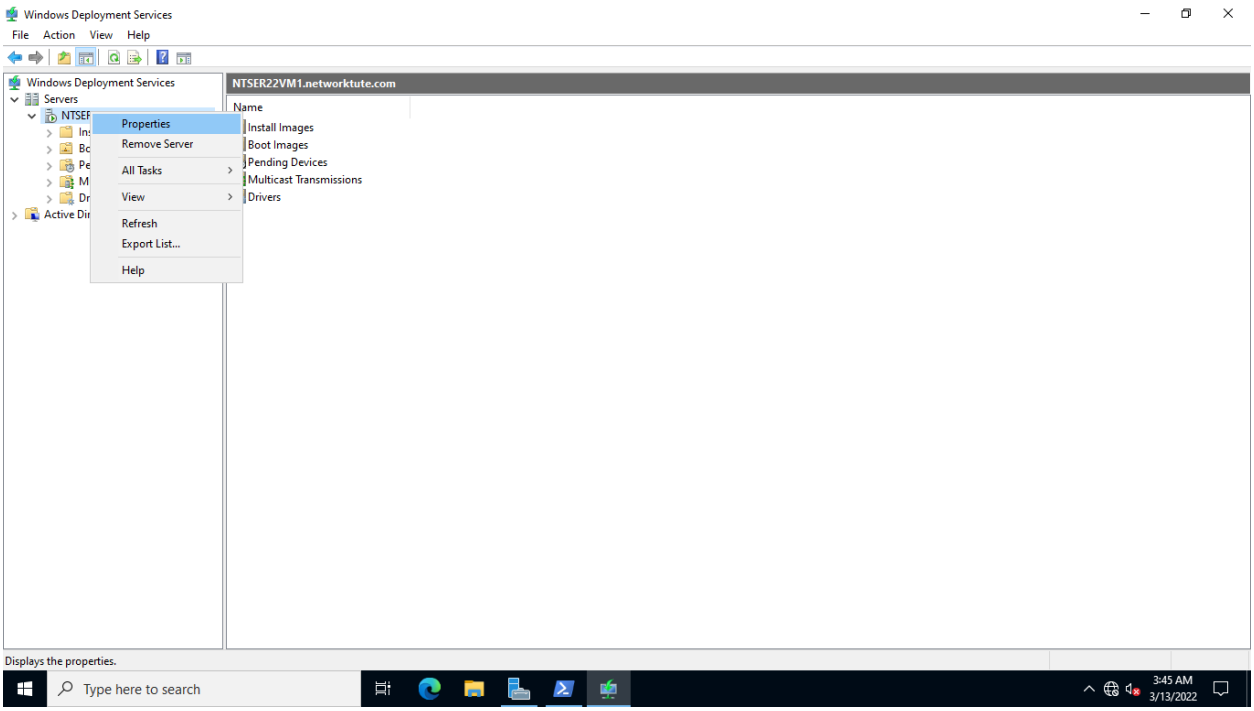


Step 2:

On the **Windows Deployment Services** window, expand the **Servers** node.

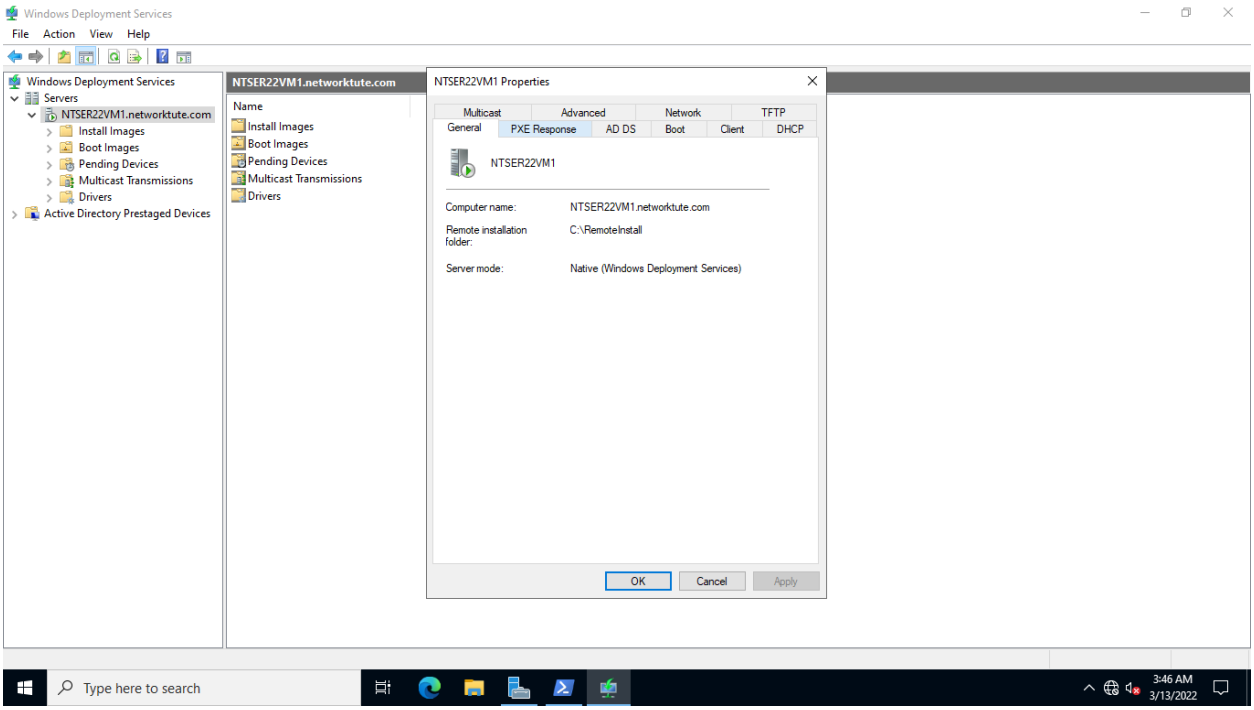
Then expand **NTSER22VM1.networktute.com**

Right-click **NTSER22VM1.networktute.com** and select **Properties**.



Step 3:

On the **NTSER22VM1 Properties** dialog box, click on the **PXE Response** tab.

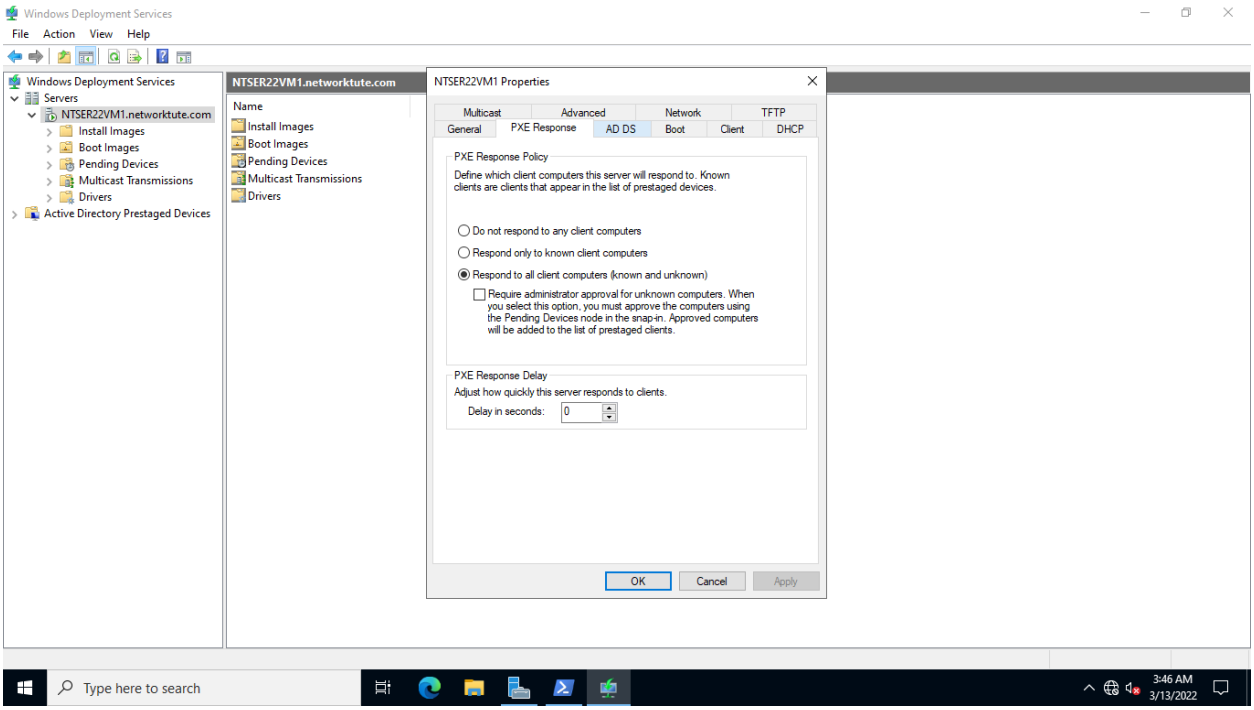


Step 4:

On the **PXE Response** tab, select the **Respond to all client computers** (**known and unknown**) option.

Ensure that the **Require administrator approval for unknown computers**. checkbox is unticked.

Then click on the **AD DS** tab.



Step 5:

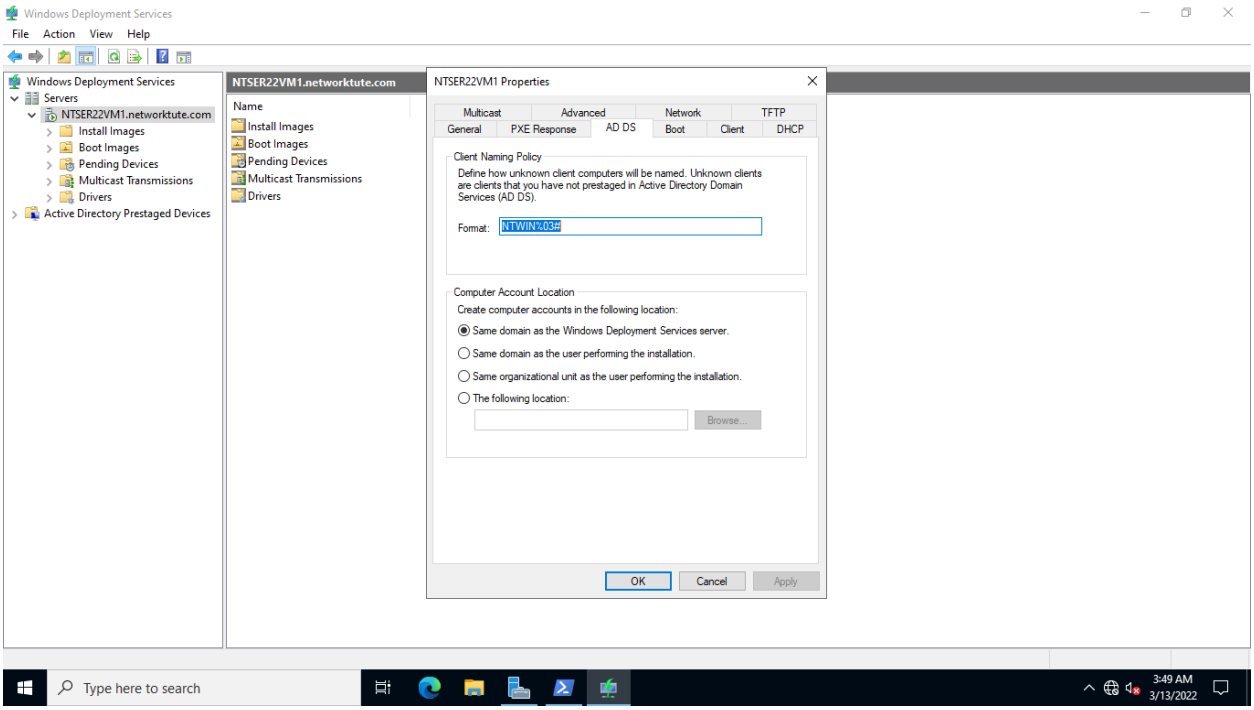
When naming machines installed using Windows Deployment Services, the AD DS tab specifies the name convention to use. The many variables used to name new computers installed through WDS are as follows:

- **%Username -** This option instructs WDS to base the computer name on the username of the WDS client user. When logging into WDS with the Administrator account, for example, Username will be substituted by Administrator.
- **61 -** WDS will use the first 61 characters of the user's name who signed in to the WDS client if this setting is enabled.
- **% -** Percentile character is a placeholder for the username.
- **# -** The number [n] is used with hash. If you want to specify a running number after the computer name, use this symbol with the variable percent [0][n]#. When you input #03#, for example, a three-digit number between 001 and 999 is used.

Still in the **AD DS** tab, type-over the existing entry in the **Format** textbox, with the following:

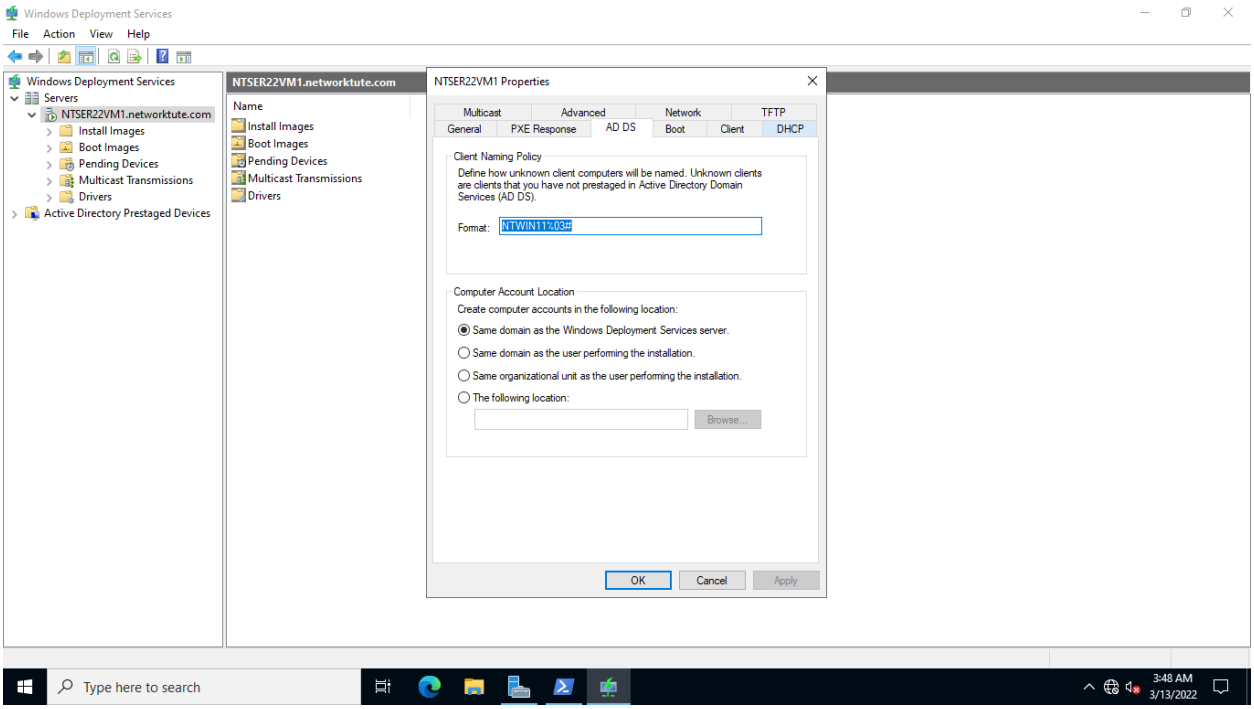
NTWIN%03#

Note: You may find that your keyboard has the % and # symbol under different keys for this step.



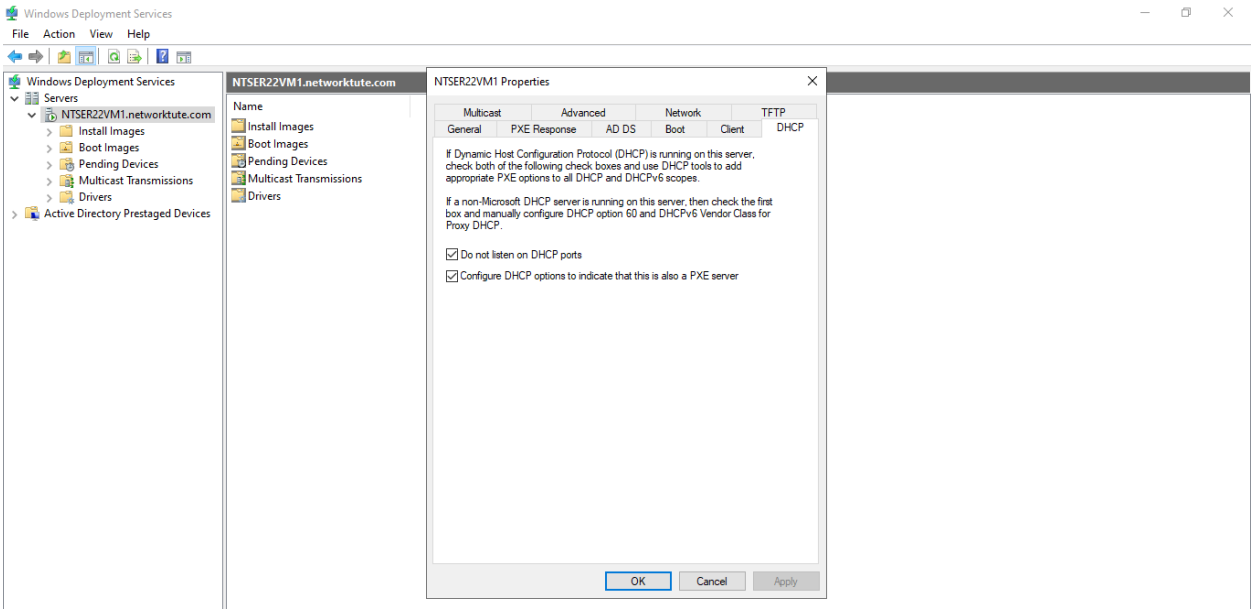
Step 6:

Click the **DHCP** tab.



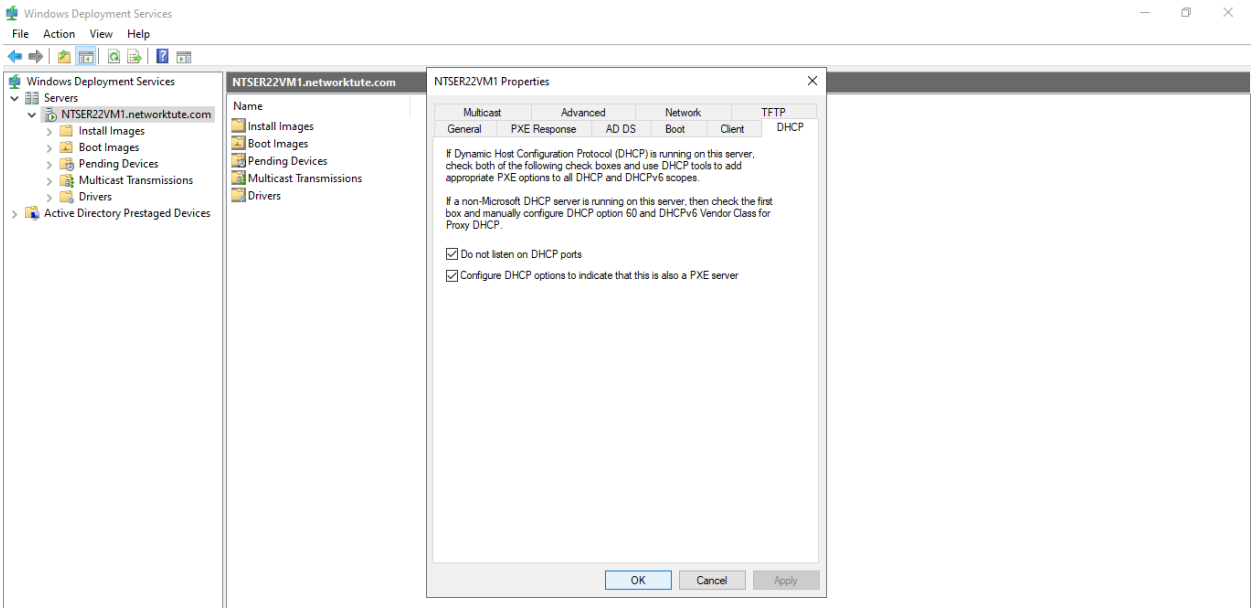
Step 7:

On the **DHCP** tab, tick both the **Do not listen on DHCP ports** and **Configure DHCP options to indicate that this is also a PXE server** checkboxes.



Step 8:

Click **OK** to save changes.



Step 9:

Close the **Windows Deployment Services** window.