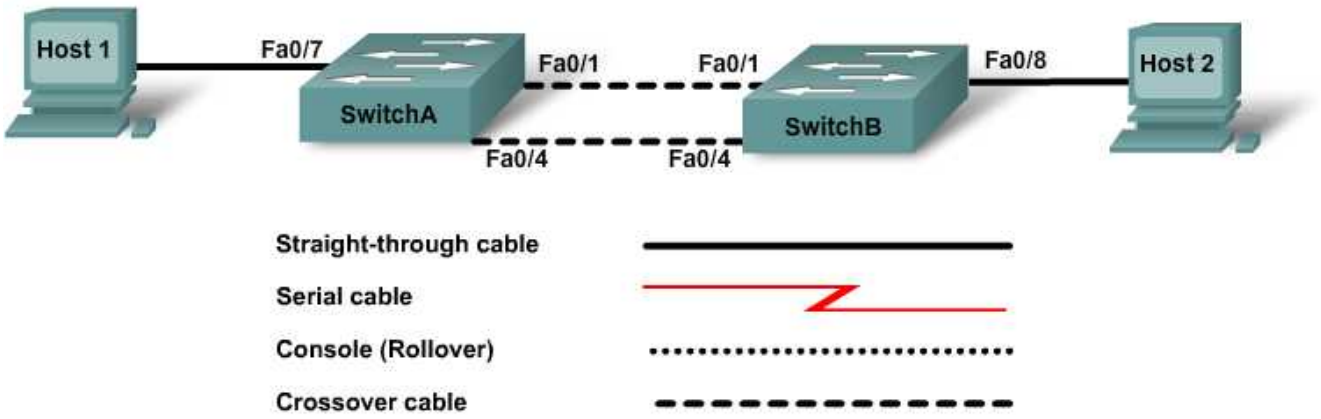
Lab 3.2.4 Verifying STP with Show Commands



Switch Designation	Switch Name	Enable Secret Password	Enable, Console, and vty Passwords	VLAN 1 IP Address	Subnet Mask	Default Gateway
Switch 1	SwitchA	class	cisco	192.168.1.2	255.255.255.0	N/A
Switch 2	SwitchB	class	cisco	192.168.1.3	255.255.255.0	N/A

Objectives

- Create a switched network with redundant links.
- Observe how the Spanning Tree Protocol adjusts to changes in the switched network topology.
- Verify the status of a spanning tree.

Background / Preparation

This lab demonstrates advantages and disadvantages of the Spanning Tree Protocol in dealing with changes to a switched network with redundant links. You will configure the network with default factory settings and then examine the spanning-tree tables for the switches before and after a link is removed. You will use various **show** commands to verify the operation of the spanning-tree algorithm.

The following resources are required:

- Two Cisco 2960 switches or other comparable switches
- Two Windows-based PCs, one with a terminal emulation program, one as the host, one as the server
- At least one RJ-45-to-DB-9 connector console cable to configure the switches
- Two straight-through Ethernet cables

- Two crossover Ethernet cables
- Access to the PC command prompt
- Access to PC network TCP/IP configuration

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.

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. The steps provided in this lab use IOS commands and do not require the use of SDM. If you wish to use SDM, refer to the instructions in the Lab Manual, located on the Academy Connection in the Tools section or contact your instructor if necessary.

Step 1: Cable the network

a. Connect Host 1 to Switch 1 Fast Ethernet port Fa0/7, using a straight-through Ethernet cable.

b. Connect Host 2 to Switch 2 Fast Ethernet port Fa0/8, using a straight-through Ethernet cable.

c. Connect Switch 1 Fast Ethernet port Fa0/1 to Switch 2 FastEthernet port Fa0/1, using a crossover Ethernet cable.

d. Create a redundant link between the switches by connecting Switch 1 Fast Ethernet port Fa0/4 to Switch 2 Fast Ethernet port Fa0/4, using a crossover Ethernet cable.

What is the advantage of providing redundant links in a network like this one?

_____

_____

Step 2: Configure the switches

a. Establish a terminal emulation session to Switch 1 from Host 1.

b. Configure the switch hostname, passwords, interface VLAN 1 IP address, and subnet mask on Switch 1.

c. Save the configuration.

d. Establish a terminal emulation session to Switch 2 from either Host 1 or Host 2.

e. Configure the switch hostname, passwords, interface VLAN 1 IP address, and subnet mask on Switch 2.

f. Save the configuration.

Step 3: Configure the hosts

a. Configure each host to use an IP address in the same network as the switches.

b. Configure each host to use the same subnet mask as the switches.

Step 4: Verify connectivity

a. To verify that the network is set up successfully, ping from Host 1 to Host 2.

Was the ping successful? _____

b. If the ping is not successful, verify the connections and configurations again. Check to ensure that all cables are correct and that connections are seated.

Step 5: Examine interface VLAN 1 information

a. On SwitchA, enter the command **show hardware** at the privileged EXEC mode prompt.

What is the MAC address of SwitchA? _____

b. On SwitchB, enter the command **show hardware** at the privileged EXEC mode prompt.

What is the MAC address of SwitchB? _____

Which switch should be the root of the spanning tree for this network?

_____

Step 6: Determine the roles of ports participating in the spanning tree on each switch

a. On SwitchA, enter the command **show spanning-tree** at the privileged EXEC mode prompt.

b. On SwitchB, enter the command **show spanning-tree** at the privileged EXEC mode prompt.

Which switch is the root bridge? _____

c. The spanning tree is using three ports on each switch. Complete this chart indicating the port state and role for each port.

SwitchA		
Interface	**Role**	**State**
SwitchB		
Interface	**Role**	**State**

Step 7: Create a change in the network topology

a. Remove the crossover cable from the forwarding port on the non-root bridge.

b. Wait a few seconds, and then enter the **show spanning-tree** command again on the non-root bridge.

What changes do you see in the spanning tree?

_____

c. Check the spanning tree on the root bridge.

What changes have occurred there?

_____

d. Continue to check the spanning tree on both switches until a new tree has been calculated and all ports are either forwarding or blocking.

How long does it take for this to happen?

_____

e. Replace the cable that was removed in Step 7a.

f. Wait again until both switches have recalculated their tables.

How much time has passed since you first removed the crossover cable?

_____

What effect did these topology changes have on network uptime?

_____

Step 8: Examine the spanning tree on each switch

a. On each switch, enter the command **show spanning-tree detail**.

b. Examine the information for port Fa0/1. The output shows the interface, role, and state for each switch. It also provides details about port activity and characteristics.

How might the following information help you to verify the status of the network and troubleshoot network problems?

1) Number of transitions to forwarding state:

_____

_____

2) Number of BPDUs that have been sent and received:

_____

_____

c. On each switch, enter the following commands. Determine the type of information that each command provides:

show spanning-tree bridge

_____

_____

show spanning-tree summary

_____

_____

Step 9: Reflection

Your networking team is deciding whether to disable Spanning Tree Protocol on the switches in your corporate network. Explain how you would feel about this decision. What are the advantages and disadvantages? How would this decision affect your network design?

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