

An-Najah National University



Networks-Lab
Dr. Muhannad Al-Jabi
Thursday 8:00am – 2:00pm
Summer Semester

Experiment Information	
Experiment Name: DHCP and DNS	Experiment Number: #6
Performed: 7 of July, 2021	Submitted: 24 of July, 2021
Partner Students	
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Introduction:

This lab is divided into two sections. The first section discusses DHCP server services and how to configure them. The second one discusses DNS server services and how to configure them. To install and configure services, we use a server with a Windows server.

Objectives:

- Install the DHCP Server service. And authorize a DHCP server, create a DHCP scope, configure DHCP scope options, and finally configure a DHCP reservation.
- Install the DNS Server service, then create a forward lookup zone. And finally create reverse lookup zone.

Procedure:

DHCP Server

A DHCP Server assigns IP addresses to client computers for a set length of time via a lease generating process. Because IP address leases are often transitory, DHCP clients must seek to renew their leases with the DHCP server regularly.

DHCP is an Internet Engineering Task Force (IETF) protocol for configuring hosts on a TCP/IP-based network, such as a private intranet, to decrease the administrative cost and complexity. The DHCP Server service automates the process of configuring TCP/IP on DHCP clients.

➤ Configuring Server:

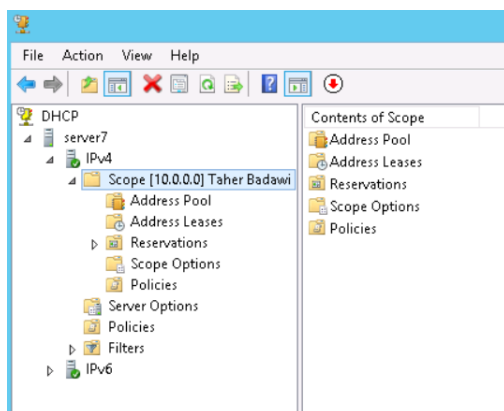
- Turn on the server, then enter username Administrator and password Net123456.
- Open the network connections control panel. In Network-Connections, open Properties, then double-click on (TCP/IPv4), then choose to use the following IP address, then type 10.0.7.2 and next to Subnet mask type 255.255.255.0. Then type 10.0.7.1 in default-gateway. Finally, close the Network Connections control panel.

➤ **Install DHCP Server:**

All the steps are written in order and detail inside the manual, so there is no need to re-mention them here.

➤ **Creating, Configuring, and Assigning a Scope**

- ✓ In the DHCP window, right-click the server on which you want to create the new scope and choose New Scope. The New Scope Wizard appears.
- ✓ Click the Next button on the Welcome page.
- ✓ Enter a name and a description for your new scope and click the Next button.
- ✓ In the IP Address Range page, enter 10.0.7.10 as the start IP address for the scope and 10.0.7.250 as the end IP address. Leave the subnet mask controls alone. Click the Next button.



- ✓ In the Add Exclusions page, click Next without adding any excluded addresses.
- ✓ In the Lease Duration page, set the lease duration to 3 days and click the Next button.
- ✓ In the Configure DHCP Options page, click the Next button to indicate that you want to configure default options for this scope.
- ✓ Enter a router (gateway) IP address (in this case, 10.0.7.1) in the IP Address field and then click the Add button. Once the address is added, click the Next button.

- ✓ In the Domain Name and DNS Servers page, Click the Next button.
- ✓ On the WINS Servers page, click the Next button to leave the WINS options unset and display the Activate Scope page.
- ✓ Select the No; I Will Activate This Scope Later radio button. Click the Next button. When the Wizard Summary page appears, click the Finish button to create the scope.
- ✓ Right-click the server, then select activate command. Use switch 3550 to Connect PC1 and PC2 with DHCP server- Windows Server 2012.
- ✓ In each PC, open a command prompt and type the following commands.
 - Ipconfig /release - Release the IP address for Network Card.
 - Ipconfig /renew - Renew the IP address for Network Card.

```
C:\Users\NetworksPC>ipconfig /release
Windows IP Configuration

An error occurred while releasing interface Loopback Pseudo-Interface 1 : The system cannot find the file specified.

Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix  . : 
    Link-local IPv6 Address . . . . . : fe80::bdce:88c1:7060:88a3::11
    Default Gateway . . . . . : 

Tunnel adapter isatap.{C9ACBDCE-69FC-415D-9E85-19B612011D1F}:

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

C:\Users\NetworksPC>ipconfig /renew
Windows IP Configuration

An error occurred while releasing interface Loopback Pseudo-Interface 1 : The system cannot find the file specified.

Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix  . : 
    Link-local IPv6 Address . . . . . : fe80::bdce:88c1:7060:88a3::11
    IPv4 Address. . . . . : 10.0.7.100
    Subnet Mask . . . . . : 255.0.0.0
    Default Gateway . . . . . : 10.0.7.1

Tunnel adapter isatap.{C9ACBDCE-69FC-415D-9E85-19B612011D1F}:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :
```

```
C:\Users\NetworksPC>ipconfig /renew
Windows IP Configuration

An error occurred while releasing interface Loopback Pseudo-Interface 1 : The system cannot find the file specified.

Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix  . : 
    Link-local IPv6 Address . . . . . : fe80::dcb8:f84a:cc8b:9f24::11
    IPv4 Address. . . . . : 10.0.7.200
    Subnet Mask . . . . . : 255.0.0.0
    Default Gateway . . . . . : 10.0.7.1

Tunnel adapter isatap.{C9ACBDCE-69FC-415D-9E85-19B612011D1F}:


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

Tunnel adapter 6TO4 Adapter:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :
```

➤ Creating and Testing a Client Reservation.

- ✓ In the DHCP window, expand the target server's scope until you see the address leases.

 DHCP

server7

IPv4

Scope [10.0.0.0] Taher Badawi

Address Pool

Address Leases

Reservations

Scope Options

Policies

Server Options

Policies

Filters

IPv6

Client IP Address	Name	Lease Expiration
10.0.7.10	BAD_ADDRESS	7/8/2021 11:08:23 AM
10.0.7.11	NetworksPC-7-1	7/11/2021 10:11:22 AM
10.0.7.12	NetworksPC-7-2	7/11/2021 10:11:47 AM

- ✓ Right-click the Address Leases node and click Export List on the pop-up menu.
- ✓ Record the MAC address of PC1 and PC2.
 - At a command prompt, ipconfig /all for each PC.
 - Record the physical address for the Ethernet adapter Intel Gigabit NIC.

```
C:\Users\NetworksPC>ipconfig /all

Windows IP Configuration

Host Name . . . . . : NetworksPC-7-1
Primary Dns Suffix . . . . . :
Node Type . . . . . : Hybrid
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No

Ethernet adapter Local Area Connection:

Connection-specific DNS Suffix . :
Description . . . . . : Intel(R) 82579LM Gigabit Network Connection
Physical Address. . . . . : B8-CA-3A-A4-AC-43
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes
Link-local IPv6 Address . . . . . : fe80::bdce:88c1:7060:88a3%11(Preferred)
IPv4 Address. . . . . : 10.0.7.11(Preferred)
Subnet Mask . . . . . : 255.0.0.0
Lease Obtained. . . . . : Thursday, July 08, 2021 8:59:27 AM
Lease Expires . . . . . : Sunday, July 11, 2021 8:59:26 AM
Default Gateway . . . . . : 10.0.7.1
DHCP Server . . . . . : 10.0.7.2
DHCPv6 IAID . . . . . : 246991418
DHCPv6 Client DUID. . . . . : 00-01-00-01-21-DD-14-C2-B8-CA-3A-A4-AD-B4

DNS Servers . . . . . : 10.0.7.2
NetBIOS over Tcpip. . . . . : Enabled

Tunnel adapter isatap.{C9ACBDC6-69FC-415D-9E85-19B612011D1F}:

Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
Description . . . . . : Microsoft ISATAP Adapter #3
Physical Address. . . . . : 00-00-00-00-00-00-E0
DHCP Enabled. . . . . : No
Autoconfiguration Enabled . . . . : Yes
```

```
C:\Users\NetworksPC>ipconfig /all

Windows IP Configuration

Host Name . . . . . : NetworksPC-7-2
Primary Dns Suffix . . . . . :
Node Type . . . . . : Hybrid
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No

Ethernet adapter Local Area Connection:

Connection-specific DNS Suffix . :
Description . . . . . : Intel(R) 82579LM Gigabit Network Connection
Physical Address. . . . . : B8-CA-3A-A4-AD-E8
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes
Link-local IPv6 Address . . . . . : fe80::dcb8:f84a:cc8b:9f24%11(Preferred)
IPv4 Address. . . . . : 10.0.7.12(Preferred)
Subnet Mask . . . . . : 255.0.0.0
Lease Obtained. . . . . : Thursday, July 08, 2021 9:59:52 AM
Lease Expires . . . . . : Sunday, July 11, 2021 9:59:52 AM
Default Gateway . . . . . : 10.0.7.1
DHCP Server . . . . . : 10.0.7.2
DHCPv6 IAID . . . . . : 246991418
DHCPv6 Client DUID. . . . . : 00-01-00-01-21-DD-14-C2-B8-CA-3A-A4-AD-B4

DNS Servers . . . . . : 10.0.7.2
NetBIOS over Tcpip. . . . . : Enabled

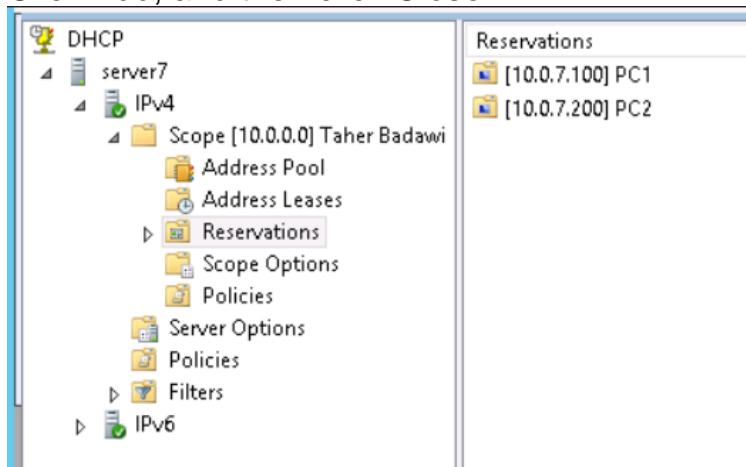
Tunnel adapter isatap.{C9ACBDC6-69FC-415D-9E85-19B612011D1F}:

Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
Description . . . . . : Microsoft ISATAP Adapter #3
Physical Address. . . . . : 00-00-00-00-00-00-E0
DHCP Enabled. . . . . : No
Autoconfiguration Enabled . . . . : Yes

Tunnel adapter 6T04 Adapter:

Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
Description . . . . . : Microsoft 6to4 Adapter
Physical Address. . . . . : 00-00-00-00-00-00-E0
DHCP Enabled. . . . . : No
Autoconfiguration Enabled . . . . : Yes
```

- ✓ In DHCP, in the console tree, under the scope that you created in the preceding exercise, click Reservations.
- ✓ Right-click Reservations, and then click New Reservation.
- ✓ In the New Reservation dialog box, in the Reservation name box, type PC1.
- ✓ In the IP address box, type 10.0.7.100.
- ✓ In the MAC address box, type the address of your partner's network adapter for PC1
- ✓ Click Add, and then, Repeat previous two steps for PC2: 10.0.7.200.
- ✓ Click Add, and then click Close.



- ✓ At a command prompt for each PC, type ipconfig /release. then renew

```
C:\Users\NetworksPC>ipconfig /release

Windows IP Configuration

An error occurred while releasing interface Loopback Pseudo-Interface 1 : The system cannot find the file specified.

Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix  . : 
    Link-local IPv6 Address . . . . . : fe80::bdce:88c1:7060:88a3%11
    Default Gateway . . . . . : 

Tunnel adapter isatap.{C9ACBDCE-69FC-415D-9E85-19B612011D1F}:

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

C:\Users\NetworksPC>ipconfig /renew

Windows IP Configuration

An error occurred while releasing interface Loopback Pseudo-Interface 1 : The system cannot find the file specified.

Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix  . : 
    Link-local IPv6 Address . . . . . : fe80::bdce:88c1:7060:88a3%11
    IPv4 Address. . . . . : 10.0.7.100
    Subnet Mask . . . . . : 255.0.0.0
    Default Gateway . . . . . : 10.0.7.1

Tunnel adapter isatap.{C9ACBDCE-69FC-415D-9E85-19B612011D1F}:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :
```

```
C:\Users\NetworksPC>ipconfig /renew

Windows IP Configuration

An error occurred while releasing interface Loopback Pseudo-Interface 1 : The system cannot find the file specified.

Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix  . : 
    Link-local IPv6 Address . . . . . : fe80::dcb8:f84a:cc8b:9f24%11
    IPv4 Address. . . . . : 10.0.7.200
    Subnet Mask . . . . . : 255.0.0.0
    Default Gateway . . . . . : 10.0.7.1

Tunnel adapter isatap.{C9ACBDCE-69FC-415D-9E85-19B612011D1F}:

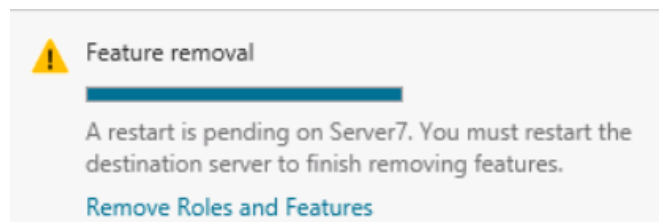
    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . : 

Tunnel adapter 6T04 Adapter:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :
```

➤ Removing DHCP.

- ✓ Open Server Manager. Then on a local server, select DHCP. Select tools, then remove the rule.
- ✓ In the Windows Components wizard, on the Windows Components page, click Networking Services, and then click Details.
- ✓ In the Networking Services dialog box, clear the Dynamic Host Configuration Protocol (DHCP) check box, and then click OK.
- ✓ On the Windows Components page, click Next.
- ✓ When the configuration process is complete, click Finish.
- ✓



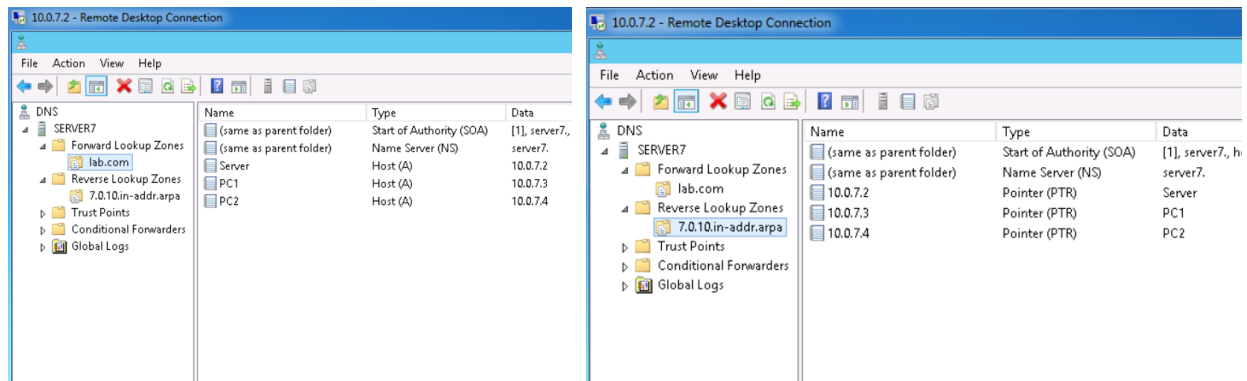
DNS Server

In Internet Protocol (IP) networks, the Domain Name System (DNS) is an essential component of client/server communication. DNS is a distributed database used in IP networks to translate computer names into IP addresses or resolve them.

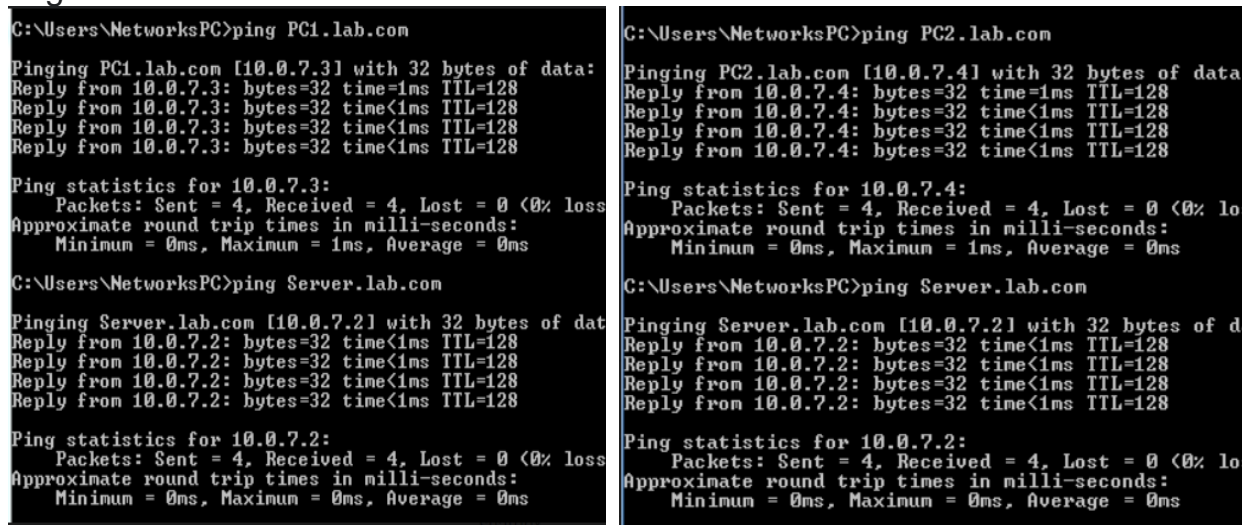
➤ Installing the DNS Server Service.

All the steps are written in order and detail inside the manual, so there is no need to re-mention them here. But there are some screenshots we should include here.

Forward and Reverse Lookup Zone:



Ping PC1 and PC2 and Server:



To know the name:

```
C:\Users\NetworksPC>nslookup 10.0.7.2
Server:      server
Address:     10.0.7.2

Name:        server
Address:     10.0.7.2

C:\Users\NetworksPC>nslookup 10.0.7.3
Server:      server
Address:     10.0.7.2

Name:        pc1
Address:     10.0.7.3

C:\Users\NetworksPC>nslookup 10.0.7.4
Server:      server
Address:     10.0.7.2

Name:        pc2
Address:     10.0.7.4
```

➤ Conclusion.

In this experiment, we learned how to set up a DHCP server and receive a dynamic IP address from it. Authorize a DHCP server, construct a DHCP scope, configure DHCP scope options, and configure a DHCP reservation is also covered.

And, we learned how to set up a DNS server and configure it to convert IP addresses to domain names and vice versa automatically. We also learn how to construct a DNS forward and reverse lookup zone and authorize a DNS server.