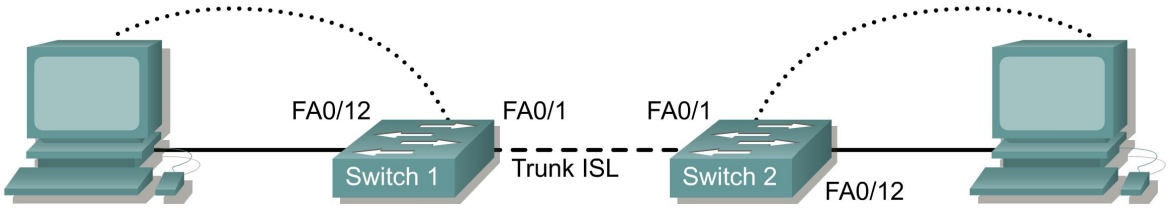
Lab 9.1.5a Trunking with ISL



Switch Designation	Switch Name	Enable Secret Password	Enable, VTY, and Console Passwords	VLAN 1 IP Address	Subnet Mask	VLAN Names and Numbers	Switch Port Assignments
Switch 1	Switch_A	class	cisco	192.168.1.2	255.255.255.0	VLAN 1 Native VLAN 10 Accounting VLAN 20 Marketing VLAN 30 Engineering	fa0/2 - 0/3 fa0/4 - 0/6 fa0/7 - 0/9 fa0/10 - 0/12
Switch 2	Switch_B	class	cisco	192.168.1.3	255.255.255.0	VLAN 1 Native VLAN 10 Accounting VLAN 20 Marketing VLAN 30 Engineering	fa0/2 - 0/3 fa0/4 - 0/6 fa0/7 - 0/9 fa0/10 - 0/12

Straight-through cable ——— Serial cable ——— Console (Rollover)••••••••• Crossover cable – – – –

Objective

- Create a basic switch configuration and verify it.
- Create multiple VLANs, name them and assign multiple member ports to them.
- Create an ISL trunk line between the two switches to allow communication between paired VLANs.
- Test the VLANs functionality by moving a workstation from one VLAN to another.

Background/Preparation

Note: The use of Catalyst 2950 switches is not appropriate for this lab as they only support 802.1q trunking.

Trunking changes the formatting of the packets. The ports need to be in agreement as to which format is being used to transmit data on the trunk or no data will be passed. If there is different trunking encapsulation on the two ends of the link they will not able to communicate. Similar situation will occur if one of the ports is configured in trunking mode, unconditionally, and the other one is in access mode, unconditionally.

When managing a switch, the Management Domain is always VLAN 1. The Network Administrator's workstation must have access to a port in the VLAN 1 Management Domain. All ports are assigned to VLAN 1 by default. This lab will also help demonstrate how VLANs can be used to separate traffic.

Cable a network similar to the one in the diagram. The configuration output used in this lab is produced from a 2900 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 switch

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 switch

Configure the IP address, mask, and default gateway on each host. Be sure to choose addresses that are on the same subnet as the switch.

Step 3 Verify connectivity

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

b. Were the pings successful? _____

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

Step 4 Display the VLAN interface information

On Switch_A, type the command **show vlan** at the Privileged EXEC prompt as follows:

```
Switch_A#show vlan
```

Note: There should be an entry for VLAN 1 and the default VLANs (1002 +). If other VLANs appear, they could be deleted as instructed in Step 2 of the Erasing and Reloading instructions at the end of this lab or refer to the Lab Exercise: Deleting VLAN Configurations.

Step 5 Create and name three VLANs

Enter the following commands to create and name three VLANs:

```
Switch_A#vlan database
Switch_A(vlan)#vlan 10 name Accounting
Switch_A(vlan)#vlan 20 name Marketing
Switch_A(vlan)#vlan 30 name Engineering
Switch_A(vlan)#exit
```

Use the **show vlan** command to verify that the VLANs have been created correctly.

Step 6 Assign ports to a VLAN 10

Assigning ports to VLANs must be done from the interface mode. Enter the following commands to add ports 0/4 to 0/6 to VLAN 10:

```
Switch_A#configure terminal
Switch_A(config)#interface fastethernet 0/4
Switch_A(config-if)#switchport mode access
Switch_A(config-if)#switchport access vlan 10
Switch_A(config-if)#interface fastethernet 0/5
Switch_A(config-if)#switchport mode access
Switch_A(config-if)#switchport access vlan 10
Switch_A(config-if)#interface fastethernet 0/6
Switch_A(config-if)#switchport mode access
Switch_A(config-if)#switchport access vlan 10
Switch_A(config-if)#end
```

Step 7 Assign ports to VLAN 20

Enter the following commands to add ports 0/7 to 0/9 to VLAN 20:

```
Switch_A#configure terminal
Switch_A(config)#interface fastethernet 0/7
Switch_A(config-if)#switchport mode access
Switch_A(config-if)#switchport access vlan 20
Switch_A(config-if)#interface fastethernet 0/8
Switch_A(config-if)#switchport mode access
Switch_A(config-if)#switchport access vlan 20
Switch_A(config-if)#interface fastethernet 0/9
Switch_A(config-if)#switchport mode access
Switch_A(config-if)#switchport access vlan 20
Switch_A(config-if)#end
```

Step 8 Assign ports to VLAN 30

Enter the following commands to add ports 0/10 to 0/12 to VLAN 30:

```
Switch_A#configure terminal
Switch_A(config)#interface fastethernet 0/10
Switch_A(config-if)#switchport mode access
Switch_A(config-if)#switchport access vlan 30
Switch_A(config-if)#interface fastethernet 0/11
Switch_A(config-if)#switchport mode access
Switch_A(config-if)#switchport access vlan 30
Switch_A(config-if)#interface fastethernet 0/12
Switch_A(config-if)#switchport mode access
Switch_A(config-if)#switchport access vlan 30
Switch_A(config-if)#end
```

Step 9 Create VLANs on Switch_B

Repeat Steps 5 through 8 on Switch_B to create its VLANs.

Step 10 Display the VLAN interface information

a. On Switch_A, type the command **show vlan** at the Privileged EXEC prompt as follows:

```
Switch_A#show vlan
```

b. Are ports 0/10 through 0/12 assigned to VLAN 30? _____

Step 11 Test the VLANs

Ping from the host in Switch_A port 0/12 to the host in Switch_B port 0/12.

a. Was the ping successful? _____

b. Why? _____

Ping from the host in Switch_A port 0/12 to the switch IP 192.168.1.2.

c. Was the ping successful? _____

d. Why? _____

Step 12 Create the ISL trunk

On both switches, Switch_A and Switch_B, type the following command at the fastethernet 0/1 interface command prompt

```
Switch_A(config)#interface fastethernet 0/1
Switch_A(config-if)#switchport mode trunk
Switch_A(config-if)#switchport trunk encapsulation isl
Switch_A(config-if)#end

Switch_B(config)#interface fastethernet 0/1
Switch_B(config-if)#switchport mode trunk
Switch_B(config-if)#switchport trunk encapsulation isl
Switch_B(config-if)#end
```

Step 13 Verify the ISL trunk

a. To verify that port fastethernet 0/1 has been established as a trunk port, type **show interface fastethernet 0/1 switchport** at the Privileged EXEC mode prompt.

b. What type of trunking encapsulation is shown on the output results? _____

c. According to the output with **show interface fastethernet 0/1 switchport** on Switch_B, is there a difference from the Administrative Trunking Encapsulation from the Operational Trunking Encapsulation?

_____

d. On the fragment “Trunking VLANs Enable” from the output, what does the word “ALL” mean? _____

e. What would happen if the two ports of the trunk were using different encapsulation? _____

f. Explain._____

Step 14 Test the VLANS and the trunk

Ping from the host in Switch_A port 0/12 to the host in Switch_B port 0/12.

a. Was the ping successful? _____

b. Why? _____

Ping from the host in Switch_A port 0/12 to the switch IP 192.168.1.2.

c. Was the ping successful? _____

d. Why? _____

Step 15 Move host

Move the host in Switch_A from port 0/12 to port 0/8. Wait until the port LED goes green and then go to the next step.

Step 16 Test the VLANS and the trunk

Ping from the host in Switch_A port 0/8 to the host in Switch_B port 0/12.

a. Was the ping successful? _____

b. Why? _____

Ping from the host in Switch_A port 0/8 to the switch IP 192.168.1.2.

c. Was the ping successful? _____

d. Why? _____

Step 17 Move host

Move the host in Switch_B from port 0/12 to port 0/7. Wait until the port LED goes green and then go to the next step.

Step 18 Test the VLANS and the trunk

Ping from the host in Switch_A port 0/8 to the host in Switch_B port 0/7.

a. Was the ping successful? _____

b. Why? _____

Ping from the host in Switch_A port 0/8 to the switch IP 192.168.1.2.

c. Was the ping successful? _____

d. Why? _____

Step 19 Move host

Move the host in Switch_A from port 0/8 to port 0/2. Wait until the port LED goes green and then go to the next step.

Step 20 Test the VLANS and the trunk

Ping from the host in Switch_A port 0/2 to the host in Switch_B port 0/7.

a. Was the ping successful? _____

Ping from the host in Switch_A port 0/2 to the switch IP 192.168.1.2.

b. Was the ping successful? _____

c. Why? _____

Step 21 Move host

Move the host in Switch_B from port 0/7 to port 0/3. Wait until the port LED goes green and then go to the next step.

Step 22 Test the VLANS and the trunk

Ping from the host in Switch_A port 0/2 to the host in Switch_B port 0/3.

a. Was the ping successful? _____

b. Why? _____

Ping from the host in Switch_B port 0/3 to the switch IP 192.168.1.2.

c. Was the ping successful? _____

d. Why? _____

Ping from the host in Switch_B port 0/3 to the switch IP 192.168.1.3.

e. Was the ping successful? _____

f. Why? _____

g. What conclusions can be drawn from the testing that was just performed in regards to VLAN membership and VLANs across a trunk?

_____

_____

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

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**.

   Switch>**enable**

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

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(config)#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**.

