

# Réseaux/Networks

## TP2

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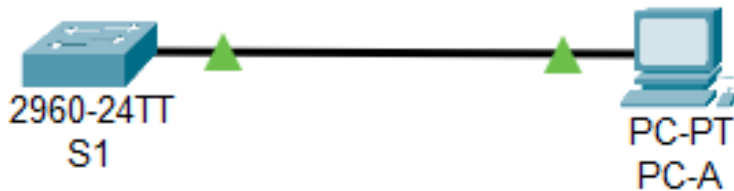
G1:

GUO Xiaofan

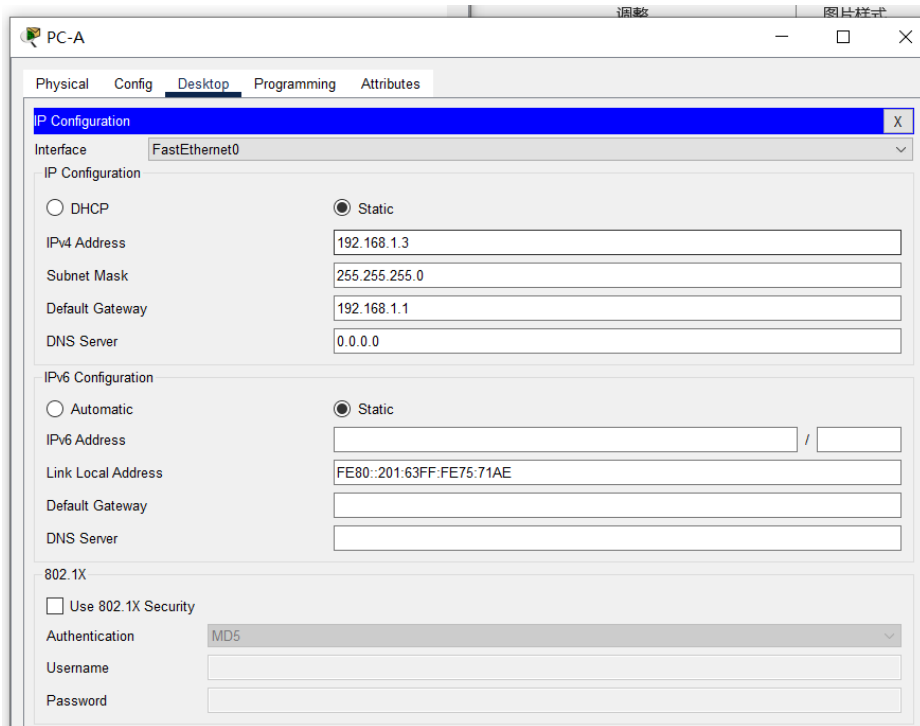
Zhao Chao

# Lab-View Network Device MAC Addresses

**Ex1/ Part 1/Step 1/a.&b.:**



**Ex1/ Part 1/Step 2/a.**



**Ex1/ Part 1/Step 2/b.**

```
C:\>ping 192.168.1.2

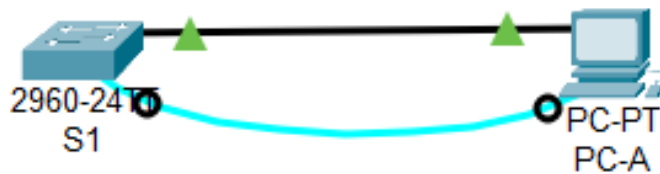
Pinging 192.168.1.2 with 32 bytes of data:

Request timed out.
Request timed out.
```

**Were the pings successful? Explain**

No. The switch has not been configured now.

### Ex1/ Part 1/Step 3/a.



### Ex1/ Part 1/Step 3/b.&c.&d.

```
Switch>enable
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname S1
S1(config)#no ip domain-lookup
S1(config)#interface vlan 1
S1(config-if)#ip address 192.168.1.2 255.255.255.0
S1(config-if)#no shutdown

S1(config-if)#
%LINK-5-CHANGED: Interface Vlan1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state to up

S1(config-if)#end
S1#
%SYS-5-CONFIG_I: Configured from console by console
```

### Ex1/ Part 1/Step 4

```
C:\>ping 192.168.1.2

Pinging 192.168.1.2 with 32 bytes of data:

Request timed out.
Reply from 192.168.1.2: bytes=32 time<1ms TTL=255
Reply from 192.168.1.2: bytes=32 time<1ms TTL=255
Reply from 192.168.1.2: bytes=32 time<1ms TTL=255

Ping statistics for 192.168.1.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

Were the pings successful?

Yes.

**Ex1/ Part 2/Step 1/a.**

**What is the OUI portion of the MAC address for this device?**

5C-26-0A

**What is the serial number portion of the MAC address for this device?**

24-2A-60

**Using the example above, find the name of the vendor that manufactured this NIC.**

Dell Inc.

**Ex1/ Part 2/Step 1/b.**

```
C:\>ipconfig /all

FastEthernet0 Connection:(default port)

    Connection-specific DNS Suffix...:
    Physical Address.....: 0001.6375.71AE
    Link-local IPv6 Address.....: FE80::201:63FF:FE75:71AE
    IPv6 Address.....: ::
    IPv4 Address.....: 192.168.1.3
    Subnet Mask.....: 255.255.255.0
    Default Gateway.....: ::
                           192.168.1.1
    DHCP Servers.....: 0.0.0.0
    DHCPv6 IAID.....:
    DHCPv6 Client DUID.....: 00-01-00-01-2A-93-8B-67-00-01-63-75-71-AE
    DNS Servers.....: ::
                           0.0.0.0

Bluetooth Connection:

    Connection-specific DNS Suffix...:
    Physical Address.....: 0090.0C8C.0E67
    Link-local IPv6 Address.....: ::
    IPv6 Address.....: ::
    IPv4 Address.....: 0.0.0.0
    Subnet Mask.....: 0.0.0.0
    Default Gateway.....: ::
                           0.0.0.0
    DHCP Servers.....: 0.0.0.0
    DHCPv6 IAID.....:
    DHCPv6 Client DUID.....: 00-01-00-01-2A-93-8B-67-00-01-63-75-71-AE
    DNS Servers.....: ::
                           0.0.0.0
```

**Identify the serial number portion of the MAC address for the NIC of PC-A.**

75.71AE

**Identify the name of the vendor that manufactured the NIC of PC-A.**

0001.63

Cisco Systems, Inc

## Ex1/ Part 2/Step 2/a.

```
S1>enable
S1#show interface vlan 1
Vlan1 is up, line protocol is up
  Hardware is CPU Interface, address is 000a.419d.7b04 (bia 000a.419d.7b04)
  Internet address is 192.168.1.2/24
  MTU 1500 bytes, BW 100000 Kbit, DLY 1000000 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 21:40:21, 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
    1682 packets input, 530955 bytes, 0 no buffer
    Received 0 broadcasts (0 IP multicast)
    0 runs, 0 giants, 0 throttles
    0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
    563859 packets output, 0 bytes, 0 underruns
    0 output errors, 23 interface resets
    0 output buffer failures, 0 output buffers swapped out
```

**What is the MAC address for VLAN 1 on S1?**

000a.419d.7b04

**What is the MAC serial number for VLAN 1?**

9d.7b04

**What is the OUI for VLAN 1?**

00-0a-41

**Based on this OUI, what is the name of the vendor?**

Cisco Systems

**What does bia stand for?**

Burned in address.

**Why does the output show the same MAC address twice?**

The MAC address is alterable through a software command, yet the original address (bia) remains unchanged and is displayed within parentheses.

## Ex1/ Part 2/Step 2/b.

```
S1#show arp
Protocol Address      Age (min)  Hardware Addr  Type   Interface
Internet 192.168.1.2      -         000A.419D.7B04  ARPA   Vlan1
Internet 192.168.1.3      16        0001.6375.71AE  ARPA   Vlan1
S1#
```

What Layer 2 addresses are displayed on S1?

000A.419D.7B04

0001.6375.71AE

What Layer 3 addresses are displayed on S1?

192.168.1.2

192.168.1.3

Ex1/ Part 2/Step 3/ Did the switch display the MAC address of PC-A? If you answered yes, what port was it on?

```
C:\>
C:\>
C:\>ping 192.168.1.2

Pinging 192.168.1.2 with 32 bytes of data:

Reply from 192.168.1.2: bytes=32 time<1ms TTL=255
Reply from 192.168.1.2: bytes=32 time=5ms TTL=255
Reply from 192.168.1.2: bytes=32 time<1ms TTL=255
```

```
S1#show mac address-table
      Mac Address Table
-----
Vlan  Mac Address      Type      Ports
----  -
S1#show mac address-table
      Mac Address Table
-----
Vlan  Mac Address      Type      Ports
----  -
1     0001.6375.71ae    DYNAMIC   Fa0/6
S1#
```

Yes. Port should be F0/6. Answers will vary for the MAC address. In the example above, the MAC address would be 5c26.0a24.2a60.

**Ex1/ Part 2/ Reflection Questions/1. Can you have broadcasts at the Layer 2 level? If so, what would the MAC address be?**

Layer 2 allows for broadcasts.

ARP utilizes broadcasts to retrieve MAC address information.

The broadcast address is FF.FF.FF.FF.FF.FF.

**Ex1/ Part 2/ Reflection Questions/2. Why would you need to know the MAC address of a device.**

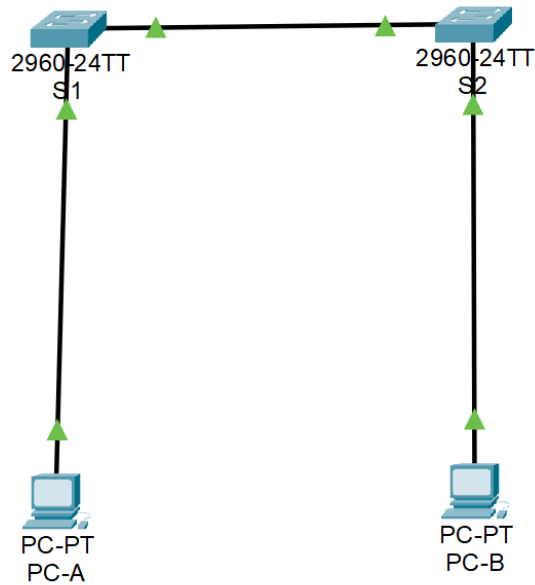
Several reasons might exist. In expansive networks, identifying a device by its MAC address might prove simpler than using its IP address, aiding in location and identification.

The MAC OUI reveals the manufacturer, aiding in narrowing down the search.

Additionally, Layer 2 supports security measures, necessitating knowledge of permissible MAC addresses.

# Lab - View the Switch MAC Address Table

## Ex2/ Part 1/Step 1:



## Ex2/ Part 1/Step 2:

PC-A

Physical Config **Desktop** Programming Attributes

**IP Configuration**

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.1.1

Subnet Mask 255.255.255.0

Default Gateway 0.0.0.0

DNS Server 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address

Link Local Address FE80::2E0:F9FF

Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

Authentication MD5

Username

Password

PC-B

Physical Config **Desktop** Programming Attributes

**IP Configuration**

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.1.2

Subnet Mask 255.255.255.0

Default Gateway 0.0.0.0

DNS Server 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address

Link Local Address FE80::2D0:FFFF:FE9C

Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

Authentication MD5

Username

Password



### Ex2/ Part 1/Step 3:

```
PC-A
Physical Config Desktop Programming Attributes
Terminal
Switch>enable
Switch#erase startup-config
Erasing the nvram filesystem will remove all configuration files! Continue? [confirm]
[OK]
Erase of nvram: complete
%SYS-7-NV_BLOCK_INIT: Initialized the geometry of nvram
Switch#delete vlan.dat
Delete filename [vlan.dat]?
Delete flash:/vlan.dat? [confirm]
%Error deleting flash:/vlan.dat (No such file or directory)

Switch#reload
Proceed with reload? [confirm]
C2960 Boot Loader (C2960-HBOOT-M) Version 12.2(25r)FX, RELEASE SOFTWARE (fc4)
Cisco WS-C2960-24TT (RC32300) processor (revision C0) with 21039K bytes of memory.
2960-24TT starting...
Base ethernet MAC Address: 00E0.F979.52E1
Xmodem file system is available.
Initializing Flash...
flashfs[0]: 1 files, 0 directories
flashfs[0]: 0 orphaned files, 0 orphaned directories
flashfs[0]: Total bytes: 64016384
flashfs[0]: Bytes used: 4670455
flashfs[0]: Bytes available: 59345929
flashfs[0]: flashfs fsck took 1 seconds.
...done Initializing Flash.

Boot Sector Filesystem (bs:) installed, fsid: 3
Parameter Block Filesystem (pb:) installed, fsid: 4

Loading "flash:/2960-lanbasek9-mz.150-2.SE4.bin"...
##### [OK]
Smart Init is enabled
smart init is sizing iomem
          TYPE      MEMORY_REQ
TOTAL:      0x00000000
Rounded IOMEM up to: 0Mb.
Using 6 percent iomem. [0Mb/512Mb]

Restricted Rights Legend
Use, duplication, or disclosure by the Government is
subject to restrictions as set forth in subparagraph
(c) of the Commercial Computer Software - Restricted
Rights clause at FAR sec. 52.227-19 and subparagraph
(c) (1) (ii) of the Rights in Technical Data and Computer
Software clause at DFARS sec. 252.227-7013.
        cisco Systems, Inc.
        170 West Tasman Drive
```

The image displays two side-by-side screenshots of a PC-A terminal window, likely running a Cisco IOS emulator. The window has a title bar with a green icon and the text "PC-A". Below the title bar is a menu bar with options: Physical, Config, Desktop (selected), Programming, and Attributes.

The left screenshot shows the terminal output after entering the command `Switch>enable`. The prompt changes to `Switch#`. The user then enters `show running-config`, and the terminal displays the current configuration, which is 1080 bytes long. The configuration includes the version 15.0, service timestamps for log and debug messages, no password encryption, the hostname `Switch`, spanning-tree mode `pvt` and extend system-id, and 13 interfaces (FastEthernet0/1 through FastEthernet0/13) configured with `no ip address` and `shutdown`.

The right screenshot shows the terminal output after entering the command `Switch#`. The prompt changes to `Switch#`. The user then enters `show running-config`, and the terminal displays the current configuration, which is 1080 bytes long. The configuration includes the version 15.0, service timestamps for log and debug messages, no password encryption, the hostname `Switch`, spanning-tree mode `pvt` and extend system-id, and 13 interfaces (FastEthernet0/1 through FastEthernet0/13) configured with `no ip address` and `shutdown`.

## Ex2/ Part 1/Step 4/a:

```
Switch#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#hostname S1
S1(config)#
```

```
Switch#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#hostname S2
```

## Ex2/ Part 1/Step 4/b.

```
S1(config)#int vlan1
S1(config-if)#ip address 192.168.1.11 255.255.255.0
S1(config-if)#no shutdown

S1(config-if)#
%LINK-5-CHANGED: Interface Vlan1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state to up
S1(config-if)#
```

```
S2(config)#int vlan 1
S2(config-if)#ip address 192.168.1.12 255.255.255.0
S2(config-if)#no shutdown

S2(config-if)#
%LINK-5-CHANGED: Interface Vlan1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state to up
```

## Ex2/ Part 1/Step 4/c.

```
S1(config-if)#exit
S1(config)#line console 0
S1(config-line)#password cisco
S1(config-line)#login
S1(config-line)#line vty 0 15
S1(config-line)#password cisco
S1(config-line)#login
S1(config-line)#exit
S1(config)#
```

```
S2(config-if)#exit
S2(config)#line console 0
S2(config-line)#password cisco
S2(config-line)#login
S2(config-line)#exit
S2(config)#line vty 0 15
S2(config-line)#password cisco
S2(config-line)#login
S2(config-line)#exit
S2(config)#
```

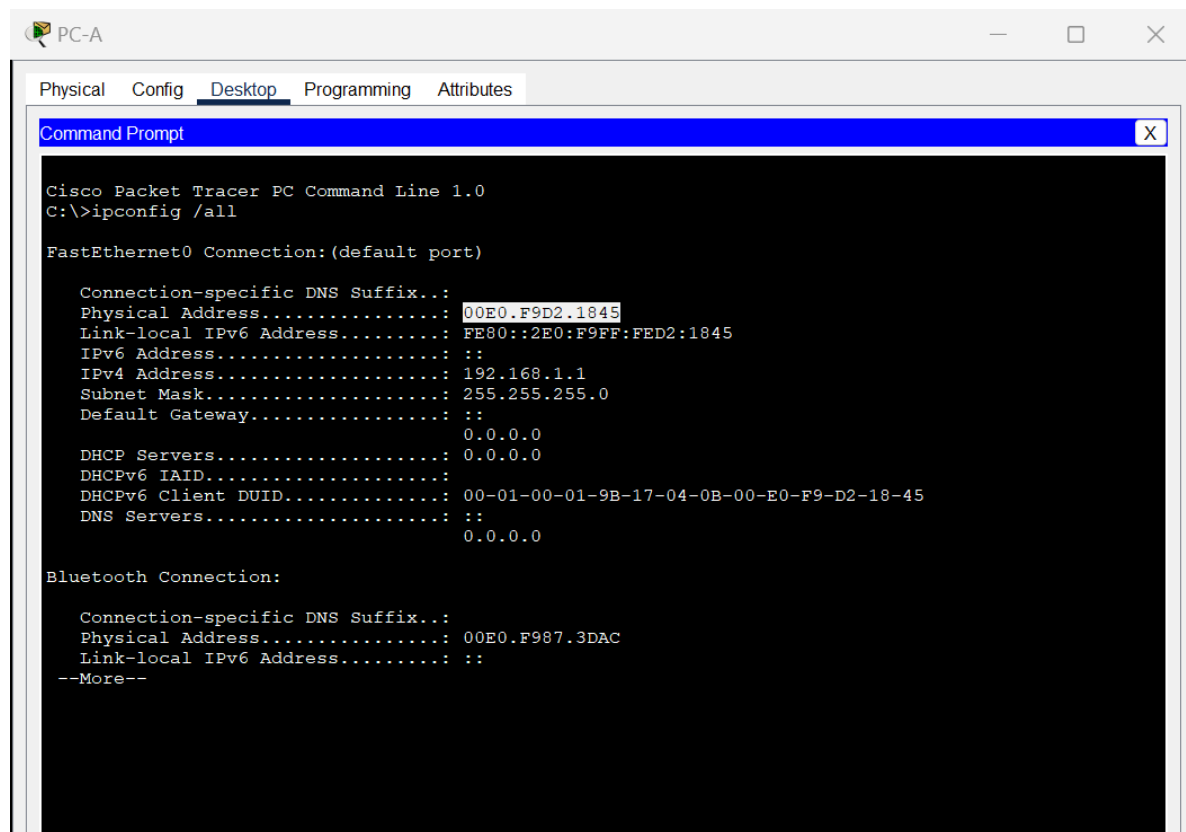
## Ex2/ Part 1/Step 4/d.

```
S1(config)#enable secret class
S1(config)#
```

```
S2(config)#enable secret class
S2(config)#
```

## Ex2/ Part 2/Step 1/a:

**PC-A MAC Address: 00E0.F9D2.1845**



The screenshot shows a Cisco Packet Tracer PC Command Line window for PC-A. The window has tabs for Physical, Config, Desktop, Programming, and Attributes. The Desktop tab is active, displaying a Command Prompt. The prompt shows the output of the 'ipconfig /all' command. The FastEthernet0 connection details are as follows:

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ipconfig /all

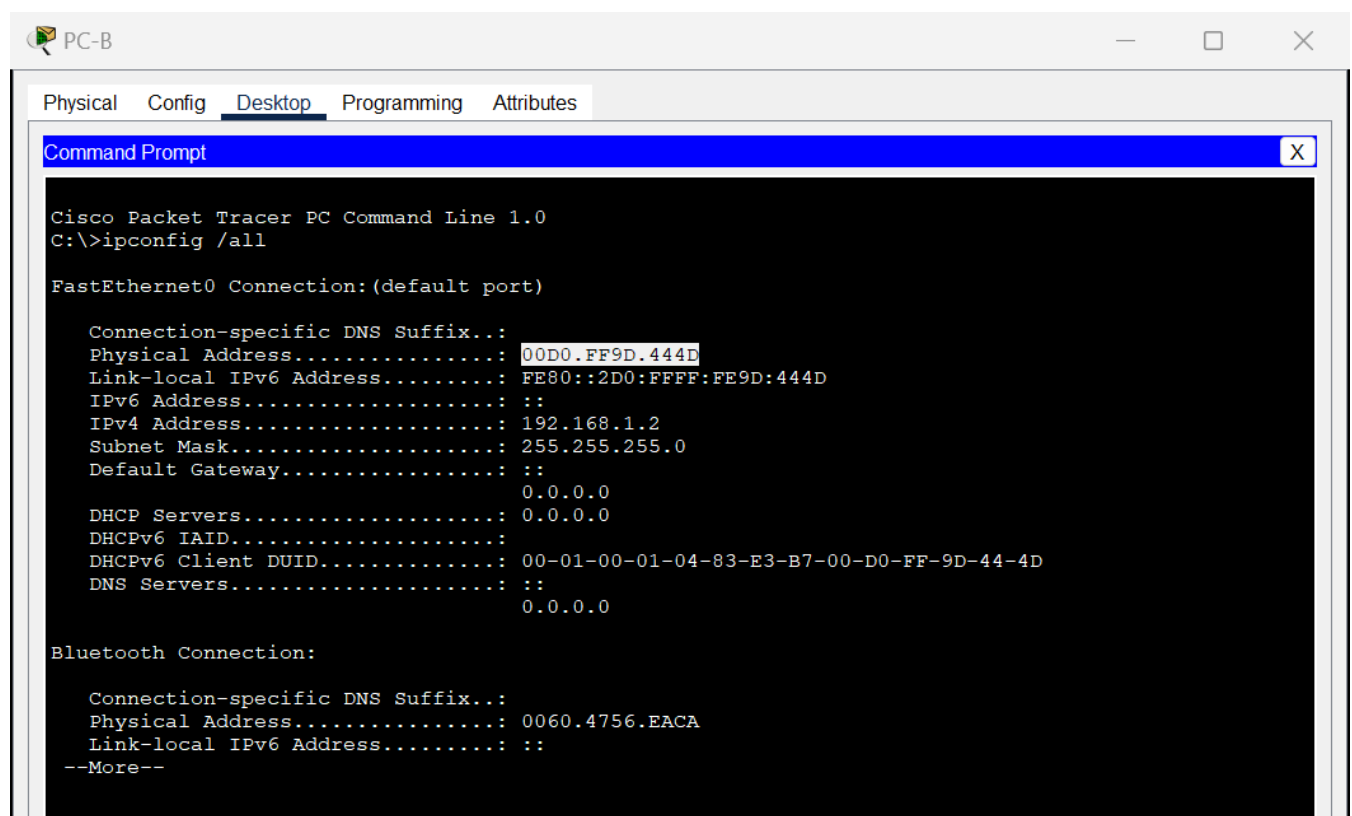
FastEthernet0 Connection:(default port)

    Connection-specific DNS Suffix...:
    Physical Address. ....: 00E0.F9D2.1845
    Link-local IPv6 Address. ....: FE80::2E0:F9FF:FED2:1845
    IPv6 Address. ....: ::
    IPv4 Address. ....: 192.168.1.1
    Subnet Mask. ....: 255.255.255.0
    Default Gateway. ....: ::
                                0.0.0.0
    DHCP Servers. ....: 0.0.0.0
    DHCPv6 IAID. ....:
    DHCPv6 Client DUID. ....: 00-01-00-01-9B-17-04-0B-00-E0-F9-D2-18-45
    DNS Servers. ....: ::
                                0.0.0.0

Bluetooth Connection:

    Connection-specific DNS Suffix...:
    Physical Address. ....: 00E0.F987.3DAC
    Link-local IPv6 Address. ....: ::
    --More--
```

**PC-B MAC Address: 00D0.FF9D.444D**



The screenshot shows a Cisco Packet Tracer PC Command Line window for PC-B. The window has tabs for Physical, Config, Desktop, Programming, and Attributes. The Desktop tab is active, displaying a Command Prompt. The prompt shows the output of the 'ipconfig /all' command. The FastEthernet0 connection details are as follows:

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ipconfig /all

FastEthernet0 Connection:(default port)

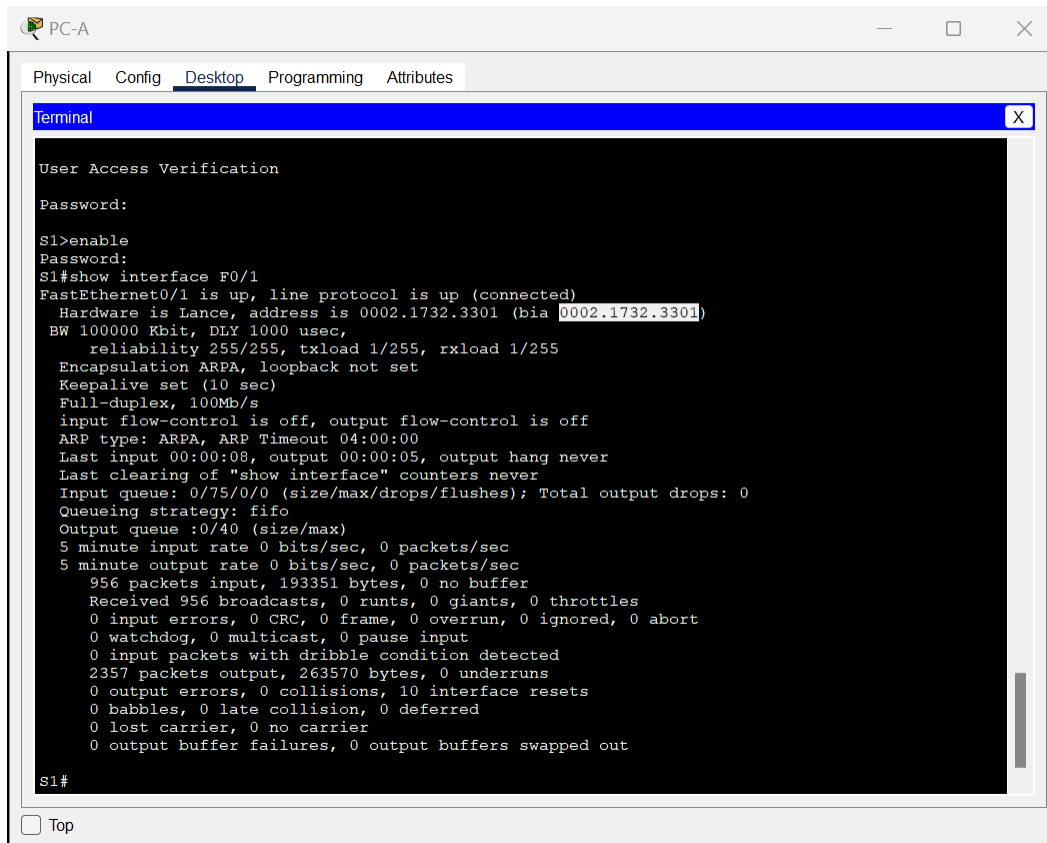
    Connection-specific DNS Suffix...:
    Physical Address. ....: 00D0.FF9D.444D
    Link-local IPv6 Address. ....: FE80::2D0:FFFF:FE9D:444D
    IPv6 Address. ....: ::
    IPv4 Address. ....: 192.168.1.2
    Subnet Mask. ....: 255.255.255.0
    Default Gateway. ....: ::
                                0.0.0.0
    DHCP Servers. ....: 0.0.0.0
    DHCPv6 IAID. ....:
    DHCPv6 Client DUID. ....: 00-01-00-01-04-83-E3-B7-00-D0-FF-9D-44-4D
    DNS Servers. ....: ::
                                0.0.0.0

Bluetooth Connection:

    Connection-specific DNS Suffix...:
    Physical Address. ....: 0060.4756.EACA
    Link-local IPv6 Address. ....: ::
    --More--
```

## Ex2/ Part 2/Step 1/b:

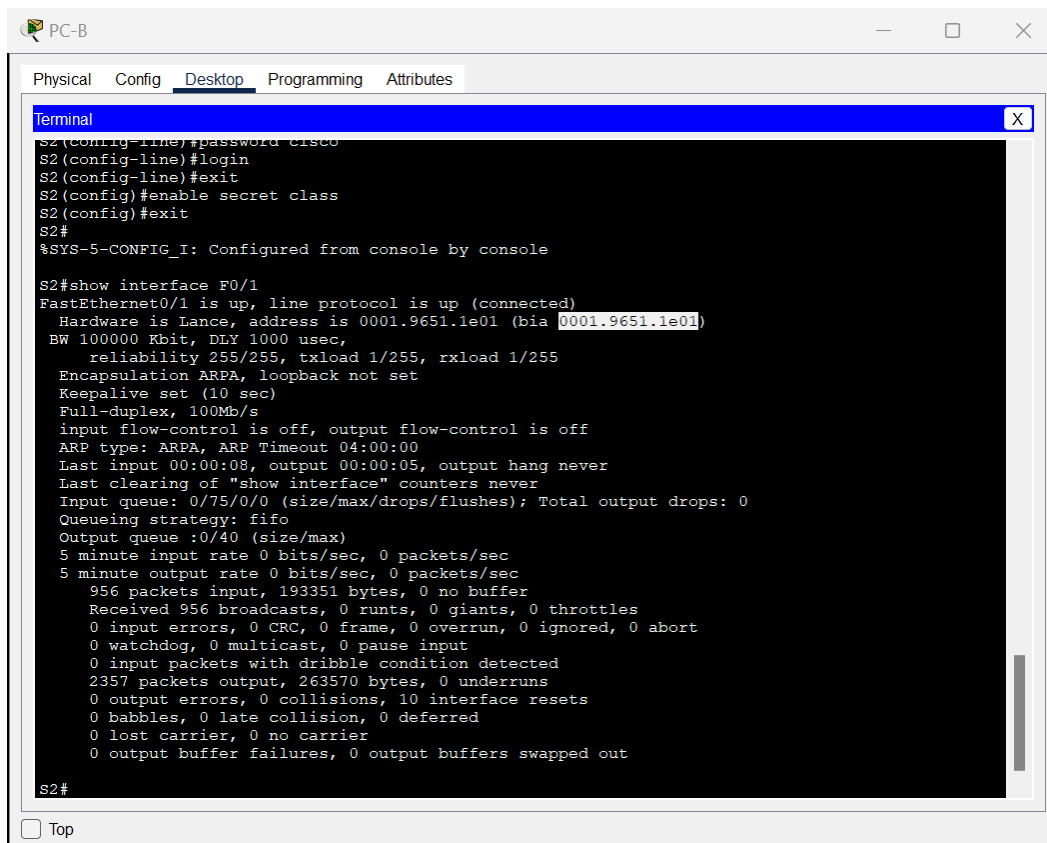
### S1 Fast Ethernet 0/1 MAC Address: 0002.1732.3301



The screenshot shows a terminal window titled "PC-A" with tabs for Physical, Config, Desktop, Programming, and Attributes. The Desktop tab is active, displaying a terminal window. The terminal output shows a user access verification prompt, followed by the command "S1>enable" and "S1#show interface F0/1". The output of the show command displays the configuration for FastEthernet0/1, including the MAC address 0002.1732.3301, which is highlighted in the original image. The terminal ends with "S1#".

```
PC-A
Physical Config Desktop Programming Attributes
Terminal
User Access Verification
Password:
S1>enable
Password:
S1#show interface F0/1
FastEthernet0/1 is up, line protocol is up (connected)
  Hardware is Lance, address is 0002.1732.3301 (bia 0002.1732.3301)
  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
    0 output errors, 0 collisions, 10 interface resets
    0 babbles, 0 late collision, 0 deferred
    0 lost carrier, 0 no carrier
    0 output buffer failures, 0 output buffers swapped out
S1#
```

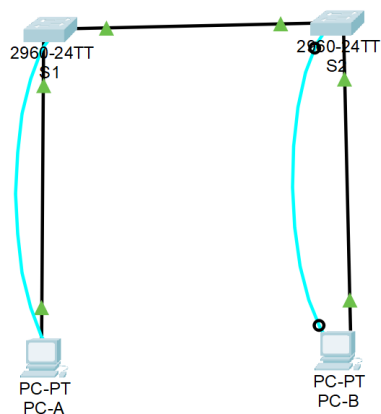
### S2 Fast Ethernet 0/1 MAC Address: 0001.9651.1e01



The screenshot shows a terminal window titled "PC-B" with tabs for Physical, Config, Desktop, Programming, and Attributes. The Desktop tab is active, displaying a terminal window. The terminal output shows the configuration steps for S2: "S2(config-line)#password cisco", "S2(config-line)#login", "S2(config-line)#exit", "S2(config)#enable secret class", and "S2(config)#exit". It then shows the command "S2#show interface F0/1" and its output, which displays the configuration for FastEthernet0/1, including the MAC address 0001.9651.1e01, which is highlighted in the original image. The terminal ends with "S2#".

```
PC-B
Physical Config Desktop Programming Attributes
Terminal
S2(config-line)#password cisco
S2(config-line)#login
S2(config-line)#exit
S2(config)#enable secret class
S2(config)#exit
S2#
%SYS-5-CONFIG_I: Configured from console by console
S2#show interface F0/1
FastEthernet0/1 is up, line protocol is up (connected)
  Hardware is Lance, address is 0001.9651.1e01 (bia 0001.9651.1e01)
  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
    0 output errors, 0 collisions, 10 interface resets
    0 babbles, 0 late collision, 0 deferred
    0 lost carrier, 0 no carrier
    0 output buffer failures, 0 output buffers swapped out
S2#
```

## Ex2/ Part 2/Step 2/a:



## Ex2/ Part 2/Step 2/b.

PC-A

Physical Config Desktop Programming Attributes

Terminal

```
User Access Verification
Password:
S1>enable
Password:
S1#show interface F0/1
FastEthernet0/1 is up, line protocol is up (connected)
  Hardware is Lance, address is 0002.1732.3301 (bia 0002.1732.3301)
  BW 100000 Kbit, DLY 1000 usec
```

PC-B

Physical Config Desktop Programming Attributes

Terminal

```
S2#show interface F0/1
FastEthernet0/1 is up, line protocol is up (connected)
  Hardware is Lance, address is 0001.9651.1e01 (bia 0001.9651.1e01)
  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
    0 output errors, 0 collisions, 10 interface resets
    0 babbles, 0 late collision, 0 deferred
    0 lost carrier, 0 no carrier
    0 output buffer failures, 0 output buffers swapped out

S2#show mac address-table
      Mac Address Table
-----
Vlan    Mac Address      Type      Ports
----
1       0002.1732.3301   DYNAMIC   Fa0/1
S2#
```

☐ Top

- Are there any MAC addresses recorded in the MAC address table?

Yes.

- What MAC addresses are recorded in the table? To which switch ports are they mapped and to which devices do they belong? Ignore MAC addresses that are mapped to the CPU.

The S1's MAC address recorded in via Fa0/1 switch port.

- If you had not previously recorded MAC addresses of network devices in Step 1, how could you tell which devices the MAC addresses belong to, using only the output from the show mac address-table command? Does it work in all scenarios?

"show mac address-table command" shows the port that the MAC addresses were learned on and it would identify the MAC address belongs to which network device in the simple network system.

But when multiple MAC addresses associated to the same port or the device uses a dynamic address, MAC addresses might not be directly correlated with specific devices.

## Ex2/ Part 2/Step 3:

a.

```
S2#clear mac address-table dynamic
S2#
```

b.

```
S2#show mac address-table
Mac Address Table
-----
Vlan    Mac Address      Type    Ports
----    -
1       0002.1732.3301   DYNAMIC Fa0/1
S2#show mac address-table
Mac Address Table
-----
Vlan    Mac Address      Type    Ports
----    -
1       0002.1732.3301   DYNAMIC Fa0/1
S2#
```

- Does the MAC address table have any addresses in it for VLAN 1? Are there other MAC addresses listed?

No. Just S1's MAC address re-recorded in via Fa0/1 switch port.

- Wait 10 seconds, type the show mac address-table command, and press Enter. Are there new addresses in the MAC address table?

No, the same line showed.

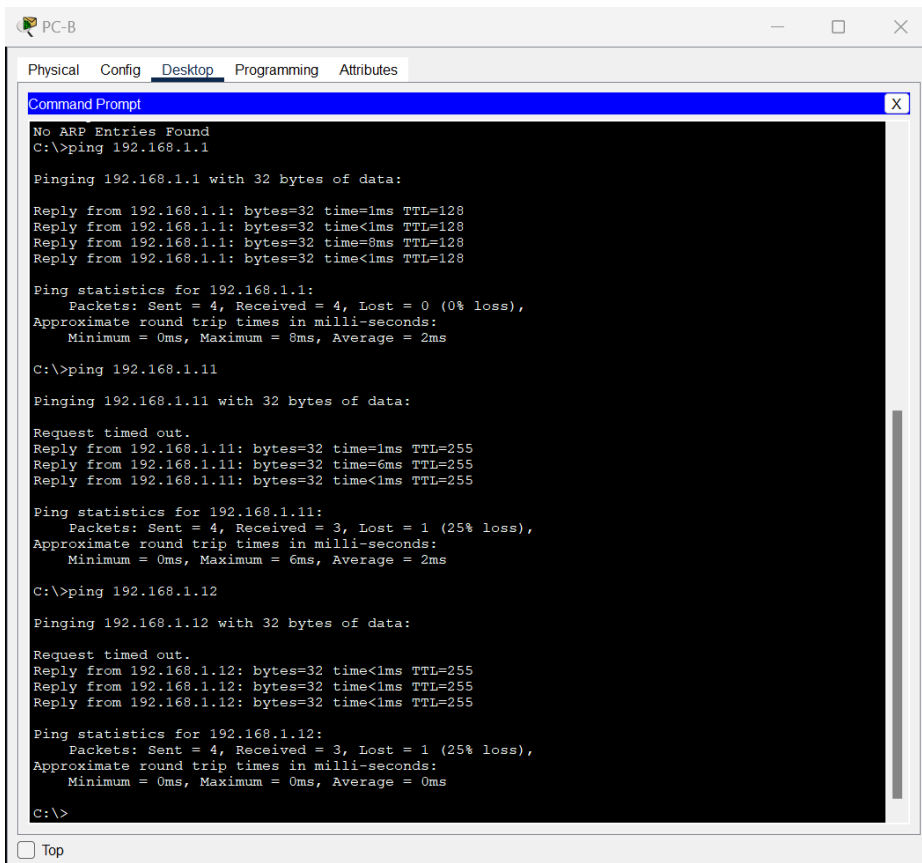
#### Ex2/ Part 2/Step 4/a.

```
C:\>arp -a
No ARP Entries Found
C:\>|
```

- Not including multicast or broadcast addresses, how many devices IP-to-MAC address pairs have been learned by ARP?

ARP cache have no entries in it.

#### Ex2/ Part 2/Step 4/b.



The screenshot shows a Windows desktop environment with a window titled 'PC-B'. Inside the window, there is a 'Command Prompt' application. The Command Prompt displays the following output:

```
No ARP Entries Found
C:\>ping 192.168.1.1

Pinging 192.168.1.1 with 32 bytes of data:

Reply from 192.168.1.1: bytes=32 time<1ms TTL=128
Reply from 192.168.1.1: bytes=32 time<1ms TTL=128
Reply from 192.168.1.1: bytes=32 time=8ms TTL=128
Reply from 192.168.1.1: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 8ms, Average = 2ms

C:\>ping 192.168.1.11

Pinging 192.168.1.11 with 32 bytes of data:

Request timed out.
Reply from 192.168.1.11: bytes=32 time=1ms TTL=255
Reply from 192.168.1.11: bytes=32 time=6ms TTL=255
Reply from 192.168.1.11: bytes=32 time<1ms TTL=255

Ping statistics for 192.168.1.11:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 6ms, Average = 2ms

C:\>ping 192.168.1.12

Pinging 192.168.1.12 with 32 bytes of data:

Request timed out.
Reply from 192.168.1.12: bytes=32 time<1ms TTL=255
Reply from 192.168.1.12: bytes=32 time<1ms TTL=255
Reply from 192.168.1.12: bytes=32 time<1ms TTL=255

Ping statistics for 192.168.1.12:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

- Did all devices have successful replies? If not, check your cabling and IP configurations.

Yes, all devices have successful replies.

Ex2/ Part 2/Step 4/c.

- Has the switch added additional MAC addresses to the MAC address table? If so, which addresses and devices?

Yes, including S1(1<sup>st</sup> line), PC-A(4<sup>th</sup> line) , PC-B(2<sup>nd</sup> line),

```
S2#show mac address-table
Mac Address Table
-----
```

| Vlan | Mac Address    | Type    | Ports  |
|------|----------------|---------|--------|
| 1    | 0002.1732.3301 | DYNAMIC | Fa0/1  |
| 1    | 00d0.ff9d.444d | DYNAMIC | Fa0/18 |
| 1    | 00e0.f979.52e1 | DYNAMIC | Fa0/1  |
| 1    | 00e0.f9d2.1845 | DYNAMIC | Fa0/1  |

```
S2#
```

- Does the PC-B ARP cache have additional entries for all network devices that were sent pings?

Yes, PC-A(1<sup>st</sup> line), S1(2<sup>nd</sup> line), S2(3<sup>rd</sup> line).

```
C:\>arp -a
```

| Internet Address | Physical Address | Type    |
|------------------|------------------|---------|
| 192.168.1.1      | 00e0.f9d2.1845   | dynamic |
| 192.168.1.11     | 00e0.f979.52e1   | dynamic |
| 192.168.1.12     | 0005.5eb3.6114   | dynamic |

```
C:\>|
```

Ex2/ Part 2/Reflection Question:

what might be some of the challenges on larger networks?

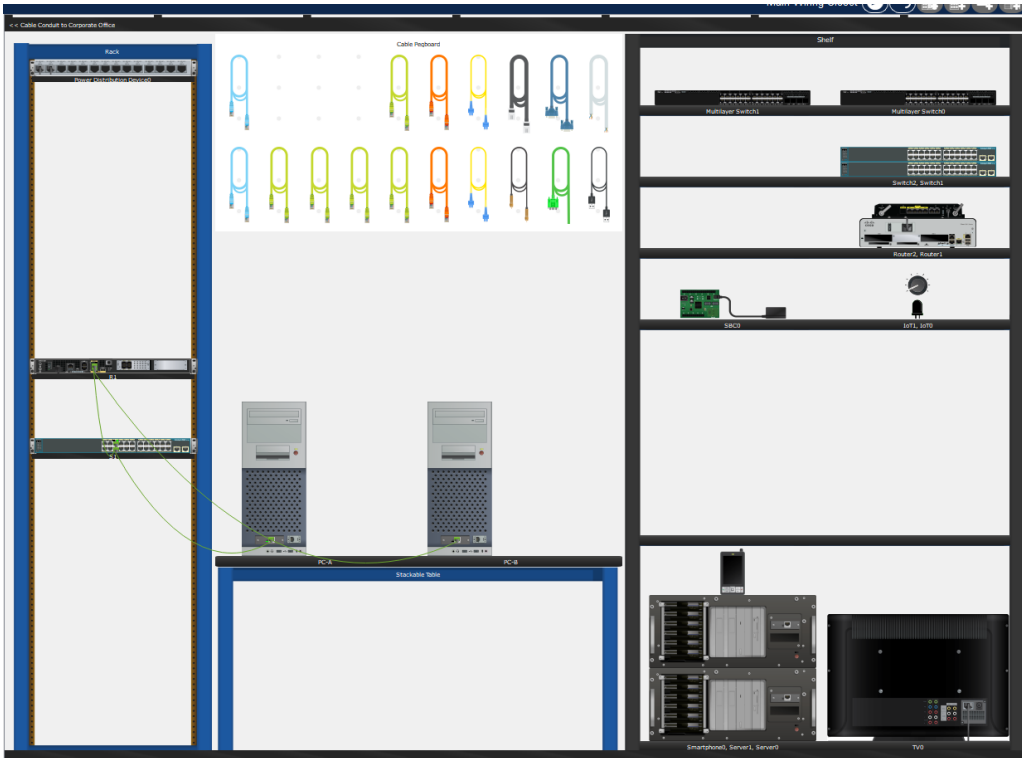
1. **ARP Cache Size Limitations:** on the large network system, the number of entries may surpass the capacity of the caches.
2. **MAC Address Table Scalability:** the number of MAC addresses can handle may limited.
3. **Dynamic Nature of Devices:** Devices on the large network are often dynamic, the displayed data deviates from the real situation.



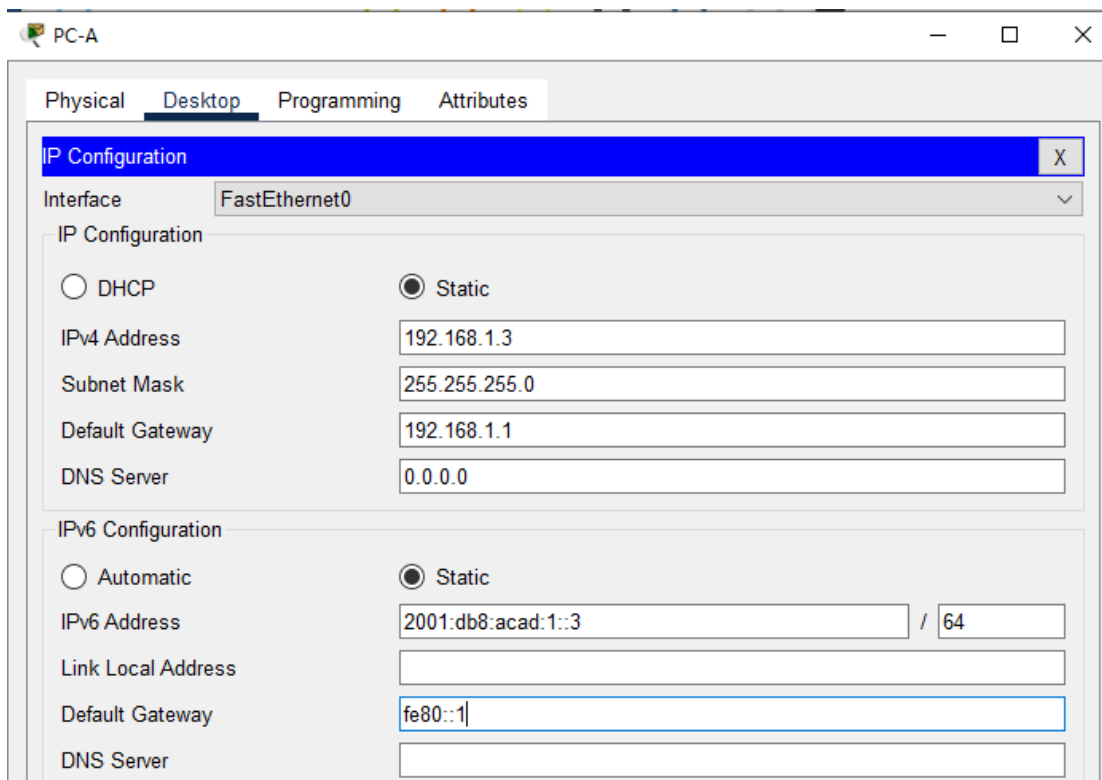
# Packet Tracer-

## Build a Switch and Router Network - Physical Mode

Ex3/ Part 1/a.&b.&c.&d.



Ex3/ Part 2/Step1/a.



### Ex3/ Part 2/Step1/b.

PC-A

Physical Desktop Programming Attributes

IP Configuration X

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.1.3

Subnet Mask 255.255.255.0

Default Gateway 192.168.1.1

DNS Server 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address 2001:db8:acad:1::3 / 64

Link Local Address

Default Gateway fe80::1

DNS Server

### Ex3/ Part 2/Step1/c. Why were the pings not successful?

Layer 3 traffic isn't being routed between subnets because the router interfaces (default gateways) haven't been configured yet.

### Ex3/ Part 2/Step2/d.&e.& f.& g.& h.

```
Router>enable
Router#conf term
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R1
R1(config)#enable secret class
R1(config)#line console 0
R1(config-line)#password cisco
R1(config-line)#login
R1(config-line)#exit
R1(config)#line vty 0 15
R1(config-line)#password cisco
R1(config-line)#login
R1(config-line)#exit
R1(config)#service password-encryption
R1(config)#banner motd <Unauthorized Access is Prohibited!>
R1(config)#int g0/0/0
R1(config-if)#ip address 192.168.0.1 255.255.255.0
R1(config-if)#ipv6 address 2001:db8:acad:1::1/64
R1(config-if)#ipv6 address fe80::1 link-local
R1(config-if)#no shutdown
R1(config-if)#
%LINK-S-CHANGED: Interface GigabitEthernet0/0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0/0, changed state to up
R1(config-if)#int g0/0/1
R1(config-if)#ip address 192.168.1.1 255.255.255.0
R1(config-if)#ipv6 address 2001:db8:acad:1::1/64
R1(config-if)#ipv6 address fe80::1 link-local
R1(config-if)#no shutdown
R1(config-if)#
%LINK-S-CHANGED: Interface GigabitEthernet0/0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0/1, changed state to up
```

Top

R1

S1

PC-A

**Ex3/ Part 2/Step2/i.&j.&k.&l.**

```
R1(config-if)#int g0/0/0
R1(config-if)#description Connection to PC-B
R1(config-if)#int
R1(config-if)#int g0/0/1
R1(config-if)#description Connection to S1
R1(config-if)#exit
R1(config)#ipv6 unicast-routing
R1(config)#end
R1#
%SYS-5-CONFIG_I: Configured from console by console

R1#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
R1#clock set ?
  hh:mm:ss  Current Time
R1#clock set 10:10:15 ?
  <1-31>    Day of the month
  MONTH    Month of the year
R1#clock set 10:10:15 16 November 2023
```

**Ex3/ Part 2/Step2/m.&n. Were the pings successful? Explain.**

```
C:\>ping 192.168.0.3

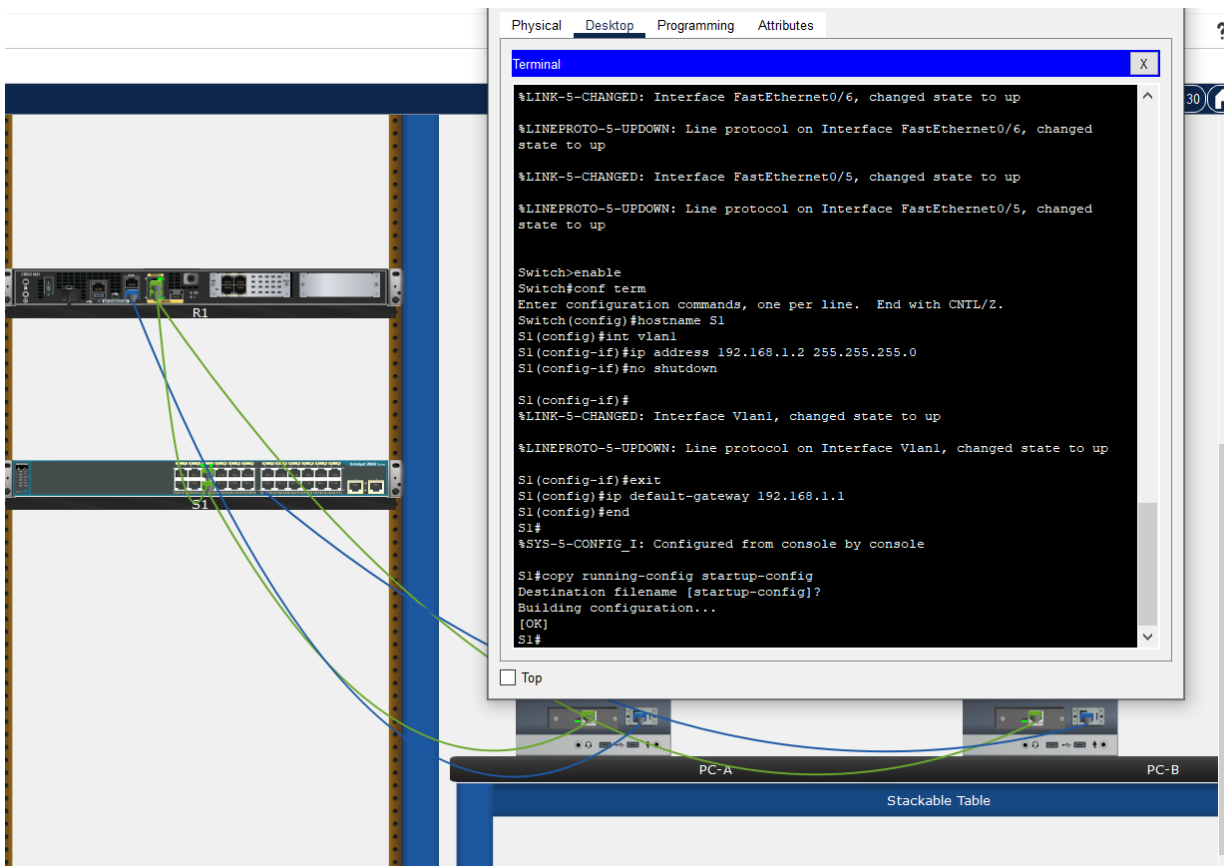
Pinging 192.168.0.3 with 32 bytes of data:

Request timed out.
Reply from 192.168.0.3: bytes=32 time<1ms TTL=127
Reply from 192.168.0.3: bytes=32 time<1ms TTL=127
Reply from 192.168.0.3: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.0.3:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Yes. The router effectively routes traffic between the two subnets. The default configurations of the 2960 switch automatically activate the interfaces linked to devices.

### Ex3/ Part 2/Step3/a.&b.&c.& d.& e.&f.



### Ex3/ Part 2/Step4/a.

```
C:\>ping 192.168.0.3

Pinging 192.168.0.3 with 32 bytes of data:

Reply from 192.168.0.3: bytes=32 time<1ms TTL=127
Reply from 192.168.0.3: bytes=32 time<1ms TTL=127
Reply from 192.168.0.3: bytes=32 time=1ms TTL=127
Reply from 192.168.0.3: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.0.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

### Ex3/ Part 2/Step4/b.

```
S1#ping 192.168.0.3

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.3, timeout is 2 seconds:
.!!!!
Success rate is 80 percent (4/5), round-trip min/avg/max = 0/0/0 ms

S1#
```

### Ex3/ Part 3/Step1/a.

```
R1#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter
area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

    192.168.0.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.168.0.0/24 is directly connected, GigabitEthernet0/0/0
L       192.168.0.1/32 is directly connected, GigabitEthernet0/0/0
    192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.168.1.0/24 is directly connected, GigabitEthernet0/0/1
L       192.168.1.1/32 is directly connected, GigabitEthernet0/0/1
```

What code is used in the routing table to indicate a directly connected network?

C (a directly connected subnet)

L (a local interface)

How many route entries are coded with a C code in the routing table?

TWO.

What interface types are associated to the C coded routes?

G0/0/0 & G0/0/1.

### Ex3/ Part 3/Step1/b.

```
R1#show ipv6 route
IPv6 Routing Table - 5 entries
Codes: C - Connected, L - Local, S - Static, R - RIP, B - BGP
       U - Per-user Static route, M - MIPv6
       I1 - ISIS L1, I2 - ISIS L2, IA - ISIS interarea, IS - ISIS summary
       ND - ND Default, NDp - ND Prefix, DCE - Destination, NDr - Redirect
       O - OSPF intra, OI - OSPF inter, OE1 - OSPF ext 1, OE2 - OSPF ext 2
       ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2
       D - EIGRP, EX - EIGRP external
C 2001:DB8:ACAD::/64 [0/0]
  via GigabitEthernet0/0/0, directly connected
L 2001:DB8:ACAD::1/128 [0/0]
  via GigabitEthernet0/0/0, receive
C 2001:DB8:ACAD:1::/64 [0/0]
  via GigabitEthernet0/0/1, directly connected
L 2001:DB8:ACAD:1::1/128 [0/0]
  via GigabitEthernet0/0/1, receive
L FF00::/8 [0/0]
  via Null0, receive
```

### Ex3/ Part 3/Step2/a.

```
R1#show interface g0/0/1
GigabitEthernet0/0/1 is up, line protocol is up (connected)
  Hardware is Lance, address is 0060.4731.8102 (bia 0060.4731.8102)
  Description: Connection to S1
  Internet address is 192.168.1.1/24
  MTU 1500 bytes, BW 1000000 Kbit, DLY 100 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Full-duplex, 100Mb/s, media type is RJ45
  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 (size/max/drops); 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 130 bits/sec, 0 packets/sec
    21 packets input, 2608 bytes, 0 no buffer
      Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
    0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
    0 input packets with dribble condition detected
    204 packets output, 16816 bytes, 0 underruns
    0 output errors, 0 collisions, 1 interface resets
```

What is the operational status of the G0/0/1 interface?

GigabitEthernet0/0/1 is up, line protocol is up

What is the Media Access Control (MAC) address of the G0/1 interface?

0060.4731.8102

How is the internet address displayed in this command?

192.168.1.1/24

### Ex3/ Part 3/Step2/b.

```
R1#
R1#show ipv6 interface g0/0/1
GigabitEthernet0/0/1 is up, line protocol is up
  IPv6 is enabled, link-local address is FE80::1
  No Virtual link-local address(es):
  Global unicast address(es):
    2001:DB8:ACAD:1::1, subnet is 2001:DB8:ACAD:1::/64
  Joined group address(es):
    FE02::1
    FE02::2
    FE02::1:FF00:1
  MTU is 1500 bytes
  ICMP error messages limited to one every 100 milliseconds
  ICMP redirects are enabled
  ICMP unreachables are sent
  ND DAD is enabled, number of DAD attempts: 1
  ND reachable time is 30000 milliseconds
  ND advertised reachable time is 0 (unspecified)
  ND advertised retransmit interval is 0 (unspecified)
  ND router advertisements are sent every 200 seconds
  ND router advertisements live for 1800 seconds
  ND advertised default router preference is Medium
  Hosts use stateless autoconfig for addresses.
```



### Ex3/ Part 3/Step3/a.

```
R1#show ip interface brief
Interface                IP-Address      OK? Method Status      Protocol
GigabitEthernet0/0/0     192.168.0.1     YES manual up          up
GigabitEthernet0/0/1     192.168.1.1     YES manual up          up
GigabitEthernet0/1/0     unassigned      YES unset  up          down
GigabitEthernet0/1/1     unassigned      YES unset  up          down
GigabitEthernet0/1/2     unassigned      YES unset  up          down
GigabitEthernet0/1/3     unassigned      YES unset  up          down
Vlan1                    unassigned      YES unset  administratively down down
R1#
```

### Ex3/ Part 3/Step3/b.

```
R1#show ipv6 interface g0/0/1
GigabitEthernet0/0/1 is up, line protocol is up
  IPv6 is enabled, link-local address is FE80::1
  No Virtual link-local address(es):
  Global unicast address(es):
    2001:DB8:ACAD:1::1, subnet is 2001:DB8:ACAD:1::/64
  Joined group address(es):
    FF02::1
    FF02::2
    FF02::1:FF00:1
  MTU is 1500 bytes
  ICMP error messages limited to one every 100 milliseconds
  ICMP redirects are enabled
  ICMP unreachable are sent
  ND DAD is enabled, number of DAD attempts: 1
  ND reachable time is 30000 milliseconds
  ND advertised reachable time is 0 (unspecified)
  ND advertised retransmit interval is 0 (unspecified)
  ND router advertisements are sent every 200 seconds
  ND router advertisements live for 1800 seconds
  ND advertised default router preference is Medium
  Hosts use stateless autoconfig for addresses.
R1#show ip interface brief
Interface                IP-Address      OK? Method Status      Protocol
GigabitEthernet0/0/0     192.168.0.1     YES manual up          up
GigabitEthernet0/0/1     192.168.1.1     YES manual up          up
GigabitEthernet0/1/0     unassigned      YES unset  up          down
GigabitEthernet0/1/1     unassigned      YES unset  up          down
GigabitEthernet0/1/2     unassigned      YES unset  up          down
GigabitEthernet0/1/3     unassigned      YES unset  up          down
Vlan1                    unassigned      YES unset  administratively down down
R1#
R1#show ipv6 interface brief
GigabitEthernet0/0/0     [up/up]
  FE80::1
  2001:DB8:ACAD::1
GigabitEthernet0/0/1     [up/up]
  FE80::1
  2001:DB8:ACAD:1::1
GigabitEthernet0/1/0     [up/down]
GigabitEthernet0/1/1     [up/down]
GigabitEthernet0/1/2     [up/down]
GigabitEthernet0/1/3     [up/down]
Vlan1                    [administratively down/down]
  unassigned
R1#
```

### Ex3/ Part 3/Step3/c.

```
S1>enable
S1#show ip interface brief
Interface                IP-Address      OK? Method Status  Protocol
FastEthernet0/1          unassigned      YES manual down    down
FastEthernet0/2          unassigned      YES manual down    down
FastEthernet0/3          unassigned      YES manual down    down
FastEthernet0/4          unassigned      YES manual down    down
FastEthernet0/5          unassigned      YES manual up       up
FastEthernet0/6          unassigned      YES manual up       up
FastEthernet0/7          unassigned      YES manual down    down
FastEthernet0/8          unassigned      YES manual down    down
FastEthernet0/9          unassigned      YES manual down    down
FastEthernet0/10         unassigned      YES manual down    down
FastEthernet0/11         unassigned      YES manual down    down
FastEthernet0/12         unassigned      YES manual down    down
FastEthernet0/13         unassigned      YES manual down    down
FastEthernet0/14         unassigned      YES manual down    down
FastEthernet0/15         unassigned      YES manual down    down
FastEthernet0/16         unassigned      YES manual down    down
FastEthernet0/17         unassigned      YES manual down    down
FastEthernet0/18         unassigned      YES manual down    down
FastEthernet0/19         unassigned      YES manual down    down
FastEthernet0/20         unassigned      YES manual down    down
FastEthernet0/21         unassigned      YES manual down    down
FastEthernet0/22         unassigned      YES manual down    down
FastEthernet0/23         unassigned      YES manual down    down
FastEthernet0/24         unassigned      YES manual down    down
GigabitEthernet0/1       unassigned      YES manual down    down
GigabitEthernet0/2       unassigned      YES manual down    down
Vlan1                    192.168.1.2     YES manual up       up
S1#
```

**Ex3/ Part 3/ Reflection Questions/1. If the G0/0/1 interface showed that it was administratively down, what interface configuration command would you use to bring the interface up?**

R1(config-if)# no shutdown

**Ex3/ Part 3/ Reflection Questions/2. What would happen if you had incorrectly configured interface G0/0/1 on the router with an IP address of 192.168.1.2?**

PC-A cannot ping PC-B as they belong to different networks. To route packets to PC-B, PC-A requires the default gateway router. However, PC-A is configured to use 192.168.1.1 as the default gateway router, which isn't assigned to any device on the LAN. Consequently, packets destined for the default gateway cannot reach their intended destination for routing.

Cisco Packet Tracer - C:\Users\16273\GitHub\ISEP-Documents\2309-2401\Réseaux et Networks\TP2-EN\TP2-ex3.pka - Guest - 2023-11-14 20:13:29

File Edit Options View Tools Extensions Window Help

Activity Results

Congratulations Guest! You completed the activity.



# Packet Tracer - Examine the ARP Table

**Ex4/ Part 1/Step 1/b:**

```
C:\>arp -d
```

**Ex4/ Part 1/Step 1/c:**

```
C:\>ping 172.16.31.3

Pinging 172.16.31.3 with 32 bytes of data:

Reply from 172.16.31.3: bytes=32 time<1ms TTL=128
Reply from 172.16.31.3: bytes=32 time<1ms TTL=128
Reply from 172.16.31.3: bytes=32 time<1ms TTL=128
Reply from 172.16.31.3: bytes=32 time<1ms TTL=128

Ping statistics for 172.16.31.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>|
```

**Ex4/ Part 1/Step 1/d:** Click Capture/Forward once. The ARP PDU moves Switch1 while the ICMP PDU disappears, waiting for the ARP reply. Open the PDU and record the destination MAC address.

The screenshot shows the 'PDU Information at Device: Switch1' window. It has three tabs: 'OSI Model', 'Inbound PDU Details', and 'Outbound PDU Details'. The 'OSI Model' tab is active, displaying the following information:

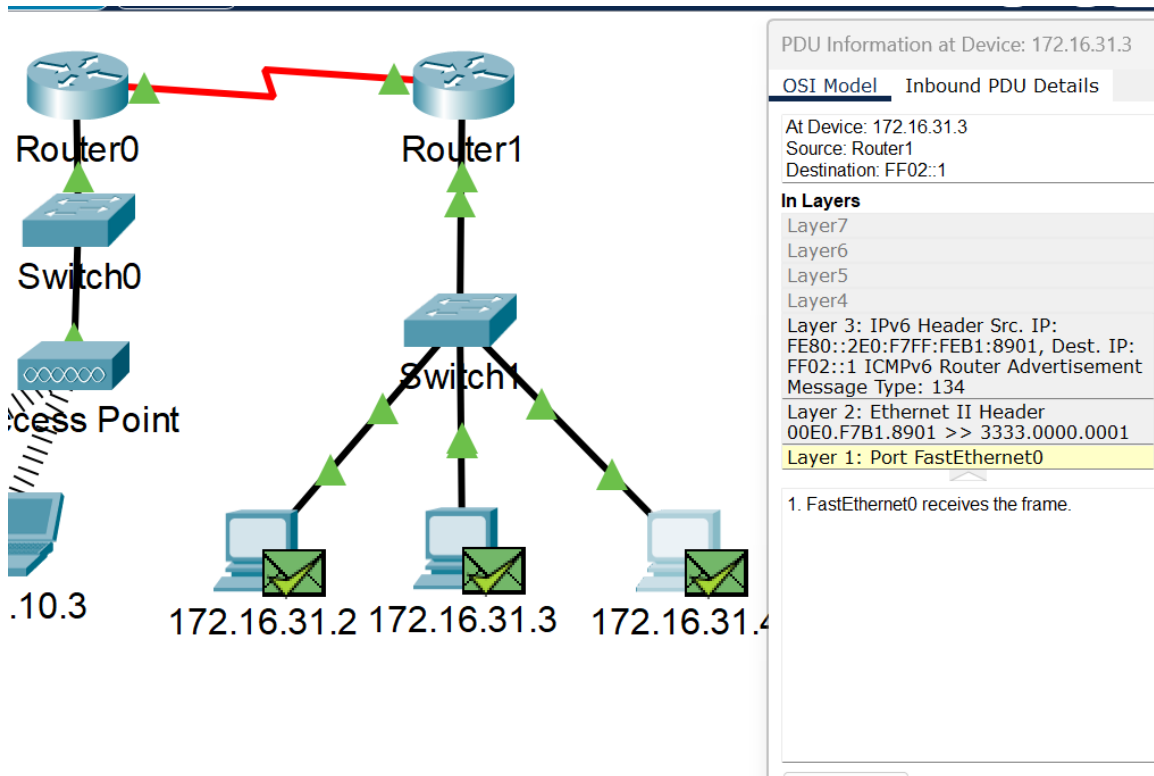
- At Device: Switch1
- Source: 172.16.31.2
- Destination: 172.16.31.3

Below this, there are two columns: 'In Layers' and 'Out Layers'. Both columns list the layers of the OSI model from Layer 7 down to Layer 1. In the 'In Layers' column, 'Layer 1: Port FastEthernet0/2' is highlighted in yellow. In the 'Out Layers' column, 'Layer 1: Port(s): FastEthernet0/1' is highlighted. Below the layers, a text box contains the message: '1. FastEthernet0/2 receives the frame.' At the bottom of the window, there are three buttons: 'Challenge Me', '<< Previous Layer', and 'Next Layer >>'.

**Is this address listed in the table above?**

No.

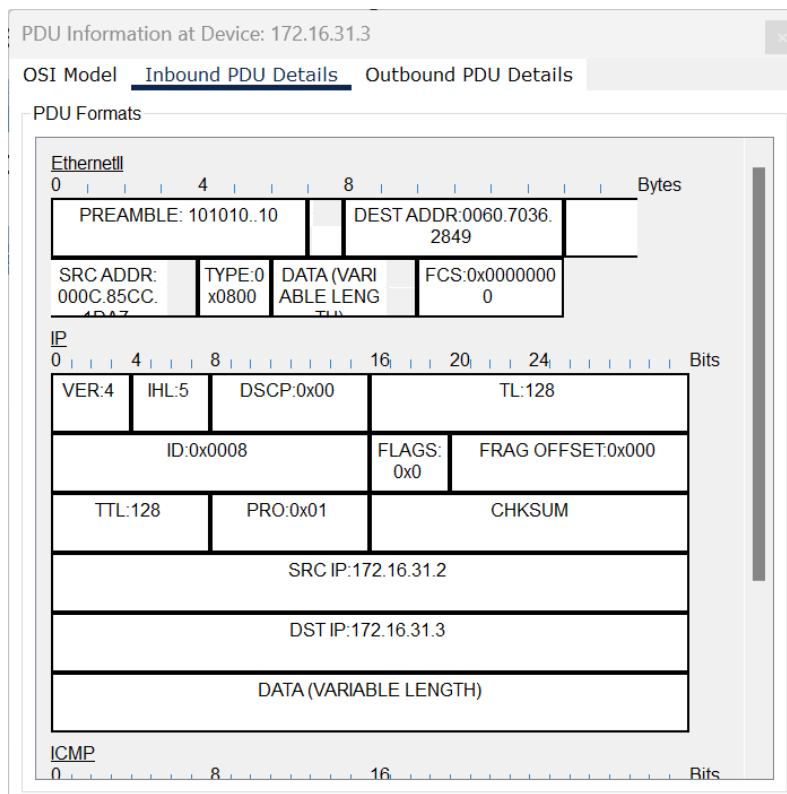
**Ex4/ Part 1/Step 1/e. Click Capture/Forward to move the PDU to the next device.**



**How many copies of the PDU did Switch1 make?**

3.

**Ex4/ Part 1/Step 1/f. What is the IP address of the device that accepted the PDU?**



172.16.31.3

**Ex4/ Part 1/Step 1/g. Open the PDU and examine Layer 2. What happened to the source and destination MAC addresses?**

PDU Information at Device: 172.16.31.3

OSI Model   Inbound PDU Details   Outbound PDU Details

At Device: 172.16.31.3  
Source: 172.16.31.2  
Destination: Broadcast

| In Layers                                                                                                           | Out Layers                                                                                                          |
|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| Layer7                                                                                                              | Layer7                                                                                                              |
| Layer6                                                                                                              | Layer6                                                                                                              |
| Layer5                                                                                                              | Layer5                                                                                                              |
| Layer4                                                                                                              | Layer4                                                                                                              |
| Layer3                                                                                                              | Layer3                                                                                                              |
| Layer 2: Ethernet II Header 000C.85CC.1DA7 >> FFFF.FFFF.FFFF ARP Packet Src. IP: 172.16.31.2, Dest. IP: 172.16.31.3 | Layer 2: Ethernet II Header 0060.7036.2849 >> 000C.85CC.1DA7 ARP Packet Src. IP: 172.16.31.3, Dest. IP: 172.16.31.2 |
| Layer 1: Port FastEthernet0                                                                                         | Layer 1: Port(s): FastEthernet0                                                                                     |

1. FastEthernet0 receives the frame.

FFFF.FFFF.FFFF turned into MAC address of 172.16.31.3, Source became destination.

**Ex4/ Part 1/Step 1/ h. Click Capture/Forward until the PDU returns to 172.16.31.2. How many copies of the PDU did the switch make during the ARP reply?**

PDU Information at Device: 172.16.31.2

OSI Model   Outbound PDU Details

PDU Formats

EthernetII

| Bytes                    |              |                           |                 |
|--------------------------|--------------|---------------------------|-----------------|
| PREAMBLE: 101010..10     |              | DEST ADDR: FFFF.FFFF.FFFF |                 |
| SRC ADDR: 000C.85CC.1DA7 | TYPE: 0x0806 | DATA (VARIABLE LENGTH)    | FCS: 0x00000000 |

Arp

| Bits                        |            |                       |  |
|-----------------------------|------------|-----------------------|--|
| HARDWARE TYPE: 0x0001       |            | PROTOCOL TYPE: 0x0800 |  |
| HLEN: 0x06                  | PLEN: 0x04 | OPCODE: 0x0001        |  |
| SOURCE MAC : 000C.85CC.1DA7 |            |                       |  |
| SOURCE IP : 172.16.31.2     |            |                       |  |
| TARGET MAC: 0000.0000.0000  |            |                       |  |
| TARGET IP: 172.16.31.3      |            |                       |  |

One.

**Ex4/ Part 1/Step 2/a.** Note that the ICMP packet reappears. Open the PDU and examine the MAC addresses. **Do the MAC addresses of the source and destination align with their IP addresses?**

PDU Information at Device: 172.16.31.2

OSI Model   Outbound PDU Details

At Device: 172.16.31.2  
Source: 172.16.31.2  
Destination: Broadcast

| In Layers | Out Layers                                                                                                             |
|-----------|------------------------------------------------------------------------------------------------------------------------|
| Layer7    | Layer7                                                                                                                 |
| Layer6    | Layer6                                                                                                                 |
| Layer5    | Layer5                                                                                                                 |
| Layer4    | Layer4                                                                                                                 |
| Layer3    | Layer3                                                                                                                 |
|           | Layer 2: Ethernet II Header 000C.85CC.1DA7 >> FFFF.FFFF.FFFF ARP<br>Packet Src. IP: 172.16.31.2, Dest. IP: 172.16.31.3 |
| Layer2    |                                                                                                                        |
| Layer1    | Layer 1: Port(s): FastEthernet0                                                                                        |

1. The ARP process constructs a request for the target IP address.  
2. The device encapsulates the PDU into an Ethernet frame.

Yes.

**Ex4/ Part 1/Step 2/ b.** Switch back to Realtime and the ping completes.

```
C:\>
ping 172.16.31.3

Pinging 172.16.31.3 with 32 bytes of data:

Reply from 172.16.31.3: bytes=32 time=26ms TTL=128
Reply from 172.16.31.3: bytes=32 time<1ms TTL=128
Reply from 172.16.31.3: bytes=32 time<1ms TTL=128
Reply from 172.16.31.3: bytes=32 time<1ms TTL=128

Ping statistics for 172.16.31.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 26ms, Average = 6ms

C:\>
```

☐ Top

Realtime

**Ex4/ Part 1/Step 2/ c.** Click 172.16.31.2 and enter the arp -a command. **To what IP address does the MAC address entry correspond?**

```
C:\>arp -a

Internet Address      Physical Address      Type
172.16.31.3          0060.7036.2849       dynamic
```

172.16.31.3

**Ex4/ Part 1/Step 2/ d.** In general, when does an end device issue an ARP request?

When the receiver's MAC address is unknown.

**Ex4/ Part 2/Step 1/ a.** From 172.16.31.2, enter the ping 172.16.31.4 command.

```
C:\>ping 172.16.31.4

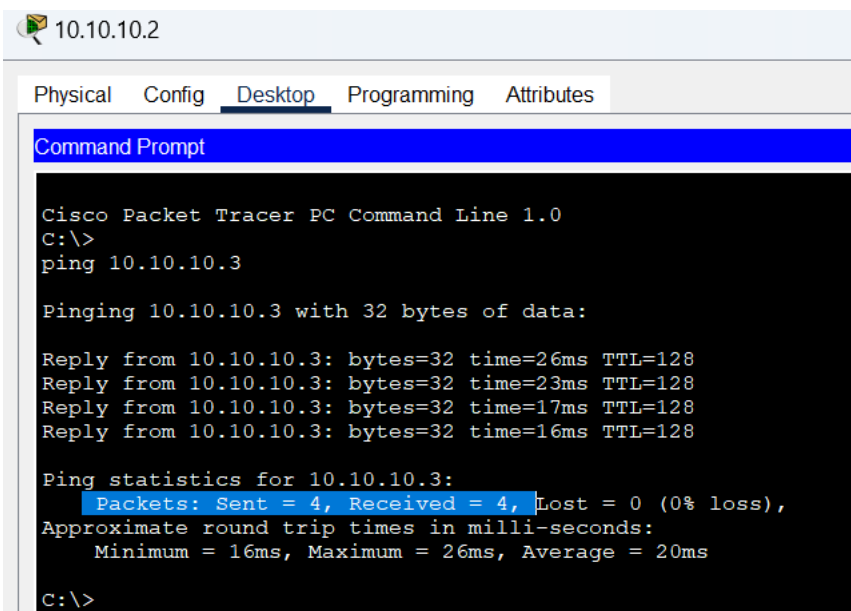
Pinging 172.16.31.4 with 32 bytes of data:

Reply from 172.16.31.4: bytes=32 time<1ms TTL=128
Reply from 172.16.31.4: bytes=32 time<1ms TTL=128
Reply from 172.16.31.4: bytes=32 time<1ms TTL=128
Reply from 172.16.31.4: bytes=32 time=2ms TTL=128

Ping statistics for 172.16.31.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 2ms, Average = 0ms

C:\>|
```

**Ex4/ Part 2/Step 1/c.** Enter the ping 10.10.10.3 command. How many replies were sent and received?



The screenshot shows the Cisco Packet Tracer PC Command Line interface for a PC named 10.10.10.2. The 'Desktop' tab is selected, and the 'Command Prompt' window is open. The user has entered the command 'ping 10.10.10.3'. The output shows four successful replies from 10.10.10.3 with varying round trip times (26ms, 23ms, 17ms, 16ms) and a TTL of 128. The ping statistics summary indicates that 4 packets were sent, 4 were received, and there was 0% loss, with an average round trip time of 20ms.

```
Cisco Packet Tracer PC Command Line 1.0
C:\>
ping 10.10.10.3

Pinging 10.10.10.3 with 32 bytes of data:

Reply from 10.10.10.3: bytes=32 time=26ms TTL=128
Reply from 10.10.10.3: bytes=32 time=23ms TTL=128
Reply from 10.10.10.3: bytes=32 time=17ms TTL=128
Reply from 10.10.10.3: bytes=32 time=16ms TTL=128

Ping statistics for 10.10.10.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 16ms, Maximum = 26ms, Average = 20ms

C:\>
```

4 sent, 4 received.

**Ex4/ Part 2/Step 2/a.** Click Switch1 and then the CLI tab. Enter the show mac-address-table command. Do the entries correspond to those in the table above?

```
Switch>enable
Switch#show mac-address-table

Mac Address Table
-----
Vlan    Mac Address      Type    Ports
----    -
1       00e0.f7b1.8901   DYNAMIC Gig0/1
Switch#
```

Yes.

**Ex4/ Part 2/Step 2/b.** Click Switch0, then the CLI tab. Enter the show mac-address-table command. **Do the entries correspond to those in the table above?**

```
Switch0>enable
Switch0#show mac-address-table
      Mac Address Table
-----
Vlan    Mac Address      Type    Ports
----    -
1       0001.6458.2501   DYNAMIC Gig0/1
Switch0#
```

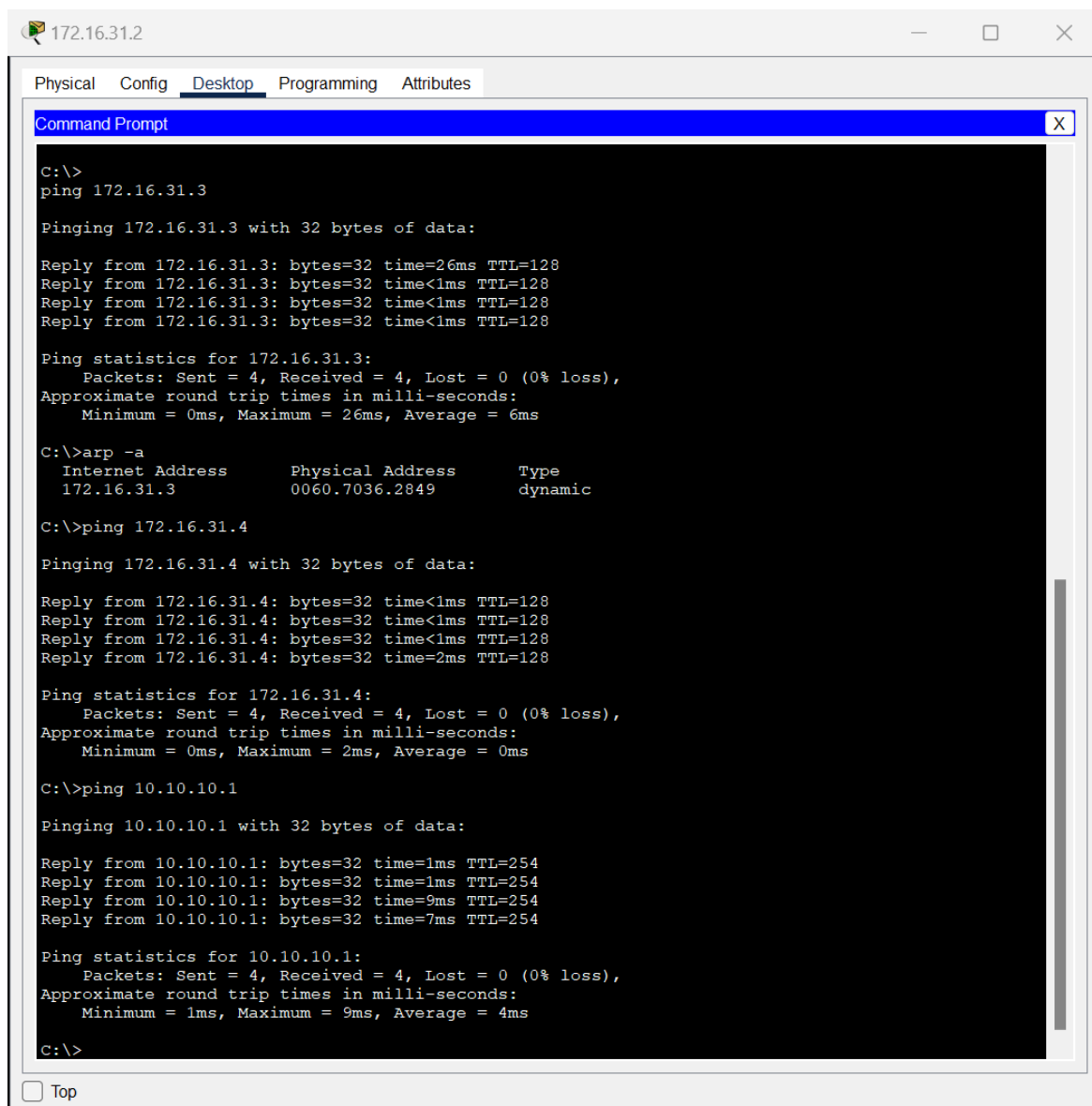
Yes.

**Ex4/ Part 2/Step 2/c.** Why are two MAC addresses associated with one port?

Both devices connect to one port through the Access Point.

**Ex4/ Part 3/Step 1/a.** Click 172.16.31.2 and open the Command Prompt.

**Ex4/ Part 3/Step 1/b.** Enter the ping 10.10.10.1 command.



```
172.16.31.2
Physical Config Desktop Programming Attributes
Command Prompt
C:\>
ping 172.16.31.3

Pinging 172.16.31.3 with 32 bytes of data:

Reply from 172.16.31.3: bytes=32 time=26ms TTL=128
Reply from 172.16.31.3: bytes=32 time<1ms TTL=128
Reply from 172.16.31.3: bytes=32 time<1ms TTL=128
Reply from 172.16.31.3: bytes=32 time<1ms TTL=128

Ping statistics for 172.16.31.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 26ms, Average = 6ms

C:\>arp -a
Internet Address      Physical Address      Type
172.16.31.3           0060.7036.2849        dynamic

C:\>ping 172.16.31.4

Pinging 172.16.31.4 with 32 bytes of data:

Reply from 172.16.31.4: bytes=32 time<1ms TTL=128
Reply from 172.16.31.4: bytes=32 time<1ms TTL=128
Reply from 172.16.31.4: bytes=32 time<1ms TTL=128
Reply from 172.16.31.4: bytes=32 time=2ms TTL=128

Ping statistics for 172.16.31.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 2ms, Average = 0ms

C:\>ping 10.10.10.1

Pinging 10.10.10.1 with 32 bytes of data:

Reply from 10.10.10.1: bytes=32 time=1ms TTL=254
Reply from 10.10.10.1: bytes=32 time=1ms TTL=254
Reply from 10.10.10.1: bytes=32 time=9ms TTL=254
Reply from 10.10.10.1: bytes=32 time=7ms TTL=254

Ping statistics for 10.10.10.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 9ms, Average = 4ms

C:\>
```

**Ex4/ Part 3/Step 1/c. Type arp -a. What is the IP address of the new ARP table entry?**

```
C:\>arp -a
Internet Address      Physical Address      Type
172.16.31.1           00e0.f7b1.8901       dynamic
172.16.31.3           0060.7036.2849       dynamic
172.16.31.4           0002.1640.8d75       dynamic
```

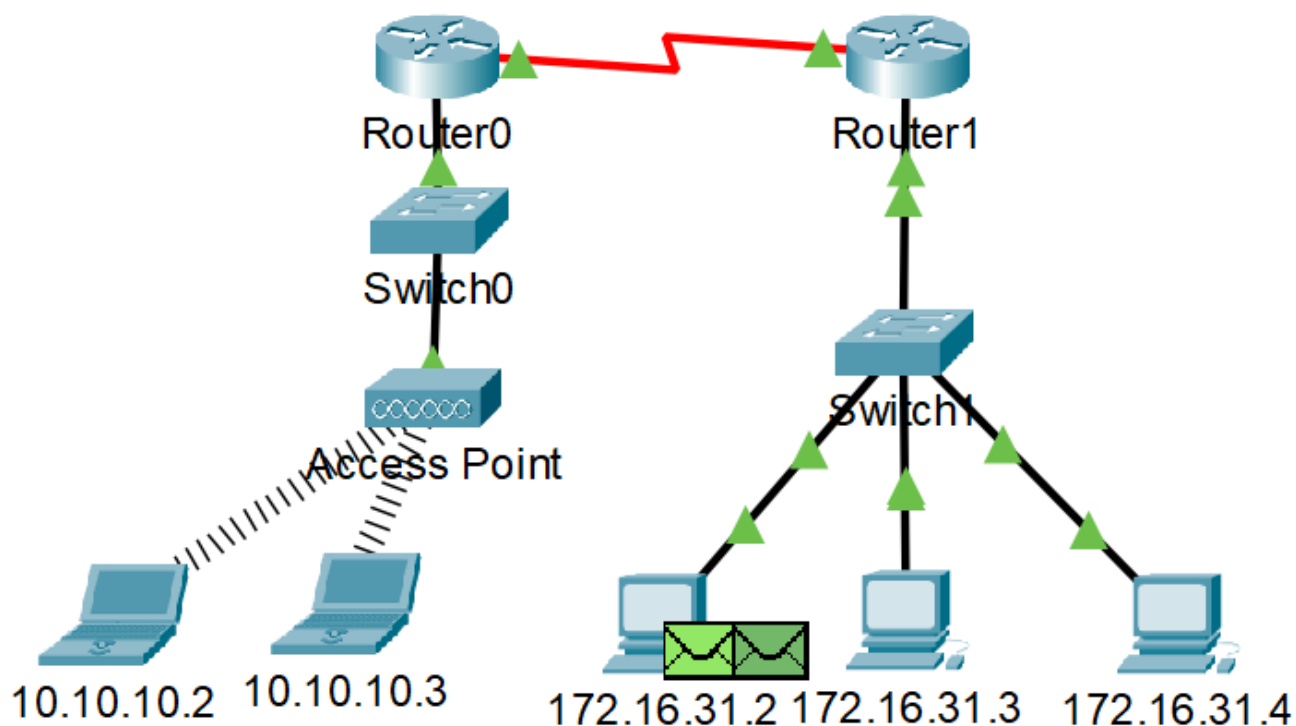
172.16.31.1

**Ex4/ Part 3/Step 1/ d. Enter arp -d to clear the ARP table and switch to Simulation mode.**

```
C:\>arp -d
C:\>
```

**Ex4/ Part 3/Step 1/ e. Repeat the ping to 10.10.10.1. How many PDUs appear?**

```
C:\>ping 10.10.10.1
Pinging 10.10.10.1 with 32 bytes of data:
```



Two.

**Ex4/ Part 3/Step 1/ f.** Click Capture/Forward. Click the PDU that is now at Switch1. **What is the target destination IP destination address of the ARP request?**

PDU Information at Device: Switch1

OSI Model   Inbound PDU Details   Outbound PDU Details

At Device: Switch1  
Source: 172.16.31.2  
Destination: Broadcast

**In Layers**

Layer7  
Layer6  
Layer5  
Layer4  
Layer3  
Layer 2: Ethernet II Header 000C.85CC.1DA7 >> FFFF.FFFF.FFFF ARP  
Packet Src. IP: 172.16.31.2, Dest. IP: 172.16.31.1  
Layer 1: Port FastEthernet0/1

**Out Layers**

Layer7  
Layer6  
Layer5  
Layer4  
Layer3  
Layer 2: Ethernet II Header 000C.85CC.1DA7 >> FFFF.FFFF.FFFF ARP  
Packet Src. IP: 172.16.31.2, Dest. IP: 172.16.31.1  
Layer 1: Port(s): FastEthernet0/2  
FastEthernet0/3 GigabitEthernet0/1

1. FastEthernet0/1 receives the frame.

172.16.31.1

**Ex4/ Part 3/Step 1/ g.** The destination IP address is not 10.10.10.1. **Why?**

The host's IPv4 configuration stores the gateway address, typically the router interface within the same network. If the destination isn't on the local network, the source initiates the ARP process to find the MAC address corresponding to the router interface acting as the gateway.

**Ex4/ Part 3/Step 2/a.** Switch to Realtime mode. Click Router1 and then the CLI tab.

**Ex4/ Part 3/Step 2/b.** Enter privileged EXEC mode and then the show mac-address-table command. **How many MAC addresses are in the table? Why?**

```
Router#show mac-address-table
          Mac Address Table
-----
Vlan      Mac Address      Type      Ports
----      -
Router#
```

Zero, because the command "show mac address-table" serves a distinct purpose compared to the switch command.



**Ex4/ Part 3/Step 2/c. Enter the show arp command. Is there an entry for 172.16.31.2? What happens to the first ping in a situation where the router responds to the ARP request?**

```
Router#show arp
Protocol  Address          Age (min)  Hardware Addr  Type   Interface
Internet  172.16.31.1       -          00E0.F7B1.8901  ARPA   GigabitEthernet0/0
Internet  172.16.31.2       8          000C.85CC.1DA7  ARPA   GigabitEthernet0/0
Router#
```

Yes. The times out.

Cisco Packet Tracer - C:\Users\16273\GitHub\ISEP-Documents\2309-2401\Réseaux et Networks\TP2-EN\TP2-ex4.pka - Guest - 2016-08-24 15:25:38

File Edit Options View Tools Extensions Window Help

Activity Results

Congratulations Guest! You completed the activity.

[Overall Feedback](#) [Assessment Items](#) [Connectivity Tests](#)