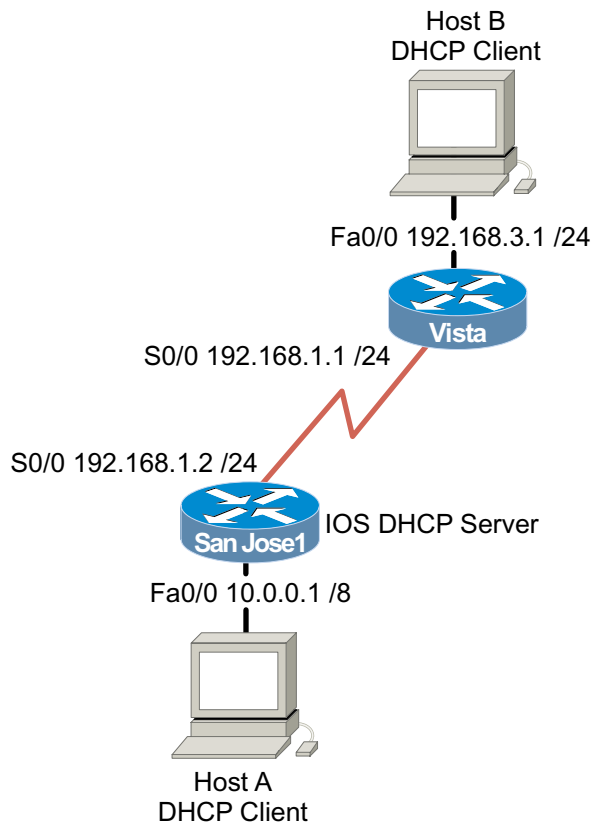


2.10.3: Using DHCP and IP Helper Addresses



Objective

In this lab, you configure a Cisco router to act as a DHCP server for clients on two separate subnets. You also use the IP helper address feature to forward DHCP requests from a remote subnet.

Scenario

Clients on the 192.168.3.0/24 network and the 10.0.0.0/8 network require the services of DHCP for automatic IP configuration. You must configure SanJose1 to serve both subnets by creating two separate address pools. Finally, you need to configure Vista's FastEthernet interface to forward UDP broadcasts (including DHCP requests) to SanJose1.

Step 1

Build and configure the network according to the diagram. Connect Host A and Host B as shown, but configure these clients to obtain their IP addresses automatically. Because these hosts rely on DHCP, you can't test them using **ping** until Step 5.

Configure RIPv2 on SanJose1 and Vista. Be sure to enable updates on all active interfaces with the **network** command:

```
SanJose1(config)#router rip
SanJose1(config)#version 2
SanJose1(config-router)#network 192.168.1.0
SanJose1(config-router)#network 10.0.0.0
```

Use **ping** and **show ip route** to verify your work and test connectivity between SanJose1 and Vista.

Step 2

Configure SanJose1 to act as a DHCP server for clients on the 10.0.0.0/8 network.

First, verify that SanJose1's software can use DHCP services and that they are enabled:

```
SanJose1(config)#service dhcp
```

Next, configure the DHCP address pool for the 10.0.0.0 network. Name the **pool 10-net**:

```
SanJose1(config)#ip dhcp pool 10-net  
SanJose1(dhcp-config)#network 10.0.0.0 255.0.0.0
```

Step 3

International Travel Agency uses the first ten addresses in this address range to statically address servers and routers. From global configuration mode, you can exclude addresses from the DHCP pool so that the server does not attempt to assign them to clients. Configure SanJose1 to dynamically assign addresses from the ten-net pool, starting with 10.0.0.11:

```
SanJose1(config)#ip dhcp excluded-address 10.0.0.1 10.0.0.10
```

Step 4

Return to DHCP configuration mode and assign the following IP options: default gateway address, DNS server address, WINS server address, and domain name:

```
SanJose1(dhcp-config)#default-router 10.0.0.1  
SanJose1(dhcp-config)#dns-server 10.0.0.3  
SanJose1(dhcp-config)#netbios-name-server 10.0.0.4  
SanJose1(dhcp-config)#domain-name xyz.net
```

Step 5

Now you are ready to test your DHCP server. Release and renew Host A's IP configuration.

Host A should be dynamically assigned the first available address in the pool, which is 10.0.0.11. Check Host A's configuration with **winipcfg** (or **ipconfig /all** for Windows NT and Windows 2000 users) to verify that it received the proper IP address, subnet mask, default gateway, DNS server address, and WINS server address. Troubleshoot, if necessary.

Step 6

Because Host B also requires dynamic IP configuration, create a second DHCP pool with address and gateway options appropriate to Host B's network, 192.168.3.0 /24:

```
SanJose1(config)#ip dhcp pool 192.168.3-net  
SanJose1(dhcp-config)#network 192.168.3.0 255.255.255.0  
SanJose1(dhcp-config)#default-router 192.168.3.1  
SanJose1(dhcp-config)#dns-server 10.0.0.3  
SanJose1(dhcp-config)#netbios-name-server 10.0.0.4  
SanJose1(dhcp-config)#domain-name xyz.net
```

ITA has recently installed IP phones on the 192.168.3.0 network. These phones require a DHCP server to provide a TFTP server address (10.0.0.5). The Cisco IOS DHCP server configuration does not provide a keyword for TFTP servers, so you have to configure this option using its raw option number:

```
SanJose1(dhcp-config)#option 150 ip 10.0.0.5
```

Note: "option 150" is a keyword equivalent to the "TFTP's IP address".

Step 7

You have completed your configuration of the DHCP server. But Host B uses a UDP broadcast to find an IP address, and Vista is not configured to forward broadcasts. In order for DHCP to work, you must configure Vista's FastEthernet interface to forward UDP broadcasts to SanJose1:

```
Vista(config)#interface fastethernet 0/0
Vista(config-if)#ip helper-address 192.168.1.2
```

Step 8

Release and renew Host B's IP configuration while simultaneously logged into SanJose1's console (on a second host, if necessary).

1. Did SanJose1 report any DHCP messages?

Verify, using **winipcfg** or **ipconfig /all**, that Host B received the correct IP configuration, and troubleshoot if necessary.

2. Because you didn't issue an **ip dhcp excluded-address** command, why didn't the DHCP server assign Host B 192.168.3.1?

Issue **show ip dhcp ?** and note the choices. Try the **conflict** and **binding** options.

3. How did SanJose1 know to assign Host B an address from the 192.168.3-net pool and not the ten-net pool?
