

Experiment No: 4

Date:

DHCP AND DNS INSTALLATION

AIM:

To install and configure DHCP and DNS Services in the domain controller.

THEORY:

DHCP:

In a large network, manually assigning IP addresses and other parameters (such as subnet mask, gateway, DNS address etc) is a very difficult thing. DHCP's job is to centralize the process of IP address and option assignment. You can configure a DHCP server with a range of addresses (called a pool) and other configuration information and let it assign all of the IP parameters to all its client machines. The client gets these address parameters through the DORA process (Discover, Offer, Request, and Acknowledge).

Scope: It is a contiguous range of addresses and a set of parameters like DNS address etc. It also has IP addresses to be Excluded (makes those unavailable in the pool) or Reserved (to give a specific IP address to a specific MAC address; i.e. set a permanent DHCP lease).

DNS:

The *Domain Name System (DNS)* is a service that resolves a hostname to an Internet Protocol (IP) address. Any computer providing domain name services is a *DNS name server*. A *DNS client* is any machine that issues *queries* (requests) to a DNS server. These queries are generated by processes called *resolvers*.

Different types of records are stored in DNS servers.

- The *Name server (NS) records* list the name servers for a domain. This record allows other name servers to look up names in your domain.
- A *host record* (also called an *A record* for IPv4 and *AAAA record* for IPv6) is used to associate statically a host's name to its IP addresses.
- *Alias record*, or *canonical name (CNAME) record* are used to point more than one DNS record toward a host for which an A record already exists.
- The *pointer (PTR) record* does just the opposite of the host record; i.e. mapping an IP address to a hostname.
- The *mail exchanger (MX) record* is used to specify which servers accept mail for this domain.

Host Records are used in Forward Lookup Zones and Pointer Records are used in Reverse Lookup Zones.

Note: While installing ADDS, DNS service is automatically installed because ADDS cannot function without DNS.

DHCP INSTALLATION AND CONFIGURATION:

Prerequisites:

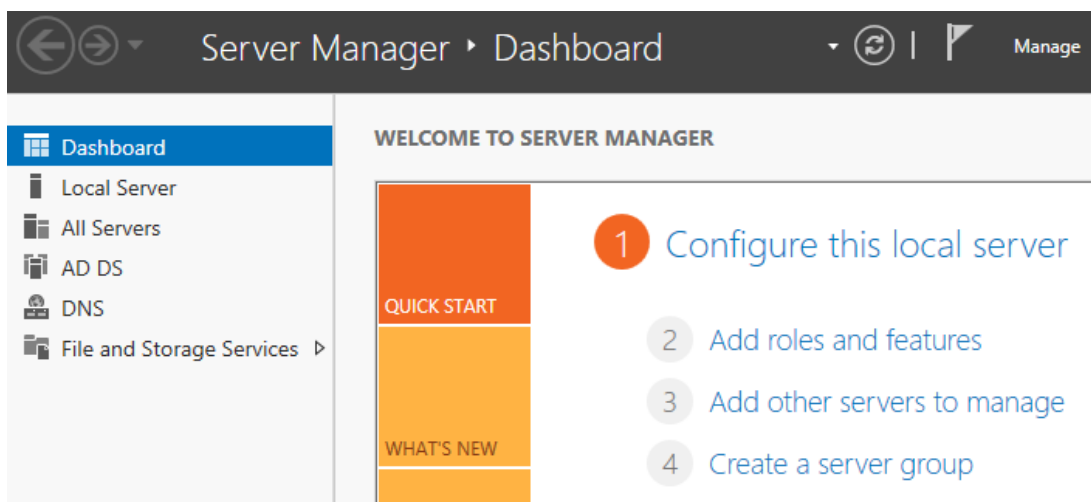
Before you proceed with setting up a DHCP server on your Windows Server 2012 R2, you have to fulfill the following four requirements for an installation and configuration to be successful.

1. Administrator account has strong password
2. Static IP is configured for the server (here 192.168.10.1)
3. Current security updates from Windows Update are installed
4. Firewall is turned off

Procedure:

Part 1: Installing DHCP Server

Step 1: Open **Server Manager** from task bar and click **Add roles and features**



Step 2: Before you run the installation wizard, make sure that an administrator account has a strong password, static IP is configured, and security updates from Windows updates are installed. When you are done, click **Next**

Step 3: Select **Role-based or feature-based installation** and click **Next**

Select installation type

DESTINATION SERVER
testserver.testdomain.com

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.

< Previous

Next >

Install

Cancel

Step 4: Select a destination server on which you want to install the DHCP server. In our case, there is only one server which is a local server and it is selected by default. Click **Next**

Add Roles and Features Wizard

DESTINATION SERVER
testserver.testdomain.com

Select destination server

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
testserver.testdomain.com	192.168.10.1	Microsoft Windows Server 2012 R2 Datacenter Evaluation

< ||| >

1 Computer(s) found

This page shows servers that are running Windows Server 2012, 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.

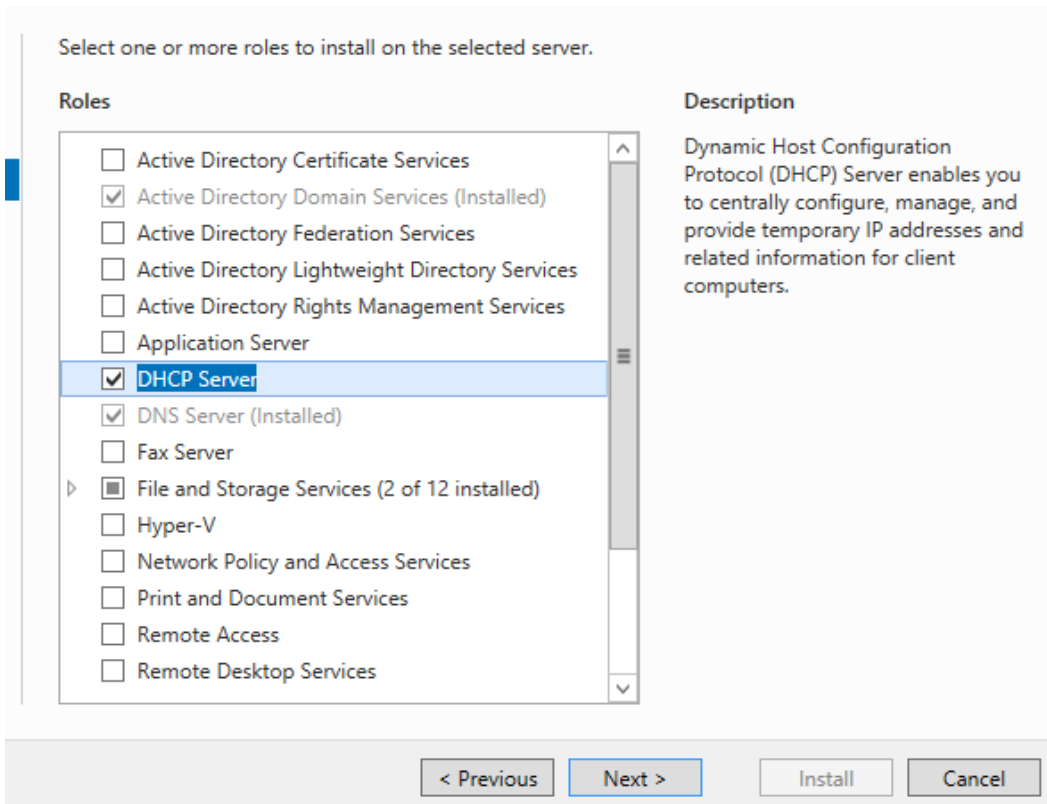
< Previous

Next >

Install

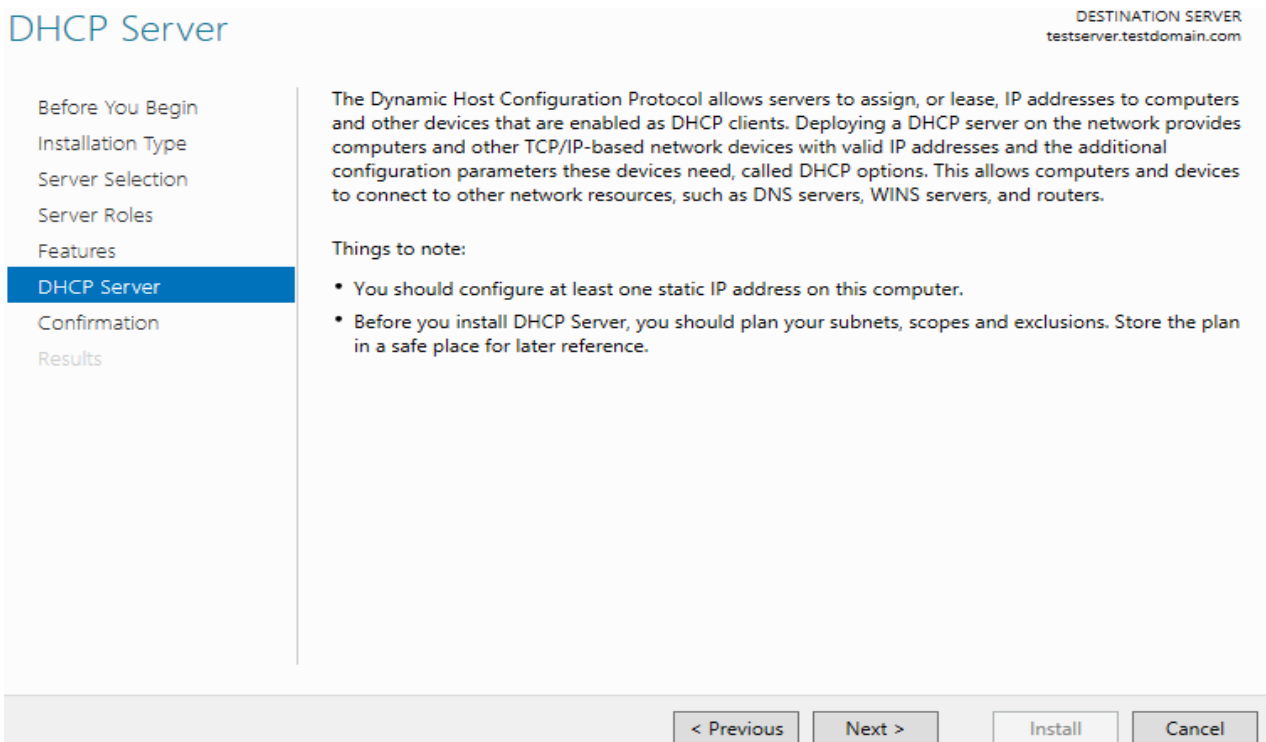
Cancel

Step 5: Select DHCP server role by checking the appropriate box. As soon as you check the box, a small window will pop up alerting you that there are some other features which are also required to be installed along with the DHCP server. Click **Add Features** and then click **Next**.



Step 7: The **Select Features** window will appear. Nothing to be changed there. Click **Next**.

Step 8: Note the things outlined in the screen and click **Next**



Step 9: Confirm your installation selections and click **Install**

Confirm installation selections

DESTINATION SERVER
testserver.testdomain.com

- 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](#)

< Previous Next > **Install** Cancel

Step 10: When the installation is completed, click **Close** to finish the installation.

Installation progress

DESTINATION SERVER
testserver.testdomain.com

- Before You Begin
- Installation Type
- Server Selection
- Server Roles
- Features
- DHCP Server
- Confirmation
- Results**

View installation progress

i Feature installation

Configuration required. Installation succeeded on testserver.testdomain.com.

DHCP Server

- Launch the DHCP post-install wizard
- [Complete DHCP configuration](#)

Remote Server Administration Tools

- Role Administration Tools
 - DHCP Server Tools

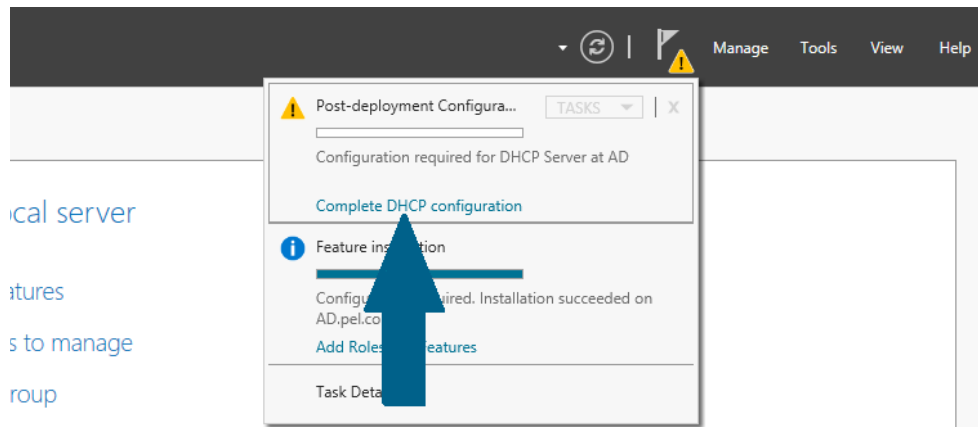
1 You can close this wizard without interrupting running tasks. View task progress or open this page again by clicking **Notifications** in the command bar, and then **Task Details**.

[Export configuration settings](#)

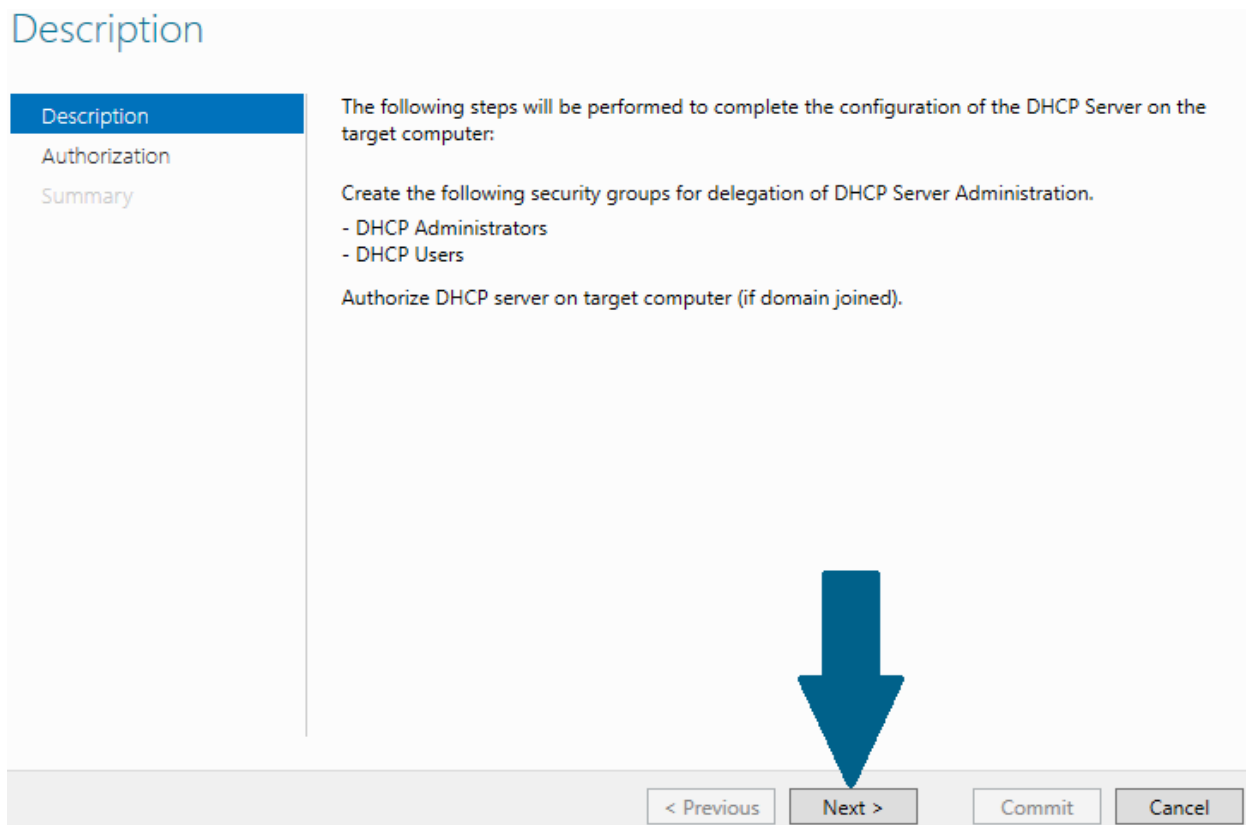
< Previous Next > **Close** Cancel

Part 2: Configuring DHCP Server and Creating Scope

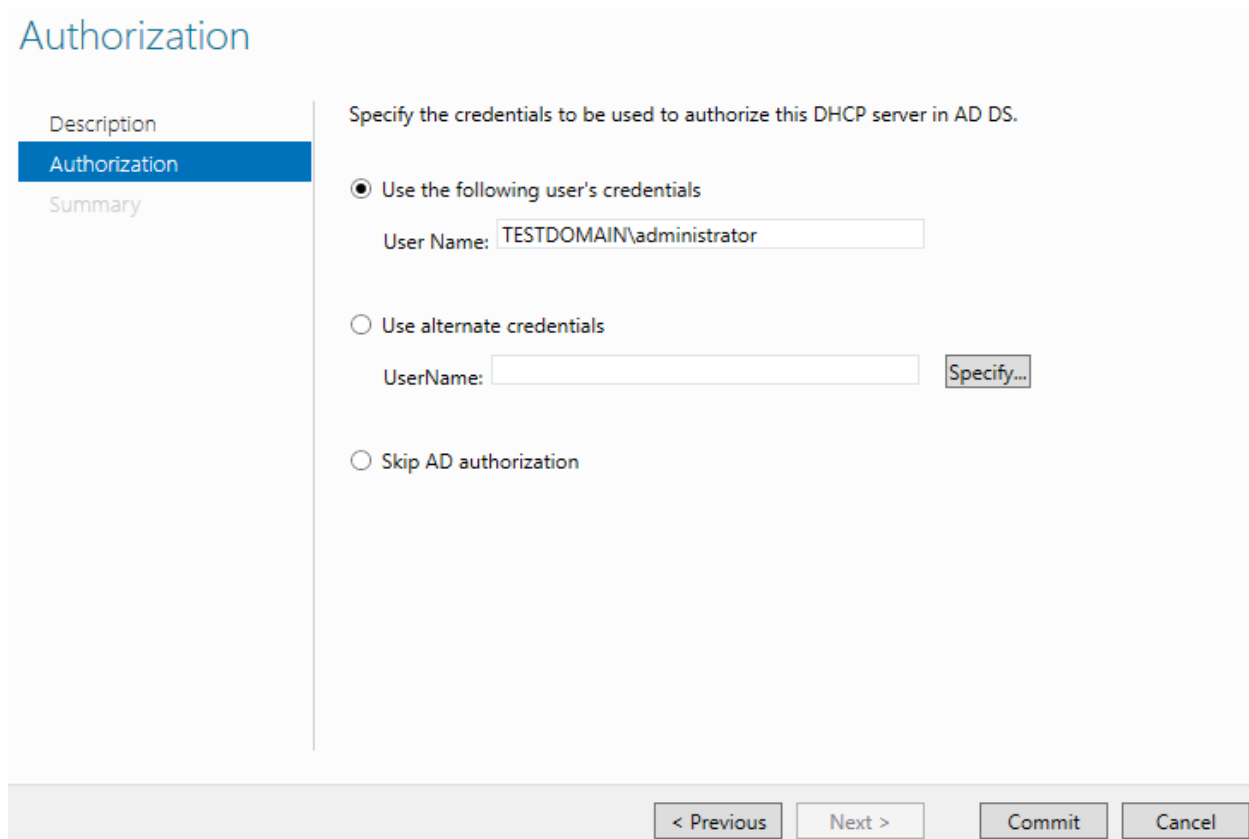
Step 11: Open Server Manager and click the notifications icon. A small window will appear. Click **Complete DHCP configuration**



Step 12: Click **Next**

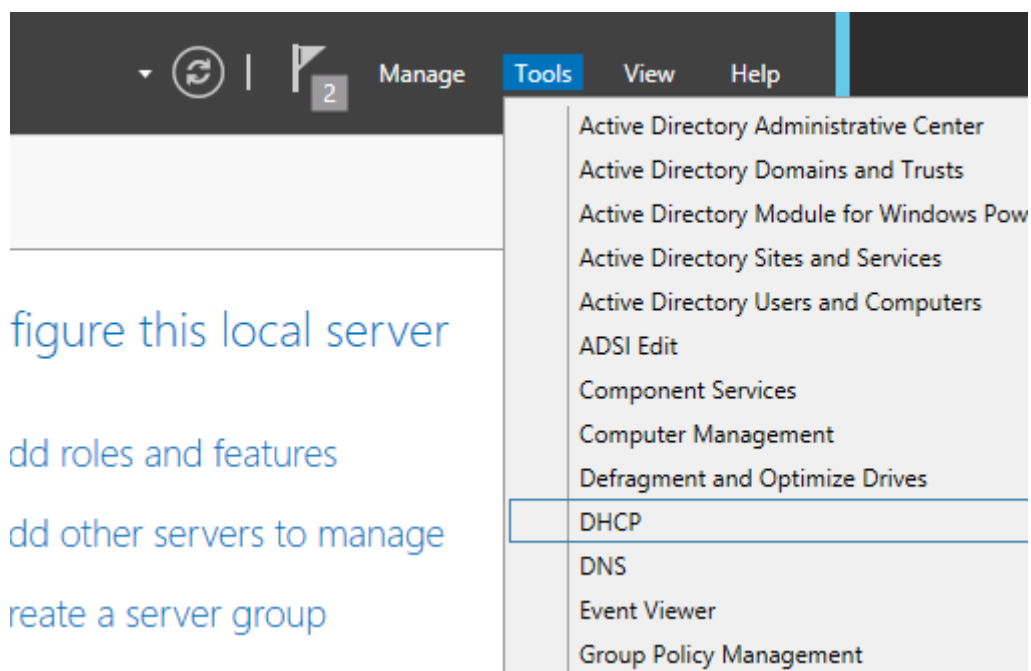


Step 13: Choose Skip AD authorization if we do not have any ADDS configured. If there is ADDS configured, choose the first option. Click **Commit**.

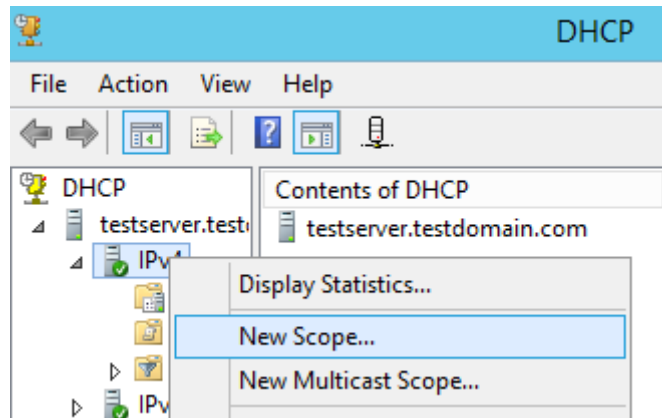


Step 14: A **Summary** window will appear. Read the summary and click **Close**.

Step 15: Open Server Manager and click on **Tools**. When a small window appears, scroll to **DHCP** and click it.

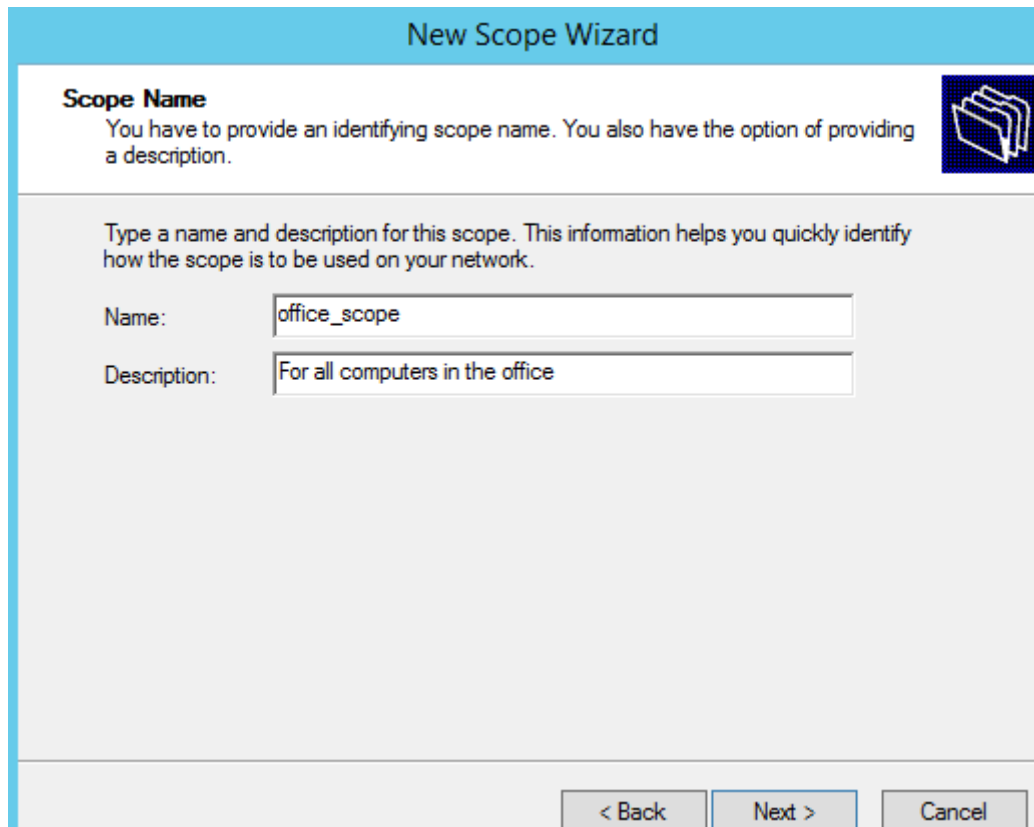


Step 16: A management console will appear. In the console, right click on **IPv4** and scroll to **New Scope** and click it.



Step 17: A welcome window will appear for Scope Creation. Click **Next**.

Step 18: Provide name and meaningful description of this new scope and click **Next**.



Step 19: Provide IP address range along with subnet you need to distribute to client machines and click **Next**.

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

Step 20: Provide any IP addresses you need to exclude from the pool and click **Add**. These addresses may be assigned statically for some network printers or systems with shared folders. Click **Next**.

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:


Excluded address range:

Subnet delay in milli second:

< Back Next > Cancel

Step 21: Keep lease duration as 8 days (default) 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:

Step 22: Choose **No, I will configure these options later** and click **Next** to finish the scope creation without configuring the gateway, DNS address options. (If you need to configure the Gateway and DNS addresses, choose **Yes**, click **Next**, give the gateway address, give the DNS address and keep the WINS address as blank).

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

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="192 . 168 . 10 . 1"/>	<input type="button" value="Add"/>
<input type="button" value="Resolve"/>	<div style="border: 1px solid gray; height: 40px;"></div>	<input type="button" value="Remove"/>
		<input type="button" value="Up"/>
		<input type="button" value="Down"/>

Step 23: You can activate the scope now itself or later.

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

Step 24: If not activated, right-click on the new scope you just created in the above step and click **Activate**.

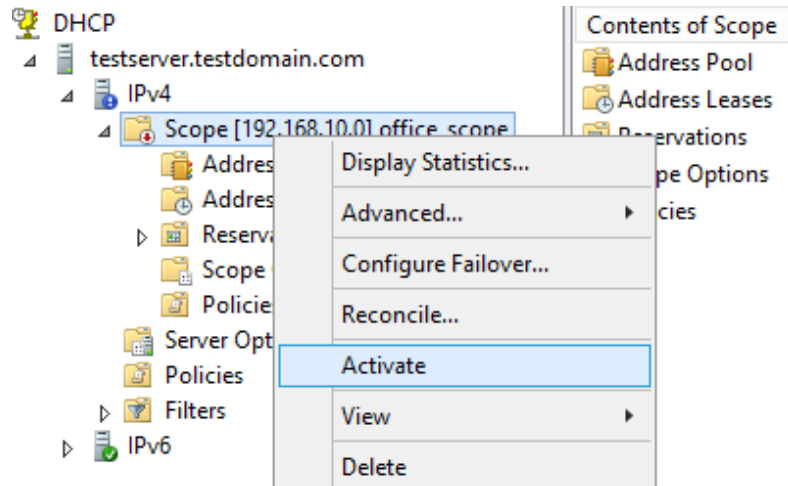
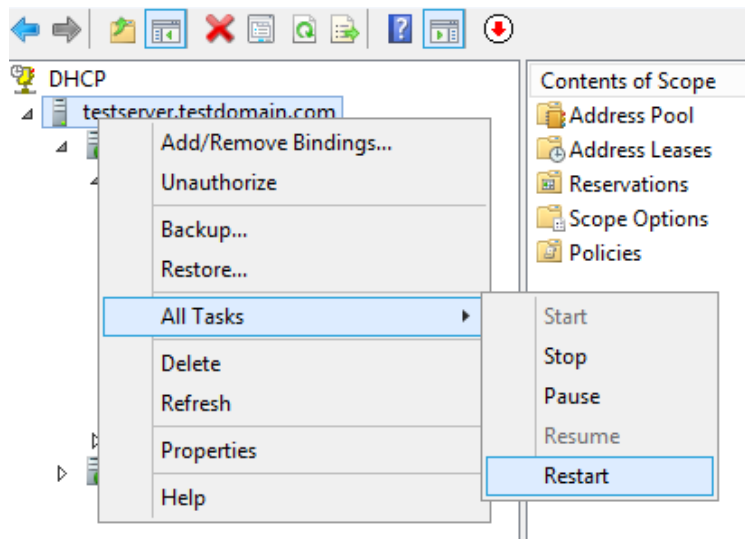


Figure 24

Step 25: Right-click on your server, scroll to **All Tasks** and then click **Restart** to finish with configuration.



Step 26: Check the clients whether the IP Pool has been activated or not.

DNS INSTALLATION AND CONFIGURATION:

Prerequisites:

For DNS server to be configured, you should meet the following requirements:

1. Administrator account has strong password
2. At least one static IP is configured
3. Current security updates from Windows Update are installed
4. Firewall is turned off

Procedure:

Installing DNS Server Role

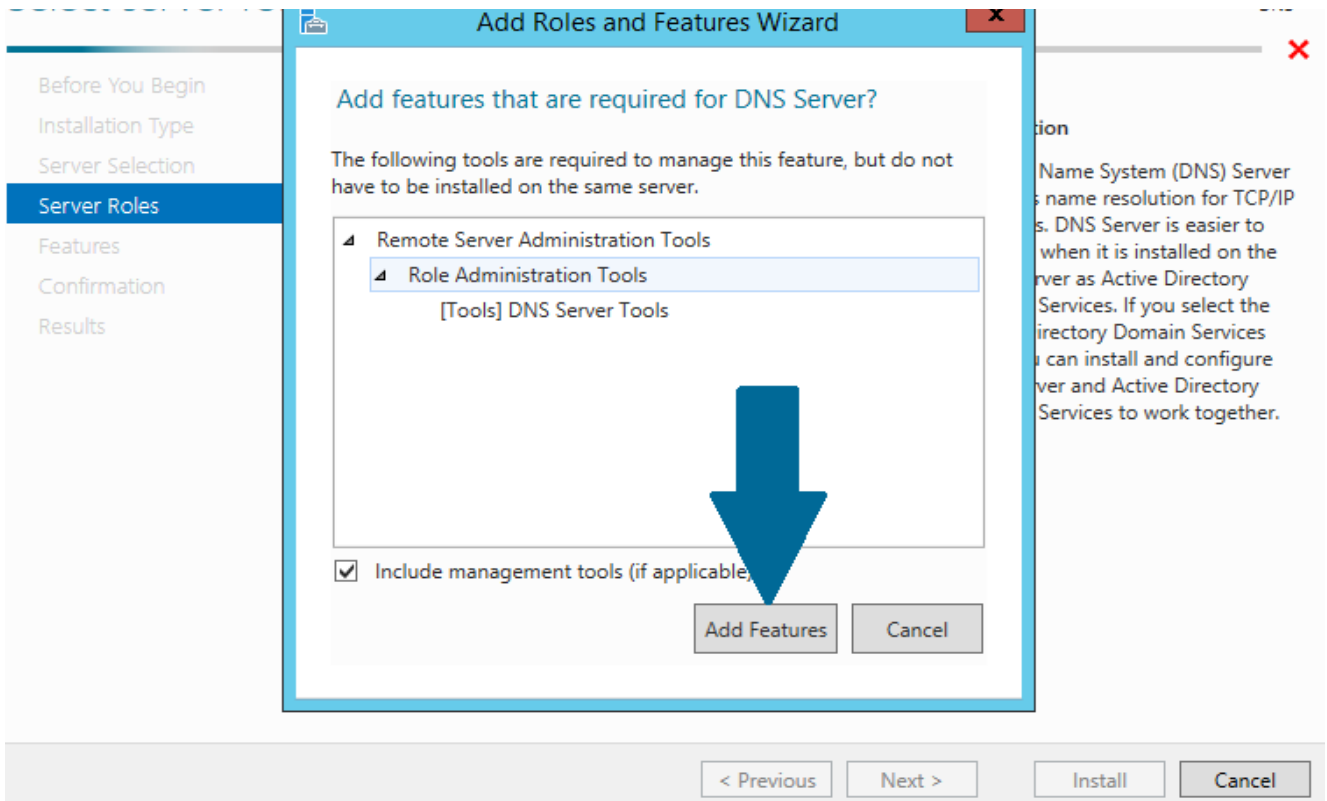
Step 1: From task bar, open server manager dashboard

Step 2: Read the notes and meet the prerequisites. Click **Next** when you are done.

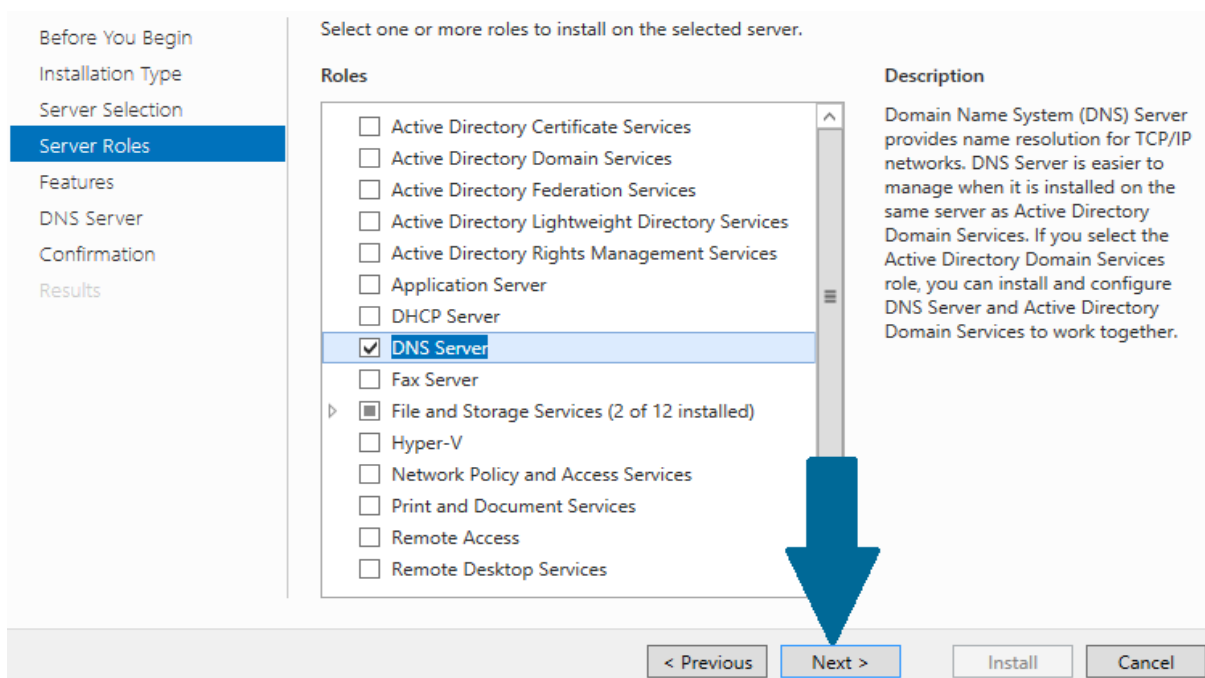
Step 3: Choose **Role-based or feature-based installation** and click **Next**.

Step 4: Select the destination server from the server pool on which you want to configure DNS and click **Next**.

Step 5: Choose DNS Server from server roles. When prompted to install additional necessary features along with the DNS server, click **Add Features**.

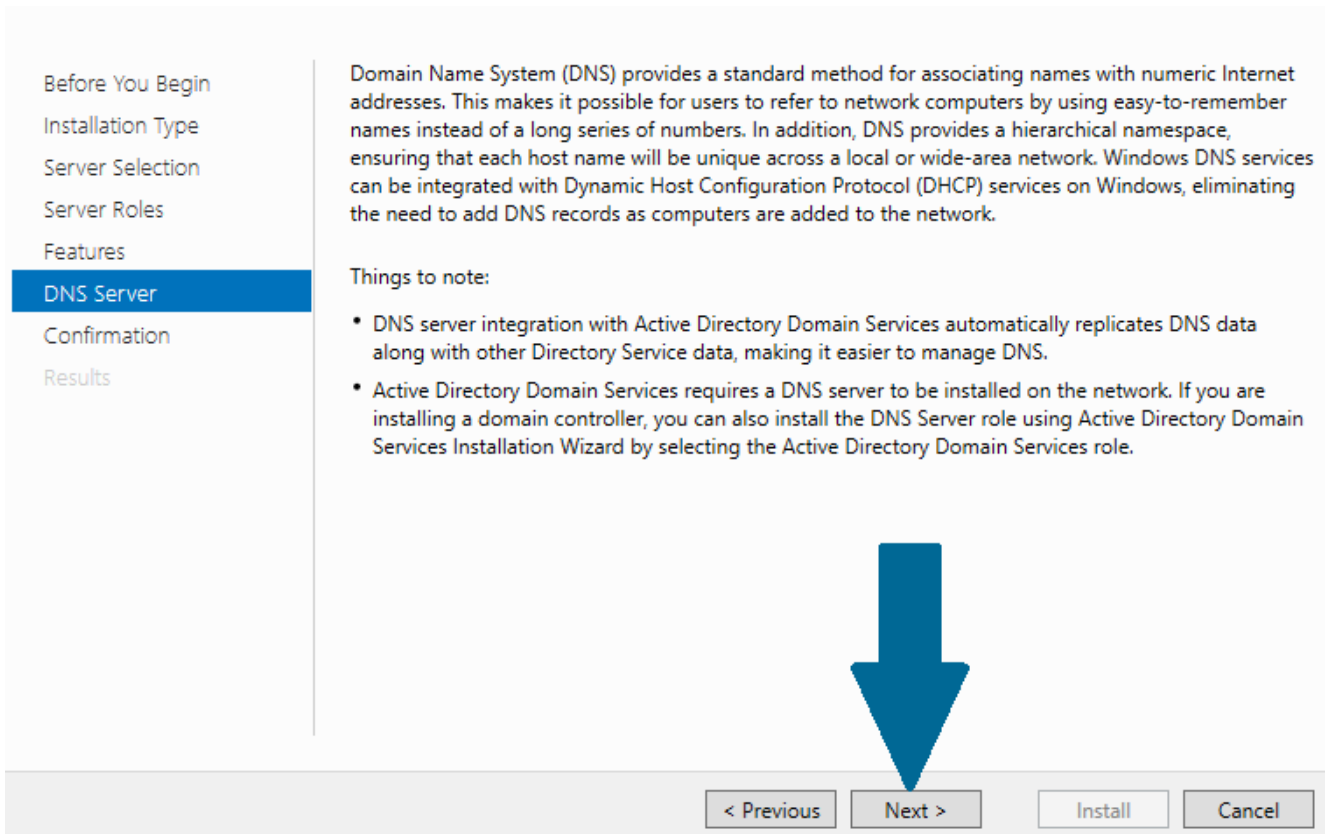


Step 6: Click **Next**



Step 7: In features, keep default selections and click **Next**.

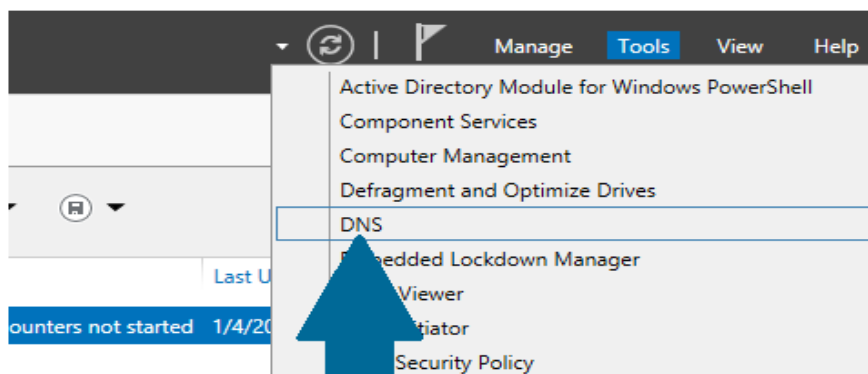
Step 8: Read the important notes and click **Next**.



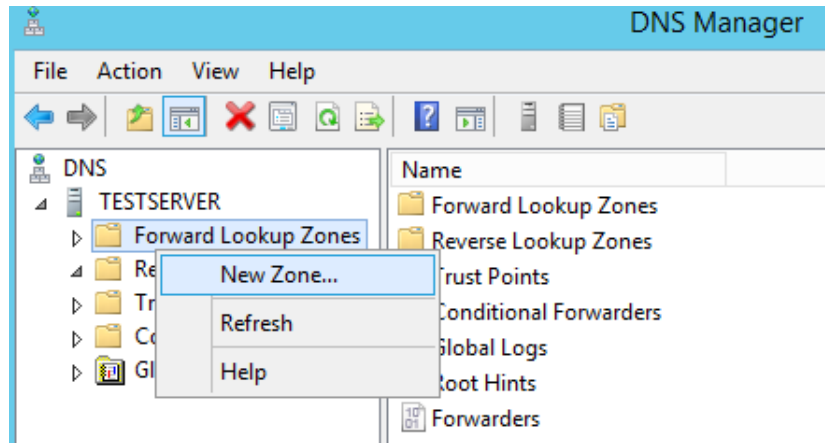
Step 9: Click **Install**. Wait for a moment before DNS role is installed

Configuring Forward Lookup Zone

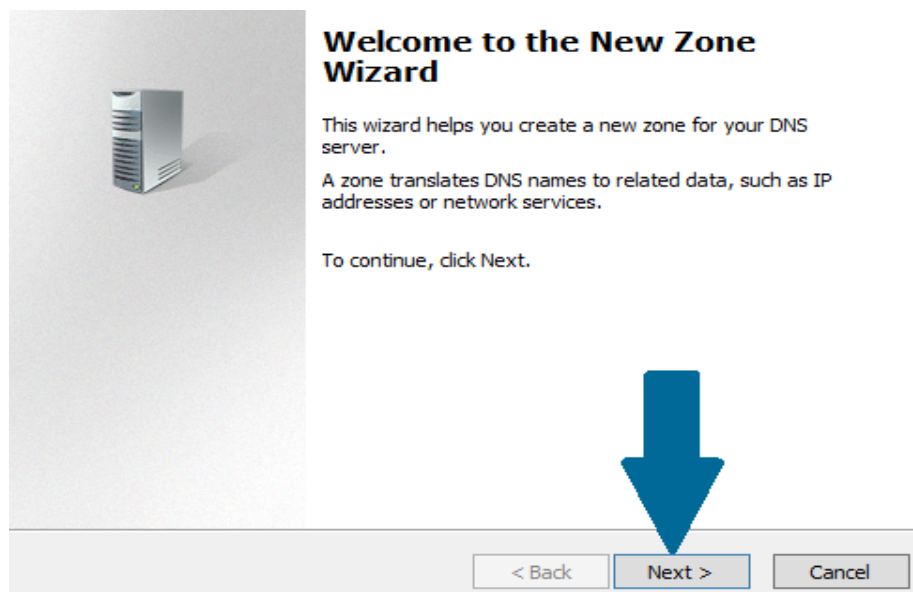
Step 1: Open server manager dashboard, and then open tools. Scroll to DNS and click it



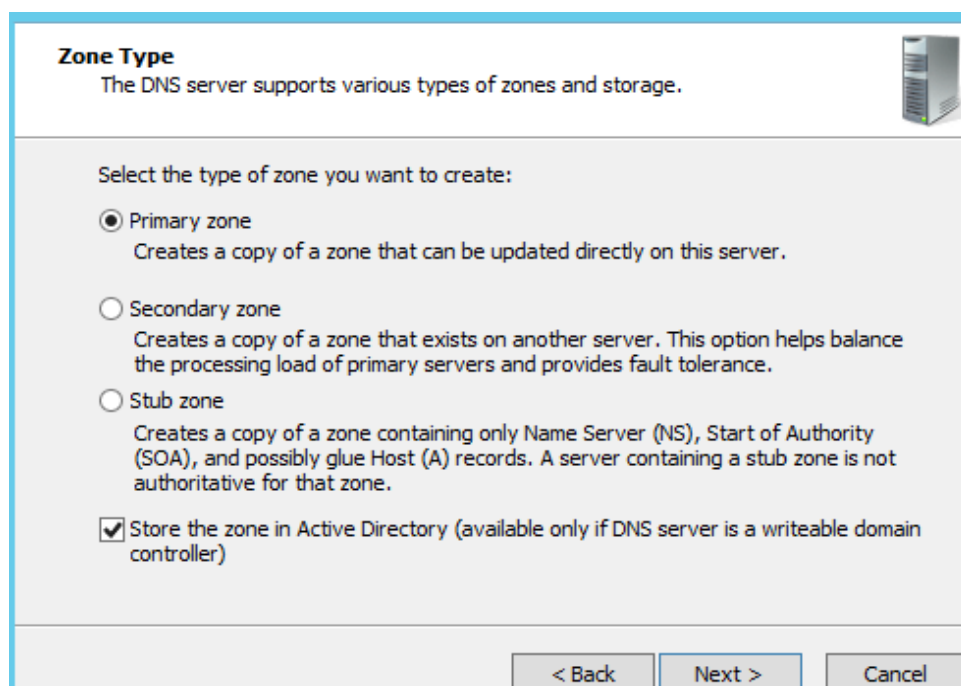
Step 2: Right-click **Forward Lookup Zones** and click **New Zone**



Step 3: Click Next




Step 4: Provide the Zone Type (primary, secondary or stub). It will be **primary**.



Step 5: Keep the **Zone replication scope**, as such (scope in the domain).

Step 6: Provide the zone name (can be same as domain name) and click **Next**


Zone Name 

What is the name of the new zone?

The zone name specifies the portion of the DNS namespace for which this server is authoritative. It might be your organization's domain name (for example, microsoft.com) or a portion of the domain name (for example, newzone.microsoft.com). The zone name is not the name of the DNS server.

Zone name:

Step 7: Choose **Do not allow dynamic updates** and click **Next**


Dynamic Update 

You can specify that this DNS zone accepts secure, nonsecure, or no dynamic updates.

Dynamic updates enable DNS client computers to register and dynamically update their resource records with a DNS server whenever changes occur.

Select the type of dynamic updates you want to allow:

Allow only secure dynamic updates (recommended for Active Directory)
This option is available only for Active Directory-integrated zones.

Allow both nonsecure and secure dynamic updates
Dynamic updates of resource records are accepted from any client.
 This option is a significant security vulnerability because updates can be accepted from untrusted sources.

Do not allow dynamic updates
Dynamic updates of resource records are not accepted by this zone. You must update these records manually.

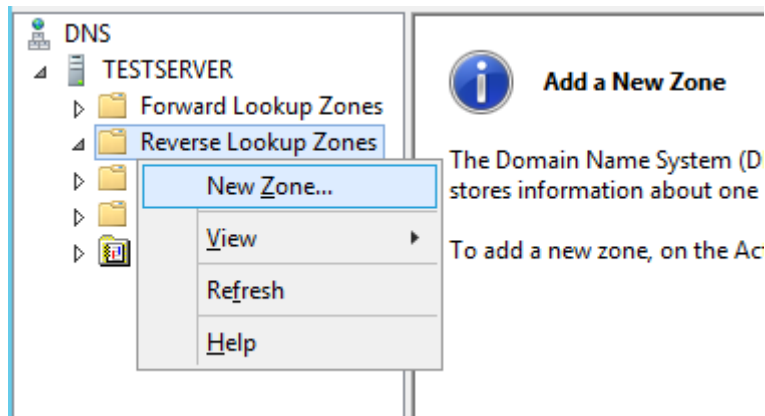
< Back Next > Cancel

Step 8: Click **Finish** to successfully create the new zone.

Configuring Reverse Lookup Zone

Step 1: Open server manager from task bar and click on Tools. Scroll to DNS and then click on it.

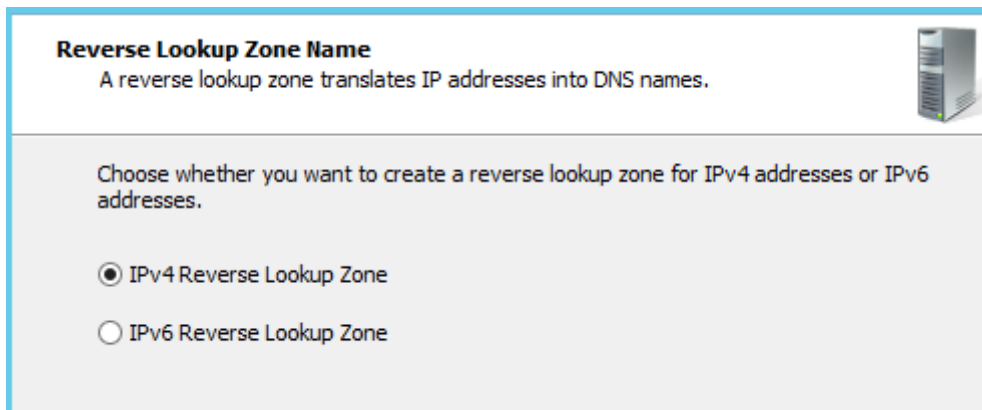
Step 2: **Right-click** Reverse Lookup Zones and then click **New Zone**.



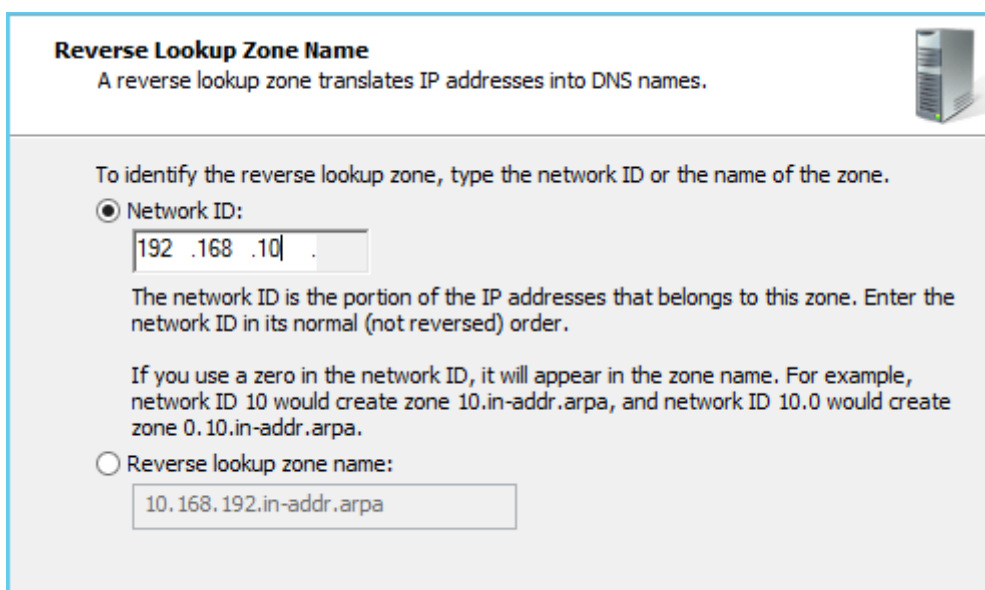
Step 3: In the welcome window, click **Next**.

Step 4: Choose **Primary Zone** and click **Next**. Then, keep the **Zone replication scope**, as such (scope in the domain).

Step 5: Choose **IPv4 Reverse Lookup Zone** and click **Next**



Step 6: Provide **network ID** and click **Next**.

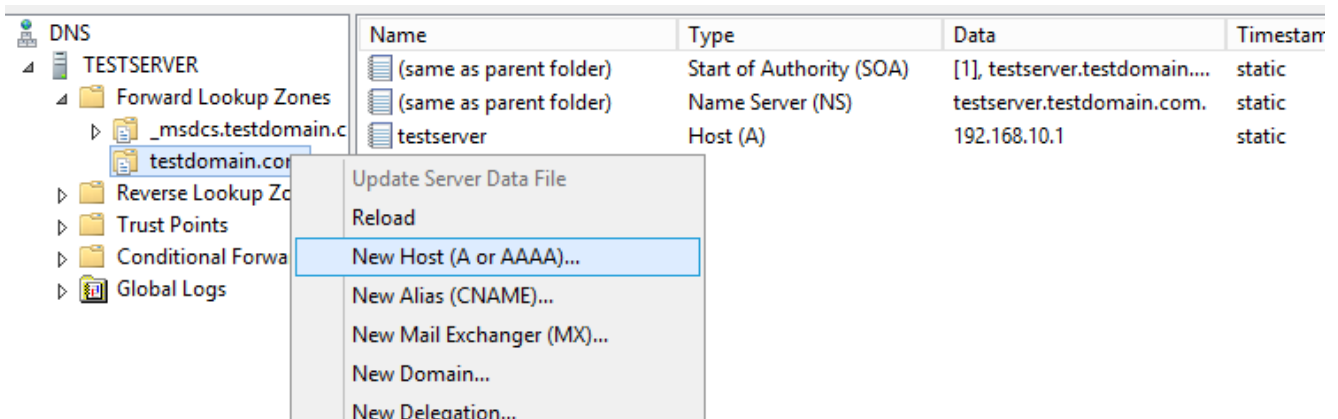


Step 7: In the new window, choose **Do not allow dynamic updates** and click **Next**.

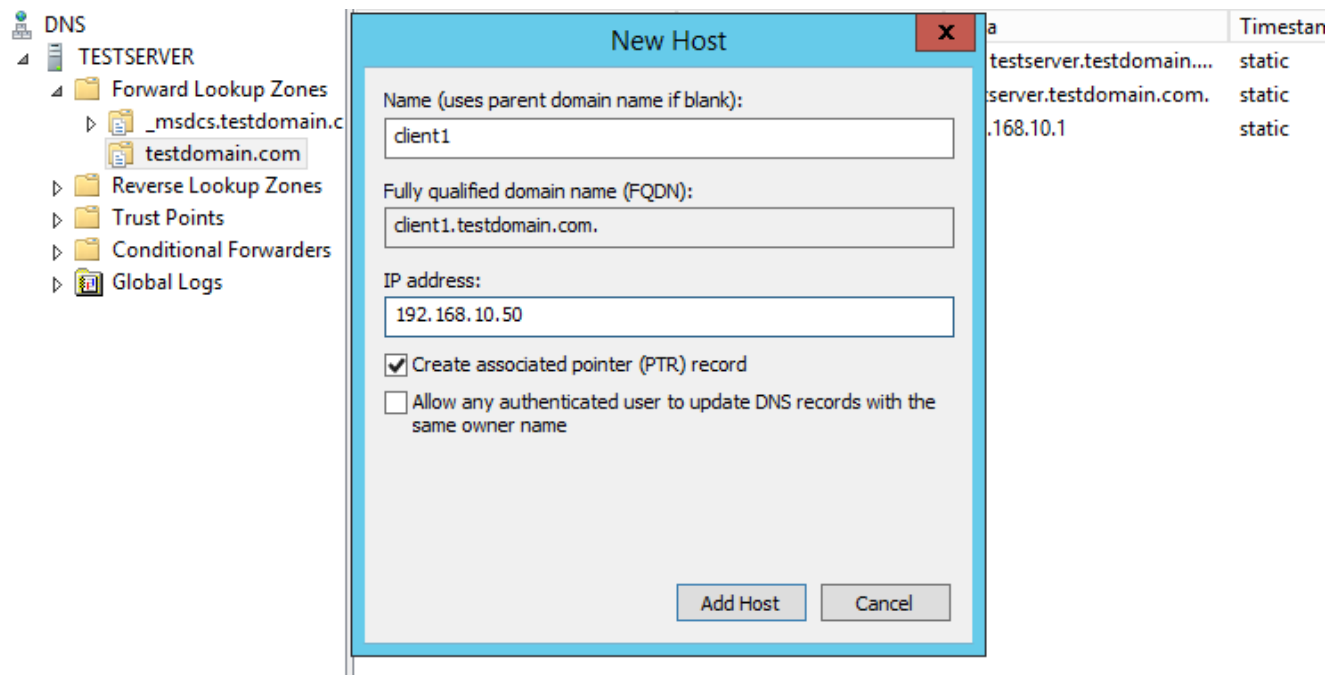
Step 8: Click **Finish** to end the wizard.

Adding a New Host Record in Forward Lookup Zone

Step 1: Locate the zone in forward lookup zones and right-click on it. Scroll to New Host (A or AAAA) and click on it.



Step 2: Provide the **name** and click **Add Host**.

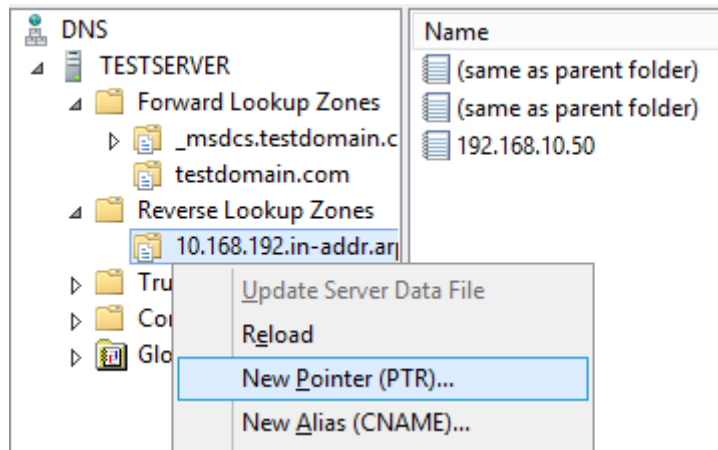


Step 3: Click **Add Host** and this new host record will be visible in zone.

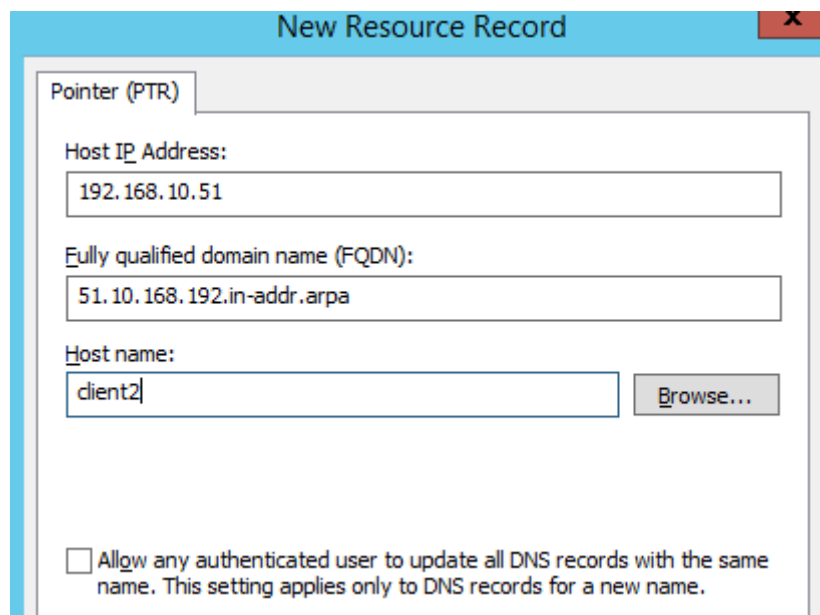
Adding a New PTR Record in Reverse Lookup Zone

The system allows you to create pointer records while creating host records, by default. If Pointer records are to be created manually, do the following steps.

Step 1: Right-click the desired reverse lookup zone. Scroll to **New Pointer (PTR)**.



Step 2: Provide host IP address and name. Click **OK**



Testing the lookups using 'nslookup' command

In the command line, type **nslookup <IPAddress>**. If the DNS is working fine, it will show the system domain name. Type **nslookup <domain name>**. If the DNS is working fine, it will show the system IP Address.

```
Default Server: testserver
Address: 192.168.10.1

> 192.168.10.50
Server: testserver
Address: 192.168.10.1

Name: client1.testdomain.com
Address: 192.168.10.50

> client2
Server: testserver
Address: 192.168.10.1

Name: client2.testdomain.com
Address: 192.168.10.51
```

Note: If the DNS Server name in **nslookup** shows **Unknown**, go to the newly created Forward Lookup Zone, open the domain's **NS record** (Name Server record), and add the server's IP address.

RESULT:

Installed and configured the DHCP and DNS in the server.