Réseaux/Networks

TP2

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G2:

GUO Xiaofan

LIN Yingqi

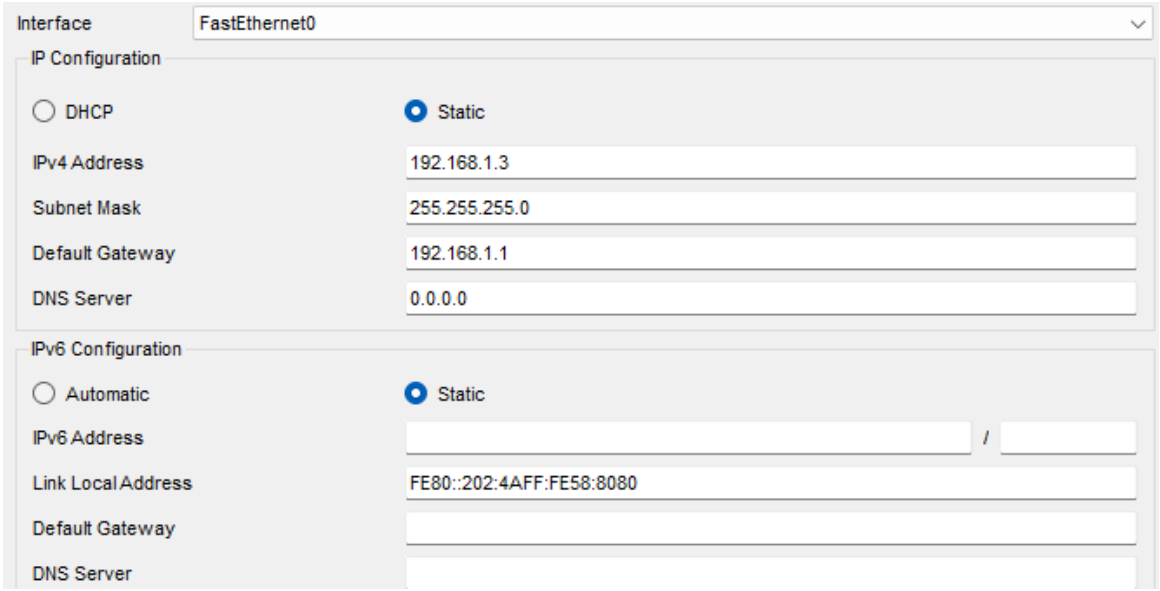
YIN Chenghao

Lab-View Network Device MAC Addresses

Part1

Step 1

Step 2:




```
C:\>ping 192.168.1.2

Pinging 192.168.1.2 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 192.168.1.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>
```

The pings were not successful yet, because the switch has not been configured.

Step 3:

a.&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
```

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
```

The pings were successful.

Part 2

Step 1:

(a)

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

  5C-26-0A*Type your answers here.*

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

  24-2A-60*ype your answers here.*

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

  Dell Inc.

(b)

From the command prompt on PC-A, issue the ipconfig /all command and identify the OUI portion of the MAC address for the NIC of PC-A.

```
C:\>ipconfig /all

FastEthernet0 Connection:(default port)

   Connection-specific DNS Suffix..:
   Physical Address.................: 0002.4A58.8080
   Link-local IPv6 Address.........: FE80::202:4AFF:FE58:8080
   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..............: 00-01-00-01-76-DB-95-7B-00-02-4A-58-80-80
   DNS Servers.....................: ::
                                     0.0.0.0
```

- **identify the OUI portion of the MAC address for the NIC of PC-A.**

  00-02-4A

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

  58-80-80

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

```
00-02-4A    (hex)          Cisco Systems, Inc
00024A      (base 16)      Cisco Systems, Inc
                           80 West Tasman Drive
                           San Jose  CA  94568
                           US
```

  Cisco Systems, Inc

Step 2:

Console into S1 and use the show interfaces vlan 1 command to find the MAC address information.

```
S1>enable
S1#show interface vlan 1
Vlan1 is up, line protocol is up
  Hardware is CPU Interface, address is 0000.0c02.ee6d (bia 0000.0c02.ee6d)
  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 runts, 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

S1#
```

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

  0000.0c02.ee6d

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

  02-ee-6d***s here.***

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

  00-00-0C*Type your answers here.*

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

```
                                  US

00-00-0C    (hex)                 Cisco Systems, Inc
00000C      (base 16)             Cisco Systems, Inc
                                  170 WEST TASMAN DRIVE
                                  SAN JOSE  CA  95134-1706
                                  US
```

  Cisco Systems.

- **What does bia stand for?**

  Burned in address.

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

The MAC address can be changed via a software command and the actual address will still be there.

(b)

```
S1>enable
S1#show arp
Protocol  Address          Age (min)  Hardware Addr   Type   Interface
Internet  192.168.1.2              -   0000.0C02.EE6D  ARPA   Vlan1
Internet  192.168.1.3             59   0002.4A58.8080  ARPA   Vlan1
S1#show mac address-table
          Mac Address Table
-------------------------------------------

Vlan    Mac Address       Type        Ports
----    -----------       --------    -----

   1    0002.4a58.8080    DYNAMIC     Fa0/6
```

- **What Layer 2 addresses are displayed on S1?**

  0000.0C02.EE6D

  0002.4A58.8080**.**

- **What Layer 3 addresses are displayed on S1?**

  192.168.1.2

  192.168.1.3

Step 3:

- **Did the switch display the MAC address of PC-A? If you answered yes, what port was it on?**

```
S1>enable
S1#show arp
Protocol  Address          Age (min)  Hardware Addr   Type   Interface
Internet  192.168.1.2              -   0000.0C02.EE6D  ARPA   Vlan1
Internet  192.168.1.3             59   0002.4A58.8080  ARPA   Vlan1
S1#show mac address-table
          Mac Address Table
-------------------------------------------

Vlan    Mac Address       Type        Ports
----    -----------       --------    -----

   1    0002.4a58.8080    DYNAMIC     Fa0/6
```

Yes. Port should be F0/6, the MAC address would be 0002.4a58.8080.

Reflection Questions

1. Can you have broadcasts at the Layer 2 level? If so, what would the MAC address be?

I can have broadcasts at Layer 2.

ARP will use broadcasts to find MAC address information.

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

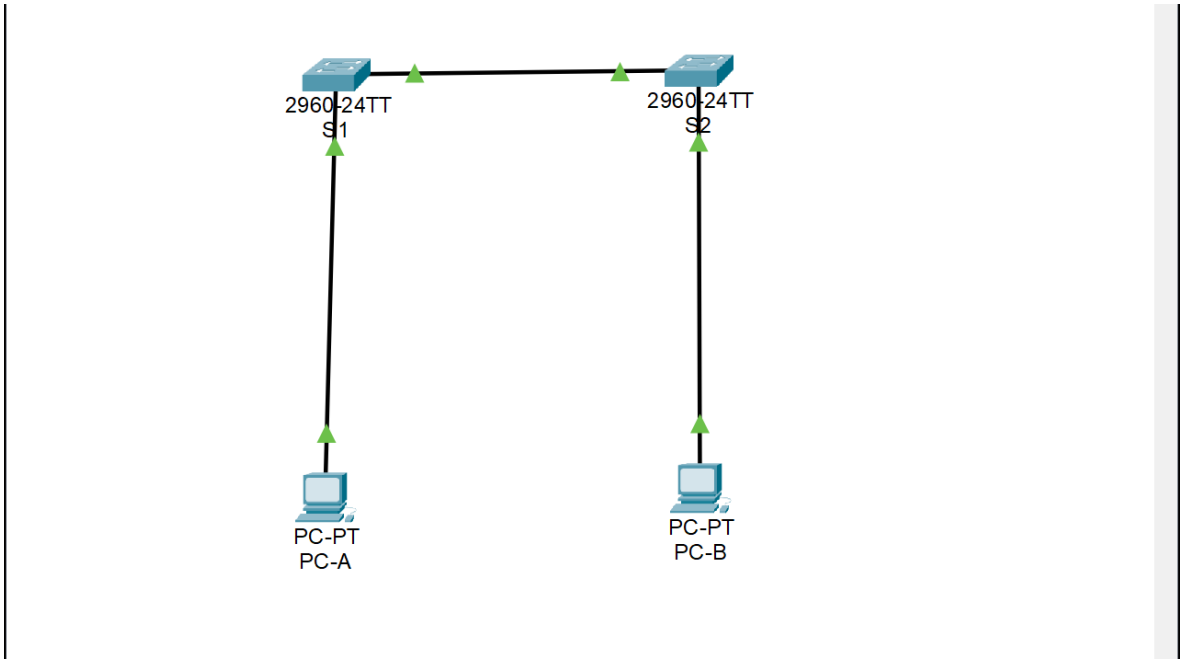
2. Why would you need to know the MAC address of a device?

In a large network, it may be easier to pinpoint location and identity of a device by its MAC address instead of its IP address. The MAC OUI will list the manufacturer, which may help narrow down the search. Security measures can be applied at Layer 2, so knowledge of allowable MAC addresses is needed.

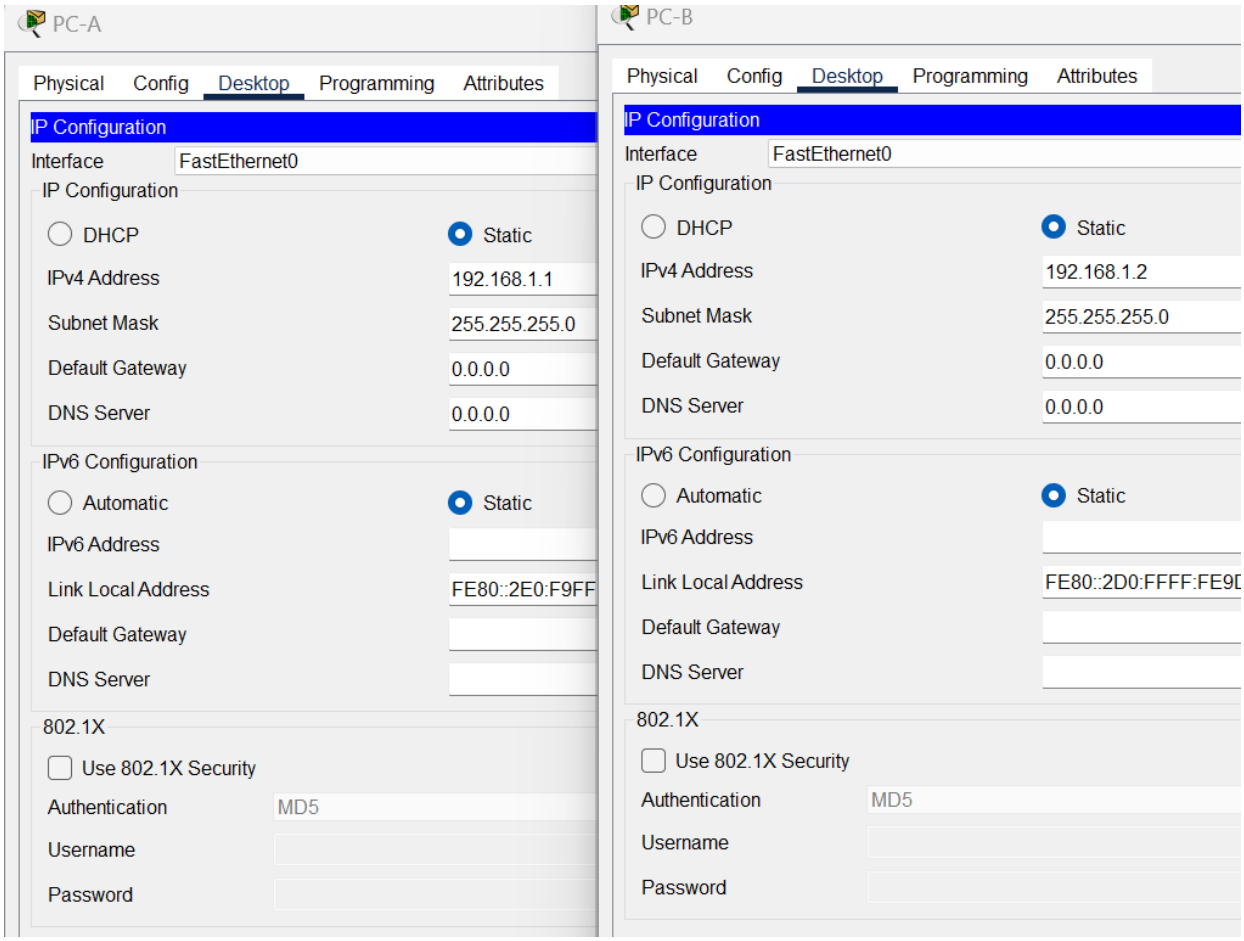
Lab - View the Switch MAC Address Table

Part 1

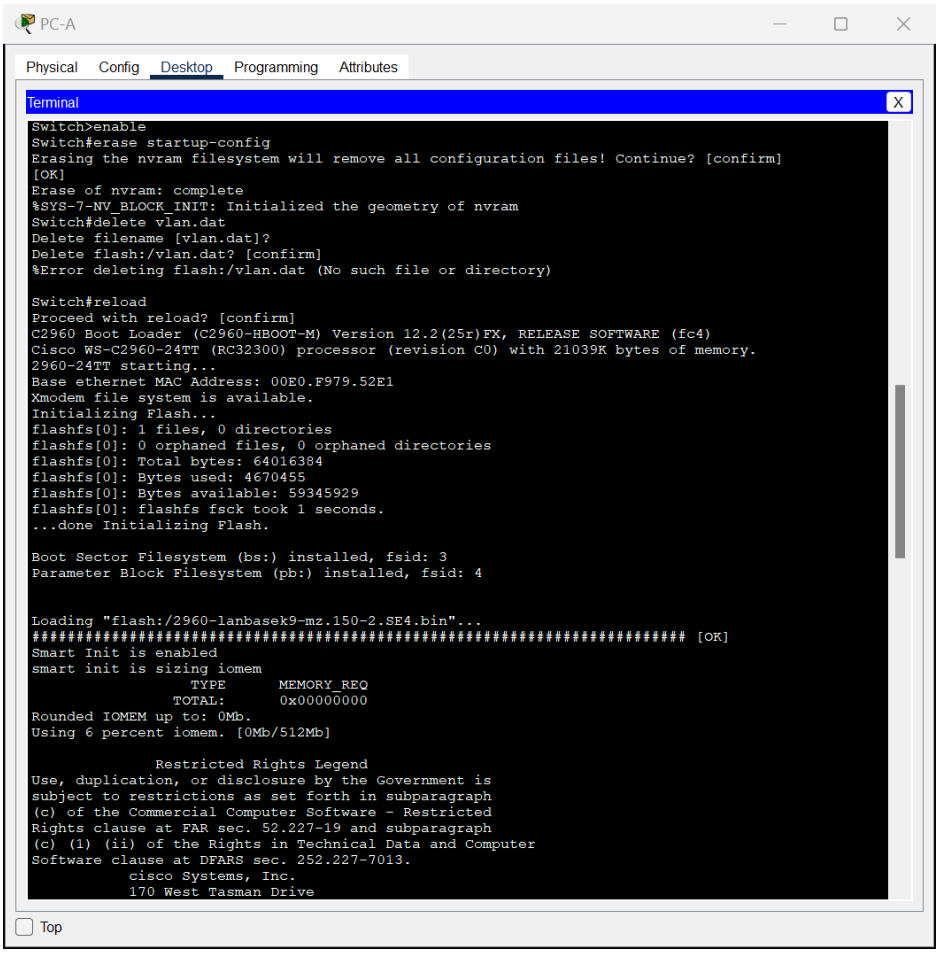
Step 1:

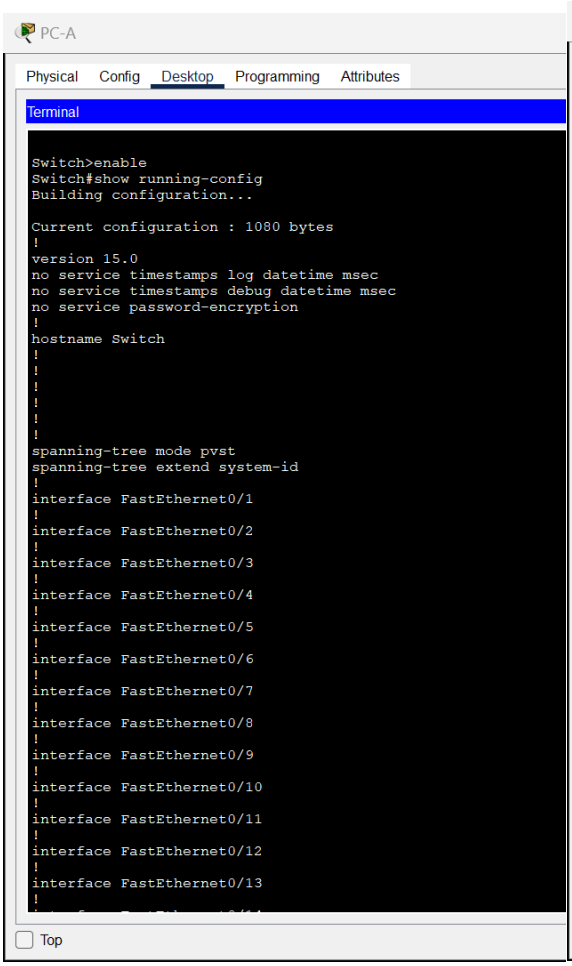


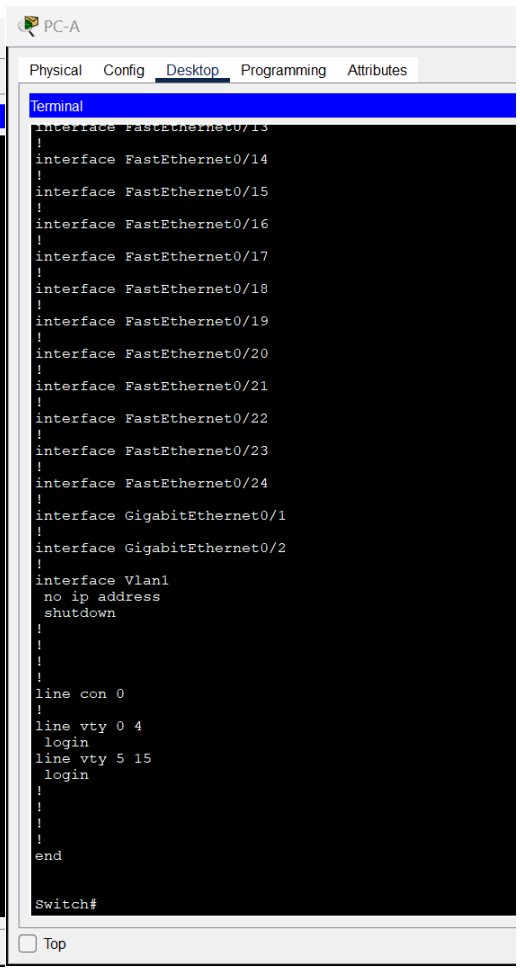
Step 2:



Step 3:


PC-A
Physical
Config
Desktop
Programming
Attributes
Terminal
X
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
Top


PC-A
Physical
Config
Desktop
Programming
Attributes
Terminal
Switch>enable
Switch#show running-config
Building configuration...
Current configuration : 1080 bytes
!
version 15.0
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname Switch
!
!
!
!
!
!
spanning-tree mode pvst
spanning-tree extend system-id
!
interface FastEthernet0/1
!
interface FastEthernet0/2
!
interface FastEthernet0/3
!
interface FastEthernet0/4
!
interface FastEthernet0/5
!
interface FastEthernet0/6
!
interface FastEthernet0/7
!
interface FastEthernet0/8
!
interface FastEthernet0/9
!
interface FastEthernet0/10
!
interface FastEthernet0/11
!
interface FastEthernet0/12
!
interface FastEthernet0/13
!
Top


PC-A
Physical
Config
Desktop
Programming
Attributes
Terminal
!
interface FastEthernet0/14
!
interface FastEthernet0/15
!
interface FastEthernet0/16
!
interface FastEthernet0/17
!
interface FastEthernet0/18
!
interface FastEthernet0/19
!
interface FastEthernet0/20
!
interface FastEthernet0/21
!
interface FastEthernet0/22
!
interface FastEthernet0/23
!
interface FastEthernet0/24
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface Vlan1
no ip address
shutdown
!
!
!
!
line con 0
!
line vty 0 4
login
line vty 5 15
login
!
!
!
!
end
Switch#
Top

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
```

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
```

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)#
```

d.

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

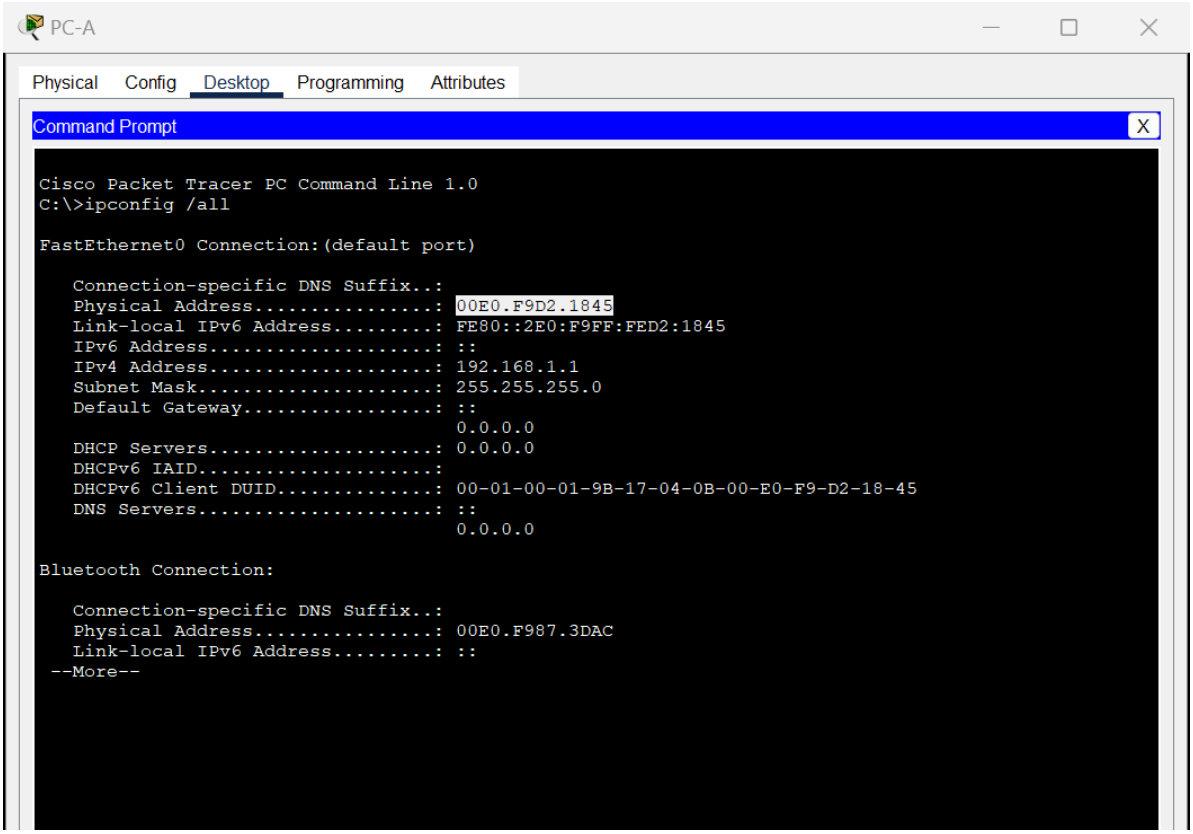
```
S2(config)#enable secret class
S2(config)#
```

Part2

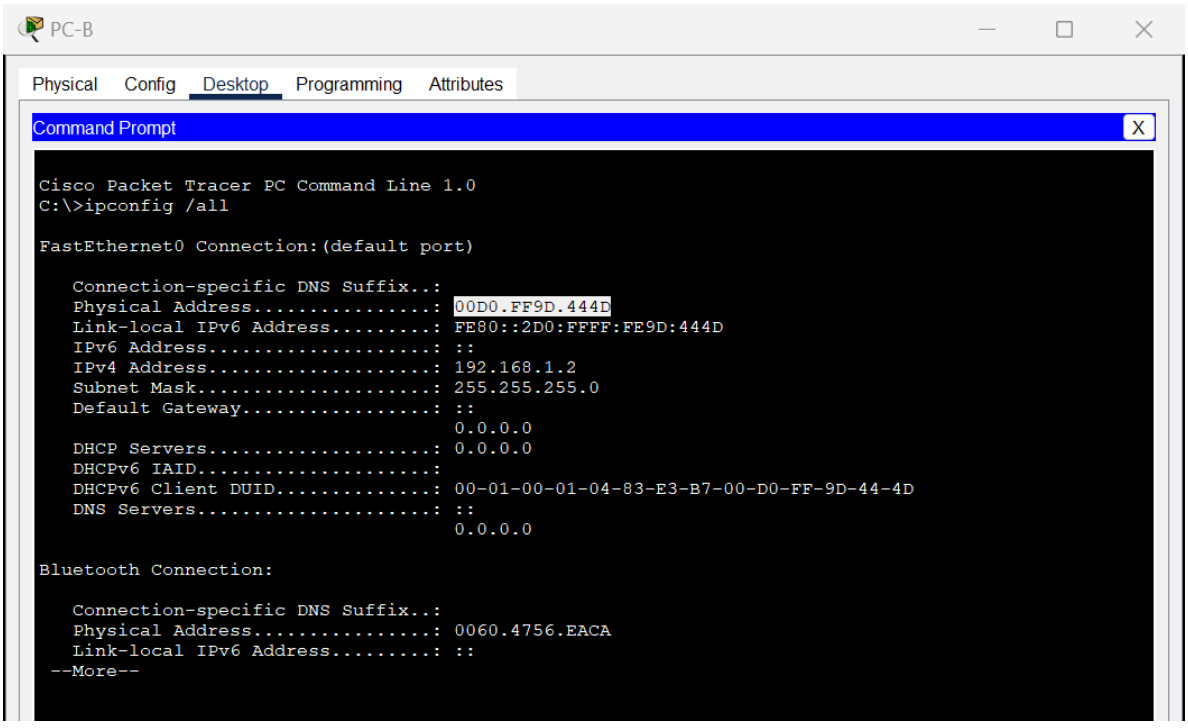
Step 1:

a.

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

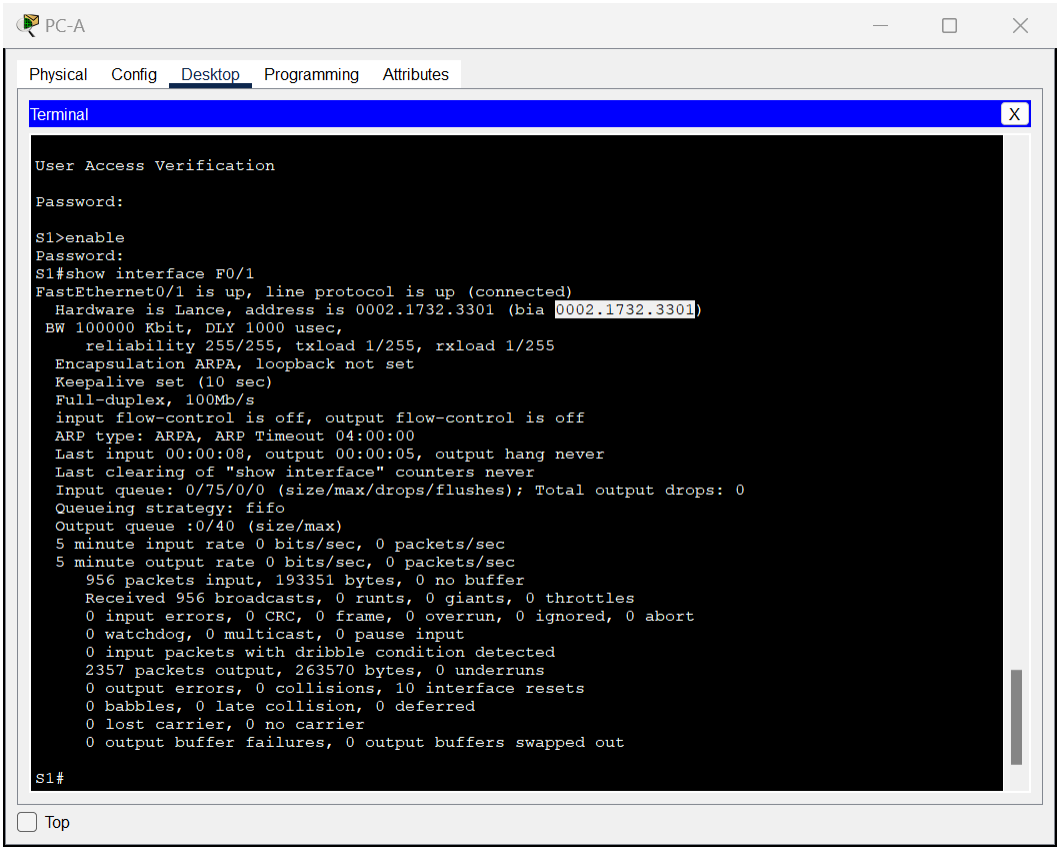


PC-B MAC Address: 00D0.FF9D.444D

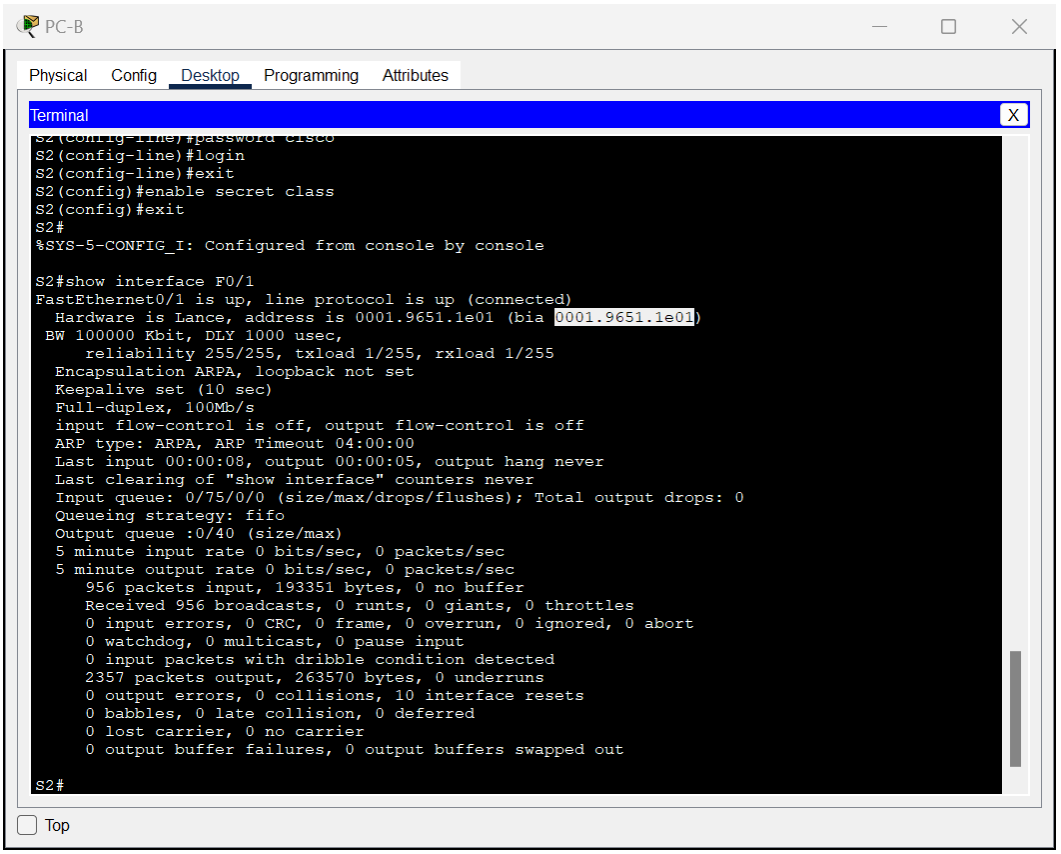


b.

S1 Fast Ethernet 0/1 MAC Address: 0002.1732.3301

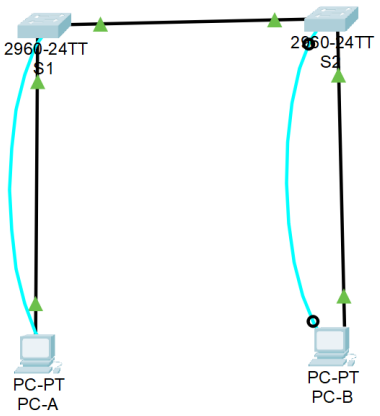


S2 Fast Ethernet 0/1 MAC Address: 0001.9651.1e01



Step 2:

a.



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)
```

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.

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.

Step 4:

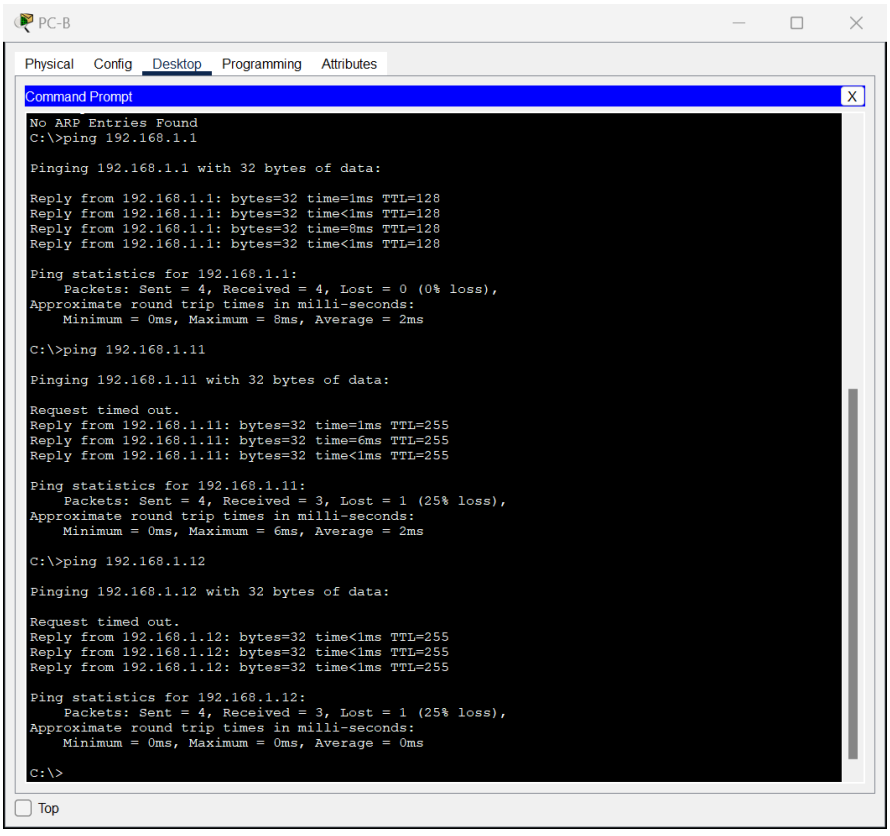
a.

```
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.

b.



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

  Yes, all devices have successful replies.

c.

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

  Yes, including S1(1st line), PC-A(4th line) , PC-B(2nd 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(1st line), S1(2nd line), S2(3rd 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:\>
```

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-

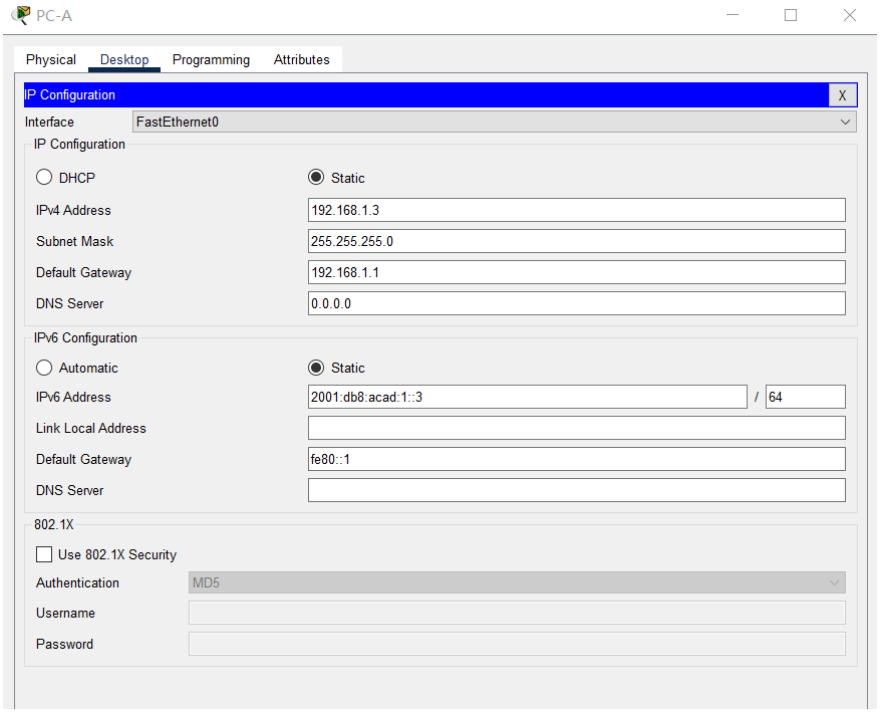
Build a Switch and Router Network - Physical Mode

Part1

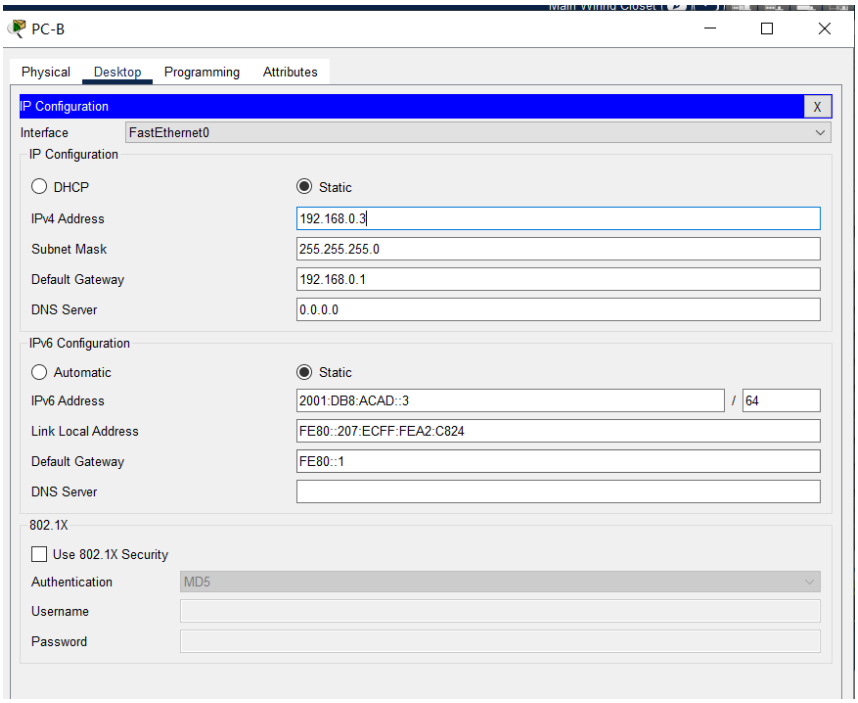
Part2

Step1

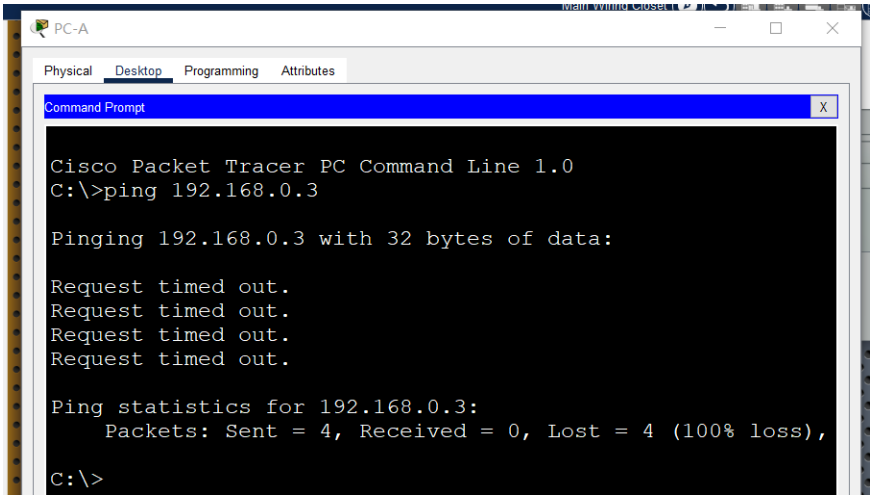
a.



b.



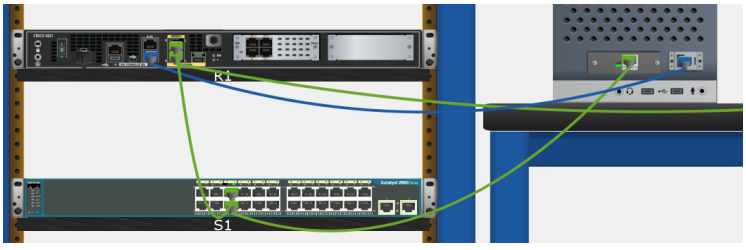
c.



The router interfaces, which serve as the default gateways, have not been configured. As a result, Layer 3 traffic is not being forwarded between the subnets.

Step2

a.



b.

```
Router>enable
Router#
```

b.

```
Router#confi term
Enter configuration commands, one per line.  End with
CNTL/Z.
Router(config)#
```

cd.

```
Router(config)#hostname R1
R1(config)#enable secret class
```

e.

```
R1(config)#line console 0
R1(config-line)#password cisco
R1(config-line)#login
R1(config-line)#exit
```

f.

```
R1(config)#line vty 0 15
R1(config-line)#password cisco
R1(config-line)#login
R1(config-line)#exit
```

g.

```
R1(config)#service password-encryption
```

h.

```
R1(config)#banner motd &unauthorized access is
prohibited&
```

i.

```
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:0::1/64
R1(config-if)#ipv6 address fe80::1 link-local
R1(config-if)#no shutdown

R1(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0/0, changed
state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface
GigabitEthernet0/0/0, changed state to up
```

j.

```
R1(config-if)#int g0/0/0
R1(config-if)#description Connection to PC-B
R1(config-if)#int g0/0/1
R1(config-if)#description Connection to S1
R1(config-if)#exit
```

k.

```
R1(config-if)#exit
R1(config)#ipv6 unicast-routing
```

l.

```
R1#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
```

m.

```
R1#clock set ?
  hh:mm:ss  Current Time
R1#clock set 09:30:00
% Incomplete command.
R1#clock set 09:30:00 ?
  <1-31>  Day of the month
  MONTH   Month of the year
R1#clock set 09:30:00 16
% Incomplete command.
R1#clock set 09:30:00 16 November 2023
```

n.

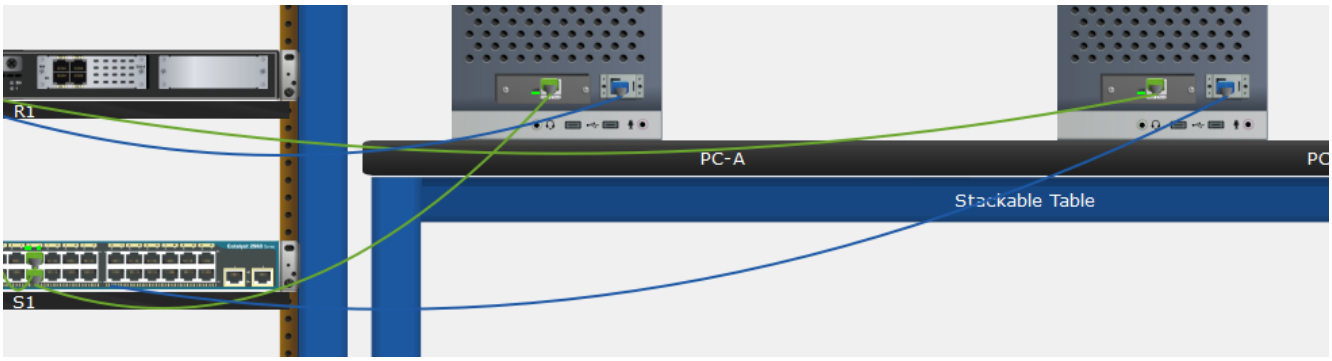
```
C:\>ping 192.168.0.3

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
```

```
C:\>ping 2001:db8:acad::3

Pinging 2001:db8:acad::3 with 32 bytes of data:

Reply from 2001:DB8:ACAD::3: bytes=32 time<1ms TTL=127
Reply from 2001:DB8:ACAD::3: bytes=32 time<1ms TTL=127
Reply from 2001:DB8:ACAD::3: bytes=32 time<1ms TTL=127
Reply from 2001:DB8:ACAD::3: bytes=32 time<1ms TTL=127

Ping statistics for 2001:DB8:ACAD::3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

The router is actively directing traffic between the two subnets. The default settings on the switch automatically activate the interfaces connected to devices.

Step3:

a.



b.&c.

```
Switch>
Switch>enable
Switch#conf term
Enter configuration commands, one per line.  End with
CNTL/Z.
Switch(config)#hostname S1
S1(config)#
```

d.&e.

```
S1(config)#int 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)#exit
S1(config)#ip default-gateway 192.168.1.1
S1(config)#end
```

f.

```
S1#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
```

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 = 0ms, Average = 0ms

C:\>ping 2001:db8:acad::3

Pinging 2001:db8:acad::3 with 32 bytes of data:

Reply from 2001:DB8:ACAD::3: bytes=32 time<1ms TTL=127
Reply from 2001:DB8:ACAD::3: bytes=32 time<1ms TTL=127
Reply from 2001:DB8:ACAD::3: bytes=32 time<1ms TTL=127
Reply from 2001:DB8:ACAD::3: bytes=32 time<1ms TTL=127

Ping statistics for 2001:DB8:ACAD::3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

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
```

Part3:

Step1:

```
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?**

Both "C" and "L" designations are valid. "C" signifies a directly connected subnet, while "L" designates a local interface. Both responses are accurate.

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

  2.

- **What interface types are associated to the C coded routes?**

  G0/0/0 and G0/0/1.

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
```

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 125 bits/sec, 0 packets/sec
     30 packets input, 3680 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
     335 packets output, 27600 bytes, 0 underruns
     0 output errors, 0 collisions, 1 interface resets
```

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

  G0/0/1 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?**

  Internet address is 192.168.1.1/24.

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 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.
```

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
```

b.

```
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
```

c.

```
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
 --More--
```

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

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 successfully ping PC-B due to being on separate networks. For proper communication, PC-A relies on the default-gateway router to route packets to PC-B. However, PC-A is configured with the default-gateway address of 192.168.1.1, which is not assigned to any device on the LAN. Consequently, packets requiring routing through the default-gateway cannot reach their intended destination.

Packet Tracer - Examine the ARP Table