

Objectives:

- Whether or not your network will benefit from switching.
- To know how you add switches to your network design for the most benefit.

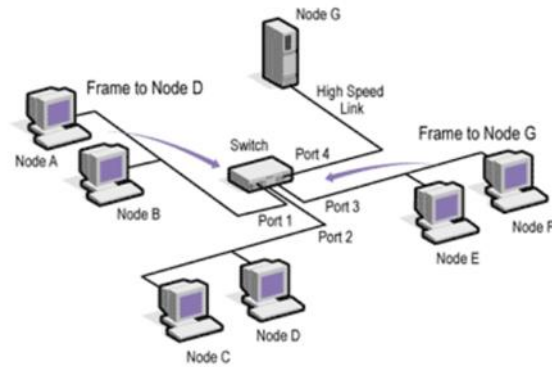
Introduction

Organizations use networks to support their applications in an effective and efficient way. While adding new users to the network, applications with high bandwidth and high capability computers can cause the network to slow down.

There are many LAN technologies but ethernet networks are the most used which are based on a single segment topology which means only one user at a time can access the bus where stations are connected physically to it using a hub making a broadcast domain. Stations are in a half-duplex mode which means they can only send or receive at one time but not at the same time. Moreover, it's a shared medium meaning if something is sent it sent to all PCs on the network. Collisions can occur because of traffic it's when data is sent from two stations at the same time and the collided data must be retransmitted again which will cause more traffic. Performance starts to get lower with congestion as the network gets larger, which is a common case nowadays, switches are one solution to segment networks.

The MAC address is a unique address for every single network adapter which is given by the manufacturer. The form of the MAC address is MM:MM:MM: SS: SS: SS the first half of the address which is MM is the manufacturer ID while the other half which is SS is the serial number given to each adapter. The MAC address is fixed and can't be modified while the IP address changes when a device goes from one network to another.

Switching hubs are devices used to perform filtering and forwarding frames between local area network segments. Based on the destination address of the packet switches decide where to send network traffic which reduced congestion. Switches are considered data link layer devices (layer 2) since they forward operations by evaluating the destination MAC address in the frame and switching the individual frames to the correct port.



A repeater hub is a device used to extend the reach of the network by repeating the signal for segments using only the same LAN technology and data rate. It sends the packet to all PCs on the segment. On the other hand, a bridge is a device that connects two segments of the same LAN or connects two LANs that use the same protocol. If a packet on one LAN is intended for a destination on an interconnected LAN, the bridge forwards the packet to that LAN; otherwise, it passes it along on the same LAN. The main difference or advantage for switches over the bridge is the bridges have 2 ports only while switches can have 12, 24 or 48 ports which allows them to have more complex architecture inside them to allow multiple conversations to simultaneously occur between ports of the hub.

Procedures

Step 1- setting up an IP address and pinging the switch.

```

C:\Users\Lab>ipconfig

Windows IP Configuration

Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix  . : 
    Link-local IPv6 Address . . . . . : fe80::14c0:cbaf:61f5:a933%11
    IPv4 Address. . . . . : 140.30.20.13
    Subnet Mask . . . . . : 255.255.0.0
    Default Gateway . . . . . : 

Tunnel adapter 6T04 Adapter:

    Connection-specific DNS Suffix  . : 
    IPv6 Address. . . . . : 2002:8c1e:140d::8c1e:140d
    Default Gateway . . . . . : 

Tunnel adapter isatap.{9C9D02A2-28B8-4E6C-8453-9B5000762000}:

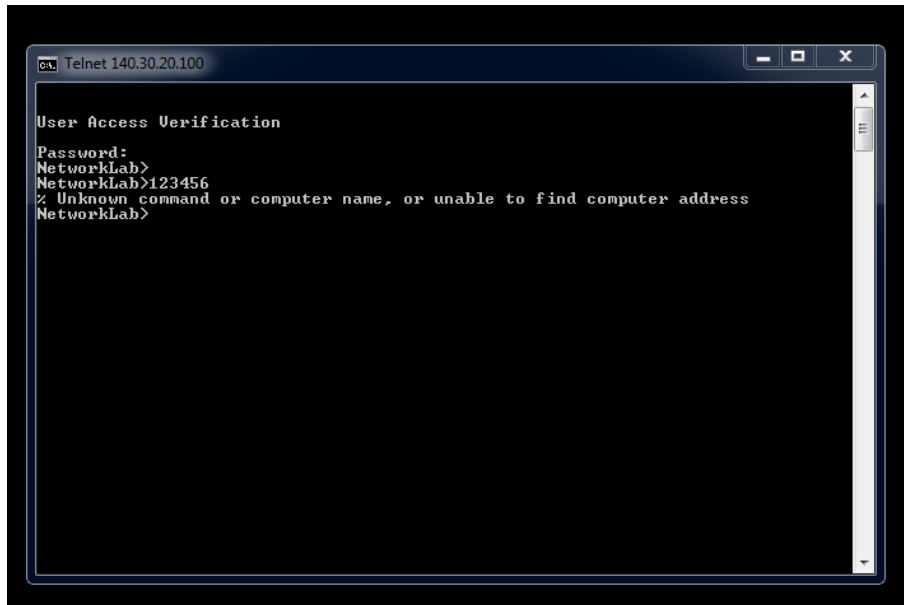
    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . : 

C:\Users\Lab>ping

Usage: ping [-t] [-a] [-n count] [-l size] [-f] [-i TTL] [-v TOS]
           [-r count] [-s count] [[-j host-list] | [-k host-list]]
           [-w timeout] [-R] [-S srcaddr] [-4] [-6] target_name
  
```

- In this step we set up IP address **140.30.20.13** to access the switch.

Step 2- we use telnet to login to the switch & show mac address.



```
Telnet 140.30.20.100

User Access Verification
Password:
NetworkLab>123456
% Unknown command or computer name, or unable to find computer address
NetworkLab>
```

- In this step we used **telnet** and added the IP address to connect it

```

C:\ Telnet 140.30.20.100

User Access Verification

Password:
NetworkLab>enable
Password:
NetworkLab#show mac add
          Mac Address Table
-----
Vlan      Mac Address      Type      Ports
-----
All       0100.0ccc.cccc   STATIC    CPU
All       0100.0ccc.cccd   STATIC    CPU
All       0180.c200.0000   STATIC    CPU
All       0180.c200.0001   STATIC    CPU
All       0180.c200.0002   STATIC    CPU
All       0180.c200.0003   STATIC    CPU
All       0180.c200.0004   STATIC    CPU
All       0180.c200.0005   STATIC    CPU
All       0180.c200.0006   STATIC    CPU
All       0180.c200.0007   STATIC    CPU
All       0180.c200.0008   STATIC    CPU
All       0180.c200.0009   STATIC    CPU
All       0180.c200.000a   STATIC    CPU
All       0180.c200.000b   STATIC    CPU
All       0180.c200.000c   STATIC    CPU
All       0180.c200.000d   STATIC    CPU
All       0180.c200.000e   STATIC    CPU
All       0180.c200.000f   STATIC    CPU
All       0180.c200.0010   STATIC    CPU
All       ffff.ffff.ffff   STATIC    CPU
1         b083.fe50.3d3b   DYNAMIC   Fa0/2
1         b083.fe50.3f9a   DYNAMIC   Fa0/5
1         b083.fe50.d78f   DYNAMIC   Fa0/12
1         b083.fe50.fadf   DYNAMIC   Fa0/6
1         b083.fe60.5c1b   DYNAMIC   Fa0/10
1         b083.fe60.5c3e   DYNAMIC   Fa0/24
1         b083.fe60.6605   DYNAMIC   Fa0/7
1         b083.fe60.dc87   DYNAMIC   Fa0/3
1         b083.fe60.e035   DYNAMIC   Fa0/4
1         c81f.6603.cffc   DYNAMIC   Fa0/9
Total Mac Addresses for this criterion: 30
NetworkLab#

```

- After we access the telnet command we used the **show mac address-table** command to verify which port that machine is connected to on the switch.

Step 3- Configuring the switch & Show interface Fast Ethernet

```

C:\Users\Lab>ipconfig/all

Windows IP Configuration

Host Name . . . . . : Group7
Primary Dns Suffix . . . . . :
Node Type . . . . . : Hybrid
IP Routing Enabled . . . . . : No
WINS Proxy Enabled . . . . . : No

Ethernet adapter Local Area Connection:

Connection-specific DNS Suffix . . :
Description . . . . . : Realtek PCIe GBE Family Controller
Physical Address. . . . . : 88-83-FE-60-E0-35
DHCIP Enabled . . . . . : No
Autoconfiguration Enabled . . . . : Yes
Link-local IPv6 Address . . . . . : fe80::14c0:cbaf:61f5:a933%11(Preferred)
IPv4 Address. . . . . : 140.30.20.13(Preferred)
Subnet Mask . . . . . : 255.255.0.0
Default Gateway . . . . . :
DHCIPv6 IRIID . . . . . : 246449150
DHCIPv6 Client DUID . . . . . : 00-01-00-01-1E-5A-DF-E3-B0-83-FE-60-E0-35

DNS Servers . . . . . : fec0:0:0:ffff::1%1
                        fec0:0:0:ffff::2%1
                        fec0:0:0:ffff::3%1
NetBIOS over Tcpip. . . . . : Enabled

Tunnel adapter 6T04 Adapter:

Connection-specific DNS Suffix . . :
Description . . . . . : Microsoft 6to4 Adapter
Physical Address. . . . . : 00-00-00-00-00-00-E0
DHCIP Enabled . . . . . : No
Autoconfiguration Enabled . . . . : Yes
IPv6 Address. . . . . : 2002:8c1e:140d::8c1e:140d(Preferred)
Default Gateway . . . . . :
DNS Servers . . . . . : fec0:0:0:ffff::1%1
                        fec0:0:0:ffff::2%1
                        fec0:0:0:ffff::3%1
NetBIOS over Tcpip. . . . . : Disabled

Tunnel adapter isatap.{9C9D02A2-28B8-4E6C-8453-9B5000762000}:

Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . . :
Description . . . . . : Microsoft ISATAP Adapter
Physical Address. . . . . : 00-00-00-00-00-00-E0
DHCIP Enabled . . . . . : No
Autoconfiguration Enabled . . . . : Yes

```

- In this step we will use **show interface fast Ethernet** to display all configuring details regarding this command
- We used **duplex half** and **speed** to change the value and the speed.
- We used **show interface fast Ethernet status** to get the transmitted data of the speed which is 10/100 base TX in duplex half.

```

C:\Telnet 140.30.20.100>

Last input never, output never, output hang never
Last clearing of "show interface" counters never
Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
Queueing strategy: fifo
Output queue: 0/40 (size/max)
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
0 packets input, 0 bytes, 0 no buffer
Received 0 broadcasts (0 multicasts)
0 runs, 0 giants, 0 throttles
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
0 watchdog, 0 multicast, 0 pause input
0 input packets with dribble condition detected
0 packets output, 0 bytes, 0 underruns
0 output errors, 0 collisions, 1 interface resets
0 unknown protocol drops
0 babbles, 0 late collision, 0 deferred
0 lost carrier, 0 no carrier, 0 pause output
0 output buffer failures, 0 output buffers swapped out
FastEthernet0/17 is down, line protocol is down (notconnect)
Hardware is Fast Ethernet, address is 005f.86bc.2791 (bia 005f.86bc.2791)
MTU 1500 bytes, BW 10000 Kbit/sec, DLY 1000 usec,
reliability 255/255, txload 1/255, rxload 1/255
Encapsulation ARPA, loopback not set
Keepalive set (10 sec)
Auto-duplex, Auto-speed, media type is 10/100BaseTX
input flow-control is off, output flow-control is unsupported
ARP type: ARPA, ARP Timeout 04:00:00
Last input never, output never, output hang never
Last clearing of "show interface" counters never
Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
Queueing strategy: fifo
Output queue: 0/40 (size/max)
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
0 packets input, 0 bytes, 0 no buffer
Received 0 broadcasts (0 multicasts)
0 runs, 0 giants, 0 throttles
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
0 watchdog, 0 multicast, 0 pause input
0 input packets with dribble condition detected
0 packets output, 0 bytes, 0 underruns
0 output errors, 0 collisions, 1 interface resets
0 unknown protocol drops
0 babbles, 0 late collision, 0 deferred
0 lost carrier, 0 no carrier, 0 pause output
0 output buffer failures, 0 output buffers swapped out
FastEthernet0/18 is down, line protocol is down (notconnect)
Hardware is Fast Ethernet, address is 005f.86bc.2792 (bia 005f.86bc.2792)
MTU 1500 bytes, BW 10000 Kbit/sec, DLY 1000 usec,
reliability 255/255, txload 1/255, rxload 1/255
Encapsulation ARPA, loopback not set
Keepalive set (10 sec)
Auto-duplex, Auto-speed, media type is 10/100BaseTX
input flow-control is off, output flow-control is unsupported
ARP type: ARPA, ARP Timeout 04:00:00
Last input never, output never, output hang never
Last clearing of "show interface" counters never
Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
Queueing strategy: fifo
Output queue: 0/40 (size/max)
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
0 packets input, 0 bytes, 0 no buffer
Received 0 broadcasts (0 multicasts)
0 runs, 0 giants, 0 throttles
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
0 watchdog, 0 multicast, 0 pause input

```

```

C:\Telnet 140.30.20.100>

Hardware is Fast Ethernet, address is 005f.86bc.278a (bia 005f.86bc.278a)
MTU 1500 bytes, BW 1000000 Kbit/sec, DLY 100 usec,
reliability 255/255, txload 1/255, rxload 1/255
Encapsulation ARPA, loopback not set
Keepalive set (10 sec)
Full-duplex, 100Mb/s, media type is 10/100BaseTX
input flow-control is off, output flow-control is unsupported
ARP type: ARPA, ARP Timeout 04:00:00
Last input never, output 00:00:01, output hang never
Last clearing of "show interface" counters never
Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
Queueing strategy: fifo
Output queue: 0/40 (size/max)
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
416 packets input, 42423 bytes, 0 no buffer
Received 368 broadcasts (247 multicasts)
0 runs, 0 giants, 0 throttles
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
0 watchdog, 247 multicast, 0 pause input
0 input packets with dribble condition detected
3670 packets output, 601264 bytes, 0 underruns
0 output errors, 0 collisions, 1 interface resets
0 unknown protocol drops
0 babbles, 0 late collision, 0 deferred
0 lost carrier, 0 no carrier, 0 pause output
0 output buffer failures, 0 output buffers swapped out
FastEthernet0/11 is up, line protocol is up (connected)
Hardware is Fast Ethernet, address is 005f.86bc.278b (bia 005f.86bc.278b)
MTU 1500 bytes, BW 1000000 Kbit/sec, DLY 100 usec,
reliability 255/255, txload 1/255, rxload 1/255
Encapsulation ARPA, loopback not set
Keepalive set (10 sec)
Full-duplex, 100Mb/s, media type is 10/100BaseTX
input flow-control is off, output flow-control is unsupported
ARP type: ARPA, ARP Timeout 04:00:00
Last input never, output 00:00:00, output hang never
Last clearing of "show interface" counters never
Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
Queueing strategy: fifo
Output queue: 0/40 (size/max)
5 minute input rate 2000 bits/sec, 2 packets/sec
183 packets input, 38724 bytes, 0 no buffer
Received 145 broadcasts (0 multicasts)
0 runs, 0 giants, 0 throttles
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored

NetworkLab#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
NetworkLab(config)#interface f
NetworkLab(config)#int
NetworkLab(config)#int fast
NetworkLab(config)#int fastEthernet 0/9
NetworkLab(config-if)#speed 10
NetworkLab(config-if)#duplex
% Incomplete command.

NetworkLab(config-if)#duplex half
NetworkLab(config-if)#Z
NetworkLab#show int
NetworkLab#show interfaces fas
NetworkLab#show interfaces fastEthernet 0/9 status

Port      Name      Status      Vlan      Duplex  Speed Type
Fa0/9     NetworkLab# connected  1          half     10 10/100BaseTX

```

Step 4- ping the address & Arp.

- In this step we ping the address **140.30.20.20** to get a response and we used Arp to get all the connected devices.

```
telnet 140.30.20.100
All 0180.c200.0008 STATIC CPU
All 0180.c200.0009 STATIC CPU
All 0180.c200.000a STATIC CPU
All 0180.c200.000b STATIC CPU
All 0180.c200.000c STATIC CPU
All 0180.c200.000d STATIC CPU
All 0180.c200.000e STATIC CPU
All 0180.c200.000f STATIC CPU
All 0180.c200.0010 STATIC CPU
All ffff.ffff.ffff STATIC CPU
1 0025.1125.a0a1 DYNAMIC Fa0/11
1 b083.fe50.3d3b DYNAMIC Fa0/2
1 b083.fe50.3f9a DYNAMIC Fa0/5
1 b083.fe50.c577 DYNAMIC Fa0/8
1 b083.fe50.d78f DYNAMIC Fa0/12
1 b083.fe50.fadf DYNAMIC Fa0/6
1 b083.fe60.5c1b DYNAMIC Fa0/10
1 b083.fe60.6605 DYNAMIC Fa0/7
1 b083.fe60.dc87 DYNAMIC Fa0/3
1 b083.fe60.e035 DYNAMIC Fa0/4
1 c81f.6603.cffe DYNAMIC Fa0/9
Total Mac Addresses for this criterion: 31
Test#
Test#
Test#
```

```
Command Prompt
Pinging 140.30.20.20 with 32 bytes of data:
Reply from 140.30.20.20: bytes=32 time=1ms TTL=128
Reply from 140.30.20.20: bytes=32 time=1ms TTL=128
Reply from 140.30.20.20: bytes=32 time=1ms TTL=128
Reply from 140.30.20.20: bytes=32 time=1ms TTL=128

Ping statistics for 140.30.20.20:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

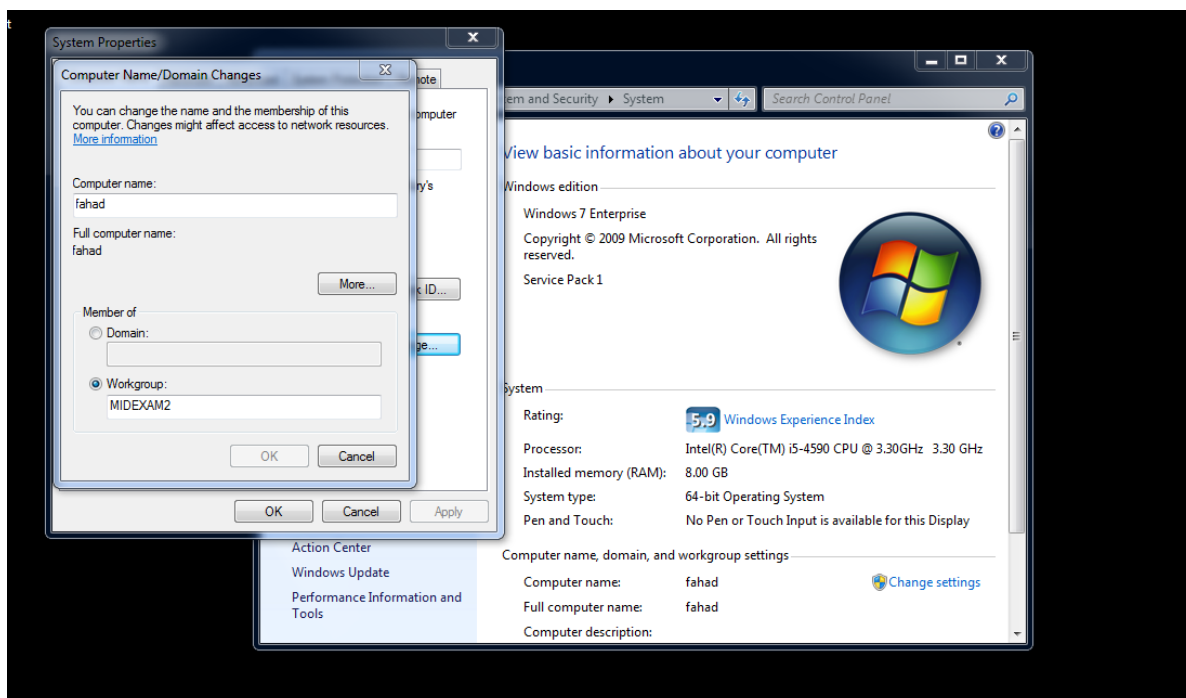
C:\Users\Lab>arp -a

Interface: 140.30.20.13 --- 0xb
Internet Address      Physical Address      Type
140.30.20.20          b0-83-fe-60-66-05    dynamic
140.30.20.40          c8-1f-66-03-cf-fc    dynamic
140.30.20.100         00-5f-06-bc-27-e0    dynamic
140.30.255.255        ff-ff-ff-ff-ff-ff    static
224.0.0.22            01-00-5e-00-00-16    static
224.0.0.252           01-00-5e-00-00-fc    static
239.255.255.250       01-00-5e-7f-ff-fa    static

C:\Users\Lab>
```

Step 5- changing the computer name.

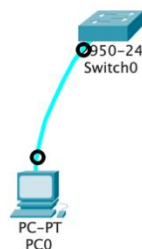
- In this step we change the computer name by going to the **system properties** and restarting the device.



(Packet tracer part)

Step 1- Accessing the switch.

- We access the switch by **enable** then we use **configure** the terminal and change the host name by **hostname lab4**.
- Int clan 1 used to config-if and enter the Ip address.



```
PC0
Physical Config Desktop Programming Attributes

Terminal
Cisco IOS Software, C2900 Software (C2900-UNIVERSAL-K9), Version 12.2(25)FX, RELEASE SOFTWARE (rc1)
Copyright (c) 1986-2005 by Cisco Systems, Inc.
Compiled Wed 12-Oct-05 22:05 by pt_team

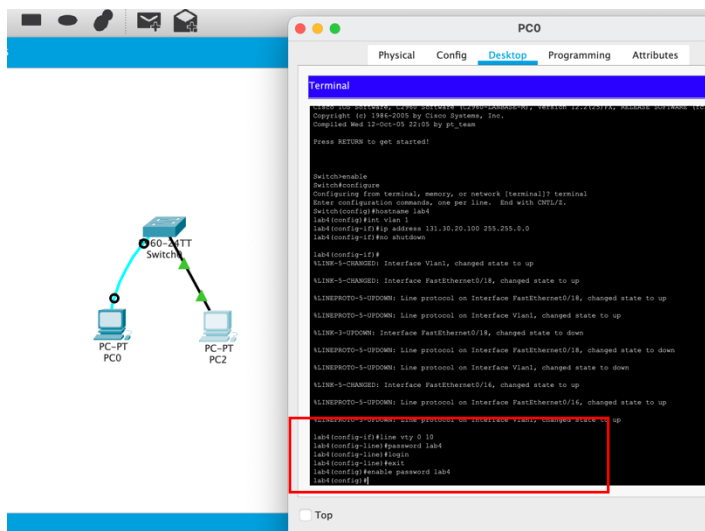
Press RETURN to get started!

Switch>enable
Switch#configure
Configuring from terminal, memory, or network [terminal]? terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname lab4
lab4(config)#int vlan 1
lab4(config-if)#ip address 131.30.20.100 255.255.0.0
lab4(config-if)#no shutdown

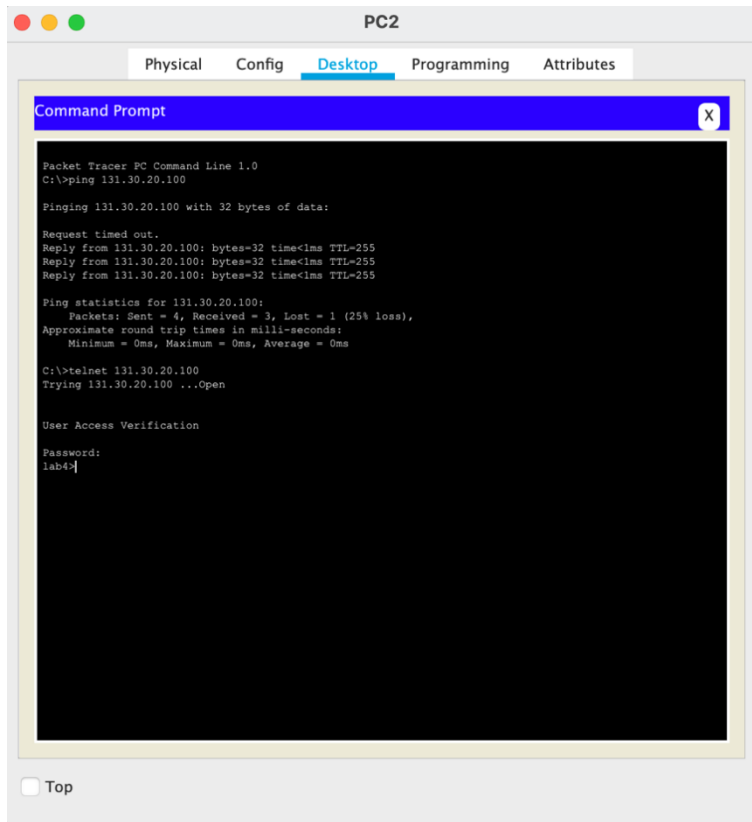
lab4(config-if)#
%LINK-5-CHANGED: Interface Vlan1, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/18, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/18, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state to up
%LINK-3-UPDOWN: Interface FastEthernet0/18, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/18, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state to down
%LINK-5-CHANGED: Interface FastEthernet0/16, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/16, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state to up

lab4(config-if)#line vty 0 10
lab4(config-line)#password lab4
lab4(config-line)#login
lab4(config-line)#exit
lab4(config)#enable password lab4
lab4(config)#
```

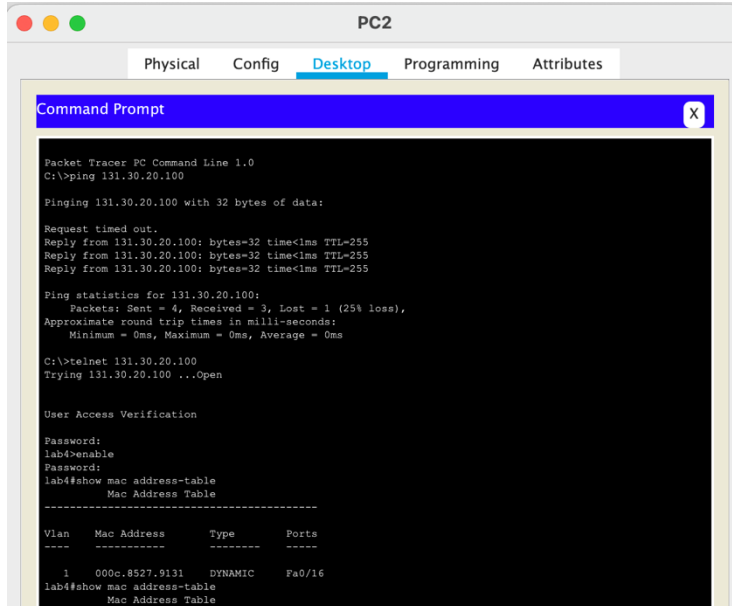
Step 2- Accessing the switch using telnet.



- We add another pc and use **line vet** to enter the config-line and login and exit with enable password.

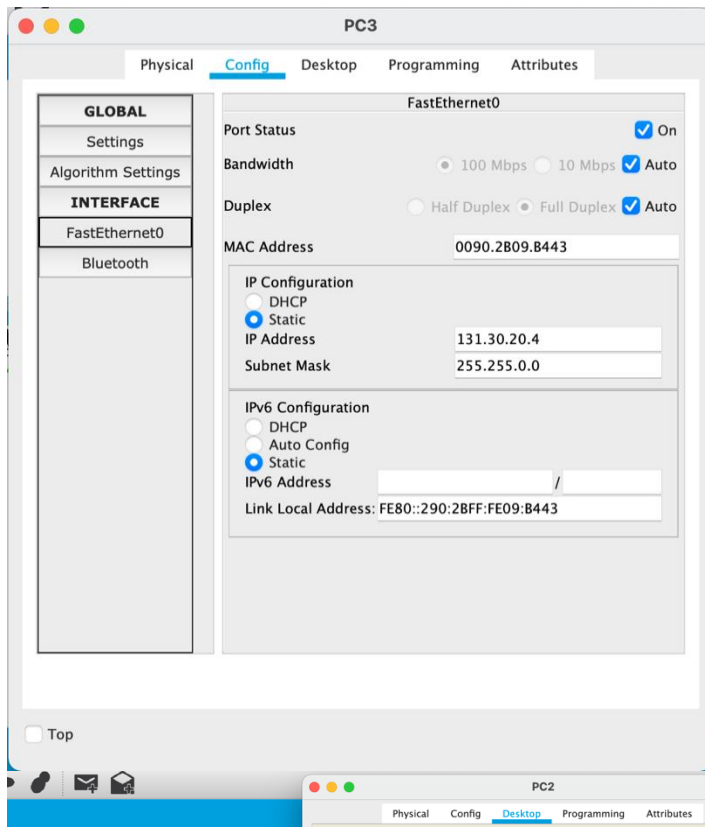


- After adding the new pc, we **ping** the switch and **telnet** to access.

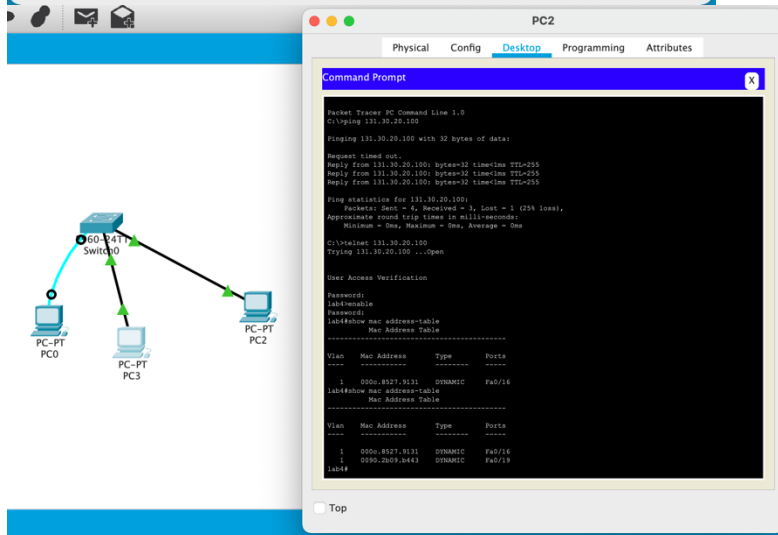


- After accessing the telnet, we use **show mac address-table** to see the pc connected.

Step 3- Accessing the switch using telnet.



- We add a **third pc** and **ping** it the use **telnet** and **show mac address** to see the connecting devices.



Step 4- configuring the speed and duplex with telnet.

- In this step we use **config, interface fast Ethernet 0/16 commands** to configure the interface duplex and speed.
- We used the second figure **interface fast Ethernet 0/16 status** to display the duplex and speed.
- Finally in this step we set the **duplex to full** and the **speed to 10**.

```
lab4>
lab4>enable
Password:
lab4#show inte
lab4#show interfaces f
lab4#show interfaces fastEthernet 0/16
FastEthernet0/16 is up, line protocol is up (connected)
  Hardware is Lance, address is 0010.11dd.de10 (bia 0010.11dd.de10)
  BW 100000 Kbit, DLY 1000 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  Full-duplex, 100Mb/s
  input flow-control is off, output flow-control is off
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:08, output 00:00:05, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue :0/40 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
    956 packets input, 193351 bytes, 0 no buffer
    Received 956 broadcasts, 0 runts, 0 giants, 0 throttles
    0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
    0 watchdog, 0 multicast, 0 pause input
    0 input packets with dribble condition detected
  2357 packets output, 263570 bytes, 0 underruns
--More--
```

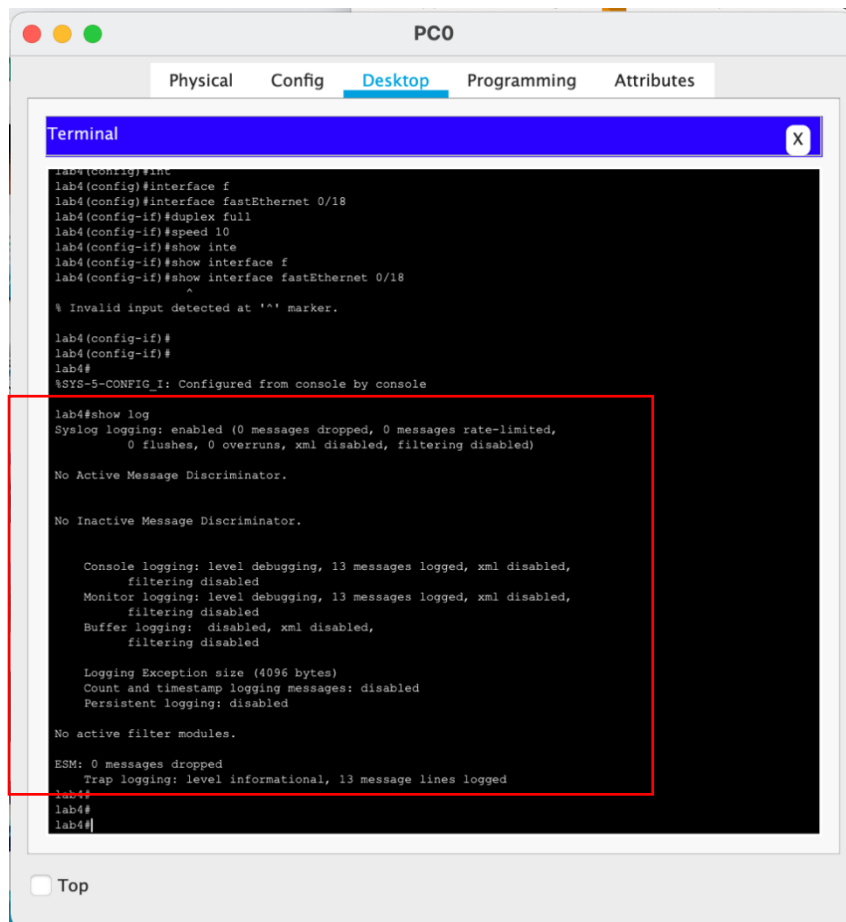
☐ Top

```
lab4#show inte
lab4#show interfaces f
lab4#show interfaces fastEthernet 0/16 status
Port      Name      Status      Vlan      Duplex  Speed Type
Fa0/16    connected 1          auto     auto  10/100BaseTX
lab4#
```

☐ Top

```
lab4#config
Configuring from terminal, memory, or network [terminal]? terminal
Enter configuration commands, one per line. End with CNTL/Z.
lab4(config)#int
lab4(config)#interface f
lab4(config)#interface fastEthernet 0/18
lab4(config-if)#duplex full
lab4(config-if)#speed 10
lab4(config-if)#show inte
lab4(config-if)#show interface f
```

☐ Top



The screenshot shows a terminal window titled "PC0" with tabs for Physical, Config, Desktop, Programming, and Attributes. The Desktop tab is active, displaying a terminal session. The user has entered several commands to configure interface f on lab4, including setting the interface type to fastEthernet 0/18, duplex to full, and speed to 10. After a syntax error, the user enters the correct commands. The terminal then displays the output of the "show log" command, which is highlighted with a red box. The log output shows that Syslog logging is enabled with 0 messages dropped, 0 messages rate-limited, 0 flushes, and 0 overruns. It also shows that console, monitor, and buffer logging are disabled. The log output ends with "ESM: 0 messages dropped" and "Trap logging: level informational, 13 message lines logged".

```
lab4(config)#int f
lab4(config)#interface f
lab4(config)#interface fastEthernet 0/18
lab4(config-if)#duplex full
lab4(config-if)#speed 10
lab4(config-if)#show inte
lab4(config-if)#show interface f
lab4(config-if)#show interface fastEthernet 0/18
^
% Invalid input detected at '^' marker.

lab4(config-if)#
lab4(config-if)#
lab4#
%SYS-5-CONFIG_I: Configured from console by console

lab4#show log
Syslog logging: enabled (0 messages dropped, 0 messages rate-limited,
0 flushes, 0 overruns, xml disabled, filtering disabled)

No Active Message Discriminator.

No Inactive Message Discriminator.

Console logging: level debugging, 13 messages logged, xml disabled,
filtering disabled
Monitor logging: level debugging, 13 messages logged, xml disabled,
filtering disabled
Buffer logging: disabled, xml disabled,
filtering disabled

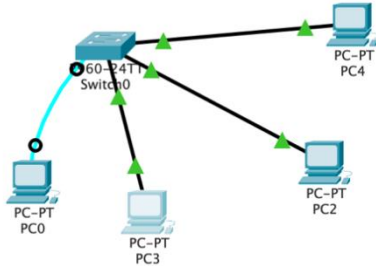
Logging Exception size (4096 bytes)
Count and timestamp logging messages: disabled
Persistent logging: disabled

No active filter modules.

ESM: 0 messages dropped
Trap logging: level informational, 13 message lines logged
lab4#
lab4#
lab4#
```

- We used **show log** to track errors and check the updates.

Step 5- checking interface by pinging another host & Arp.



- We add a 4th pc and ping its Ip address that we set as **131.30.20.50**
- We used Arp -a to get the physical address.
- Finally, we used telnet to get the mac address table to check all connected devices.

PC3

Physical Config Desktop Programming Attributes

Command Prompt

```
Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 131.30.20.50

Pinging 131.30.20.50 with 32 bytes of data:

Reply from 131.30.20.50: bytes=32 time=1ms TTL=128
Reply from 131.30.20.50: bytes=32 time=12ms TTL=128
Reply from 131.30.20.50: bytes=32 time<1ms TTL=128
Reply from 131.30.20.50: bytes=32 time=1ms TTL=128

Ping statistics for 131.30.20.50:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 12ms, Average = 3ms

C:\>arp -a

Internet Address      Physical Address      Type
-----
131.30.20.50          0001.648e.26ac        dynamic

C:\>telnet 131.30.20.100
Trying 131.30.20.100 ...Open

User Access Verification

Password:
lab4>enable
Translating "enable"...domain server (255.255.255.255)
% Unknown command or computer name, or unable to find computer address

lab4>enable
Password:
lab4#show mac ad
lab4#show mac address-table

      Mac Address Table
-----
Vlan    Mac Address      Type      Ports
-----
1       0001.648e.26ac    DYNAMIC   Fa0/9
1       0090.2b09.b443    DYNAMIC   Fa0/19
lab4#
```

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Conclusion

In this lab, we learned new commands to use. We accessed the switch and did multiple commands on the switch like telnet which is used to configure the IP address to access the network for other machines. We learned how to modify the speed and duplex of ports. We also used the mac address table to see the status and connections of computers. We are using "show interface status" to check status, speed, and duplex of interfaces. We've seen how to map an IP address to a MAC The address and how to disable it.