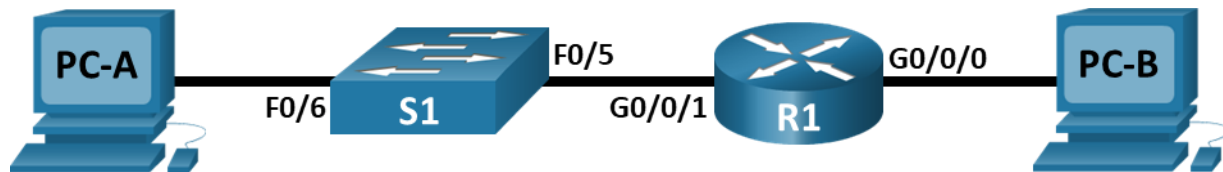


## Lab - Build a Switch and Router Network

### Topology



### Addressing Table

Device	Interface	IP Address / Prefix	Default Gateway
R1	G0/0/0	192.168.0.1 /24	N/A
	G0/0/1	192.168.1.1 /24	N/A
S1	VLAN 1	192.168.1.2 /24	192.168.1.1
PC-A	NIC	192.168.1.3 /24	192.168.1.1
PC-B	NIC	192.168.0.3 /24	192.168.0.1

### Objectives

**Part 1: Set Up the Topology and Initialize Devices**

**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 4221 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)
- Console cables to configure the Cisco IOS devices via the console ports
- Ethernet cables as shown in the topology

**Note:** The Gigabit Ethernet interfaces on Cisco 4221 routers are autosensing and an Ethernet straight-through 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: Cable the network as shown in the topology.

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

##### Step 2: Initialize and reload the router and switch.

If configuration files were previously saved on the router and switch, initialize and reload these devices back to their default configurations.

#### 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. Refer to the **Erro! A origem da referência não foi encontrada.** and **Erro! A origem da referência não foi encontrada.** at the beginning of this lab for device names and address information.

##### 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.

**Note:** If pings are not successful, the Windows Firewall may need to be turned off.

Why were the pings not successful?

##### Step 2: Configure the router.

- Console into the router and enable privileged EXEC mode.
- Enter configuration mode.
- Assign a device name to the router.
- Disable DNS lookup to prevent the router from attempting to translate incorrectly entered commands as though they were host names.

- e. Assign **class** as the privileged EXEC encrypted password.
- f. Assign **cisco** as the console password and enable login.
- g. Assign **cisco** as the VTY password and enable login.
- h. Encrypt the plaintext passwords.
- i. Create a banner that warns anyone accessing the device that unauthorized access is prohibited.
- j. Configure and activate both interfaces on the router.
- k. Configure an interface description for each interface indicating which device is connected to it.
- l. Save the running configuration to the startup configuration file.
- m. Set the clock on the router.

**Note:** Use the question mark (?) to help with the correct sequence of parameters needed to execute this command.

- n. Ping PC-B from a command prompt window on PC-A.

**Note:** If pings are not successful, the Windows Firewall may need to be turned off.

Were the pings successful? Explain.

### Step 3: Configure the switch.

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

- a. Console into the switch and enable privileged EXEC mode.
- b. Enter configuration mode.
- c. Assign a device name to the switch.
- d. Disable DNS lookup to prevent the router from attempting to translate incorrectly entered commands as though they were host names.
- e. Configure and activate the VLAN interface on the switch S1.
- f. Configure the default gateway for the switch S1.
- g. Save the running configuration to the startup configuration file.

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

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

- a. Use the **show ip route** 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.

- a. Use the **show ip interface 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?

How is the Internet address displayed in this command?

### 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** command. The command output displays a summary list of the interfaces on the device and provides immediate feedback to the status of each interface.

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

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

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

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

### Reflection Questions

1. If the G0/0/1 interface showed that it was administratively down, what interface configuration command would you use to turn the interface up?
2. What would happen if you had incorrectly configured interface G0/0/1 on the router with an IP address of 192.168.1.2?