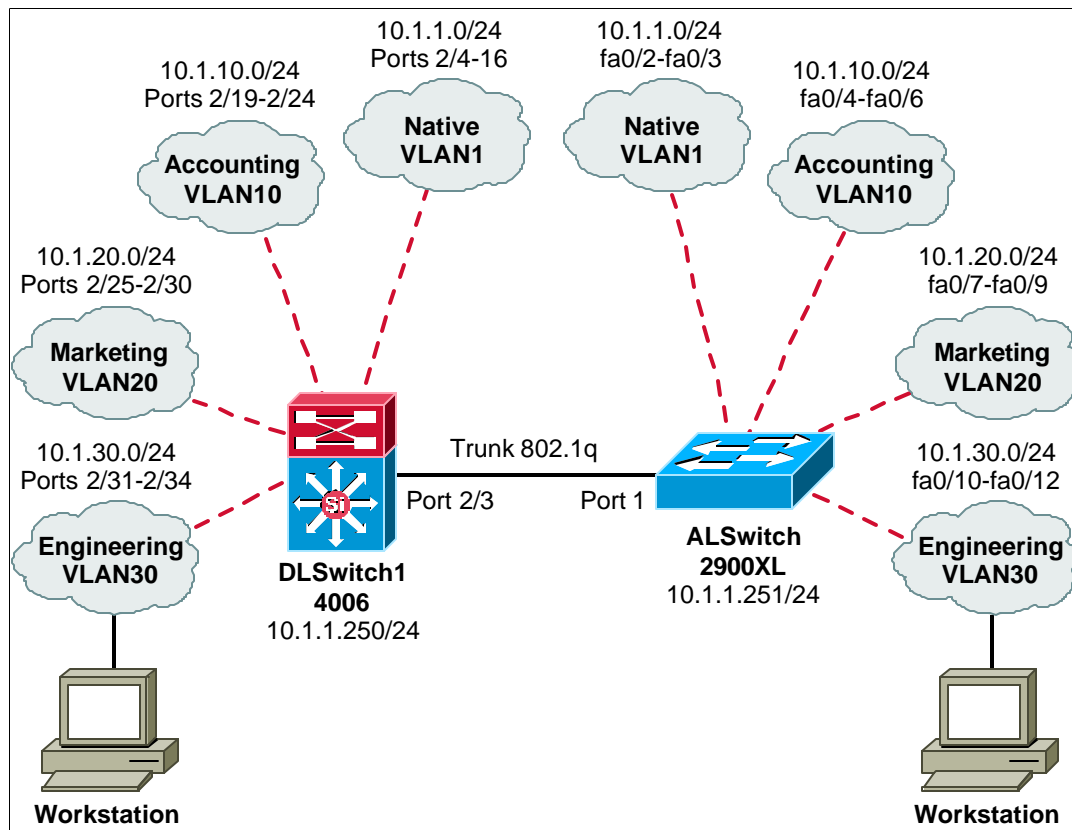


Lab 4.6.4: VLAN Trunking and VTP Domain



Objective:

Configure a VLAN trunk between a Catalyst 4000 switch and Catalyst 2900 switch.

Scenario:

Your network is growing. You have out grown your 2900 and need to add more port capacity. As time goes on, your plan is to continue to add Catalyst 2900 switches in your IDF's. At this point you are adding a Catalyst 4000 in your MDF to tie all of these 2900s together. In order to make adds/moves/changes easier to manage, you will configure VLANs throughout your entire network. The 4000 will be at the core of this switch configuration.

You will need to configure the link between the 4000 and 2900 as a trunk line, which will extend the VLAN configuration between both switches. The Catalyst 4000 switch will act as a VLAN VTP server that will propagate VLAN information to the 2900.

Design:

Switched Network VTP Configuration Information:

Switch	VTP Domain	VTP Mode
DLSwitch1	Corp	Server
ALSwitch	Corp	Client

Switch VLAN Port Assignments:

Switch	VLAN 1 Default	VLAN 10 Accounting	VLAN 20 Marketing	VLAN 30 Engineering
DLSwitch1		19-24	25-30	31-34
ALSwitch		4-6	7-9	10-12

Lab Tasks:

1. First, configure your 4000 switch to the diagram above. You can skip this step if you already have the Lab 3.1.3 (4000 initial setup) configured.

```
Console> enable
Console> (enable) set system name DLSwitch1
System name set.
DLSwitch1> (enable)

DLSwitch1> (enable) set password
Enter old password: (Because you do not currently have a password, just hit enter)
Enter new password:
Retype new password:
Password changed.

DLSwitch1> (enable) set enablepass
Enter old password: (Because you do not currently have a password, just hit enter)
Enter new password:
Retype new password:
Password changed.

DLSwitch1> (enable) set interface sc0 10.1.1.250 255.255.255.0
DLSwitch1> (enable) set interface sc0 1
```

2. Next, configure your 2900 switch to the diagram above. You can skip this step if you already have the Lab 3.2.3 (2900 initial setup) configured.

```
Switch>enable
Switch#

Set the switch name.

Switch#config terminal
Switch(config)#host ALSwitch
ALSwitch(config)#

ALSwitch(config)#enable password class
ALSwitch(config)#line con 0
ALSwitch(config-line)#password cisco
ALSwitch(config-line)#login
ALSwitch(config-line)#line vty 0 15
ALSwitch(config-line)#password cisco
ALSwitch(config-line)#login

ALSwitch(config)#interface vlan 1
ALSwitch(config-if)#ip address 10.1.1.251 255.255.255.0
```

3. We need to configure VTP (VLAN Trunking Protocol) on both switches. VTP is the protocol that will communicate information about which VLANs exist from one switch to another. If VTP did not provide this information, we would have to create the VLANs on all switches individually.

By default, the Catalyst 4000 is configured as a VTP server.

Due to the switch defaulting to a VTP server, we do not have to turn VTP server on. In the event that this was shut off, we would use the command:

```
DLSwitch1> (enable) set vtp mode server
```

We want the 4000 to act as a VTP server to provide our VLAN information to our other switches.

Once the 4000 is setup as a VTP server, we need to specify the VTP domain name:

```
DLSwitch1> (enable) set vtp domain corp
```

This command sets the VTP server domain name to "corp". This name must match all other switches that are in this VTP domain.

The Catalyst 2900XL will be configured as the VTP client. We want the 2900XL to learn the VLANs from the 4000s VTP server.

This is done through the vtp database command on the 2900XL. This command puts you into a new type of IOS configuration mode. Note that this mode is entered from the privileged mode exec prompt, and not the traditional "config term" configuration mode.

```
ALSwitch#vlan database  
ALSwitch(vlan)#vtp client  
ALSwitch(vlan)#vtp domain corp  
ALSwitch(vlan)#exit  
ALSwitch#
```

This sets the 2900XL in client VTP mode and sets the VTP domain name to "corp".

Once the VTP protocol is configured, you will be able to configure VLANs.

4. Next we will assign our ports on our 4000 to their appropriate VLANs and set their names. You can skip this step if you already have the Lab 4.3.1.1 configured.

```
DLSwitch1> (enable) set vlan 10 2/19-24  
DLSwitch1> (enable) set vlan 20 2/25-30  
DLSwitch1> (enable) set vlan 30 2/31-34  
DLSwitch1> (enable) set vlan 10 name Accounting  
DLSwitch1> (enable) set vlan 20 name Marketing  
DLSwitch1> (enable) set vlan 30 name Engineering
```

We do not need to configure the other ports as VLAN 1 because that is the default VLAN to which ports are assigned.

Use the **show vlan** command to verify that your ports are assigned to the correct VLAN.

```

DLSwitch1> (enable) sh vlan
VLAN Name                Status    IfIndex Mod/Ports, Vlans
-----
1    default                active    6       1/1-2
                                           2/1-18
10   Accounting              active    45      2/19-24
20   Marketing               active    46      2/25-30
30   Engineering             active    47      2/31-34
1002 fddi-default           active    7
1003 token-ring-default     active    10
1004 fddinet-default        active    8
1005 trnet-default         active    9

```

The 2900XL is in client VTP mode. Therefore, VLAN information should get passed on to the 2900XL from the 4000.

- Now let's cable up our trunk line. We need to connect Port 1 (fa0/1) on our ALSwitch (2900XL) to port 2/3 (1st 10/100 Ethernet port) on our DLSwitch1 (4000).

What type of cable do we need to use when we connect two switches together?

Use the appropriate cable to connect these two switches together.

- Configure the each end of the trunk link as a 802.1q encapsulated trunk line.

On the Catalyst 4000:

```
DLSwitch1> (enable) set trunk 2/3 nonegotiate dot1q 1-1005
```

This command sets port 2/3 to a dot1q trunk line that supports VLANs 1-1005. The **nonegotiate** command tells the switch that it should not try to auto-sense what type of trunk link this is.

On the Catalyst 2900XL:

```

ALSwitch#config term
ALSwitch(config)#int fa0/1
ALSwitch(config)#switchport mode trunk
ALSwitch(config)#switchport trunk encapsulation dot1q

```

The first interface command tells the switch that this switch port is a trunk link. The second command tells the switch that this is 802.1q trunk line.

- Now that we have our VLAN trunk link configured, we need to check to see if our VTP client (the 2900XL) has picked up our defined VLANs.

You may need to give the two switches a few moments for them to exchange VLAN information.

Use the **show vlan** command on the 2900XL to see if it has learned the new VLANs from the 4000.

ALSwitch#**sh vlan**

VLAN	Name	Status	Ports
1	default	active	Fa0/2, Fa0/3, Fa0/4, Fa0/5, Fa0/6, Fa0/7, Fa0/8, Fa0/9, Fa0/10, Fa0/11, Fa0/12
10	Accounting	active	
20	Marketing	active	
30	Engineering	active	
1002	fddi-default	active	
1003	token-ring-default	active	
1004	fddinet-default	active	
1005	trnet-default	active	

VLAN	Type	SAID	MTU	Parent	RingNo	BridgeNo	Stp	BrdgMode	Trans1	Trans2
1	enet	100001	1500	-	-	-	-	-	0	0
10	enet	100010	1500	-	-	-	-	-	0	0
20	enet	100020	1500	-	-	-	-	-	0	0
30	enet	100030	1500	-	-	-	-	-	0	0
1002	fddi	101002	1500	-	0	-	-	-	0	0
1003	tr	101003	1500	-	0	-	-	srb	0	0
1004	fdnet	101004	1500	-	-	-	ieee	-	0	0
1005	trnet	101005	1500	-	-	-	ibm	-	0	0

You should now see the three VLANs that were created on the 4000 show up on the 2900XL.

Even though the VLANs are now configured on the 2900XL, we not assigned any ports to those VLANs.

8. Assign ports on the 2900XL to their appropriate VLANs:

```
ALSwitch(config)#interface fa0/4  
ALSwitch(config-if)#switchport access vlan 10
```

```
ALSwitch(config)#interface fa0/5  
ALSwitch(config-if)#switchport access vlan 10
```

```
ALSwitch(config)#interface fa0/6  
ALSwitch(config-if)#switchport access vlan 10
```

```
ALSwitch(config)#interface fa0/7  
ALSwitch(config-if)#switchport access vlan 20
```

```
ALSwitch(config)#interface fa0/8  
ALSwitch(config-if)#switchport access vlan 20
```

```
ALSwitch(config)#interface fa0/9  
ALSwitch(config-if)#switchport access vlan 20
```

```
ALSwitch(config)#interface fa0/10  
ALSwitch(config-if)#switchport access vlan 30
```

```
ALSwitch(config)#interface fa0/11  
ALSwitch(config-if)#switchport access vlan 30
```

```
ALSwitch(config)#interface fa0/12  
ALSwitch(config-if)#switchport access vlan 30
```

9. On the Catalyst 2900XL, examine the output of the **show vtp counters** and **show vtp status** commands.

What command shows how many VTP advertisements have been transmitted and received?

What command shows how which mode (server or client) the switch is in?

10. On the Catalyst 4000, examine the output of the **show vtp statistics** and **show vtp domain** commands.

What command shows how many VTP advertisements have been transmitted and received?

What command shows how which mode (server or client) the switch is in?

11. Now place two workstations in the same VLAN but on different switches. Try to ping one another. You should be successful.