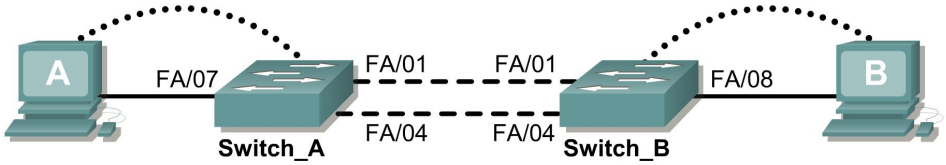
Lab 7.2.4 Selecting the Root Bridge – 2924XL Series



Switch Designation	Switch Name	Enabe Secret Password	Enable,VTY, and Console Passwords	VLAN 1 IP Address	Default Gateway IP Address	Subnet Mask
Switch 1	Switch_A	class	cisco	192.168.1.2	192.168.1.1	255.255.255.0
Switch 2	Switch_B	class	cisco	192.168.1.3	192.168.1.1	255.255.255.0

Objective

- Create a basic switch configuration and verify it.
- Determine which switch is selected as the root switch with the factory default settings.
- Force the other switch to be selected as the root switch.

Background/Preparation

Cable a network similar to the one in the diagram. The configuration output used in this lab is produced from a 2950 series switch. Any other switch used may produce different output. The following steps are to be executed on each switch unless specifically instructed otherwise.

Start a HyperTerminal session.

Note: Go to the erase and reload instructions at the end of this lab. Perform those steps on all switches in this lab assignment before continuing.

Step 1 Configure the switches

Configure the hostname, access and command mode passwords, as well as the management LAN settings. These values are shown in the chart. If problems occur while performing this configuration, refer to the Basic Switch Configuration lab.

Step 2 Configure the hosts attached to the switches

Configure the host to use the same subnet for the address, mask, and default gateway as on the switch.

Step 3 Verify connectivity

a. To verify that the hosts and switches are correctly configured, ping the switches from the hosts.

b. Were the pings successful? Yes

c. If the answer is no, troubleshoot the hosts and switches configurations.

Step 4 Display the show interface VLAN options

a. Type **show interface vlan 1**.

b. List some of the options available: Ethernet, status, type

Step 5 Display VLAN interface information

a. On Switch_A, type the command **show interface VLAN 1** at the Privileged EXEC mode prompt as follows:

```
Switch_A#show interface vlan 1
```

b. What is the MAC address of the switch? 0002.4b20.9b80

c. On Switch_B type the command **show interface VLAN 1** at the Privileged EXEC mode prompt as follows:

```
Switch_B#show interface vlan 1
```

d. What is the MAC address of the switch? 0002.4b21.3640

e. Which switch should be the root of the spanning-tree for VLAN 1? Switch A

Step 6 Display the spanning-tree table on each switch

a. At the Privileged EXEC mode prompt, type the following on Switch_A:

Type **show spanning-tree brief** if running version 12.0 of the IOS. If running version 12.1 of the IOS, type **show spanning-tree**.

```
Switch_A#show spanning-tree brief
```

b. On Switch_B type **show spanning-tree brief** at the Privileged EXEC mode prompt as follows:

```
Switch_B#show spanning-tree brief
```

Examine the output and answer the following questions.

c. Which switch is the root switch? Switch A

d. What is the priority of the root switch? 32768

e. What is the bridge id of the root switch? 0002.4b20.9b80

f. Which ports are forwarding on the root switch? FastEthernet 0/1, 0/4, 0/7

g. Which ports are blocking on the root switch? All but FastEthernet 0/1, 0/4 and 0/7 (they are down and in the blocking state since there is nothing connected to them)

h. What is the priority of the non-root switch? 32768

i. What is the bridge id of the non-root switch? 0002.4b21.3640

j. Which ports are forwarding on the non-root switch? FastEthernet 0/1 and 0/8

k. Which ports are blocking on the non-root switch? FastEthernet 0/1 and 0/8, are also blocking because they are down)

l. What is the status of the link light on the blocking port? Orange

Step 7 Reassign the root bridge

a. It has been determined that the switch selected as the root bridge, by using default values, is not the best choice. It is necessary to force the "other" switch to become the root switch.

b. In the example output given the root switch by default is Switch_A. Switch_B is preferred as the root switch. Go to the console and enter configuration mode if necessary.

c. Determine the parameters that can be configured for the Spanning-Tree Protocol by issuing the following:

```
Switch_B(config)#spanning-tree ?
```

d. List the options. Forward-time, hello-time, max-age, portfast, priority, protocol, uplinkfast, vlan

e. Set the priority of the switch that is not root to 4096.

If version 12.0 is used, enter the following:

```
Switch_B(config)#spanning-tree priority 1
Switch_B(config)#exit
```

If version 12.1 is used, enter the following:

```
Switch_B(config)#spanning-tree vlan 1 priority 4096
Switch_B(config)#exit
```

Step 8 Display the switch spanning-tree table

a. At the Privileged EXEC mode prompt, type the following on Switch_A:

Note: Type **show spanning-tree brief** if running version 12.0 of the IOS. If running version 12.1 of the IOS, type **show spanning-tree**.

```
Switch_A#show spanning-tree brief
```

b. On Switch_B type **show spanning-tree brief** at the Privileged EXEC mode prompt as follows:

```
Switch_B#show spanning-tree brief
```

Examine the output and answer the following questions.

c. Which switch is the root switch? Switch B

d. What is the priority of the root switch? Priority is 4096

e. Which ports are forwarding on the root switch? FastEthernet 0/1, 0/4, and 0/8

f. Which ports are blocking on the root switch? All the other FastEthernet ports

g. What is the priority of the non-root switch? 32768

h. Which ports are forwarding on the non-root switch? FastEthernet 0/1 and 0/7

i. Which ports are blocking on the non-root switch? All but FastEthernet 0/1 and 0/7

j. What is the status of the link light on the blocking port? Orange

Step 9 Verify the running configuration file on the root switch

a. On the switch that was changed to be the root bridge, type **show running-config** at the Privileged EXEC mode prompt.

b. Is there an entry in the running configuration file that specifies the spanning-tree priority of this switch? Yes

c. What does that entry say? spanning-tree vlan 1 priority 4096

Note: The output is different depending on if the IOS used is version 12.0 or version 12.1.

Once the steps are complete, log off by typing **exit**, and turn all the devices off. Then remove and store the cables and adapter.

```
Sample output from actual switches may show either switch as the root
intitally depending on the MAC address.



C:\>ping 192.168.1.2

Pinging 192.168.1.2 with 32 bytes of data:

Reply from 192.168.1.2: bytes=32 time=1ms TTL=255
Reply from 192.168.1.2: bytes=32 time=1ms TTL=255
Reply from 192.168.1.2: bytes=32 time=1ms TTL=255
Reply from 192.168.1.2: bytes=32 time=1ms TTL=255

Ping statistics for 192.168.1.2:
      Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
      Minimum = 1ms, Maximum = 1ms, Average = 1ms

C:\>ping 192.168.1.3

Pinging 192.168.1.3 with 32 bytes of data:

Reply from 192.168.1.3: bytes=32 time=3ms TTL=255
Reply from 192.168.1.3: bytes=32 time=2ms TTL=255
Reply from 192.168.1.3: bytes=32 time=1ms TTL=255
Reply from 192.168.1.3: bytes=32 time=1ms TTL=255

Ping statistics for 192.168.1.3:
      Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
      Minimum = 1ms, Maximum = 3ms, Average = 1ms

C:\>
```



```
Switch_A#show interface vlan1 ?
  accounting       Show interface accounting
  crb              Show interface routing/bridging info
  ethernet         Show ethernet vlan type
  fair-queue       Show interface Weighted Fair Queueing (WFQ) info
  flow-control     Show flow control information
  irb              Show interface routing/bridging info
  link-trap        Show interface traps on no link
  mac-accounting   Show interface MAC accounting info
  precedence       Show interface precedence accounting info
  pruning          Show interface pruning information
  random-detect    Show interface Weighted Random Early Detection (WRED)
     info
  rate-limit       Show interface rate-limit info
  status           Show interface line status
  switchport       L2 interface information
  trbrf            Show BRF tokenring vlan type
  type             Show vlan types
  |                Output modifiers
  <cr>


Switch_A#show interface vlan1
VLAN1 is up, line protocol is up
  Hardware is CPU Interface, address is 0002.4b21.3640 (bia
     0002.4b21.3640)
  Internet address is 192.168.1.2/24
  MTU 1500 bytes, BW 10000 Kbit, DLY 1000 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:00, output 00:00:24, output hang never
  Last clearing of "show interface" counters never
  Queueing strategy: fifo
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     7 packets input, 672 bytes, 0 no buffer
     Received 7 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
     0 input packets with dribble condition detected
     4 packets output, 2472 bytes, 0 underruns
     0 output errors, 0 collisions, 1 interface resets
     0 babbles, 0 late collision, 0 deferred
     0 lost carrier, 0 no carrier
     0 output buffer failures, 0 output buffers swapped out


Switch_B#show interface vlan1
VLAN1 is up, line protocol is up
  Hardware is CPU Interface, address is 0002.4b20.9b80 (bia
     0002.4b20.9b80)
  Internet address is 192.168.1.3/24
  MTU 1500 bytes, BW 10000 Kbit, DLY 1000 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
```



```
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:00, output 00:00:00, output hang never
  Last clearing of "show interface" counters never
  Queueing strategy: fifo
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  5 minute input rate 1000 bits/sec, 2 packets/sec
  5 minute output rate 2000 bits/sec, 2 packets/sec
     66 packets input, 4791 bytes, 0 no buffer
     Received 12 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
     0 input packets with dribble condition detected
     64 packets output, 15637 bytes, 0 underruns
     0 output errors, 0 collisions, 1 interface resets
     0 babbles, 0 late collision, 0 deferred
     0 lost carrier, 0 no carrier
     0 output buffer failures, 0 output buffers swapped out
```

```
Switch_A#show spanning-tree brief

VLAN1
  Spanning tree enabled protocol IEEE
  ROOT ID     Priority 32768
              Address 0002.4b20.9b80
              Hello Time   2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority     32768
              Address      0002.4b21.3640
              Hello Time   2 sec  Max Age 20 sec  Forward Delay 15 sec
```

Port Name	Port ID	Prio	Cost	Sts	Designated Cost	Designated Bridge ID	Designated Port ID
Fa0/1	128.13	128	19	FWD	0	0002.4b20.9b80	128.13
Fa0/2	128.14	128	19	BLK	19	0002.4b21.3640	128.14
Fa0/3	128.15	128	19	BLK	19	0002.4b21.3640	128.15
Fa0/4	128.16	128	19	BLK	0	0002.4b20.9b80	128.16
Fa0/5	128.17	128	19	BLK	19	0002.4b21.3640	128.17
Fa0/6	128.18	128	19	BLK	19	0002.4b21.3640	128.18
Fa0/7	128.19	128	19	FWD	19	0002.4b21.3640	128.19
Fa0/8	128.20	128	19	BLK	19	0002.4b21.3640	128.20
Fa0/9	128.22	128	19	BLK	19	0002.4b21.3640	128.22
Fa0/10	128.23	128	19	BLK	19	0002.4b21.3640	128.23
Fa0/11	128.24	128	19	BLK	19	0002.4b21.3640	128.24
Fa0/12	128.25	128	19	BLK	19	0002.4b21.3640	128.25

```
Switch_B#show spanning-tree brief

VLAN1
  Spanning tree enabled protocol IEEE
  ROOT ID     Priority 32768
              Address 0002.4b20.9b80
              This bridge is the root
              Hello Time   2 sec  Max Age 20 sec  Forward Delay 15 sec
```



```
  Bridge ID    Priority    32768
               Address     0002.4b20.9b80
               Hello Time   2 sec  Max Age 20 sec  Forward Delay 15 sec

Port                                 Designated
Name     Port ID Prio Cost Sts  Cost  Bridge ID       Port ID
-------  ------- ---- ---- ---  ----  --------------- -------
Fa0/1    128.13  128  19   FWD  0     0002.4b20.9b80 128.13
Fa0/2    128.14  128  19   BLK  0     0002.4b20.9b80 128.14
Fa0/3    128.15  128  19   BLK  0     0002.4b20.9b80 128.15
Fa0/4    128.16  128  19   FWD  0     0002.4b20.9b80 128.16
Fa0/5    128.17  128  19   BLK  0     0002.4b20.9b80 128.17
Fa0/6    128.18  128  19   BLK  0     0002.4b20.9b80 128.18
Fa0/7    128.19  128  19   BLK  0     0002.4b20.9b80 128.19
Fa0/8    128.20  128  19   FWD  0     0002.4b20.9b80 128.20
Fa0/9    128.22  128  19   BLK  0     0002.4b20.9b80 128.22
Fa0/10   128.23  128  19   BLK  0     0002.4b20.9b80 128.23
Fa0/11   128.24  128  19   BLK  0     0002.4b20.9b80 128.24
Fa0/12   128.25  128  19   BLK  0     0002.4b20.9b80 128.25

Switch B(config)#spanning-tree ?
  forward-time  Set a Spanning Tree FORWARD Interval
  hello-time    Set a Spanning Tree HELLO Interval
  max-age       Set a Spanning Tree MAX AGE Interval
  portfast      Allow a change from blocking to forwarding
  priority      Set a Spanning Tree Priority
  protocol      Spanning tree protocol type
  uplinkfast    Enable UplinkFast Feature
  vlan          VLAN Switch Spanning Trees
  <cr>


Switch A#show spanning-tree brief

VLAN1
  Spanning tree enabled protocol IEEE
  ROOT ID    Priority 1
             Address 0002.4b21.3640
             This bridge is the root
             Hello Time   2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID    Priority    1
               Address     0002.4b21.3640
               Hello Time   2 sec  Max Age 20 sec  Forward Delay 15 sec
Port                                 Designated
Name     Port ID Prio Cost Sts  Cost  Bridge ID       Port ID
-------  ------- ---- ---- ---  ----  --------------- -------
Fa0/1    128.13  128  19   FWD  0     0002.4b21.3640 128.13
Fa0/2    128.14  128  19   BLK  0     0002.4b21.3640 128.14
Fa0/3    128.15  128  19   BLK  0     0002.4b21.3640 128.15
Fa0/4    128.16  128  19   LRN  0     0002.4b21.3640 128.16
Fa0/5    128.17  128  19   BLK  0     0002.4b21.3640 128.17
Fa0/6    128.18  128  19   BLK  0     0002.4b21.3640 128.18
Fa0/7    128.19  128  19   FWD  0     0002.4b21.3640 128.19
Fa0/8    128.20  128  19   BLK  0     0002.4b21.3640 128.20
Fa0/9    128.22  128  19   BLK  0     0002.4b21.3640 128.22
Fa0/10   128.23  128  19   BLK  0     0002.4b21.3640 128.23
```



```
Fa0/11   128.24   128   19    BLK  0      0002.4b21.3640 128.24
Fa0/12   128.25   128   19    BLK  0      0002.4b21.3640 128.25
```

```
Switch_A#show running-config
Building configuration...

Current configuration:
!
version 12.0
no service pad
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname Switch_A
!
enable secret 5 $1$Spup$4rLiyqQseDcu2xWzhd9Ko.

!

spanning-tree vlan 1 priority 1
ip subnet-zero
!

interface FastEthernet0/1
!
interface FastEthernet0/2
!
interface FastEthernet0/3
!
interface FastEthernet0/4
!
interface FastEthernet0/5
!
interface FastEthernet0/6
!
interface FastEthernet0/7
!
interface FastEthernet0/8
!
interface FastEthernet0/9
!
interface FastEthernet0/10
!
interface FastEthernet0/11
!
interface FastEthernet0/12
!
interface VLAN1
  ip address 192.168.1.2 255.255.255.0
  no ip directed-broadcast
  no ip route-cache
!
ip default-gateway 192.168.1.1
!
line con 0
  password cisco
```



```
 login
 transport input none
 stopbits 1
line vty 0 4
 password cisco
 login
line vty 5 15
 password cisco
 login
!
end
```


Erasing and Reloading the Switch

For the majority of the labs in CCNA 3 and CCNA 4 it is necessary to start with an unconfigured switch. Use of a switch with an existing configuration may produce unpredictable results. These instructions allow preparation of the switch prior to performing the lab so previous configuration options do not interfere. The following is the procedure for clearing out previous configurations and starting with an unconfigured switch. Instructions are provided for the 2900, 2950, and 1900 Series switches.

2900 and 2950 Series Switches

1. Enter into the privileged EXEC mode by typing **enable**.

   If prompted for a password, enter **class** (if that does not work, ask the instructor).

   ```
   Switch>enable
   ```

2. Remove the VLAN database information file.

   ```
   Switch#delete flash:vlan.dat
   Delete filename [vlan.dat]?[Enter]
   Delete flash:vlan.dat? [confirm] [Enter]
   ```

   If there was no VLAN file, this message is displayed.

   ```
   %Error deleting flash:vlan.dat (No such file or directory)
   ```

3. Remove the switch startup configuration file from NVRAM.

   ```
   Switch#erase startup-config
   ```

   The responding line prompt will be:

   ```
   Erasing the nvram filesystem will remove all files! Continue? [confirm]
   ```

   Press **Enter** to confirm.

   The response should be:

   ```
   Erase of nvram: complete
   ```

4. Check that VLAN information was deleted.

   Verify that the VLAN configuration was deleted in Step 2 using the **show vlan** command. If previous VLAN configuration information (other than the default management VLAN 1) is still present it will be necessary to power cycle the switch (hardware restart) instead of issuing the **reload** command. To power cycle the switch, remove the power cord from the back of the switch or unplug it. Then plug it back in.

   If the VLAN information was successfully deleted in Step 2, go to Step 5 and restart the switch using the **reload** command.

5. Software restart (using the **reload** command)

   Note: This step is not necessary if the switch was restarted using the power cycle method.

   a. At the privileged EXEC mode enter the command **reload**.

      ```
      Switch#reload
      ```

      The responding line prompt will be:

      ```
      System configuration has been modified. Save? [yes/no]:
      ```

   b. Type **n** and then press **Enter**.

      The responding line prompt will be:

      ```
      Proceed with reload? [confirm] [Enter]
      ```

      The first line of the response will be:

      ```
      Reload requested by console.
      ```

      After the switch has reloaded, the line prompt will be:

      ```
      Would you like to enter the initial configuration dialog? [yes/no]:
      ```

   c. Type **n** and then press **Enter**.

      The responding line prompt will be:

      ```
      Press RETURN to get started! [Enter]
      ```

1900 Series Switches

1. Remove VLAN Trunking Protocol (VTP) information.

   ```
   #delete vtp
   This command resets the switch with VTP parameters set to factory
   defaults.
   All other parameters will be unchanged.

   Reset system with VTP parameters set to factory defaults, [Y]es or
   [N]o?
   ```

   Enter **y** and press **Enter**.

2. Remove the switch startup configuration from NVRAM.

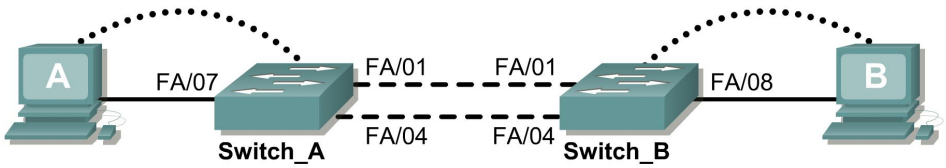
   ```
   #delete nvram
   ```

   This command resets the switch with factory defaults. All system parameters will revert to their default factory settings. All static and dynamic addresses will be removed.

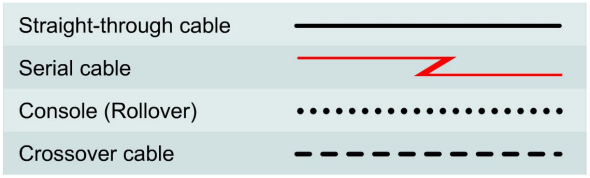
   Reset system with factory defaults, [**Y**]es or [**N**]o?

   Enter **y** and press **Enter**.

Lab 7.2.4 Selecting the Root Bridge – 2950 Series



Switch Designation	Switch Name	Enabe Secret Password	Enable,VTY, and Console Passwords	VLAN 1 IP Address	Default Gateway IP Address	Subnet Mask
Switch 1	Switch_A	class	cisco	192.168.1.2	192.168.1.1	255.255.255.0
Switch 2	Switch_B	class	cisco	192.168.1.3	192.168.1.1	255.255.255.0



Objective

- Create a basic switch configuration and verify it.
- Determine which switch is selected as the root switch with the factory default settings.
- Force the other switch to be selected as the root switch.

Background/Preparation

Cable a network similar to the one in the diagram. The configuration output used in this lab is produced from a 2950 series switch. Any other switch used may produce different output. The following steps are to be executed on each switch unless specifically instructed otherwise.

Start a HyperTerminal session.

Note: Go to the erase and reload instructions at the end of this lab. Perform those steps on all switches in this lab assignment before continuing.

Step 1 Configure the switches

Configure the hostname, access and command mode passwords, as well as the management LAN settings. These values are shown in the chart. If problems occur while performing this configuration, refer to the Basic Switch Configuration lab.

Step 2 Configure the hosts attached to the switches

Configure the host to use the same subnet for the address, mask, and default gateway as on the switch.

Step 3 Verify connectivity

a. To verify that the hosts and switches are correctly configured, ping the switches from the hosts.

b. Were the pings successful? Yes

c. If the answer is no, troubleshoot the hosts and switches configurations.

Step 4 Display the show interface VLAN options

a. Type **show interface vlan 1**.

b. List some of the options available: counters, status, trunk

Step 5 Display VLAN interface information

a. On Switch_A, type the command **show interface VLAN 1** at the Privileged EXEC mode prompt as follows:

```
Switch_A#show interface vlan 1
```

b. What is the MAC address of the switch? 0009.b7f5.5a41

c. On Switch_B type the command **show interface VLAN 1** at the Privileged EXEC mode prompt as follows:

```
Switch_B#show interface vlan 1
```

d. What is the MAC address of the switch? 0009.b7f5.6d81

e. Which switch should be the root of the spanning-tree for VLAN 1? Switch A

Step 6 Display the spanning-tree table on each switch

a. At the Privileged EXEC mode prompt, type the following on Switch_A:

Type **show spanning-tree brief** if running version 12.0 of the IOS. If running version 12.1 of the IOS, type **show spanning-tree**.

```
Switch_A#show spanning-tree brief
```

b. On Switch_B type **show spanning-tree brief** at the Privileged EXEC mode prompt as follows:

```
Switch_B#show spanning-tree brief
```

Examine the output and answer the following questions.

c. Which switch is the root switch? Switch A

d. What is the priority of the root switch? 32768

e. What is the bridge id of the root switch? 0009.b7f5.5a41

f. Which ports are forwarding on the root switch? FastEthernet 0/1, 0/4, 0/7

g. Which ports are blocking on the root switch? None

h. What is the priority of the non-root switch? 32768

i. What is the bridge id of the non-root switch? 0009.b7f5.6d81

j. Which ports are forwarding on the non-root switch? FastEthernet 0/1 and 0/8

k. Which ports are blocking on the non-root switch? FastEthernet 0/4

l. What is the status of the link light on the blocking port? Green

Step 7 Reassign the root bridge

a. It has been determined that the switch selected as the root bridge, by using default values, is not the best choice. It is necessary to force the "other" switch to become the root switch.

b. In the example output given the root switch by default is Switch_A. Switch_B is preferred as the root switch. Go to the console and enter configuration mode if necessary.

c. Determine the parameters that can be configured for the Spanning-Tree Protocol by issuing the following:

```
Switch_B(config)#spanning-tree ?
```

d. List the options. backboneFast, portfast, uplinkfast, vlan

e. Set the priority of the switch that is not root to 4096.

If version 12.0 is used, enter the following:

```
Switch_B(config)#spanning-tree priority 1
Switch_B(config)#exit
```

If version 12.1 is used, enter the following:

```
Switch_B(config)#spanning-tree vlan 1 priority 4096
Switch_B(config)#exit
```

Step 8 Display the switch spanning-tree table

a. At the Privileged EXEC mode prompt, type the following on Switch_A:

Note: Type **show spanning-tree brief** if running version 12.0 of the IOS. If running version 12.1 of the IOS, type **show spanning-tree**.

```
Switch_A#show spanning-tree brief
```

b. On Switch_B type **show spanning-tree brief** at the Privileged EXEC mode prompt as follows:

```
Switch_B#show spanning-tree brief
```

Examine the output and answer the following questions.

c. Which switch is the root switch? Switch_B

d. What is the priority of the root switch? 4096

e. Which ports are forwarding on the root switch? FastEthernet 0/1, 0/4, and 0/8

f. Which ports are blocking on the root switch? None

g. What is the priority of the non-root switch? 32768

h. Which ports are forwarding on the non-root switch? FastEthernet 0/1 and 0/7

i. Which ports are blocking on the non-root switch? FastEthernet 0/4

j. What is the status of the link light on the blocking port? Green

Step 9 Verify the running configuration file on the root switch

a. On the switch that was changed to be the root bridge, type **show running-config** at the Privileged EXEC mode prompt.

b. Is there an entry in the running configuration file that specifies the spanning-tree priority of this router? Yes

c. What does that entry say? spanning-tree vlan 1 priority 4096

Note: The output is different depending on if the IOS used is version 12.0 or version 12.1.

Once the steps are complete, log off by typing **exit**, and turn all the devices off. Then remove and store the cables and adapter.

```
C:\>ping 192.168.1.2

Pinging 192.168.1.2 with 32 bytes of data:

Reply from 192.168.1.2: bytes=32 time=1ms TTL=255
Reply from 192.168.1.2: bytes=32 time=1ms TTL=255
Reply from 192.168.1.2: bytes=32 time=1ms TTL=255
Reply from 192.168.1.2: bytes=32 time=1ms TTL=255

Ping statistics for 192.168.1.2:
      Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
      Minimum = 1ms, Maximum = 1ms, Average = 1ms

C:\>ping 192.168.1.3

Pinging 192.168.1.3 with 32 bytes of data:

Reply from 192.168.1.3: bytes=32 time=3ms TTL=255
Reply from 192.168.1.3: bytes=32 time=2ms TTL=255
Reply from 192.168.1.3: bytes=32 time=1ms TTL=255
Reply from 192.168.1.3: bytes=32 time=1ms TTL=255

Ping statistics for 192.168.1.3:
      Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
      Minimum = 1ms, Maximum = 3ms, Average = 1ms

C:\>
```

```
Switch_A#show interface vlan1 ?
  accounting       Show interface accounting
  counters         Show interface counters
  crb              Show interface routing/bridging info
  description      Show interface description
  etherchannel     Show interface etherchannel information
  fair-queue       Show interface Weighted Fair Queueing (WFQ) info
  irb              Show interface routing/bridging info
  mac-accounting   Show interface MAC accounting info
  precedence       Show interface precedence accounting info
  pruning          Show interface trunk VTP pruning information
```



```
  random-detect    Show interface Weighted Random Early Detection (WRED)
     info
  rate-limit       Show interface rate-limit info
  shape            Show interface Traffic Shape info
  stats            Show interface packets & octets, in & out, by switching
     path
  status           Show interface line status
  switchport       Show interface switchport information
  trunk            Show interface trunk information
  |                Output modifiers
  <cr>
```

```
Switch_A#show interface vlan 1
Vlan1 is up, line protocol is up
  Hardware is CPU Interface, address is 0009.b7f5.6d80 (bia
     0009.b7f5.6d80)
  Internet address is 192.168.1.2/24
  MTU 1500 bytes, BW 1000000 Kbit, DLY 10 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:01:00, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue :0/40 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 9000 bits/sec, 5 packets/sec
     1184 packets input, 104481 bytes, 0 no buffer
     Received 137 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
     3439 packets output, 1160044 bytes, 0 underruns
     0 output errors, 4 interface resets
     0 output buffer failures, 0 output buffers swapped out
```

```
Switch_A#show spanning-tree brief

VLAN1
  Spanning tree enabled protocol ieee
  Root ID     Priority    32768
              Address     0009.b7f5.5a41
              Cost        19
              Port        1 (FastEthernet0/1)
              Hello Time   2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    32768
              Address     0009.b7f5.6d81
              Hello Time   2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time 300

Interface                                      Designated
Name                 Port ID Prio Cost  Sts Cost  Bridge ID           Port ID
-------------------- ------- ---- ----- --- ----- ------------------- ---
FastEthernet0/1      128.1    128    19 FWD     0 32768 0009.b7f5.5a41 128.1
FastEthernet0/4      128.4    128    19 BLK     0 32768 0009.b7f5.5a41 128.4
```



```
FastEthernet0/7    128.7    128    19 FWD    19 32768 0009.b7f5.6d81 128.7
```

```
Switch_B#show spanning-tree brief

VLAN1
  Spanning tree enabled protocol ieee
  Root ID     Priority    32768
              Address     0009.b7f5.5a41
              This bridge is the root
              Hello Time   2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    32768
              Address     0009.b7f5.5a41
              Hello Time   2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time 300

Interface                                        Designated
Name               Port ID Prio Cost  Sts Cost  Bridge ID            Port ID
------------------- ------- ---- ----- --- ----- -------------------- ---
FastEthernet0/1   128.1    128    19 FWD      0 32768 0009.b7f5.5a41 128.1
FastEthernet0/4   128.4    128    19 FWD      0 32768 0009.b7f5.5a41 128.4
FastEthernet0/8   128.8    128    19 FWD      0 32768 0009.b7f5.5a41 128.8
```

```
Switch_A(config)#spanning-tree ?
  backbonefast  Enable BackboneFast Feature
  portfast      Spanning tree portfast options
  uplinkfast    Enable UplinkFast Feature
  vlan          VLAN Switch Spanning Tree

Switch_A#show spanning-tree

  VLAN1 is executing the ieee compatible Spanning Tree protocol
      Bridge Identifier has priority 4096, address 0009.b7f5.6d81
      Configured hello time 2, max age 20, forward delay 15
      We are the root of the spanning tree
      Topology change flag not set, detected flag not set
      Number of topology changes 4 last change occurred 00:01:34 ago
      Times:   hold 1, topology change 35, notification 2
               hello 2, max age 20, forward delay 15
      Timers: hello 1, topology change 0, notification 0, aging 300

  Port 1 (FastEthernet0/1) of VLAN1 is forwarding
      Port path cost 19, Port priority 128, Port Identifier 128.1.
      Designated root has priority 4096, address 0009.b7f5.6d81
      Designated bridge has priority 4096, address 0009.b7f5.6d81
      Designated port id is 128.1, designated path cost 0
      Timers: message age 0, forward delay 0, hold 0
      Number of transitions to forwarding state: 1
      BPDU: sent 101, received 1436

  Port 4 (FastEthernet0/4) of VLAN1 is forwarding
```



```
        Port path cost 19, Port priority 128, Port Identifier 128.4.
        Designated root has priority 4096, address 0009.b7f5.6d81
        Designated port id is 128.4, designated path cost 0
        Timers: message age 0, forward delay 0, hold 0
        Number of transitions to forwarding state: 1
        BPDU: sent 98, received 1433

    Port 7 (FastEthernet0/7) of VLAN1 is forwarding
        Port path cost 19, Port priority 128, Port Identifier 128.7.
        Designated root has priority 4096, address 0009.b7f5.6d81
        Designated bridge has priority 4096, address 0009.b7f5.6d81
        Designated port id is 128.7, designated path cost 0
        Timers: message age 0, forward delay 0, hold 0
        Number of transitions to forwarding state: 1
        BPDU: sent 2408, received 0


Switch A#show running-config
Building configuration...

Current configuration : 1233 bytes
!
version 12.1
no service pad
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname Switch_A
!
enable secret 5 $1$K0Nw$Vfv.yuMmf20yNpzBO3uOh0

!
ip subnet-zero
no ip finger
!

spanning-tree vlan 1 priority 4096
!

interface FastEthernet0/1
!
interface FastEthernet0/2
!
interface FastEthernet0/3
!
interface FastEthernet0/4
!
interface FastEthernet0/5
!
interface FastEthernet0/6
!
interface FastEthernet0/7
!
interface FastEthernet0/8
!
interface FastEthernet0/9
!
interface FastEthernet0/10
!
```



```
interface FastEthernet0/11
!
interface FastEthernet0/12
!
interface FastEthernet0/13
!
interface FastEthernet0/14
!
interface FastEthernet0/15
!
interface FastEthernet0/16
!
interface FastEthernet0/17
!
interface FastEthernet0/18
!
interface FastEthernet0/19
!
interface FastEthernet0/20
!
interface FastEthernet0/21
!
interface FastEthernet0/22
!
interface FastEthernet0/23
!
interface FastEthernet0/24
!
interface Vlan1
 ip address 192.168.1.2 255.255.255.0
 no ip route-cache
!
ip default-gateway 192.168.1.1
ip http server
!
line con 0
 password cisco
 login
 transport input none
line vty 0 4
 password cisco
 login
line vty 5 15
 password cisco
 login
!
end
```


Erasing and Reloading the Switch

For the majority of the labs in CCNA 3 and CCNA 4 it is necessary to start with an unconfigured switch. Use of a switch with an existing configuration may produce unpredictable results. These instructions allow preparation of the switch prior to performing the lab so previous configuration options do not interfere. The following is the procedure for clearing out previous configurations and starting with an unconfigured switch. Instructions are provided for the 2900, 2950, and 1900 Series switches.

2900 and 2950 Series Switches

1. Enter into the privileged EXEC mode by typing **enable**.

   If prompted for a password, enter **class** (if that does not work, ask the instructor).

   ```
   Switch>enable
   ```

2. Remove the VLAN database information file.

   ```
   Switch#delete flash:vlan.dat
   Delete filename [vlan.dat]?[Enter]
   Delete flash:vlan.dat? [confirm] [Enter]
   ```

   If there was no VLAN file, this message is displayed.

   ```
   %Error deleting flash:vlan.dat (No such file or directory)
   ```

3. Remove the switch startup configuration file from NVRAM.

   ```
   Switch#erase startup-config
   ```

   The responding line prompt will be:

   ```
   Erasing the nvram filesystem will remove all files! Continue? [confirm]
   ```

   Press **Enter** to confirm.

   The response should be:

   ```
   Erase of nvram: complete
   ```

4. Check that VLAN information was deleted.

   Verify that the VLAN configuration was deleted in Step 2 using the **show vlan** command. If previous VLAN configuration information (other than the default management VLAN 1) is still present it will be necessary to power cycle the switch (hardware restart) instead of issuing the **reload** command. To power cycle the switch, remove the power cord from the back of the switch or unplug it. Then plug it back in.

   If the VLAN information was successfully deleted in Step 2, go to Step 5 and restart the switch using the **reload** command.

5. Software restart (using the **reload** command)

Note: This step is not necessary if the switch was restarted using the power cycle method.

a. At the privileged EXEC mode enter the command **reload**.

```
Switch#reload
```

The responding line prompt will be:

```
System configuration has been modified. Save? [yes/no]:
```

b. Type **n** and then press **Enter**.

The responding line prompt will be:

```
Proceed with reload? [confirm] [Enter]
```

The first line of the response will be:

```
Reload requested by console.
```

After the switch has reloaded, the line prompt will be:

```
Would you like to enter the initial configuration dialog? [yes/no]:
```

c. Type **n** and then press **Enter**.

The responding line prompt will be:

```
Press RETURN to get started! [Enter]
```

1900 Series Switches

1. Remove VLAN Trunking Protocol (VTP) information.

```
#delete vtp
This command resets the switch with VTP parameters set to factory
defaults.
All other parameters will be unchanged.

Reset system with VTP parameters set to factory defaults, [Y]es or
[N]o?
```

Enter **y** and press **Enter**.

2. Remove the switch startup configuration from NVRAM.

```
#delete nvram
```

This command resets the switch with factory defaults. All system parameters will revert to their default factory settings. All static and dynamic addresses will be removed.

Reset system with factory defaults, [**Y**]es or [**N**]o?

Enter **y** and press **Enter**.

