



HACETTEPE UNIVERSITY

DEPARTMENT OF  
COMPUTER ENGINEERING

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## BBM453: Computer Networks Laboratory Lab 8: VLAN

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Group 14  
Source IP : 192.168.0.27

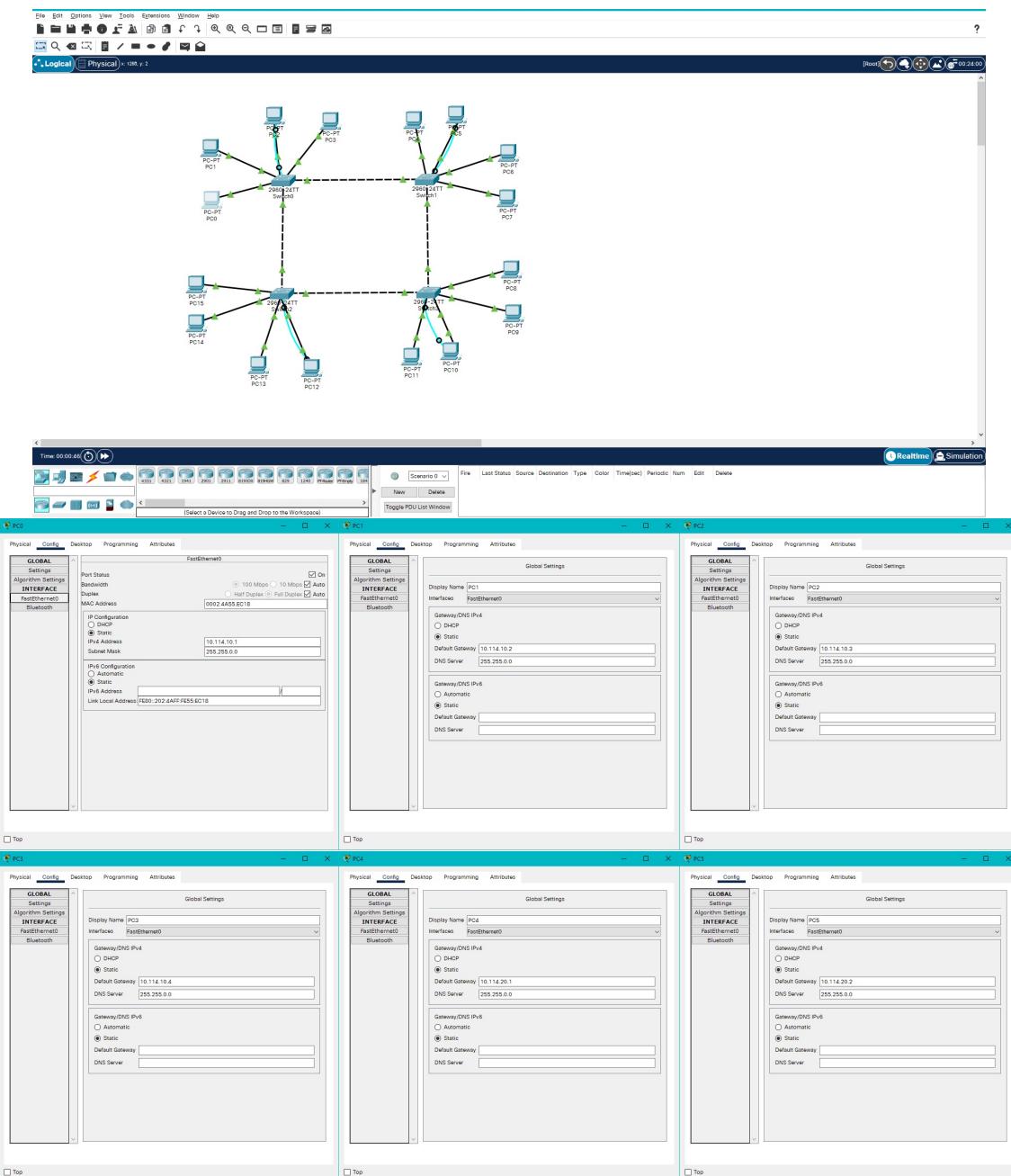
Nov 30,2021

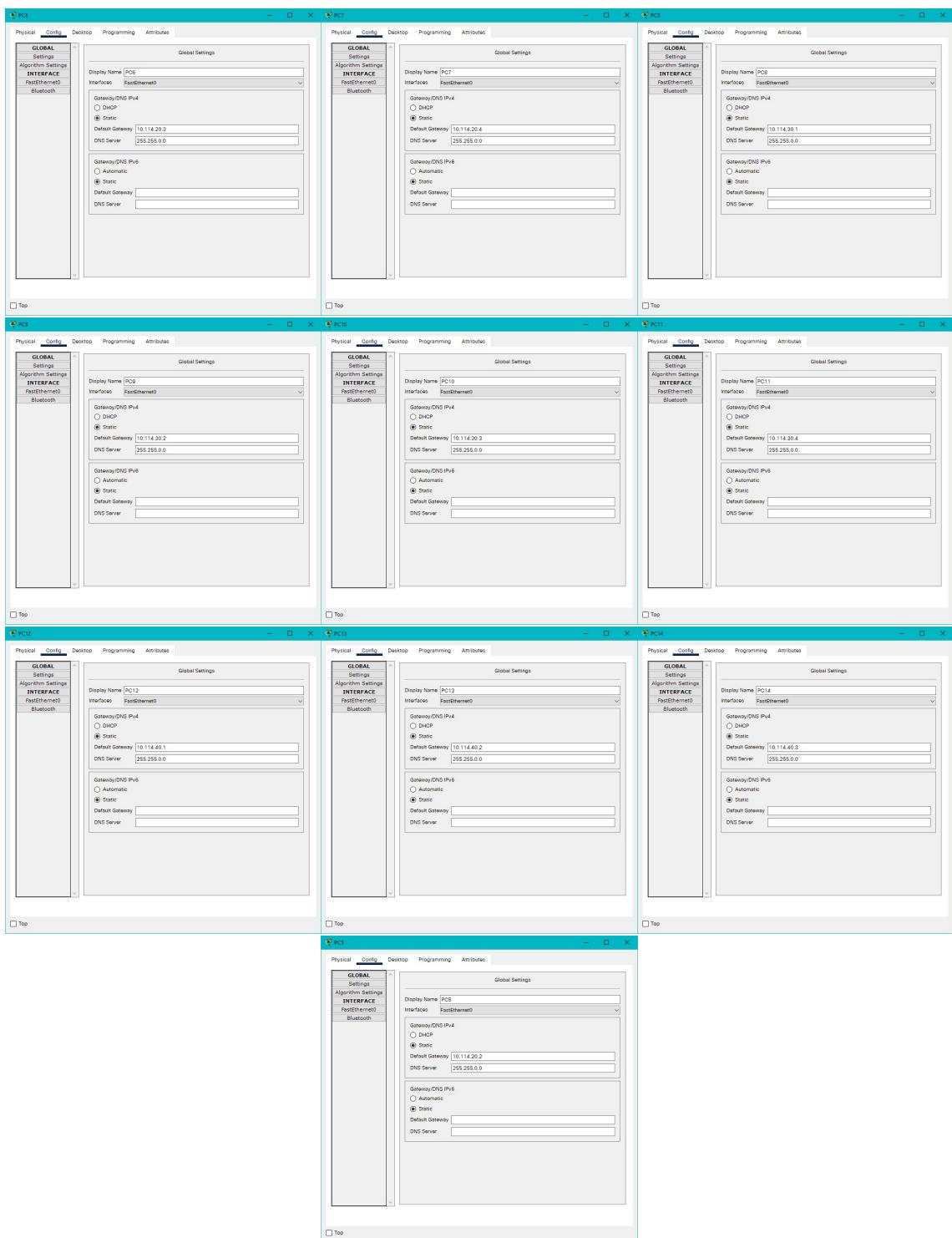
# SOLUTIONS

## EXPERIMENT STEPS

1. In this experiment you're going to create a network similar to one in previous lab. You should virtually group computers as shown in Figure-1 using VLAN configuration on Cisco Switches.

We created a network as described in the pdf.

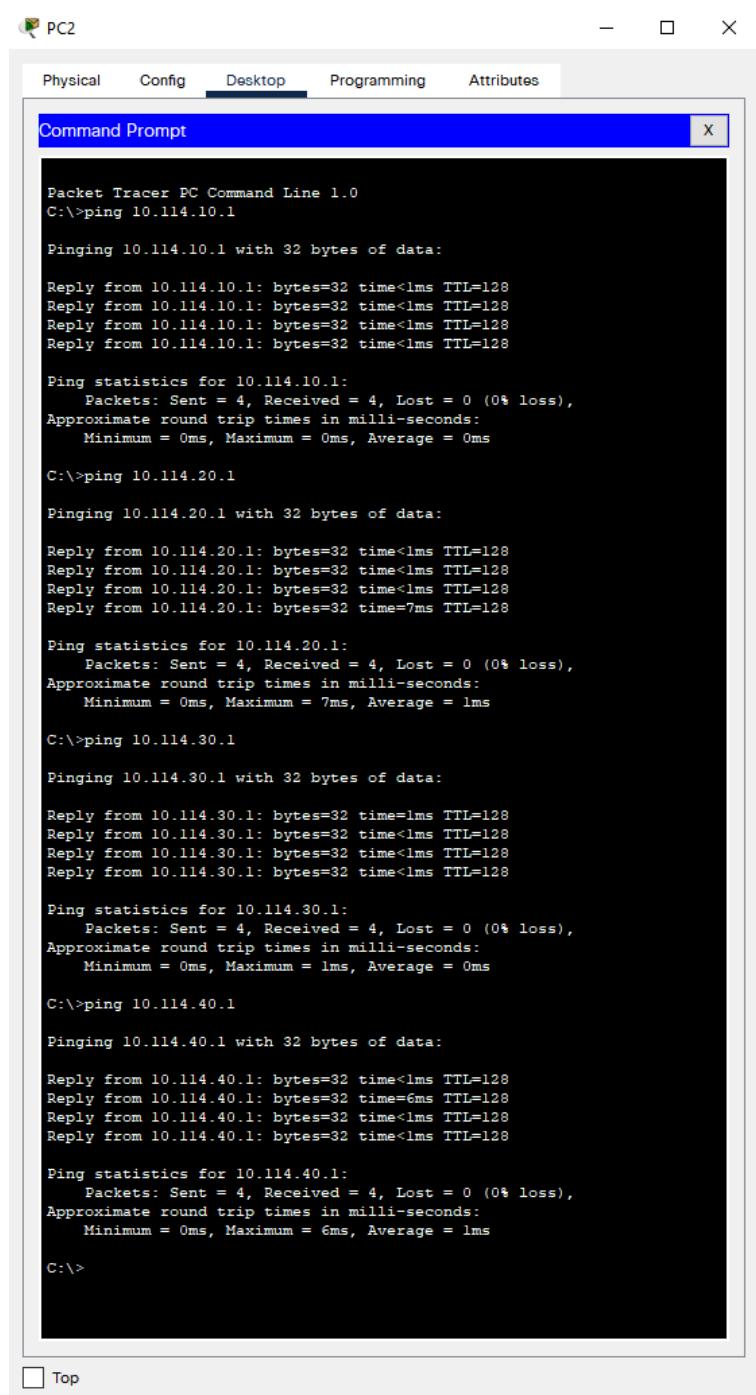




## 2. Assign IP addresses to your computers' eth0 adapter as described in the Table-1 similar to previous Lab. Make sure that all computers are connected to the network and all can be pinged.

We made sure by testing couple of pings and the light is green indicating the connections are valid.

Group Name	IP Address 1	IP Address 2	IP Address 3	IP Address 4	Subnet Mask
Group1	10.114.10.1	10.114.10.2	10.114.10.3	10.114.10.4	255.255.0.0
Group2	10.114.20.1	10.114.20.2	10.114.20.3	10.114.20.4	255.255.0.0
Group3	10.114.30.1	10.114.30.2	10.114.30.3	10.114.30.4	255.255.0.0
Group4	10.114.40.1	10.114.40.2	10.114.40.3	10.114.40.4	255.255.0.0



The screenshot shows a Windows Command Prompt window titled "PC2". The window has tabs at the top: Physical, Config, Desktop, Programming, and Attributes. The "Desktop" tab is selected. Below the tabs is a title bar with "Command Prompt" and a close button. The main area of the window displays the output of several ping commands. The output is as follows:

```
Packet Tracer PC Command Line 1.0
C:\>ping 10.114.10.1

Pinging 10.114.10.1 with 32 bytes of data:
Reply from 10.114.10.1: bytes=32 time<1ms TTL=128

Ping statistics for 10.114.10.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 10.114.20.1

Pinging 10.114.20.1 with 32 bytes of data:
Reply from 10.114.20.1: bytes=32 time<1ms TTL=128
Reply from 10.114.20.1: bytes=32 time<1ms TTL=128
Reply from 10.114.20.1: bytes=32 time<1ms TTL=128
Reply from 10.114.20.1: bytes=32 time=7ms TTL=128

Ping statistics for 10.114.20.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 7ms, Average = 1ms

C:\>ping 10.114.30.1

Pinging 10.114.30.1 with 32 bytes of data:
Reply from 10.114.30.1: bytes=32 time=1ms TTL=128
Reply from 10.114.30.1: bytes=32 time<1ms TTL=128
Reply from 10.114.30.1: bytes=32 time<1ms TTL=128
Reply from 10.114.30.1: bytes=32 time<1ms TTL=128

Ping statistics for 10.114.30.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

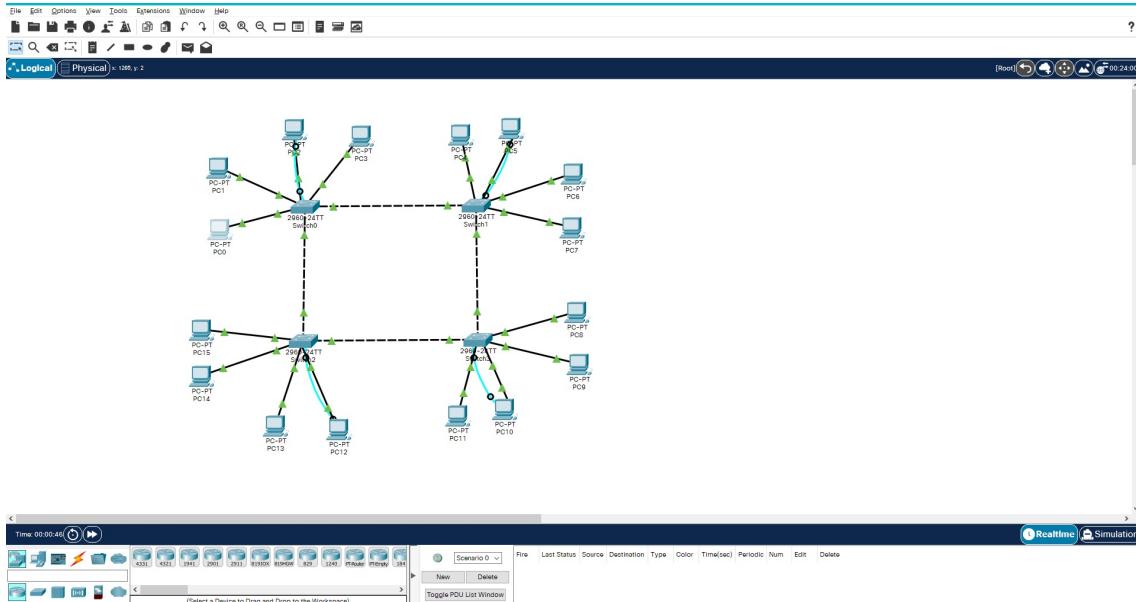
C:\>ping 10.114.40.1

Pinging 10.114.40.1 with 32 bytes of data:
Reply from 10.114.40.1: bytes=32 time<1ms TTL=128
Reply from 10.114.40.1: bytes=32 time=6ms TTL=128
Reply from 10.114.40.1: bytes=32 time<1ms TTL=128
Reply from 10.114.40.1: bytes=32 time<1ms TTL=128

Ping statistics for 10.114.40.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 6ms, Average = 1ms

C:\>
```

3. Switches can be configured via telnet or console connection. We are going to use console connection using console (blue) cable. You should select one computer from your group which has a console cable attached to its onboard serial port. Then just plug the RJ-45 end of the cable to Switch's console port on the back side.



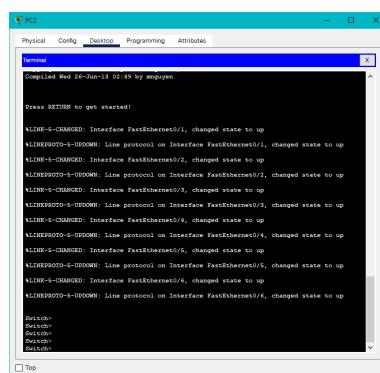
We have plugged the console (blue) cables according to pdf. Every switch has a dedicated console pc.

4. In Unix systems, there is a tool called minicom which can use serial port of the system and send keystrokes to the terminal attached. So enter minicom from console of the computer (which is connected to the switch) and enter into the Cisco device command line interface.

Since T.A said that this question will be skipped, there's no answer here.

**5. You should see something like: Switch> after pressing Enter for a couple of times.**

Yes we can see it, PC2 is connected to Switch0 via RS-232 cable.



## 6. Now you are in the Cisco IOS operating system, and you can only use Cisco commands for configuration or troubleshooting. You can enter ? command and see which commands you can use in that level.

Yes we observed the commands.

```
$LINK-5-CHANGED: Interface FastEthernet0/3, changed state to up
$LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state to up
$LINK-5-CHANGED: Interface FastEthernet0/4, changed state to up
$LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/4, changed state to up
$LINK-5-CHANGED: Interface FastEthernet0/5, changed state to up
$LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/5, changed state to up
$LINK-5-CHANGED: Interface FastEthernet0/6, changed state to up
$LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/6, changed state to up

Switch>
Switch>
Switch>
Switch>
Switch>?
Exec commands:
  connect      Open a terminal connection
  disable      Turn off privileged commands
  disconnect   Disconnect an existing network connection
  enable       Turn on privileged commands
  exit         Exit from the EXEC
  logout       Exit from the EXEC
  ping         Send echo messages
  resume       Resume an active network connection
  show         Show running system information
  ssh          Open a secure shell client connection
  telnet       Open a telnet connection
  terminal     Set terminal line parameters
  traceroute   Trace route to destination
Switch>
```

## 7-8. Now you are ready to configure VLAN settings according to Figure-1. You have to associate related ports with described VLANs and define Trunk links between Switch connections.

First we activated every port to corresponding vlan. Then we activated corresponding ports to trunk mode. In every switch port 1 and port 2 connects to other switches so they are set to trunk mode. And port 3-4-5-6 are for pcs in clock-wise direction. For example switch 0 port 1 and 2 are trunk mode port 3-4 are vlan 5 and port 5-6 are vlan 2. We also realized while activating ports to trunk mode, the cable sends the signal and switch at the end automatically activates it's corresponding port to trunk mode. Regardless we check after each step and made sure.

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, Fa0/25
2 VLAN0002	active	Fa0/5
5 VLAN0005	active	Fa0/2
1003 Token-ring-default	active	
1003 IEEE802.1Q Default	active	
1003 IEEE802.1Q	active	
1005 Trunk-default	active	

VLAN Type	SID	MTU	Parent	RingsNo	BridgeMode	Stp	BridgeMode	Transl	Trans2
1 ethernet	100001	1500	-	-	-	-	-	0	0
1 ethernet	100002	1500	-	-	-	-	-	0	0
1 ethernet	100003	1500	-	-	-	-	-	0	0
1003 IEEE802.1Q	101004	1500	-	-	-	-	-	0	0
1004 Tokenring	101005	1500	-	-	-	-	-	0	0

VLAN Name	Status	Ports
1 default	active	Fa0/1, Fa0/2, Fa0/3, Fa0/4, Fa0/7 Fa0/5, Fa0/6, 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, Gig0/1, Gig0/2
2 VLAN0002	active	Fa0/5
5 VLAN0005	active	Fa0/2
1003 Eth-Sid-default	active	
1003 IEEE802.1Q Default	active	
1003 IEEE802.1Q	active	
1005 Trunk-default	active	



switch 0 port 1

```

PC1 Terminal
Switch>enable
Switch>configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#interface fastethernet0/1
Switch(config-if)#switchport mode trunk
Switch(config-if)#exit
Switch(config)#
Switch#  
VTP 5-COMTU_1: Configured from console by console
Switch>show vlan
VLAN Name Status Ports
1 default active Fa0/2, Fa0/9, Fa0/10
Fa0/11, Fa0/12, Fa0/13
Fa0/14, Fa0/15, Fa0/17
Fa0/18, Fa0/19, Fa0/20
Fa0/21, Fa0/23, Fa0/24, Gig0/1
Gig0/2
2 VLAN0002 active Fa0/5, Fa0/6
1002 fa0-default active Fa0/3, Fa0/4
1003 token-ring-default active
1004 fabric-default active
1005 vnet-default active
VLAN Type SAID MTU Parent RingNo BridgeNo Stp BridgeMode Transl Tranc2
1 enet 100001 1500 -
2 enet 100002 1500 -
3 enet 100003 1500 -
4 enet 100004 1500 -
5 enet 100005 1500 -
6 enet 100006 1500 -
7 enet 100007 1500 -
8 enet 100008 1500 -
9 enet 100009 1500 -
1002 fddi 101002 1500 -
1003 fddi 101003 1500 -
1004 fddi 101004 1500 -
1005 fddi 101005 1500 -
--More--
```

switch 0 port 1

switch 0 port 1

switch 1 port 1

```

PC1 Terminal
Switch>enable
Switch>configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#interface fastethernet0/1
Switch(config-if)#switchport mode trunk
Switch(config-if)#exit
Switch(config)#
Switch#  
VTP 5-COMTU_1: Configured from console by console
Switch>show vlan
VLAN Name Status Ports
1 default active Fa0/7, Fa0/8, Fa0/9, Fa0/10
Fa0/11, Fa0/12, Fa0/13
Fa0/14, Fa0/15, Fa0/17
Fa0/18, Fa0/19, Fa0/20
Fa0/21, Fa0/23, Fa0/24, Gig0/1, Gig0/2
2 VLAN0002 active Fa0/6, Fa0/4
1002 fa0-default active
1003 token-ring-default active
1004 fabric-default active
1005 vnet-default active
VLAN Type SAID MTU Parent RingNo BridgeNo Stp BridgeMode Transl Tranc2
1 enet 100001 1500 -
2 enet 100002 1500 -
3 enet 100003 1500 -
4 enet 100004 1500 -
5 enet 100005 1500 -
6 enet 100006 1500 -
7 enet 100007 1500 -
8 enet 100008 1500 -
9 enet 100009 1500 -
1002 fddi 101002 1500 -
1003 fddi 101003 1500 -
1004 fddi 101004 1500 -
1005 fddi 101005 1500 -
--More--
```

switch 1 port 1

switch 1 port 2

switch 1 receive signal from switch 0

switch 2 port 1 had already been activated

```

PC1 Terminal
Switch>enable
Switch>configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#interface fastethernet0/1
Switch(config-if)#switchport mode trunk
Switch(config-if)#exit
Switch(config)#
Switch#  
VTP 5-COMTU_1: Configured from console by console
Switch>show vlan
VLAN Name Status Ports
1 default active Fa0/2, Fa0/7, Fa0/8, Fa0/9
Fa0/10, Fa0/11, Fa0/12, Fa0/13
Fa0/14, Fa0/15, Fa0/17
Fa0/18, Fa0/19, Fa0/20
Fa0/21, Fa0/23, Fa0/24, Gig0/1, Gig0/2
2 VLAN0002 active Fa0/5, Fa0/4
1002 fa0-default active
1003 token-ring-default active
1004 fabric-default active
1005 vnet-default active
VLAN Type SAID MTU Parent RingNo BridgeNo Stp BridgeMode Transl Tranc2
1 enet 100001 1500 -
2 enet 100002 1500 -
3 enet 100003 1500 -
4 enet 100004 1500 -
5 enet 100005 1500 -
6 enet 100006 1500 -
7 enet 100007 1500 -
8 enet 100008 1500 -
9 enet 100009 1500 -
1002 fddi 101002 1500 -
1003 fddi 101003 1500 -
1004 fddi 101004 1500 -
1005 fddi 101005 1500 -
--More--
```

switch 2 port 1 had already been activated

switch 2 port 2

switch 1 receive signal from switch 0

switch 3 port 1

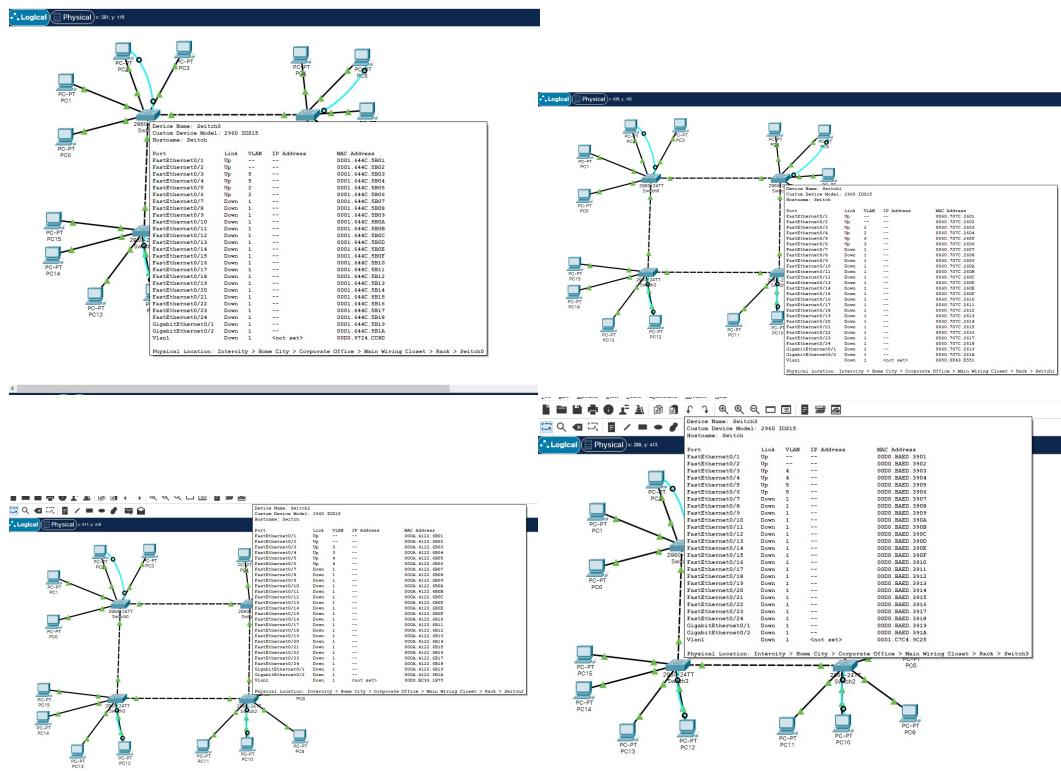
```

PC1 Terminal
Switch>enable
Switch>configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#interface fastethernet0/1
Switch(config-if)#switchport mode trunk
Switch(config-if)#exit
Switch(config)#
Switch#  
VTP 5-COMTU_1: Configured from console by console
Switch>show vlan
VLAN Name Status Ports
1 default active Fa0/2, Fa0/7, Fa0/8, Fa0/9
Fa0/10, Fa0/11, Fa0/12, Fa0/13
Fa0/14, Fa0/15, Fa0/17
Fa0/18, Fa0/19, Fa0/20
Fa0/21, Fa0/23, Fa0/24, Gig0/1, Gig0/2
2 VLAN0002 active Fa0/5, Fa0/4
1002 fa0-default active
1003 token-ring-default active
1004 fabric-default active
1005 vnet-default active
VLAN Type SAID MTU Parent RingNo BridgeNo Stp BridgeMode Transl Tranc2
1 enet 100001 1500 -
2 enet 100002 1500 -
3 enet 100003 1500 -
4 enet 100004 1500 -
5 enet 100005 1500 -
6 enet 100006 1500 -
7 enet 100007 1500 -
8 enet 100008 1500 -
9 enet 100009 1500 -
1002 fddi 101002 1500 -
1003 fddi 101003 1500 -
1004 fddi 101004 1500 -
1005 fddi 101005 1500 -
--More--
```

switch 3 port 1

switch 3 port 2

switch 3 received port 2 signal from switch 0 and also port 1 received signal from switch 2



**9.If all four switch configurations were completed, now ping from a computer to one that is in your group but in a different VLAN. And try ping to another group but in the same VLAN.**

We have chosen pc2 to ping from. First we have pinged pc4 which is in the same vlan (vlan2) but different group (switch). We got the ping result in success. Then we pinged pc0 which in vlan5 but in the same group. We got ping result in timed out.

```

PC2
Physical Config Desktop Programming Attributes
Command Prompt
X

Packet Tracer PC Command Line 1.0
C:\>ping 10.114.20.1

Pinging 10.114.20.1 with 32 bytes of data:
Reply from 10.114.20.1: bytes=32 time<1ms TTL=128

Ping statistics for 10.114.20.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 10.114.10.1

Pinging 10.114.10.1 with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 10.114.10.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
C:\>

```

 Top

## **REFERENCES**

LaTex Tutorials  
Assignment Paper  
Cisco Networking Academy Introduction  
Cisco IOS Lan Book  
Cisco VLAN Configuration