

EE 5302 : COMPUTER NETWORKING
WORKSHOP 1

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REG NO. : EG/ 2019/3647

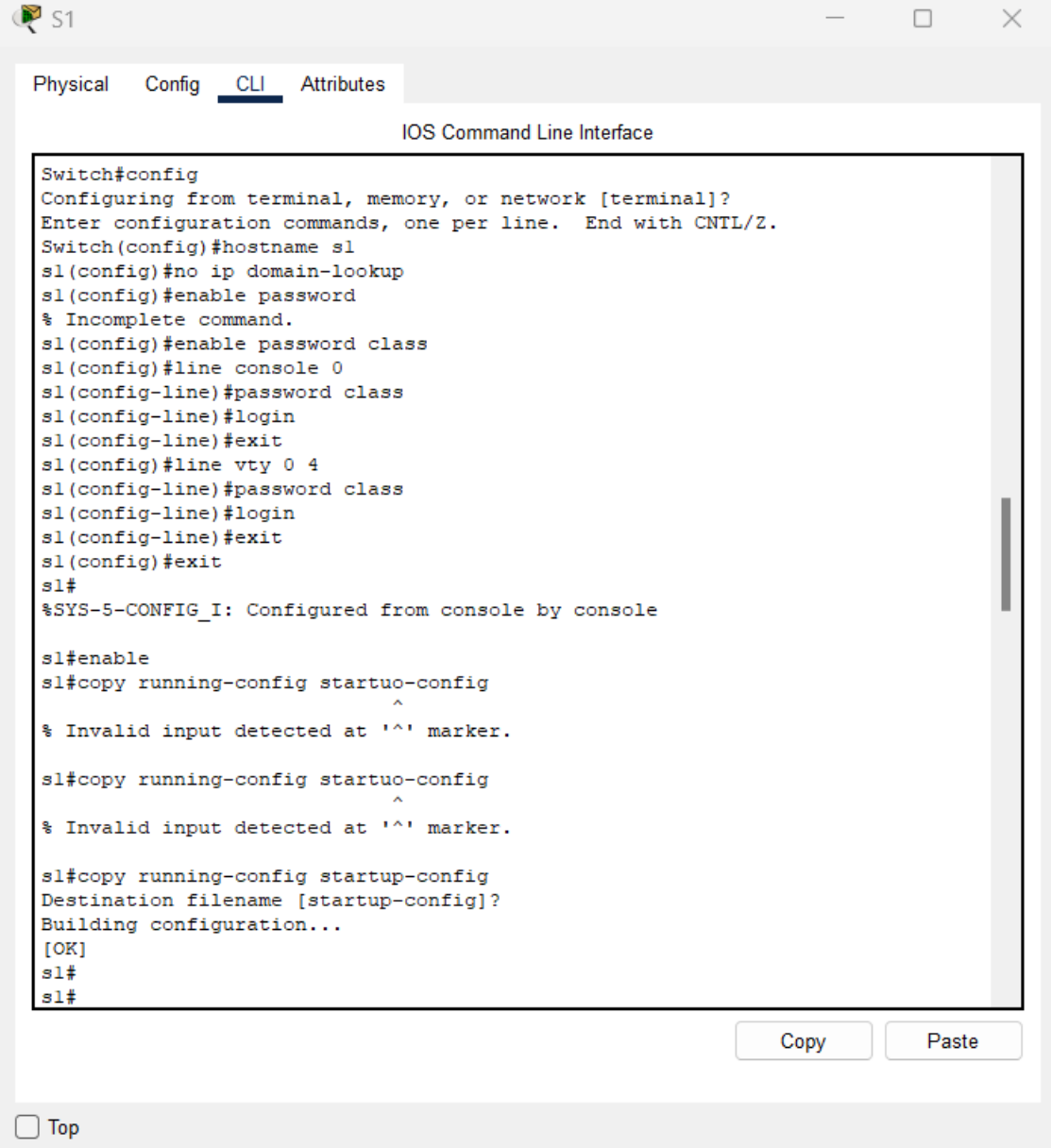
DATE : 04/03/2023

Task 1: Prepare the Network

1. Cable a network that is similar to the one in the topology diagram.
2. Clear any existing configurations on the switches, and initialize all ports in the shutdown state.

Task 2: Perform Basic Switch Configurations

1. Configure the switches according to the following guidelines.



The screenshot shows a window titled 'S1' with tabs for 'Physical', 'Config', 'CLI', and 'Attributes'. The 'CLI' tab is active, displaying the 'IOS Command Line Interface'. The terminal output shows the following commands and responses:

```
Switch#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname s1
s1(config)#no ip domain-lookup
s1(config)#enable password
% Incomplete command.
s1(config)#enable password class
s1(config)#line console 0
s1(config-line)#password class
s1(config-line)#login
s1(config-line)#exit
s1(config)#line vty 0 4
s1(config-line)#password class
s1(config-line)#login
s1(config-line)#exit
s1(config)#exit
s1#
%SYS-5-CONFIG_I: Configured from console by console

s1#enable
s1#copy running-config startuo-config
      ^
% Invalid input detected at '^' marker.

s1#copy running-config startuo-config
      ^
% Invalid input detected at '^' marker.

s1#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
s1#
s1#
```

At the bottom of the window, there are 'Copy' and 'Paste' buttons, and a 'Top' button with a checkbox.

Figure 1: Configuration of switch 1

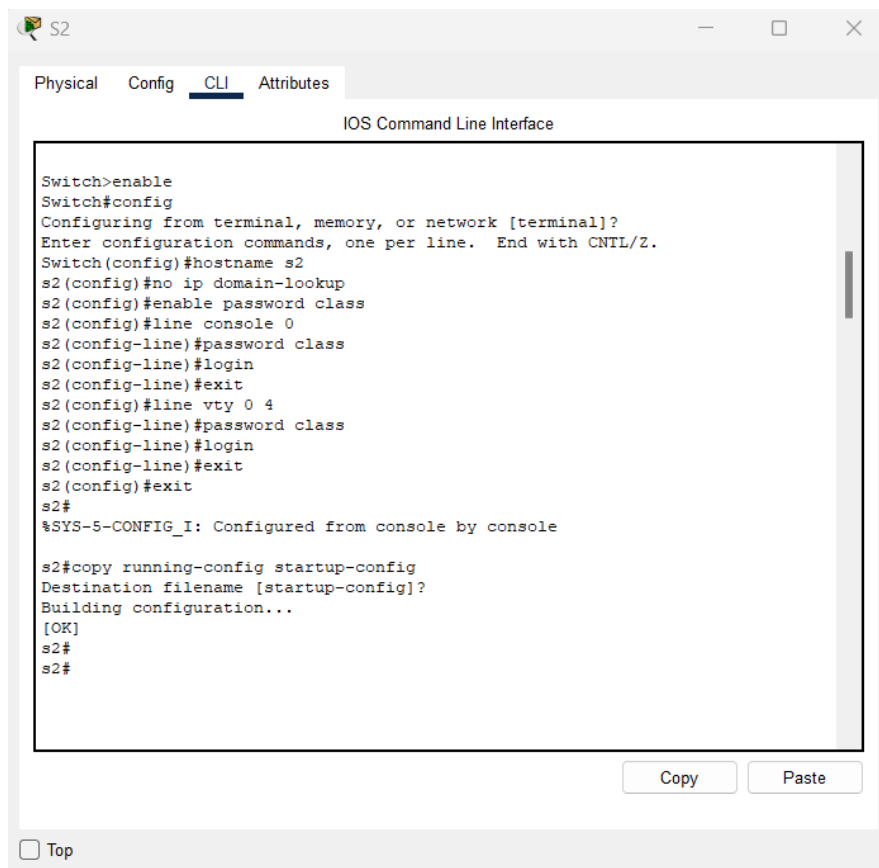


Figure 2: Configuration of switch 2

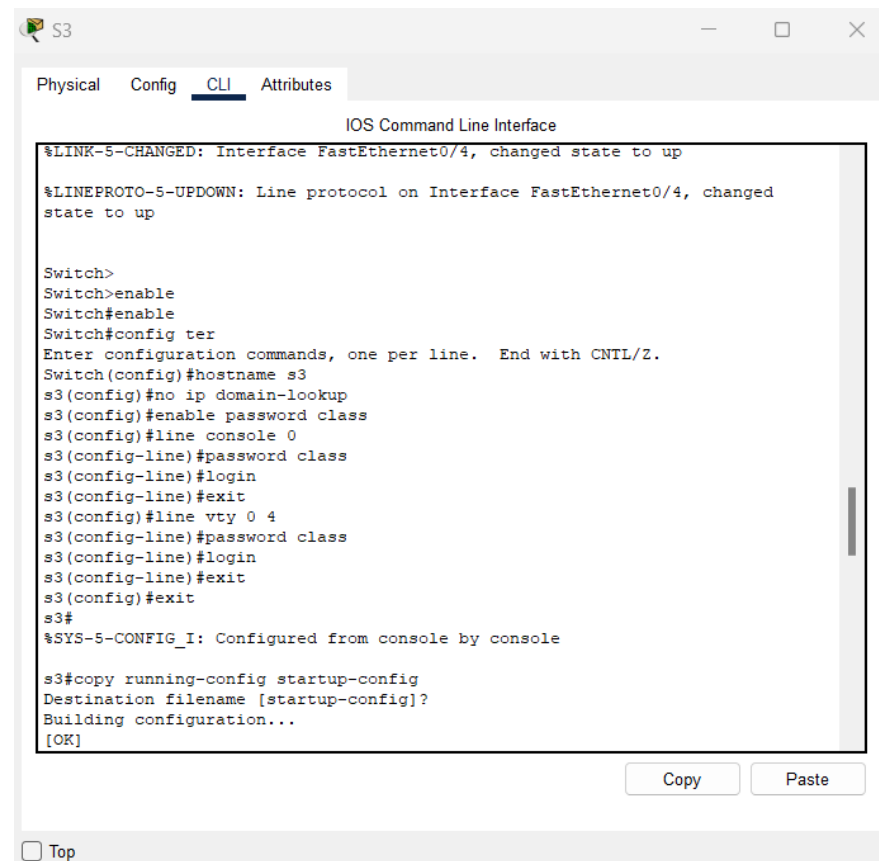


Figure 3: Configuration of switch 3

2. Re-enable the user ports on S2 and S3.

```
s1#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
s1(config)#interface range fa0/1, fa0/2, fa0/3
s1(config-if-range)#switchport mode access
s1(config-if-range)#no shutdown
s1(config-if-range)#exit
```

Figure 4: Re-enable the user ports on S1

```
s3(config)#interface range fa0/1,fa0/2,fa0/3
s3(config-if-range)#switchport mode access
s3(config-if-range)#no shutdown
s3(config-if-range)#
s3(config-if-range)#
s3(config-if-range)#exit
```

Figure 5: Re-enable the user ports on S3

Task 3: Configure and Activate Ethernet Interfaces

1. Configure the PCs.

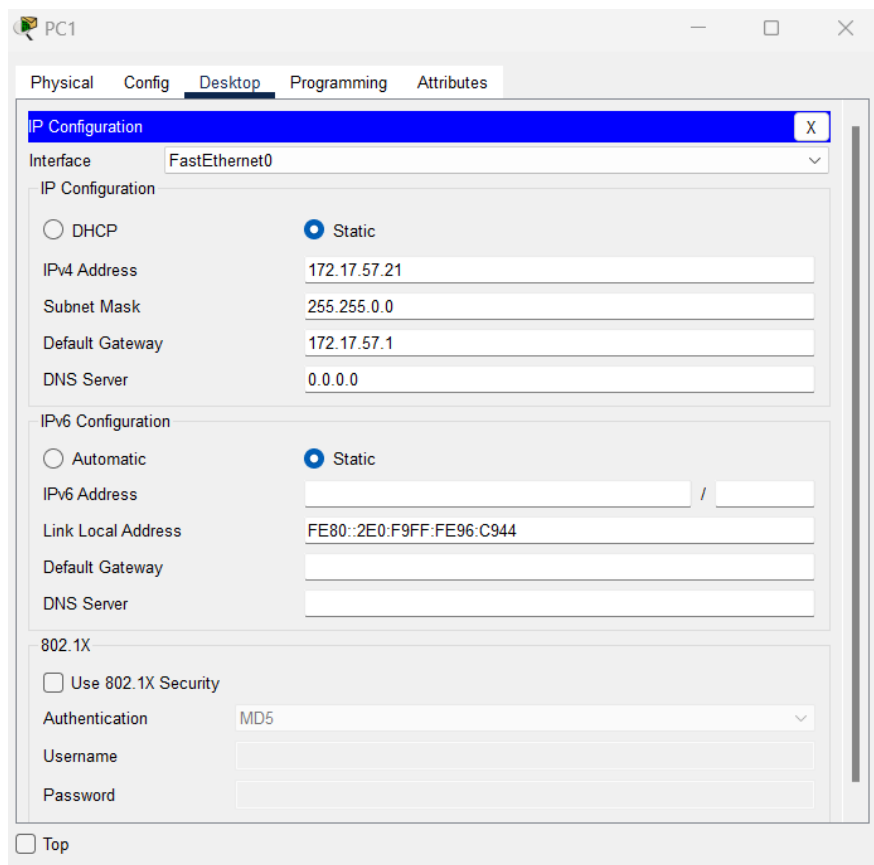


Figure 6: Configuration of PC1

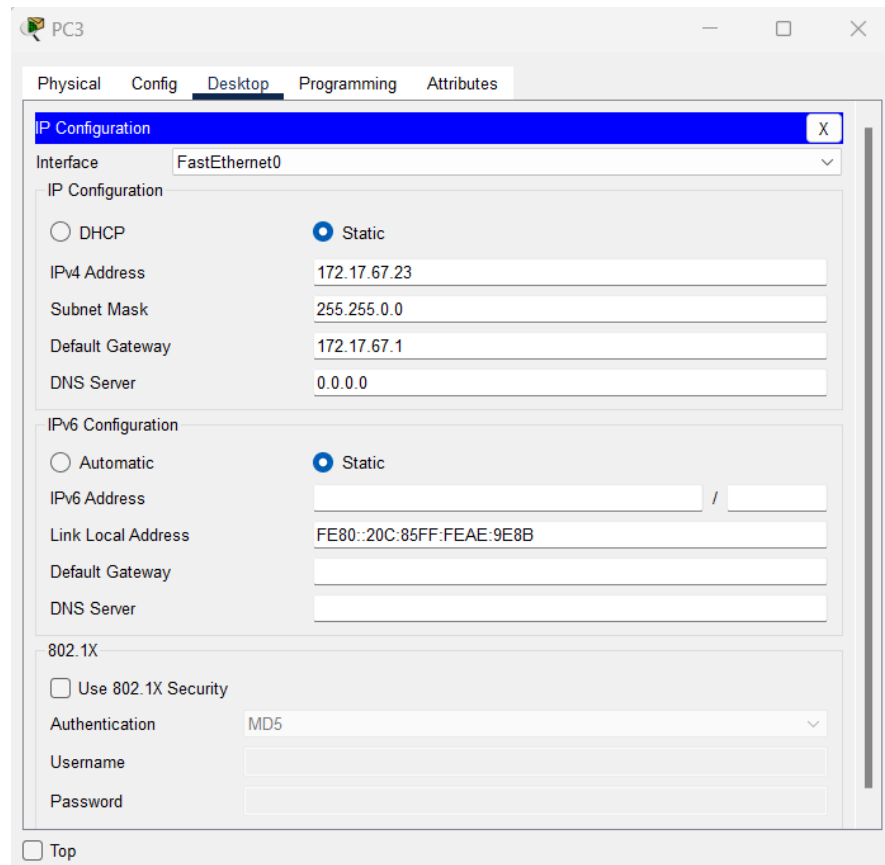


Figure 7: Configuration of PC2

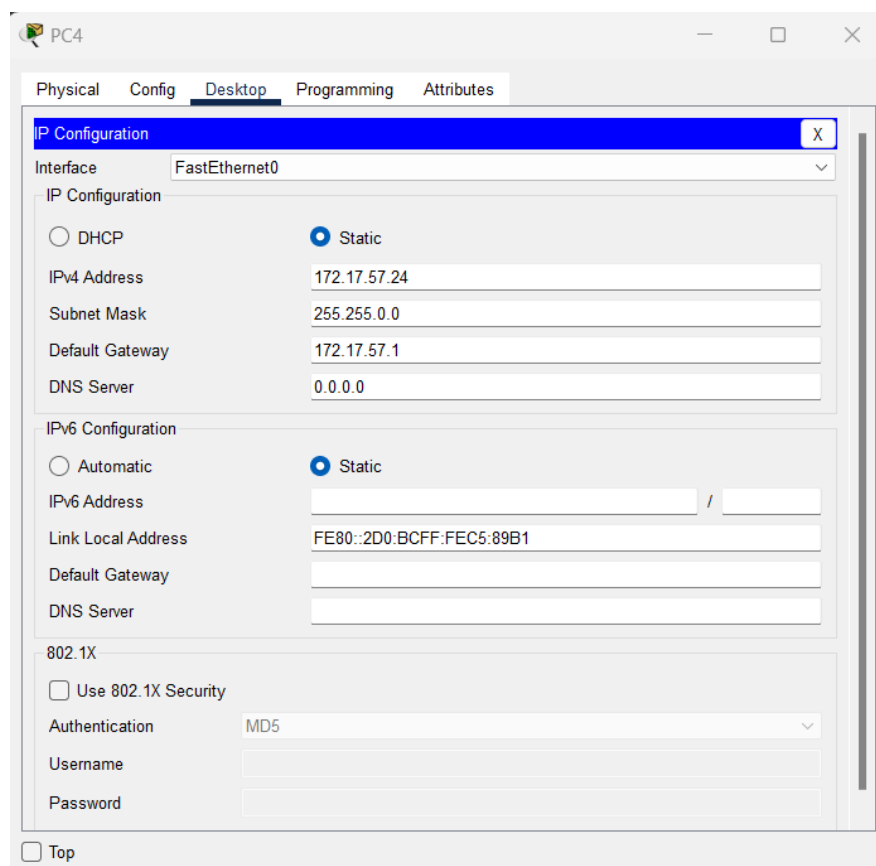


Figure 8: Configuration of PC3

PC5

Physical Config **Desktop** Programming Attributes

IP Configuration [X]

Interface: FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address: 172.17.47.25

Subnet Mask: 255.255.0.0

Default Gateway: 172.17.47.1

DNS Server: 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address: /

Link Local Address: FE80::204:9AFF:FE27:C37

Default Gateway:

DNS Server:

802.1X

☐ Use 802.1X Security

Authentication: MD5

Username:

Password:

☐ Top

Figure 9: Configuration of PC5

PC6

Physical Config **Desktop** Programming Attributes

IP Configuration [X]

Interface: FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address: 172.17.67.26

Subnet Mask: 255.255.0.0

Default Gateway: 172.17.67.1

DNS Server: 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address: /

Link Local Address: FE80::2D0:BAFF:FE09:DD2A

Default Gateway:

DNS Server:

802.1X

☐ Use 802.1X Security

Authentication: MD5

Username:

Password:

☐ Top

Figure 10: Configuration of PC6

Task 4: Configure VLANs on the Switch

1. Create VLANs on switch S1.



Figure 11: Creating VLAN for S1

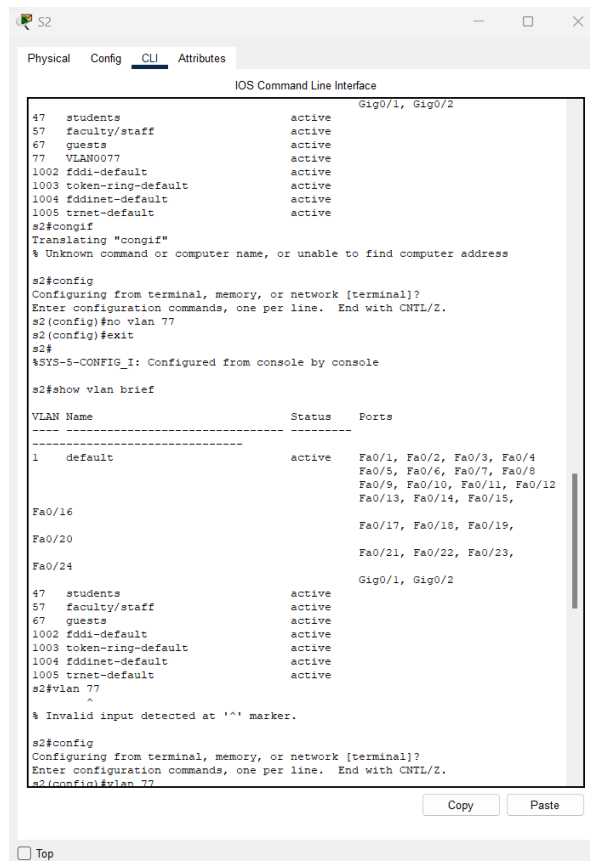


Figure 12: Creating VLAN for S2

```

s2#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
s2(config)#vlan 77
s2(config-vlan)#name management
s2(config-vlan)#end
s2#
%SYS-5-CONFIG_I: Configured from console by console

s2#show vlan brief

VLAN Name                Status    Ports
-----
1    default                active    Fa0/1, Fa0/2, Fa0/3, Fa0/4
                                           Fa0/5, Fa0/6, Fa0/7, Fa0/8
                                           Fa0/9, Fa0/10, Fa0/11, Fa0/12
                                           Fa0/13, Fa0/14, Fa0/15,
Fa0/16
Fa0/20
Fa0/24
                                           Fa0/17, Fa0/18, Fa0/19,
                                           Fa0/21, Fa0/22, Fa0/23,
                                           Gig0/1, Gig0/2
47   students                active
57   faculty/staff            active
67   guests                   active
77   management               active
1002 fddi-default              active
1003 token-ring-default      active
1004 fddinet-default         active
1005 trnet-default           active
s2#
s2#
s2#

```

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☐ Top

Figure 13: Creating VLAN for S3

2. Configure and name VLANs on switches S2 and S3.
3. Assign switch ports to VLANs on S2 and S3.

```

User Access Verification

Password:

s1>enable
Password:
s1#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
s1(config)#interface range fa0/6-10
s1(config-if-range)#switchport access vlan 67
s1(config-if-range)#interface range fa0/11-17
s1(config-if-range)#switchport access vlan 57
s1(config-if-range)#interface range fa0/18-24
s1(config-if-range)#switchport access vlan 47
s1(config-if-range)#end
s1#
%SYS-5-CONFIG_I: Configured from console by console

s1#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
s1#

```

Copy

Paste

Figure 14: Assign switch ports to VLANs on S1

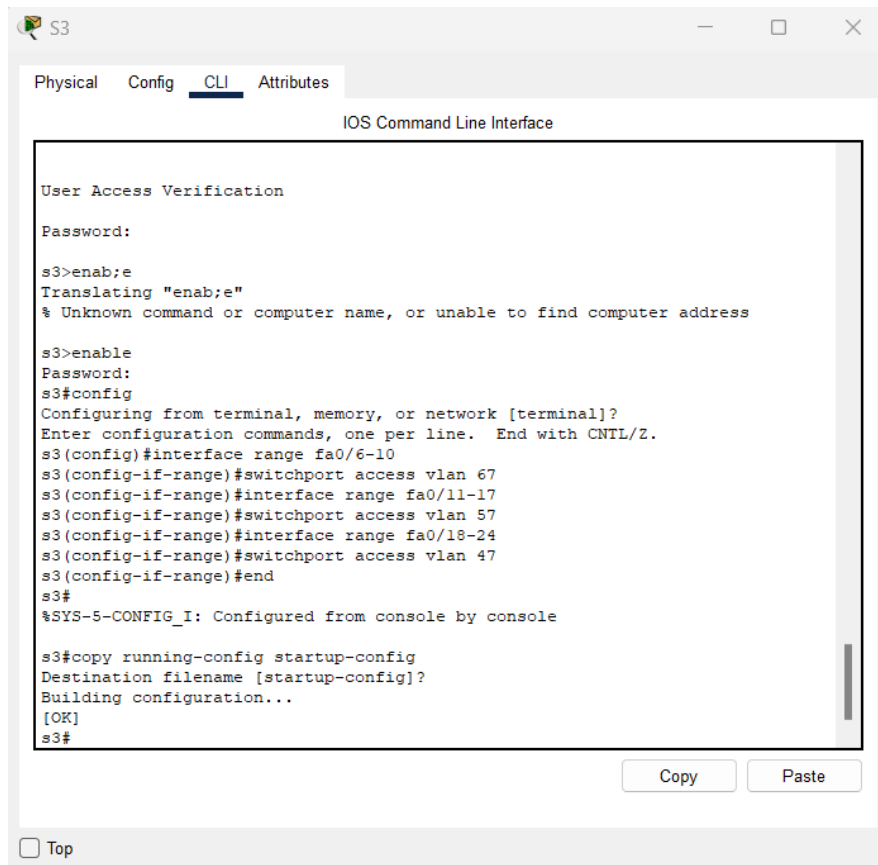


Figure 15: Assign switch ports to VLANs on S3

4. Determine which ports have been added.
5. Assign the management VLAN.

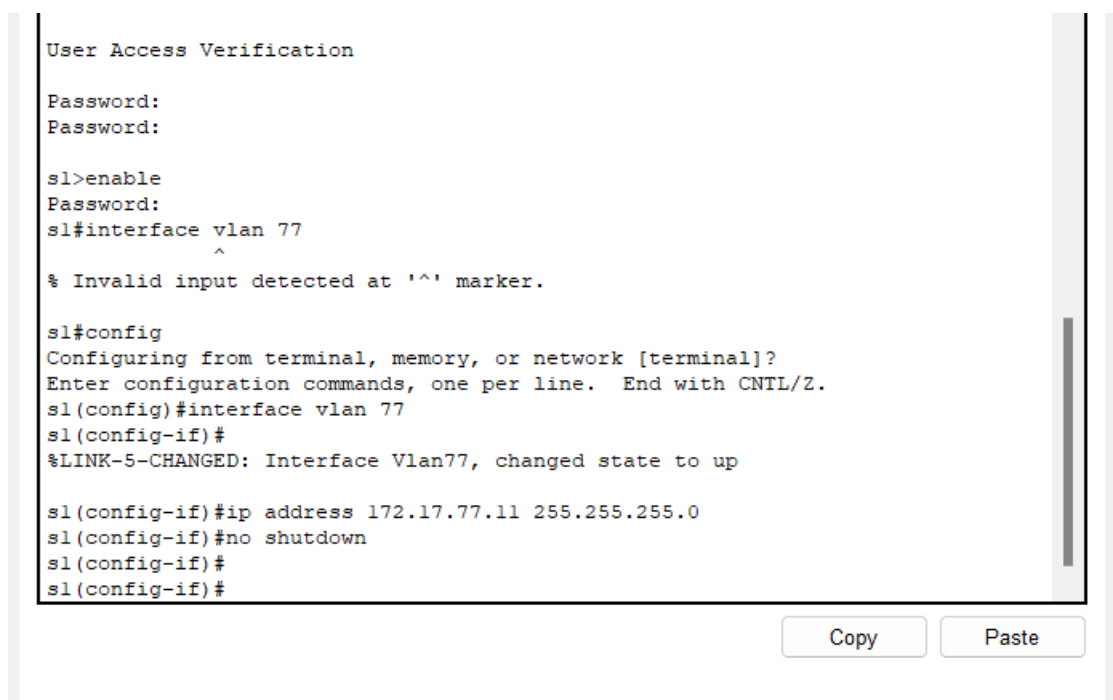


Figure 16: Assigning the management VLAN on S1

```
User Access Verification

Password:
s2>enable
Password:
s2#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
s2(config)#interface vlan 77
s2(config-if)#
%LINK-5-CHANGED: Interface Vlan77, changed state to up
s2(config-if)#ip address 172.17.99.11 255.255.255.0
s2(config-if)#no shutdown
s2(config-if)#
s2(config-if)#
```

☐ Top

Figure 17: Assigning the management VLAN on S2

```
User Access Verification

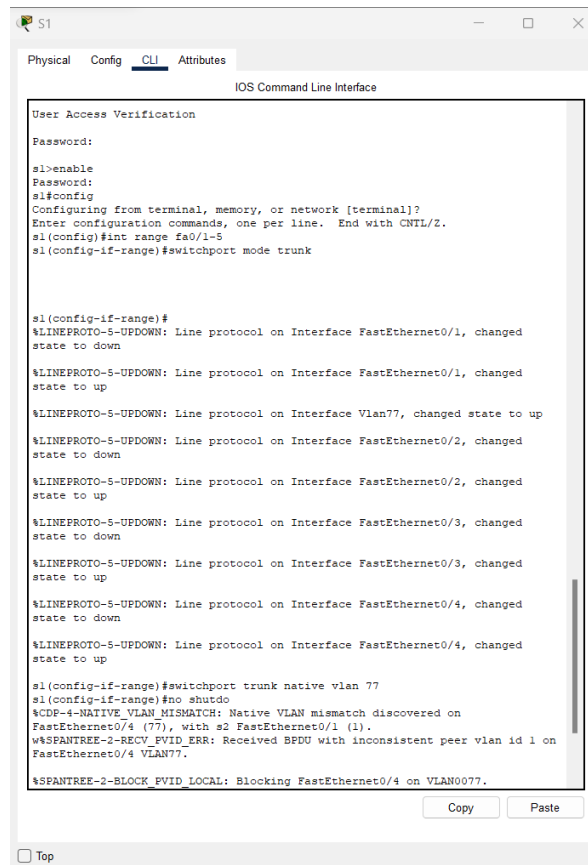
Password:
s3>enable
Password:
s3#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
s3(config)#interface vlan 77
s3(config-if)#
%LINK-5-CHANGED: Interface Vlan77, changed state to up

s3(config-if)#ip address 172.17.77.13 255.255.255.0
s3(config-if)#no shutdown
s3(config-if)#
s3(config-if)#
```

☐ Top

Figure 18: Assigning the management VLAN on S3

6. Configure trunking and the native VLAN for the trunking ports on all switches



```
S1
Physical Config CLI Attributes
IOS Command Line Interface

User Access Verification
Password:
s1>enable
Password:
s1#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
s1(config)#int range fa0/1-5
s1(config-if-range)#switchport mode trunk

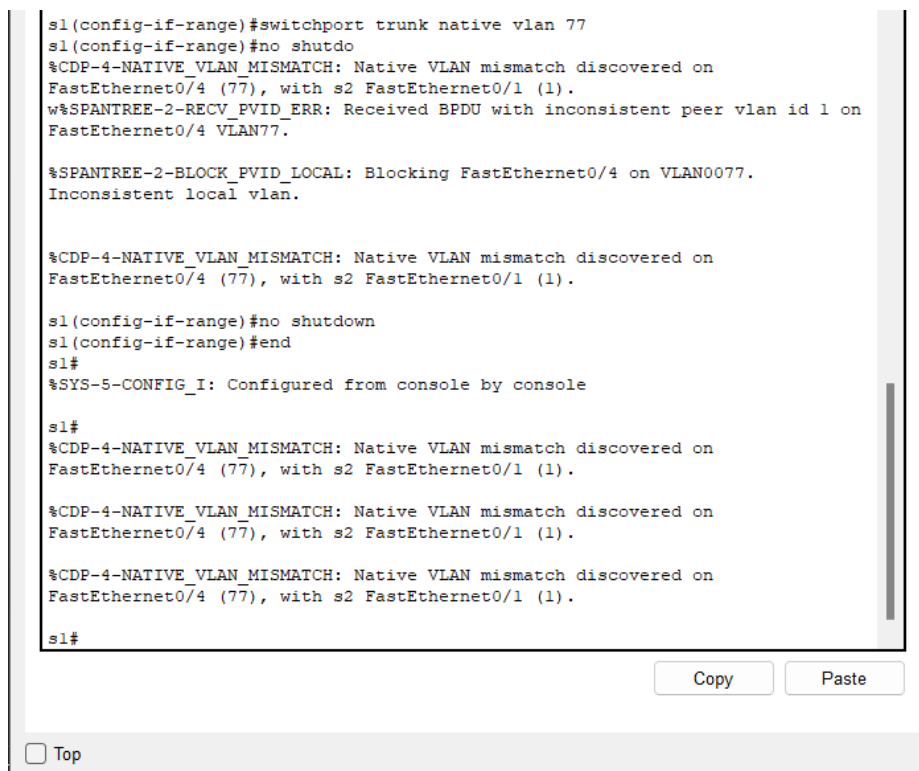
s1(config-if-range)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed
state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed
state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan77, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/2, changed
state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/2, changed
state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed
state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed
state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/4, changed
state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/4, changed
state to up

s1(config-if-range)#switchport trunk native vlan 77
s1(config-if-range)#no shutdo
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on
FastEthernet0/4 (77), with s2 FastEthernet0/1 (1).
w%SPANTREE-2-RECV_EVID_ERR: Received BPDU with inconsistent peer vlan id 1 on
FastEthernet0/4 VLAN77.

%SPANTREE-2-BLOCK_EVID_LOCAL: Blocking FastEthernet0/4 on VLAN0077.

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```

Figure 19: Configuration of trunking and the native VLAN for the trunking ports on S1-1



```
s1(config-if-range)#switchport trunk native vlan 77
s1(config-if-range)#no shutdo
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on
FastEthernet0/4 (77), with s2 FastEthernet0/1 (1).
w%SPANTREE-2-RECV_EVID_ERR: Received BPDU with inconsistent peer vlan id 1 on
FastEthernet0/4 VLAN77.

%SPANTREE-2-BLOCK_EVID_LOCAL: Blocking FastEthernet0/4 on VLAN0077.
Inconsistent local vlan.

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on
FastEthernet0/4 (77), with s2 FastEthernet0/1 (1).

s1(config-if-range)#no shutdown
s1(config-if-range)#end
s1#
%SYS-5-CONFIG_I: Configured from console by console

s1#
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on
FastEthernet0/4 (77), with s2 FastEthernet0/1 (1).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on
FastEthernet0/4 (77), with s2 FastEthernet0/1 (1).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on
FastEthernet0/4 (77), with s2 FastEthernet0/1 (1).

s1#

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```

Figure 20: Configuration of trunking and the native VLAN for the trunking ports on S1-2

A screenshot of a network configuration window for device S2. The window has tabs for Physical, Config, CLI, and Attributes, with CLI selected. The title bar says 'S2' and the window title is 'IOS Command Line Interface'. The CLI shows a sequence of commands and system messages. The commands include enabling the console, entering configuration mode, setting the interface range fa0/1-5 to trunk, and configuring the native VLAN to 77. System messages indicate VLAN mismatches and successful configuration. The prompt ends at S2#.

```

S2
Physical Config CLI Attributes
IOS Command Line Interface
Password:
s2>enable
Password:
s2#config
Configuring from terminal, memory, or network [terminal]? int range fa0/1-5
?Must be "terminal", "memory" or "network"
s2#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
s2(config)#
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on
FastEthernet0/1 (1), with s1 FastEthernet0/4 (77).

s2(config)#int range fa0/1-5
s2(config-if-range)#switchport mode trunk

s2(config-if-range)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/2, changed
state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/2, changed
state to up

s2(config-if-range)#switchport trunk native
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on
FastEthernet0/1 (1), with s1 FastEthernet0/4 (77).

% Incomplete command.
s2(config-if-range)#switchport trunk native vlan 77
s2(config-if-range)#%SPANTREE-2-UNBLOCK_CONSIST_PORT: Unblocking
FastEthernet0/1 on VLAN0077. Port consistency restored.

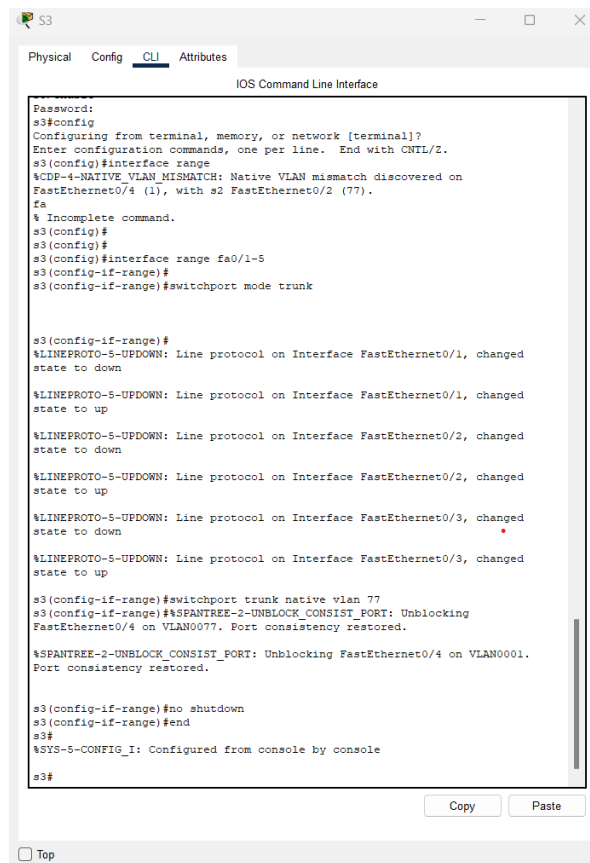
%SPANTREE-2-UNBLOCK_CONSIST_PORT: Unblocking FastEthernet0/1 on VLAN0001.
Port consistency restored.

s2(config-if-range)#
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on
FastEthernet0/2 (77), with s3 FastEthernet0/4 (1).

s2(config-if-range)#
s2(config-if-range)#
s2(config-if-range)#
s2(config-if-range)#
s2(config-if-range)#no shutdown
s2(config-if-range)#end
s2#
%SYS-5-CONFIG_I: Configured from console by console
s2#

```

Figure 21: Configuration of trunking and the native VLAN for the trunking ports on S2

A screenshot of a network configuration window for device S3. The window has tabs for Physical, Config, CLI, and Attributes, with CLI selected. The title bar says 'S3' and the window title is 'IOS Command Line Interface'. The CLI shows a sequence of commands and system messages. The commands include entering configuration mode, setting the interface range fa0/1-5 to trunk, and configuring the native VLAN to 77. System messages indicate VLAN mismatches and successful configuration. The prompt ends at S3#.

```

S3
Physical Config CLI Attributes
IOS Command Line Interface
Password:
s3#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
s3(config)#interface range
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on
FastEthernet0/4 (1), with s2 FastEthernet0/2 (77).

fa
% Incomplete command.
s3(config)#
s3(config)#
s3(config)#interface range fa0/1-5
s3(config-if-range)#
s3(config-if-range)#switchport mode trunk

s3(config-if-range)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed
state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed
state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/2, changed
state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/2, changed
state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed
state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed
state to up

s3(config-if-range)#switchport trunk native vlan 77
s3(config-if-range)#%SPANTREE-2-UNBLOCK_CONSIST_PORT: Unblocking
FastEthernet0/4 on VLAN0077. Port consistency restored.

%SPANTREE-2-UNBLOCK_CONSIST_PORT: Unblocking FastEthernet0/4 on VLAN0001.
Port consistency restored.

s3(config-if-range)#no shutdown
s3(config-if-range)#end
s3#
%SYS-5-CONFIG_I: Configured from console by console
s3#

```

Figure 22: Configuration of trunking and the native VLAN for the trunking ports on S3

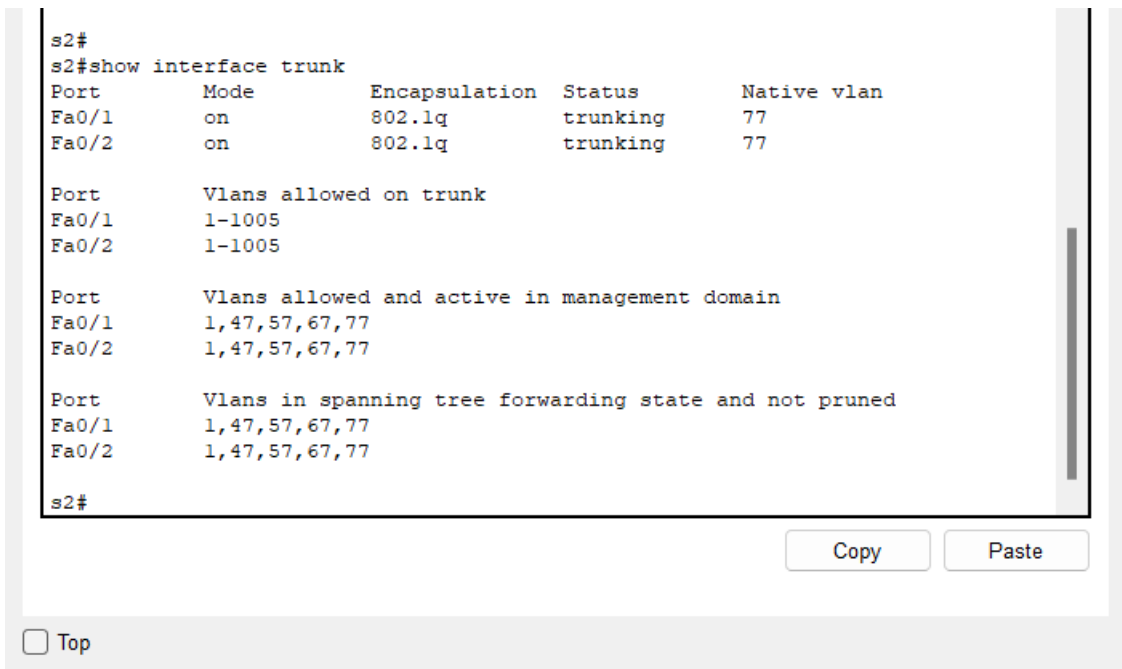


Figure 23: Showing interface trunk of S2

7. Verify that the switches can communicate.

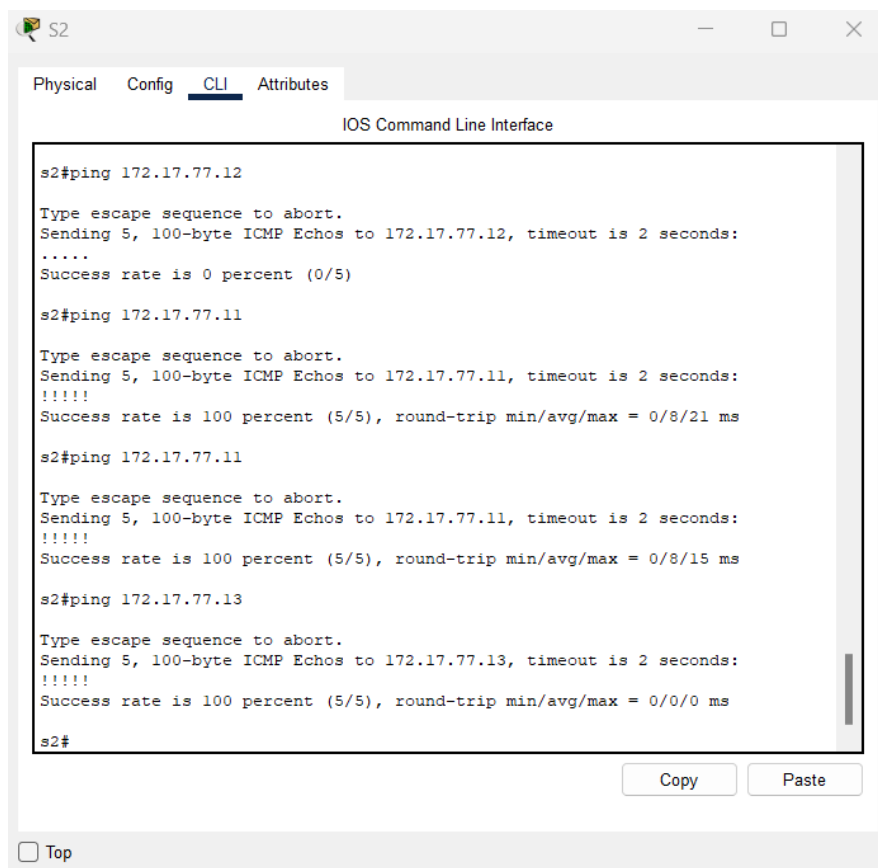


Figure 24: Verifying of S2

8. Ping several hosts from PC2.

Ping from host PC2 to host PC1 (172.17.10.21). Is the ping attempt successful?

- Yes

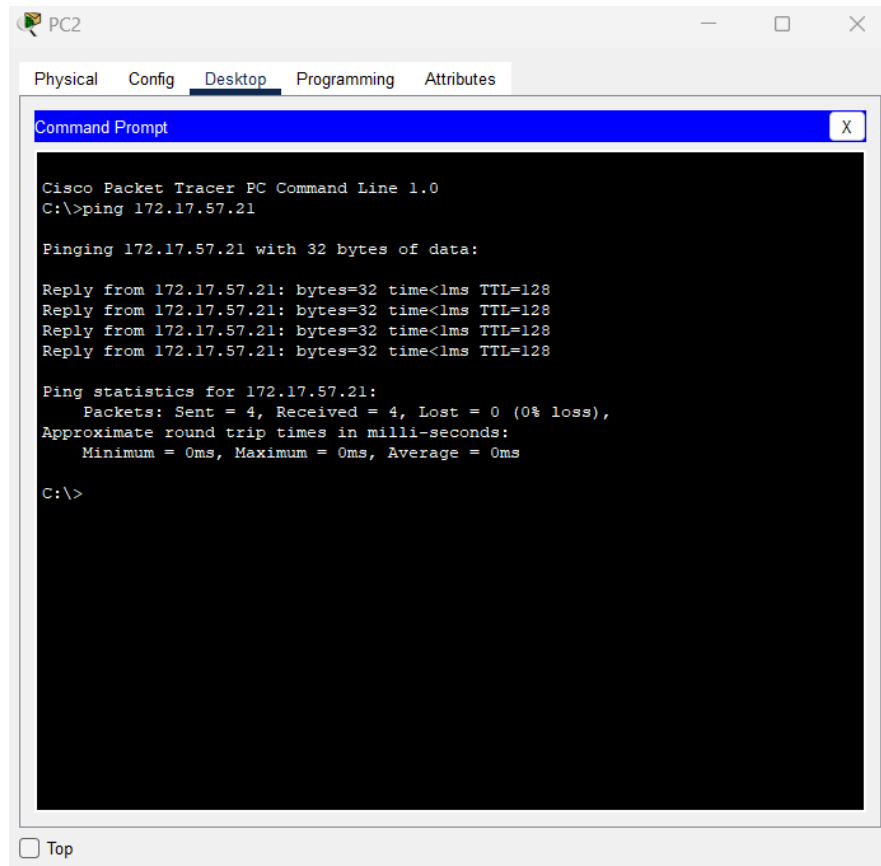


Figure 25: Pinging from host PC2 to host PC1

Ping from host PC2 to the switch VLAN 99 IP address 172.17.99.12. Is the ping attempt successful?

- No.

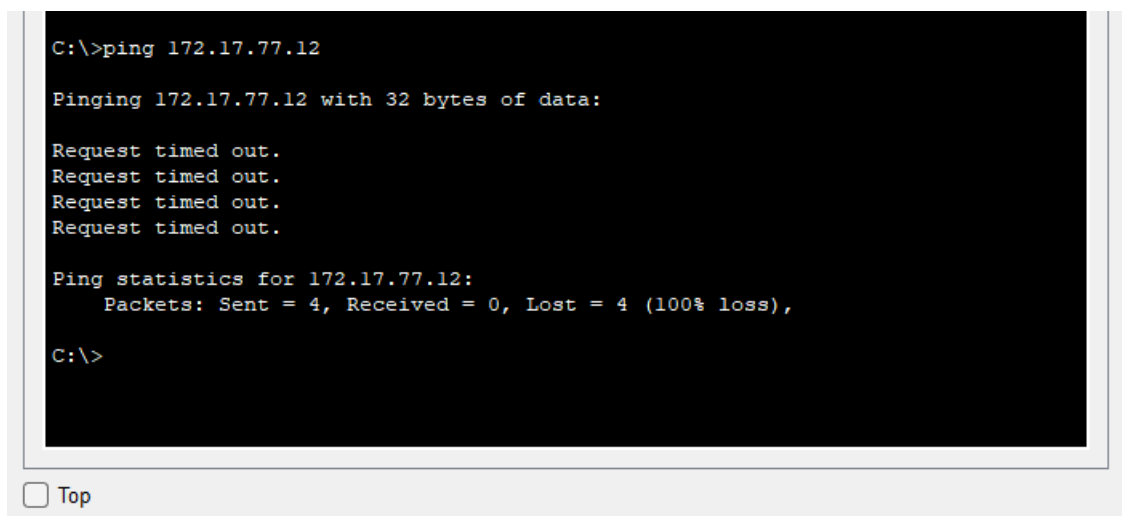
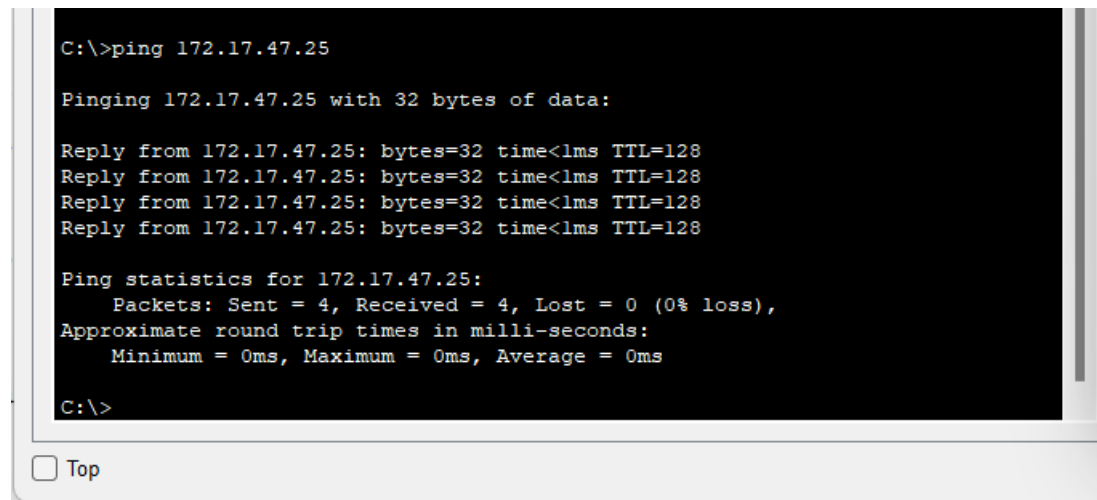


Figure 26: Ping from host PC2 to the switch VLAN 77 IP address 172.17.77.12

Ping from host PC2 to host PC5. Is the ping attempt successful?

- Yes



```
C:\>ping 172.17.47.25

Pinging 172.17.47.25 with 32 bytes of data:

Reply from 172.17.47.25: bytes=32 time<1ms TTL=128
Reply from 172.17.47.25: bytes=32 time<1ms TTL=128
Reply from 172.17.47.25: bytes=32 time<1ms TTL=128
Reply from 172.17.47.25: bytes=32 time<1ms TTL=128

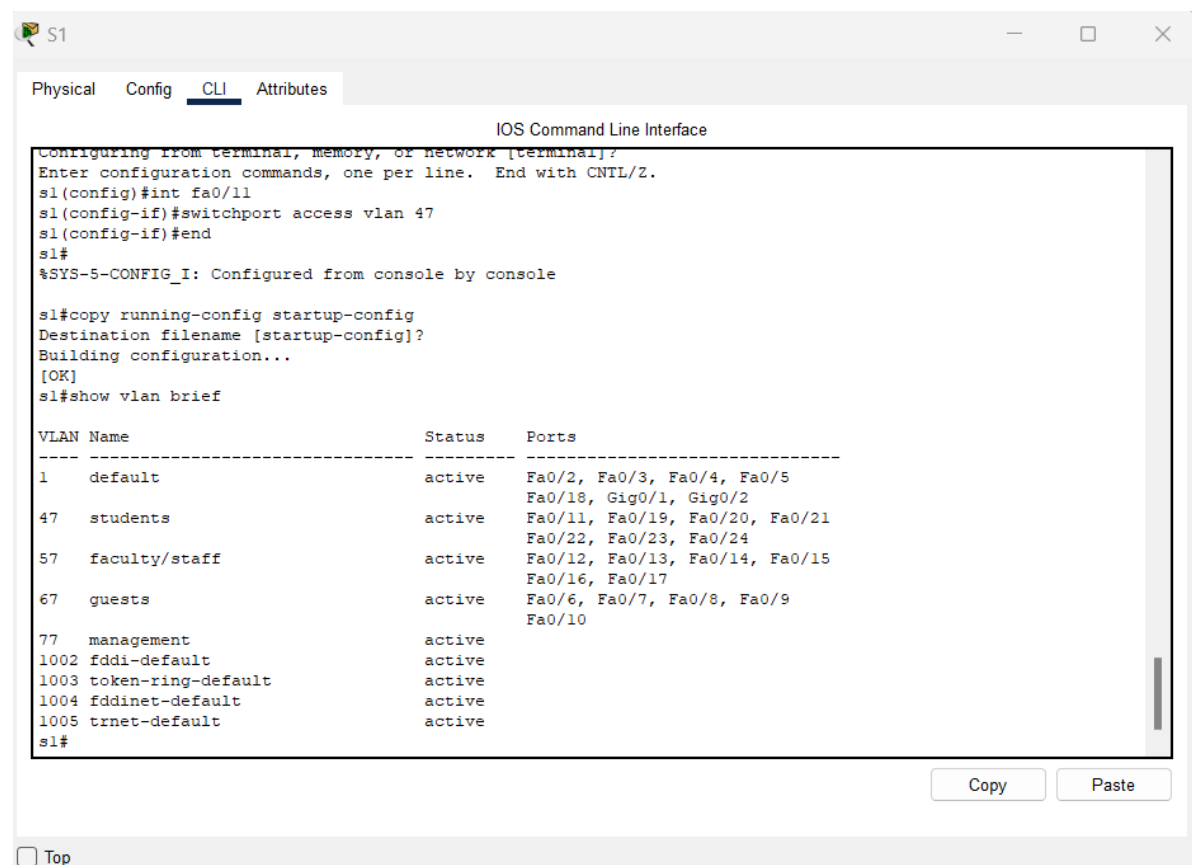
Ping statistics for 172.17.47.25:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

Figure 27: Pinging from host PC2 to host PC5

9. Move PC1 into the same VLAN as PC2

How to move PC1 into the same VLAN as PC2?



```
S1
Physical Config CLI Attributes
IOS Command Line Interface
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
s1(config)#int fa0/11
s1(config-if)#switchport access vlan 47
s1(config-if)#end
s1#
%SYS-5-CONFIG_I: Configured from console by console

s1#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
s1#show vlan brief

VLAN Name                Status    Ports
-----
1    default                active    Fa0/2, Fa0/3, Fa0/4, Fa0/5
                                           Fa0/18, Gig0/1, Gig0/2
47   students               active    Fa0/11, Fa0/19, Fa0/20, Fa0/21
                                           Fa0/22, Fa0/23, Fa0/24
57   faculty/staff          active    Fa0/12, Fa0/13, Fa0/14, Fa0/15
                                           Fa0/16, Fa0/17
67   guests                 active    Fa0/6, Fa0/7, Fa0/8, Fa0/9
                                           Fa0/10
77   management             active
1002 fddi-default           active
1003 token-ring-default    active
1004 fddinet-default        active
1005 trnet-default          active
s1#
```

Figure 28: Moving PC1 into the same VLAN as PC2

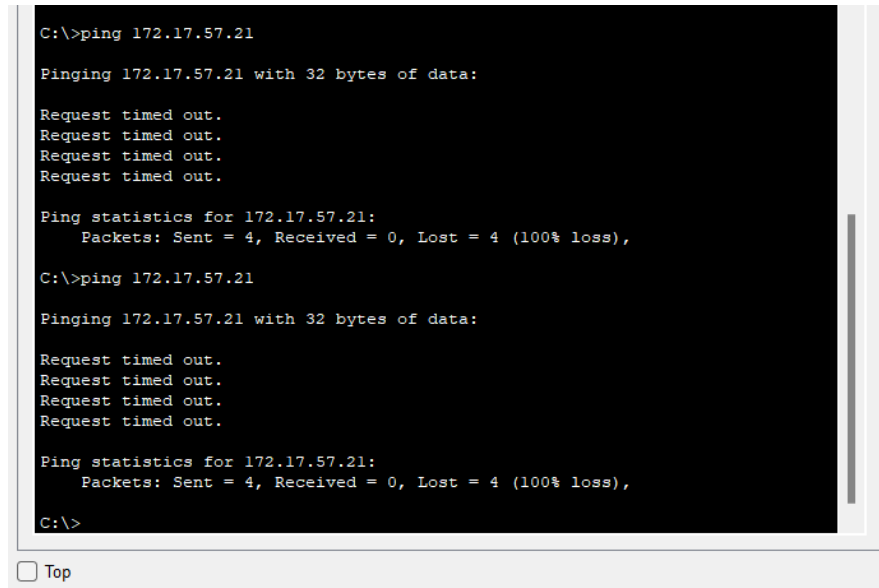
10. Change the IP address and network on PC1. Which can be accessible from PC2?

Ping from host PC2 to host PC1. Is the ping attempt successful?

- No

Why?

- The ports PC1 and PC2 utilize are in the same VLAN, but because they are in different subnetworks, they cannot directly communicate.



```
C:\>ping 172.17.57.21

Pinging 172.17.57.21 with 32 bytes of data:

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

Ping statistics for 172.17.57.21:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>ping 172.17.57.21

Pinging 172.17.57.21 with 32 bytes of data:

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

Ping statistics for 172.17.57.21:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>
```

☐ Top

Figure 29: Changing the IP address and network on PC1.

11. Change the IP address and network on PC1. Which can be accessible from PC2?

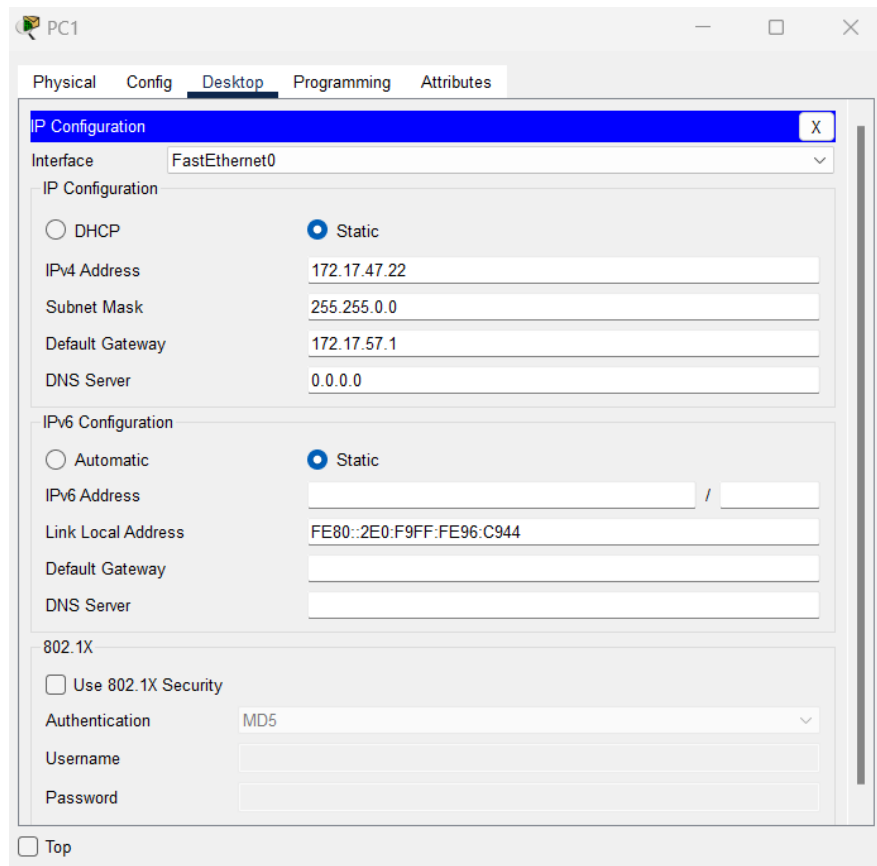


Figure 30:

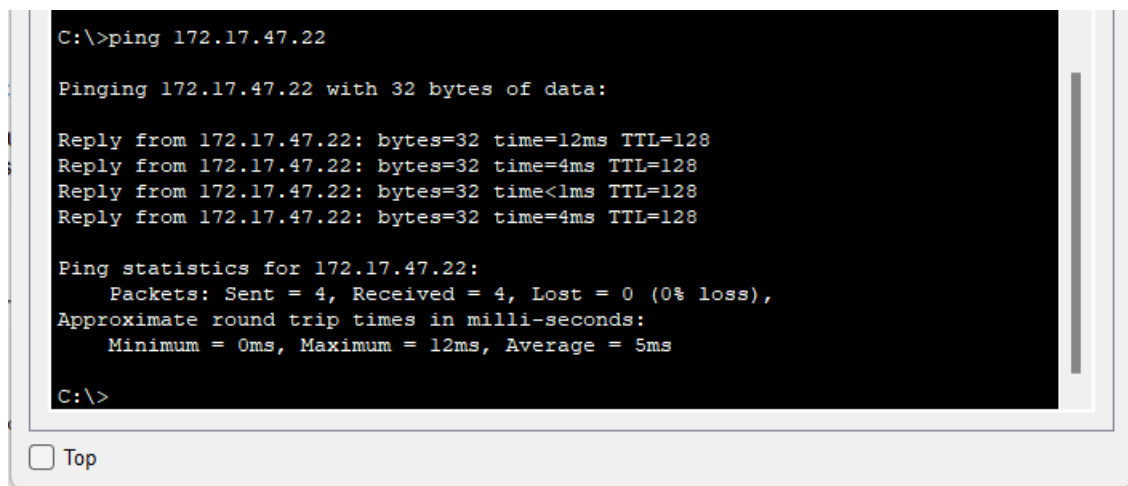


Figure 31: