

## LAB PROGRAM - 9

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

**Procedure :**

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COMPASS  
Date: 3/2/23

### Experiment - 9

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

**Topology:**

**Procedure:**

**step 1:** Create a topology as shown above. Choose 1841 Router and 2960 - 24TT Switch. [ PC → Switch: Copper (cross over wire) ]

**step 2:** Set the IP address of the 4 PC's and the gateway respectively. We use class C type addresses.

**step 3:** In Switch, go to Config tab → VLAN database. provide VLAN no: 2 and name: NEWVLAN.

**step 4:** Select interface fastethernet 4/1 and make it trunk. [ Trunk allows switch to forward frames from different VLANs over a single link called trunk. ]

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step 5: select the second interface i.e 0/3 and 0/4.  
 select each of them and set the VLAN no as 2.

step 6: Router → Config tab → VLAN database → enter  
 the VLAN name and number just created (helps student  
 understand new VLAN)

step 7: Router1 → CLI

Router (vlan) # exit

Router # config t

interface fastEthernet 0/0.1

encapsulation dot1q 2 [networking standard that supports  
 VLAN's]

ip address 192.168.2.1 255.255.255.0

no shut

exit

exit

Finally, ping from PC to VLAN PC

Result:

PC > ping 192.168.20.3

pinging 192.168.20.3 with 32 bytes of data

Request timed out

Reply from 192.168.20.3 : bytes=32 time=0ms TTL=127

Reply from 192.168.20.3 : bytes=32 time=6ms TTL=127

Reply from 192.168.20.3 : bytes=32 time=0ms TTL=127

Ping statistics for 192.168.20.3:

packets: Sent = 4, Received = 3, Lost = 1 (25% loss),

Approximate round trip times in milliseconds:

Minimum = 0ms, Maximum = 6ms, Average = 1ms



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### observation:

VLAN - (virtual local area network) is a logical subnetwork of devices in a broadcast domain that is partitioned by network switches so as to act as its own LAN.

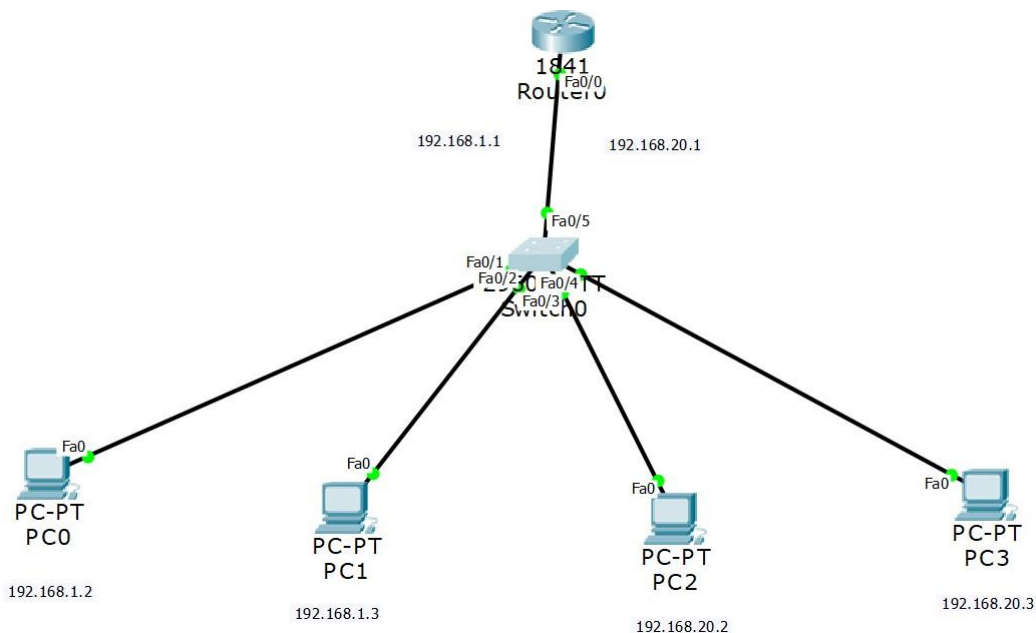
VLAN operate either at layer 2 <sup>(DLL)</sup> or layer 3 <sup>NL</sup>.

VLAN creates multiple standalone networks out of the same networking backbone. This is more secure, and it reduces the no of broadcasts individual devices receive.

VLAN's don't use IP addresses they deal with subnets or class C type addresses.

3/2/23

### Topology:



## Switch VLAN Database:

The screenshot displays the Cisco Packet Tracer environment with a focus on configuring Switch0. The top navigation bar includes tabs for Physical, Config, and CLI, with the Config tab currently selected.

**VLAN Configuration Interface:**

- Left Sidebar:** A tree view showing the hierarchy of the switch configuration: GLOBAL (Settings), SWITCH (Algorithm Settings, VLAN Databases), and INTERFACE (listing various Ethernet ports).
- Main Panel:** Titled "VLAN Configuration", it contains input fields for "VLAN Number" and "VLAN Name". Below these are "Add" and "Remove" buttons.
- VLAN List Table:** A table displaying existing VLAN configurations.
 

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

Switch0

Physical Config CLI

**INTERFACE**

astEthernet0/  
astEthernet0/  
astEthernet0/  
astEthernet0/  
astEthernet0/  
astEthernet0/  
astEthernet0/  
astEthernet0/  
astEthernet0/  
astEthernet0/  
astEthernet0/1  
astEthernet0/1

**FastEthernet0/5**

Port Status ☒ On

Bandwidth ☒ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

Trunk VLAN 1-1005

Tx Ring Limit 10

☒ 1:default  
☒ 20:NEWVLAN  
☒ 1002:fdi-defaul

**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 Database), and 'INTERFACE'. The 'VLAN Database' section is active, showing a table of VLANs. At the top, there are input fields for 'VLAN Number' and 'VLAN Name', and '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 input fields for 'Port Status', 'Bandwidth', 'Duplex', 'Access', 'VLAN', and 'Tx Ring Limit'. Below the table, there is a section for 'Equivalent IOS Commands'.

Port Status	Bandwidth	Duplex	Access	VLAN	Tx Ring Limit
<input checked="" type="checkbox"/> On	<input type="radio"/> 100 Mbps <input type="radio"/> 10 Mbps <input checked="" type="radio"/> Auto	<input type="radio"/> Half Duplex <input checked="" type="radio"/> Full Duplex <input checked="" type="radio"/> Auto	Access	1	10

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 R0 : VLAN DataBase:

Router0

Physical Config CLI

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

FastEthernet0/0

FastEthernet0/1

VLAN Configuration

VLAN Number

VLAN Name

AddRemove

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 R0 :

### CLI:

```
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

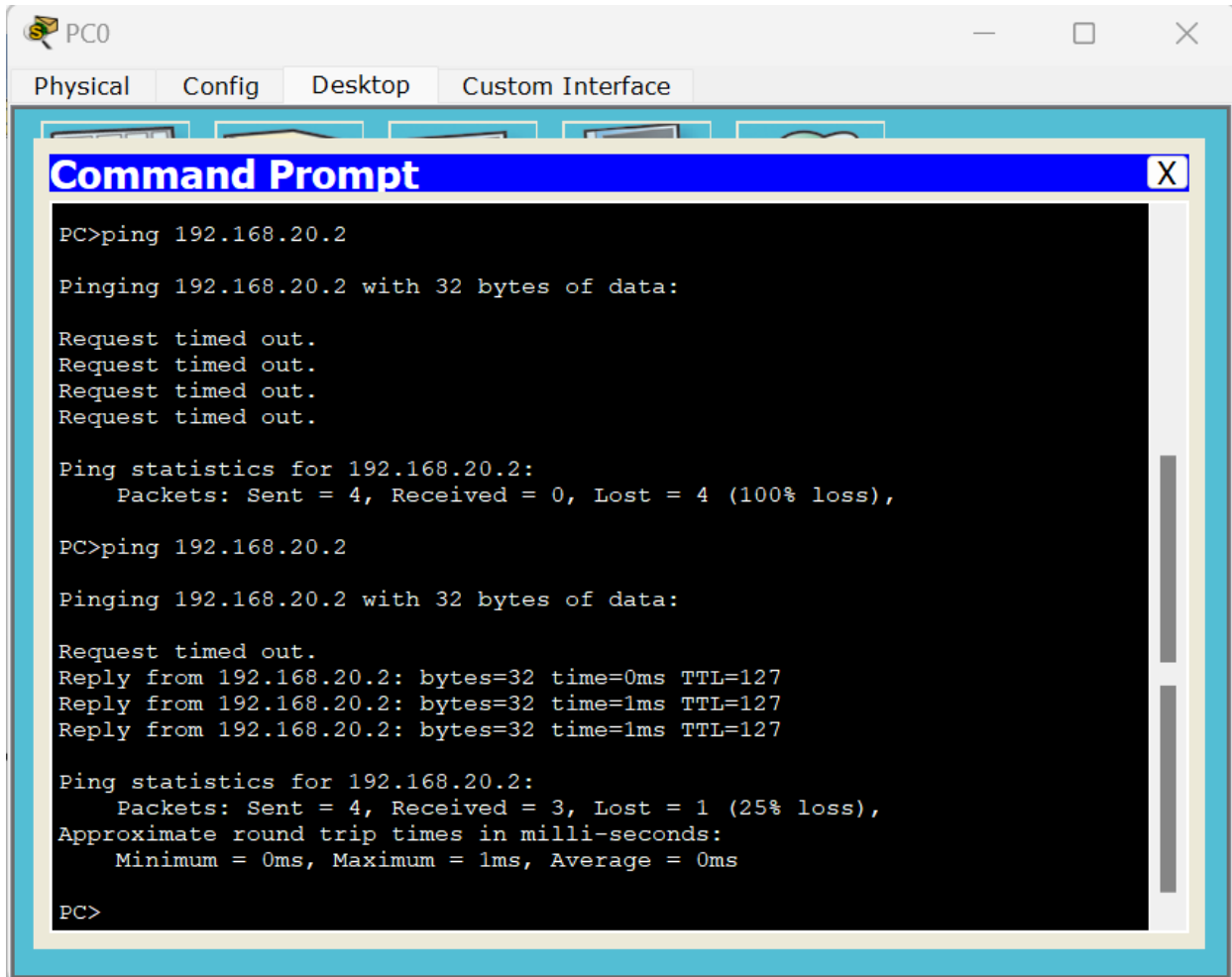
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
exit
Router(config)#int fa 0/0.1
Router(config-subif)#
%LINK-5-CHANGED: Interface FastEthernet0/0.1, changed state to up

%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)#
```

## Ping Result :

P0: [Before and after VLAN configuration was successful.]



The screenshot shows a Packet Tracer PC0 desktop environment. The 'Config' tab is selected. A 'Command Prompt' window is open, displaying the results of two ping commands to the IP address 192.168.20.2. The first command shows a 100% loss of packets, while the second command shows a 25% loss of packets after a successful VLAN configuration.

```
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>
```