



شَبكات الحواسيب
Computer Networks

جَامعة
الْمَنارة

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LAB4 (Theoretical)

- Local Area Network (LAN)
 - Connecting different LANs together
 - Using Router
 - Router:
 - Configuring DHCP Server in Router

Step 3	<pre>ip dhcp excluded-address <i>low-address</i> [<i>high-address</i>]</pre> <p>Example:</p> <pre>Router(config)# ip dhcp excluded-address 192.168.9.0</pre>	Specifies IP addresses that the DHCP server should not assign to DHCP clients. In this example, we are excluding the router address.
Step 4	<pre>ip dhcp pool <i>name</i></pre> <p>Example:</p> <pre>Router(config)# ip dhcp pool dpool1 Router(config-dhcp)#</pre>	Creates a DHCP address pool on the router and enters DHCP pool configuration mode. The <i>name</i> argument can be a string or an integer.
Step 5	<pre>network <i>network-number</i> [<i>mask</i> <i>prefix-length</i>]</pre> <p>Example:</p> <pre>Router(config-dhcp)# network 10.10.0.0 255.255.255.0 Router(config-dhcp)#</pre>	Defines subnet number (IP) address for the DHCP address pool, optionally including the mask.

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Step 6	import all Example: Router(config-dhcp)# import all Router(config-dhcp)#	Imports DHCP option parameters into the DHCP portion of the router database.
Step 7	default-router address [address2...address8] Example: Router(config-dhcp)# default-router 10.1.1.1 Router(config-dhcp)#	Specifies up to 8 default routers for a DHCP client.
Step 8	dns-server address [address2...address8] Example: Router(config-dhcp)# dns-server 192.168.35.2 Router(config-dhcp)#	Specifies up to 8 DNS servers available to a DHCP client.

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Step 9 `domain-name domain`

Specifies the domain name for a DHCP client.

Example:

```
Router(config-dhcp) # domain-name cisco.com
Router(config-dhcp) #
```

Step 10 `exit`

Exits DHCP configuration mode, and enters global configuration mode.

Example:

```
Router(config-dhcp) # exit
Router(config) #
```

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 - Example:

```
RouterA# config terminal
RouterA(config)# interface fastEthernet 1/0
RouterA(config-if)# ip address 192.168.10.1 255.255.255.0
RouterA(config-if)# no shut
%LINK-5-CHANGED: Interface FastEthernet1/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/0, changed state to
down

RouterA(config-if)# exit
RouterA(config)# ip dhcp pool IPD
RouterA(dhcp-config)# network 192.168.10.0 255.255.255.0
RouterA(dhcp-config)# default-router 192.168.10.1
RouterA(dhcp-config)# exit
RouterA(config)# ip dhcp excluded-address 192.168.10.1 192.168.10.10
RouterA(config)# ip dhcp excluded-address 192.168.10.12 192.168.10.14
```

LAB4 (Theoretical)

- Local Area Network (LAN)
 - Connecting different LANs together
 - Using Router
 - Router:
 - Configuring (DHCP-Relay) IP-Helper
 - SUMMARY STEPS
 - 1. enable
 - 2. configure terminal
 - 3. interface type number
 - 4. ip helper-address address
 - 5. exit
 - 6. ip dhcp relay prefer known-good-server
 - 7. exit



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LAB4 (Theoretical)

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Command or Action	Purpose
Step 1 <code>enable</code> Example: <code>Router> enable</code>	Enables privileged EXEC mode. <ul style="list-style-type: none">• Enter your password if prompted.
Step 2 <code>configure terminal</code> Example: <code>Router# configure terminal</code>	Enters global configuration mode.
Step 3 <code>interface type number</code> Example: <code>Router(config)# interface FastEthernet0/0</code>	Configures an interface and enters interface configuration mode.

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<p>Step 4 <code>ip helper-address address</code></p> <p>Example:</p> <pre>Router(config-if)# ip helper-address 172.16.1.2</pre>	<p>Forwards UDP broadcasts, including BOOTP and DHCP.</p> <ul style="list-style-type: none">• The <i>address</i> argument can be a specific DHCP server address, or it can be the network address if other DHCP servers are on the destination network segment. Using the network address enables other servers to respond to DHCP requests.• If you have multiple servers, you can configure one helper address for each server.
<p>Step 5 <code>exit</code></p> <p>Example:</p> <pre>Router(config-if)# exit</pre>	<p>(Optional) Exits interface configuration mode and enters global configuration mode.</p>
<p>Step 6 <code>ip dhcp relay prefer known-good-server</code></p> <p>Example: • .</p> <pre>Router(config)# ip dhcp relay prefer known-good-server</pre>	<p>(Optional) Reduces the frequency with which the DHCP clients change their address and forwards client requests to the server that handled the previous request.</p> <ul style="list-style-type: none">• The DHCP relay deletes the ARP entries for addresses offered to the DHCP client on the unnumbered interfaces.

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 - Router:
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 - Example:



```
RouterC # config terminal
RouterC(config)# interface fa0/0
RouterC(config-if)# ip address 10.10.0.1 255.255.255.0
RouterC(config-if)# ip helper-address 192.168.1.10
RouterC(config-if)# no shutdown
RouterC(config-if)# exit
RouterC(config)# interface fa1/0
RouterC(config-if)# ip address 192.168.1.1 255.255.255.0
RouterC(config-if)# ip helper-address 192.168.1.10
RouterC(config-if)# no shutdown
RouterC(config-if)# end
RouterC# copy run start
```

LAB4 (Practical)

- Training: Task is to connect different LANs by using IP Router and DHCP Server
 - LAN1:
 - Consists of 3 hosts connecting without WiFi
 - IP range 192.168.10.100 ~ 200
 - LAN2:
 - Consists of 3 hosts connecting via WiFi
 - IP range 192.168.20.100 ~ 200
 - LAN3:
 - Consists of 2 hosts connecting via WiFi and 1 host without WiFi
 - IP range 192.168.30.100 ~ 200
 - Give a solution for building such NW
 - Discuss your solution by giving the reason
 - Define the suitable subnet mask
 - Is it necessary to configure the Gateway and DNS server?
 - Achieving the connection between the previous LANs for which the hosts in the LANs can as possible see each others



LAB4 (Practical)

- Homework: Task is to connect different LANs by using IP Router and DHCP server
 - Available Hardware:
 - IP Routers
 - 5 companies which want to connect to the Internet
 - Each one consists of 2 hosts at least
 - Web Server as Internet Service Provider (www.myweb.com)
 - E-Mail Server as Internet Service Provider (pop3.sy, smtp.sy)
 - Give a solution for building such NW
 - Discuss your solution by giving the reason
 - Define the required IP ranges for each LAN
 - Define the suitable subnet mask
 - Is it necessary to configure the Gateway and DNS server?
 - Configure the IP Routers for achieving the connection between the LANS as well as the Internet
 - Testing the NW by using ping command and Browser and Email Client