Experiment No: 4

Date:

DHCP AND DNS INSTALLATION

<u>AIM:</u>

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

Server Ma	anager 🕨 Dashboard 🛛 🗸 🕫 🖡 Manage
📰 Dashboard	WELCOME TO SERVER MANAGER
Local Server All Servers AD DS	1 Configure this local server
B DNS■ File and Storage Services 	2 Add roles and features
	3 Add other servers to manage WHAT'S NEW 4 Create a server group

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	Select the installation type. You can install roles and features on a running physical computer or virtual machine, or on an offline virtual bard dick (VHD)
Installation Type	machine, or on an online virtual hard disk (virb).
Server Selection	Role-based or feature-based installation Configure a single server by adding roles role services and features
Server Roles	configure a single server by adding roles, role services, and reathersi
Features	Remote Desktop Services installation Install required role services for Virtual Desktop Infrastructure (VDI) to create a virtual machine-based
Confirmation	or session-based desktop deployment.
Results	
	< 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**

a	Add Roles and Features Wizard
Select destination	DESTINATION SERVER testserver.testdomain.com
Before You Begin	Select a server or a virtual hard disk on which to install roles and features.
Installation Type	Select a server from the server pool
Server Selection	 Select a virtual hard disk
Server Roles	Server Pool
Features	
Confirmation	Filter:
Results	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.**

NUICS	Description
 Active Directory Certificate Services Active Directory Domain Services (Installed) Active Directory Federation Services Active Directory Lightweight Directory Services Active Directory Rights Management Services Application Server DHCP Server DNS Server (Installed) Fax Server File and Storage Services (2 of 12 installed) Hyper-V Network Policy and Access Services Print and Document Services Remote Access Remote Desktop Services 	 Dynamic Host Configuration Protocol (DHCP) Server enables yo to centrally configure, manage, an provide temporary IP addresses an related information for client computers.

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	To install the following roles, role services, or features on selected server, click Install.
Installation Type	Restart the destination server automatically if required
Server Selection	Optional features (such as administration tools) might be displayed on this page because they have
Server Roles	been selected automatically. If you do not want to install these optional features, click Previous to clear their check boxes.
Features	
DHCP Server	DHCP Server
Confirmation	Remote Server Administration Tools
Results	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 Configuration required. Installation succeeded on testserver.testdomain Configuration required. Installation succeeded on testserver.testdomain Configuration Tequired. Installation succeeded on testserver.testdomain DHCP Server Launch the DHCP post-install wizard Complete DHCP configuration Remote Server Administration Tools Role Administration Tools DHCP Server Tools You can close this wizard without interrupting running tasks. View task page again by clicking Notifications in the command bar, and then Task	n.com.
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**

	· @ /	Manage	Tools	View	Help
	Post-deployment Configura TASKS V X				
cal server	Complete DHCP configuration				
atures	Configure vired. Installation succeeded on AD.pel.co				
s to manage	Add Roles eatures				
roup	Task Deta				

Step 12: Click Next

Description	
Description	The following steps will be performed to complete the configuration of the DHCP Server on the target computer:
Authorization	
Summary	Create the following security groups for delegation of DHCP Server Administration.
	- DHCP Administrators - DHCP Users
	Authorize DHCP server on target computer (if domain joined).
	< Previous Next > Commit Cancel

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

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: TESTDOMAIN\administrator Use alternate credentials UserName: Specify, Skip AD authorization 	
	< Previous Next > Commit C	ancel

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.

	New Scope Wizard	
Scope Name You have to pro a description.	ovide an identifying scope name. You also have the option of providing	J.
Type a name ar how the scope	nd description for this scope. This information helps you quickly identify is to be used on your network.	
Name:	office_scope	
Description:	For all computers in the office	
	< Back Next > Cance	el

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.	(J)
Configuration settings for DHCP Server Enter the range of addresses that the scope distributes. Start IP address: 192 . 168 . 10 . 11 End IP address: 192 . 168 . 10 . 30 Configuration settings that propagate to DHCP Client	
Length: 24 Subnet mask: 255 . 255 . 0	
< 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 DHCPOFFER 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: 192.168.10.15 192.168.10.20
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 ca	an use an IP ad	dress from this sco	ope.
Lease durations should typically be equal to the a connected to the same physical network. For mo portable computers or dial-up clients, shorter leas Likewise, for a stable network that consists main locations, longer lease durations are more approp	average time the bile networks th e durations can ly of desktop co priate.	e computer is lat consist mainly be useful. mputers at fixed	of
Set the duration for scope leases when distribute Limited to:	d by this server		
Days: Hours: Minutes:			
	< Back	Next >	Cancel

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.	<u>G</u>			
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 				
O No. I will configure these options later				

Domain Name and The Domain Nar	I DNS Servers ne System (DNS) maps	and translates domain names used	by clients
on your network			
You can specify the r	oarent domain you want	the client computers on your netwo	ork to use for
DNS name resolution			
Parent domain: tes	domain.com		
To configure scope of servers.	lients to use DNS serve	ers on your network, enter the IP ad	dresses for those
To configure scope of servers.	lients to use DNS serve	ers on your network, enter the IP ad I <u>P</u> address:	dresses for those
To configure scope of servers. Server name:	lients to use DNS serve	ers on your network, enter the IP ad I <u>P</u> address: 192 . 168 . 10 . 1	dresses for those A <u>d</u> d
To configure scope of servers. Server name:	lients to use DNS serve R <u>e</u> solve	ers on your network, enter the IP ad I <u>P</u> address: 192 . 168 . 10 . 1	dresses for those A <u>d</u> d <u>R</u> emove
To configure scope of servers.	lients to use DNS serve	ers on your network, enter the IP ad I <u>P</u> address: 192 . 168 . 10 . 1	dresses for those Add Bemove Up
To configure scope of servers.	lients to use DNS serve	ers on your network, enter the IP ad IP address: 192 . 168 . 10 . 1	dresses for those Add <u>R</u> emove <u>Up</u> 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
< <u>B</u> ack <u>N</u> ext > Cancel

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

Scope
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.eases
ons
tions

Figure 24

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

(•		2 🗊 🗙 🗒 Q 🗟 🛛 🗊				
Ţ	DHCP Contents of Scope						
⊿	Ē	test	server.testdomain.com		📫 Address Pool		
	⊿		Add/Remove Bindings		🗟 Address Leases		
		4	Unauthorize		📓 Reservations		
			Backup	_	Scope Options		
			Restore		Policies		
			All Tasks 🕨 🕨		Start		
			Delete		Stop		
			Refresh		Pause		
			Properties		Resume		
	⊳			Restart	Restart		
			нер				

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**.

	📥 Add Roles and Features Wizard	×
Before You Begin Installation Type Server Selection	Add features that are required for DNS Server? The following tools are required to manage this feature, but do not have to be installed on the same server.	tion Name System (DNS) Server name resolution for TCP/IP
Features Confirmation Results	 Remote Server Administration Tools Role Administration Tools [Tools] DNS Server Tools Include management tools (if applicable, Add Features Cancel 	s. DNS Server is easier to when it is installed on the rver as Active Directory Services. If you select the irectory Domain Services a can install and configure ver and Active Directory Services to work together.
	< Previous Next >	Install

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

Ζοι	ne 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:
	testdomain.com

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

amic Undat •

Dynamic Update You can specify that this DNS zone accepts supdates.	secure, nonsecure, or	no dynamic	III III
Dynamic updates enable DNS client computer resource records with a DNS server whenever Select the type of dynamic updates you wan	rs to register and dyn er changes occur. t to allow:	amically update the	eir
 Allow only secure dynamic updates (record This option is available only for Active Direction 	nmended for Active D ectory-integrated zor	irectory) 1es.	
 Allow both nonsecure and secure dynamic Dynamic updates of resource records are This option is a significant security accepted from untrusted sources. 	c updates e accepted from any c vulnerability because	lient. updates can be	
Do not allow dynamic updates Dynamic updates of resource records are these records manually.	not accepted by this	zone. You must up	odate
[< Back Ne	xt > Car	ncel



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

Reverse Lookup Zone Name A reverse lookup zone translates IP addresses into DNS names.	
Choose whether you want to create a reverse lookup zone for IPv4 addresse addresses.	s or IPv6
IPv4 Reverse Lookup Zone	
○ IPv6 Reverse Lookup Zone	

Step 6: Provide network ID and click Next.

Reverse Lookup Zone Name A reverse lookup zone translates IP addresses into DNS names.	
To identify the reverse lookup zone, type the network ID or the name of the Network ID: 192 .168 .10 .	zone.
, The network ID is the portion of the IP addresses that belongs to this zor network ID in its normal (not reversed) order.	e. Enter the
If you use a zero in the network ID, it will appear in the zone name. For e network ID 10 would create zone 10.in-addr.arpa, and network ID 10.0 v zone 0.10.in-addr.arpa.	xample, vould create
O Reverse lookup zone name:	
10.168.192.in-addr.arpa	

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.

● ▲	DNS	New Host 🗙	a testserver.testdomain	Timestan static
	 Forward Lookup Zones _msdcs.testdomain.c testdomain.com Reverse Lookup Zones Trust Points Conditional Forwarders Global Logs 	Name (uses parent domain name if blank): client1 Fully qualified domain name (FQDN): client1.testdomain.com. IP address: 192.168.10.50 Create associated pointer (PTR) record Allow any authenticated user to update DNS records with the same owner name Add Host Cancel	server.testdomain.com. .168.10.1	static static

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).

🚊 DNS		Name	
⊿		🗐 (same as pare	ent folder)
⊿ 📔 Forward Lookup Zones		🗐 (same as pare	ent folder)
Image: provide the second s		192.168.10.50	
📑 tes	tdomain.com		
⊿ 🧮 Revers	e Lookup Zones		
📑 <u>10.</u>	168.192.in-addr.arj		
⊳ 🦳 Tru	Update Server D	ata File	
⊳ 🧰 Coi	Reload		
⊳ 🗊 Glo —	n <u>e</u> louu		
	New <u>P</u> ointer (P1	「R)	
	New <u>A</u> lias (CNA	ME)	

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

New Resource Record
Pointer (PTR)
Host IP Address:
192.168.10.51
Eully qualified domain name (FQDN):
51.10.168.192.in-addr.arpa
Host name:
dient2 Browse
Allow any authenticated user to update all DNS records with the same name. This setting applies only to DNS records for a new name.

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 S	Gerver: testserver
Address:	192.168.10.1
> 192.168	e.10.50
Server:	testserver
Address:	192.168.10.1
Name:	client1.testdomain.com
Address:	192.168.10.50
> client2 Server: Address:	testserver 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.