

A close up of a device

Description automatically generated

COE 371L

Computer Networks I

Fall 2019

Lab #10

Section #2

Title: VLANs

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Lab - Configuring VLANs and Trunking

1. Build the Network and Configure Basic Device Settings

In Part 1, you will set up the network topology and configure basic settings on the PC hosts and switches.

* 1. Cable the network as shown in the topology.

Attach the devices as shown in the topology diagram, and cable as necessary.

* 1. Initialize and reload the switches as necessary.
  2. Configure basic settings for each switch.
  3. Configure PC hosts.
  4. Test connectivity.

Verify that the PC hosts can ping one another.

**Note**: It may be necessary to disable the PCs firewall to ping between PCs.

Can PC-A ping PC-B? Yes

Can PC-A ping PC-C? No

Can PC-A ping S1? No

Can PC-B ping PC-C? No

Can PC-B ping S2? No

Can PC-C ping S2? No

Can S1 ping S2? Yes

**[Report – 2Pts]** If you answered no to any of the above questions, why were the pings unsuccessful?

Pings unsuccessful since the device we are trying to ping are located in different subnets.

1. Create VLANs and Assign Switch Ports
   1. Create VLANs on the switches.
      1. Create the VLANs on S1.
      2. Create the same VLANs on S2.
      3. Issue the **show vlan** command to view the list of VLANs on S1.

**[Report – 1Pts]** What is the default VLAN? Vlan1

**[Report – 1Pts]** What ports are assigned to the default VLAN?

All switch ports

* 1. Assign VLANs to the correct switch interfaces.
     1. Assign VLANs to the interfaces on S1.
     2. Issue the **show vlan** **brief** command and verify that the VLANs are assigned to the correct interfaces.
     3. Issue the **show ip interface brief** command.

**[Report – 2Pts]** What is the status of VLAN 99? Why?

Status is up down. This is because it hasn’t been assigned to a port yet.

* + 1. **[Report – 2Pts]** Use the Topology to assign VLANs to the appropriate ports on S2.

S2(config)#vlan 10

S2(config-vlan)# name student

S2(config-vlan)# vlan 20

S2(config-vlan)#name faculty

S2(config-vlan)# vlan 99

S2(config-vlan)# name management

S2(config-vlan)# end

S2(config)# int fa0/11

S2(config-if)# switchport access vlan10

S2(config-if)# int fa0/18

S2(config-if)# switchport access vlan20

* + 1. **[Report – 1Pts]** Remove the IP address for VLAN 1 on S2.

S2(config)# int vlan 1

S2(config-if)# no ip add

* + 1. **[Report – 1Pts]** Configure an IP address for VLAN 99 on S2 according to the Addressing Table.

S2(config-if)# int vlan 99

S2(config-if)#ip address 192.168.1.12 255.255.255.0

* + 1. Use the **show vlan brief** command to verify that the VLANs are assigned to the correct interfaces.

S2# **show vlan brief**

**[Report – 1Pts]** Is PC-A able to ping PC-B? Why?

No, because f0/1 is not assigned to vlan 10

**[Report – 1Pts]** Is S1 able to ping S2? Why?

No, because Ip addresses for switches are in vlan 99

1. Maintain VLAN Port Assignments and the VLAN Database

In Part 3, you will change VLAN assignments to ports and remove VLANs from the VLAN database.

* 1. Assign a VLAN to multiple interfaces.
     1. On S1, assign interfaces F0/11 – 24 to VLAN 10.
     2. Issue the **show vlan brief** command to verify VLAN assignments.
     3. **[Report – 1Pts]** Reassign F0/11 and F0/21 to VLAN 20.

S1(config)# int range f0/11, f0/21

S1(config-if-range)# switchport access vlan 20

* + 1. Verify that VLAN assignments are correct.
  1. Remove a VLAN assignment from an interface.
     1. Use the **no** **switchport access vlan** command to remove the VLAN 10 assignment to F0/24.
     2. Verify that the VLAN change was made.

**[Report – 1Pts]** Which VLAN is F0/24 now associated with?

Vlan1

* 1. Remove a VLAN ID from the VLAN database.
     1. Add VLAN 30 to interface F0/24 without issuing the VLAN command.
     2. Verify that the new VLAN is displayed in the VLAN table.

S1# **show vlan brief**

**[Report – 1Pts]** What is the default name of VLAN 30?

Vlan0030

* + 1. Use the **no vlan 30** command to remove VLAN 30 from the VLAN database.
    2. Issue the **show vlan brief** command. F0/24 was assigned to VLAN 30.

**[Report – 1Pts]** After deleting VLAN 30, what VLAN is port F0/24 assigned to? What happens to the traffic destined to the host attached to F0/24?

Not a single vlan is assigned to port f0/24

S1# **show vlan brief**

* + 1. Issue the **no switchport access vlan** command on interface F0/24.
    2. **[Report – 1Pts]** Issue the **show vlan brief** command to determine the VLAN assignment for F0/24. To which VLAN is F0/24 assigned?

Vlan1

**Note**: Before removing a VLAN from the database, it is recommended that you reassign all the ports assigned to that VLAN.

**[Report – 2Pts]** Why should you reassign a port to another VLAN before removing the VLAN from the VLAN database?

We should do so because when interfaces are assigned to a vlan, ports in the vlan database are unavailable for use until they get reassigned to another vlan.

1. Configure an 802.1Q Trunk Between the Switches

In Part 4, you will configure interface F0/1 to use the Dynamic Trunking Protocol (DTP) to allow it to negotiate the trunk mode. After this has been accomplished and verified, you will disable DTP on interface F0/1 and manually configure it as a trunk.

* 1. Use DTP to initiate trunking on F0/1.

The default DTP mode of a 2960 switch port is dynamic auto. This allows the interface to convert the link to a trunk if the neighboring interface is set to trunk or dynamic desirable mode.

* + 1. Set F0/1 on S1 to negotiate trunk mode.
    2. Issue the **show vlan brief** command on S1 and S2. Interface F0/1 is no longer assigned to VLAN 1. Trunked interfaces are not listed in the VLAN table.

S1# **show vlan brief**

* + 1. Issue the **show interfaces trunk** command to view trunked interfaces. Notice that the mode on S1 is set to desirable, and the mode on S2 is set to auto.

S1# **show interfaces trunk**

S2# **show interfaces trunk**

**Note**: By default, all VLANs are allowed on a trunk. The **switchport trunk** command allows you to control what VLANs have access to the trunk. For this lab, keep the default settings which allows all VLANs to traverse F0/1.

* + 1. Verify that VLAN traffic is traveling over trunk interface F0/1.

Can S1 ping S2? Yes

Can PC-A ping PC-B? Yes

Can PC-A ping PC-C? No

Can PC-B ping PC-C? No

Can PC-A ping S1? No

Can PC-B ping S2? No

Can PC-C ping S2? No

**[Report – 1Pts]** If you answered no to any of the above questions, explain below.

We were unable to ping some PCs because they were in a different Vlan.

* 1. Manually configure trunk interface F0/1.

The **switchport mode trunk** command is used to manually configure a port as a trunk. This command should be issued on both ends of the link.

* + 1. Change the switchport mode on interface F0/1 to force trunking. Make sure to do this on both switches.
    2. Issue the **show interfaces trunk** command to view the trunk mode. Notice that the mode changed from **desirable** to **on**.

S2# **show interfaces trunk**

**[Report – 2Pts]** Why might you want to manually configure an interface to trunk mode instead of using DTP?

When we use the command switchport trunk mode, every port will become a trunk no matter what type of machine is connected

1. Delete the VLAN Database

In Part 5, you will delete the VLAN Database from the switch. It is necessary to do this when initializing a switch back to its default settings.

* 1. Determine if the VLAN database exists.
  2. Delete the VLAN database.
     1. Issue the **delete vlan.dat** command to delete the vlan.dat file from flash and reset the VLAN database back to its default settings. You will be prompted twice to confirm that you want to delete the vlan.dat file. Press Enter both times.
     2. Issue the **show flash** command to verify that the vlan.dat file has been deleted.

S1# **show flash**

Directory of flash:/

2 -rwx 1285 Mar 1 1993 00:01:24 +00:00 config.text

3 -rwx 43032 Mar 1 1993 00:01:24 +00:00 multiple-fs

4 -rwx 5 Mar 1 1993 00:01:24 +00:00 private-config.text

5 -rwx 11607161 Mar 1 1993 02:37:06 +00:00 c2960-lanbasek9-mz.150-2.SE.bin

32514048 bytes total (20859904 bytes free)

**[Report – 1Pts]** To initialize a switch back to its default settings, what other commands are needed?

Erase startupconfig

reload

delete vlan

1. [Report – 2Pts] Reflection
   1. What is needed to allow hosts on VLAN 10 to communicate to hosts on VLAN 20?

a router must be placed to communicate between the two vlans.

* 1. What are some primary benefits that an organization can receive through effective use of VLANs?

Better performance, improved security and easy implementation