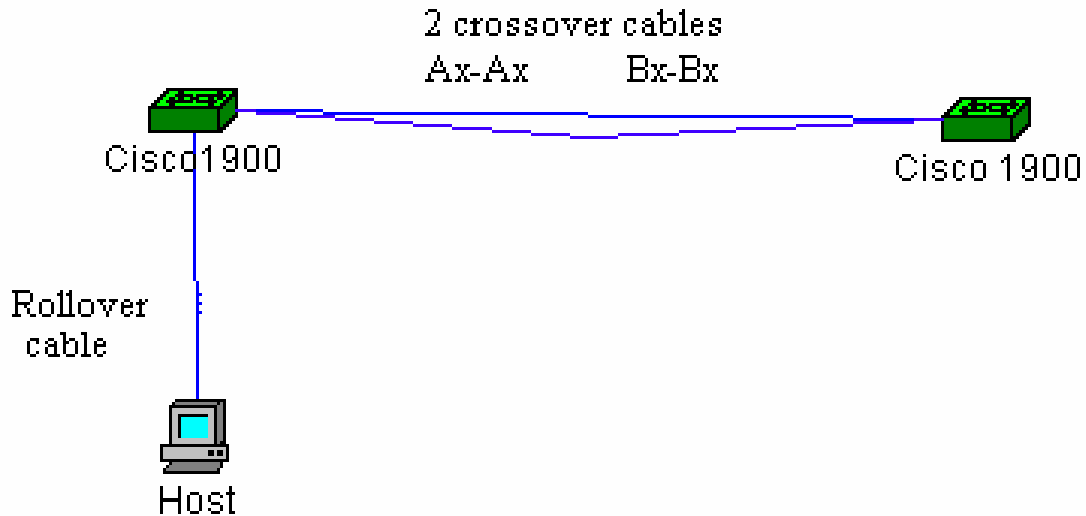


Lab —STP configuration on Catalyst 1900 – Command Line Interface



Estimated Time: 30 mins

Objectives:

- To gain a better understanding of how STP works.
- To be able to configure and monitor STP on a Cisco series switch.

Background:

Spanning-Tree Protocol (STP) is a Layer 2 protocol designed to run on Cisco Catalyst switches including the 1900. The protocol for STP is specified as IEEE 802.1d. The main purpose of STP is to ensure a loop free network when using redundant paths. Loops can be fatal to network operation. The 2 factors that determine STP states on a switch with fully redundant paths are Bridge Priority and Bridge ID (MAC address).

Specific Terminology:

STP- STP is a bridge protocol that utilizes the spanning-tree algorithm, enabling a learning bridge to dynamically work around loops in a network topology by creating a spanning tree. Bridges exchange Bridge Protocol Data Unit (BPDU) messages with other bridges to detect loops, and then remove the loops by shutting down selected ports. Refers to both the IEEE 802.1 Spanning-Tree Protocol standard and the earlier Digital Equipment Corporation Spanning-Tree Protocol upon which it is based.

The IEEE version supports bridge domains and allows the bridge to construct a loop-free topology across an extended LAN. The IEEE version is generally preferred over the Digital version.

Preparation:

To begin the lab exercise students will need to have a workstation connected to the switch's console port. Two crossover cables will be needed, which will connect both FastEthernet ports of the two switches.

Resources Required:

In order to complete the lab students will require at least 2 switches, 1 workstation, 1 rollover cable, and 2 Ethernet crossover cables.

Websites Required:

Lab from Cisco on STP

<http://www.cisco.com/warp/public/473/5.html> - oper

Information on STP

http://www.cisco.com/univercd/cc/td/doc/product/lan/c2900xl/29_35sa6/eescg/masctrnk.htm.

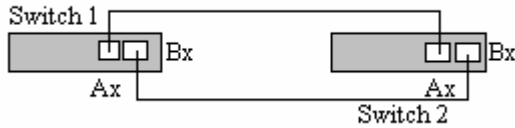
Notes:

Steps:

Step 1:

Begin by making sure that all cables are properly connected. One crossover cable should connect FastEthernet port 0/26 (Ax) on Switch 1 to FastEthernet port 0/26 (Ax) on Switch 2 and the other should connect FastEthernet port 0/27 (Bx) on Switch 1 to FastEthernet port 0/27 (Bx) on Switch 2. This configuration allows a full redundancy backbone between the switches.

Example:



Step 2:

Once in Command Line Interface (CLI) mode on Switch 1, delete all saved configurations by entering the following commands:

```
Switch1#delete nvram
```

Once the NVRAM has been deleted on Switch 1 repeat this step on Switch 2. After deleting both configurations unplug both switches and then plug both back in.

Step 3:

After the switch has performed its self test you should notice that only the ports with cable's attached to them are lit up.

During the first minute after self test, what is the color of the LED lights above the FastEthernet ports on both switches? _____

After the ports have entered into their STP states the LED lights turn either green or amber. You should notice that only 1 port out of the four turns amber. Why does one of the ports turn amber? What STP state is it in? (Hint: use the **show spantree** command if you need help.)

Why are 3 of the ports green? What STP state are they in?

Step 4:

Enter the command line interface on Switch 1. Enter the following commands to implement a hostname and password on the switch: (Note: all commands in this lab were done using the **9.00.04** IOS Image.)

```
>en  
#configure terminal  
 #(config)hostname Switch1  
 Switch1(config)#enable secret class
```

Step 5:

Exit configuration mode by typing **Ctrl+Z**. Next enter the following command to view the port priority of FastEthernet ports 0/26 (Ax) and 0/27 (Bx).

Switch1#**show spantree 1**

Continue to press the space bar until you are able to view the STP statistics for Port FastEthernet 0/26 and Port FastEthernet 0/27.

What is the port priority for FastEthernet port 0/26? And for 0/27?

Step 6:

Enter the following commands to view the MAC address of the switch.

Switch1#**show version**

What is Switch1's MAC address? _____

Why do you think the MAC address of the switch is important for STP?

Step 7:

Next plug the console cable from your computer into Switch2 and repeat steps 2-6. Name this switch *Switch2* and document your findings for steps 5 & 6 below.

Port Priority of FastEthernet ports 0/26 and 0/27. _____

Mac address of Switch2. _____

Step 8:

Plug the console cable back into Switch 1 and enter into the CLI. Set the bridge priority to 1 by entering the following command in global configuration mode:

Switch1(config)#**spantree-template 1 priority 1**

This command sets Switch1 to the root bridge for the network. Now issue the following command to view the changes you have just made to the switch:

Switch1#**show spantree 1**

You should notice that the bridge priority is now set to 1.

Note: You can always tell which switch is the root switch by looking at the color of the STP ports, all of the root switch's STP ports will always be green.

Step 9:

Notice that the port priority for all four ports that you documented was the same.

What 2 factors are used to determine STP states for fully redundant paths? _____

Step 10:

Enter Switch1's interface configuration mode for FastEthernet port 0/27 by entering the following command:

```
Switch1#config  
Switch1(config)#interface fa 0/27
```

Once in interface configuration mode enter the following commands to change the priority setting on the port.

```
Switch1(config-if)#spantree priority 1
```

You should notice some of the lights on the switch changing to amber as they learn their new STP states. You'll notice after a few minutes that the port whose priority you changed is now in forwarding mode (green light).

Why did the STP port states change when you lowered the priority setting on the port? _____

Step 11:

Plug the console cable back into Switch 1 and enter into the CLI. Set the bridge priority to 65536 by entering the following command in global configuration mode:

```
Switch1(config)#spantree-template 1 priority 65536
```

Now issue the following command to view the changes you have just made to the switch:

Switch1#**show spantree 1**

You should notice that the bridge priority is now set to 65536.

By giving Switch1 a higher priority number you have changed the root switch to Switch2, which is still set at the lower (default) priority of 32768. You should notice the lights beginning to change above the ports.

Step 12:

The purpose of STP is to reduce the risk of loops in the network as well as provide redundant paths in case a route goes down. Unplug the FastEthernet port 0/27 (Bx) on Switch2. You should notice after a few minutes that the amber colored port turns to green (forwarding mode). From this you can see that if a port goes down, STP automatically switches to forwarding mode on the blocked port, thereby providing full path redundancy.

Comments:
