



Department of Computer Science and Engineering
Islamic University of Technology (IUT)
A subsidiary organ of OIC

Lab Report 03

CSE 4412: Data Communication and Networking Lab

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Section: B

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Title: Understanding the basics of Variable Length Subnet Mask (VLSM) and VLANs and Inter-VLAN communication

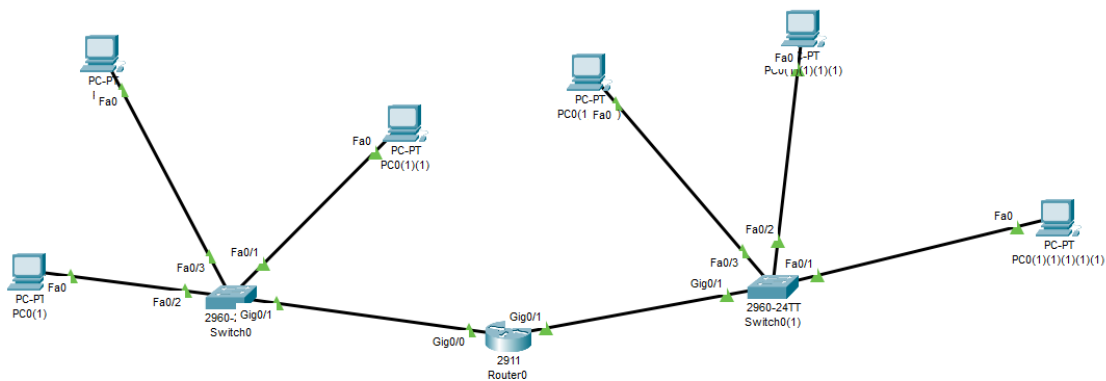
Objectives:

1. Understanding subnet mask
2. Creating efficient network for smaller scope
3. Understanding intra-VLAN connection
4. Understanding inter-VLAN connection
5. Creating trunk over the switches

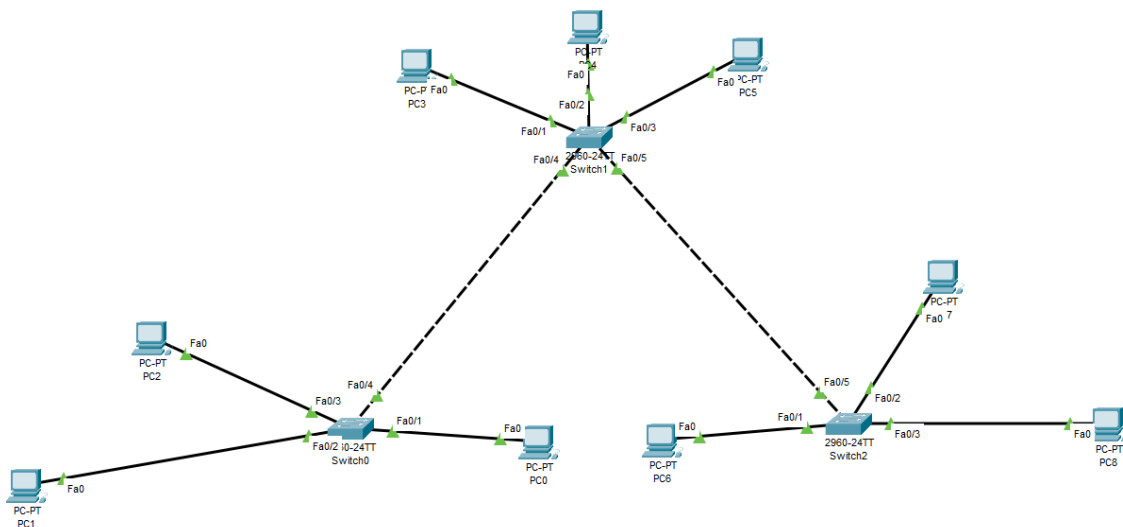
Diagram of the experiment:

(Provide screenshot of the final network topology. Make sure to label the network components.)

TASK #01:



TASK #02:



Working Procedure:

(Explain in brief how you completed the tasks. Provide necessary screenshots of used commands for each task.)

TASK #01:

- Create the network topology
- Insert the IP addresses for,
 - PC - 1 : 192.168.11.10 (255.255.255.224)
 - PC - 2 : 192.168.11.20 (255.255.255.224)
 - PC - 3 : 192.168.11.15 (255.255.255.224)
 - PC - 4 : 192.168.11.36 (255.255.255.224)
 - PC - 4 : 192.168.11.40 (255.255.255.224)
 - PC - 4 : 192.168.11.45 (255.255.255.224)
- Configured the router with the following commands
 - enable
 - configure terminal
 - interface gigabitethernet 0/0
 - ip address 192.168.11.1 255.255.255.224
 - no shutdown
 - exit
 - interface gigabitethernet 0/0
 - ip address 192.168.11.33 255.255.255.224
 - no shutdown
 - exit
 - exit
 - copy running-config startup-config
- Sent ping request to verify the network working or not...

TASK #02:

- In each switch inserted the command...
 - conf t
 - vlan 10
 - name stud
 - exit
 - vlan 20
 - name teach
 - exit
 - vlan 30
 - name admin
 - exit
 - interface fastethernet 0/1
 - switchport mode access
 - switchport access vlan 10

- no shutdown
 - interface fastethernet 0/2
 - switchport mode access
 - switchport access vlan 20
 - no shutdown
 - interface fastethernet 0/3
 - switchport mode access
 - switchport access vlan 30
 - no shutdown
 - interface fastethernet 0/4
 - switchport mode trunk
 - switchport trunk allowed vlan all
 - no shutdown
- Repet this for the switch 2 and switch 3 just need to adjust the correct line of trunk.
 - Now connection is set to the vlans

Questions (Answer to the point):

1. How many host bits are needed in the largest required subnet?

Ans: in this case , 5. We needed to host 21 unique addresses. So,

$$21 < 2^5$$

$$21 < 32$$

That's why we have used 5 bits in the host.

2. How many VLANs need to be configured to each of the switches?

Ans: 3

3. Which interfaces need Access Link?

Ans: for switch 1...

- FastEthernet 0/1
- FastEthernet 0/2
- FastEthernet 0/3

4. Which interfaces need Trunk Link?

Ans: for switch 1 ...

- FastEthernet 0/4

5. After configuring VLAN, what will happen if we broadcast?

Ans:

Within the VLAN: If a broadcast message is sent within a VLAN, it will be received by all devices within that VLAN. VLANs segment the network logically, so broadcasts are contained within the VLAN and do not propagate to devices in other VLANs. This segmentation helps reduce network traffic and enhances security and performance.

Inter-VLAN Broadcasting: By default, VLANs block broadcast traffic from crossing between them. This means that a broadcast within one VLAN will not be forwarded to

devices in other VLANs. If inter-VLAN communication is required, routers or Layer 3 switches need to be configured to route traffic between VLANs, which may include specific configurations to allow or control broadcast traffic between VLANs.

Challenges (if any):