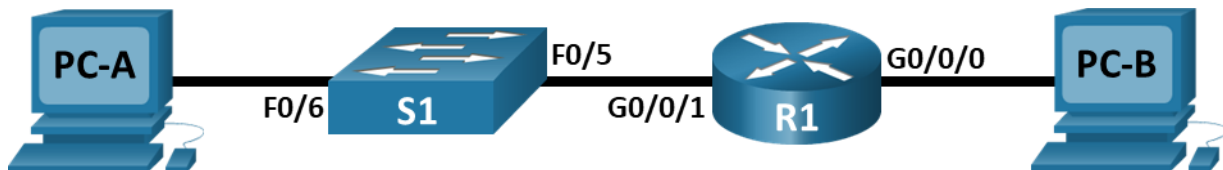


Lab - Build a Switch and Router Network - Modified

Topology



Addressing Table

Device	Interface	IP Address / Prefix	Default Gateway
R1	G0/0/0	172.16.0.1 /24	N/A
	G0/0/1	172.16.1.1 /24	N/A
S1	VLAN 1	172.16.1.2 /24	172.16.1.1
PC-A	NIC	172.16.1.3 /24	172.16.1.1
PC-B	NIC	172.16.0.3 /24	172.16.0.1

Note: This was originally a hardware lab that has been modified for Packet Tracer. In this lab you will create a new “hardware” lab using Packet Tracer.

Objectives

Part 1: Set Up the Topology

Part 2: Configure Devices and Verify Connectivity

Background / Scenario

This is a comprehensive lab to review previously covered IOS commands. In this lab, you will cable the equipment as shown in the topology diagram. You will then configure the devices to match the addressing table. After the configurations have been saved, you will verify your configurations by testing for network connectivity.

After the devices have been configured and network connectivity has been verified, you will use IOS commands to retrieve information from the devices to answer questions about your network equipment.

This lab provides minimal assistance with the actual commands necessary to configure the router. Test your knowledge by trying to configure the devices without referring to the content or previous activities.

Required Resources

- 1 Router (Cisco 4331 with Cisco IOS XE Release 16.9.4 universal image or comparable)
- 1 Switch (Cisco 2960 with Cisco IOS Release 15.2(2) lanbasek9 image or comparable)
- 2 PCs (Windows with a terminal emulation program, such as Tera Term)
- Ethernet cables as shown in the topology

Note: The Gigabit Ethernet interfaces on Cisco 4331 routers are autosensing and an Ethernet straightthrough cable may be used between the router and PC-B. If using another model Cisco router, it may be necessary to use an Ethernet crossover cable.

Instructions Part 1: Set Up Topology and Initialize Devices

Step 1: Start Cisco Packet Tracer and create a blank workspace.

Step 2: Drag and drop the Required Resources onto the workspace.

Step 3: Cable the network as shown in the topology.

- Attach the devices shown in the topology diagram, and cable, as necessary.

Part 2: Configure Devices and Verify Connectivity

In Part 2, you will set up the network topology and configure basic settings, such as the interface IP addresses, device access, and passwords.

Step 1: Assign static IP information to the PC interfaces.

- Configure the IP address, subnet mask, and default gateway settings on PC-A.
- Configure the IP address, subnet mask, and default gateway settings on PC-B.
- Ping PC-B from a command prompt window on PC-A.

The pings will not be successful at this point.

Step 2: Configure the router.

- Access the router and enable privileged EXEC mode.
- Enter configuration mode.
- Assign the device name, **R1** to the router.
- Disable DNS lookup to prevent the router from attempting to translate incorrectly entered commands as though they were host names (**no ip domain-lookup**).
- Assign **class** as the privileged EXEC encrypted password.
- Assign **cisco** as the console password and enable login.
- Assign **cisco** as the VTY password and enable login.
- Encrypt the plaintext passwords.
- Create a banner that warns anyone accessing the device that unauthorized access is prohibited.
- Configure and activate both interfaces on the router.
- Configure an interface description for each interface indicating which device is connected to it.
- Save the running configuration to the startup configuration file.

Step 3: Configure the switch.

In this step, you will configure the **hostname**, the **VLAN 1** interface and its **default gateway**.

- Access the switch and enable privileged EXEC mode.
- Enter configuration mode.
- Assign a device name to the switch.
- Disable DNS lookup to prevent the router from attempting to translate incorrectly entered commands as though they were host names (**no ip domain-lookup**).
- Configure and activate the VLAN interface on the switch S1.
- Configure the default gateway for the switch S1.
- Save the running configuration to the startup configuration file.

Step 4: Verify connectivity end-to-end connectivity.

- From PC-A, ping PC-B.
- From S1, ping PC-B.

All the pings should be successful.

Part 3: Display Device Information

In Part 3, you will use **show** commands to retrieve interface and routing information from the router and switch.

Step 1: Display the routing table on the router.

- Use the **show ip route (sh ip ro)** command on the router R1 to answer the following questions.

What code is used in the routing table to indicate a directly connected network?

How many route entries are coded with a C code in the routing table?

What interface types are associated to the C coded routes?

Step 2: Display interface information on the router R1.

- Use the **show ip interface g0/0/1 (sh ip int g0/0/1)** to answer the following questions.

What is the operational status of the G0/0/1 interface?

What is the Media Access Control (MAC) address of the G0/1 interface?

Step 3: Display a summary list of the interfaces on the router and switch.

There are several commands that can be used to verify an interface configuration. One of the most useful of these is the **show ip interface brief (sh ip int b)** command. The command output displays a summary list of the interfaces on the device and provides immediate feedback to the status of each interface.

- Enter the **show ip interface brief** command on the router R1.

```
R1# show ip interface brief
```

- Enter the **show ip interface brief** command on the switch S1.

```
S1# show ip interface brief
```