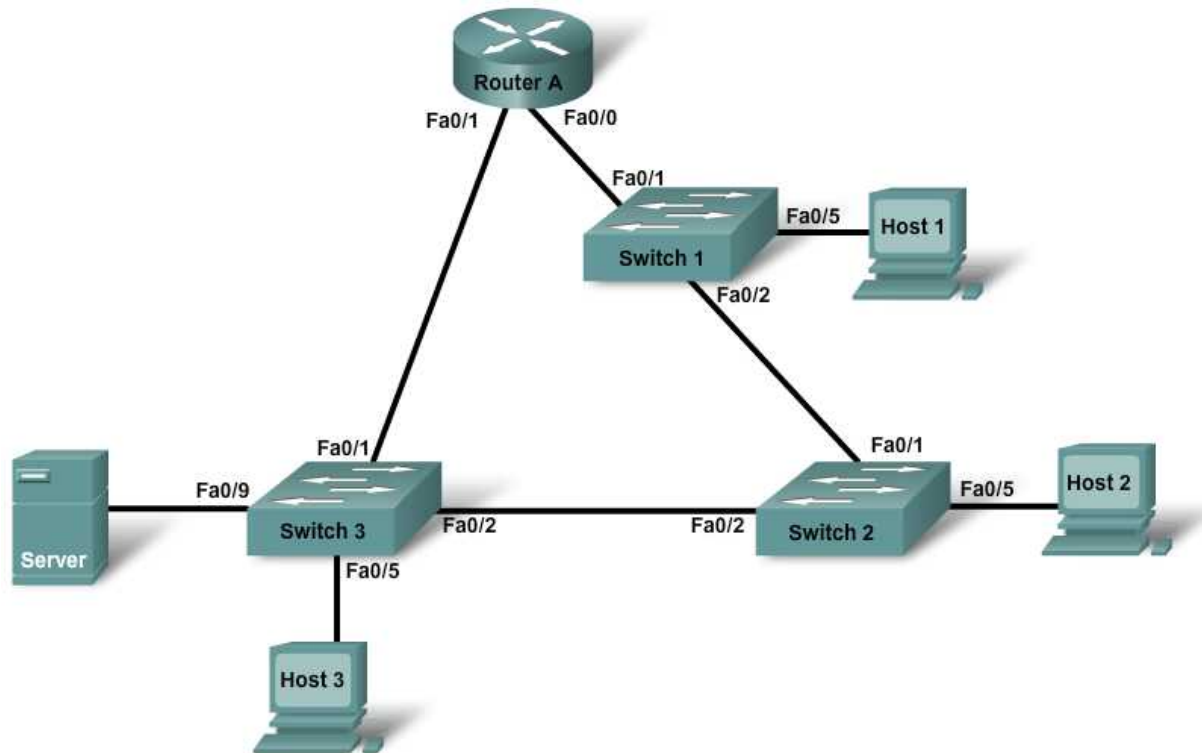


Lab 3.4.3 Part A: Configuring Inter-VLAN Routing



Device	FastEthernet 0/0	FastEthernet 0/1	IP Address	Default Gateway	Enable Secret Password	Enable, vty, and Console Passwords
Router A	192.168.12.1	192.168.13.1			cisco	class
Switch 1			192.168.12.2	192.168.12.1	cisco	class
Switch 2			192.168.12.3	192.168.12.1	cisco	class
Switch 3			192.168.13.2	192.168.13.1	cisco	class
Host 1			192.168.12.4	192.168.12.1		
Host 2			192.168.12.5	192.168.12.1		
Host 3			192.168.12.6	192.168.12.1		
Server			192.168.13.3	192.168.13.1		

Objectives

- Configure a router for inter-VLAN communication.
- Verify connectivity between VLANs.

Background / Preparation

This is a two part lab: Part A configures inter-VLAN routing using separate router interfaces for each VLAN. Part B configures inter-VLAN routing using subinterfaces. It is important to complete both Part A and Part B of the lab.

This lab focuses on the basic configuration of the Cisco 1841 router or a comparable router using Cisco IOS commands. Part A of this lab shows how two different VLANs communicate through a router using separate Fast Ethernet interfaces for each VLAN. This is not a recommended practice, because this topology does not scale well. Trunking requires fewer router and switch ports, which will be shown in Part B of this lab. The information in this lab applies to other routers; however, command syntax may vary.

The following resources are required:

- Three Cisco 2960 switches or other comparable switch
- One router with 2 Ethernet interfaces to connect to switches
- Four Windows-based PCs, one with a terminal emulation program
- At least one RJ-45-to-DB-9 connector console cable to configure the router and switches
- Two straight-through Ethernet cables to connect from the router to Switch 1 and Switch 3
- Four straight-through Ethernet cables to connect the hosts and server to the switches
- Two crossover Ethernet cables to connect Switch 1 to Switch 2 and Switch 2 to Switch 3

NOTE: Make sure the router and all the switches have been erased and have no startup configurations. For instructions, refer to the end of this lab. Instructions are provided for both the switch and router.

NOTE: SDM Enabled Routers – If the startup-config is erased in an SDM enabled 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 A Fa0/0 interface with a straight-through cable to the Fa0/1 interface on Switch 1.
- b. Connect the Switch 1 Fa0/2 port to the Switch 2 Fa0/1 switch port using a crossover cable.
- c. Connect the Fa0/2 port of Switch 2 to the Fa0/2 port of Switch 3 using a crossover cable.
- d. Use a straight-through cable to connect the Fa0/1 port of Switch 3 to the Fa0/1 interface of Router A Fa0/1 port.
- e. Connect the remaining PCs as shown in the diagram. Use switchport Fa0/5 on Switches 1, 2, and 3 to connect each PC to each switch. Use Fa0/9 to connect the server to Switch 3.

Step 2: Perform basic configurations 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 A with a hostname and console, Telnet, and privileged passwords according to the table and diagram.

Step 3: Configure Fast Ethernet connections for each VLAN on the router

- a. Configure Router A Fa0/0 interface to be on the same network as VLAN 12.

```
RouterA(config)#interface fa0/0
RouterA(config-if)#ip address 192.168.12.1 255.255.255.0
RouterA(config-if)#no shutdown
RouterA(config-if)#exit
```

- b. Configure Router A Fa0/1 interface to be on the same network as VLAN 13.

```
RouterA(config)#interface fa0/1
RouterA(config-if)#ip address 192.168.13.1 255.255.255.0
RouterA(config-if)#no shutdown
RouterA(config-if)#exit
```

Step 4: Configure Switch 1

- a. Configure Switch 1 with a hostname and console, Telnet and privileged passwords according to the table and diagram.
- b. Configure Switch 1 with the VLAN 1 IP address of 192.168.12.2/24 and a default gateway of 192.168.12.1. Assigning an IP address to the switch allows for remote configuration.

Step 5: Configure Switch 2

- a. Configure Switch 2 with a hostname and console, Telnet, and privileged passwords according to the table and diagram.
- b. Configure Switch 2 with the VLAN 1 IP address of 192.168.12.3/24 and a default gateway of 192.168.12.1.

Step 6: Configure Switch 3

- a. Configure Switch 3 with a hostname and console, Telnet, and privileged passwords according to the table and diagram.
- b. Configure Switch 3 with the VLAN 1 IP address of 192.168.13.2/24 and a default gateway of 192.168.13.1.

Step 7: Configure Host 1

Configure Host 1 with an IP address of 192.168.12.4, subnet mask of 255.255.255.0, and a default gateway of 192.168.12.1.

Step 8: Configure Host 2

Configure Host 2 with an IP address of 192.168.12.5, subnet mask of 255.255.255.0, and a default gateway of 192.168.12.1.

Step 9: Configure Host 3

Configure Host 3 with an IP address of 192.168.12.6, subnet mask of 255.255.255.0, and a default gateway of 192.168.12.1.

Step 10: Configure the server

Configure the server with an IP address of 192.168.13.3, subnet mask of 255.255.255.0, and a default gateway of 192.168.13.1.

Step 11: Verify connectivity

The router should be able to ping the interfaces of the other devices.

- a. From the router, issue a ping to Host 1.
Is the ping successful? _____
- b. From the router, issue a ping to Host 2.
Is the ping successful? _____
- c. From the router, issue a ping to Host 3.
Is the ping successful? _____
- d. From the router, issue a ping to the server.
Is the ping successful? _____

Host 1 should be able to ping all other devices.

- a. From Host 1, ping Host 2.
Is the ping successful? _____
- b. From Host 1, ping the server.
Is the ping successful? _____
Why can Host 1 ping the server? _____
- c. From the server, ping Host 1.
Is the ping successful? _____

If the pings are not successful, verify the connections and configurations again. Check to ensure that all cables are correct and that connections are seated. Check the router and switch configurations.

- d. From Switch 3, issue the command **show spanning-tree**.
Which ports are being used on Switch 3? _____
What is the role of each of these ports? _____
Which switch is acting as the root? _____
What is the protocol that allows VLANs to communicate without switching loops?

Step 12: Reflection

- a. Why does this topology not scale well?

- b. Why would a VLAN benefit from trunking?

- c. Which device provides connectivity between different VLANs?
