

PRACTICAL-2

AIM:

An organization works on IT projects. It has mainly 3 departments i.e. php, .net and android. CEO of that organization wants to configure a single network but virtually divided into 3 department in such a way that the packets can travel or broadcasted within the same department only. Demonstrate the configuration of such network in cisco packet tracer.

THEORY:

Switch

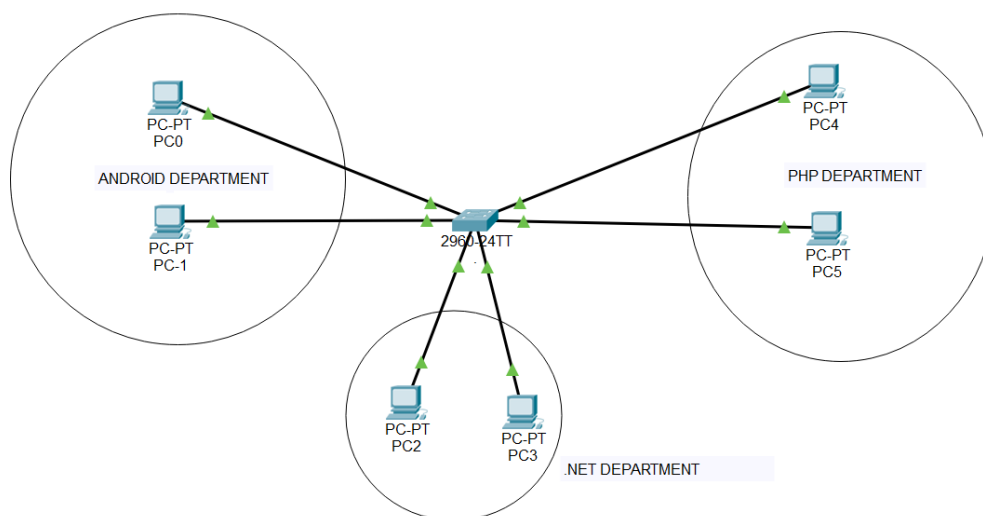
- Switches are networking devices operating at layer 2 or a data link layer of the OSI model.
- They connect devices in a network and use packet switching to send, receive or forward data packets or data frames over the network.
- A switch has many ports, to which computers are plugged in.
- When a data frame arrives at any port of a network switch, it examines the destination address, performs necessary checks and sends the frame to the corresponding device
- It supports unicast, multicast as well as broadcast communications.
- Switches are active devices, equipped with network software and network management capabilities
- Switches can perform some error checking before forwarding data to the destined port.

VLAN

- **VLAN** is a custom network which is created from one or more local area networks.
- It enables a group of devices available in multiple networks to be combined into one logical network.
- The result becomes a virtual LAN that is administered like a physical LAN. The full form of VLAN is defined as Virtual Local Area Network.
- VLAN in networking is a virtual extension of LAN

PRACTICAL IMPLEMENTATION:

- In this practical, we will use switch as we have to divide only one network and there is no need of other network.
- Then, we will take some PCs which will act as different hosts for different departments.



- Now, Assign IP Address to each and every PC.
- To assign IP Address, DESKTOP >> IP CONFIGURATION

The screenshot shows a network configuration window with tabs: Physical, Config, Desktop (selected), Programming, and Attributes. The 'IP Configuration' tab is active, showing settings for the 'FastEthernet0' interface. The 'IP Configuration' section has two radio buttons: 'DHCP' (unselected) and 'Static' (selected). Below these are text fields for 'IP Address' (30.30.30.2), 'Subnet Mask' (255.0.0.0), 'Default Gateway' (0.0.0.0), and 'DNS Server' (0.0.0.0). The 'IPv6 Configuration' section has three radio buttons: 'DHCP' (unselected), 'Auto Config' (unselected), and 'Static' (selected). Below these are text fields for 'IPv6 Address' (empty), 'Link Local Address' (FE80::20D:BDFF:FEBA:4974), 'IPv6 Gateway' (empty), and 'IPv6 DNS Server' (empty). The '802.1X' section has a checkbox 'Use 802.1X Security' (unchecked), a dropdown 'Authentication' (MD5), and text fields for 'Username' and 'Password' (both empty). A 'Top' button is at the bottom left.

Physical Config **Desktop** Programming Attributes

IP Configuration X

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IP Address 30.30.30.2

Subnet Mask 255.0.0.0

Default Gateway 0.0.0.0

DNS Server 0.0.0.0

IPv6 Configuration

☐ DHCP ☐ Auto Config ☒ Static

IPv6 Address /

Link Local Address FE80::20D:BDFF:FEBA:4974

IPv6 Gateway

IPv6 DNS Server

802.1X

☐ Use 802.1X Security

Authentication MD5

Username

Password

☐ Top

- Repeat same steps for all the PCs.
- Give different IP address to PCs in different network
- To know the details regarding the VLAN, open the CLI in switch and type “show vlan”.

```
Switch>show vlan
```

VLAN	Name	Status	Ports
1	default	active	Fa0/1, Fa0/2, Fa0/3, Fa0/4 Fa0/5, Fa0/6, Fa0/7, Fa0/8 Fa0/9, Fa0/10, Fa0/11, Fa0/12 Fa0/13, Fa0/14, Fa0/15, Fa0/16 Fa0/17, Fa0/18, Fa0/19, Fa0/20 Fa0/21, Fa0/22, Fa0/23, Fa0/24 Gig0/1, Gig0/2
1002	fddi-default	active	
1003	token-ring-default	active	
1004	fddinet-default	active	
1005	trnet-default	active	

VLAN	Type	SAID	MTU	Parent	RingNo	BridgeNo	Stp	BrdgMode	Trans1	Trans2
1	enet	100001	1500	-	-	-	-	-	0	0
1002	fddi	101002	1500	-	-	-	-	-	0	0
1003	tr	101003	1500	-	-	-	-	-	0	0
1004	fdnet	101004	1500	-	-	-	ieee	-	0	0
1005	trnet	101005	1500	-	-	-	ibm	-	0	0

--More-- |

- By default all the ports are in one vlan.
- To create three vlans, first, go to privilege mode by typing “enable”.
- Enter in configuration mode.
- Write vlan and its ID.
- To give it a name type “ name vlan_name”
- Type “exit”

```
Switchn(config) #
Switch(config) #
Switch(config) #
Switch(config) #vlan 2
Switch(config-vlan) #name ANDROID
Switch(config-vlan) #exit
Switch(config) #
```

- Perform the same steps for another two vlans

VLAN	Name	Status	Ports
1	default	active	Fa0/1, Fa0/2, Fa0/3, Fa0/4 Fa0/5, Fa0/6, Fa0/7, Fa0/8 Fa0/9, Fa0/10, Fa0/11, Fa0/12 Fa0/13, Fa0/14, Fa0/15, Fa0/16 Fa0/17, Fa0/18, Fa0/19, Fa0/20 Fa0/21, Fa0/22, Fa0/23, Fa0/24 Gig0/1, Gig0/2
2	ANDROID	active	
3	PHP	active	
4	.NET	active	
1002	fddi-default	active	

- We will assign the ports to each newly created vlan
- Again go to configuration mode
- Then, go to interface fastEthernet0/1
- Type, switchport access vlan 2
- Exit from the interface
- Repeat same steps for other 2 vlans

```

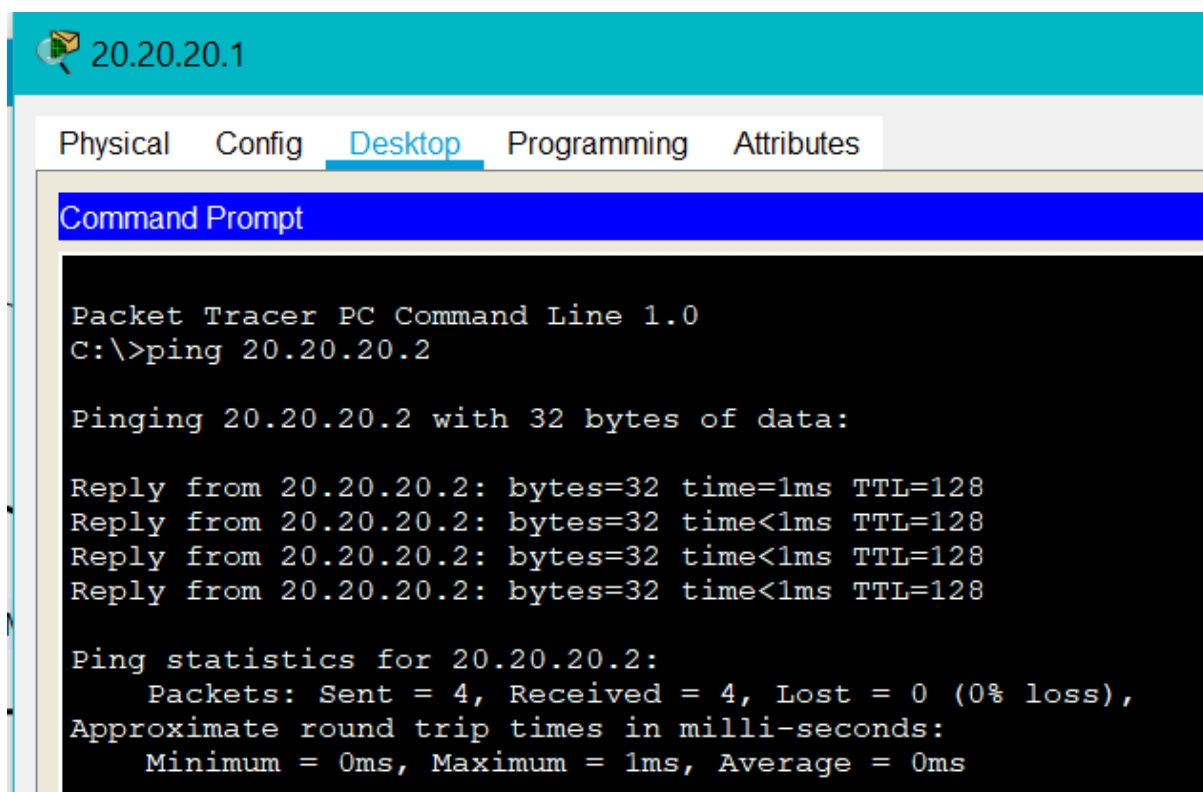
Switch>enable
Switch#conf t
Enter configuration commands, one per line.  End with C
Switch(config)#interface fastEthernet0/1
Switch(config-if)#switchport access
% Incomplete command.
Switch(config-if)#switchport access vlan 2
Switch(config-if)#exit
Switch(config)#interface fastEthernet0/2
Switch(config-if)#switch access vlan 2
Switch(config-if)#exit
Switch(config)#interface fastEthernet0/3
Switch(config-if)#switch access vlan 3
Switch(config-if)#exit
Switch(config)#interface fastEthernet0/4
Switch(config-if)#switch access vlan 3
Switch(config-if)#exit
Switch(config)#interface fastEthernet0/5
Switch(config-if)#switch access vlan 4
Switch(config-if)#exit
Switch(config)#interface fastEthernet0/6
Switch(config-if)#switch access vlan 4
Switch(config-if)#exit

```

VLAN	Name	Status	Ports
1	default	active	Fa0/7, Fa0/8, Fa0/9, Fa0/10 Fa0/11, Fa0/12, Fa0/13, Fa0/14 Fa0/15, Fa0/16, Fa0/17, Fa0/18 Fa0/19, Fa0/20, Fa0/21, Fa0/22 Fa0/23, Fa0/24, Gig0/1, Gig0/2
2	ANDROID	active	Fa0/1, Fa0/2
3	PHP	active	Fa0/3, Fa0/4
4	.NET	active	Fa0/5, Fa0/6

CHECKING THE VLAN:

1. Ping Test:



```

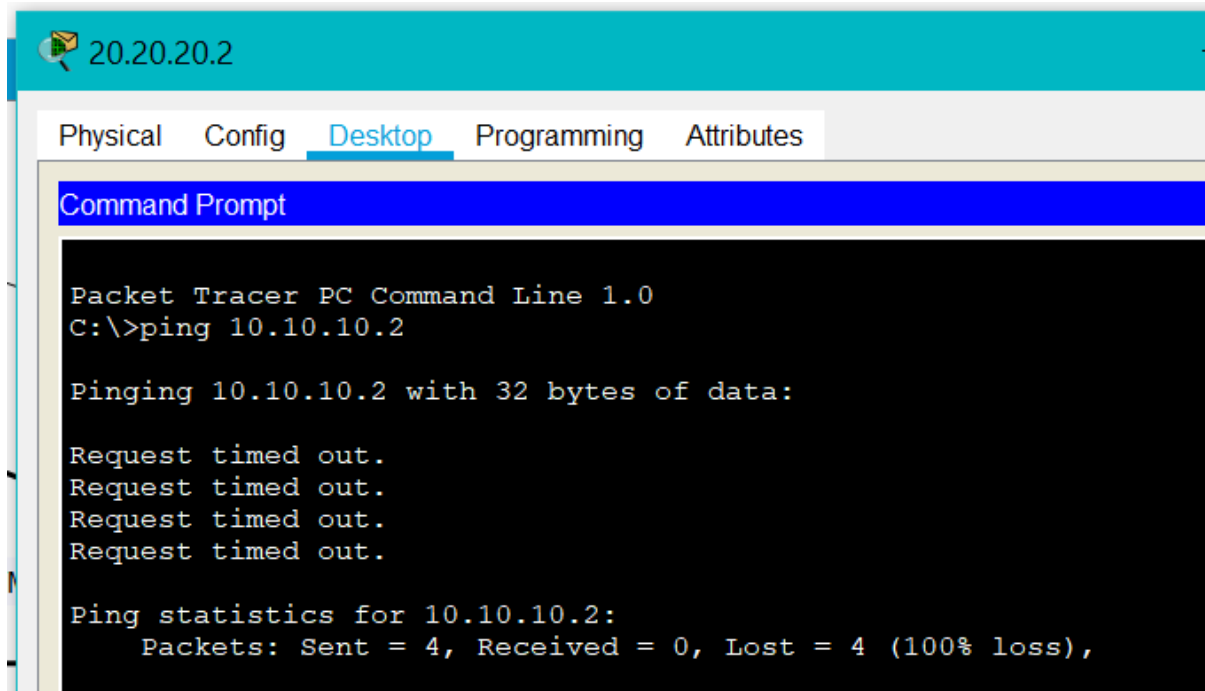
20.20.20.1
Physical  Config  Desktop  Programming  Attributes
Command Prompt

Packet Tracer PC Command Line 1.0
C:\>ping 20.20.20.2

Pinging 20.20.20.2 with 32 bytes of data:

Reply from 20.20.20.2: bytes=32 time=1ms TTL=128
Reply from 20.20.20.2: bytes=32 time<1ms TTL=128
Reply from 20.20.20.2: bytes=32 time<1ms TTL=128
Reply from 20.20.20.2: bytes=32 time<1ms TTL=128

Ping statistics for 20.20.20.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms
  
```



The screenshot shows a Packet Tracer PC configuration window for a device with IP 20.20.20.2. The 'Desktop' tab is selected, displaying a 'Command Prompt' window. The command prompt shows the execution of a ping command to 10.10.10.2, which results in four 'Request timed out' messages and a 100% loss of packets.

```
Packet Tracer PC Command Line 1.0
C:\>ping 10.10.10.2

Pinging 10.10.10.2 with 32 bytes of data:

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

Ping statistics for 10.10.10.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

We cannot communicate to devices outside the network.

CONCLUSION:

- By performing the practical, we learnt about vlan and how to configure it.