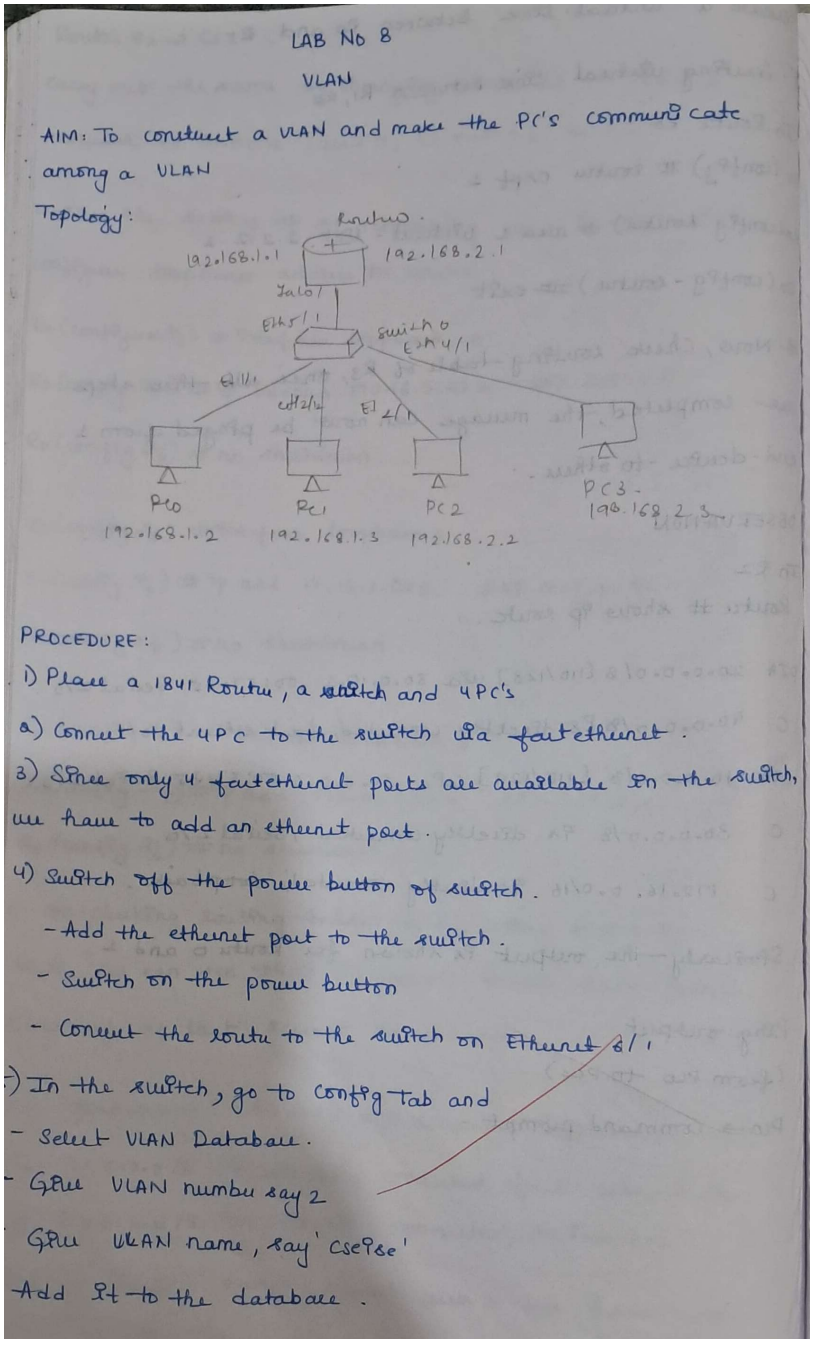
Program-12

To construct a VLAN and make the PCs communicate among a VLAN

Topology, Procedure and Observation:



6] Select the switch
- Go to config
- Go to ethernet 6/1 i.e connected to router.
- make it the trunk

7] Configure the PCs as shown in the topology.

8] Select switch:
- Go to config
- Go to fastethernet 2/11
- Set VLAN number as 2 i.e 'csense'
- Similarly set VLAN 2 for fastethernet 3/11 interface

9] Configure the router:

Router (config)# interface fastethernet 0/0
Router (config-if)# ip address 192.168.1.1 255.255.255.0
Router (config-if)# no shut
Router (config-if)# exit

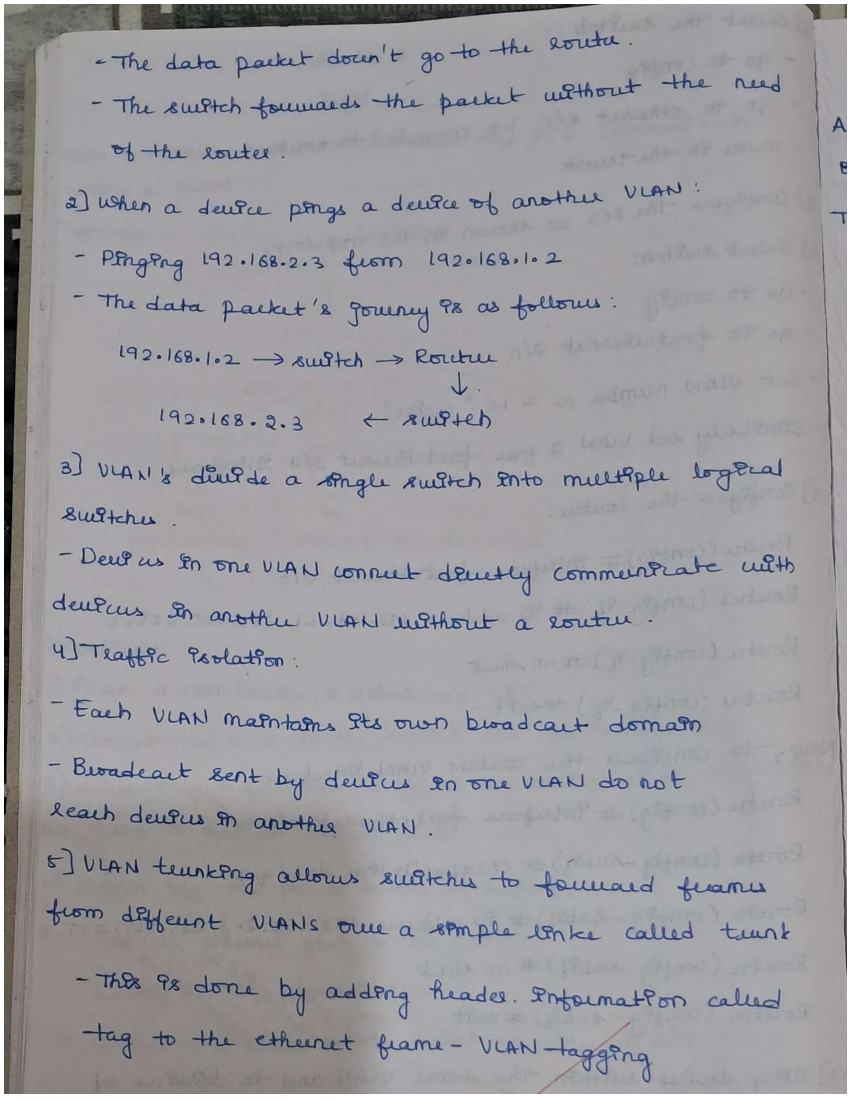
Now, to configure the router's VLAN interface.

Router (config)# interface fastethernet 0/0.1
Router (config-subif)# encapsulation dot1q 2
Router (config-subif)# ip address 192.168.2.1 255.255.255.0
Router (config-subif)# no shut
Router (config-subif)# exit

10] Ping devices within the same VLAN and to devices of different VLAN.

OBSERVATIONS:

1) When devices are pinged within same VLAN:
- Pinging 192.168.1.3 from 192.168.1.2


- The data packet doesn't go to the router.
- The switch forwards the packet without the need of the router.

2] When a device pings a device of another VLAN:

- Pinging 192.168.2.3 from 192.168.1.2
- The data packet's journey is as follows:

192.168.1.2 → switch → Router
↓
192.168.2.3 ← switch

3] VLAN's divide a single switch into multiple logical switches.

- Devices in one VLAN cannot directly communicate with devices in another VLAN without a router.

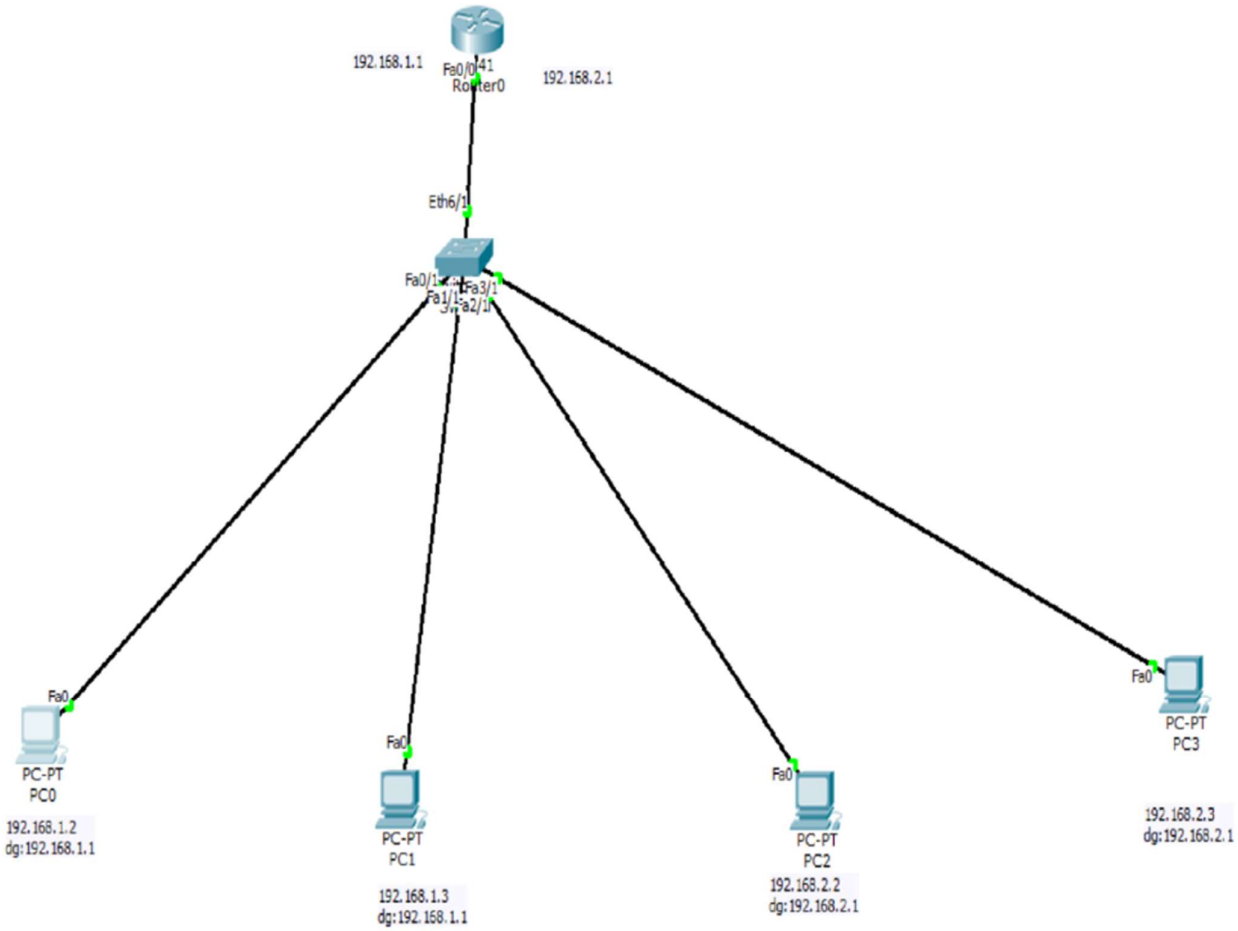
4] Traffic Isolation:

- Each VLAN maintains its own broadcast domain
- Broadcast sent by devices in one VLAN do not reach devices in another VLAN.

5] VLAN trunking allows switches to forward frames from different VLANs over a single link called trunk

- This is done by adding header information called tag to the ethernet frame - VLAN tagging

Screenshots:


192.168.1.1
Fa0/0
Router0
192.168.2.1
Eth6/1
Fa0/1
Fa3/1
Fa0
PC-PT
PC0
192.168.1.2
dg:192.168.1.1
Fa0
PC-PT
PC1
192.168.1.3
dg:192.168.1.1
Fa0
PC-PT
PC2
192.168.2.2
dg:192.168.2.1
Fa0
PC-PT
PC3
192.168.2.3
dg:192.168.2.1

Command Prompt

```
Packet Tracer PC Command Line 1.0
PC>ping 192.168.2.2

Pinging 192.168.2.2 with 32 bytes of data:

Request timed out.
Reply from 192.168.2.2: bytes=32 time=0ms TTL=127
Reply from 192.168.2.2: bytes=32 time=0ms TTL=127
Reply from 192.168.2.2: bytes=32 time=4ms TTL=127

Ping statistics for 192.168.2.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 4ms, Average = 1ms

PC>ping 192.168.2.2

Pinging 192.168.2.2 with 32 bytes of data:

Reply from 192.168.2.2: bytes=32 time=0ms TTL=127
Reply from 192.168.2.2: bytes=32 time=0ms TTL=127
Reply from 192.168.2.2: bytes=32 time=2ms TTL=127
Reply from 192.168.2.2: bytes=32 time=0ms TTL=127

Ping statistics for 192.168.2.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 2ms, Average = 0ms
```