MAHARISHI DAYANAND UNIVERSITY

Practical File

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Subject Name: Computer Networks Lab

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Experiment 1

Aim: Study of different types of Network cables and practically implement the cross-wired cable and straight through cable using clamping tool.

Apparatus Required: RJ-45 connector, Climping Tool, Twisted pair Cable

Theory:

Step 1: Start by stripping off about 2 inches of the plastic jacket off the end of the cable. Be very careful at this point, as to not nick or cut into the wires, which are inside. Doing so could alter the characteristics of your cable, or even worse render is useless. Check the wires, one more time for nicks or cuts. If there are any, just whack the whole end off, and start over.

Step 2: Spread the wires apart but be sure to hold onto the base of the jacket with your other hand. You do not want the wires to become untwisted down inside the jacket. Category 5 cable must only have 1/2 of an inch of 'untwisted' wire at the end; otherwise, it will be 'out of spec'. At this point, you obviously have ALOT more than 1/2 of an inch of un-twisted wire.

Step 3: You have 2 end jacks, which must be installed on your cable. If you are using a pre-made cable, with one of the ends whacked off, you only have one end to install - the crossed over end. Below are two diagrams, which show how you need to arrange the cables for each type of cable end. Decide at this point which end you are making and examine the associated picture below.

Diagram shows you how to prepare Cross wired connection.

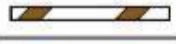
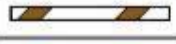
RJ45 Pin # (END 1)	Wire Color	Diagram End #1	RJ45 Pin # (END 2)	Wire Color	Diagram End #2
1	White/Orange		1	White/Green	
2	Orange		2	Green	
3	White/Green		3	White/Orange	
4	Blue		4	White/Brown	
5	White/Blue		5	Brown	
6	Green		6	Orange	
7	White/Brown		7	Blue	
8	Brown		8	White/Blue	

Diagram shows you how to prepare straight through wired connection.

RJ45 Pin # (END 1)	Wire Color	Diagram End #1	RJ45 Pin # (END 2)	Wire Color	Diagram End #2
1	White/Orange		1	White/Green	
2	Orange		2	Green	
3	White/Green		3	White/Orange	
4	Blue		4	White/Brown	
5	White/Blue		5	Brown	
6	Green		6	Orange	
7	White/Brown		7	Blue	
8	Brown		8	White/Blue	

Experiment 2

Aim: Study of following Network Devices in Detail

- Repeater
- Hub
- Switch
- Bridge
- Router
- Gate Way

Apparatus Required: No software or hardware needed.

Theory:

1. **Repeater:** Functioning at Physical Layer. A **repeater** is an electronic device that receives a signal and retransmits it at a higher level and/or higher power, or onto the other side of an obstruction, so that the signal can cover longer distances. Repeater have two ports ,so cannot be use to connect for more than two devices.

2. **Hub:** An **Ethernet hub**, **active hub**, **network hub**, **repeater hub**, **hub** or **concentrator** is a device for connecting multiple twisted pair or fiber optic Ethernet devices together and making them act as a single network segment. Hubs work at the physical layer (layer 1) of the OSI model. The device is a form of multiport repeater. Repeater hubs also participate in collision detection, forwarding a jam signal to all ports if it detects a collision.

3. **Switch:** A **network switch** or **switching hub** is a computer networking device that connects network segments. The term commonly refers to a network bridge that processes and routes data at the data link layer (layer 2) of the OSI model. Switches that additionally process data at the network layer (layer 3 and above) are often referred to as Layer 3 switches or multilayer switches.

4. **Bridge:** A **network bridge** connects multiple network segments at the data link layer (Layer 2) of the OSI model. In Ethernet networks, the term *bridge* formally means a device that behaves according to the IEEE 802.1D standard. A bridge and switch are very much alike; a switch being a bridge with numerous ports. *Switch* or *Layer 2 switch* is often used interchangeably with *bridge*. Bridges can analyze incoming data packets to determine if the bridge is able to send the given packet to another segment of the network.

5. **Router:** A **router** is an electronic device that interconnects two or more computer networks, and selectively interchanges packets of data between them. Each data packet contains address information that a router can use to determine if the source and destination are on the same network, or if the data packet must be transferred from one network to another. Where multiple routers are used in a large collection of interconnected networks, the routers exchange information about target system addresses, so that each router can build up a table showing the preferred paths between any two systems on the interconnected networks.

6. **Gate Way:** In a communications network, a network node equipped for interfacing with another network that uses different protocols.
   - A gateway may contain devices such as protocol translators, impedance matching devices, rate converters, fault isolators, or signal translators as necessary to provide system interoperability. It also requires the establishment of mutually acceptable administrative procedures between both networks.
   - A protocol translation/mapping gateway interconnects networks with different network protocol technologies by performing the required protocol conversions.

Experiment 3

Aim: Study of following Network IP

- Classification of IP address
- Sub netting
- Super netting

Apparatus Required: No software or hardware needed.

Theory:

Classification of IP Address

As show in figure we teach how the ip addresses are classified and when they are used.

Class	Address Range	Supports
Class A	1.0.0.1 to 126.255.255.254	Supports 16 million hosts on each of 127 networks.
Class B	128.1.0.1 to 191.255.255.254	Supports 65,000 hosts on each of 16,000 networks.
Class C	192.0.1.1 to 223.255.254.254	Supports 254 hosts on each of 2 million networks.
Class D	224.0.0.0 to 239.255.255.255	Reserved for multicast groups.
Class E	240.0.0.0 to 254.255.255.254	Reserved.

Sub netting

Why we Develop sub netting and how to calculate subnet mask and how to identify subnet address.

Super netting

Why we develop super netting and how to calculate supernet mask and how to identify supernet address.

Experiment 4

Aim: Connect the computers in Local Area Network.

Theory:

On the host computer, follow these steps to share the Internet connection:

1. Log on to the host computer as Administrator or as Owner.
2. Click **Start**, and then click **Control Panel**.
3. Click Network and Internet Connections.
4. Click **Network Connections**.
5. Right-click the connection that you use to connect to the Internet. For example, if you connect to the Internet by using a modem, right-click the connection that you want under Dial-up / another network available.
6. Click **Properties**.
7. Click the **Advanced** tab.
8. Under **Internet Connection Sharing**, select the **Allow other network users to connect through this computer's Internet connection** check box.
9. If you are sharing a dial-up Internet connection, select the **Establish a dial-up connection whenever a computer on my network attempts to access the Internet** check box if you want to permit your computer to automatically connect to the Internet.
10. Click **OK**. You receive the following message:

When Internet Connection Sharing is enabled, your LAN adapter will be set to use IP address 192.168.0.1. Your computer may lose connectivity with other computers on your network. If these other computers have static IP addresses, it is a good idea to set them to obtain their IP addresses automatically. Are you sure you want to enable Internet Connection Sharing?

11. Click **Yes**.

The connection to the Internet is shared to other computers on the local area network (LAN).

The network adapter that is connected to the LAN is configured

with a static IP address of 192.168.0.1 and a subnet mask of 255.255.255.0

On the client computer

To connect to the Internet by using the shared connection, you must confirm the LAN adapter IP configuration, and then configure the client computer. To confirm the LAN adapter IP configuration, follow these steps:

1. Log on to the client computer as Administrator or as Owner.
2. Click **Start**, and then click **Control Panel**.
3. Click **Network and Internet Connections**.
4. Click **Network Connections**.
5. Right-click **Local Area Connection** and then click **Properties**.
6. Click the **General** tab, click **Internet Protocol (TCP/IP)** in the **connection uses the following items** list, and then click **Properties**.
7. In the **Internet Protocol (TCP/IP) Properties** dialog box, click **Obtain an IP address automatically** (if it is not already selected), and then click **OK**.

Note: You can also assign a unique static IP address in the range of 192.168.0.2 to 192.168.0.254. For example, you can assign the following static IP address, subnet mask, and default gateway:

8. IP Address 192.168.31.202
9. Subnet mask 255.255.255.0
10. Default gateway 192.168.31.1

11. In the **Local Area Connection Properties** dialog box, click **OK**.
12. Quit Control Panel.

Experiment 5

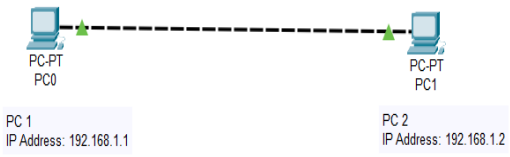
Aim: Interconnection between two PC using Cisco Packet Tracer.

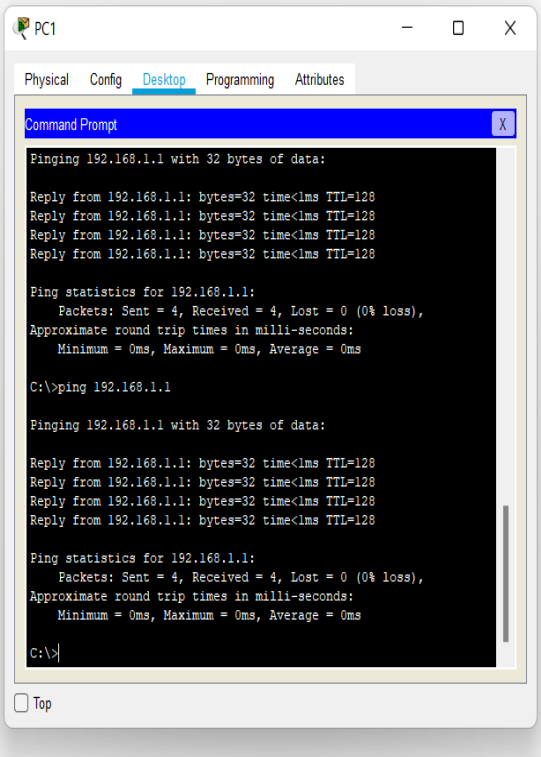
Theory:

Step 1: Connect PC1 and PC2 using copper cross-over wire.
Step 3: Put random IP address to PC1 and PC2.
Step 4: Then ping PC1 from PC2 using ping command

C:\>ping 192.168.1.1

Result:





Experiment 6

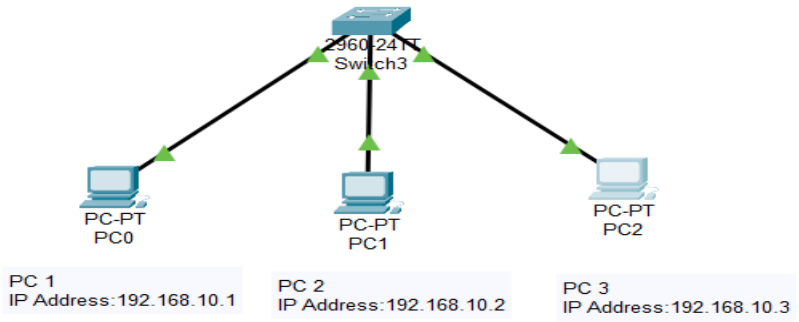
Aim: LAN simulation using Cisco Packet Tracer.

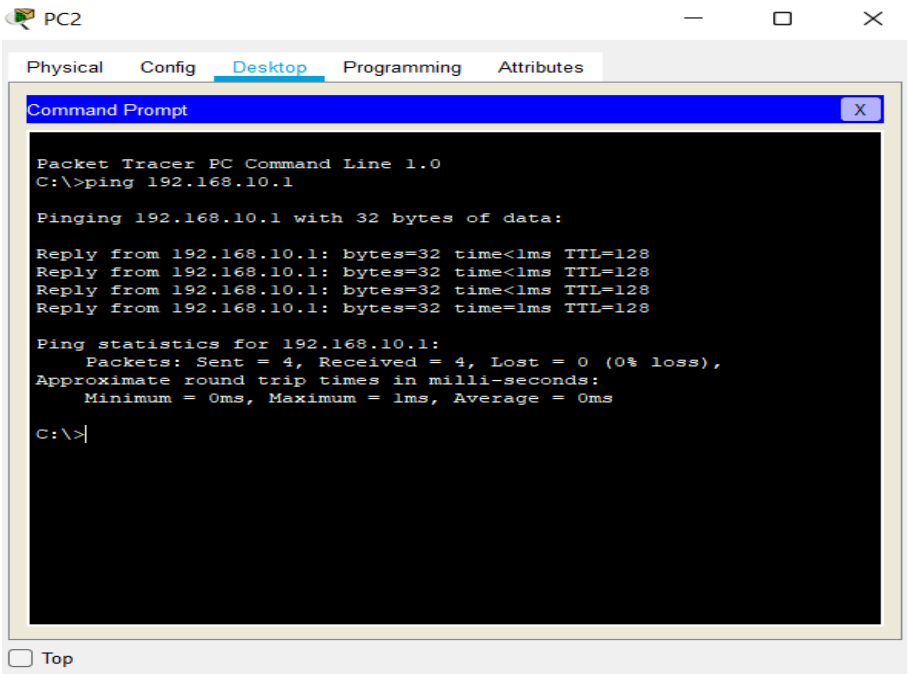
Theory:

Step 1: Connect PC1, PC2, PC3 and switch using copper straight wire.
Step 2: Put random IP address to PC1, PC2, PC3.
Step 3: Then ping PC1 using ping command

C:\>ping 192.168.10.1

Result:





Experiment 7

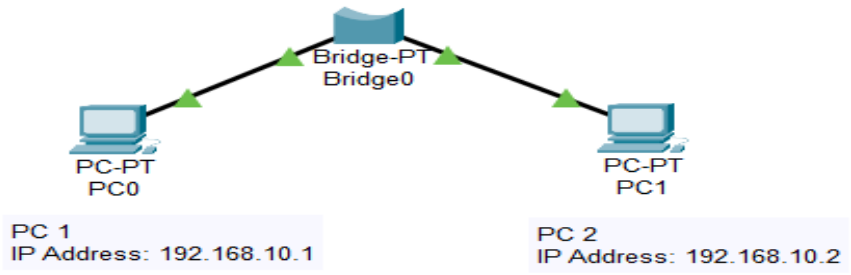
Aim: LAN simulation using bridge using Cisco Packet Tracer.

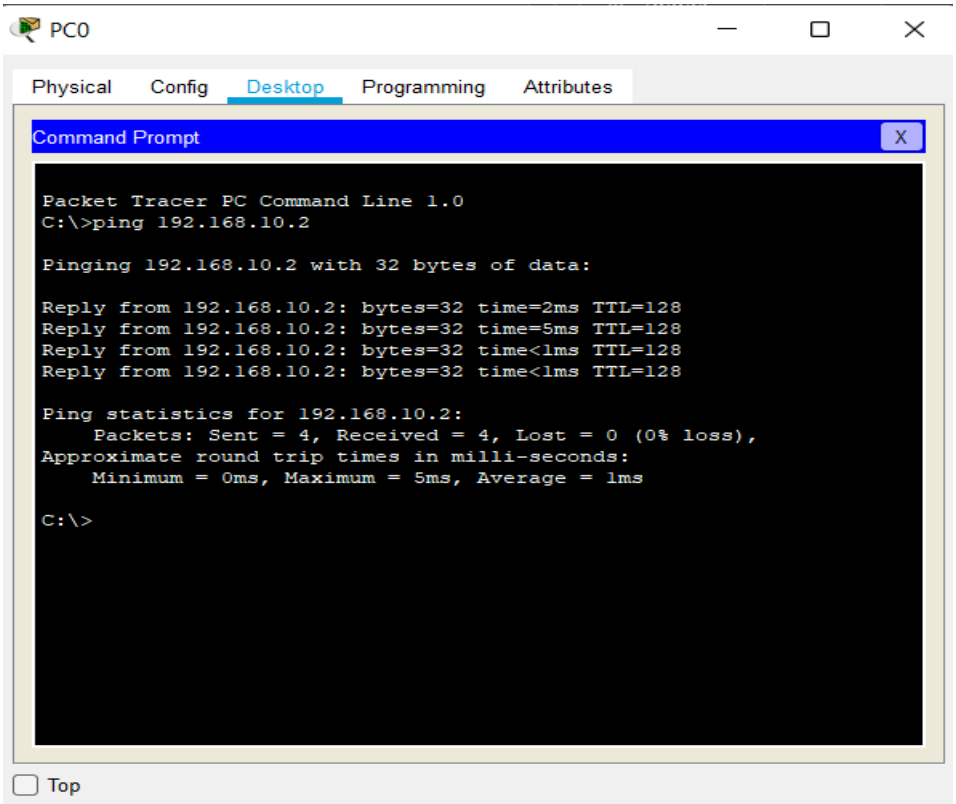
Theory:

Step 1: Connect PC1, PC2, and bridge using copper straight wire.
Step 2: Put random IP address to PC1 and PC2.
Step 3: Then ping PC2 using ping command

C:\>ping 192.168.10.2

Result:





Experiment 8

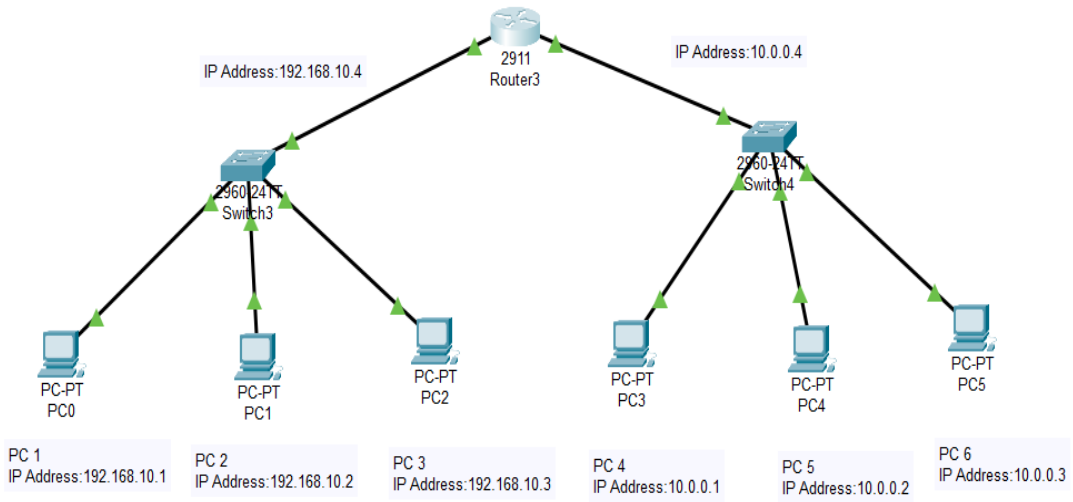
Aim: Intercommunication between two LAN using router.

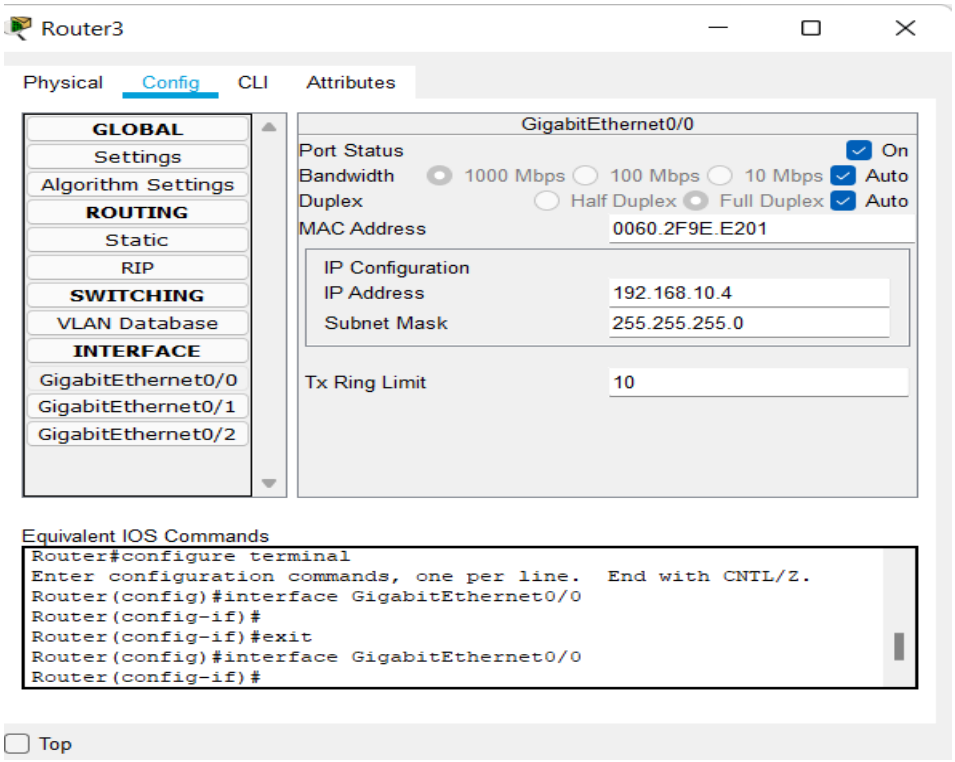
Theory:

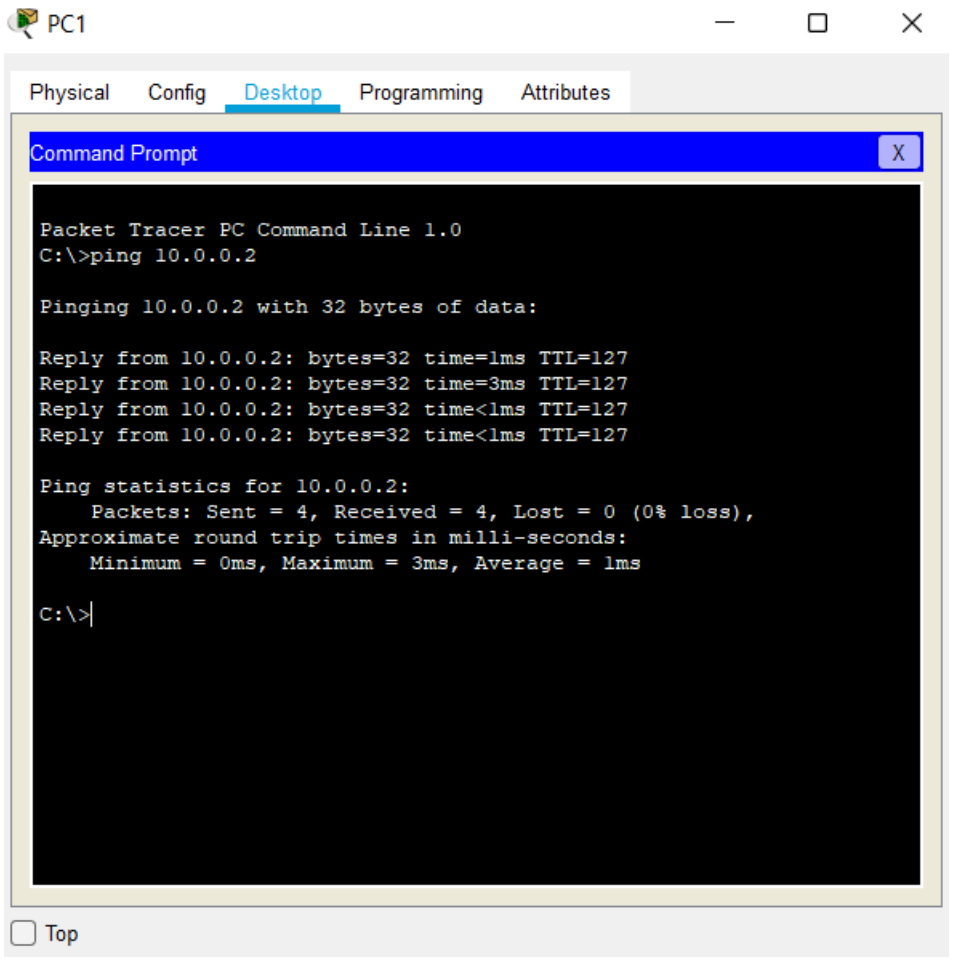
Step 1: Connect PC1, PC2, PC3 and switch1 using copper straight wire and PC4, PC5, PC6 and switch 2 using copper straight wire.
Step 2: Connect switch1, switch2 and router using copper straight wire.
Step 3: Put random IP address to PC1, PC2, PC3. And Put another random IP address to PC4, PC5, PC6.
Step 4: Set default gateway as 192.168.10.4 for PC1, PC2 and PC3. Set default gateway as 10.0.0.4 for PC4, PC5, PC6.
Step 5: Add IP address to router also.
Step 6: Then ping PC5 using ping command

```
C:\>ping 10.0.0.2
```

Result:




Router3
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
GigabitEthernet0/0
GigabitEthernet0/1
GigabitEthernet0/2
GigabitEthernet0/0
Port Status
On
Bandwidth
1000 Mbps
100 Mbps
10 Mbps
Auto
Duplex
Half Duplex
Full Duplex
Auto
MAC Address
0060.2F9E.E201
IP Configuration
IP Address
192.168.10.4
Subnet Mask
255.255.255.0
Tx Ring Limit
10
Equivalent IOS Commands
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface GigabitEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface GigabitEthernet0/0
Router(config-if)#
Top


PC1
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
Packet Tracer PC Command Line 1.0
C:\>ping 10.0.0.2
Pinging 10.0.0.2 with 32 bytes of data:
Reply from 10.0.0.2: bytes=32 time=1ms TTL=127
Reply from 10.0.0.2: bytes=32 time=3ms TTL=127
Reply from 10.0.0.2: bytes=32 time<1ms TTL=127
Reply from 10.0.0.2: bytes=32 time<1ms TTL=127
Ping statistics for 10.0.0.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 3ms, Average = 1ms
C:\>
Top

Experiment 9

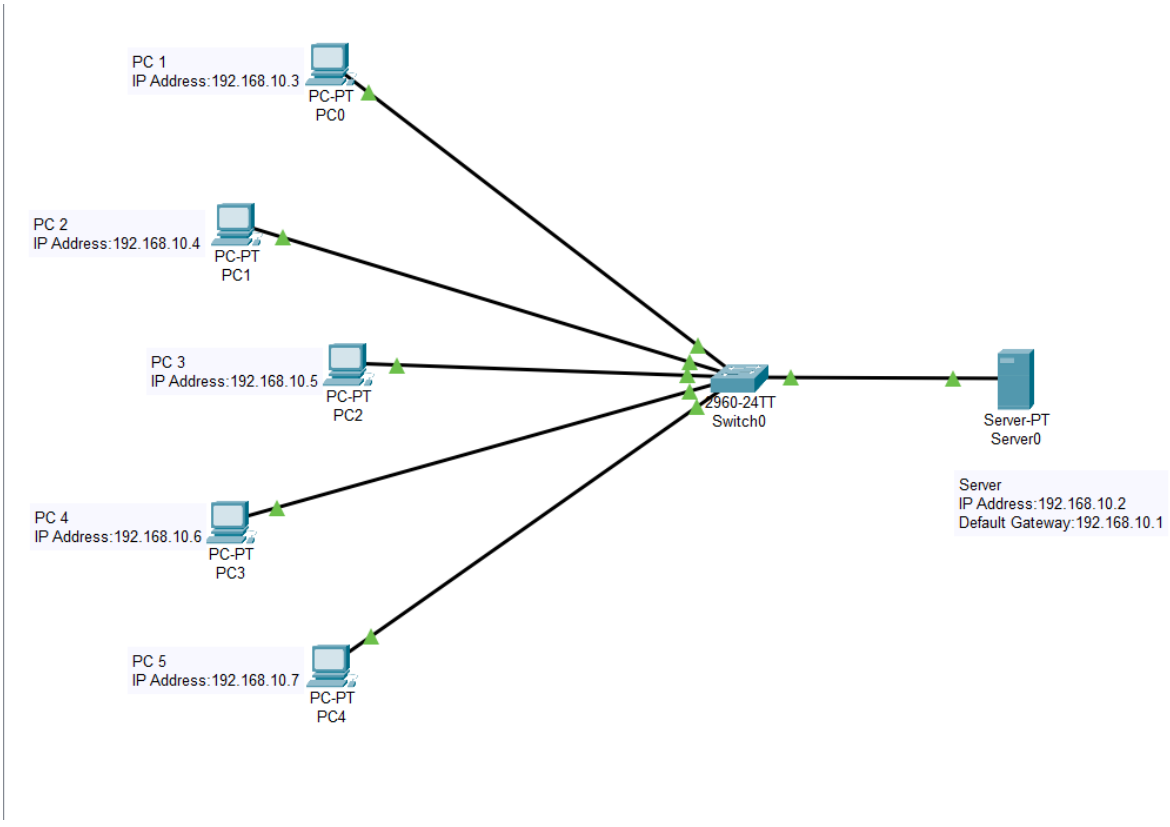
Aim: Implementing DHCP protocol using Cisco Packet Tracer.

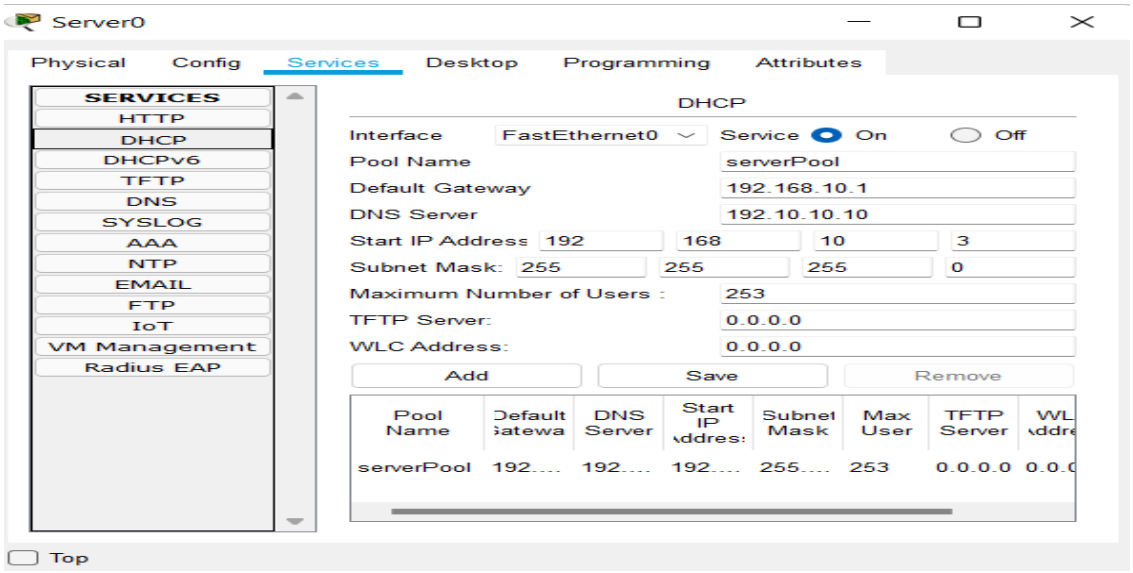
Theory:

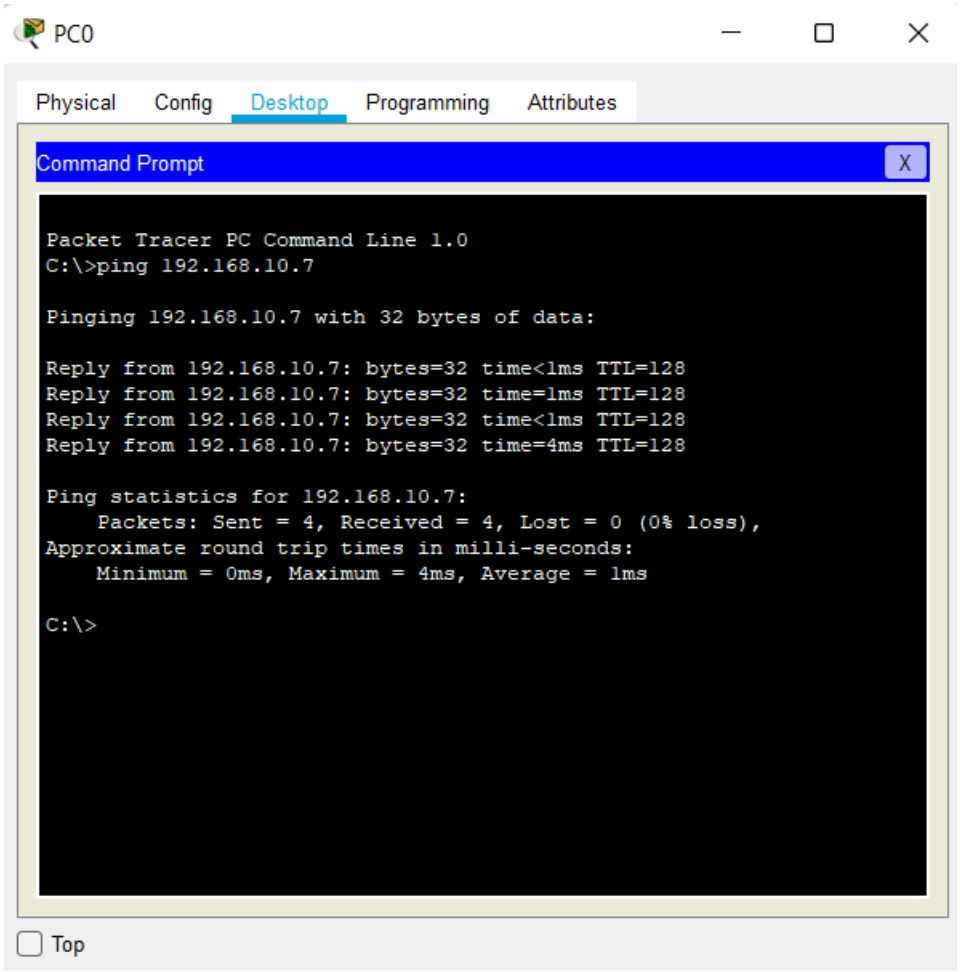
Step 1: Connect PC1, PC2, PC3, PC4, PC5, switch and server using copper straight wire.
Step 2: Set IP Address as 192.168.10.2 and Default Gateway as 192.168.10.1 of server.
Step 3: Then go to services and select DHCP and enter default gateway then set start address as 192.168.10.3.
Step 4: Then go to PCs and select DHCP option.
Step 5: Then ping PC5 from PC1 using ping command

```
C:\>ping 192.168.10.7
```

Result:




Server0
Physical
Config
Services
Desktop
Programming
Attributes
SERVICES
HTTP
DHCP
DHCPv6
TFTP
DNS
SYSLOG
AAA
NTP
EMAIL
FTP
IoT
VM Management
Radius EAP
DHCP
Interface
FastEthernet0
Service
On
Off
Pool Name
serverPool
Default Gateway
192.168.10.1
DNS Server
192.10.10.10
Start IP Address
192
168
10
3
Subnet Mask:
255
255
255
0
Maximum Number of Users :
253
TFTP Server:
0.0.0.0
WLC Address:
0.0.0.0
Add
Save
Remove
Pool Name
Default Gatewa
DNS Server
Start IP Address:
Subnet Mask
Max User
TFTP Server
WL
serverPool
192....
192....
192....
255....
253
0.0.0.0
Top


PC0
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
Packet Tracer PC Command Line 1.0
C:\>ping 192.168.10.7
Pinging 192.168.10.7 with 32 bytes of data:
Reply from 192.168.10.7: bytes=32 time<1ms TTL=128
Reply from 192.168.10.7: bytes=32 time=1ms TTL=128
Reply from 192.168.10.7: bytes=32 time<1ms TTL=128
Reply from 192.168.10.7: bytes=32 time=4ms TTL=128
Ping statistics for 192.168.10.7:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 4ms, Average = 1ms
C:\>
Top

Experiment 10

Aim: Implementing ARP protocol using Cisco Packet Tracer.

Theory:

Step 1: Connect PC1, PC2, PC3, PC4 and switch using copper straight-through wire.
Step 2: Put random IP address to PC1, PC2, PC3 and PC4.
Step 3: Then ping PC2 and PC4 using ping command

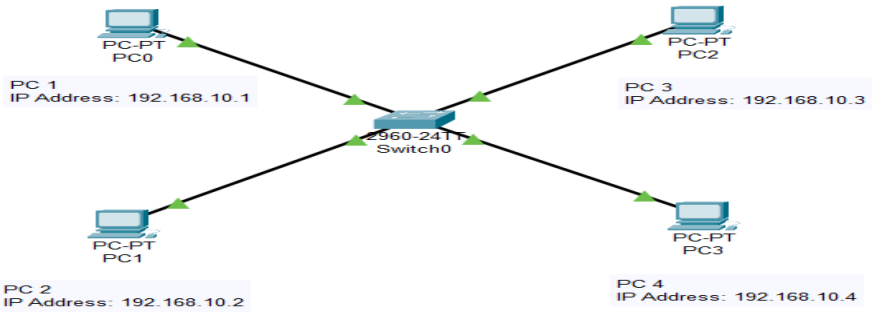
```
C:\>ping 192.168.10.2
```

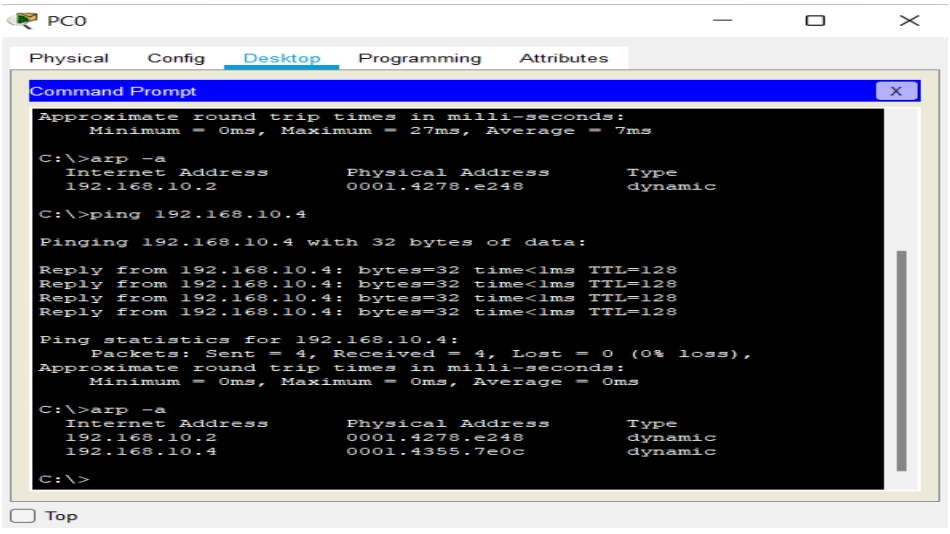
```
C:\>ping 192.168.10.4
```

Step 4: Then using ARP command find the physical address of PC2 and PC4. The run the command in the command prompt

```
C:\>arp -a
```

Result:





Experiment 11

Aim: Implementing FTP using Cisco Packet Tracer.

Theory:

Step 1: Connect PC, switch and server using copper straight wire.
Step 2: Put random IP address to PC and server.
Step 3: Then go to services of server and select FTP. Then add username and password and save.
Step 4: Then ping server using ping command

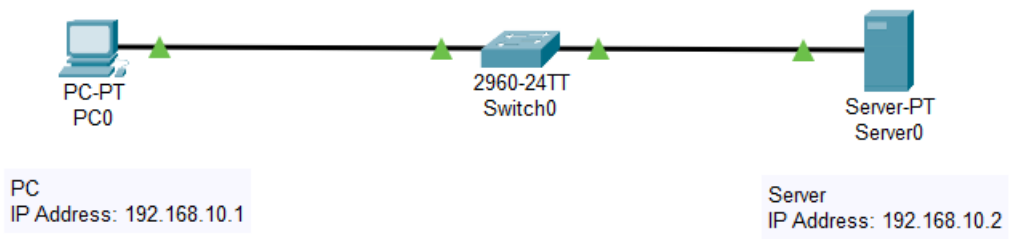
```
C:\>ping 192.168.10.2
```

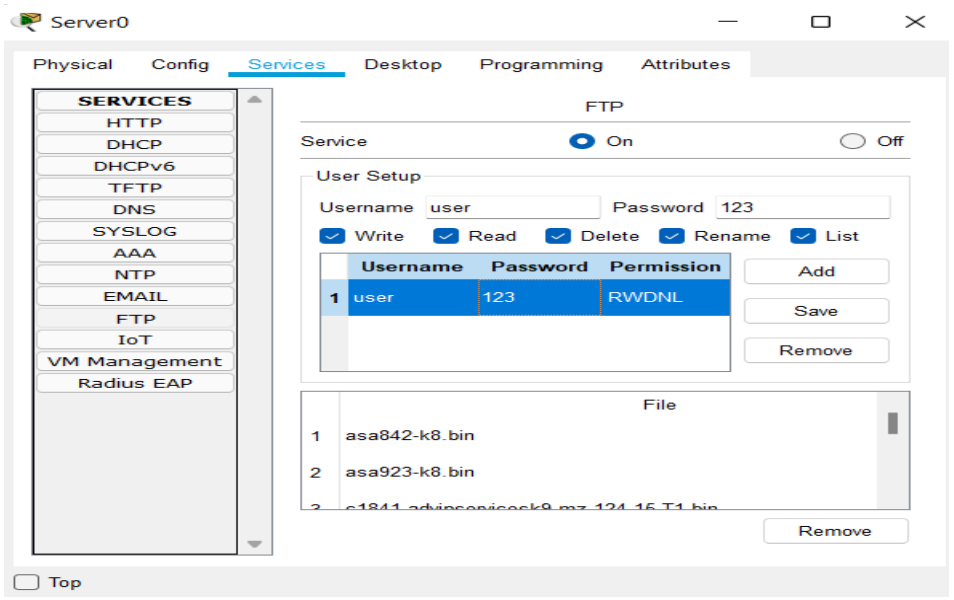
Step 5: Then run ftp command in command prompt

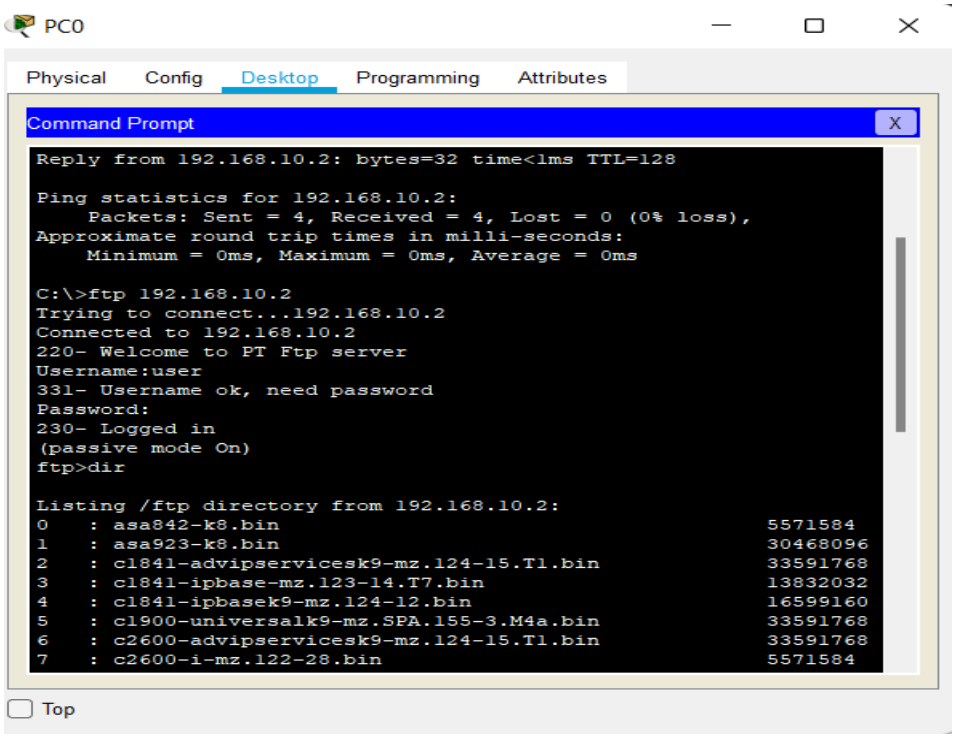
```
C:\>ftp 192.168.10.2
```

Step 6: Then enter the username and password and after that ftp services are working.

Result:




Server0
Physical
Config
Services
Desktop
Programming
Attributes
SERVICES
HTTP
DHCP
DHCPv6
TFTP
DNS
SYSLOG
AAA
NTP
EMAIL
FTP
IoT
VM Management
Radius EAP
FTP
Service
On
Off
User Setup
Username
user
Password
123
Write
Read
Delete
Rename
List
Username
Password
Permission
1
user
123
RWDNL
Add
Save
Remove
File
1
asa842-k8.bin
2
asa923-k8.bin
Remove
Top


PC0
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
Reply from 192.168.10.2: bytes=32 time<1ms TTL=128
Ping statistics for 192.168.10.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>ftp 192.168.10.2
Trying to connect...192.168.10.2
Connected to 192.168.10.2
220- Welcome to PT Ftp server
Username:user
331- Username ok, need password
Password:
230- Logged in
(passive mode On)
ftp>dir
Listing /ftp directory from 192.168.10.2:
0 : asa842-k8.bin 5571584
1 : asa923-k8.bin 30468096
2 : c1841-advipservicesk9-mz.124-15.T1.bin 33591768
3 : c1841-ipbase-mz.123-14.T7.bin 13832032
4 : c1841-ipbasek9-mz.124-12.bin 16599160
5 : c1900-universalk9-mz.SPA.155-3.M4a.bin 33591768
6 : c2600-advipservicesk9-mz.124-15.T1.bin 33591768
7 : c2600-i-mz.122-28.bin 5571584
Top

Experiment 12

Aim: Implementing VLAN using Cisco Packet Tracer.

Theory:

Step 1: Connect PC1, PC2, PC3, PC4 and switch using copper straight wire.
Step 2: Put random IP address to PC1, PC2, PC3, PC4.
Step 3: Then go to config and select VLAN database in switch.

Step 4: Then add VLAN number and name.
VLAN number: 10 and VLAN name: batch1
VLAN number: 20 and VLAN name: batch2

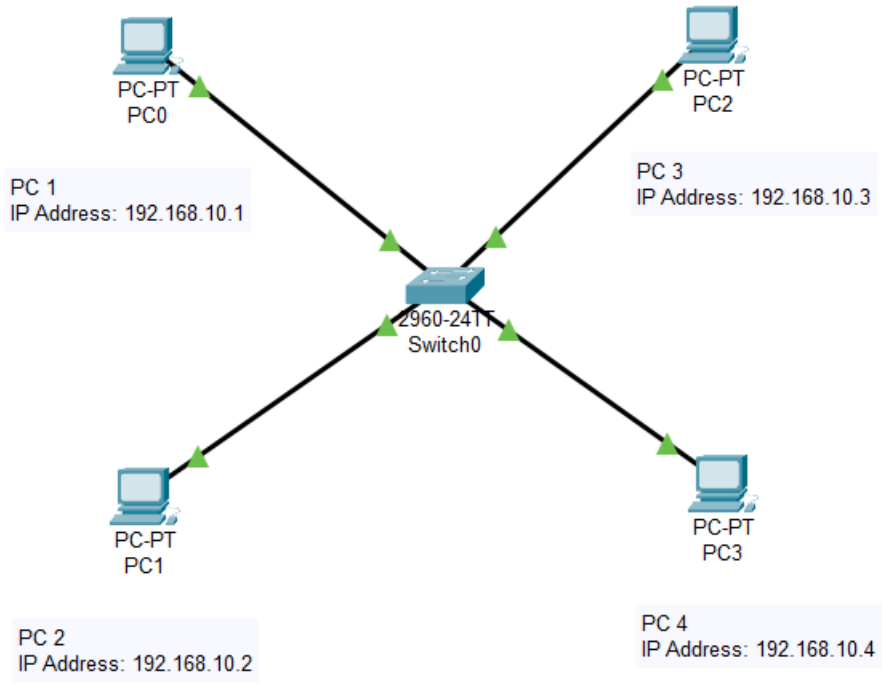
Step 5: Go to command line interface and run the command

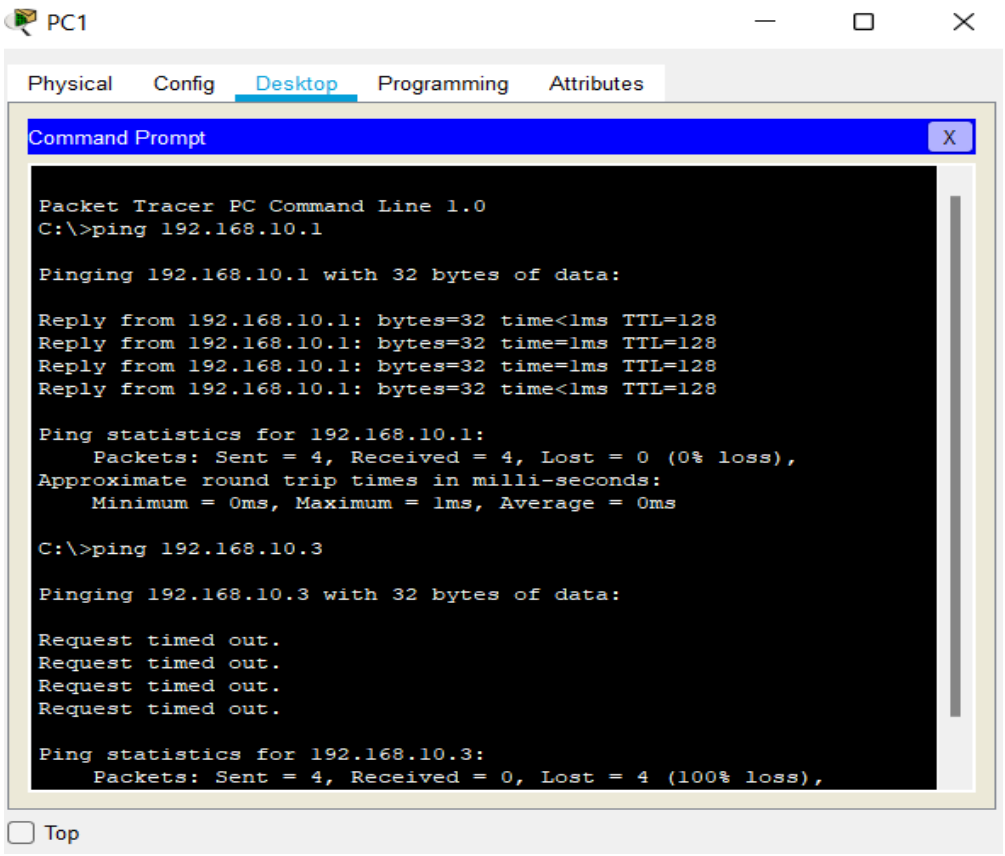
```
Switch(config)#interface FastEthernet0/1
Switch(config-if)#switchport access vlan 2
Switch(config-if)#interface FastEthernet0/2
Switch(config-if)#switchport access vlan 2
Switch(config-if)#interface FastEthernet0/3
Switch(config-if)#switchport access vlan 3
Switch(config-if)#interface FastEthernet0/4
Switch(config-if)#switchport access vlan 4
```

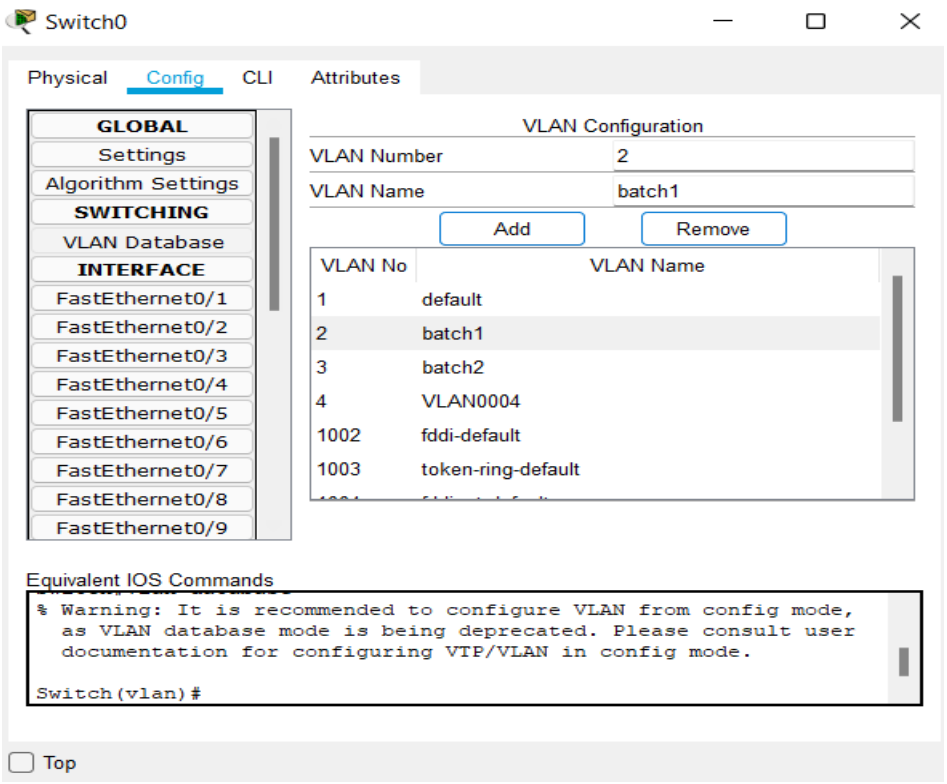
Step 6: Then ping PC1 from PC2 using ping command

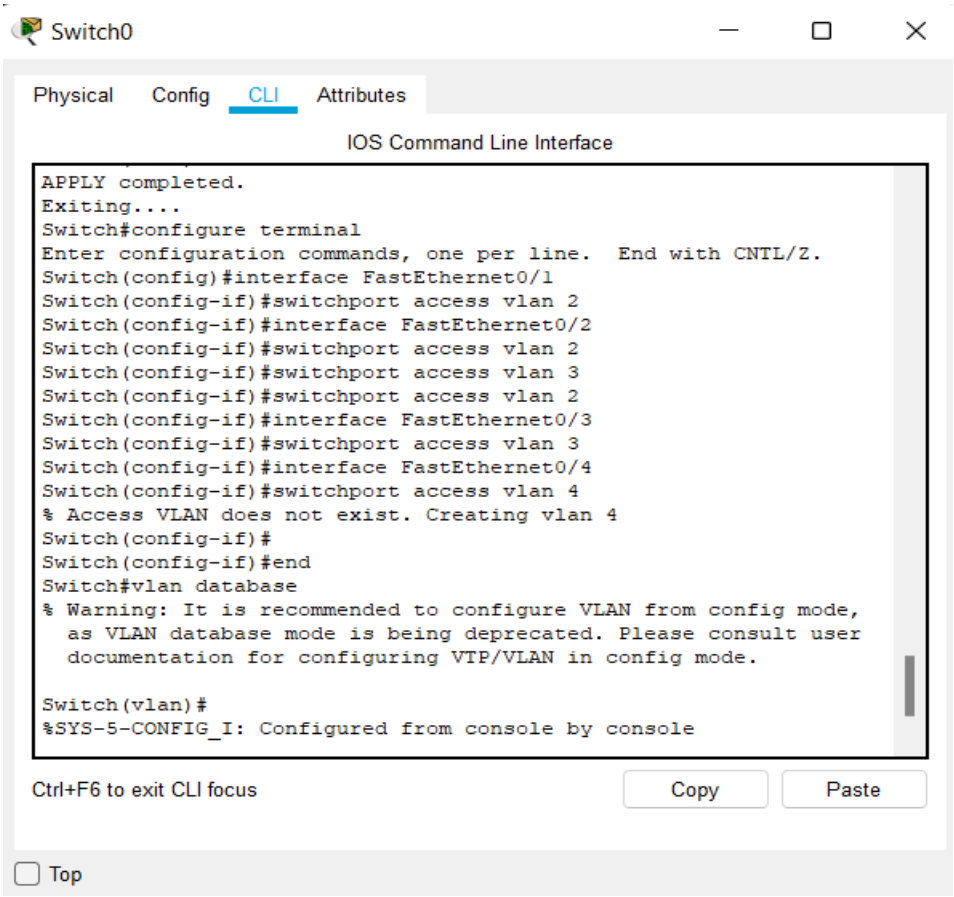
```
C:\>ping 192.168.10.1
```

Result:


PC-PT
PC0
PC 1
IP Address: 192.168.10.1
PC-PT
PC2
PC 3
IP Address: 192.168.10.3
2960-24TT
Switch0
PC-PT
PC1
PC 2
IP Address: 192.168.10.2
PC-PT
PC3
PC 4
IP Address: 192.168.10.4


PC1
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
Packet Tracer PC Command Line 1.0
C:\>ping 192.168.10.1
Pinging 192.168.10.1 with 32 bytes of data:
Reply from 192.168.10.1: bytes=32 time<1ms TTL=128
Reply from 192.168.10.1: bytes=32 time=1ms TTL=128
Reply from 192.168.10.1: bytes=32 time=1ms TTL=128
Reply from 192.168.10.1: bytes=32 time<1ms TTL=128
Ping statistics for 192.168.10.1:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 1ms, Average = 0ms
C:\>ping 192.168.10.3
Pinging 192.168.10.3 with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Ping statistics for 192.168.10.3:
Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
Top


Switch0
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
SWITCHING
VLAN Database
INTERFACE
FastEthernet0/1
FastEthernet0/2
FastEthernet0/3
FastEthernet0/4
FastEthernet0/5
FastEthernet0/6
FastEthernet0/7
FastEthernet0/8
FastEthernet0/9
VLAN Configuration
VLAN Number
2
VLAN Name
batch1
Add
Remove
VLAN No
VLAN Name
1 default
2 batch1
3 batch2
4 VLAN0004
1002 fddi-default
1003 token-ring-default
Equivalent IOS Commands
% 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.
Switch(vlan)#
Top


Switch0
Physical
Config
CLI
Attributes
IOS Command Line Interface
APPLY completed.
Exiting....
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#interface FastEthernet0/1
Switch(config-if)#switchport access vlan 2
Switch(config-if)#interface FastEthernet0/2
Switch(config-if)#switchport access vlan 2
Switch(config-if)#switchport access vlan 3
Switch(config-if)#switchport access vlan 2
Switch(config-if)#interface FastEthernet0/3
Switch(config-if)#switchport access vlan 3
Switch(config-if)#interface FastEthernet0/4
Switch(config-if)#switchport access vlan 4
% Access VLAN does not exist. Creating vlan 4
Switch(config-if)#
Switch(config-if)#end
Switch#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.
Switch(vlan)#
%SYS-5-CONFIG_I: Configured from console by console
Ctrl+F6 to exit CLI focus
Copy
Paste
Top

Experiment 13

Aim: Configure a Network topology using packet tracer software.

Apparatus Required: Cisco Packet Tracer Software

Theory:

After configuring the given network a packet should be ping from any one machine to another.

Router0 Configuration Command.....

Router>enable Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface FastEthernet0/0
Router(config-if)#ip address 192.168.0.254 255.255.255.0
Router(config-if)#no shutdown
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface
FastEthernet0/0, changed state to up
Router(config-if)#exit

Router(config)#exit
%SYS-5-CONFIG_I: Configured from console by console Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface FastEthernet0/0
Router(config-if)# Router(config-if)#exit
Router(config)#interface Serial2/0
Router(config-if)#ip address 192.168.1.1 255.255.255.0
Router(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial2/0, changed state to down
Router(config-if)#exit
Router(config)#exit
%SYS-5-CONFIG_I: Configured from console by console Router#wr

```
Building configuration... [OK]
Router#show running-config Building configuration...

Current configuration : 542 bytes
!
version 12.2
no service password-encryption
!
hostname Router
!
!
!
!
!
ip ssh version 1
!
!
interface FastEthernet0/0
ip address 192.168.0.254 255.255.255.0
duplex auto speed auto
!
interface FastEthernet1/0 no ip address
duplex auto speed auto shutdown
!
interface Serial2/0
ip address 192.168.1.1 255.255.255.0
!
interface Serial3/0 no ip address shutdown
!
interface FastEthernet4/0 no ip address
shutdown
!
interface FastEthernet5/0 no ip address
shutdown
!
```

ip classless
!
!
!
!
!
line con 0
line vty 0 4 login
!
!
end
Router#

Router1 Configuration Command.....

Continue with configuration dialog? [yes/no]: no

Press RETURN to get started!

Router>enable Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface Serial2/0
Router(config-if)#ip address 192.168.1.2 255.255.255.0
Router(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial2/0, changed state to up
Router(config-if)#exit
Router(config)#exit
%SYS-5-CONFIG_I: Configured from console by console
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#
Router(config)#interface Serial2/0 Router(config-if)#
Router(config-if)#exit Router(config)#interface FastEthernet0/0

```
Router(config-if)#ip address 192.168.2.254 255.255.255.0
Router(config-if)#no shutdown

%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface
FastEthernet0/0, changed state to up
Router(config-if)#exit Router(config)#exit
%SYS-5-CONFIG_I: Configured from console by console Router#wr
Building configuration... [OK]
Router#
Router#show running-config Building configuration...

Current configuration : 542 bytes
!
version 12.2
no service password-encryption
!
hostname Router
!
!
!
!
!
ip ssh version 1
!
!
interface FastEthernet0/0
ip address 192.168.2.254 255.255.255.0
duplex auto speed auto
!
interface FastEthernet1/0 no ip address
duplex auto speed auto shutdown
!
interface Serial2/0
ip address 192.168.1.2 255.255.255.0
```

!
interface Serial3/0 no ip address shutdown
!
interface FastEthernet4/0 no ip address
shutdown
!
interface FastEthernet5/0 no ip address
shutdown
!
ip classless
!
!
!
!
!
line con 0
line vty 0 4 login
!
!
end
Router#

IP ROUTE Command.....

Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip route 192.168.2.0 255.255.255.0 192.168.2.2
Router(config)#exit
Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2 E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR P - periodic downloaded static route

Gateway of last resort is not set

C 192.168.2.0/24 is directly connected, FastEthernet0/0
C 192.168.1.2/24 is directly connected, Serial2/0
S 192.168.2.0/24 [1/0] via 192.168.1.2
Router#

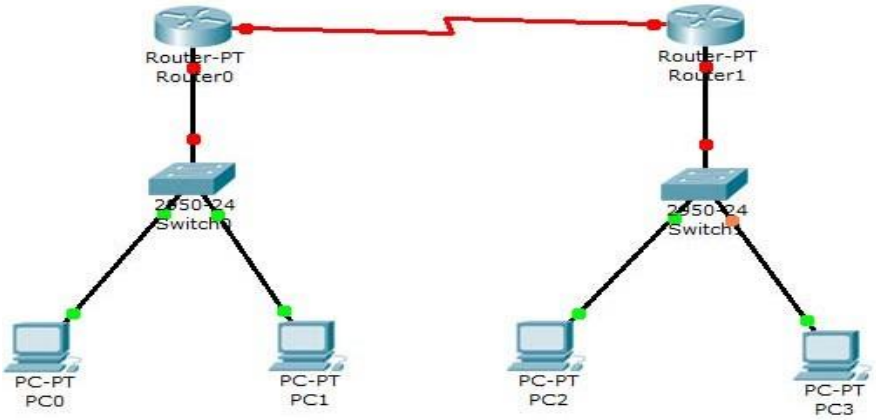
IP ROUTE Command.....

Router>enable Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2 E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR P - periodic downloaded static route

Gateway of last resort is not set

S 192.168.0.0/24 [1/0] via 192.168.1.1
C 192.168.0.0/24 is directly connected, FastEthernet0/0
C 192.168.1.1/24 is directly connected, Serial2/0
Router#

Result:



Experiment 14

Aim: Configure a Network using Distance Vector Routing protocol.

Apparatus Required: Cisco Packet Tracer Software

Theory:

Step 1: Develop a Topology shown in figure given below.
Step 2: Configure all Routers.
Step 3: Implement RIP protocols in Router to configure Network.

Router0 configuration.....

Continue with configuration dialog? [yes/no]: no

Press RETURN to get started! Router>
Router>en Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname router0 router0(config)#int lo0
%LINK-5-CHANGED: Interface Loopback0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state to up router0(config-if)#ip address 10.1.1.1 255.255.255.0
router0(config-if)#int f0/0
router0(config-if)#ip address 10.1.12.1 255.255.255.0 router0(config-if)#no shut

%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
router0(config-if)#int f0/1
router0(config-if)#ip address 10.1.14.1 255.255.255.0 router0(config-if)#no shut

%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up
router0(config-if)#end
%SYS-5-CONFIG_I: Configured from console by console router0#wr
Building configuration... [OK]

router0# router0#
%LINEPROTO-5-UPDOWN: Line protocol on Interface
FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface
FastEthernet0/1, changed state to up router0 con0 is now available
Press RETURN to get started.

router0> router0>en router0#config t
Enter configuration commands, one per line. End with CNTL/Z.
router0(config)#router rip
router0(config-router)#net 10.0.0.0 router0(config-router)#
router0(config-router)#end
%SYS-5-CONFIG_I: Configured from console by console
router0#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP D
- EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2 E1 -
OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR P - periodic
downloaded static route

Gateway of last resort is not set
10.0.0.0/24 is subnetted, 3 subnets
C 10.1.1.0 is directly connected, Loopback0
C 10.1.12.0 is directly connected, FastEthernet0/0 C 10.1.14.0 is
directly connected, FastEthernet0/1 router0#
router0#

Router1 Configuration.....

Continue with configuration dialog? [yes/no]: no

Press RETURN to get started!

Router>enable Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int lo0

%LINK-5-CHANGED: Interface Loopback0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state to up Router(config-if)#ip address 10.1.2.1 255.255.255.0
Router(config-if)#no shut Router(config-if)#int f0/1
Router(config-if)#ip address 10.1.23.1 255.255.255.0 Router(config-if)#no shut

%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up
Router(config-if)#int f0/0
Router(config-if)#ip address 10.1.12.2 255.255.255.0 Router(config-if)#no shut

%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up Router(config-if)#end
%SYS-5-CONFIG_I: Configured from console by console Router#wr
Building configuration...
[OK]
Router# Router# Router#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up Router con0 is now available
Press RETURN to get started.

Router> Router>en Router#con t
% Ambiguous command: "con t" Router#co t
% Ambiguous command: "co t" Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#net 10.0.0.0 Router(config-router)#

Router(config-router)# Router(config-router)#end
%SYS-5-CONFIG_I: Configured from console by console Router#

Router2 Configuration.....

Continue with configuration dialog? [yes/no]: no

Press RETURN to get started! Router>en
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int lo0

%LINK-5-CHANGED: Interface Loopback0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state to up Router(config-if)#ip address 10.1.3.1 255.255.255.0
Router(config-if)#no shut Router(config-if)#int f0/0
Router(config-if)#ip address 10.1.23.2 255.255.255.0 Router(config-if)#no shut

%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up Router(config-if)#int f0/1
Router(config-if)#ip address 10.1.34.1 255.255.255.0 Router(config-if)#no shut

%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up
Router(config-if)#End
%SYS-5-CONFIG_I: Configured from console by console

Router#wr
Building configuration...
[OK]
Router# Router# Router#

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
Router con0 is now available

Press RETURN to get started.

Router> Router> Router>en
Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2 E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR P - periodic downloaded static route
Gateway of last resort is not set 10.0.0.0/24 is subnetted, 3 subnets
C 10.1.3.0 is directly connected, Loopback0
C 10.1.23.0 is directly connected, FastEthernet0/0 C 10.1.34.0 is directly connected, FastEthernet0/1 Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#net 10.0.0.0 Router(config-router)#end
%SYS-5-CONFIG_I: Configured from console by console Router#
Router# Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2 E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR P - periodic downloaded static route
Gateway of last resort is not set 10.0.0.0/24 is subnetted, 7 subnets
R 10.1.1.0 [120/2] via 10.1.23.1, 00:00:19, FastEthernet0/0

R 10.1.2.0 [120/1] via 10.1.23.1, 00:00:19, FastEthernet0/0
C 10.1.3.0 is directly connected, Loopback0
R 10.1.12.0 [120/1] via 10.1.23.1, 00:00:19, FastEthernet0/0
R 10.1.14.0 [120/2] via 10.1.23.1, 00:00:19, FastEthernet0/0
C 10.1.23.0 is directly connected, FastEthernet0/0
C 10.1.34.0 is directly connected, FastEthernet0/1 Router#
Router# Router#

Router3 Configuration.....

Continue with configuration dialog? [yes/no]: no

Press RETURN to get started! Router>
Router>en Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int lo0

%LINK-5-CHANGED: Interface Loopback0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state to up Router(config-if)#int f0/0
Router(config-if)#ip address 10.1.34.2 255.255.255.0 Router(config-if)#no shut

%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up Router(config-if)#
Router(config-if)#int f0/1
Router(config-if)#ip address 10.1.14.2 255.255.255.0 Router(config-if)#no shut

%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up Router(config-if)#end
%SYS-5-CONFIG_I: Configured from console by console Router#wr
Building configuration...

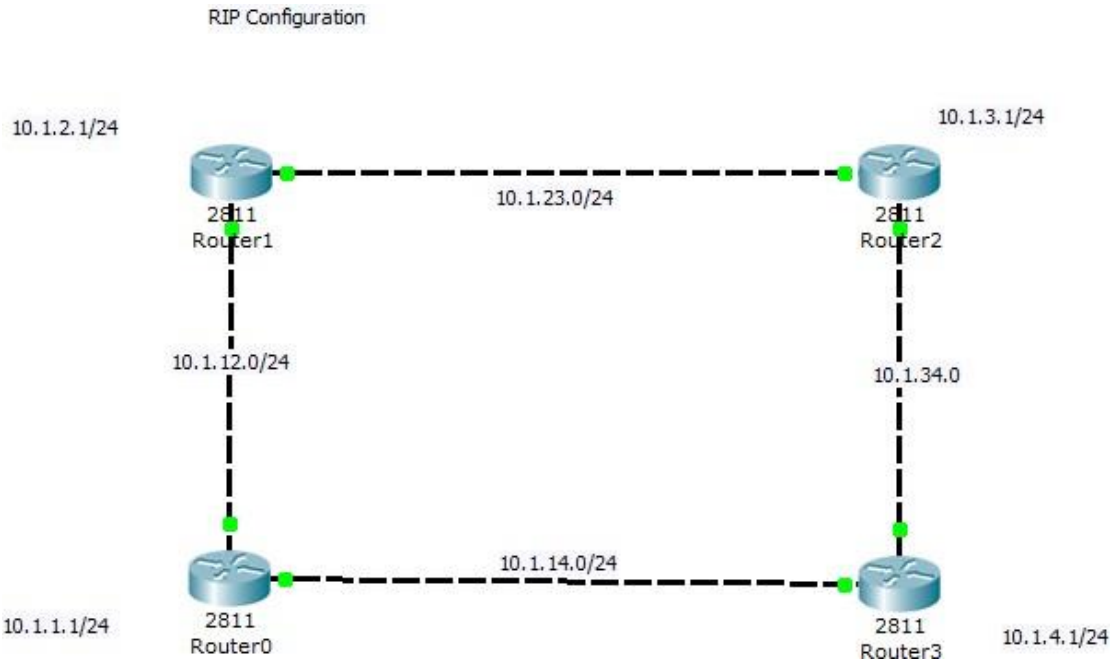
[OK]
Router# Router#
Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2 E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR P - periodic downloaded static route

Gateway of last resort is not set
10.0.0.0/24 is subnetted, 2 subnets
C 10.1.14.0 is directly connected, FastEthernet0/1 C 10.1.34.0 is directly connected, FastEthernet0/0 Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#net 10.0.0.0 Router(config-router)#

Router(config-router)#end
%SYS-5-CONFIG_I: Configured from console by console Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2 E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR P - periodic downloaded static route
Gateway of last resort is not set 10.0.0.0/24 is subnetted, 7 subnets
R 10.1.1.0 [120/1] via 10.1.14.1, 00:00:09, FastEthernet0/1
R 10.1.2.0 [120/2] via 10.1.34.1, 00:00:14, FastEthernet0/0
[120/2] via 10.1.14.1, 00:00:09, FastEthernet0/1
R 10.1.3.0 [120/1] via 10.1.34.1, 00:00:14, FastEthernet0/0
R 10.1.12.0 [120/1] via 10.1.14.1, 00:00:09, FastEthernet0/1

C 10.1.14.0 is directly connected, FastEthernet0/1
R 10.1.23.0 [120/1] via 10.1.34.1, 00:00:14, FastEthernet0/0
C 10.1.34.0 is directly connected, FastEthernet0/0 Router#

Result:



Experiment 15

Aim: Configure Network using Link State Vector Routing protocol.

Apparatus Required: Cisco Packet Tracer Software.

Theory:

Step 1: Develop a Topology shown in figure given below.
Step 2: Configure all the workstations.
Step 3: Configure all switches.
Step 4: Configure all Routers
Step 5: Implement OSPF protocols in Router to configure Network

Result: