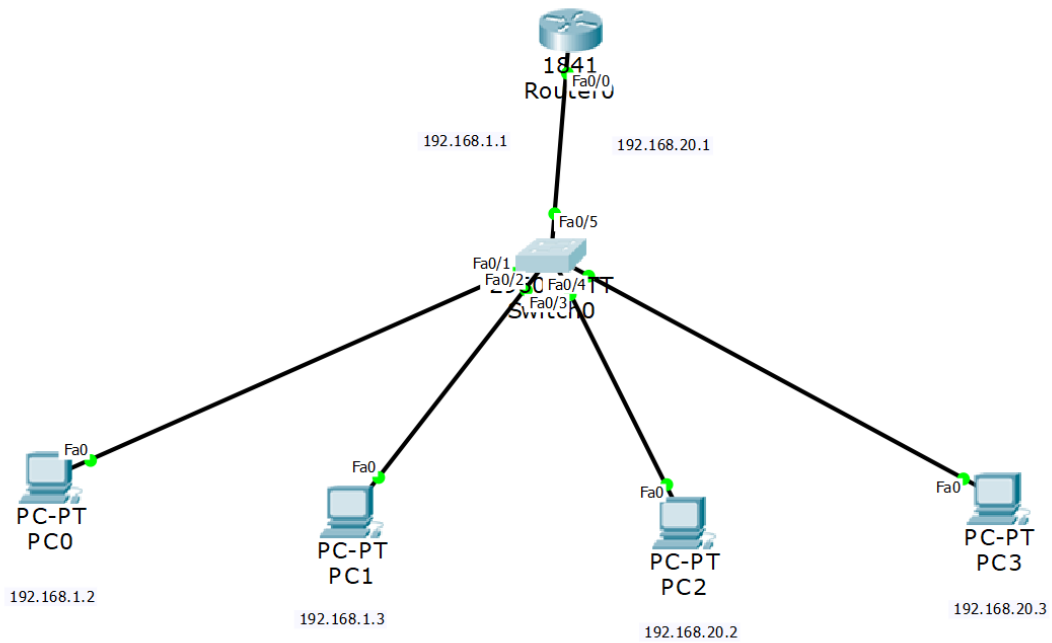


## LAB 9:

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

### Topology:



## Configurations:

### Switch VLAN Database:

**VLAN Configuration**

VLAN Number:   
VLAN Name:

VLAN No	VLAN Name
1	default
20	NEWVLAN
1002	fddi-default

**Equivalent IOS Commands**

```
Switch(config-if)#  
Switch(config-if)#  
Switch(config-if)#switchport access vlan 1  
Switch(config-if)#  
Switch(config-if)#exit  
Switch(config)#
```

### Switch FastEthernet0/5

**FastEthernet0/5**

Port Status: ☒ On

Bandwidth: ☐ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex: ☐ Half Duplex ☒ Full Duplex ☒ Auto

Trunk:  VLAN:

Tx Ring Limit:

<input checked="" type="checkbox"/> 1:default
<input checked="" type="checkbox"/> 20:NEWVLAN
<input checked="" type="checkbox"/> 1002:fddi-default

**Equivalent IOS Commands**

```
Switch(config-if)#exit  
Switch(config)#interface FastEthernet0/6  
Switch(config-if)#  
Switch(config-if)#exit  
Switch(config)#interface FastEthernet0/5  
Switch(config-if)#
```

## Switch FastEthernet0/3 and FastEthernet0/4

The screenshot shows the 'VLAN Configuration' window in the Switch0 configuration tool. The left sidebar has tabs for 'Physical', 'Config', and 'CLI'. Under 'Config', there are sections for 'GLOBAL' (Settings, Algorithm Settings), 'SWITCH' (VLAN Databases), and 'INTERFACE'. The 'VLAN Databases' section is active, showing a table of VLANs. At the top, there are input fields for 'VLAN Number' and 'VLAN Name', with 'Add' and 'Remove' buttons. Below the table, there is a section for 'Equivalent IOS Commands'.

VLAN No	VLAN Name
1	default
20	NEWVLAN
1002	fddi-default

Equivalent IOS Commands

```
Switch(config-if) #  
Switch(config-if) #  
Switch(config-if) #switchport access vlan 1  
Switch(config-if) #  
Switch(config-if) #exit  
Switch(config) #
```

## Switch FastEthernet0/1 and FastEthernet0/2

The screenshot shows the 'FastEthernet0/1' configuration window in the Switch0 configuration tool. The left sidebar has tabs for 'Physical', 'Config', and 'CLI'. Under 'Config', there are sections for 'INTERFACE' and 'SWITCH'. The 'INTERFACE' section is active, showing a list of interfaces. The 'FastEthernet0/1' interface is selected, and its configuration is shown. At the top, there are settings for 'Port Status' (On), 'Bandwidth' (100 Mbps), 'Duplex' (Full Duplex), and 'Tx Ring Limit' (10). Below these, there are dropdown menus for 'Access' and 'VLAN' (1). At the bottom, there is a section for 'Equivalent IOS Commands'.

FastEthernet0/1

Port Status ☒ On

Bandwidth ☐ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

Access  VLAN

Tx Ring Limit

Equivalent IOS Commands

```
Switch(config-if) #exit  
Switch(config) #interface FastEthernet0/3  
Switch(config-if) #  
Switch(config-if) #exit  
Switch(config) #interface FastEthernet0/1  
Switch(config-if) #
```

## Router 0 : VLAN DataBase:

Router0

PhysicalConfigCLI

GLOBAL

Settings

Algorithm Settin

ROUTING

Static

RIP

SWITCHING

VLAN Databas

INTERFACE

FastEthernet0/

FastEthernet0/

VLAN Configuration

VLAN Number

VLAN Name

Add

Remove

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

Equivalent IOS Commands

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
exit
Router(config)#int fa 0/0.1
Router(config-subif)#
%LINK-5-CHANGED: Interface FastEthernet0/0.1, changed state to up

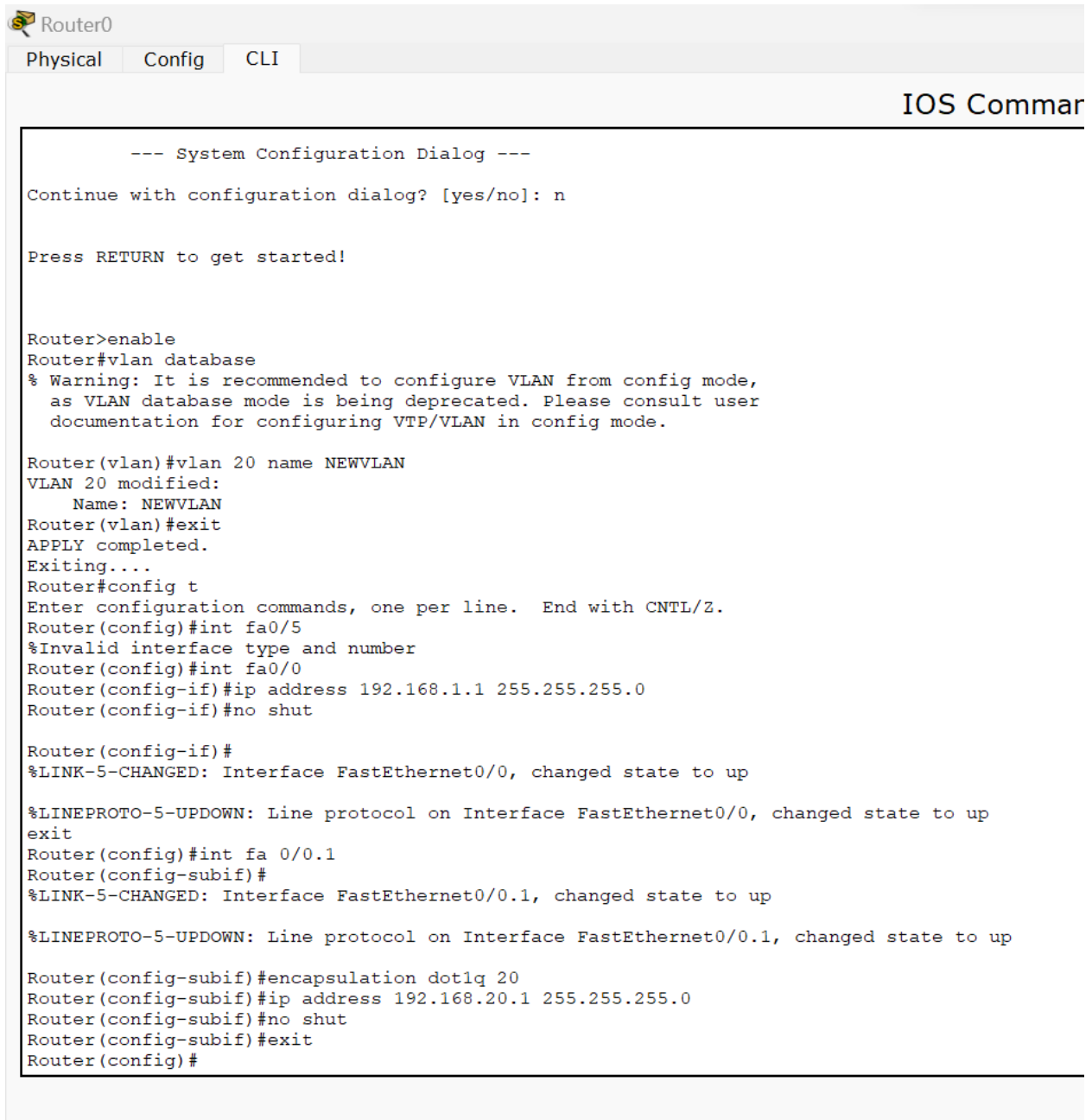
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.1, changed state to up

Router(config-subif)#encapsulation dot1q 20
Router(config-subif)#ip address 192.168.20.1 255.255.255.0
Router(config-subif)#no shut
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 0 :

### CLI:



The image shows a Cisco Packet Tracer interface for Router0. The top bar has tabs for Physical, Config, and CLI, with the CLI tab selected. The title bar says "Router0". On the right, there is a label "IOS Commar". The main area displays the CLI session. The session starts with a "System Configuration Dialog" where the user chooses 'n' to skip configuration. Then, the user enters 'enable' to get into privileged mode. Next, 'vlan database' is entered, which shows a warning about deprecation. The user creates a new VLAN named 'NEWVLAN'. After exiting VLAN mode, the user enters configuration mode ('config t') and configures interface 'fa0/0' with IP address '192.168.1.1' and subnet mask '255.255.255.0'. The interface is brought up. Then, a sub-interface 'fa 0/0.1' is created and configured with IP address '192.168.20.1' and subnet mask '255.255.255.0'. The sub-interface is also brought up. Finally, the sub-interface is configured with encapsulation 'dot1q 20'.

```
Router0
Physical Config CLI
IOS Commar

--- System Configuration Dialog ---
Continue with configuration dialog? [yes/no]: n

Press RETURN to get started!

Router>enable
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)#vlan 20 name NEWVLAN
VLAN 20 modified:
  Name: NEWVLAN
Router(vlan)#exit
APPLY completed.
Exiting....
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#int fa0/5
%Invalid interface type and number
Router(config)#int fa0/0
Router(config-if)#ip address 192.168.1.1 255.255.255.0
Router(config-if)#no shut

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
exit
Router(config)#int fa 0/0.1
Router(config-subif)#
%LINK-5-CHANGED: Interface FastEthernet0/0.1, changed state to up

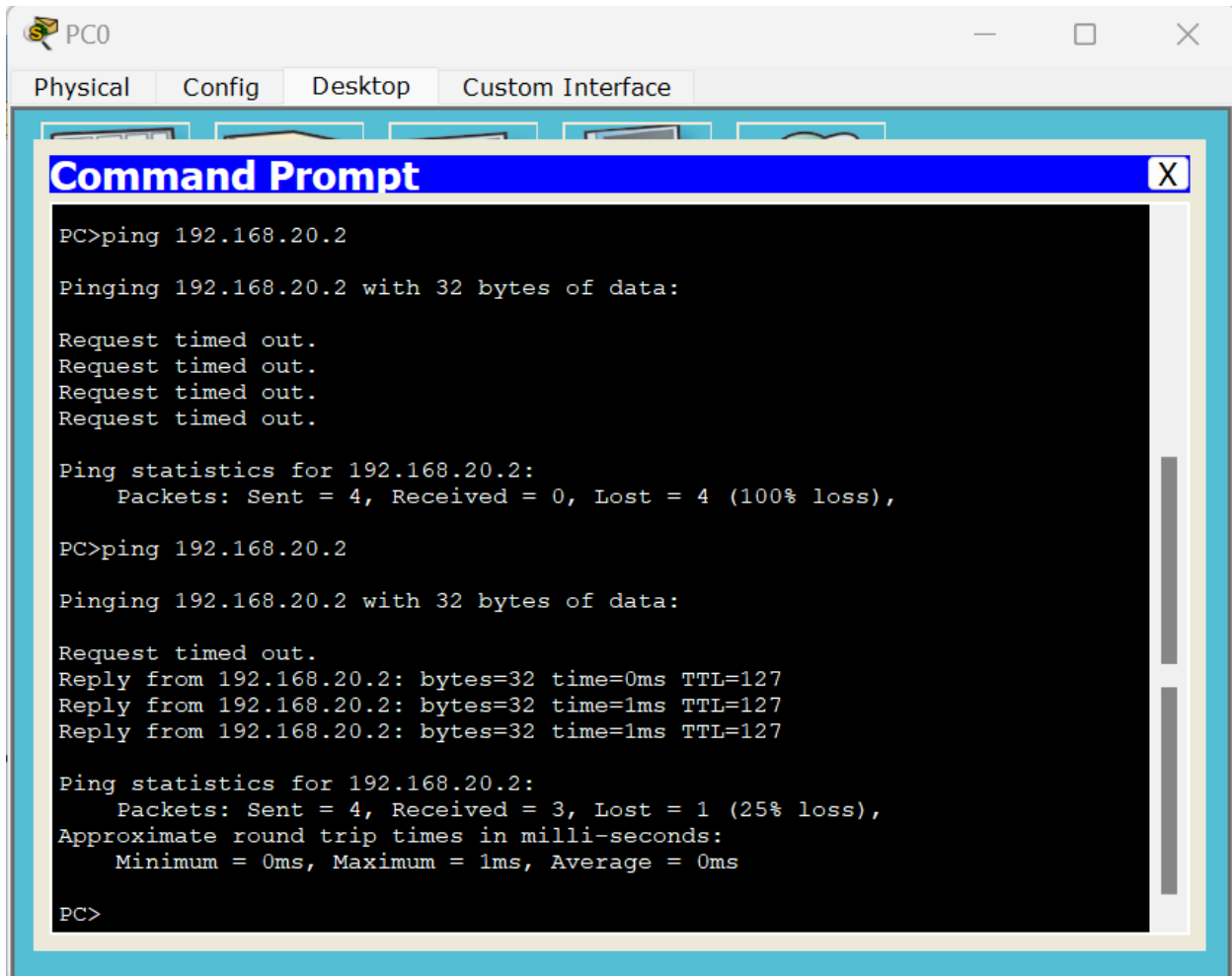
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.1, changed state to up

Router(config-subif)#encapsulation dot1q 20
Router(config-subif)#ip address 192.168.20.1 255.255.255.0
Router(config-subif)#no shut
Router(config-subif)#exit
Router(config)#
```

## Command Prompt:

P0:

Before and after VLAN configuration was successful.



The screenshot shows a window titled 'PC0' with tabs for 'Physical', 'Config', 'Desktop', and 'Custom Interface'. The 'Desktop' tab is active, displaying a 'Command Prompt' window. The Command Prompt shows two ping attempts to 192.168.20.2. The first attempt shows a 100% loss, while the second attempt shows a 25% loss.

```
PC>ping 192.168.20.2

Pinging 192.168.20.2 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 192.168.20.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

PC>ping 192.168.20.2

Pinging 192.168.20.2 with 32 bytes of data:

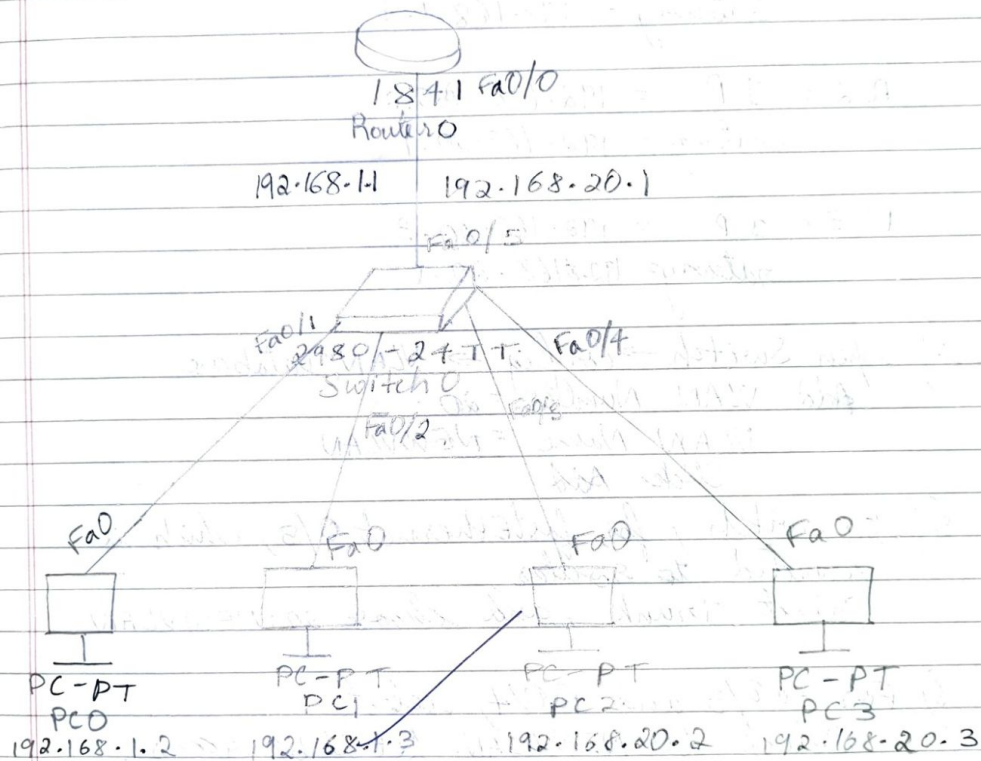
Request timed out.
Reply from 192.168.20.2: bytes=32 time=0ms TTL=127
Reply from 192.168.20.2: bytes=32 time=1ms TTL=127
Reply from 192.168.20.2: bytes=32 time=1ms TTL=127

Ping statistics for 192.168.20.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

PC>
```

## Lab 9

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

Topology:Procedure:

- 1) Create the topology as shown using 1841 Router and 2980 Switch. Connect 4 PCs to them as shown using copper straight through cable.
- 2) We use class C addressing here.



### 3) Set IP addresses and Gateways for PCs.

PC0: IP = 192.168.1.2  
Gateway = 192.168.1.1

PC1: IP = 192.168.1.3  
Gateway = 192.168.1.1

PC2: IP = 192.168.20.2  
Gateway = 192.168.20.1

PC3: IP = 192.168.20.3  
Gateway = 192.168.20.1

4) Open Switch → Config → VLAN Database  
Add VLAN Number = 20  
VLAN Name = NEWVLAN  
Click Add

5) In Switch, for fastEthernet 0/5, which is connected to router,  
Select Trunk, and choose 20:NEWVLAN

6) For Fa0/3 and Fa0/4, select  
Select 20:NEWVLAN. Let it be Access.  
For Fa0/1 and Fa0/2, leave it as it is.

7) Open Router → Config → VLAN Database  
Add VLAN Number: 20  
VLAN Name: NEWVLAN

8) In Router CLI:



```
Router>en
Router#(vlan)#exit
Router#config t
```

```
Router(config)#int fa0/0
Router(config)#ip address 192.168.1.1 255.255.255.0
Router(config-if)#no shut
Router(config-if)#exit
```

```
Router(config)#int fa 0/0.1
Router(config-subif)#encapsulation dot1q 20
Router(config-subif)#ip address 192.168.20.1 255.255.255.0
Router(config-subif)#no shut
Router(config-subif)#exit
Router(config)#exit
```

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Ping Output :-

```
PC > ping 192.168.20.2
```

Pinging 192.168.20.2 with 32 bytes of data :

Request timed out.

```
Reply from 192.168.20.2: bytes=32 time=0ms TTL=127
Reply from 192.168.20.2: bytes=32 time=1ms TTL=127
Reply from 192.168.20.2: bytes=32 time=1ms TTL=127
```

Ping statistics for 192.168.20.2 :

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

Observation :-

- We can observe that ~~before~~<sup>after</sup> VLAN is configured we can successfully ping PC2 (192.168.20.2) from PC0 (192.168.1.2).
- PC2 and PC3 are grouped together and communication among them is done via VLAN.
- 192.168.20.1 is a subinterface of the Router.