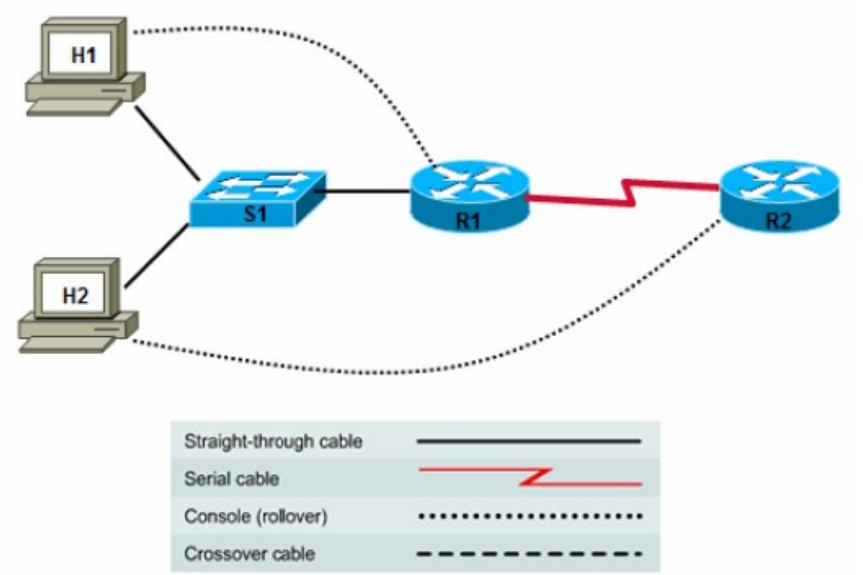
LAB 13:

Learning packet motion through DHCP server in a network using packet tracer

Introduction:

DHCP was created by the Dynamic Host Configuration Working Group of the Internet Engineering Task Force (IETF; a volunteer organization which defines protocols for use on the Internet). As such, it's definition is recorded in an Internet RFC and the Internet Activities Board (IAB) is asserting its status as to Internet Standardization. As of this writing (June 1998), DHCP is an Internet Draft Standard Protocol and is Elective. BOOTP is an Internet Draft Standard Protocol and is recommended. For more information on Internet standardization, see RFC2300 (May 1998) DHCP is based on BOOTP and maintains some backward compatibility. The main difference is that BOOTP was designed for manual pre-configuration of the host information in a server database, while DHCP allows for dynamic allocation of network



Device	Host Name	Interface	IP Address	Subnet Mask
R1	Customer	Serial 0/0/1 (DTE)	209.165.200.225	255.255.255.224
		Fast Ethernet 0/0	192.168.1.1	255.255.255.0
R2	ISP	Serial 0/0/0 (DCE)	209.165.200.226	255.255.255.224

addresses and configurations to newly attached hosts. Additionally, DHCP allows for recovery and reallocation of network addresses through a leasing mechanism. RARP is a protocol used by Sun and other vendors that allows a computer to find out its own IP number, which is one of the protocol parameters typically passed to the client system by DHCP or BOOTP. RARP doesn't support other

parameters and using it, a server can only serve a single LAN. DHCP and BOOTP are designed so they can be routed

Objectives

Configure a customer router for DHCP using the Cisco IOS CLI.

Configure a DHCP client.

Verify DHCP functionality

Step 1: Restart the Customer router to remove the DHCP commands added by SDM.

a. Because you did not save the DHCP configuration created using SDM to NVRAM, restarting the router restores the basic configuration created in Task 1, Step 2. On the Customer router, issue the **reload** command.

b. When prompted to save the configuration, respond with **no**.

c. When prompted with **Proceed with reload? [confirm]**, press **Enter**.

d. Press Enter at the **Press RETURN to get started!** prompt. You should now see the **Customer>** prompt.

Step 2: Check the host DHCP client H2 IP configuration.

a. Open a command prompt window on H2 and issue the **ipconfig /release** and **ipconfig /renew** commands. Because there is no DHCP server currently configured, it may take a while to timeout.

b. At the command prompt, now issue the **ipconfig** command. What is the IP address and subnet mask for H2? _____

Step 3: Configure the DHCP server excluded addresses on the Customer router.

To prevent certain addresses from being assigned they must be excluded from the pool. This includes the IP address of the router Fast Ethernet 0/0 interface (the default gateway). In this lab, also exclude addresses from 192.168.1.101 through 192.168.1.254 to reserve them for other purposes, such as servers and printers, which need to have a fixed IP address.

a. To exclude addresses, issue the **ip dhcp excluded-address** command.

```
Customer(config)#ip dhcp excluded-address 192.168.1.1
Customer(config)#ip dhcp excluded-address 192.168.1.101
192.168.1.254
```

b. Why do you want to exclude addresses before the DHCP pool is even created?

_____
____

_____
____

Step 4: Configure the DHCP pool.

On the Customer router, configure a DHCP pool for the internal clients.

```
Customer(config)#ip dhcp pool INTERNAL
Customer(dhcp-config)#network 192.168.1.0 255.255.255.0
Customer(dhcp-config)#domain-name abc-widgets.inc
Customer(dhcp-config)#default-router 192.168.1.1
Customer(dhcp-config)#dns-server 192.168.1.200
```

Step 5: Test the DHCP pool for H2.

a. On H2, open a command prompt and issue the **ipconfig /release** and **ipconfig /renew** commands.

b. On H2, issue the **ipconfig /all** command.

c. What IP address is issued to H2? _____

d. What is the subnet mask of H2? _____.

e. What is the default gateway of H2? _____

f. What is the connection-specific DNS suffix (domain name) of host H2? _____

g. What is the DHCP server IP address? _____

h. What is the DNS server IP address? _____

i. What is the MAC address of H2? _____

j. From H2, ping the default gateway (the router Ethernet interface). Does the ping succeed? _____

Troubleshoot as necessary, and do not proceed until the ping is successful.

Step 6: Test the DHCP pool for H1.

a. On H1, choose **Start > Settings > Control Panel > Network Connections > Local Area Connection** and change the IP configuration from static to dynamic to make H1 a DHCP client like host H2. Click the **Properties** button, and then click **Internet Protocol (TCP/IP) Properties**. Select **Obtain an IP address automatically** and **Obtain a DNS server address automatically**. Click **OK** to exit the configuration window.

b. Open a command prompt on H1 and issue the **ipconfig /release** and **ipconfig /renew** commands. Because there is no DHCP server currently configured, it may take a while to timeout.

c. At the command prompt, now issue the **ipconfig** command.

d. What IP address is issued to H1? _____

Step 7: Display the DHCP binding on the Customer router.

a. To see the IP address and host hardware (MAC) address combination assigned by the DHCP server, issue the **show ip dhcp binding** command on the Customer router.

```
Customer#show ip dhcp binding
IP address Client-ID/ Lease expiration Type
Hardware address
192.168.1.2 0100.0bdb.04a5.cd Feb 22 2008 11:19 AM Automatic
192.168.1.3 0100.07e9.63ce.53 Feb 22 2008 11:27 AM Automatic
```

b. Do the hardware addresses displayed match those recorded for hosts H1 and H2 in Task 1, Step 1?

_____

c. On the Customer router, display the characteristics of the DHCP pool using the **show ip dhcp pool** command**.**

```
Customer#show ip dhcp pool
Pool INTERNAL :
Utilization mark (high/low) : 100 / 0
```

```
Subnet size (first/next) : 0 / 0
Total addresses : 254
Leased addresses : 2
Pending event : none
1 subnet is currently in the pool :
Current index IP address range Leased addresses
192.168.1.4 192.168.1.1 - 192.168.1.254 2
```

d. How many addresses have been leased? _____

e. In the output from the command, what do you think **Current Index** means?

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