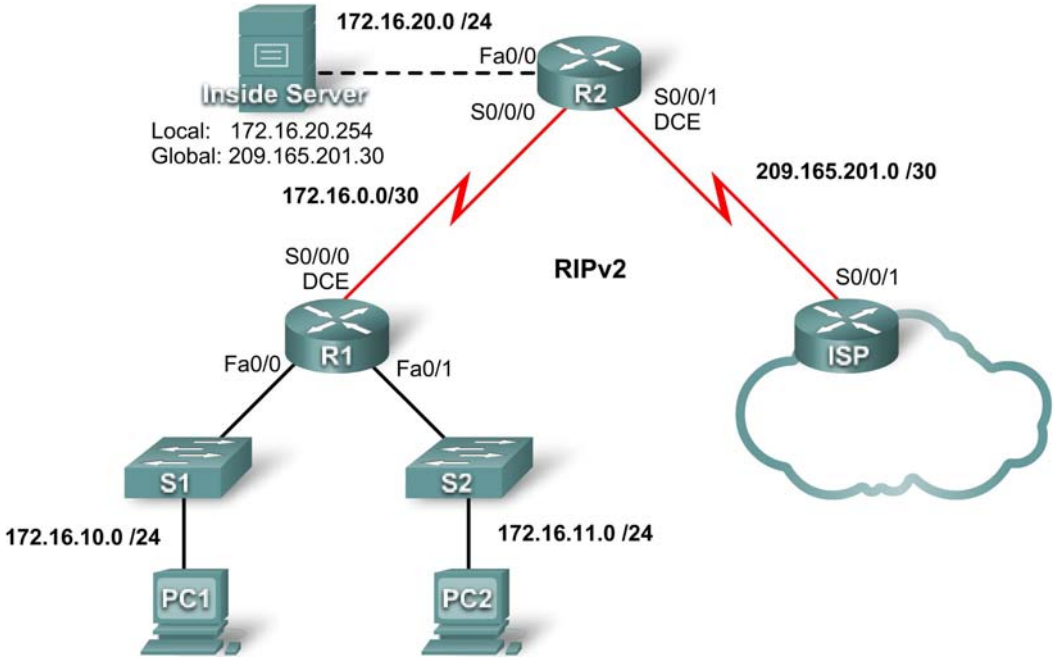
Lab 7.4.2: Challenge DHCP and NAT Configuration

Topology Diagram



Addressing Table

Device	Interface	IP Address	Subnet Mask
R1	**S0/0/0**	172.16.0.1	255.255.255.252
	Fa0/0	172.16.10.1	255.255.255.0
	Fa0/1	172.16.11.1	255.255.255.0
R2	**S0/0/0**	172.16.0.2	255.255.255.252
	S0/0/1	209.165.201.1	255.255.255.252
	Fa0/0	172.16.20.1	255.255.255.0
ISP	**S0/0/1**	209.165.201.2	255.255.255.252

Learning Objectives

Upon completion of this lab, you will be able to:

- Prepare the network
- Perform basic router configurations
- Configure a Cisco IOS DHCP server
- Configure static and default routing
- Configure static NAT

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- Configure dynamic NAT with a pool of addresses
- Configure NAT overload

Scenario

In this lab, configure the IP address services using the network shown in the topology diagram. If you need assistance, refer back to the basic DHCP and NAT configuration lab. However, try to do as much on your own as possible.

Task 1: Prepare the Network

Step 1: Cable a network that is similar to the one in the topology diagram.

You can use any current router in your lab as long as it has the required interfaces shown in the topology.

Note: If you use a 1700, 2500, or 2600 series router, the router outputs and interface descriptions may look different.

Step 2: Clear all existing configurations on the routers.

Task 2: Perform Basic Router Configurations

Configure the R1, R2, and ISP routers according to the following guidelines:

- Configure the device hostname.
- Disable DNS lookup.
- Configure a privileged EXEC mode password.
- Configure a message-of-the-day banner.
- Configure a password for the console connections.
- Configure a password for all vty connections.
- Configure IP addresses on all routers. The PCs receive IP addressing from DHCP later in the lab.
- Enable OSPF with process ID 1 on R1 and R2. Do not advertise the 209.165.200.224/27 network.

Note: Instead of attaching a server to R2, you can configure a loopback interface on R2 to use the IP address 192.168.20.254/24. If you do this, you do not need to configure the Fast Ethernet interface.

Task 3: Configure a Cisco IOS DHCP Server

Configure R2 as the DHCP server for the two R1 LANs.

Step 1: Exclude statically assigned addresses.

Exclude the first three addresses from each pool.

Step 2: Configure the DHCP pool.

Create two DHCP pools. Name one of them **R1_LAN10** for the 172.16.10.0/24 network, and name the other **R1_LAN11** for the 172.16.11.0/24 network.

Configure each pool with a default gateway and a simulated DNS at 172.16.20.254.

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Step 3: Configure a helper address.

Configure helper addresses so that broadcasts from client broadcasts are forwarded to the DHCP server.

Step 4: Verify the DHCP configuration.

Task 4: Configure Static and Default Routing

Configure ISP with a static route for the 209.165.201.0/27 network. Use the exit interface as an argument.

Configure a default route on R2 and propagate the route in OSPF. Use the next-hop IP address as an argument.

Task 5: Configure Static NAT

Step 1: Statically map a public IP address to a private IP address.

Statically map the inside server IP address to the public address 209.165.201.30.

Step 2: Specify inside and outside NAT interfaces.

Step 3: Verify the static NAT configuration.

Task 6: Configure Dynamic NAT with a Pool of Addresses

Step 1: Define a pool of global addresses.

Create a pool named **NAT_POOL** for the IP addresses 209.165.201.9 through 209.165.201.14 using a /29 subnet mask.

Step 2: Create a standard named access control list to identify which inside addresses are translated.

Use the name **NAT_ACL** and allow all hosts attached to the two LANs on R1.

Step 3: Establish dynamic source translation.

Bind the NAT pool to the ACL and allow NAT overloading.

Step 4: Specify the inside and outside NAT interfaces.

Verify that the inside and outside interfaces are all correctly specified.

Step 5: Verify the configuration.

Task 7: Document the Network

On each router, issue the **show run** command and capture the configurations.

Task 8: Clean Up

Erase the configurations and reload the routers. Disconnect and store the cabling. For PC hosts that are normally connected to other networks, such as the school LAN or the Internet, reconnect the appropriate cabling and restore the TCP/IP settings.

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