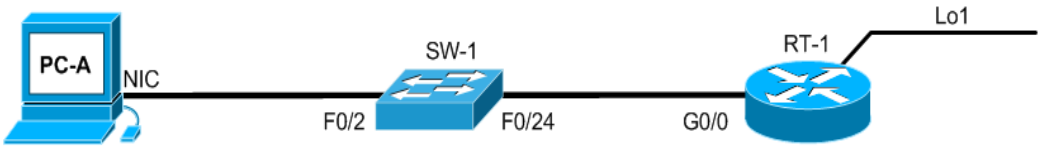
INFO-6047: Lab 04 – Vlan

Topology



Note:

1) The router in the topology above is a 2901 and the switch is a 2960 Layer 2
2) For the In-House students, you will be working on your own this week. (You can talk, help and work with each other, BUT you must build your own topology.)
3) For the On-Line students, you will have to build the lab in Packet Tracer.
4) You will find in the Lab section of FOL for this week a PowerPoint file and a text file (the text file is a copy of the router config in appendix A, please use this text file to copy from and past the configuration in to the router).
5) Please download these files, I have placed markers in the lab where you should do each capture, and specific port numbers in the addressing table and the topology…. This week it is important to follow the instruction and tables provided, or **things will not work!.**
6) Mgmt is a short form for Management, in this lab for the vlan name you can use the short or long name.
7) Keep your eye on the **IPv4 Addressing Table** below, there is **A-LOT** more information then has been provided in the past few weeks.

IPV4 Addressing Table

Device	interface	IP Address	Subnet Mask	Default Gateway	Ports	Vlan name
RT-1	G0/0	no address				
	G0/0.10	192.168.10.254	/24			
	G0/0.20	192.168.20.254	/24			
	G0/0.30	192.168.30.254	/24			
	G0/0.99	192.168.1.254	/24			
	Lo1	10.10.10.10	/32			
SW-1	Vlan 10				1 - 6	Student
	Vlan 20				7 - 12	Faculty
	Vlan 30				13 - 18	Server
	Vlan 99	192.168.1.253	/24	192.168.1.254	19 - 23	Mgmt
	Trunk				24	
PC-A	NIC	DHCP	DHCP	DHCP		

INFO-6047: Lab 04 – Vlan

Initial Setup

I would like to see each router and switch with the following:

Basic system config:

a) The time set on your devices (both the clock and the time zone).
b) Set the hostname
c) Set the enable password to "class".
d) Encrypt all passwords.
e) Disable domain name lookup.
f) Setup a banner.
g) Set the console and vty password to "cisco".
h) Setup synchronous logging on the console port.
i) Enable telnet and ssh on the vty ports

This is the same as we did last week **Basic System Config** a) through i).

By now you can see we are doing the above over and over again….. I hope you have figured out you should have a file with this stuff all ready in it, call it something like "my-startup-config.txt", and instead of finding the information each week all you need to do is open your file and copy the information and paste it into the device.

Setup the Network

a) Once you have decided which switch and router you will be using, please collaborate with your fellow students in you row/pod and make sure you are not using equipment that some one else may already be using!
PLEASE also check that your switches and routers are clean before you start!

b) Set the default gateway on the switch

```
SW-1(config)# ip default-gateway 192.168.1.254
SW-1(config)# exit
```

c) Setup your "PC" according to the Addressing Table (**for this week make sure you PC is setup to use DHCP**)

Your PC will be getting the address needed from a DHCP service on the router today. **For in class student** the action of moving the cable (as you will be asked to do later in the lab) will cause you PC-A to request a new IP address. **BUT for the on-line students** you will probably have to run the command "ipconfig /renew" to get your PC in the simulator to acquire a new IP address.

In the following watch the **prompt** and **prompt changes**…. It will let you know where you are. Then remember to back out with a "**exit**" at the end of the command sequence and watch the prompt change back to the previous level.

d) On the switch, we need to build several virtual networks (vlans) you will see a list in the "IPv4 Addressing table". To start setting up the vlans we will use the older way of putting the information into the config file for today, there are other methods, but please do this for today:
   i. Start by setting up the named for the vlans:
      i. `Sw-1(config)# vlan 10`
      ii. `Sw-1(config-vlan)# name Student`
   ii. Repeat this for each vlan in the "IPv4 Addressing table"

e) Now we can setup the ports, a list of ports in each valn can be found in the addressing table:
   i. There are a couple of different ways to complete this task:
      i. **Sw-1(config)# interface f0/1**
      ii. **Sw-1(config-if)# switchport mode access**
      iii. **Sw-1(config-if)# switchport access vlan 10**
   ii. Now you can repeat this over and over, adjusting the values for the interface and vlan (another **22** times).

   OR

   iii. As we have seen in the lectures there is a "**range**" command to reduce the number of commands we have to type:
      i. **Sw-1(config)# inter range f0/1-6**
      ii. **Sw-1(config-if-range)# switchport mode access**
      iii. **Sw-1(config-if-range)# switchport access vlan 10**
   iv. Yes, you need to repeat this command as well but only 3 more times instead of 22 times as in the section [e)->i.->**i.**,**ii.**,& **iii.**] above, you still need to adjust each of the 3 time for the range of ports and the vlan for each range as listed in the "IPv4 Addressing table".

f) We have setup the name for each vlan, we have set the ports on the switch to a vlan as described in the addressing table, now we need to actually enable or disable each valn. In this configuration we do not want to use vlan 1, **but you can not remove vlan 1**! All we can do is shut it down.
   i. To enable a vlan:
      i. **Sw-1(config)# inter vlan 10**
      ii. **Sw-1(config-if)# no shut**
   ii. To enable a vlan with and IPaddress:
      i. **Sw-1(config)# inter vlan 99**
      ii. **Sw-1(config-if)# ip add 192.168.1.253 255.255.255.0**
      iii. **Sw-1(config-if)# no shut**
   iii. To disable a vlan:
      i. **Sw-1(config)# inter vlan 1**
      ii. **Sw-1(config-if)# shutdown**
   iv. Repeat the appropriate steps above for any other vlans listed in the "IPv4 Addressing table" table

g) One thing left on the switch to do, that is setup the trunk on our 2960 switch
   i. Connect to the correct port:
      i. **Sw-1(config)# inter fa 0/24**
      ii. **Sw-1(config-if)# switchport mode trunk**

h) Now as with some of the past weeks we need the router to get this lab to work, again there is an "Appendix A" with the configuration for the router. I have included a text file in the Lab area on FOL for this week. Please move your console cable over to the router (or open the CLI if your on-line) that you will be using today, make sure it is clean, and copy the content of the "router-config.txt" file into the 2901 router.

i) Connect up the ethernet cables needed to match the connection in the Topology on page 1

j) If you have completed all the steps above, from your pc:

(PowerPoint – Capture 1)

NOTE:

The first time you ping something on a network, if the arp table has not seen the addresses you are trying to reach Pings may fail! (you saw this in the lab from last week)
Please try a second time before you give up and think that there is a problem.

k) **Can you do the two pings in the *(PowerPoint – Capture 1)* above?**
If not, you need to do some debugging and fixing… go back and figure out what is not right.
If you can "GREAT!" go on with the rest of the lab.

(PowerPoint – Capture 2)

(PowerPoint – Capture 3)

(PowerPoint – Capture 4)

(PowerPoint – Capture 5)

l) Now move the cable, from the PC, that connects to the switch, that is on vlan 10 to a port on vlan 20

(PowerPoint – Capture 6)

m) Now move the cable, from the PC, that connects to the switch, that is on vlan 20 to a port on vlan 30

(PowerPoint – Capture 7)

n) Now move the cable, from the PC, that connects to the switch, that is on vlan 30 to a port on vlan 99

(PowerPoint – Capture 8)

o) Finally, back to the original vlan, move the cable on the switch from the PC that is on vlan 99 back to a port on vlan 10 (switch port fastethernet 0/2)

(PowerPoint – Capture 9)

p) To prove that the vlans on a layer 2 switch are private from each other, un-plug the ethernet cable from the router at G0/0.

(PowerPoint – Capture 10)

That's it for today.

Clean out the configurations on the switches and routers you used this week.
Don't forget to collect your cables.
Then cleanup your workstations

Don't forget to start the quiz before the cut off time!

Appendix - A

```
enable
clock set 12:10:00 14 May 2018
configure terminal
clock timezone EST -5
hostname RT-1
service password-encryption
enable secret class
no ip domain-lookup
ip domain-name fanshawe.local
username admin privilege 15 secret sshadmin
ip dhcp excluded-address 192.168.1.1 192.168.1.30
ip dhcp excluded-address 192.168.1.200 192.168.1.254
ip dhcp excluded-address 192.168.10.1 192.168.10.30
ip dhcp excluded-address 192.168.10.200 192.168.10.254
ip dhcp excluded-address 192.168.20.1 192.168.20.30
ip dhcp excluded-address 192.168.20.200 192.168.20.254
ip dhcp excluded-address 192.168.30.1 192.168.30.30
ip dhcp excluded-address 192.168.30.200 192.168.30.254
ip dhcp pool mgmt
 network 192.168.1.0 255.255.255.0
 default-router 192.168.1.254
 dns-server 8.8.8.8
 domain-name fanshawe.local
ip dhcp pool student
 network 192.168.10.0 255.255.255.0
 default-router 192.168.10.254
 dns-server 8.8.8.8
 domain-name fanshawe.local
ip dhcp pool faculty
 network 192.168.20.0 255.255.255.0
 default-router 192.168.20.254
 dns-server 8.8.8.8
 domain-name fanshawe.local
ip dhcp pool Server
 network 192.168.30.0 255.255.255.0
 default-router 192.168.30.254
 dns-server 8.8.8.8
 domain-name fanshawe.local
exit
inter g0/0
 no ip add
 no shut
inter g0/0.1
 description Management network
 encapsulation dot1q 99
 ip add 192.168.1.254 255.255.255.0
 no shut
inter g0/0.10
 description Student network
 encapsulation dot1q 10
 ip add 192.168.10.254 255.255.255.0
 no shut
inter g0/0.20
 description Faculty network
 encapsulation dot1q 20
 ip add 192.168.20.254 255.255.255.0
 no shut
inter g0/0.30
 description Server network
 encapsulation dot1q 30
 ip add 192.168.30.254 255.255.255.0
 no shut
inter lo1
 ip add 10.10.10.10 255.255.255.255
 no shut
exit
banner motd #
Unauthorized access is strictly prohibited. #
line con 0
 password cisco
 login
 logging synchronous
 exec-timeout 240
 exit
line vty 0 15
 password cisco
 login local
 transport input all
 exec-timeout 240
 exit
crypto key generate rsa
1024
```