Computer Networks
and
Data Communications

(CSCL 3205)

Laboratory Manual
(Spring 2024)

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Experiment# 05

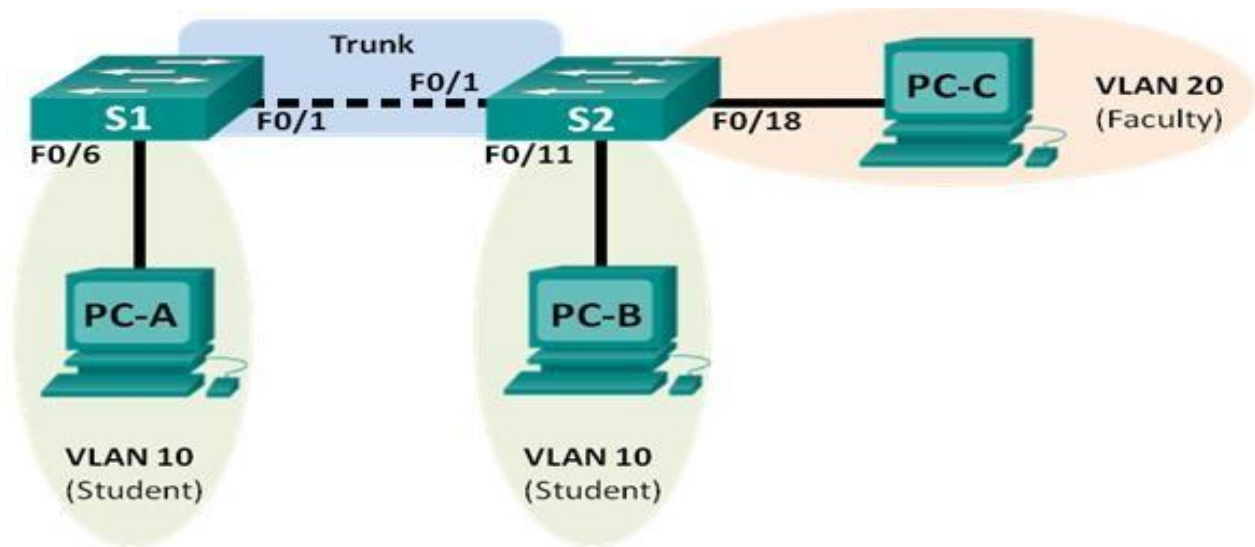# Lab 5.1 - Configuring VLANs and Trunking

Topology

Figure:5.1.1

Addressing Table

Device	Interface	IP Address	Subnet Mask	Default Gateway
S1	VLAN 1	192.168.1.11	255.255.255.0	N/A
S2	VLAN 1	192.168.1.12	255.255.255.0	N/A
PC-A	NIC	192.168.10.3	255.255.255.0	192.168.10.1
PC-B	NIC	192.168.10.4	255.255.255.0	192.168.10.1
PC-C	NIC	192.168.20.3	255.255.255.0	192.168.20.1

table: 5.1.1

Objectives

    Part 1: Build the Network and Configure Basic Device Settings

    Part 2: Create VLANs and Assign Switch Ports

    Part 3: Maintain VLAN Port Assignments and the VLAN Database

    Part 4: Configure an 802.1Q Trunk between the Switches

    Part 5: Delete the VLAN Database

Background / Scenario

    Modern switches use virtual local-area networks (VLANs) to improve network performance by separating large Layer 2 broadcast domains into smaller ones. VLANs can also be used as a security measure by controlling which hosts can communicate. In general, VLANs make it easier to design a network to support the goals of an organization.

VLAN trunks are used to span VLANs across multiple devices. Trunks allow the traffic from multiple VLANS to travel over a single link, while keeping the VLAN identification and segmentation intact.

In this lab, you will create VLANs on both switches in the topology, assign VLANs to switch access ports, verify that VLANs are working as expected, and then create a VLAN trunk between the two switches to allow hosts in the same VLAN to communicate through the trunk, regardless of which switch the host is actually attached to.

Note: The switches used are Cisco Catalyst 2960s with Cisco IOS Release 15.0(2) (lanbasek9 image). Other switches and Cisco IOS versions can be used. Depending on the model and Cisco IOS version, the commands available and output produced might vary from what is shown in the labs.

Note: Ensure that the switches have been erased and have no startup configurations. If you are unsure contact your instructor.

Required Resources

- 2 Switches.
- 3 PCs (Windows 7, Vista, or XP with terminal emulation program, such as Tera Term)
- Console cables to configure the Cisco IOS devices via the console ports
- Ethernet cables as shown in the topology

Part 1: Build the Network and Configure Basic Device Settings

In Part 1, you will set up the network topology and configure basic settings on the PC hosts and switches.

Step 1: Cable the network as shown in the topology.

Attach the devices as shown in the topology diagram, and cable as necessary.

Step 2: Initialize and reload the switches as necessary.

Step 3: Configure basic settings for each switch.

a. Disable DNS lookup.

b. Configure device name as shown in the topology.

c. Assign **class** as the privileged EXEC password.

d. Assign **cisco** as the console and vty passwords and enable login for console and vty lines.

e. Configure **logging synchronous** for the console line.

f. Configure a MOTD banner to warn users that unauthorized access is prohibited.

g. Configure the IP address listed in the Addressing Table for VLAN 1 on both switches.

h. Administratively deactivate all unused ports on the switch.

i. Copy the running configuration to the startup configuration.

Step 4: Configure PC hosts.

Refer to the Addressing Table for PC host address information.

Step 5: Test connectivity.

Verify that the PC hosts can ping one another.

Note: It may be necessary to disable the PCs firewall to ping between PCs.

Can PC-A ping PC-B? _____

Can PC-A ping PC-C? _____

Can PC-A ping S1? _____

Can PC-B ping PC-C? _____

Can PC-B ping S2? _____

Can PC-C ping S2? _____

Can S1 ping S2? _____

If you answered no to any of the above questions, why were the pings unsuccessful?

_____

_____

Part 2: Create VLANs and Assign Switch Ports

In Part 2, you will create student, faculty, and management VLANs on both switches. You will then assign the VLANs to the appropriate interface. The **show vlan** command is used to verify your configuration settings.

Step 1: Create VLANs on the switches.

a. Create the VLANs on S1.

S1(config)# **vlan 10**
S1(config-vlan)# **name Student**
S1(config-vlan)# **vlan 20**
S1(config-vlan)# **name Faculty**
S1(config-vlan)# **vlan 99**
S1(config-vlan)# **name Management**
S1(config-vlan)# **end**

b. Create the same VLANs on S2.

c. Issue the **show vlan** command to view the list of VLANs on S1.

S1# **show vlan**

```
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
                                     Fa0/17, Fa0/18, Fa0/19, Fa0/20
                                     Fa0/21, Fa0/22, Fa0/23, Fa0/24
                                     Gi0/1, Gi0/2
10   Student                 active
20   Faculty                 active
99   Management              active
1002 fddi-default            act/unsup
1003 token-ring-default      act/unsup
1004 fddinet-default         act/unsup
1005 trnet-default           act/unsup


VLAN Type  SAID    MTU  Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
---------------------------------------------------------------------------
1    enet  100001  1500 -      -      -        -    -        0      0
10   enet  100010  1500 -      -      -        -    -        0      0
20   enet  100020  1500 -      -      -        -    -        0      0
99   enet  100099  1500 -      -      -        -    -        0      0
```

VLAN	Type	SAID	MTU	Parent	RingNo	BridgeNo	Stp	BrdgMode	Trans1	Trans2
1002	fddi	101002	1500	-	-	-	-	-	0	0
1003	tr	101003	1500	-	-	-	-	-	0	0
1004	fdnet	101004	1500	-	-	-	ieee	-	0	0
1005	trnet	101005	1500	-	-	-	ibm	-	0	0

Remote SPAN VLANs

Primary	Secondary	Type	Ports

What is the default VLAN? _____

What ports are assigned to the default VLAN?

Step 2:   Assign VLANs to the correct switch interfaces.

a.   Assign VLANs to the interfaces on S1.

1)   Assign PC-A to the Student VLAN.

S1(config)# **interface f0/6**
S1(config-if)# **switchport mode access**
S1(config-if)# **switchport access vlan 10**
S1(config-if)# exit

2)   Move the switch IP address VLAN 99.

S1(config)# **interface vlan 1**
S1(config-if)# **no ip address**
S1(config-if)# **interface vlan 99**
S1(config-if)# **ip address 192.168.1.11 255.255.255.0**
S1(config-if)# **end**

b.   Issue the **show vlan brief** command and verify that the VLANs are assigned to the correct interfaces.

S1# **show vlan brief**

VLAN	Name	Status	Ports
1	default	active	Fa0/1, Fa0/2, Fa0/3, Fa0/4
			Fa0/5, Fa0/7, Fa0/8, Fa0/9
			Fa0/10, Fa0/11, Fa0/12, Fa0/13
			Fa0/14, Fa0/15, Fa0/16, Fa0/17
			Fa0/18, Fa0/19, Fa0/20, Fa0/21
			Fa0/22, Fa0/23, Fa0/24, Gi0/1
			Gi0/2
10	Student	active	Fa0/6
20	Faculty	active	
99	Management	active	
1002	fddi-default	act/unsup	
1003	token-ring-default	act/unsup	

```
1004 fddinet-default          act/unsup
1005 trnet-default            act/unsup
```

c. Issue the **show ip interfaces brief** command.

What is the status of VLAN 99? Why?

_____

d. Use the Topology to assign VLANs to the appropriate ports on S2.

e. Remove the IP address for VLAN 1 on S2.

f. Configure an IP address for VLAN 99 on S2 according to the Addressing Table.

g. Use the **show vlan brief** command to verify that the VLANs are assigned to the correct interfaces.

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, Fa0/12, Fa0/13
                                     Fa0/14, Fa0/15, Fa0/16, Fa0/17
                                     Fa0/19, Fa0/20, Fa0/21, Fa0/22
                                     Fa0/23, Fa0/24, Gi0/1, Gi0/2
10   Student                  active Fa0/11
20   Faculty                  active  Fa0/18
99   Management               active
1002 fddi-default             act/unsup
1003 token-ring-default         act/unsup
1004 fddinet-default            act/unsup
1005 trnet-default            act/unsup
```

Is PC-A able to ping PC-B? Why?

_____

Is S1 able to ping S2? Why?

_____

_____

Part 3:   Maintain VLAN Port Assignments and the VLAN Database

In Part 3, you will change VLAN assignments to ports and remove VLANs from the VLAN database.

Step 1:   Assign a VLAN to multiple interfaces.

a. On S1, assign interfaces F0/11 – 24 to VLAN 10.

S1(config)# **interface range f0/11-24**
S1(config-if-range)# **switchport mode access**
S1(config-if-range)# **switchport access vlan 10**
S1(config-if-range)# **end**

b. Issue the **show vlan brief** command to verify VLAN assignments.

c. Reassign F0/11 and F0/21 to VLAN 20.

d. Verify that VLAN assignments are correct.

Step 2:   Remove a VLAN assignment from an interface.

a.   Use the **no switchport access vlan** command to remove the VLAN 10 assignment to F0/24.

S1(config)# **interface f0/24**

S1(config-if)# **no switchport access vlan**

S1(config-if)# **end**

b.   Verify that the VLAN change was made.

Which VLAN is F0/24 is now associated with? _____

Step 3:   Remove a VLAN ID from the VLAN database.

a.   Add VLAN 30 to interface F0/24 without issuing the VLAN command.

S1(config)# **interface f0/24**

S1(config-if)# **switchport access vlan 30**

% Access VLAN does not exist. Creating vlan 30

Note: Current switch technology no longer requires that the **vlan** command be issued to add a VLAN to the database. By assigning an unknown VLAN to a port, the VLAN adds to the VLAN database.

b.   Verify that the new VLAN is displayed in the VLAN table.

S1# **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, Gi0/1, Gi0/2
10   Student                active  Fa0/12, Fa0/13, Fa0/14, Fa0/15
                                   Fa0/16, Fa0/17, Fa0/18, Fa0/19
                                   Fa0/20, Fa0/22, Fa0/23
20   Faculty                active Fa0/11, Fa0/21
30   VLAN0030               active  Fa0/24
99   Management             active
1002 fddi-default           act/unsup
1003 token-ring-default     act/unsup
1004 fddinet-default        act/unsup
1005 trnet-default          act/unsup
```

What is the default name of VLAN 30? _____

c.   Use the **no vlan 30** command to remove VLAN 30 from the VLAN database.

S1(config)# **no vlan 30**

S1(config)# **end**

d.   Issue the **show vlan brief** command. F0/24 was assigned to VLAN 30.

After deleting VLAN 30, what VLAN is port F0/24 assigned to? What happens to the traffic destined to the host attached to F0/24?

_____

S1# **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, Gi0/1, Gi0/2
10	Student	active Fa0/12, Fa0/13, Fa0/14, Fa0/15
		Fa0/16, Fa0/17, Fa0/18, Fa0/19
		Fa0/20, Fa0/22, Fa0/23
20	Faculty	active Fa0/11, Fa0/21
99	Management	active
1002	fddi-default	act/unsup
1003	token-ring-default	act/unsup
1004	fddinet-default	act/unsup
1005	trnet-default	act/unsup

e. Issue the **no switchport access vlan** command on interface F0/24.

f. Issue the **show vlan brief** command to determine the VLAN assignment for F0/24. To which VLAN is F0/24 assigned?

Note: Before removing a VLAN from the database, it is recommended that you reassign all the ports assigned to that VLAN.

Why should you reassign a port to another VLAN before removing the VLAN from the VLAN database?

Part 4: Configure an 802.1Q Trunk Between the Switches

In Part 4, you will configure interface F0/1 to use the Dynamic Trunking Protocol (DTP) to allow it to negotiate the trunk mode. After this has been accomplished and verified, you will disable DTP on interface F0/1 and manually configure it as a trunk.

Step 1: Use DTP to initiate trunking on F0/1.

The default DTP mode of a 2960 switch port is dynamic auto. This allows the interface to convert the link to a trunk if the neighboring interface is set to trunk or dynamic desirable mode.

a. Set F0/1 on S1 to negotiate trunk mode.

S1(config)# **interface f0/1**

S1(config-if)# **switchport mode dynamic desirable**

*Mar 1 05:07:28.746: %LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state to down

*Mar 1 05:07:29.744: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to down

S1(config-if)#

*Mar 1 05:07:32.772: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up

S1(config-if)#

*Mar 1 05:08:01.789: %LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan99, changed state to up

*Mar 1 05:08:01.797: %LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state to up

You should also receive link status messages on S2.

S2#

*Mar 1 05:07:29.794: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to down

S2#

*Mar 1 05:07:32.823: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up

S2#

*Mar 1 05:08:01.839: %LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan99, changed state to up

*Mar 1 05:08:01.850: %LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state to up

b. Issue the **show vlan brief** command on S1 and S2. Interface F0/1 is no longer assigned to VLAN 1. Trunked interfaces are not listed in the VLAN table.

S1# **show vlan brief**

```
VLAN Name                   Status  Ports
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
1    default                active Fa0/2, Fa0/3, Fa0/4, Fa0/5
                                   Fa0/7, Fa0/8, Fa0/9, Fa0/10
                                   Fa0/24, Gi0/1, Gi0/2
10   Student                active Fa0/6, Fa0/12, Fa0/13, Fa0/14
                                   Fa0/15, Fa0/16, Fa0/17, Fa0/18
                                   Fa0/19, Fa0/20, Fa0/22, Fa0/23
20   Faculty                active  Fa0/11, Fa0/21
99   Management                active
1002 fddi-default              act/unsup
1003 token-ring-default        act/unsup
1004 fddinet-default           act/unsup
1005 trnet-default             act/unsup
```

c. Issue the **show interfaces trunk** command to view trunked interfaces. Notice that the mode on S1 is set to desirable, and the mode on S2 is set to auto.

S1# **show interfaces trunk**

```
Port    Mode        Encapsulation Status      Native vlan
Fa0/1   desirable   802.1q        trunking    1


Port    Vlans allowed on trunk
Fa0/1   1-4094


Port    Vlans allowed and active in management domain
Fa0/1   1,10,20,99


Port    Vlans in spanning tree forwarding state and not pruned
Fa0/1   1,10,20,99
```

S2# **show interfaces trunk**

```
Port    Mode        Encapsulation Status      Native vlan
Fa0/1   auto        802.1q        trunking    1


Port    Vlans allowed on trunk
Fa0/1   1-4094


Port    Vlans allowed and active in management domain
Fa0/1   1,10,20,99


Port    Vlans in spanning tree forwarding state and not pruned
Fa0/1   1,10,20,99
```

Note: By default, all VLANs are allowed on a trunk. The **switchport trunk** command allows you to control what VLANs have access to the trunk. For this lab, keep the default settings which allows all VLANs to traverse F0/1.

d. Verify that VLAN traffic is traveling over trunk interface F0/1.

Can S1 ping S2? _____

Can PC-A ping PC-B? _____

Can PC-A ping PC-C? _____

Can PC-B ping PC-C? _____

Can PC-A ping S1? _____

Can PC-B ping S2? _____

Can PC-C ping S2? _____

If you answered no to any of the above questions, explain below.

_____

_____

Step 2: Manually configure trunk interface F0/1.

The **switchport mode trunk** command is used to manually configure a port as a trunk. This command should be issued on both ends of the link.

a. Change the switchport mode on interface F0/1 to force trunking. Make sure to do this on both switches.

S1(config)# **interface f0/1**

S1(config-if)# **switchport mode trunk**

b. Issue the **show interfaces trunk** command to view the trunk mode. Notice that the mode changed from **desirable** to **on**.

S2# **show interfaces trunk**

```
Port    Mode          Encapsulation  Status     Native vlan
Fa0/1   on            802.1q         trunking   99

Port    Vlans allowed on trunk
Fa0/1   1-4094

Port    Vlans allowed and active in management domain
Fa0/1   1,10,20,99

Port    Vlans in spanning tree forwarding state and not pruned
Fa0/1   1,10,20,99
```

Why might you want to manually configure an interface to trunk mode instead of using DTP?

_____

_____

Part 5: Delete the VLAN Database

In Part 5, you will delete the VLAN Database from the switch. It is necessary to do this when initializing a switch back to its default settings.

Step 1: Determine if the VLAN database exists.

Issue the **show flash** command to determine if a **vlan.dat** file exists in flash.

S1# **show flash**

```
Directory of flash:/
    2  -rwx     1285  Mar 1 1993 00:01:24 +00:00  config.text
    3  -rwx    43032  Mar 1 1993 00:01:24 +00:00  multiple-fs
```

   4 -rwx   5 Mar 1 1993 00:01:24 +00:00 private-config.text

   5 -rwx 11607161   Mar 1 1993 02:37:06 +00:00 c2960-lanbasek9-mz.150-2.SE.bin

   6 -rwx   736 Mar 1 1993 00:19:41 +00:00 vlan.dat

32514048 bytes total (20858880 bytes free)

Note: If there is a **vlan.dat** file located in flash, then the VLAN database does not contain its default settings.

Step 2: Delete the VLAN database.

a. Issue the **delete vlan.dat** command to delete the vlan.dat file from flash and reset the VLAN database back to its default settings. You will be prompted twice to confirm that you want to delete the vlan.dat file. Press Enter both times.

S1# delete vlan.dat

Delete filename [vlan.dat]?

Delete flash:/vlan.dat? [confirm]

S1#

b. Issue the **show flash** command to verify that the vlan.dat file has been deleted.

S1# **show flash**

Directory of flash:/

   2 -rwx   1285 Mar 1 1993 00:01:24 +00:00 config.text

   3 -rwx   43032 Mar 1 1993 00:01:24 +00:00 multiple-fs

   4 -rwx   5 Mar 1 1993 00:01:24 +00:00 private-config.text

   5 -rwx 11607161   Mar 1 1993 02:37:06 +00:00 c2960-lanbasek9-mz.150-2.SE.bin

32514048 bytes total (20859904 bytes free)

To initialize a switch back to its default settings, what other commands are needed?

_____

_____

Reflection

1. What is needed to allow hosts on VLAN 10 to communicate to hosts on VLAN 20?

_____

_____

2. What are some primary benefits that an organization can receive through effective use of VLANs?

_____

_____

_____

_____

Lab 5.2:- Class Activity

Topology
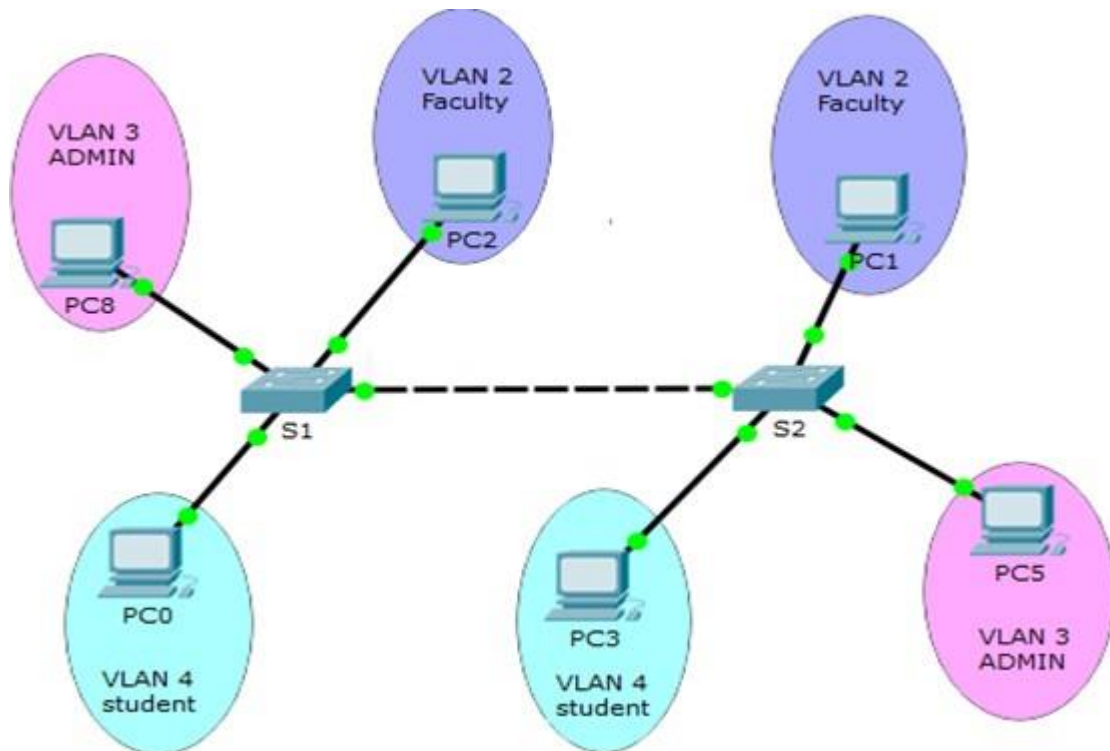
Fig:5.2.1

Addressing Table:

Device	Interface	IP Address	Subnet Mask	Default Gateway
PC0	NIC	192.168.1.2	255.255.255.0	192.168.1.1
PC3	NIC	192.168.1.3	255.255.255.0	192.168.1.1
PC1	NIC	192.168.2.2	255.255.255.0	192.168.2.1
PC2	NIC	192.168.2.3	255.255.255.0	192.168.2.1
PC5	NIC	192.168.3.2	255.255.255.0	192.168.3.1
PC8	NIC	192.168.3.3	255.255.255.0	192.168.3.1

Table:5.2.1

VLANs Table:

VLAN	Name
2	Faculty
3	ADMIN
4	Students

Table:5.2.2

VLANs Ports Assigning Table:

VLANs	Name	Switch port Number			
		device	Access Ports	device	Trunk Ports
2	Faculty	S1	fa 0/1 – fa 0/5	S1	Fast Ethernet 0/24
		S2	fa 0/1 – fa 0/4		
3	ADMIN	S1	fa 0/6 –fa 0/7	S2	Fast Ethernet 0/24
		S2	fa 0/5 – fa 0/9		
4	Students	S1	fa 0/8 – fa 0/23		
		S2	fa 0/10 – fa 0/23		

Table:5.2.3

Objectives

Part 1: Build the Network and Configure Basic Device Settings on both switches

Part 2: Create VLANs and Assign Switch Ports to VLANs

Part 3: Configure an 802.1Q Trunk between the Switches

Part 4: Verification

Part 1: Build the Network and Configure Basic Device Settings on both switches

Part 2: Create VLANs and Assign Switch Ports to VLANs.

Step 1: Creating VLANs on S1 by referring VLANs and ports assigning table [*Table:5*.2.3]

S1# **configure terminal**

S1(config) # **vlan 2**

S1(config-vlan) # **name Faculty**

S1(config) # **exit**

S1(config) # **vlan 3**

S1(config-vlan) # **name ADMIN**

S1(config) # **exit**

S1(config) # **vlan 4**

S1(config-vlan) # **name Students**

S1(config) # **exit**

Step 2: Assign a VLANs to multiple switch interfaces by referring VLANs and ports assigning table [*Table:5*.2.3]

    a. On S1, assign interfaces F0/1 – fa 0/5 to VLAN 2.

S1(config)# **interface range f0/1- fa 0/5**
S1(config-if-range)# **switchport mode access**
S1(config-if-range)# **switchport access vlan 2**
S1(config-if-range)# **exit**

    b. On S1, assign interfaces F0/6 – fa 0/7 to VLAN 3.

S1(config)# **interface range f0/6- fa 0/7**
S1(config-if-range)# **switchport mode access**
S1(config-if-range)# **switchport access vlan 3**
S1(config-if-range)# **exit**

    c. On S1, assign interfaces F0/8 – fa 0/23 to VLAN 4.

S1(config)# **interface range f0/8- fa 0/23**
S1(config-if-range)# **switchport mode access**
S1(config-if-range)# **switchport access vlan 4**
S1(config-if-range)# **end**

Step 3: Creating VLANs on S2 by using VLANs assigning table

    S2# **configure terminal**
    S2(config) # **vlan 2**
    S2(config-vlan) # **name Faculty**
    S2(config) # **exit**

    S2(config) # **vlan 3**
    S2(config-vlan) # **name ADMIN**
    S2(config) # **exit**

    S2(config) # **vlan 4**
    S2(config-vlan) # **name Students**
    S2(config) # **exit**

Step 4: Assign VLANs to multiple switch interfaces by referring VLANs and ports assigning table [*Table:5*.2.3]

    a. On S2, assign interfaces F0/1 – fa 0/4to VLAN 2.

S2(config)# **interface range f0/1- fa 0/4**
S2(config-if-range)# **switchport mode access**
S2(config-if-range)# **switchport access vlan 2**
S2(config-if-range)# **exit**

    b. On S2, assign interfaces F0/5 – fa 0/9 to VLAN 3.

S2(config)# **interface range f0/5- fa 0/9**

S2(config-if-range)# **switchport mode access**

S2(config-if-range)# **switchport access vlan 3**

S2(config-if-range)# **exit**

    c.   On S2, assign interfaces F0/10 – fa 0/23to VLAN 4.

S2(config)# **interface range f0/10- fa 0/23**

S2(config-if-range)# **switchport mode access**

S2(config-if-range)# **switchport access vlan 4**

S2(config-if-range)# **end**

Part 3: **Configure an 802.1Q Trunk between the Switches**

    Step 1:   configure trunk interface F0/24 on S1

    S1 (config) # **int fa 0/24**

    S1 (config-if) # **Switchport mode trunk**

    S1 (config-if) # **exit**

    Step 2:   configure trunk interface F0/24 on S2

    S2 (config) # **int fa 0/24**

    S2 (config-if) # **Switchport mode trunk**

    S2 (config-if) # **exit**

Part 4: **Verifications**

- Issue the **show vlan brief** command on S1 and S2. Interface F0/24 is no longer assigned to VLAN 1. Trunked interfaces are not listed in the VLAN table.

  S1# show vlan brief

  S2# show vlan brief

- Issue **show vlan brief** command on S1 and S2. It is used to verify how many VLAN exist on the switch and how many ports are assigned in different VLANs.

  S1# **show vlan brief**

  S2# **show vlan brief**

- Issue the **show interface switchport** command on both switches

Lab 5.3 – Home Activity

In the light of above experiments, Configure the following topology by using addressing table, VLAN and port assignment table.

Scenario

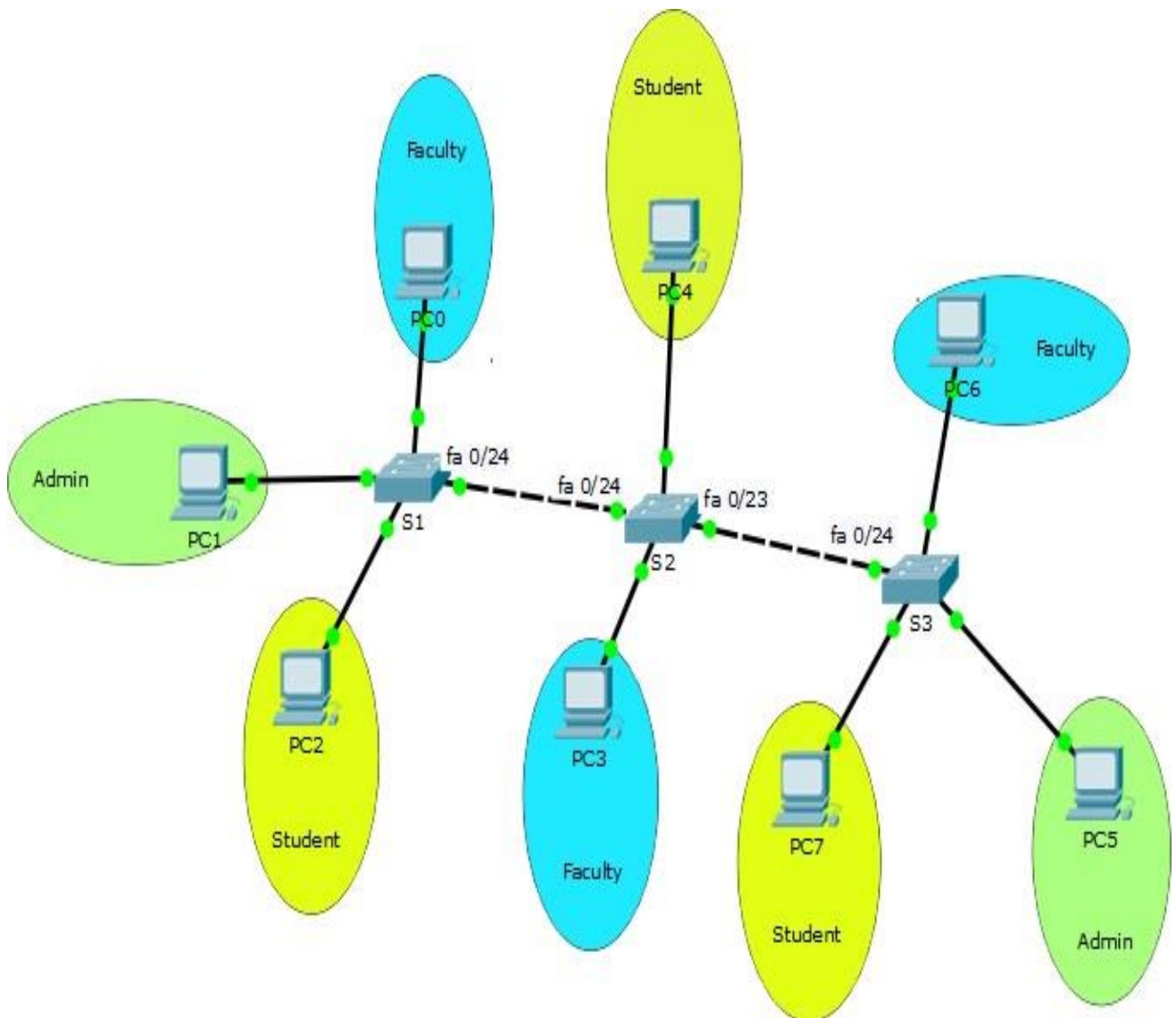Suppose you are designing a small VLAN switched network for three floor of SZABIST 100 campus.

Fig:5.3.1

Addressing Table:

Device	Interface	IP Address	Subnet Mask	Default Gateway
PC0	NIC	192.168.1.2	255.255.255.0	192.168.1.1
PC3	NIC	192.168.1.3	255.255.255.0	192.168.1.1
PC6	NIC	192.168.1.4	255.255.255.0	192.168.1.1
PC1	NIC	192.168.2.2	255.255.255.0	192.168.2.1
PC5	NIC	192.168.2.3	255.255.255.0	192.168.2.1
PC2	NIC	192.168.3.3	255.255.255.0	192.168.3.1
PC4	NIC	192.168.3.3	255.255.255.0	192.168.3.1
PC7	NIC	192.168.3.3	255.255.255.0	192.168.3.1

Table:5.3.1

VLANs and Ports Assigning Table:

VLANs	Name	Switchport Number				
		Access Ports			Trunk Ports	
2	Faculty	S1	fa 0/1 – fa 0/5	S1	Fast Ethernet 0/24	
		S2	fa 0/18 – fa 0/22			
		S3	fa 0/18 – fa 0/23			
3	ADMIN	S1	fa 0/6 –fa 0/12	S2	Fast Ethernet 0/23 Fast Ethernet 0/24	
		S2	___			
		S3	fa 0/14 – fa 0/17			
4	Students	S1	fa 0/13 – fa 0/23	S3	Fast Ethernet 0/24	
		S2	fa 0/1 – fa 0/17			
		S3	fa 0/1 – fa 0/13			

Table:5.3.2

<u>*Note:*</u>

- Put the screen shot of your designed topology at the end of this experiment.
- Also attach the printout of startup configurations of each switch.

Lab's Evaluation Sheet

Students Registration No:	2112126
Date Performed:	05/04/2024
Group No:	
Date of Submission:	05/04/2024

Sr. No.	Categories	Total Marks/Grade	Marks /Grade Obtained
1	Student's Behavior	2.5	
2	Lab Performance	2.5	
3	On Time Submission	5	
4	Home Activity	10	
	Net Result	20	

5/4/2024

Examined By: (Instructor's Name & Initial's)   Date

TOPOLOGY
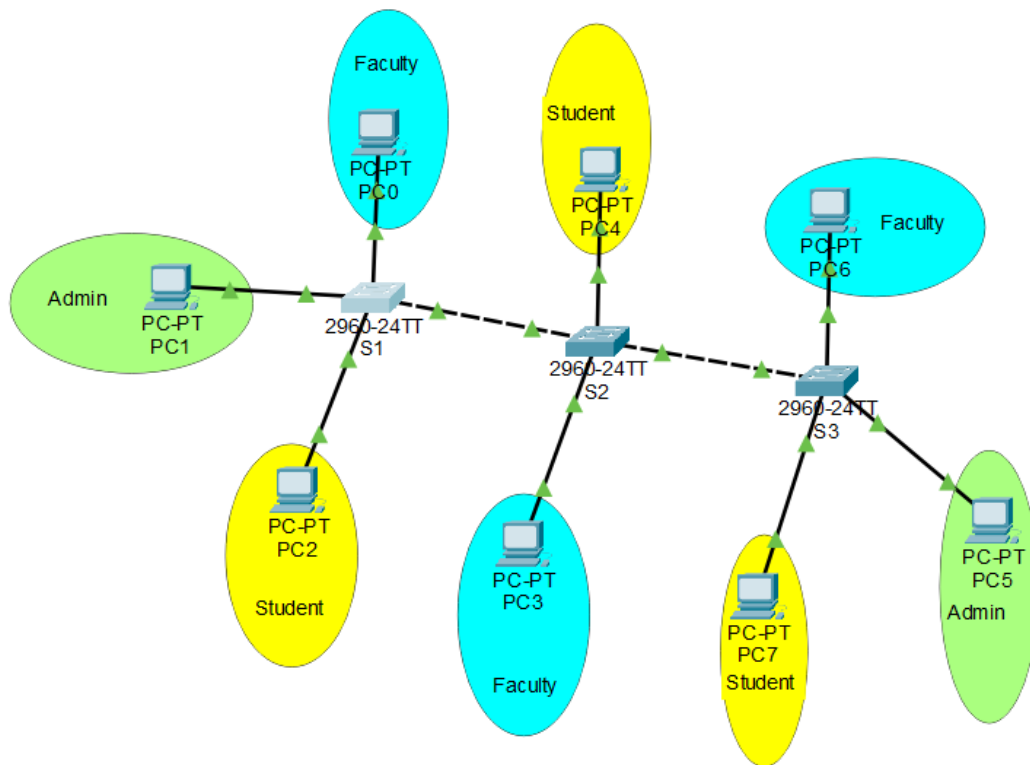
S1 Configuration

```
Switch>en
Switch#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#hostname S1
S1(config)#line console 0
S1(config-line)#password letmein
S1(config-line)#login
S1(config-line)#exit
S1(config)#enable secret itsasecret
S1(config)#service pa
S1(config)#service password-encryption
S1(config)#banner motd "This is a secure system"
S1(config)#vlan 2
S1(config-vlan)#name Faculty
S1(config-vlan)#exit
S1(config)#vlan 3
S1(config-vlan)#name ADMIN
S1(config-vlan)#exit
S1(config)#vlan 4
S1(config-vlan)#name Students
S1(config-vlan)#exit
S1(config)#interface range f0/1-fa0/5
S1(config-if-range)#switch
S1(config-if-range)#switchport m
S1(config-if-range)#switchport mode a
S1(config-if-range)#switchport mode access
S1(config-if-range)#sw
S1(config-if-range)#switchport ac
S1(config-if-range)#switchport access vlan 2
S1(config-if-range)#exit
S1(config)#inter
S1(config)#interface range f0/6-fa0/12
S1(config-if-range)#sw
S1(config-if-range)#switchport m
S1(config-if-range)#switchport mode ac
S1(config-if-range)#switchport mode access
S1(config-if-range)#swi
S1(config-if-range)#switchport acc
S1(config-if-range)#switchport access vlan 3
S1(config-if-range)#exit
S1(config)#inter
S1(config)#interface range f0/13-fa0/23
S1(config-if-range)#sw
S1(config-if-range)#switchport m
S1(config-if-range)#switchport mode acc
S1(config-if-range)#switchport mode access
```

```
S1(config-if-range)#swit
S1(config-if-range)#switchport acc
S1(config-if-range)#switchport access vlan 4
S1(config-if-range)#end
S1#
%SYS-5-CONFIG_I: Configured from console by console

S1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
S1(config)#hostname Sabih_1
Sabih_1(config)#int fa 0/24
Sabih_1(config-if)#sw
Sabih_1(config-if)#switchport mode trun
Sabih_1(config-if)#switchport mode trunk

Sabih_1(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/24, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/24, changed state to up

Sabih_1(config-if)#exit
Sabih_1(config)#
Sabih_1#
%SYS-5-CONFIG_I: Configured from console by console
```

S2 Configuration

```
Switch>en
Switch#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#hostname Sabih_2
Sabih_2(config)#line console 0
Sabih_2(config-line)#password letmein
Sabih_2(config-line)#login
Sabih_2(config-line)#exit
Sabih_2(config)#enable secret itsasecret
Sabih_2(config)#serv
Sabih_2(config)#service pas
Sabih_2(config)#service password-encryption
Sabih_2(config)#banner motd "This is a secure system"
Sabih_2(config)#vlan 2
Sabih_2(config-vlan)#name Faculty
Sabih_2(config-vlan)#exit
Sabih_2(config)#vlan 3
Sabih_2(config-vlan)#name ADMIN
Sabih_2(config-vlan)#exit
Sabih_2(config)#vlan 4
Sabih_2(config-vlan)#name Students
Sabih_2(config-vlan)#exit
Sabih_2(config)#inter
Sabih_2(config)#interface ra
Sabih_2(config)#interface range f0/18-fa0/22
Sabih_2(config-if-range)#swi
Sabih_2(config-if-range)#switchport mode access
Sabih_2(config-if-range)#sw
Sabih_2(config-if-range)#switchport ac
Sabih_2(config-if-range)#switchport access vlan 2
Sabih_2(config-if-range)#exit
Sabih_2(config)#int
Sabih_2(config)#interface range f0/1-fa0/17
Sabih_2(config-if-range)#sw
Sabih_2(config-if-range)#switchport mo
Sabih_2(config-if-range)#switchport mode acc
Sabih_2(config-if-range)#switchport mode access
Sabih_2(config-if-range)#sw
Sabih_2(config-if-range)#switchport acc
Sabih_2(config-if-range)#switchport access vlan 4
Sabih_2(config-if-range)#end
Sabih_2#
%SYS-5-CONFIG_I: Configured from console by console

Sabih_2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
```

```
Sabih_2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Sabih_2(config)#int fa 0/24
Sabih_2(config-if)#swit
Sabih_2(config-if)#switchport mode trunk
Sabih_2(config-if)#int fa 0/23
Sabih_2(config-if)#switchport mode trunk

Sabih_2(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/23, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/23, changed state to up

Sabih_2(config-if)#exit
Sabih_2(config)#exit
Sabih_2#
%SYS-5-CONFIG_I: Configured from console by console
```

S3 Configuration

```
Switch>en
Switch#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#hostname Sabih_3
Sabih_3(config)#line console 0
Sabih_3(config-line)#password letmein
Sabih_3(config-line)#login
Sabih_3(config-line)#exit
Sabih_3(config)#enable secret itsasecret
Sabih_3(config)#ser
Sabih_3(config)#service pa
Sabih_3(config)#service password-encryption
Sabih_3(config)#banner motd "This is a secure system"
Sabih_3(config)#vlan 2
Sabih_3(config-vlan)#name Faculty
Sabih_3(config-vlan)#exit
Sabih_3(config)#vlan 3
Sabih_3(config-vlan)#name ADMIN
Sabih_3(config-vlan)#exit
Sabih_3(config)#vlan 4
Sabih_3(config-vlan)#name Students
Sabih_3(config-vlan)#inter
Sabih_3(config-vlan)#inter
Sabih_3(config-vlan)#interface range f0/18-fa0/23
Sabih_3(config-if-range)#swi
Sabih_3(config-if-range)#switchport mo
Sabih_3(config-if-range)#switchport mode acc
Sabih_3(config-if-range)#switchport mode access
Sabih_3(config-if-range)#switc
Sabih_3(config-if-range)#switchport acc
Sabih_3(config-if-range)#switchport access vlan 2
Sabih_3(config-if-range)#exit
Sabih_3(config)#interface range f0/14-fa0/17
Sabih_3(config-if-range)#sw
Sabih_3(config-if-range)#switchport mo
Sabih_3(config-if-range)#switchport mode ac
Sabih_3(config-if-range)#switchport mode access
Sabih_3(config-if-range)#switc
Sabih_3(config-if-range)#switchport ac
Sabih_3(config-if-range)#switchport access vlan 3
Sabih_3(config-if-range)#exit
Sabih_3(config)#interface range f0/1-fa0/13
Sabih_3(config-if-range)#sw
Sabih_3(config-if-range)#switchport mo
Sabih_3(config-if-range)#switchport mode ac
Sabih_3(config-if-range)#switchport mode access
```

```
Sabih_3(config-if-range)#switchport mode access
Sabih_3(config-if-range)#swi
Sabih_3(config-if-range)#switchport ac
Sabih_3(config-if-range)#switchport access vlan 4
Sabih_3(config-if-range)#end
Sabih_3#
%SYS-5-CONFIG_I: Configured from console by console

Sabih_3#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Sabih_3(config)#int fa 0/24
Sabih_3(config-if)#swit
Sabih_3(config-if)#switchport mode trunk
Sabih_3(config-if)#exit
Sabih_3(config)#exit
Sabih_3#
%SYS-5-CONFIG_I: Configured from console by console
```