

# Lab Assignment



Cybersecurity Professional Program

Microsoft Security

## DHCP

**MS-06-L1**

**Implementing DHCP**

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## Lab Objective

Understand what DHCP is used for and how it can be managed by a server.

## Lab Mission

Install and configure DHCP services on a Windows server in a domain environment.

## Lab Duration

30–40 minutes

## Requirements

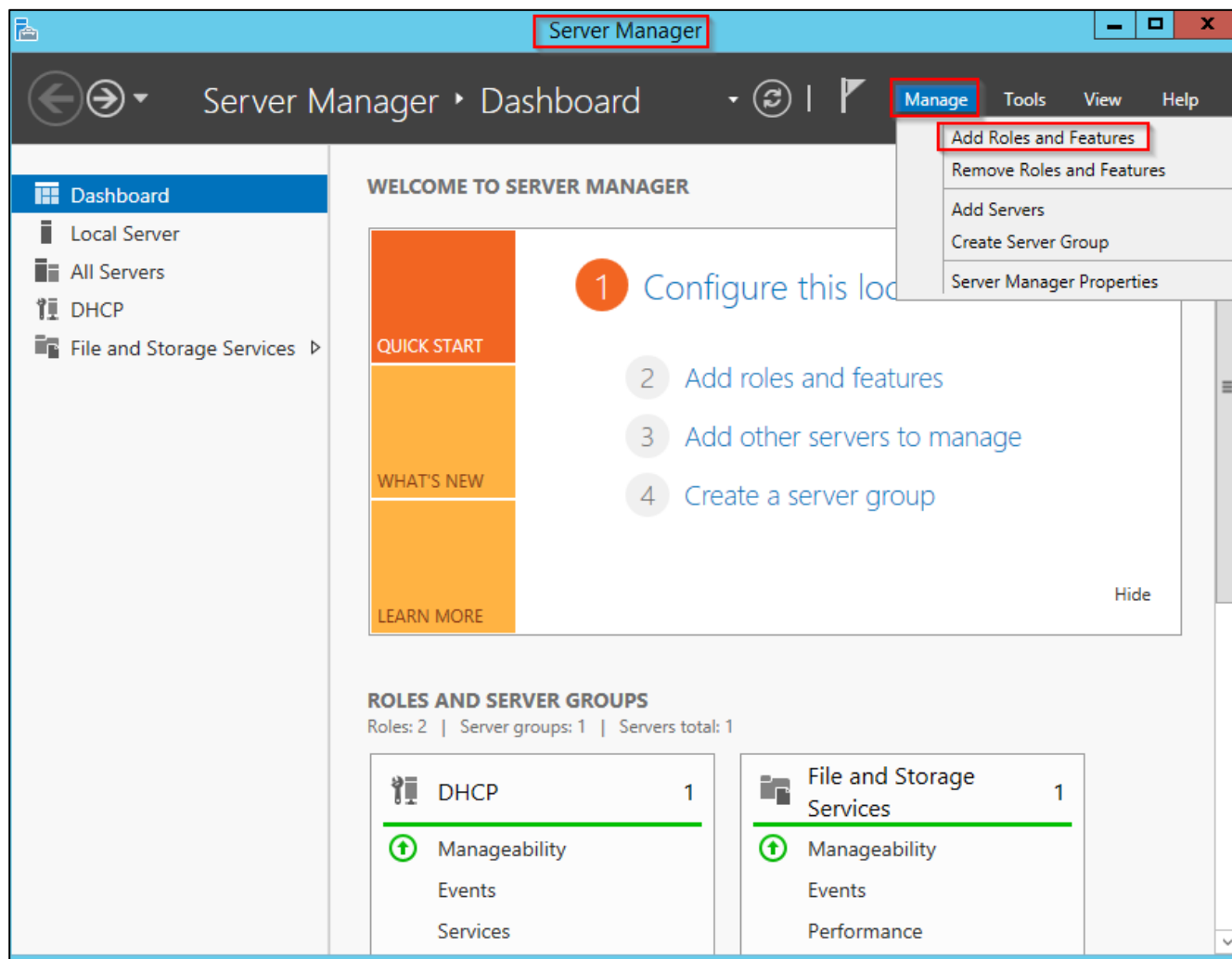
- Basic understanding of DHCP and how to configure DHCP as a service
- Knowledge of the Windows Server environment

## Resources

- Environment & Tools
  - VirtualBox
    - Server1 (DC) Windows Server 2016
    - Windows 7 Client

## Lab Task: Install and Configure DHCP

- 1 Install the DHCP role on Server1. On Server1, go to **Server Manager** > **Manage** > **Add Roles and Features**, and install the DHCP Server role, as shown below.



## Select installation type

DESTINATION SERVER  
SERVER1.cyber.local

Before You Begin

**Installation Type**

Server Selection

Server Roles

Features

Confirmation

Results

Select the installation type. You can install roles and features on a running physical computer or virtual machine, or on an offline virtual hard disk (VHD).

☒ **Role-based or feature-based installation**

Configure a single server by adding roles, role services, and features.

☐ **Remote Desktop Services installation**

Install required role services for Virtual Desktop Infrastructure (VDI) to create a virtual machine-based or session-based desktop deployment.

&lt; Previous

**Next >**

Install

Cancel

## Select destination server

DESTINATION SERVER  
SERVER1.cyber.local

Before You Begin

Installation Type

Server Selection

Server Roles

Features

Confirmation

Results

Select a server or a virtual hard disk on which to install roles and features.

☒ Select a server from the server pool☐ Select a virtual hard disk

## Server Pool

Filter:

| Name                | IP Address | Operating System                                  |
|---------------------|------------|---|
| SERVER1.cyber.local | 10.0.0.1   | Microsoft Windows Server 2016 Standard Evaluation |

1 Computer(s) found

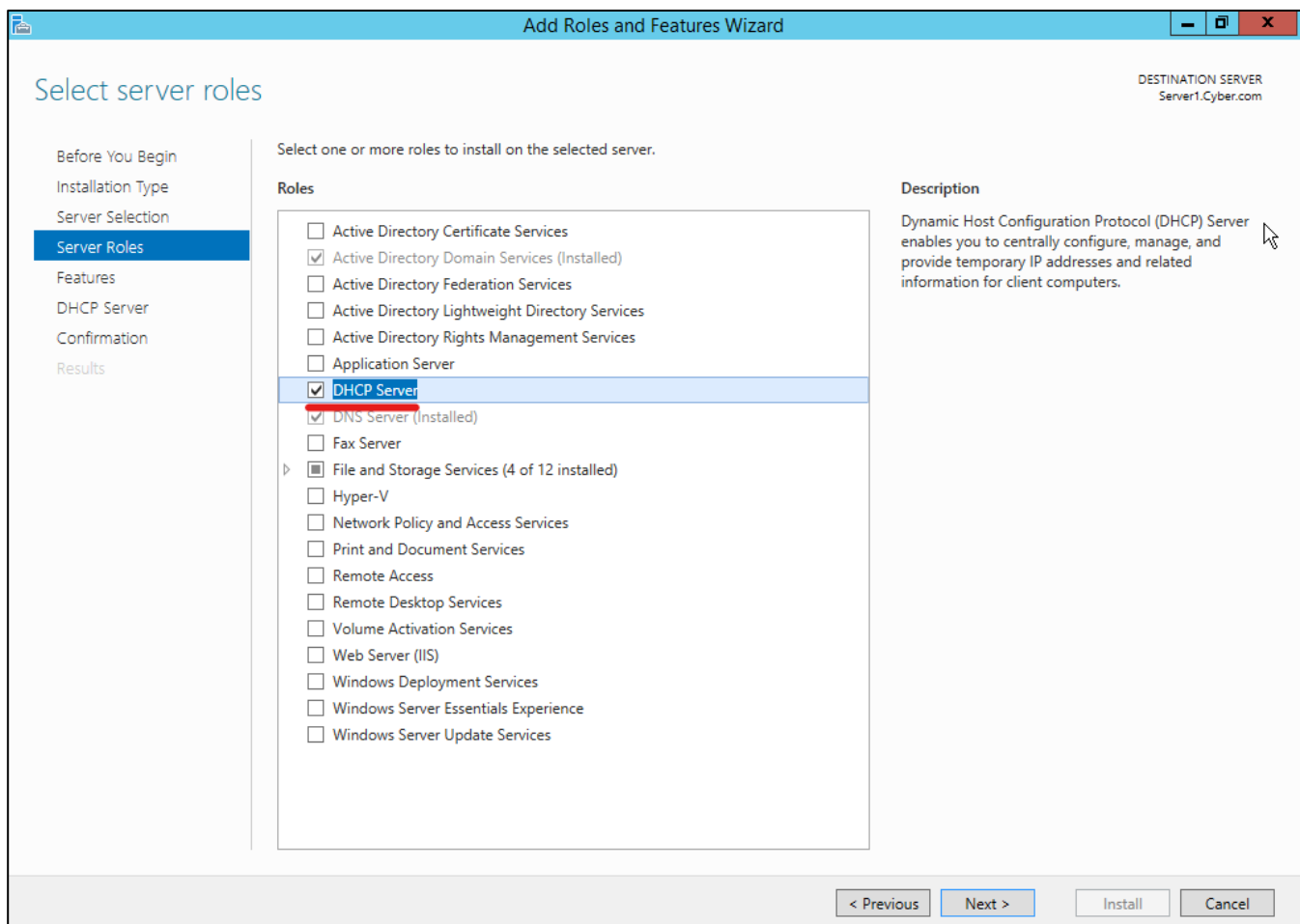
This page shows servers that are running Windows Server 2012 or a newer release of Windows Server, and that have been added by using the Add Servers command in Server Manager. Offline servers and newly-added servers from which data collection is still incomplete are not shown.

&lt; Previous

Next &gt;

Install

Cancel



### Add features that are required for DHCP Server?

The following tools are required to manage this feature, but do not have to be installed on the same server.

- ▲ Remote Server Administration Tools
  - ▲ Role Administration Tools
    - [Tools] DHCP Server Tools

☒ Include management tools (if applicable)

Add Features

Cancel

## Select server roles

DESTINATION SERVER  
SERVER1.cyber.local

Before You Begin

Installation Type

Server Selection

**Server Roles**

Features

DHCP Server

Confirmation

Results

Select one or more roles to install on the selected server.

## Roles

- ☐ Active Directory Federation Services
- ☐ Active Directory Lightweight Directory Services
- ☐ Active Directory Rights Management Services
- ☐ Device Health Attestation
- ☒ **DHCP Server**
- ☒ DNS Server (Installed)
- ☐ Fax Server
- ☒ File and Storage Services (2 of 12 installed)
- ☐ Host Guardian Service
- ☐ Hyper-V
- ☐ MultiPoint Services
- ☐ Network Policy and Access Services
- ☐ Print and Document Services
- ☐ Remote Access
- ☐ Remote Desktop Services
- ☐ Volume Activation Services
- ☐ Web Server (IIS)
- ☐ Windows Deployment Services
- ☐ Windows Server Essentials Experience
- ☐ Windows Server Update Services

## Description

Dynamic Host Configuration Protocol (DHCP) Server enables you to centrally configure, manage, and provide temporary IP addresses and related information for client computers.

&lt; Previous

**Next >**

Install

Cancel



## Select features

DESTINATION SERVER  
SERVER1.cyber.local

Before You Begin

Installation Type

Server Selection

Server Roles

**Features**

DHCP Server

Confirmation

Results

Select one or more features to install on the selected server.

## Features

- ☐ .NET Framework 3.5 Features
- ☒ .NET Framework 4.6 Features (2 of 7 installed)
- ☐ Background Intelligent Transfer Service (BITS)
- ☐ BitLocker Drive Encryption
- ☐ BitLocker Network Unlock
- ☐ BranchCache
- ☐ Client for NFS
- ☐ Containers
- ☐ Data Center Bridging
- ☐ Direct Play
- ☐ Enhanced Storage
- ☐ Failover Clustering
- ☒ Group Policy Management (Installed)
- ☐ I/O Quality of Service
- ☐ IIS Hostable Web Core
- ☐ Internet Printing Client
- ☐ IP Address Management (IPAM) Server
- ☐ iSNS Server service
- ☐ LPR Port Monitor

## Description

.NET Framework 3.5 combines the power of the .NET Framework 2.0 APIs with new technologies for building applications that offer appealing user interfaces, protect your customers' personal identity information, enable seamless and secure communication, and provide the ability to model a range of business processes.

&lt; Previous

**Next >**

Install

Cancel

## DHCP Server

DESTINATION SERVER  
SERVER1.cyber.local

Before You Begin

Installation Type

Server Selection

Server Roles

Features

DHCP Server

Confirmation

Results

The Dynamic Host Configuration Protocol allows servers to assign, or lease, IP addresses to computers and other devices that are enabled as DHCP clients. Deploying a DHCP server on the network provides computers and other TCP/IP-based network devices with valid IP addresses and the additional configuration parameters these devices need, called DHCP options. This allows computers and devices to connect to other network resources, such as DNS servers, WINS servers, and routers.

### Things to note:

- You should configure at least one static IP address on this computer.
- Before you install DHCP Server, you should plan your subnets, scopes and exclusions. Store the plan in a safe place for later reference.

&lt; Previous

Next &gt;

Install

Cancel

## Confirm installation selections

DESTINATION SERVER  
SERVER1.cyber.local[Before You Begin](#)[Installation Type](#)[Server Selection](#)[Server Roles](#)[Features](#)[DHCP Server](#)**Confirmation**[Results](#)

To install the following roles, role services, or features on selected server, click Install.

☐ Restart the destination server automatically if required

Optional features (such as administration tools) might be displayed on this page because they have been selected automatically. If you do not want to install these optional features, click Previous to clear their check boxes.

DHCP Server

Remote Server Administration Tools

Role Administration Tools

DHCP Server Tools

[Export configuration settings](#)  
[Specify an alternate source path](#)

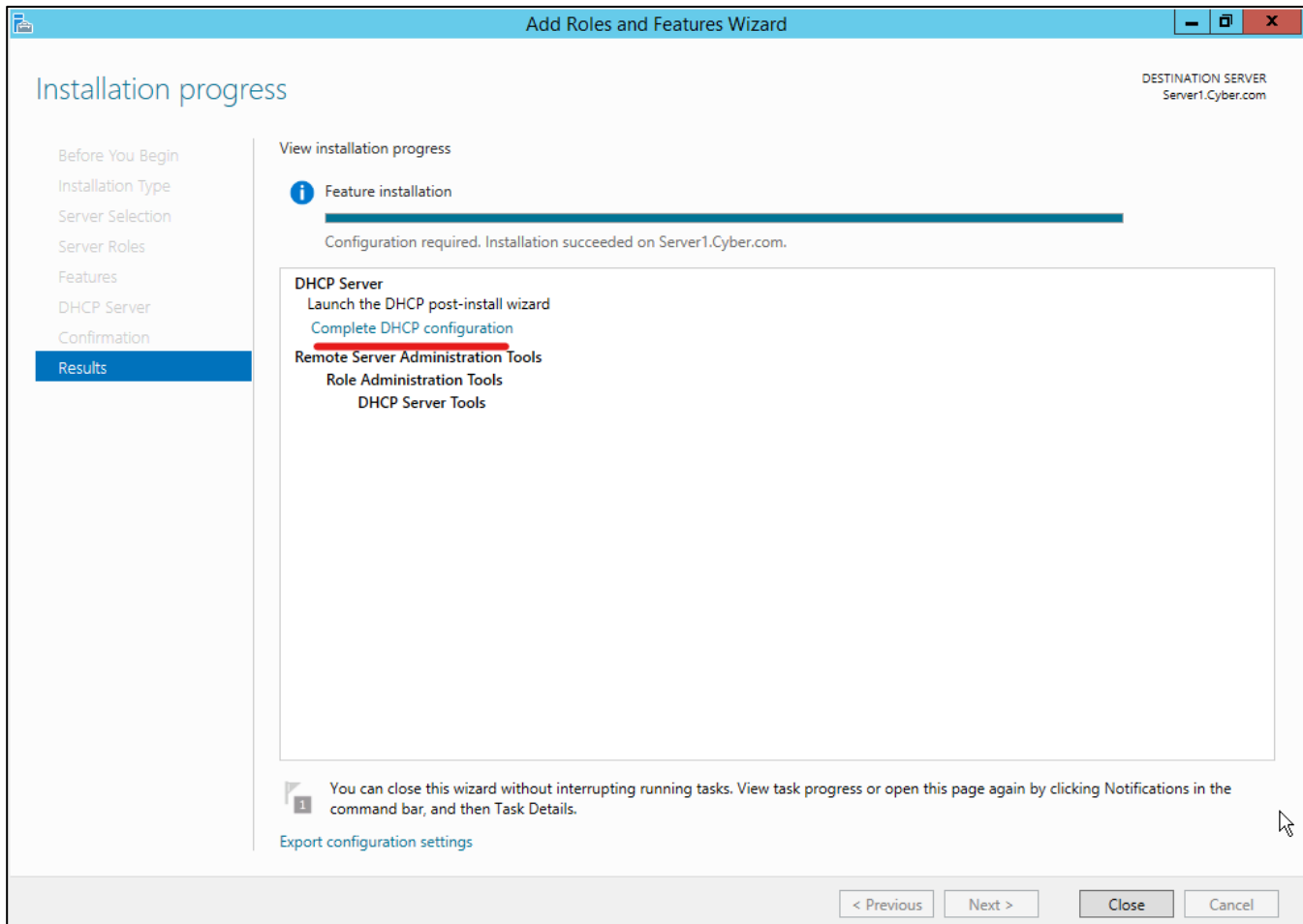
&lt; Previous

Next &gt;

**Install**

Cancel

- 2 Complete the installation with the wizard and authorize the DHCP server by clicking **Complete DHCP configuration**. Click **Next** on the description windows and **Commit** on the authorization window. Make sure the credentials specified are those of the administrator.



DHCP Post-Install configuration wizard

Authorization

Description

Authorization

Summary

Specify the credentials to be used to authorize this DHCP server in AD DS.

☒ Use the following user's credentials

User Name:

☐ Use alternate credentials

User Name:

☐ Skip AD authorization

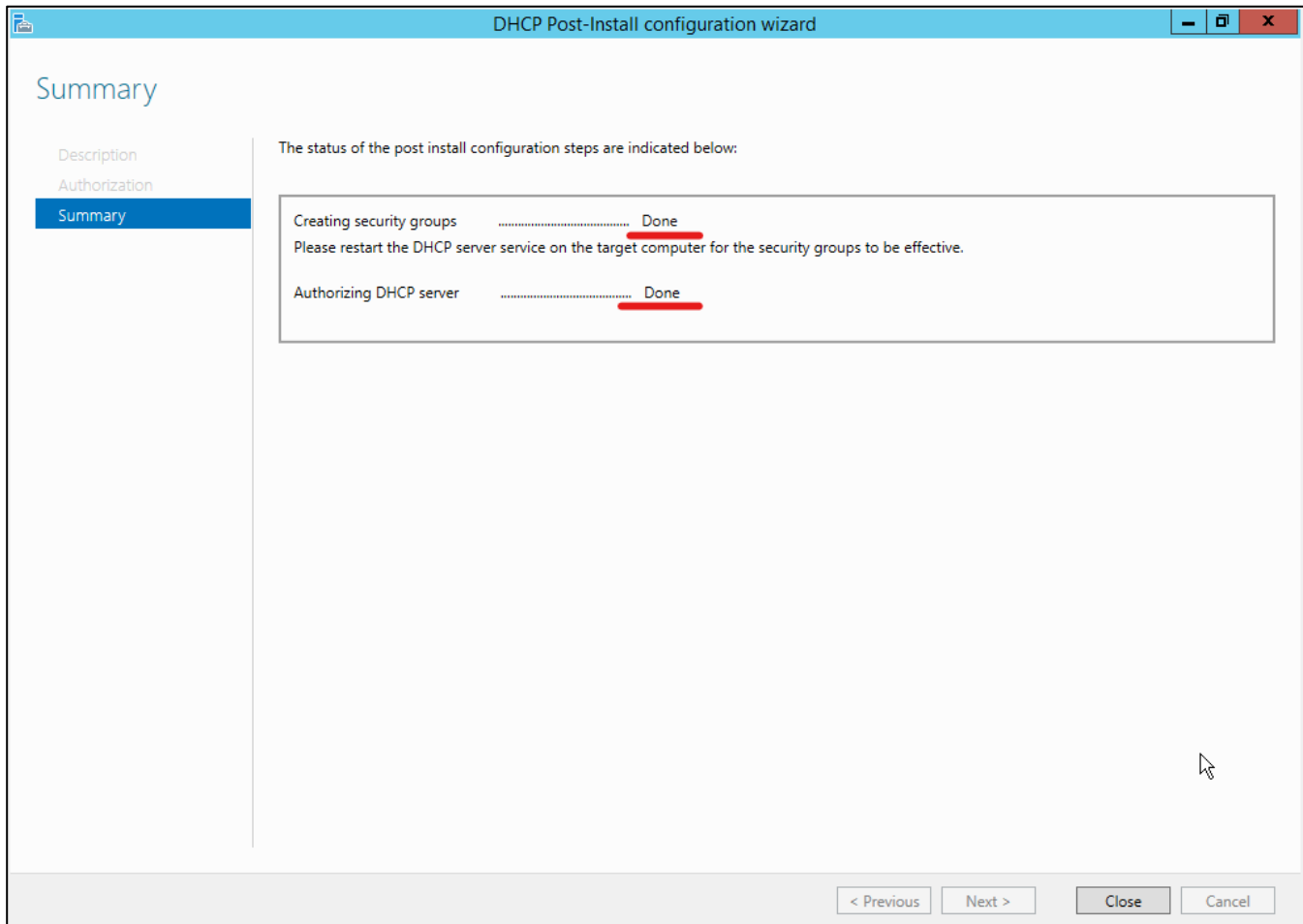
< Previous

Next >

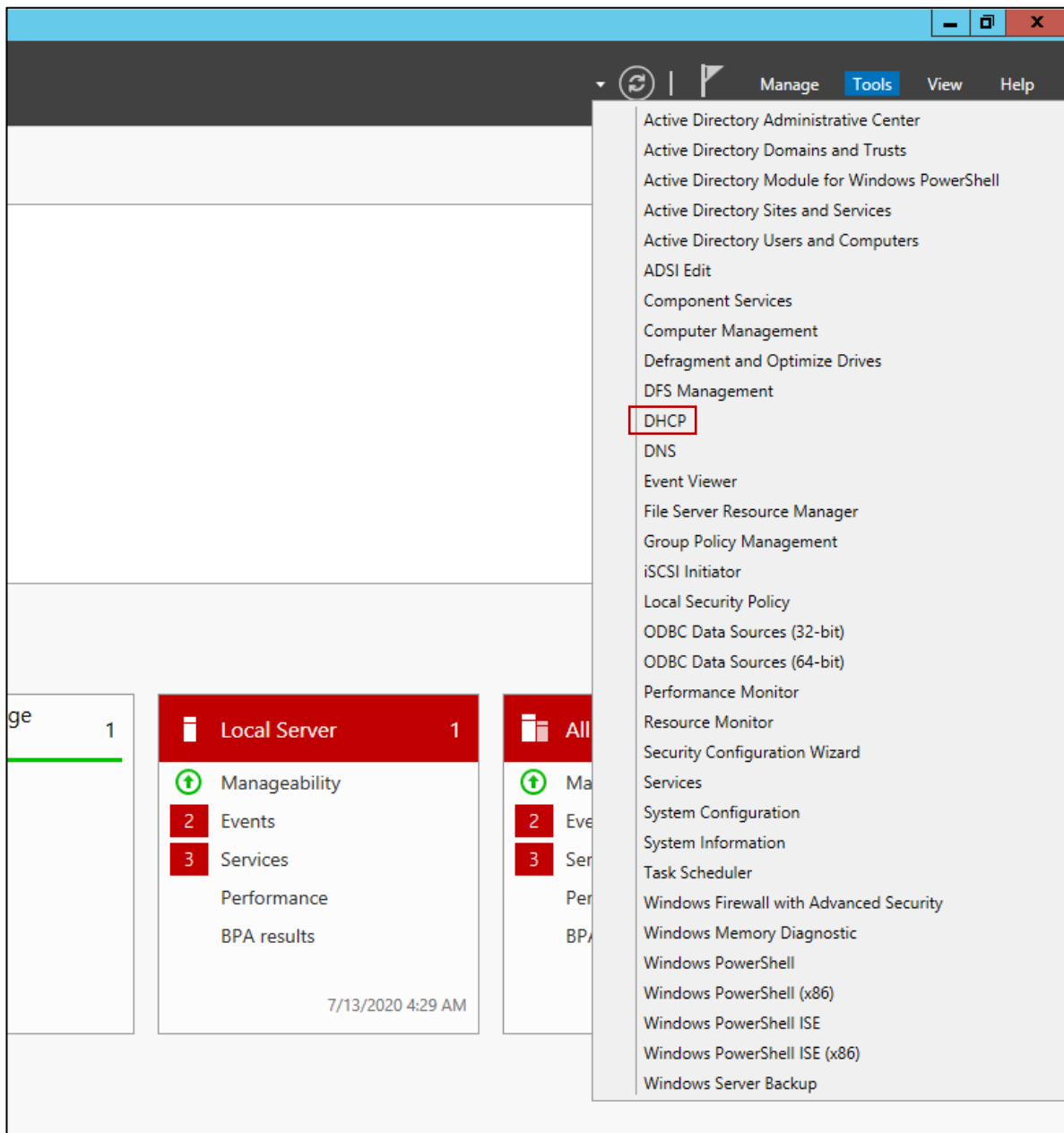
Commit

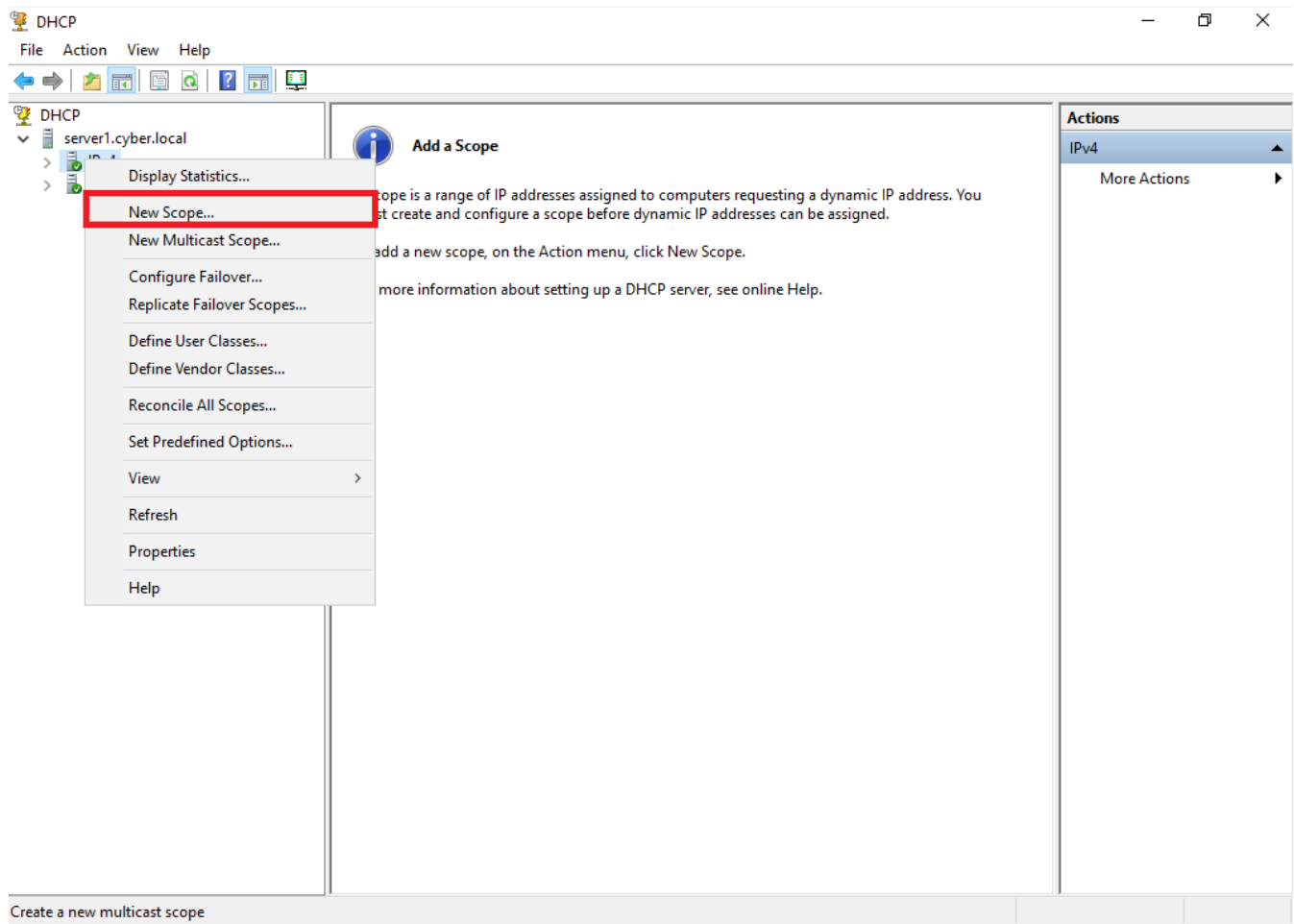
Cancel

- 3 After clicking **Commit**, the summary windows should display the status of the steps. Make sure you see *Done* for both. Close this window and the next window.



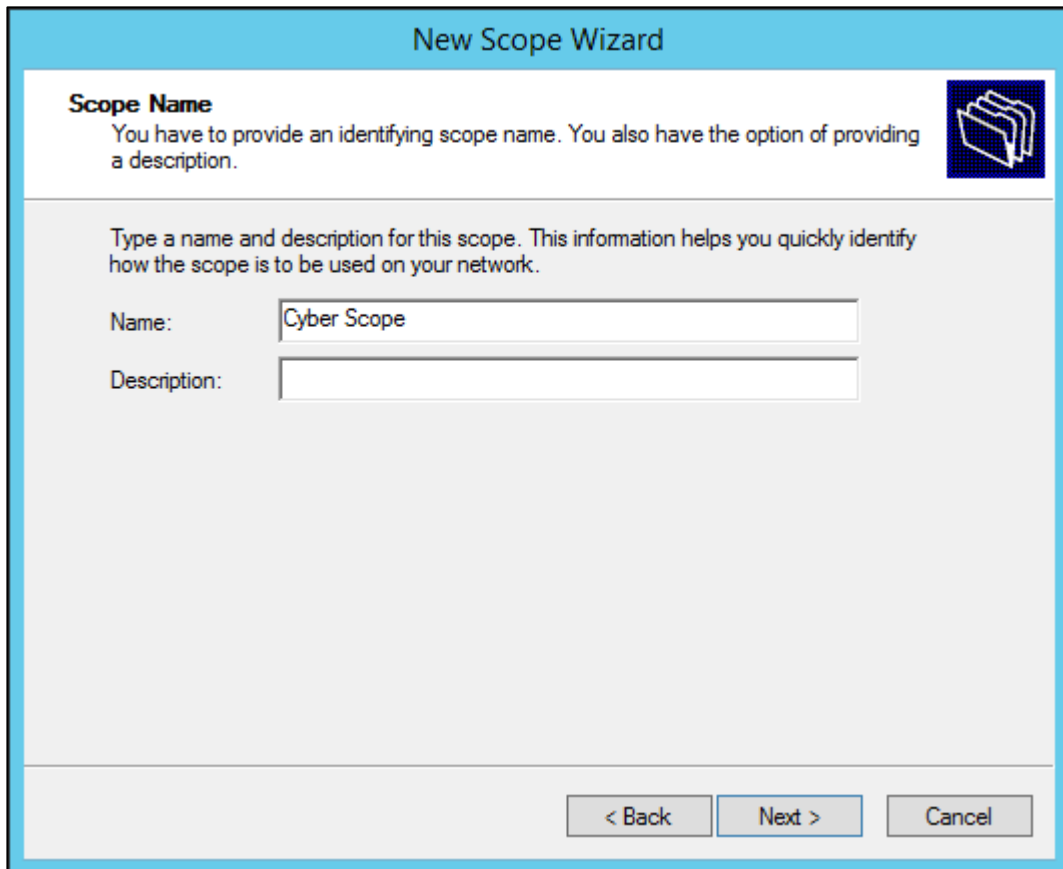
- 4 Open the DHCP interface by clicking **Tools** and **DHCP** and start creating a new scope by expanding **server1.cyber.com** and **IPv4**. Right-click **IPv4** and select **New Scope...**







- 5 Name the scope **Cyber Scope** and click **Next**. The description is optional.



The image shows a 'New Scope Wizard' dialog box. It has a light blue title bar with the text 'New Scope Wizard'. Below the title bar, there is a section titled 'Scope Name' with a folder icon to its right. The text in this section says: 'You have to provide an identifying scope name. You also have the option of providing a description.' Below this, there is a larger text area that says: 'Type a name and description for this scope. This information helps you quickly identify how the scope is to be used on your network.' Underneath this text area, there are two input fields. The first is labeled 'Name:' and contains the text 'Cyber Scope'. The second is labeled 'Description:' and is empty. At the bottom of the dialog box, there are three buttons: '< Back', 'Next >', and 'Cancel'.

**New Scope Wizard**

**Scope Name**  
You have to provide an identifying scope name. You also have the option of providing a description.

Type a name and description for this scope. This information helps you quickly identify how the scope is to be used on your network.

Name:


Description:

< Back   Next >   Cancel

- 6** Set the IP address range to **10.0.0.1–10.0.0.200**, with subnet mask **255.255.255.0** and click **Next**.

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: 10 . 0 . 0 . 1

End IP address: 10 . 0 . 0 . 200

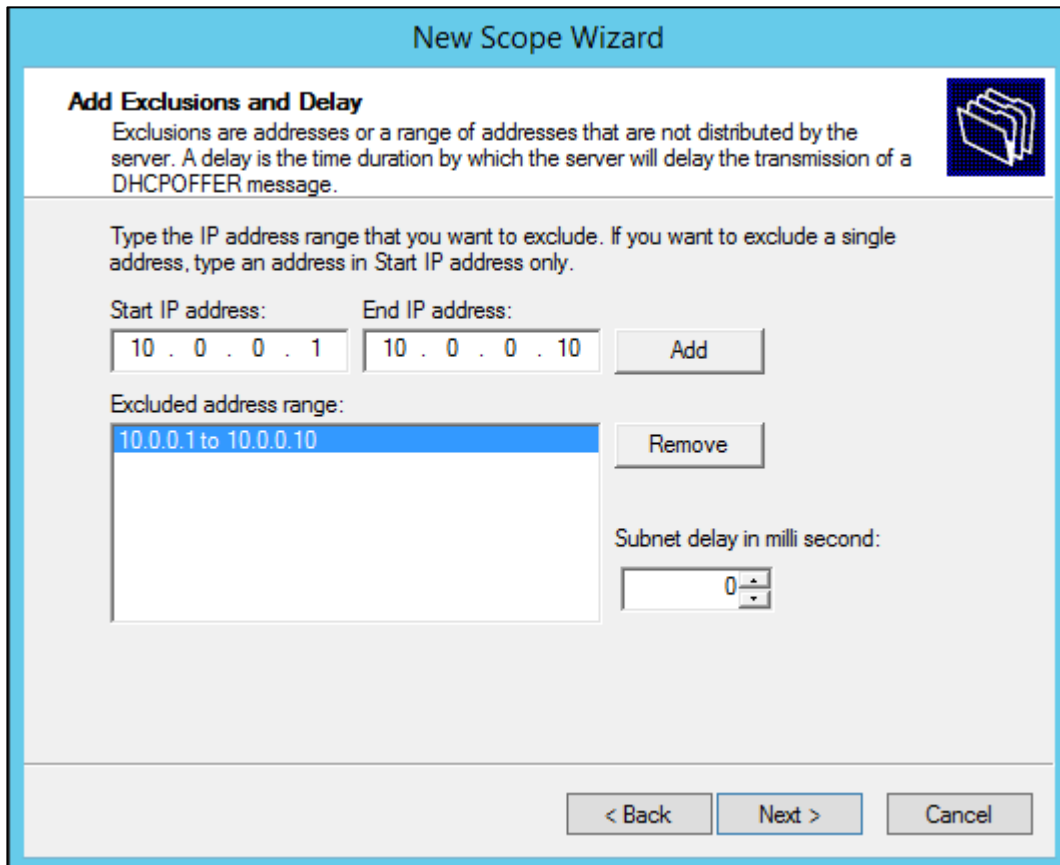
Configuration settings that propagate to DHCP Client

Length: 8

Subnet mask: 255 . 255 . 255 . 0

< Back Next > Cancel

- 7** Exclude the range **10.0.0.1–10.0.0.10** from the DHCP allocation and click **Next**.



The image shows a screenshot of the 'New Scope Wizard' window, specifically the 'Add Exclusions and Delay' step. The window has a blue title bar and a light blue header. Below the header, there is a section titled 'Add Exclusions and Delay' with a folder icon. The text explains that exclusions are addresses or ranges not distributed by the server and that a delay is the time duration for DHCP message transmission. Below this, there are input fields for 'Start IP address' and 'End IP address', both containing '10 . 0 . 0 . 1' and '10 . 0 . 0 . 10' respectively. An 'Add' button is to the right of these fields. Below the input fields is a list box labeled 'Excluded address range:' containing the text '10.0.0.1 to 10.0.0.10'. A 'Remove' button is to the right of the list box. Below the list box is a 'Subnet delay in milli second:' label and a spinner box set to '0'. At the bottom of the window are three buttons: '< Back', 'Next >', and 'Cancel'.

New Scope Wizard

**Add Exclusions and Delay**

Exclusions are addresses or a range of addresses that are not distributed by the server. A delay is the time duration by which the server will delay the transmission of a DHCP OFFER message.

Type the IP address range that you want to exclude. If you want to exclude a single address, type an address in Start IP address only.

Start IP address: End IP address:

10 . 0 . 0 . 1 10 . 0 . 0 . 10 Add

Excluded address range:

10.0.0.1 to 10.0.0.10 Remove

Subnet delay in milli second:

0

< Back Next > Cancel

- 8 Set the lease duration to seven days and click **Next**.

New Scope Wizard

Lease Duration

The lease duration specifies how long a client can use an IP address from this scope.

Lease durations should typically be equal to the average time the computer is connected to the same physical network. For mobile networks that consist mainly of portable computers or dial-up clients, shorter lease durations can be useful. Likewise, for a stable network that consists mainly of desktop computers at fixed locations, longer lease durations are more appropriate.

Set the duration for scope leases when distributed by this server.

Limited to:

Days:

Hours:

Minutes:

7

0

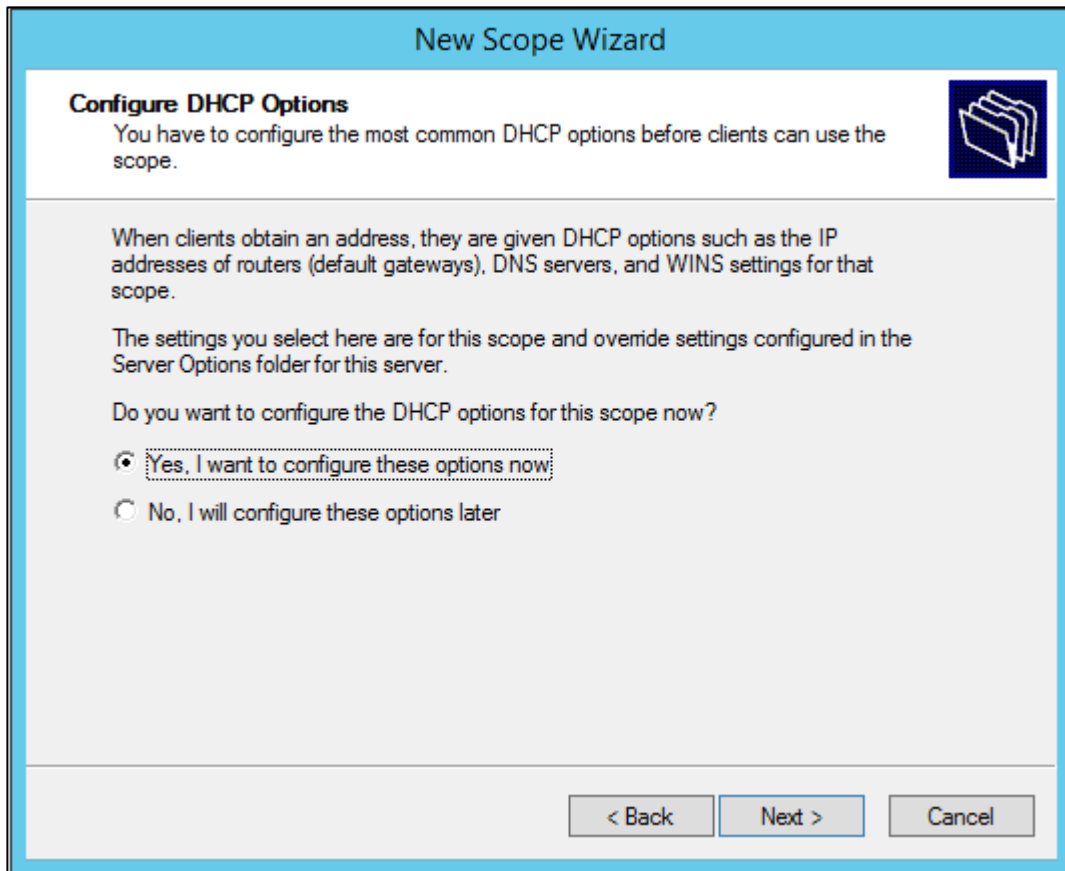
0

< Back

Next >

Cancel

- 9 When asked if you want to configure DHCP options, select **Yes...** and click **Next**.



The image shows a Windows-style dialog box titled "New Scope Wizard". The main heading is "Configure DHCP Options". Below this, a paragraph states: "You have to configure the most common DHCP options before clients can use the scope." To the right of this text is a small icon of a folder with a document. Another paragraph explains: "When clients obtain an address, they are given DHCP options such as the IP addresses of routers (default gateways), DNS servers, and WINS settings for that scope." A third paragraph states: "The settings you select here are for this scope and override settings configured in the Server Options folder for this server." Below this, a question is asked: "Do you want to configure the DHCP options for this scope now?". There are two radio button options: the first is selected and labeled "Yes, I want to configure these options now"; the second is labeled "No, I will configure these options later". At the bottom right, there are three buttons: "< Back", "Next >", and "Cancel".

**New Scope Wizard**

**Configure DHCP Options**

You have to configure the most common DHCP options before clients can use the scope.

When clients obtain an address, they are given DHCP options such as the IP addresses of routers (default gateways), DNS servers, and WINS settings for that scope.

The settings you select here are for this scope and override settings configured in the Server Options folder for this server.

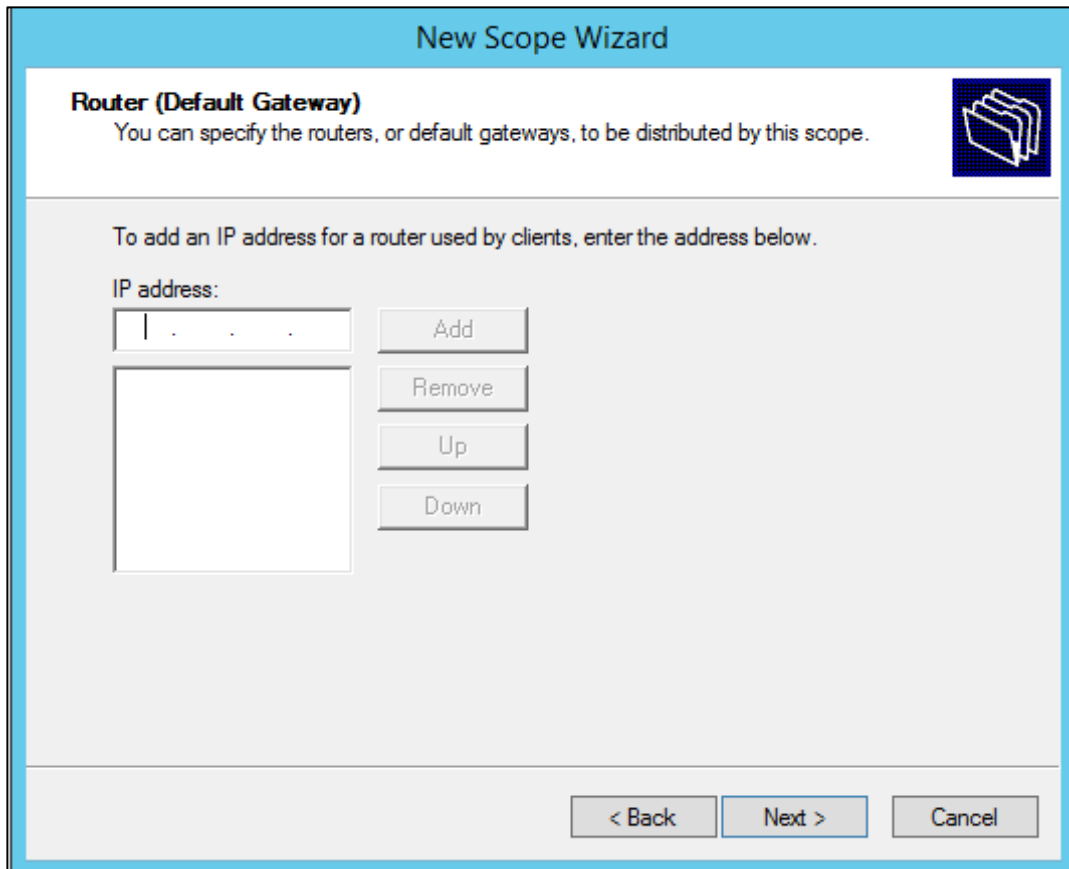
Do you want to configure the DHCP options for this scope now?

☒ Yes, I want to configure these options now

☐ No, I will configure these options later

< Back   Next >   Cancel

- 10** Leave the Router (Default Gateway) fields blank and click **Next**.



The image shows a screenshot of the 'New Scope Wizard' window, specifically the 'Router (Default Gateway)' step. The window has a blue title bar with the text 'New Scope Wizard'. Below the title bar, the section is titled 'Router (Default Gateway)' with a subtitle 'You can specify the routers, or default gateways, to be distributed by this scope.' and a folder icon. The main area contains the instruction 'To add an IP address for a router used by clients, enter the address below.' followed by the label 'IP address:'. There is a text input field with a vertical cursor and four dots, and a list box below it. To the right of these are four buttons: 'Add', 'Remove', 'Up', and 'Down'. At the bottom of the window are three buttons: '< Back', 'Next >', and 'Cancel'.

**New Scope Wizard**

**Router (Default Gateway)**  
You can specify the routers, or default gateways, to be distributed by this scope.


To add an IP address for a router used by clients, enter the address below.

IP address:

- 11 In the DNS configuration step, make sure the parent domain is **cyber.local** and add the address **10.0.0.1**, then click **Next**.

New Scope Wizard

**Domain Name and DNS Servers**  
The Domain Name System (DNS) maps and translates domain names used by clients on your network.



You can specify the parent domain you want the client computers on your network to use for DNS name resolution.

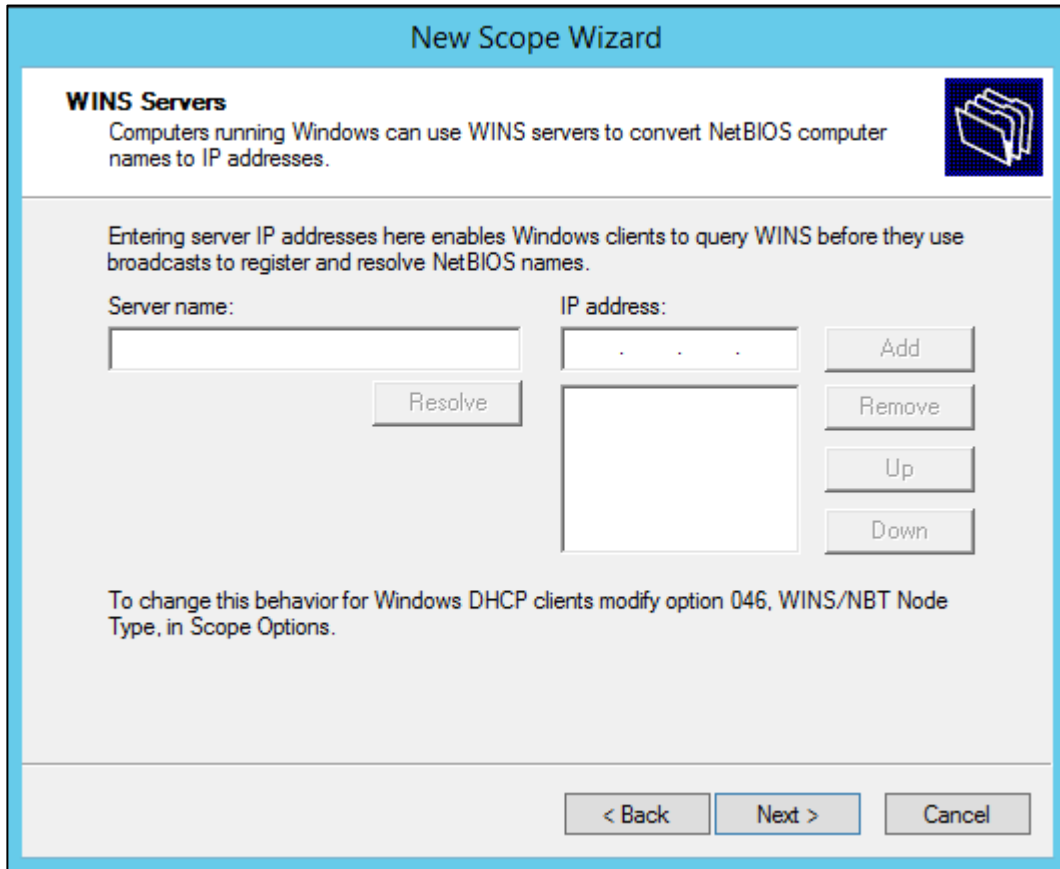
Parent domain:

To configure scope clients to use DNS servers on your network, enter the IP addresses for those servers.

| Server name:                           | IP address:                           |                                       |
|--|---------------------------------------|---------------------------------------|
| <input type="text"/>                   | <input type="text" value="10.0.0.1"/> | <input type="button" value="Add"/>    |
| <input type="button" value="Resolve"/> |                                       | <input type="button" value="Remove"/> |
|  |                                       | <input type="button" value="Up"/>     |
|  |                                       | <input type="button" value="Down"/>   |

< Back **Next >** Cancel

- 12** Skip the configuration of the WINS server by leaving all fields blank and clicking **Next**.



The image shows a screenshot of the 'New Scope Wizard' window, specifically the 'WINS Servers' step. The window has a blue title bar with the text 'New Scope Wizard'. Below the title bar, the section is titled 'WINS Servers' with a small icon of a folder. The text explains that computers running Windows can use WINS servers to convert NetBIOS computer names to IP addresses. It then states: 'Entering server IP addresses here enables Windows clients to query WINS before they use broadcasts to register and resolve NetBIOS names.' There are two input fields: 'Server name:' and 'IP address:'. The 'IP address:' field has a dropdown menu showing '. . .'. To the right of the 'IP address:' field are four buttons: 'Add', 'Remove', 'Up', and 'Down'. Below these fields is a 'Resolve' button. At the bottom of the window, there are three buttons: '< Back', 'Next >', and 'Cancel'.

**New Scope Wizard**

**WINS Servers**  
Computers running Windows can use WINS servers to convert NetBIOS computer names to IP addresses.

Entering server IP addresses here enables Windows clients to query WINS before they use broadcasts to register and resolve NetBIOS names.

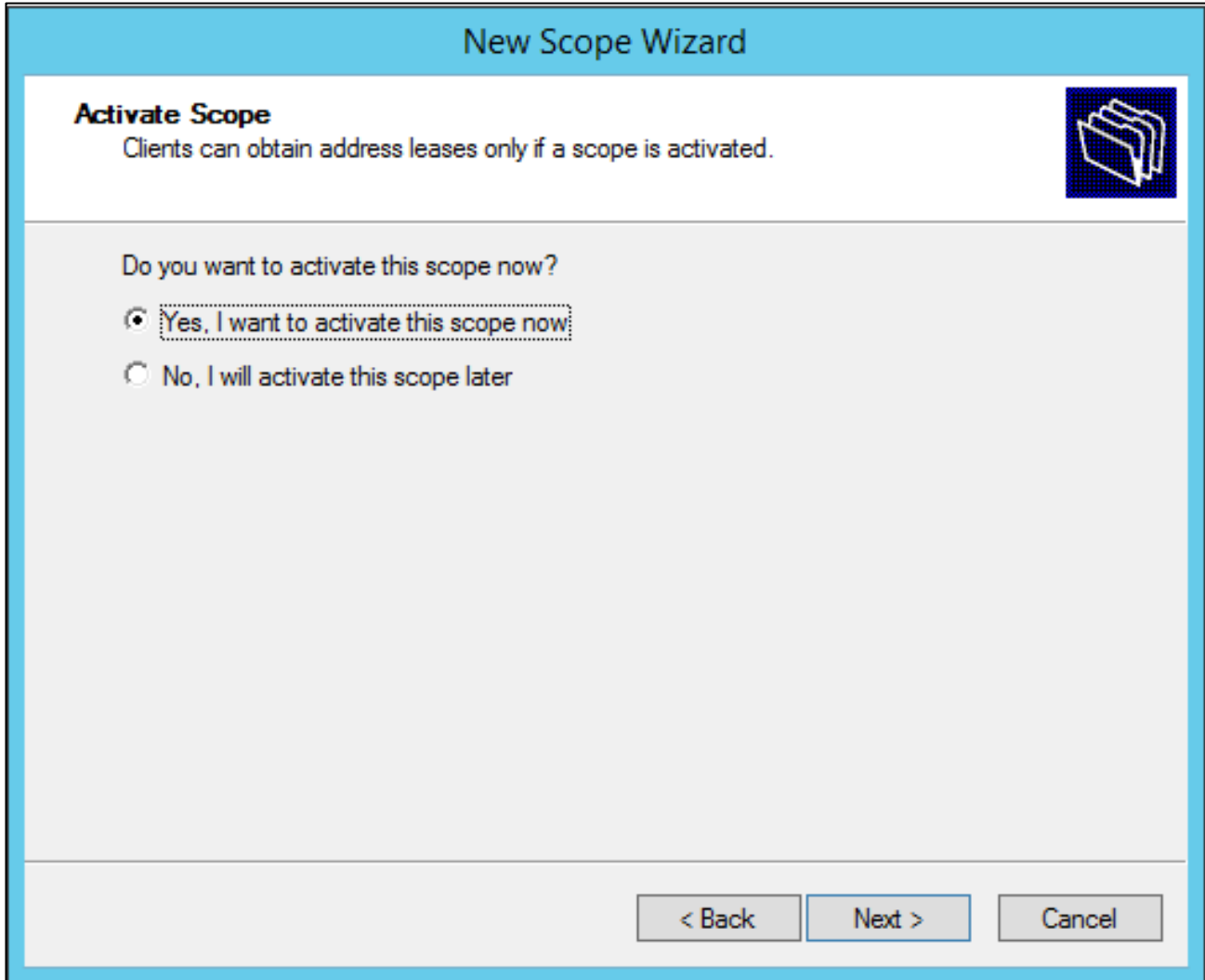
Server name:

IP address:

To change this behavior for Windows DHCP clients modify option 046, WINS/NBT Node Type, in Scope Options.



- 13** Select the option to activate the scope now and click **Next**. In the completion window that appears, click **Finish**.



The image shows a screenshot of the 'New Scope Wizard' window. The title bar is light blue and contains the text 'New Scope Wizard'. The main content area has a white background. At the top left, the text 'Activate Scope' is displayed in bold, followed by the instruction 'Clients can obtain address leases only if a scope is activated.' To the right of this text is a small icon of a folder with a document inside. Below the instruction, the question 'Do you want to activate this scope now?' is asked. There are two radio button options: 'Yes, I want to activate this scope now' (which is selected) and 'No, I will activate this scope later'. At the bottom right of the window, there are three buttons: '< Back', 'Next >', and 'Cancel'.

**New Scope Wizard**

**Activate Scope**  
Clients can obtain address leases only if a scope is activated.

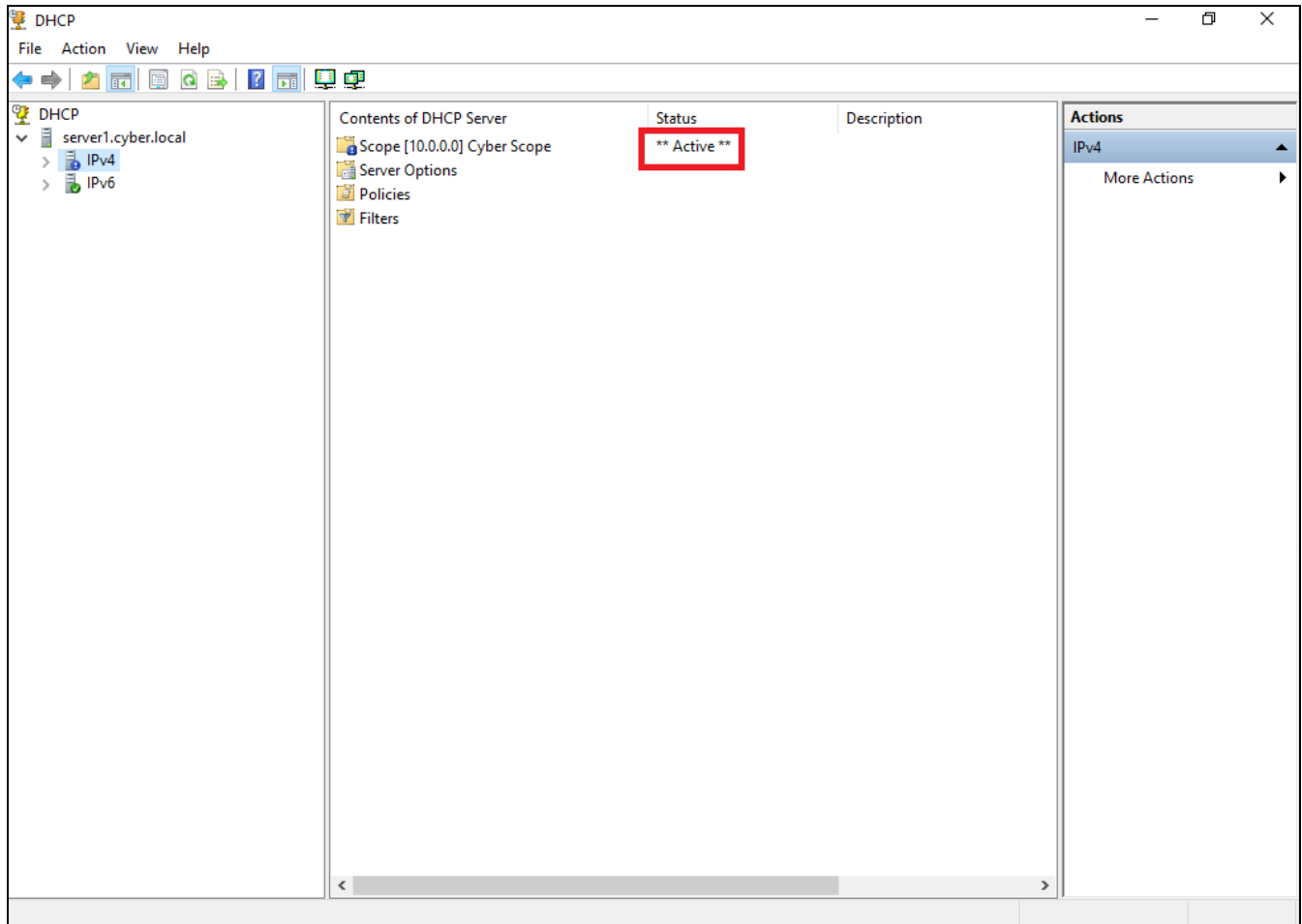
Do you want to activate this scope now?

☒ Yes, I want to activate this scope now

☐ No, I will activate this scope later

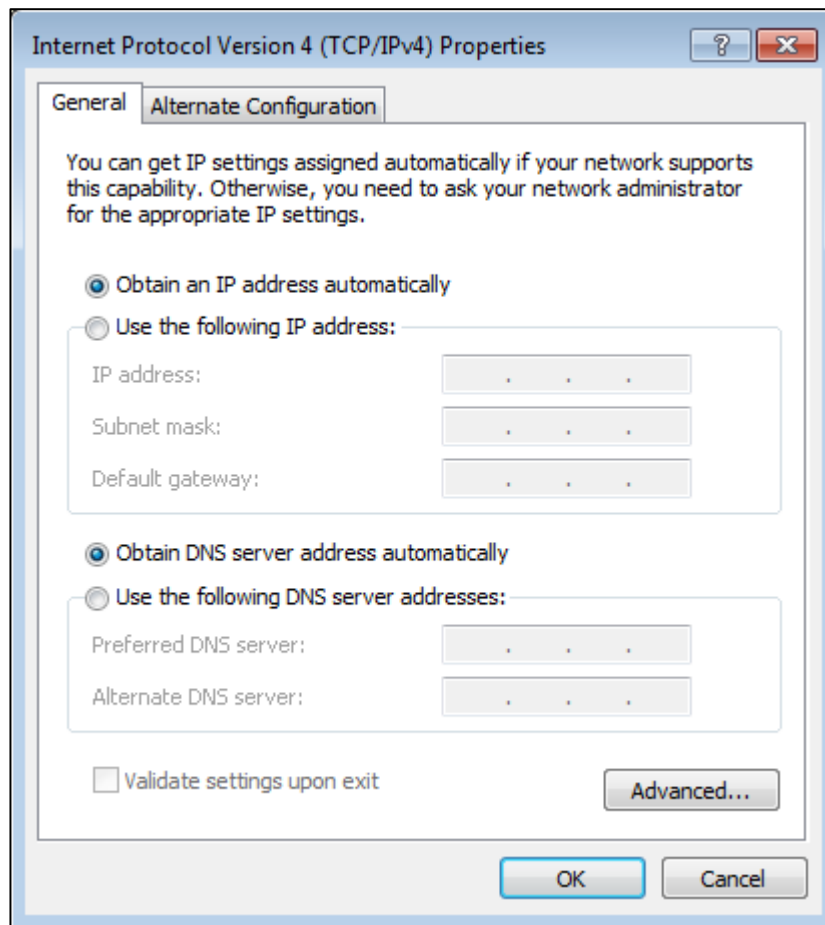
< Back   Next >   Cancel

- 14** Open the DHCP management tool and verify that the scope was created and activated.



**15** Log into Client7 and configure the client to obtain an IP address.

- Go to the client and log in as **cyber\administrator**.
- Open **Network and Internet Settings** and go to **Adapter Settings**.
- Right-click your adapter (local area connection) and click **Properties**.
- Open TCP/IPv4 settings and change to ***Obtain an IP address automatically*** (do this for the DNS settings as well).



- 16 Open the command prompt and run the **ipconfig /all** command to determine if the DHCP server assigned an IP address to the client. Note the **physical address**, or **MAC address**, in the green box below is **08002752A2CD** (yours may be different). You will need this when you configure the DHCP reservation in Step 19.

```
Administrator: C:\Windows\system32\cmd.exe

C:\Users\Administrator>ipconfig /all

Windows IP Configuration

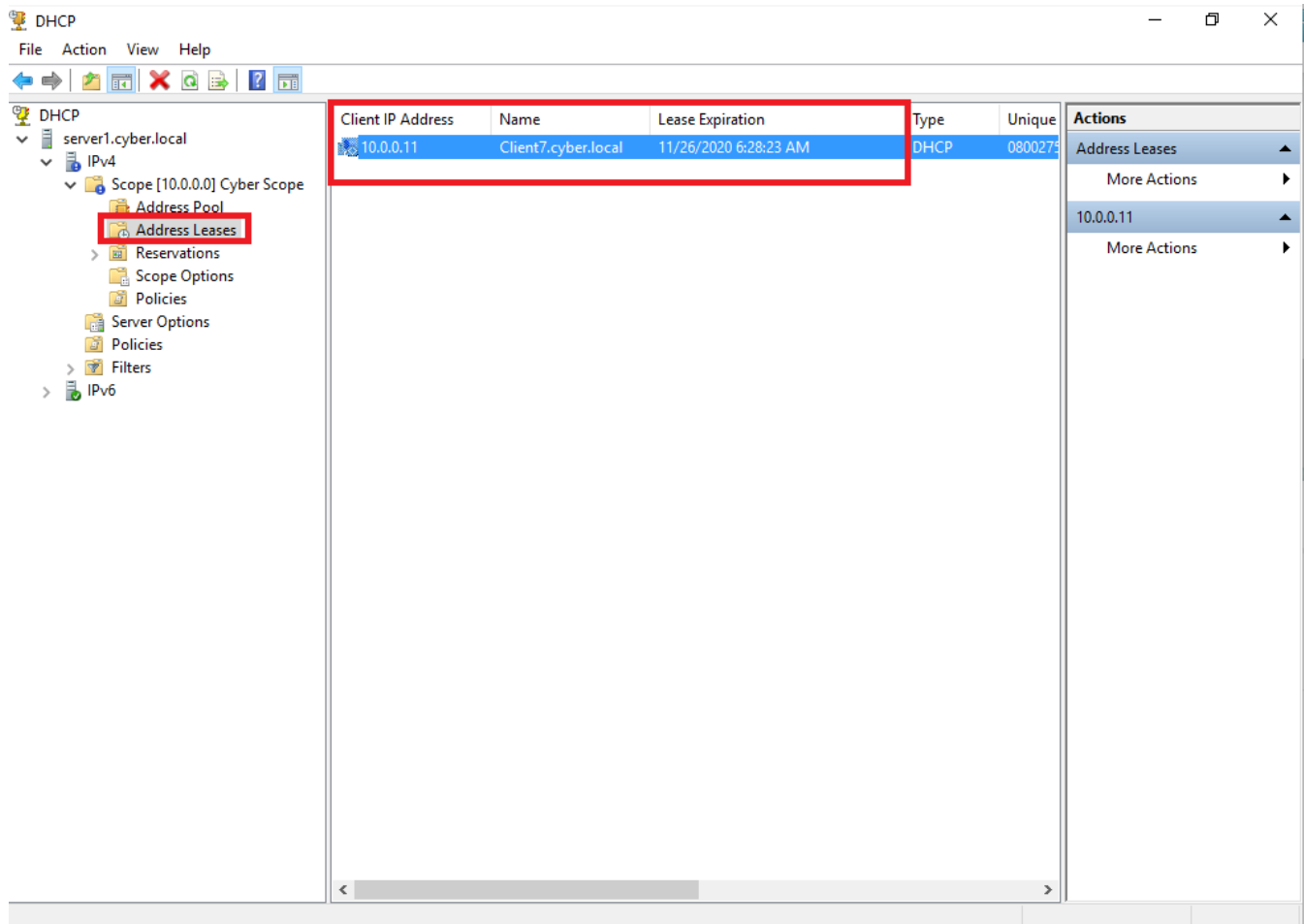
Host Name . . . . . : Client7
Primary Dns Suffix . . . . . : cyber.local
Node Type . . . . . : Hybrid
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No
DNS Suffix Search List. . . . . : cyber.local

Ethernet adapter Local Area Connection:

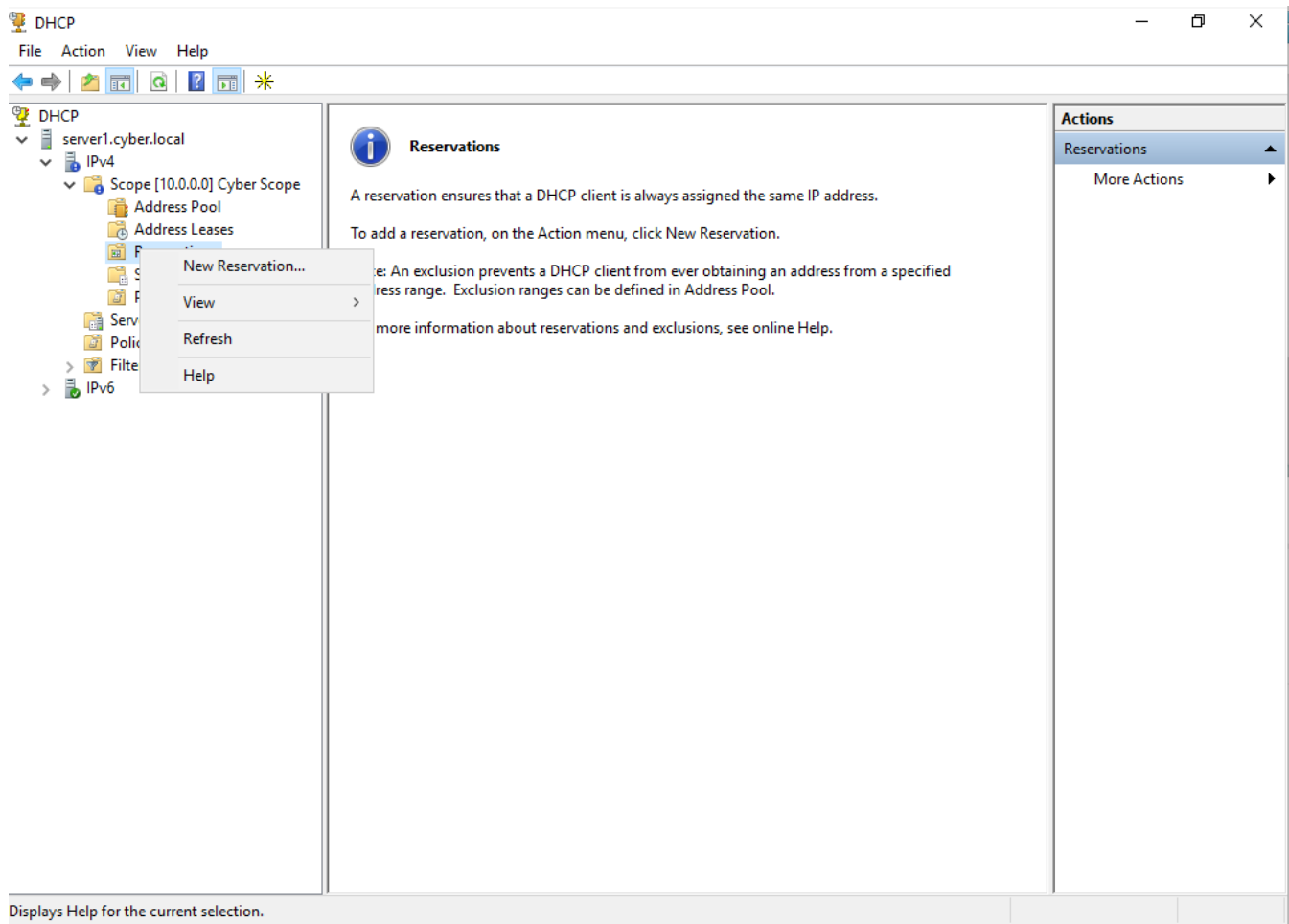
Connection-specific DNS Suffix . : cyber.local
Physical Address. . . . . : 08-00-27-52-A2-CD
Link-local IPv6 Address . . . . . : fe80::7918-2913-b878-72d%11(Preferred)
IPv4 Address. . . . . : 10.0.0.11(Preferred)
Subnet Mask . . . . . : 255.255.255.0
Lease Obtained. . . . . : Thursday, November 17, 2020 9:28:23 AM
Lease Expires . . . . . : Thursday, November 26, 2020 9:28:22 AM
Default Gateway . . . . . :
DHCP Server . . . . . : 10.0.0.1
DHCPv6 IAID . . . . . : 235405351
DHCPv6 Client DUID. . . . . : 00-01-00-01-27-34-25-EE-08-00-27-52-A2-CD

DNS Servers . . . . . : 10.0.0.1
NetBIOS over Tcpip. . . . . : Enabled
```

- 17** Go to the DHCP server and view address leases. In the DHCP console, go to **IPv4 > Scope > Address Leases**, and view the client's lease settings.



- 18** Open the DHCP management tool, click your scope to expand it, and right-click **Reservations** to create a new reservation.



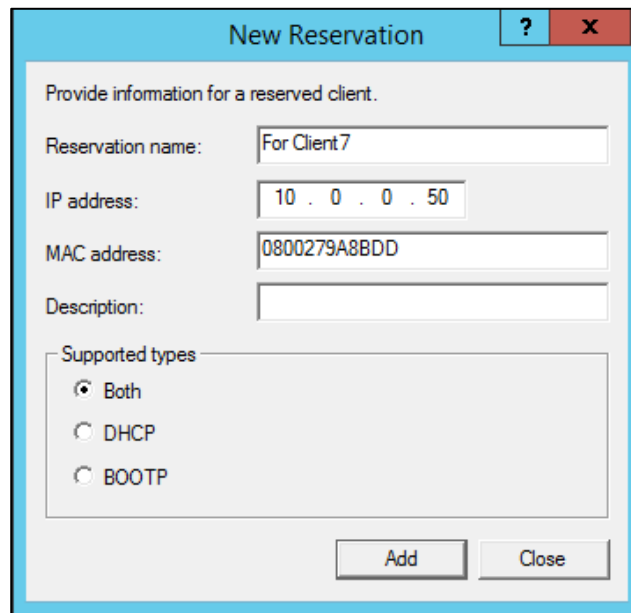
- 19** Configure the DHCP reservations for the client with the name **For Client7**, as follows:

IP address: **10.0.0.50**

MAC address: **Refer to Step 16 and use your Physical/MAC address, which may be different.**

Description: Optional

Support types: Select **Both**



New Reservation

Provide information for a reserved client.

Reservation name: For Client7

IP address: 10 . 0 . 0 . 50

MAC address: 0800279A8BDD

Description:

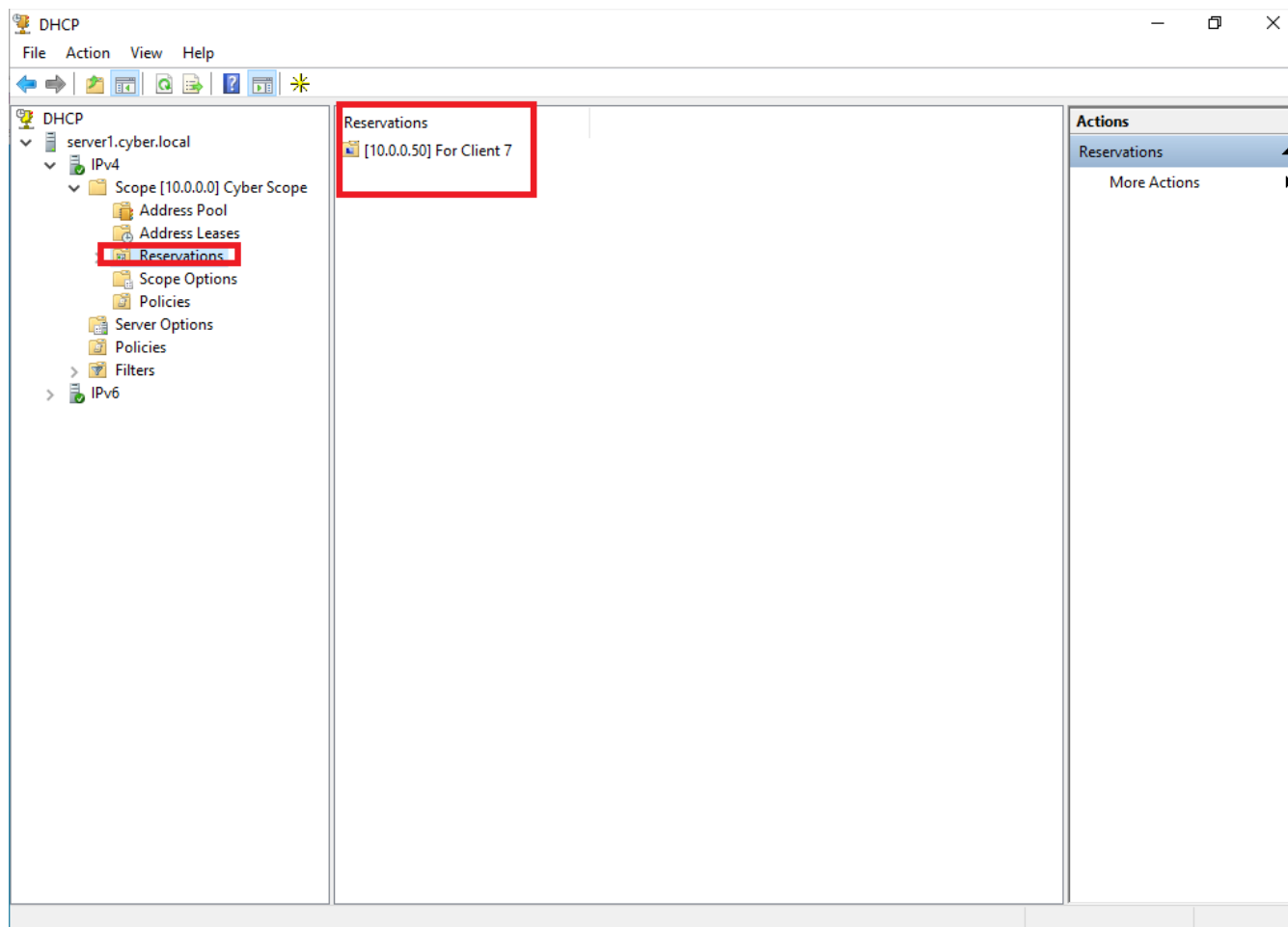
Supported types

☒ Both

☐ DHCP

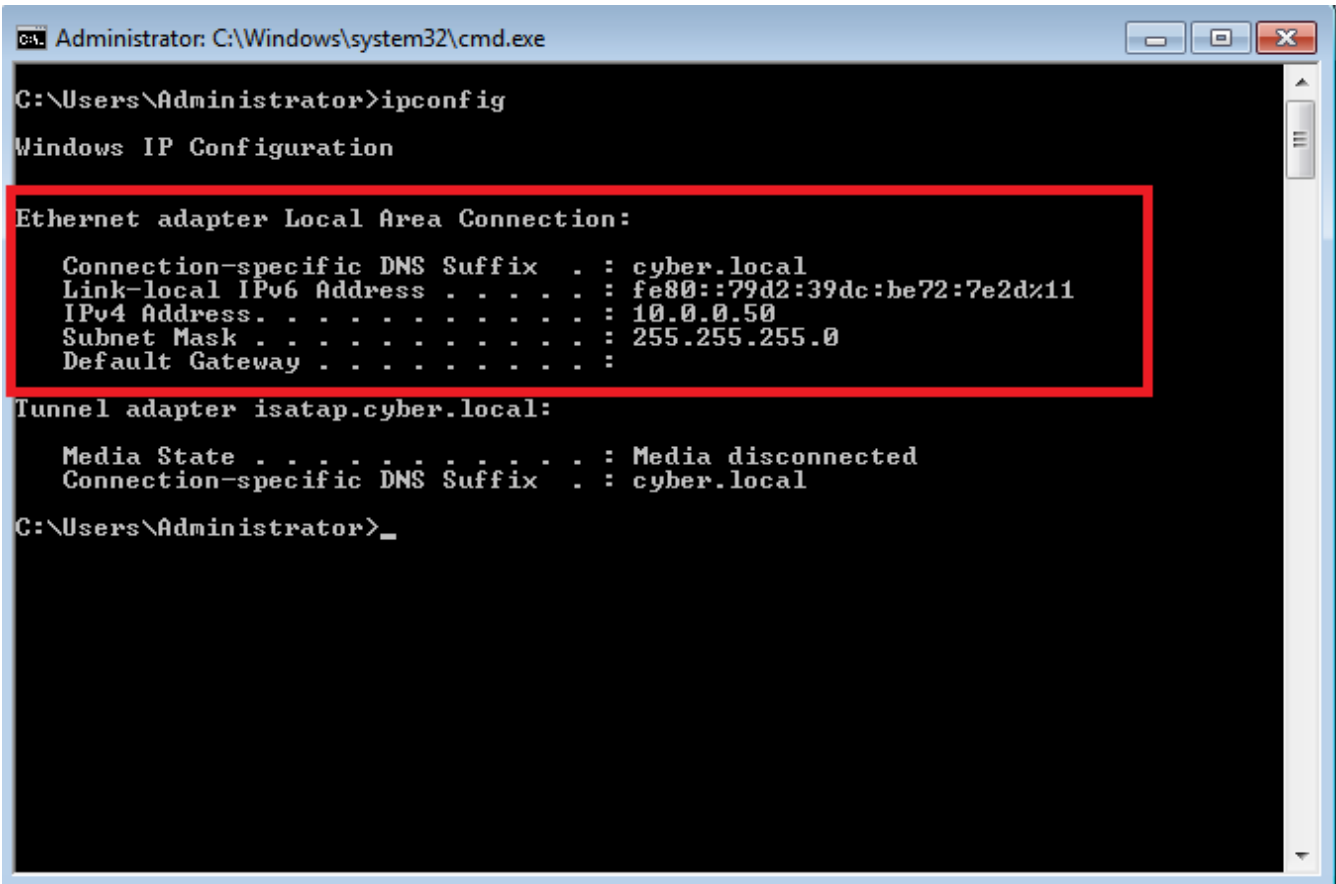
☐ BOOTP

Add Close





- 20** Check the client settings to verify the reservations by requesting the IP again using ***ipconfig /renew***. **Note:** If you receive an error message, try ***ipconfig*** instead. The system may have already assigned the reservation.



```
Administrator: C:\Windows\system32\cmd.exe

C:\Users\Administrator>ipconfig

Windows IP Configuration

Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix  . : cyber.local
    Link-local IPv6 Address . . . . . : fe80::79d2:39dc:be72:7e2d%11
    IPv4 Address. . . . . : 10.0.0.50
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . :

Tunnel adapter isatap.cyber.local:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . : cyber.local

C:\Users\Administrator>_
```