

NAME : Manvi Sharma

USN: 1BM22CS149

CN LAB 9

AIM: TO CREATE A VIRTUAL LAN ON TOP OF THE PHYSICAL LAN AND ENABLE COMMUNICATION B/W PHYSICAL LAN AND VIRTUAL LAN

OBSERVATION:

Lab-09

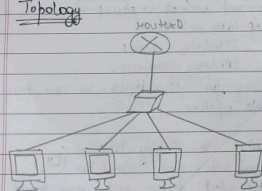
Aim:- To create a virtual lan on top of the physical lan and enable communication b/w physical lan and virtual lan.

→ Switch acts like a trunk

→ Trunk:- a interface that helps to pass or mgt. to different lan

To connect to other router switch is connected to router.

Topology



→ for Topology,

→ select Router → 1841, Switch → 2950T-24 and 4 Generic PC-PT (Enddevices), PC0, PC1, PC2, PC3

Steps → Router0 configuration

→ Physical Lan

Go to Router → CLI is

```
Router > enable
Router(Config) > interface fastethernet0/0
Router(Config) > ip address 192.168.10.1
Router(Config) > no shutdown
Router(Config) > exit
```

Router > ip address 192.168.10.1
Router(Config) > no shutdown
Router(Config) > exit

Left 3 PCs are under physical lan. Normal config

Steps → PC0, PC1 config

→ PC0 → fastethernet0 →
ip address = 192.168.10.2
Subnet mask = 255.255.255.0
gateway = 192.168.10.1 [default gateway]

→ PC1 → config → fastethernet0
ip address = 192.168.10.3
Subnet mask = 255.255.255.0
gateway = 192.168.10.1

Setting up Virtual LAN

PC0, PC1 are under virtual LAN

PC2 is connected to switch with Fa0/24

PC3 is connected to switch with Fa0/24

Steps → Select switch go to fastethernet0/24, VLAN Database

VLAN no. → 20
VLAN name → vlan20

add

go to fastethernet0/24 → (Access) VLAN: 20: vlan20
fastethernet0/24 → (Access) VLAN: 20: vlan20

Steps → PC2, PC3 config

→ PC2 → ip address = 192.168.20.1
gateway = 192.168.20.3 [Router subinterface]

→ PC3 → ip address = 192.168.20.2
gateway = 192.168.20.3

Steps → Change Access for Router to Trunk

go to switch → fastethernet0/24 → help → VLAN Database → VLAN: 20
VLAN: 20: vlan20

from fastethernet0/24 → Trunk VLAN: 20: vlan20

Steps → Router Config for (subinterface) virtual LAN.

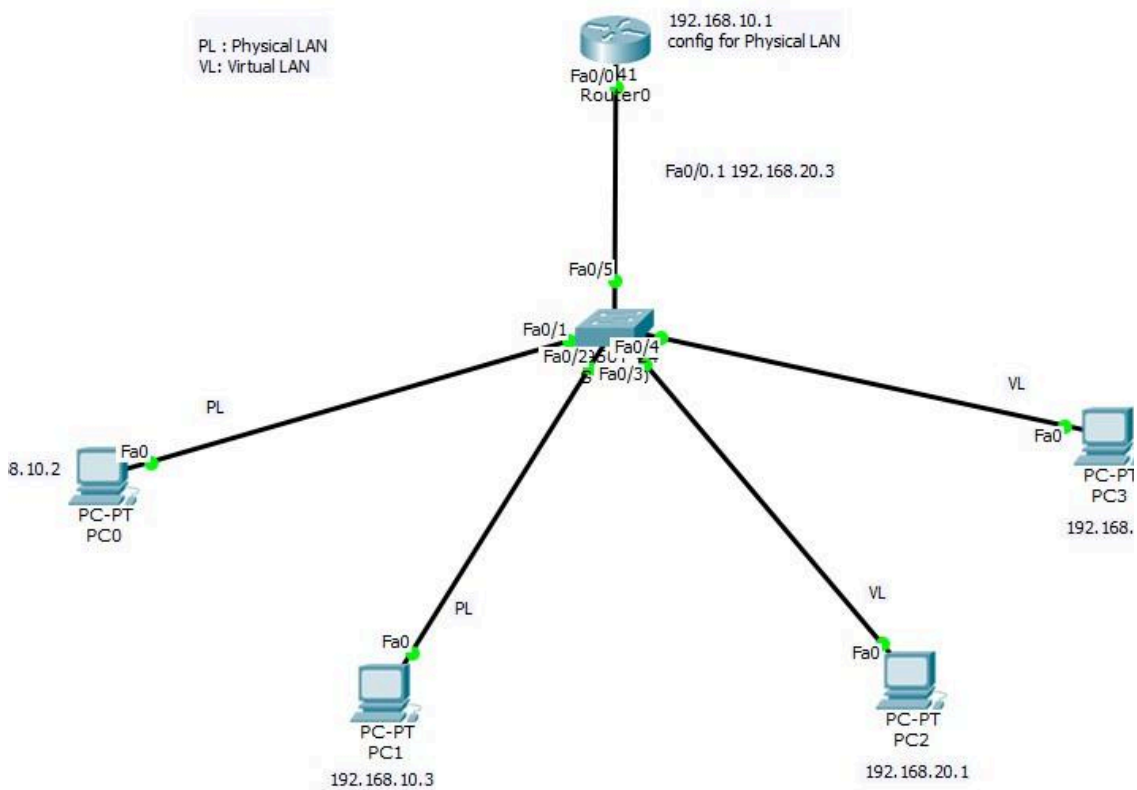
> enable
> config t
> interface fastethernet0/0.1
> encapsulation dot1q 20 // create subinterface with network 20
> ip address 192.168.20.3 255.255.255.0
> no shutdown
> exit.

Step 7 → Ping from Router to PC's to PC's
(network 10 to network 20)

from PC0 to PC2 :-

PC > Ping 192.168.20.1
Packets: sent=4, received=4, loss=0%

TOPOLOGY:



PC0 CONFIGURATION:

PC0

Physical Config Desktop Custom Interface

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Port Status ☒ On

Bandwidth ☐ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address 0090.0CB8.BD6D

IP Configuration

☐ DHCP

☒ Static

IP Address 192.168.10.2

Subnet Mask 255.255.255.0

IPv6 Configuration

☐ DHCP

☐ Auto Config

☒ Static

IPv6 Address

Link Local Address: FE80::290:CFF:FE88:BD6D

PC2 CONFIGURATION:

PC2

Physical Config Desktop Custom Interface

GLOBAL

Settings

Algorithm Settings

INTERFACE

FastEthernet0

Port Status ☒ On

Bandwidth ☐ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address 0090.0C54.884E

IP Configuration

☐ DHCP

☒ Static

IP Address 192.168.20.1

Subnet Mask 255.255.255.0

IPv6 Configuration

☐ DHCP

☐ Auto Config

☒ Static

IPv6 Address

Link Local Address: FE80::290:CFF:FE54:884E

PC2 Gateway CONFIGURATION:

The screenshot shows the 'Global Settings' window for PC2. The 'Display Name' is 'PC2'. Under 'Gateway/DNS', 'Static' is selected. The 'Gateway' is '192.168.20.3' and the 'DNS Server' is '0.0.0.0'. Under 'Gateway/DNS Ipv6', 'Static' is also selected. The 'IPv6 Gateway' and 'IPv6 DNS Server' fields are empty.

ROUTER0 CONFIGURATION:

The screenshot shows the 'IOS Command Line Interface' for Router0. The configuration commands entered are:

```
Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int fa0/0
Router(config-if)#ip address 192.168.10.1 255.255.255.0
Router(config-if)#ip address 192.168.10.1 255.255.255.0ip address 192.168.10.1
255.255.255.0no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to
up
```

SWITCH Fa 0/3 configuration

The screenshot shows the configuration for FastEthernet0/3 on Switch0. The port status is 'On'. Bandwidth is '100 Mbps' and Duplex is 'Full Duplex'. The port is configured as 'Access' type, assigned to 'VLAN 20', and has a 'Tx Ring Limit' of '10'.

Equivalent IOS Commands:

```
Switch(config-if)#exit
Switch(config)#interface FastEthernet0/3
Switch(config-if)#
Switch(config-if)#exit
Switch(config)#interface FastEthernet0/4
Switch(config-if)#
Switch(config-if)#exit
Switch(config)#interface FastEthernet0/3
Switch(config-if)#
```

SWITCH Fa 0/5 configuration

The screenshot shows the configuration for FastEthernet0/5 on Switch0. The port status is 'On'. Bandwidth is '100 Mbps' and Duplex is 'Full Duplex'. The port is configured as 'Trunk' type, assigned to 'VLAN 2-1001', and has a 'Tx Ring Limit' of '10'.

Equivalent IOS Commands:

```
Switch(config-if)#
Switch(config-if)#switchport trunk allowed vlan remove 1003
Switch(config-if)#
Switch(config-if)#
Switch(config-if)#switchport trunk allowed vlan remove 1004
Switch(config-if)#
Switch(config-if)#
Switch(config-if)#switchport trunk allowed vlan remove 1005
Switch(config-if)#
```


SWITCH VLAN Database

Switch0

Physical Config CLI

GLOBAL

Settings

Algorithm Settings

SWITCH

VLAN Database

INTERFACE

FastEthernet0/1

FastEthernet0/2

FastEthernet0/3

FastEthernet0/4

FastEthernet0/5

FastEthernet0/6

FastEthernet0/7

FastEthernet0/8

FastEthernet0/9

FastEthernet0/10

VLAN Configuration

VLAN Number

VLAN Name

Add Remove

VLAN No	VLAN Name
1	default
20	VLAN1
1002	fddi-default
1003	token-ring-default
1004	fddinet-default
1005	trnet-default

Equivalent IOS Commands

```
Switch(config-if)#exit
Switch(config)#interface FastEthernet0/4
Switch(config-if)#
Switch(config-if)#exit
Switch(config)#interface FastEthernet0/3
Switch(config-if)#
Switch(config-if)#exit
Switch(config)#
```

Creation of Fa 0/0.1

Encapsulating Fa 0/0.1

Router0

Physical Config CLI

IOS Command Line Interface

```
Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int fa0/0.1
Router(config-subif)#
%LINK-5-CHANGED: Interface FastEthernet0/0.1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.1, changed state to up

Router(config-subif)#ip address 192.168.20.3 255.255.255.0

% Configuring IP routing on a LAN subinterface is only allowed if that subinterface is already configured as part of an IEEE 802.1Q, IEEE 802.1Q, or ISL VLAN.

Router(config-subif)#exit
Router(config)#
Router(config)#exit
Router#vlan database
% Warning: It is recommended to configure VLAN from config mode, as VLAN database mode is being deprecated. Please consult user documentation for configuring VTP/VLAN in config mode.

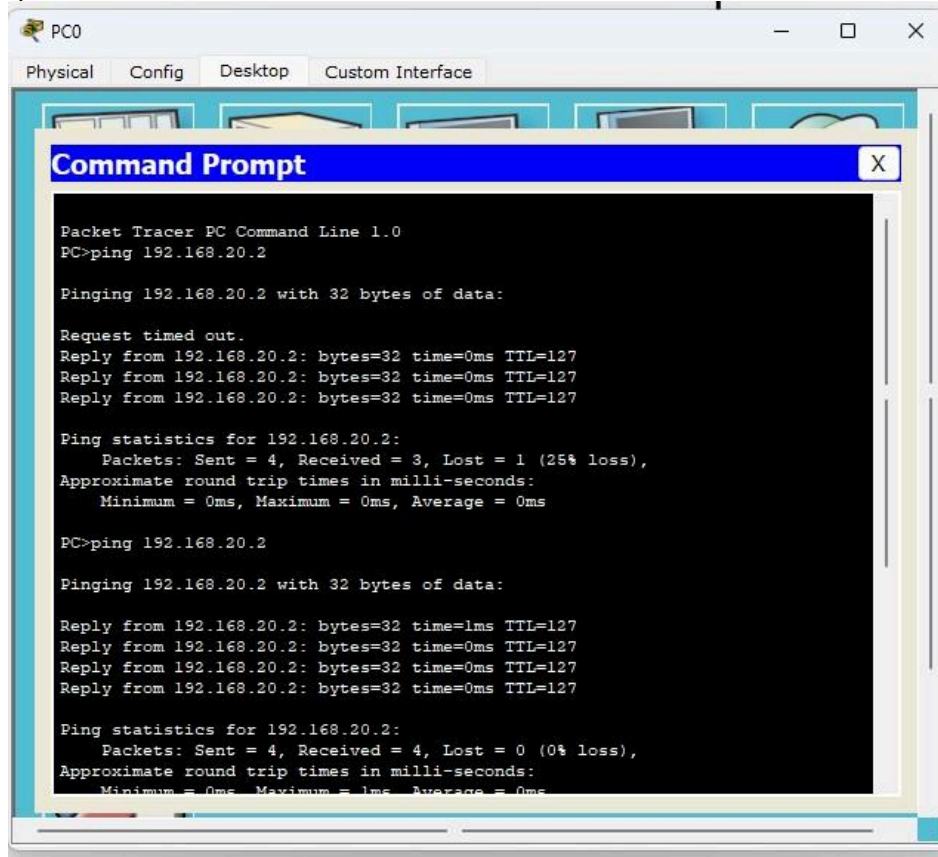
Router(vlan)#
%SYS-5-CONFIG_I: Configured from console by console

Router(vlan)#vlan 20 name VLAN1
VLAN 20 modified:
  Name: VLAN1
Router(vlan)#exit
APPLY completed.
Exiting...
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int fa0/0.1
Router(config-subif)#encapsulation dot1q 20
Router(config-subif)#ip address 192.168.20.3 255.255.255.0
Router(config-subif)#no shutdown
Router(config-subif)#exit
Router(config)#
```

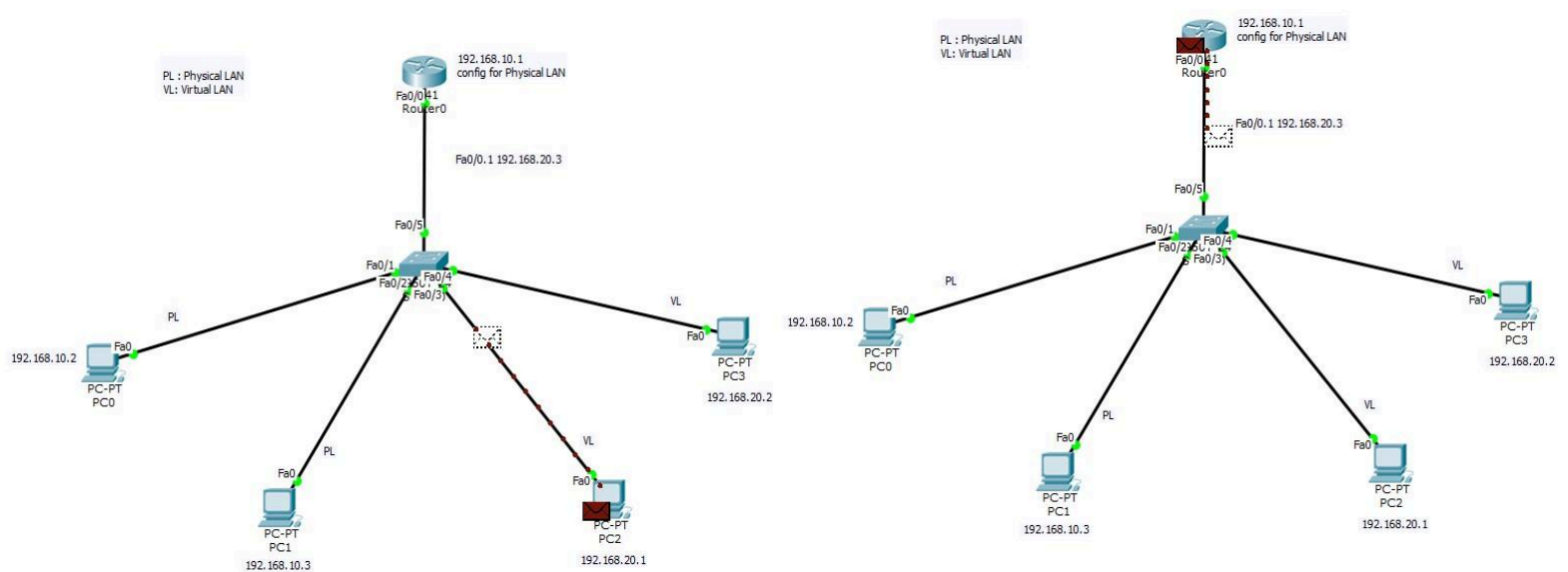
Router con0 is now available

Copy Paste

Ping message packet from PC0 to PC2



PDU



PDU Received

