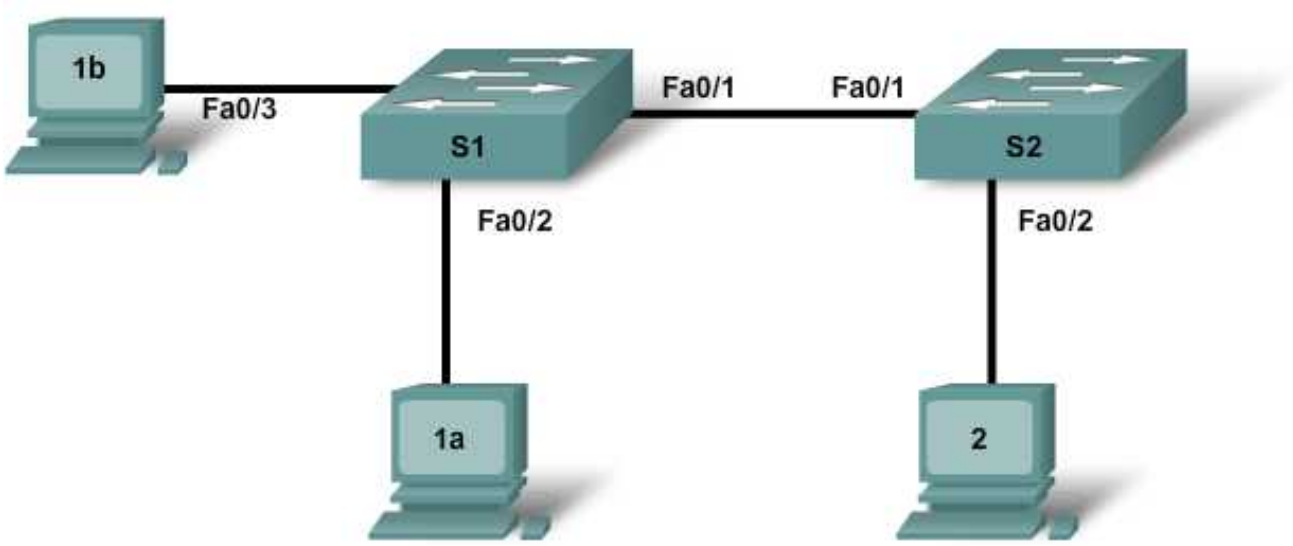
# Lab 3.4.2 Configuring a Trunk Port to Connect Switches




| Device | Host Name / Interface | Fa0/0 or NIC Address | VLAN1 address |
|---|---|---|---|
| Switch 1 | S1 | n/a | 172.16.1.1/24 |
| Switch 2 | S2 | 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 |
| Host 2 | n/a | 172.16.1.12/24 | n/a |

## Objectives

- Observe default switch VLAN configuration and operation.
- Configure static VLANs on a switch.
- Verify VLAN configuration and operation.
- Configure trunking between switches.

## 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 Fast Ethernet 0/1 or Fast Ethernet 1/1, depending on the slot and port.

The following resources are required:

- Two Cisco 2960 switches or equivalent switches
- Three Windows-based PCs with a terminal emulation program
- At least one RJ-45-to-DB-9 connector console cable to configure the switches
- Three straight-through Ethernet cables to connect from the PCs to the switches
- One crossover Ethernet cable to connect S1 to S2

**NOTE:** Make sure that the routers and the switches have been erased and have no startup configurations. Instructions for erasing both switch and router are provided in the Lab Manual, located on Academy Connection in the Tools section.

### Step 1: Connect the equipment

a. Connect Switch 1 Fa0/1 interface to Switch 2 Fa0/1 interface with a crossover cable.

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

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

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

### Step 2: Perform basic configuration of Switch 1 and Switch 2

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

b. Configure Switch 1 with a hostname, VLAN 1 IP address, and console, Telnet, and privileged passwords according to the table diagram. Save the configuration.

c. Configure Switch 2 with a hostname, VLAN 1 IP address, and console, Telnet, and privileged passwords according to the table diagram. Save the configuration.

### Step 3: Configure host PCs

Configure the host PCs according to the information in the table and diagram.

### Step 4: Verify default VLAN configuration and connectivity

a. When directly connecting some switches, as in this lab, the switch ports automatically configure themselves for trunking. To prevent this, manually configure the switch ports for normal operation on S1 and S2.

```
S1(config)#interface fa0/1
S1(config-if)#switchport mode access
S2(config)#interface fa0/1
S2(config-if)#switchport mode access
```

b. Verify default VLAN configurations on both switches with the **show vlan** command.

```
S1#show vlan
S2#show vlan
```

Is every switch port assigned to a VLAN? _____

Which VLAN do the ports appear in? _____

Should any host or switch be able to ping any other host or switch at this time? _____

c. Verify this by pinging from Host 1a to all the other hosts and switches.

Are all the pings successful? _____

### Step 5: Create and verify VLAN configuration

a. Create and name VLANs 2 and 3 on both switches.

```
S1(config)#vlan 2
S1(config-vlan)#name fred
S1(config-vlan)#exit
S1(config)#vlan 3
S1(config-vlan)#name wilma
S1(config-vlan)#exit


S2(config)#vlan 2
S2(config-vlan)#name fred
S2(config-vlan)#exit
S2(config)#vlan 3
S2(config-vlan)#name wilma
S2(config-vlan)#exit
```

b. Assign switch ports to VLANs. The ports connecting Hosts 1a and 2 will be assigned to VLAN 2 and the port connecting Host 1b will be assigned to VLAN 3. Save the configurations.

```
S1(config)#int fa0/2
S1(config-if)#switchport access vlan 2
S1(config-if)#exit
S1(config)#interface fa0/3
S1(config-if)#switchport access vlan 3
S1(config-if)#end
S1#copy running-config startup-config

S2(config)#int fa0/2
S2(config-if)#switchport access vlan 2
S2(config-if)#end
S2#copy running-config startup-config
```

c. Test connectivity between devices.

1) Ping from S1 to S2.

Are the pings successful? _____

To what VLAN do the management interfaces of S1 and S2 belong? _____

2) Ping from Host 1a to Host 2.

Are the pings successful? _____

To what VLAN do Hosts 1a and 2 belong?

_____

To what VLAN do the Fa0/1 interfaces of the switches belong? _____

If Hosts 1a and 2 belong to the same VLAN, why can't they ping each other?

_____

3) Ping from host 1a to S1.

Are the pings successful? _____

Why can't Host 1a ping S1?

_____

## Step 6: Configure and verify trunking

To allow connectivity within multiple VLANs across multiple switches, trunking can be configured. Without trunking, each VLAN requires a separate physical connection between switches.

a. Configure trunking on S1 and S2. Port Fa0/1 on S1 is already connected to port Fa0/1 on S2.

```
S1(config)#int Fa0/1
S1(config-if)#switchport mode trunk
S1(config-if)#end

S2(config)#int Fa0/1
S2(config-if)#switchport mode trunk
S2(config-if)#end
```

b. Verify the creation of the trunk with the **show interfaces trunk** command.

```
S1#show interfaces trunk

S2#show interfaces trunk
```

Do the trunk interfaces appear in the output? _____

What VLAN is set as the native VLAN? _____

What VLANs are allowed to communicate over the trunk? _____

c. View the VLAN configuration on both switches with the **show vlan** command.

```
S1#show vlan

S2#show vlan
```

Do the S1 and S2 Fa0/1 interfaces appear in a VLAN? Why or why not?

_____

d. Retest the connectivity between devices.

1) Ping from S1 to S2.

Are the pings successful? _____

2) Ping from Host 1a to Host 2.

Are the pings successful? _____

3) Ping from Host 1b to Host 2.

Are the pings successful? _____

4) Ping from Host 1a to S1.

Are the pings successful? _____

e. The ping test should show that devices that belong to the same VLAN can now communicate with each other across switches, but devices in different VLANs cannot communicate with each other.

What would have to be configured to allow devices in different VLANs to communicate with each other?

_____

### Step 7: Observe the default trunking behavior of switches

a. Previously in this lab, the Fa0/1 interfaces on the switches were manually configured for trunking. Remove that configuration with the **no switchport mode trunk** command.

```
S1(config)#int Fa0/1
S1(config-if)#no switchport mode trunk
S1(config-if)#end

S2(config)#int Fa0/1
S2(config-if)#no switchport mode trunk
S2(config-if)#end
```

b. View the trunking status of the switch ports.

```
S1#show interfaces trunk

S2#show interface trunk
```

Are Fa0/1 on S1 and S2 in trunking mode?

_____

What trunking mode did they default to?

_____

What trunking encapsulation did they default to?

_____

### Step 8: Reflection

a. Why would trunking be configured in a network?

_____

_____

_____

_____

b. Does trunking allow for communication between VLANS?

_____

c. With no configuration, from which VLAN are frames forwarded across the trunk without VLAN tagging added?

_____