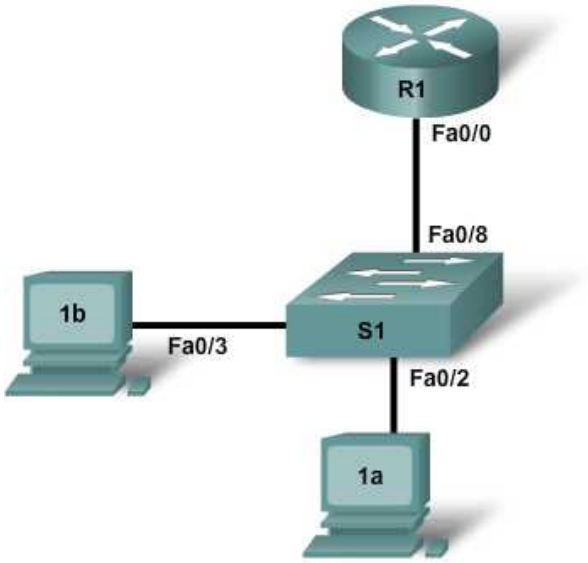
Lab 3.3.2 Configuring, Verifying, and Troubleshooting VLANs



Device	Host Name / Interface	Fa0/0 or NIC Address	VLAN 1 address
Router 1	R1	172.16.1.1/24	n/a
Switch 1	S1	n/a	172.16.1.2/24
Host 1a	n/a	172.16.1.10/24	n/a
Host 1b	n/a	172.16.1.11/24	n/a

Objectives

- Observe default switch VLAN configuration and operation.
- Configure static VLANs on a switch.
- Verify VLAN configuration and operation.
- Modify an existing VLAN configuration.

Background / Preparation

This lab focuses on the basic VLAN configuration of the Cisco 2960 switch (or similar) using Cisco IOS commands. The information in this lab applies to other switches; however, command syntax may vary. Depending upon the switch model, the interface designations may differ. For example, modular switches have multiple slots; therefore, the Fast Ethernet ports may be FastEthernet 0/1 or FastEthernet 1/1, depending on the slot and port. The router used can be any router.

The following resources are required:

- One Cisco 2960 switch or equivalent switch
- One Cisco 1841 router or equivalent
- Two Windows-based PCs with a terminal emulation program
- At least one RJ-45-to-DB-9 connector console cable to configure the switch and the router
- Three straight-through Ethernet cables to connect from the PCs to Switch 1

NOTE: Make sure that the router and all the switches have been erased and have no startup configurations. For detailed instructions, refer to the Lab Manual that is located on Academy Connection in the Tools section.

NOTE: SDM Routers – If the startup-config is erased in an SDM router, SDM will no longer come up by default when the router is restarted. It will be necessary to build a basic router configuration using IOS commands. Contact your instructor if necessary.

Step 1: Connect the equipment

a. Connect the router Fa0/0 interface with a straight-through cable to Switch 1 Fa0/8 interface.

b. Connect the Host 1a Ethernet interface with a straight-through cable to Switch 1 Fa0/2 interface.

c. Connect the Host 1b Ethernet interface with a straight-through cable to Switch 1 Fa0/3 interface.

d. Connect a PC with a console cable to perform configurations on the router and switch.

e. Configure IP addresses on the hosts as shown in the chart.

Step 2: Perform basic configuration on the router

a. Connect a PC to the console port of the router to perform configurations using a terminal emulation program.

b. Configure Router 1 with a hostname, console, Telnet, and privileged passwords according to the table.

c. Configure the Fa0/0 interface IP address and mask according to the table.

Step 3: Configure Switch 1

a. Configure S1 hostname and passwords.

b. Configure Switch 1 with a hostname and console, Telnet, and privileged passwords according to the addressing table.

c. Configure S1 with an IP address and default gateway.

```
S1(config)#interface vlan1
S1(config-if)#ip address 172.16.1.2 255.255.255.0
S1(config-if)#no shutdown
S1(config-if)#exit
S1(config)#ip default-gateway 172.16.1.1
```



```
S1(config)#end
```

Step 4: Verify connectivity and default VLAN configuration

a. Verify LAN connectivity by pinging from the router to the switch and the hosts. Also verify that you can ping from host to host.

b. Verify default VLAN configuration with the **show vlan** command on S1.

```
S1#show vlan
```

Are all switch ports assigned to VLAN 1? _____

Step 5: Configure VLANs on S1

a. Create and name two additional VLANs on S1.

```
S1(config)#vlan 20
S1(config-vlan)#name fred
S1(config-vlan)#exit
S1(config)#vlan 30
S1(config-vlan)#name wilma
S1(config-vlan)#exit
```

b. Verify the creation of the new VLANs with the **show vlan** command.

```
S1#show vlan
```

Do the new VLANs appear in the output? _____

What interfaces belong to the new VLANs? _____

c. Assign interfaces to VLANs. Assign S1 port Fa0/2 to VLAN 20 and ports Fa0/3 – Fa0/8 to VLAN 30.

```
S1(config)#interface fastethernet 0/2
S1(config-if)#switchport mode access
S1(config-if)#switchport access vlan 20
S1(config-if)#exit
S1(config)#interface range fastethernet 0/3 - 8
S1(config-if-range)#switchport mode access
S1(config-if-range)#switchport access vlan 30
S1(config-if-range)#end
S1#show running-config
```

Observe that the **switchport access** command was applied to ports Fa0/2 – Fa0/8.

d. Verify the port assignments of the new VLANs with the **show vlan** command.

```
S1#show vlan
```

Which interfaces now belong to VLAN 1? _____

Which interfaces belong to VLAN 20? _____

Which interfaces belong to VLAN 30? _____

e. Other commands can be used to show different amounts of information or specific pieces of information. Enter the following commands on S1 and observe the output:

```
S1#show vlan brief
```

Is all of the basic VLAN membership information shown? _____

```
S1#show vlan id 30
```

What information is shown? _____

```
S1#show vlan name fred
```

What information is shown? _____

Step 6: Verify VLAN segmentation

In the previous step, the ports connected to R1 and Host 1b were placed in one VLAN and Host 1a was placed in another. Even though these hosts are connected to one switch, it appears as if there are two separate switches. Connectivity tests will prove this.

a. Ping from Host 1b to R1.

Were the pings successful? _____

b. Ping from Host 1b to Host 1a.

Were the pings successful? _____

c. Ping from Host 1a to R1.

Were the pings successful? _____

Why were some pings successful and others not?

_____

How could Host 1b communicate with Host 1a in different VLAN?

_____

Step 7: Change and delete VLAN configurations

a. Reassign S1 port Fa0/3 to VLAN 20.

```
S1(config)#interface Fa0/3
S1(config-if)#switchport access vlan 20
S1(config)#end
S1#show vlan
```

Does the output reflect the VLAN membership change? _____

b. Remove VLAN 30.

Which two commands would be used to delete all VLAN configuration and return to the default configuration?

_____

Step 8: Reflection

a. Why would VLANs be configured in a network?

_____

_____

_____

_____

b. What must be set up to communicate between VLANS?

_____

c. With no configuration, what VLAN are all ports a member of?

_____