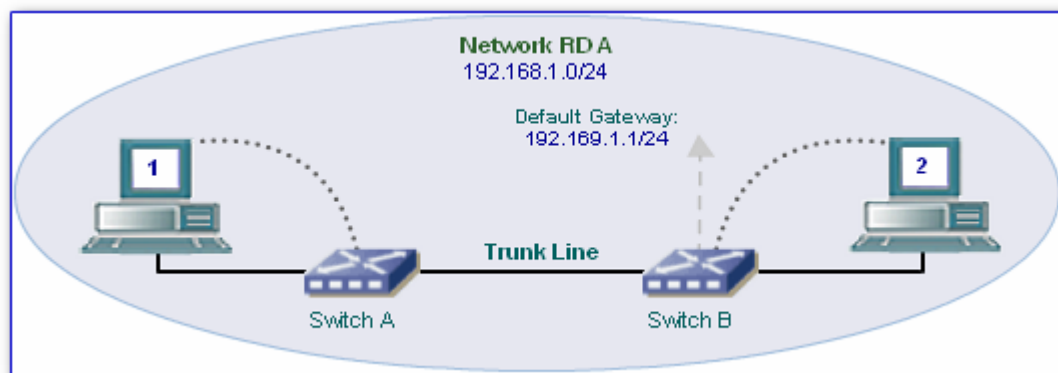


Portfolio Exercise 6b: Configuring Trunking. Configuring a VTP Client and Server**Objectives**

- Create and name VLANs and assign member ports to them.
- Create an 802.1q or ISL trunk line between two switches to allow paired VLANs to communicate.
- Configure one switch as a VTP client and one as a VTP server.
- Test the functionality of the VLANs.
- *Collect portfolio evidence for part of Grading Criteria P6*

Scenario

This practical provides you with the opportunity to demonstrate that you can configure trunking between two switches. You will then configure the VTP protocol so that a server switch can keep a client switch informed about existing VLANs.

Task 1: Document the Configuration**a. Specify the configuration of the switch and the hosts**

Using the diagram above for reference, fill in the table below. Details such as the switch names and IP addresses you may decide for yourself.

	Switch_A	Switch_B
Name		
Enable Secret Password		
VTY and Console Password		
VLAN IP Address and Subnet Mask		
Gateway IP Address and Subnet Mask		

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For this practical you will need to use either a pair of 2950 switches or a pair of 1900 switches. Do not mix 1900 and 2950 switches because they use different trunk line encapsulations.

You will need to decide on the ports to assign to each VLAN, the ports to use for the trunk line and the encapsulation method. Consider the information below and then fill in the table.

- ◇ **VLAN 1 Ports:** Assign ports 0/1 to 0/3 to the management VLAN.
- ◇ **VLAN 2 and 3 Ports:** 3 ports need to be assigned to each VLAN. Decide which 3 port to use for each and write this information in the table below. I would suggest you use the same port assignments on each switch
- ◇ **Trunk Line Port:** You will need to decide on the port to use for the trunk line.
 - *1900 switch Ethernet ports cannot be used for trunk lines. You will need to reserve one of the Fast Ethernet ports for the trunk line. The Fast Ethernet ports are usually the highest ports, e.g. fa0/26. You will need to check this on the switch.*
 - *Any 2950 switch Fast Ethernet port can be used for a trunk line. Typically fa0/1 is used.*
- ◇ **Encapsulation:** When data is passed on a trunk line between switches, the formatting of the packets is changed. The switches on each end of a trunk line need to be in agreement as to which format to use. The choices are **802.1q** encapsulation or **ISL** encapsulation. If there is a different trunking encapsulation on the two ends of the link the switches will not be able to communicate.
 - *1900 switches only support ISL encapsulation*
 - *2950 switches only support 802.1q encapsulation*

	Switch_A	Switch_B
VLAN 1 ports		
VLAN 2 ports		
VLAN 3 ports		
Trunk line port		
Encapsulation		

Now decide on IP addresses for the hosts and fill the table below.

	IP Address	Subnet Mask	Default Gateway
Host 1			
Host 2			

Portfolio Exercise 6b: Configuring Trunking. Configuring a VTP Client and Server**Task 2: Configure the Switches and the Hosts**

You will need to configure **each switch** as follows:-

- Set the name and the enable, console and VTY passwords
- Configure the VLAN management port with an IP address and subnet mask.
- Specify the default gateway IP address and subnet mask.

a. Configure the switches

As a reminder, the various configuration commands are specified below. You will need remember which mode to be in for yourself, e.g. global configuration mode etc.

For each switch, carry out the following:-

Delete any existing configuration including the startup configuration and any **vlan** database information stored in a **vlan.dat** file. See below.

- For 2900 and 2950 series switches, use the **erase startup-config** and **delete flash:vlan.dat** commands. Then **reload** the switch.
- For 1900 series switches, use the **delete nvram** and **delete vtp** commands. Then **reload** the switch.

Set the switch's name using the **hostname** command

Set the enable password using the **enable secret** command

Set the line console and vty passwords using the **password** and **login** command

Set the IP address and subnet mask on the VLAN port using the **ip address** command and activate the port using the **no shutdown** command

Set the default gateway IP address and subnet mask using the **ip default-gateway** command.

*Don't forget to save your configuration using the **copy run start** command*

b. Configure the Hosts

Configure the hosts with the IP addresses, subnet masks and default gateway as specified in your documentation.

c. Verify Connectivity

If you have configured the switches and the hosts correctly you should be able to ping one host from another host if they are on the **same switch**

- Attach hosts 1 and 2 to Switch A and ping one host from another host
- Attach hosts 1 and 2 to Switch B and ping one host from another host

~~A printout showing output from ipconfig and the ping results is required~~

Portfolio Exercise 6b: Configuring Trunking. Configuring a VTP Client and Server**Task 3: Create New VLANs**

Now you have completed the configuration of the switches and the hosts, you need to create a new VLAN on **one** of the switches and assign ports to the appropriate VLAN.

a. Display existing VLAN information

On **each switch**, type the following command at the Privileged EXEC prompt:

```
Switch#show vlan
```

1900:

```
Switch#show vlan-membership
```

Note: There should be an entry for VLAN 1 and the default VLANs (1002 +). If other VLANs appear, they should be deleted as instructed Task 2a.

b. Create a new VLAN

On **each switch**, enter the commands to create and name VLAN 2:

```
Switch#vlan database
```

```
Switch(vlan)#vlan 2 name VLAN2
```

```
Switch(vlan)#exit
```

1900:

```
Switch#config terminal
```

```
Switch(config)#vlan 2 name VLAN2
```

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

c. Assign interfaces to VLAN 2

On **each switch** assign the ports you decided on in Task1 to VLAN 2. As an example, the commands below will assign port 0/4 to VLAN 2.

```
Switch#configure terminal
```

```
Switch(config)#interface fastethernet 0/4
```

```
Switch(config-if)#switchport mode access
```

```
Switch(config-if)#switchport access vlan 2
```

```
Switch(config-if)#end
```

Portfolio Exercise 6b: Configuring Trunking. Configuring a VTP Client and Server**1900:**

```
Switch#config terminal

Switch(config)#interface Ethernet 0/4

Switch(config-if)#vlan static 2

Switch(config)#end.
```

To check the port assignments, type the appropriate **show vlan** or **show vlan-membership** command for your switch at the Privileged EXEC prompt:

Tip: Instead of displaying all of the VLANs you can look at specific vlan information as follows:-

```
Switch#show vlan id 2

or

Switch#show vlan name VLAN2
```

1900:

```
Switch#show vlan 2
```

Are all your ports assigned to the correct VLANs? _____

If not then troubleshoot and fix the problem

d. Test the VLANs

If you have configured the switches and the hosts correctly you should only be able to ping one host from another host only if they are on the **same VLAN** and on the **same switch**.

Connect both host to ports in VLAN 2 on Switch A

Can the hosts ping each other? _____

Connect both host to ports in VLAN 2 on Switch B

Can the hosts ping each other? _____

Connect host1 to a port in VLAN 2 on Switch A and host 2 to a port in VLAN 2 on Switch B.

Can the hosts ping each other? _____

If hosts on the same VLAN and on the same switch cannot ping each other then troubleshoot and fix the problem.

Portfolio Exercise 6b: Configuring Trunking. Configuring a VTP Client and Server**Task 4: Create the Trunk**

Now you have completed the VLAN configuration and port assignments on the switches, you need to create the trunk line between the switches. This will allow hosts on different switches to communicate through the trunk line, provided they are on the same VLAN.

a. Create the trunk

On **each switch**, type the following commands at the appropriate port interface command prompt.

2950:

This example uses the Fast Ethernet port 0/1. Refer to your table in Task 1 for the appropriate trunk port number to use.

```
Switch(config)#interface fastethernet 0/1
```

```
Switch(config-if)#switchport mode trunk
```

```
Switch(config-if)#end
```

1900:

This example uses the Fast Ethernet port 0/26. Refer to your table in Task 1 for the appropriate trunk port number to use.

```
Switch#configure terminal
```

```
Switch(config)#interface fastethernet0/26
```

```
Switch(config-if)#trunk on
```

Note:

The 2950 switch will only support 802.1Q trunking and the 1900 switch will only support ISL trunking, not 802.1Q. It is not necessary to specify the encapsulation type on these switches since they only supports one particular encapsulation method. For a switch that supports more than one encapsulation method you could specify the encapsulation to use as follows:-

```
Switch(config-if)#switchport trunk encapsulation dot1q
```

or

```
Switch(config-if)#switchport trunk encapsulation isl
```

b. Verify the trunk

To verify a trunk port has been established, type the following at the Privileged EXEC mode prompt *using your trunk port number*.

```
show interface fastethernet 0/1 switchport
```

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

What do you think the word "ALL" means for the "Trunking VLANs Enable" output?

Explain what you think would happen if the ports at each end of the trunk were using a different encapsulations?

c. Test the trunk

If you have configured the trunk correctly, a host on one switch should be able to ping a host on the other switch, *provided they are in the same VLAN*.

Connect host1 to a port in VLAN 1 on Switch A

Connect host2 to a port in VLAN 1 on Switch B

Should the hosts be able to ping each other? _____

Can the hosts ping each other? _____

Connect host1 to a port in VLAN 2 on Switch A

Connect host2 to a port in VLAN 2 on Switch B

Should the hosts be able to ping each other? _____

Can the hosts ping each other? _____

Connect host1 to a port in VLAN 1 on Switch A

Connect host2 to a port in VLAN 2 on Switch B

Should the hosts be able to ping each other? _____

Can the hosts ping each other? _____

Portfolio Exercise 6b: Configuring Trunking. Configuring a VTP Client and Server**Task 5: Configure VTP**

This next section is concerned with configuring VTP

a. Set up the VTP server and client

VTP (VLAN Trunking Protocol) is the protocol that allows switches to communicate VLAN information to each other. VTP simplifies configuration of VLANs on switches by propagating VLAN configuration information to all switches in the network. This means that an administrator can configure VLANs on one switch and use VTP to inform other switches to use the same VLAN information. If it weren't for VTP, VLANs would have to be created on all switches individually.

To configure VTP, one of your switches will need to be set up as a VTP server and the other as a VTP client. The VTP server will keep any VTP clients updated about VLANs. By default, the Catalyst switch series are configured as VTP servers but it is always best to make sure by issuing the appropriate command.

Configure Switch A as the VTP server as follows:-

2950:

```
Switch_A#vlan database
Switch_A(vlan)#vtp server
Switch_A(vlan)#vtp domain testdom
Switch_A(vlan)#exit
```

1900:

```
Switch_A#configure terminal
Switch_A(config)#vtp server
Switch_A(config)#vtp domain testdom
```

Configure Switch B as the VTP **client** in exactly the same way as above except replace the command ...

```
vtp server
with
vtp client
```

Then verify the VTP configuration using the command:-

```
Switch# show vtp status
```


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- b. Add a new VLAN on Switch A

On **Switch A only**, enter the appropriate commands to create and name VLAN 3.

On **Switch A only**, enter the appropriate commands to assign the ports you defined in Task 1 to VLAN 3.

Type the **show vlan** or **show vlan-membership** command to check the VLAN and port assignments.

- c. Verify migration of VTP information to Switch B

Information on the new VLAN 3 you created on Switch A should be propagated to Switch B. To check this, type the **show vlan** or **show vlan-membership** command on Switch B.

Has VLAN 3 been created on Switch B? _____

Explain the results? _____

Has information on port assignments for VLAN 3 also been propagated to Switch B? _____

Explain the results? _____

~~Print out your final Switch A configuration and label it appropriately~~

~~Print out your final Switch B configuration and label it appropriately~~

- d. Restore the switch configuration to a default state

Erase the existing configuration and the vlan database from each switch and reload it. You should see the default switch prompt when it reloads.

Evidence

Please supply the following evidence to support your implementation of this task

~~Screenshots and configuration files required~~

- Screenshot showing the **ipconfig** and **ping** results of one host pinging another
- Printout showing Switch A's final configuration. Include suitable annotation pointing out parts you specifically configured.
- Printout showing Switch B's final configuration. Include suitable annotation

Please annotate, sign, date, put the portfolio exercise number and task number on all evidence pages