Lab 7

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Summary

This lab teaches us how to use the Cisco IOS XE and to configure static Ethernet interfaces on Cisco switches. Firstly, we set up a VLAN using a static IP set on the odd number computers, and test the system using wireshark on the even numbered computer.

Then the next experiment is setting up DHCP to set dynamic IP addresses for the even numbered computer.

We test this also using Wireshark and look at the 4way handshaking process while restarting the network.

Exercise 1 - VLAN

Task 1: Include the output of

a) 1. Show run:

co2016-9300-12#show vlan											
	VLAN	LAN Name					tus	s Ports			
	1	default			acti		Gil/0/1, Gil/0/2, Gil/0/3 Gil/0/4, Gil/0/5, Gil/0/6 Gil/0/7, Gil/0/8, Gil/0/9 Gil/0/10, Gil/0/11, Gil/0/12 Gil/0/13, Gil/0/14, Gil/0/15 Gil/0/16, Gil/0/17, Gil/0/18 Gil/0/19, Gil/0/20, Gil/0/21 Gil/0/22, Gil/0/23, Gil/0/24 Apl/0/1				
	1003 1004	lab7 fddi-default token-ring-default fddinet-default trnet-default					active act/unsup act/unsup act/unsup act/unsup act/unsup				
	 1 50		SAID 100001 100050 101002	MTU 1500 1500 1500	Parent - -	RingNo - -	Bridge - -	No Stp 	BrdgMode - -	Trans1 0 0	Trans2 0 0 0

2) show vlan

```
co2016-9300-12#show run
Building configuration...
Current configuration : 9813 bytes
! Last configuration change at 15:30:06 UTC Mon Oct 23 2023 by admin
version 16.12
no service pad
service timestamps debug datetime msec
service timestamps log datetime msec
service password-encryption
service call-home
no platform punt-keepalive disable-kernel-core
hostname co2016-9300-12
vrf definition Mgmt-vrf
address-family ipv4
exit-address-family
address-family ipv6
exit-address-family
--More--
```

```
interface Vlan50
  ip address 10.0.50.1 255.255.255.0
!
ip default-gateway 192.168.254.254
ip forward-protocol nd
ip http server
ip http authentication local
ip http secure-server
ip ssh authentication-retries 2
ip ssh version 2
```

Task 2: Include the output of

1) show run

```
!
interface Loopback0
  no ip address
!
interface GigabitEthernet0/0
  vrf forwarding Mgmt-vrf
  ip address 192.168.77.112 255.255.255.0
  negotiation auto
!
interface GigabitEthernet1/0/1
  switchport access vlan 50
  switchport mode access
!
interface GigabitEthernet1/0/2
!
interface GigabitEthernet1/0/2
!
```

2) show vlan

We see that in the previous screenshot Gi 1/0/1 was under Vlan1, but after we changed configuration in the other system, running show vlan will show Gi 1/0/1 under lab7.

```
co2016-9300-12#show vlan
VLAN Name
                                                           Status Ports
                                                           active Gil/0/2, Gil/0/3, Gil/0/4, Gil/0/5, Gil/0/6, Gil/0/7, Gil/0/8, Gil/0/9, Gil/0/10 Gil/0/11, Gil/0/12, Gil/0/13, Gil/0/14, Gil/0/15, Gil/0/16, Gil/0/17, Gil/0/18 Gil/0/19, Gil/0/20, Gil/0/21, Gil/0/22, Gil/0/23, Gil/0/24, Apl/0/1
    default
G1/0/19
50 lab7 active Gil/0/1
1002 fddi-default act/unsup
1003 token-ring-default act/unsup
1004 fddinet-default act/unsup
1005 trnet-default act/unsup
                            MTU Parent RingNo BridgeNo Stp BrdgMode Trans1 Trans2
VLAN Type SAID
1 enet 100001
50 enet 100050
1002 fddi 101002
1003 tr
                101003
                                  1500
                                                                        ieee -
ibm -
1004 fdnet 101004
                                  1500
1005 trnet 101005
Remote SPAN VLANs
Primary Secondary Type
                                                        Ports
```

Task 3)

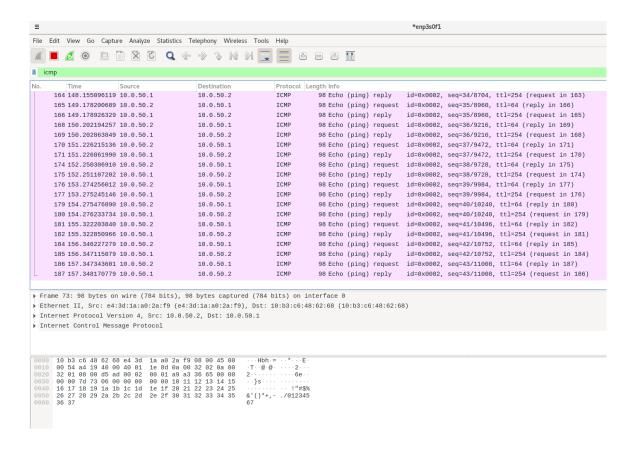
1) Ping the VLAN50's address front the terminal of the even numbered PC

```
[489labuser@co2061-24 ~]$ ping 10.0.50.1
PING 10.0.50.1 (10.0.50.1) 56(84) bytes of data.
64 bytes from 10.0.50.1: icmp_seq=2 ttl=254 time=1.11 ms
64 bytes from 10.0.50.1: icmp_seq=3 ttl=254 time=0.996 ms
64 bytes from 10.0.50.1: icmp_seq=4 ttl=254 time=0.999 ms
64 bytes from 10.0.50.1: icmp_seq=5 ttl=254 time=1.04 ms
^C
--- 10.0.50.1 ping statistics ---
5 packets transmitted, 4 received, 20% packet loss, time 4015ms
rtt min/avg/max/mdev = 0.996/1.034/1.106/0.044 ms
[489labuser@co2061-24 ~]$
```

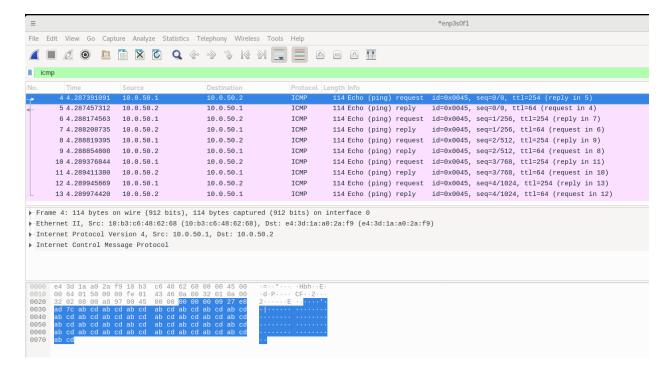
2) ping the even numbered PC from the switch

```
co2016-9300-12#ping 10.0.50.2
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.0.50.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
co2016-9300-12#
```

Task 4)Pinging 10.0.50.1 from the even computer and filtering out ICMP on wireshark gives the result



Below shows ping sent from an odd computer switch to even computer.



What difference, if any, do you observe between the pings sent from (and received by) the even computer to your CISCO switch?

The difference between the 2 will be the source and destination address.

For the first screenshot we ping the switch from the even computer, so the source will be 10.0.50.2, and once that is received by the switch, the even computer gets an ACK from the switch (10.0.50.1).

In the next screenshot, the process will be flipped.

Exercise 2 - DHCP

Task 5: Include the output of

1) show run

```
ip domain name ece.iastate.edu
ip dhcp excluded-address 10.0.50.1
ip dhcp excluded-address 10.0.50.2
ip dhcp excluded-address 10.0.50.3
ip dhcp excluded-address 10.0.50.254
ip dhcp excluded-address 10.0.50.1 10.0.50.3
!
ip dhcp pool VLAN50
network 10.0.50.0 255.255.255.0
default-router 10.0.50.1
dns-server 4.8.9.50
lease 0 2
!
!
login on-success log
!
```

Task 6: Provide a screenshot that demonstrates the final IP address from your computer was truly selected from the DHCP pool. (10 points)

```
enp3s0f1: flags=4163<UP,
inet 10.0.50.2
```

Above is the static IP set before, for the even computer.

Below is the new Dynamic IP set after we set configured interface enp3s0f1 to accept DHCP information.

```
enp3s0f1: flags=-28605<UP,BROADCAST,RUNNING,MULTICAST,DYNAMIC> mtu 1500 inet 10.0.50.4 netmask 255.255.255.0 broadcast 10.0.50.255 inet6 fe80::e63d:laff:fea0:2af9 prefixlen 64 scopeid 0x20link> ether e4:3d:la:a0:2a:f9 txqueuelen 1000 (Ethernet) RX packets 616 bytes 52432 (51.2 KiB) RX errors 0 dropped 0 overruns 0 frame 0 TX packets 78 bytes 11839 (11.5 KiB) TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0 device interrupt 17
```

Task 7: Take a screenshot of the applicable packet serves.

Comment on your observation of these packets and the purpose you believe each of these packets serves

```
41 30.302749286 0.0.0.0 255.255.255 DHCP 351 DHCP Discover - Transaction ID 0x50e2b61d
42 30.303750906 10.0.50.1 10.0.50.4 DHCP 342 DHCP Offer - Transaction ID 0x50e2b61d
43 30.303969870 0.0.0.0 255.255.255 DHCP 357 DHCP Request - Transaction ID 0x50e2b61d
44 30.305040884 10.0.50.1 10.0.50.4 DHCP 342 DHCP ACK - Transaction ID 0x50e2b61d
```

The above is a snippet from wireshark, as we restart the network using nmcli networking off and on, we see a DHCP 4-way handshake executing. As we saw in task 7, using DHCP, the dynamic address is 10.50.0.4.

Task 8: Take a final snapshot of your list of commands

```
call-home
! If contact email address in call-home is configured as sch-smart-licensing@cisco.com
! the email address configured in Cisco Smart License Portal will be used as contact email address to send SCH notifications. contact-email-addr sch-smart-licensing@cisco.com
profile "CiscoTAC-1"
    active
    destination transport-method http
    no destination transport-method email
ip routing
!
!
!
!
!
!
!
!
!
!
! op domain name ece.iastate.edu
!
!
!
```

Above is the new output when we run "show run". We remove the dhcp settings by adding no to all the commands that we ran in conf terminal.

For example:

```
no ip dhcp excluded-address 10.0.50.1 10.0.50.3 no ip dhcp pool VLAN50
```

This will remove all the rules set by us. Below we see the old output while setting up DHCP

```
call-home
! If contact email address in call-home is configured as sch-smart-licensing@cisco.com
! the email address configured in Cisco Smart License Portal will be used as contact email address to send SCH notifications.
contact-email-addr sch-smart-licensing@cisco.com
profile "ciscoTAC-1"
active
destination transport-method http
no destination transport-method email
ip routing
!
!
!
!
!
! domain name ece.iastate.edu
ip dhop excluded-address 10.0,50.1
ip dhop excluded-address 10.0,50.2
ip dhop excluded-address 10.0,50.3
ip dhop excluded-address 10.0,50.254
ip dhop excluded-address 10.0,50.1
!
! dhop excluded-address 10.0,50.1
!
! dhop pool VLAN50
network 10.0,50.0 255.255.255.0
default-router 10.0,50.1
dns-server 4.8.9.50
lease 0 2
!
!
!
!
!
! login on-success log
```