LABORATORY PROGRAM – 11

To construct a VLAN and make the PC's communicate among a VLAN

18/12/24

Lab No. 9

VLAN

Aim: To construct a VLAN and make the PC's communicate among a VLAN.

Topology:-

Procedure:-

① Place a 1841 Router, a Switch and PCs

② Connect the four PCs to the Switch via fasthethernet.

③ Since only 4 fasthethernet ports are available in the Switch, we have add an ethernet port

④ Switch of the power button of the Switch
→ Add the ethernet port to the Switch
→ Switch on the power button
→ Connect the router to the Switch via ethernet6/1

⑤ In the Switch, go to Config Tab and
→ Select VLAN Database
→ Give VLAN number   (Say 2)
→ Give VLAN name (Say 'cseise')
→ Add it to the Database.

⑥ Select the Switch:
→ Go to   Config
→ Go to   ethernet 6/1 ie Connected to router
→ Make it the trunk

⑦ Configure the PC's as shown in the Topology

⑧ Select Switch:
→ Go to Config
→ Go to fastethernet 2/1
→ Set VLAN number as 2 i.e 'cseise'
→ Similarly set VLAN 2 for fastethernet
   3/1 interface

⑨ Configure the router:
Router (config) # intf
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) # noshut
Router (Config-subif) # exit

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

OBSERVATIONS:

① When devices ar pinged within Same VLAN:
→ Pinging 192.168.1.3 from 192.168.1.2
→ data packet doesn't go the router
→ The Switch forwards the packets 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 packets journey is as follows
192.168.1.2 → Switch → Router → Switch → 192.168.2.3

③ VLANs divide a Single Switch into multiple Logical Switches
→ Devices in one VLAN connot directly communicate with devices in another VLAN without a router

④ Traffic isolation:
→ Each VLAN maintains its own broadcast domain
→ BroadCasts Sent by devices in one VLAN donot 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 an additional header information Called tag to the ethernet frame - VLAN Tagging
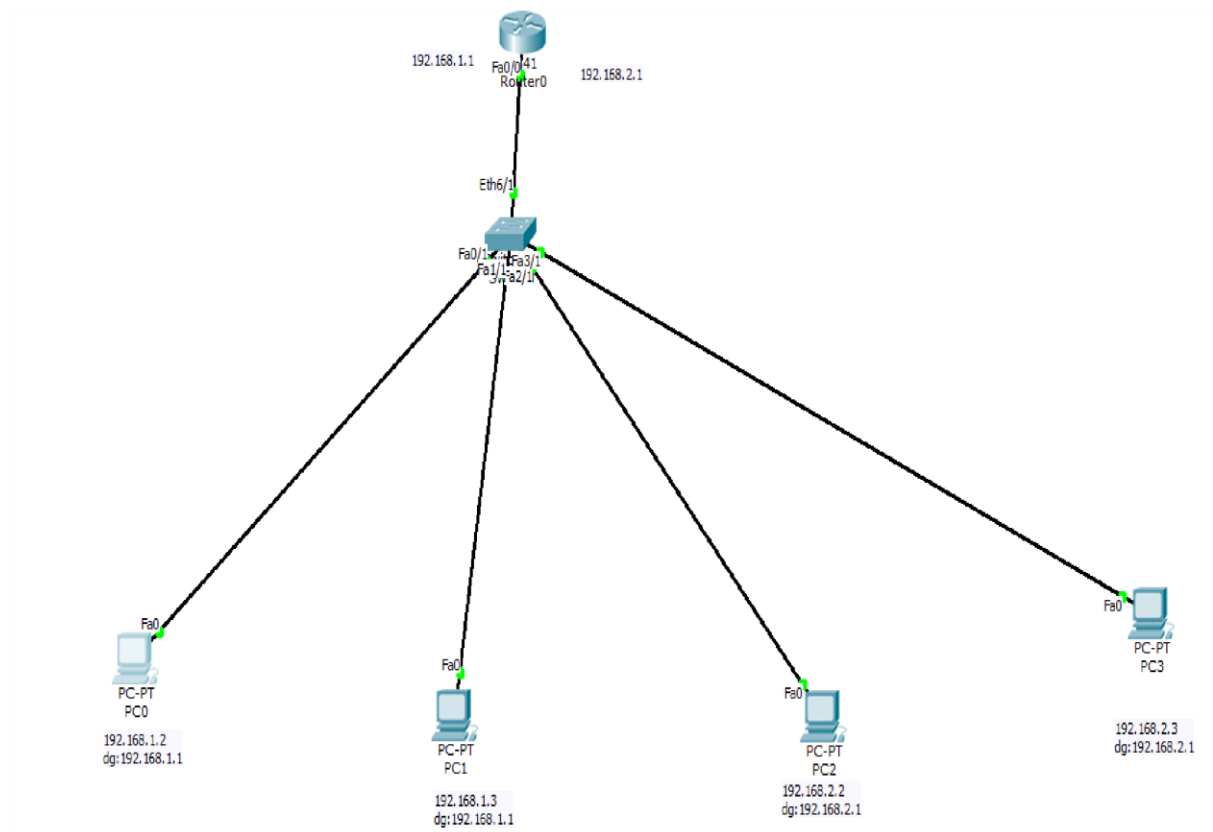
Command Prompt

```
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

PC>ping 192.168.2.3

Pinging 192.168.2.3 with 32 bytes of data:

Request timed out.
Reply from 192.168.2.3: bytes=32 time=3ms TTL=127
Reply from 192.168.2.3: bytes=32 time=2ms TTL=127
Reply from 192.168.2.3: bytes=32 time=1ms TTL=127

Ping statistics for 192.168.2.3:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 3ms, Average = 2ms

PC>ping 192.168.2.3

Pinging 192.168.2.3 with 32 bytes of data:

Reply from 192.168.2.3: bytes=32 time=0ms TTL=127
Reply from 192.168.2.3: bytes=32 time=0ms TTL=127
Reply from 192.168.2.3: bytes=32 time=2ms TTL=127
Reply from 192.168.2.3: bytes=32 time=0ms TTL=127

Ping statistics for 192.168.2.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 2ms, Average = 0ms

PC>
```