Experiment No 3

Aim: Build a simple network topology and configure it for static routing protocol using packet tracer. Setup a network and configure IP addressing, subnetting, masking

Theory:

Static routing is a form of routing that occurs when a router uses a manually-configured routing entry, rather than information from a dynamic routing protocol to forward traffic. In many cases, static routes are usually manually configured by a network administrator by adding in entries into a routing table, though this may not always be the case. Unlike dynamic routing, static routes are fixed and do not change if the network is changed or reconfigured. Static routing and dynamic routing are not mutually exclusive. Both dynamic routing and static routing are usually used on a router to maximize routing efficiency and to provide backups in the event that dynamic routing information fails to be exchanged. Static routing can also be used in stub networks, or to provide a gateway Static routing. **Network topologies** describe the methods in which all the elements of a network are mapped. The topology term refers to both the physical and logical layout of a network. Two main types of network topologies in computer networks are

1) Physical topology : This type of network is an actual layout of the computer cables and other network devices.

2) Logical topology : Logical topology gives insight's about a network's physical design.

Different types of Physical Topologies are: P2P Topology, Bus Topology, Ring Topology, Star Topology, Tree Topology, Mesh Topology, Hybrid Topology.

• **Ping** - Ping is a command-line utility, available on virtually any operating system with network connectivity, that acts as a test to see if a networked device is reachable.The ping command sends a request over the network to a specific device. A successful ping results in a response from the computer that was pinged back to the originating computer.

Syntax: ping (ip address of other device)

• **Ifconfig (logical connection)-** command is used to configure the kernel-resident network nterfaces. It is used at the boot time to set up the interfaces as necessary. After that, it is usually used when needed

during debugging or when you need system tuning. Also, this command is used to assign the IP address and netmask to an interface or to enable or disable a given interface.

Syntax: ifconfig

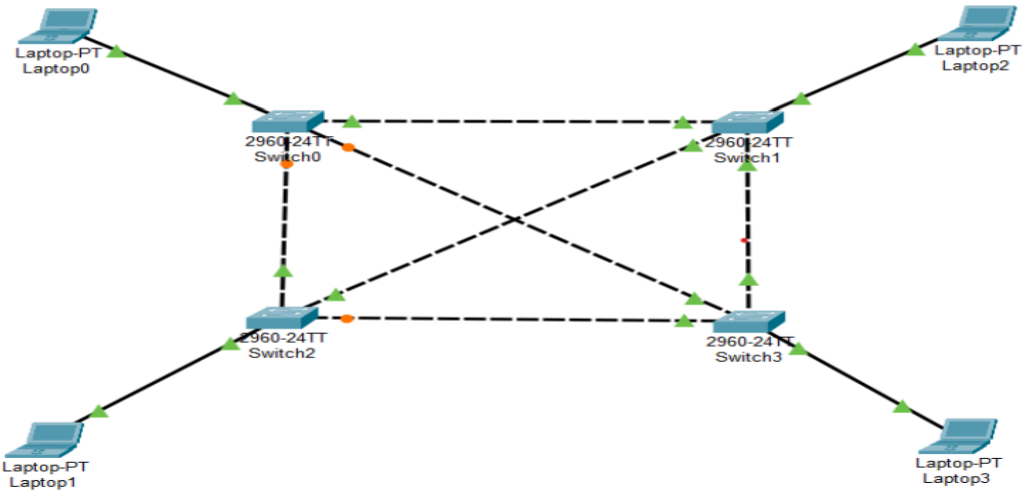
• **ipconfig /all (physical connection):** Displays all current TCP/IP network configuration values and refreshes Dynamic Host Configuration Protocol (DHCP) and Domain Name System (DNS) settings. Used without parameters, ipconfig displays Internet Protocol version 4 (IPv4) and IPv6 addresses, subnet mask, and default gateway for all adapters.

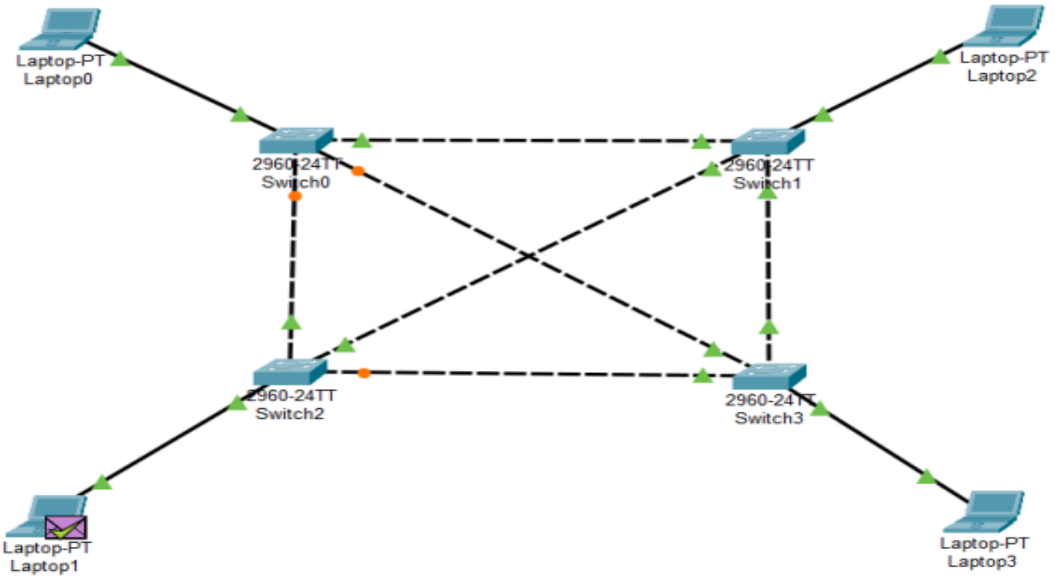
Syntax: ipconfig /all

Procedure and Output:

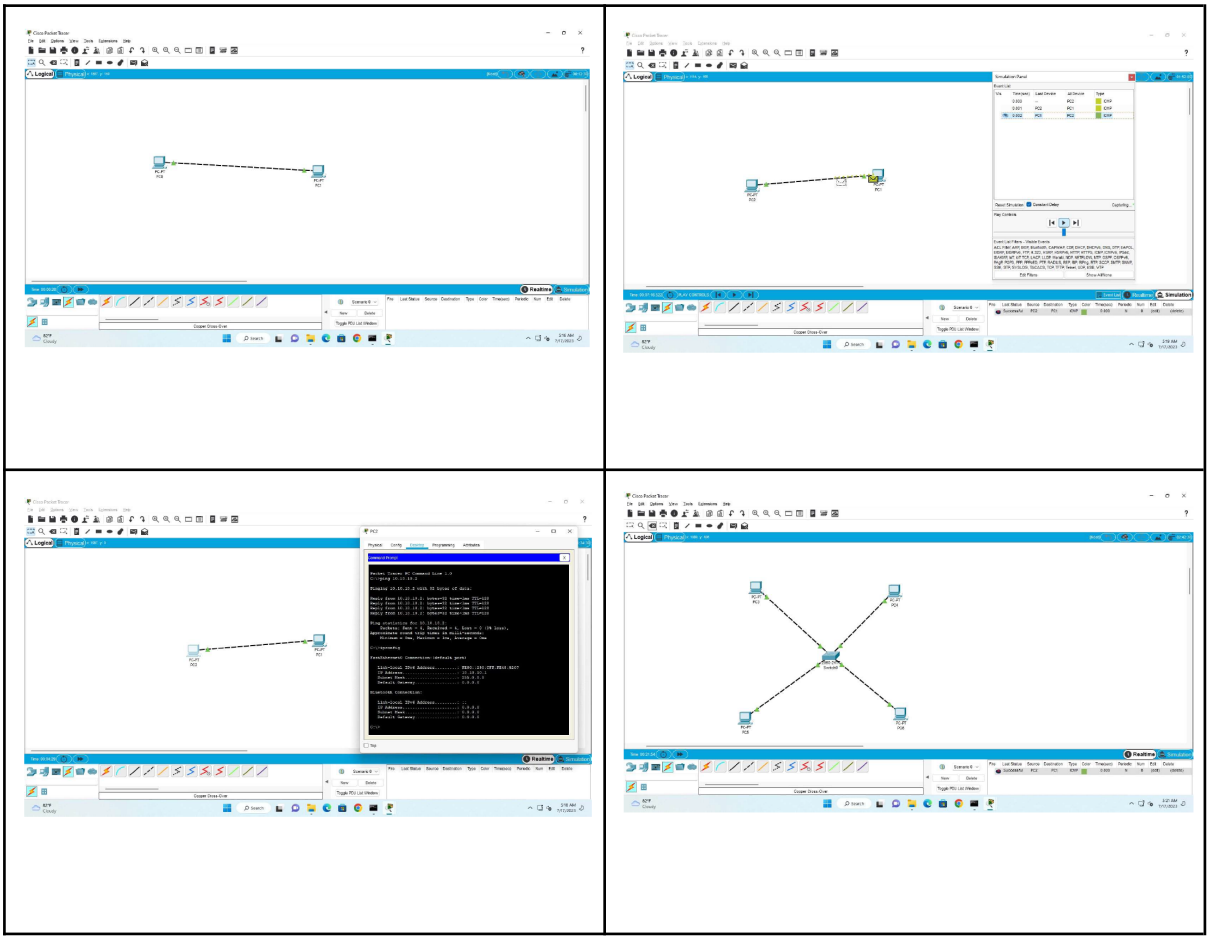
1. Create any topology by connecting four devices with four switches using copper straight through and connect the switches with copper cross over like shown in figure
2. Connection should be made by selecting the fast ether connection.
3. Assign ip address for both Pc's with appropriate ip and subnet mask and default gateway. 4. Now configure both router with static route.
5. Configure ip addresses and check the connection by using ipconfig and ping cmd.

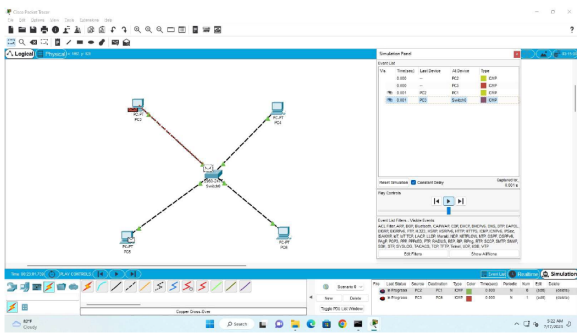
Eg : Mesh Topology

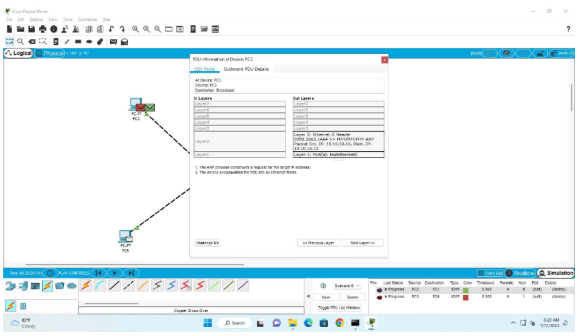


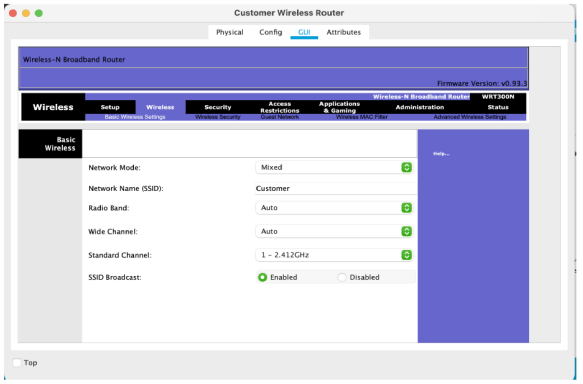

Laptop-PT
Laptop0
Laptop-PT
Laptop2
2960-24TT
Switch0
2960-24TT
Switch1
2960-24TT
Switch2
2960-24TT
Switch3
Laptop-PT
Laptop1
Laptop-PT
Laptop3

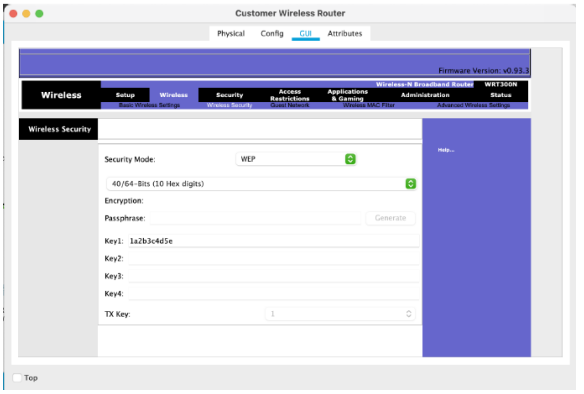
Output:

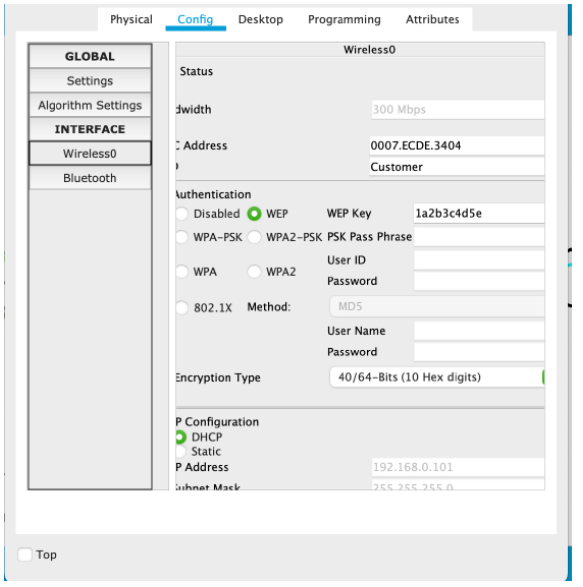


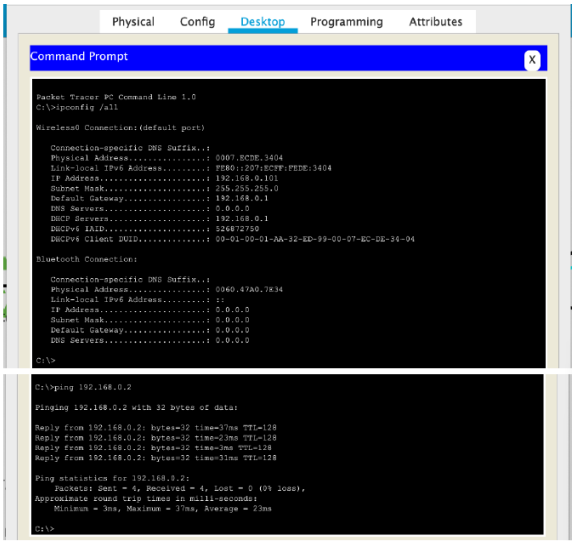


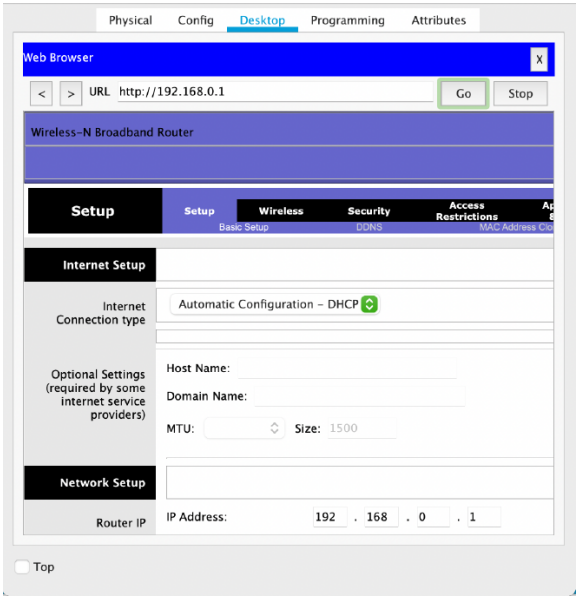



Customer Wireless Router
Physical
Config
GUI
Attributes
Wireless-N Broadband Router
Firmware Version: v0.93.3
Wireless
Setup
Wireless
Security
Access Restrictions
Applications & Gaming
Administration
Status
Basic Wireless
Network Mode:
Mixed
Network Name (SSID):
Customer
Radio Band:
Auto
Wide Channel:
Auto
Standard Channel:
1 - 2.412GHz
SSID Broadcast:
Enabled
Disabled
Top


Customer Wireless Router
Physical
Config
GUI
Attributes
Wireless
Wireless Security
Security Mode:
WEP
40/64-Bits (10 Hex digits)
Encryption:
Passphrase:
Generate
Key1:
1a2b3c4d5e
Key2:
Key3:
Key4:
TX Key:
Top


Physical
Config
Desktop
Programming
Attributes
GLOBAL
Settings
Algorithm Settings
INTERFACE
Wireless0
Bluetooth
Wireless0
Status
Address
0007.ECDE.3404
Customer
Authentication
Disabled
WEP
WEP Key
1a2b3c4d5e
WPA-PSK
WPA2-PSK
PSK Pass Phrase
WPA
WPA2
User ID
Password
802.1X
Method:
MD5
User Name
Password
Encryption Type
40/64-Bits (10 Hex digits)
IP Configuration
DHCP
Static
IP Address
192.168.0.101
Top


Physical
Config
Desktop
Programming
Attributes
Command Prompt
Packet Tracer PC Command Line 1.0
C:\>ipconfig /all
Wireless0 Connection:(default port)
Connection-specific DNS Suffix..:
Physical Address.....: 0007.ECDE.3404
Link-local IPv6 Address.....: FE80::207:ECFF:FEDE:3404
IP Address.....: 192.168.0.101
Subnet Mask.....: 255.255.255.0
Default Gateway.....: 192.168.0.1
DNS Servers.....: 0.0.0.0
DHCP Servers.....: 192.168.0.1
DHCPv6 IAID.....: 526872750
DHCPv6 Client DUID.....: 00-01-00-01-AA-32-ED-99-00-07-EC-DE-34-04
Bluetooth Connection:
Connection-specific DNS Suffix..:
Physical Address.....: 0060.47A0.7B34
Link-local IPv6 Address.....: ::
IP Address.....: 0.0.0.0
Subnet Mask.....: 0.0.0.0
Default Gateway.....: 0.0.0.0
DNS Servers.....: 0.0.0.0
C:\>
C:\>ping 192.168.0.2
Pinging 192.168.0.2 with 32 bytes of data:
Reply from 192.168.0.2: bytes=32 time=37ms TTL=128
Reply from 192.168.0.2: bytes=32 time=23ms TTL=128
Reply from 192.168.0.2: bytes=32 time=3ms TTL=128
Reply from 192.168.0.2: bytes=32 time=31ms TTL=128
Ping statistics for 192.168.0.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 3ms, Maximum = 37ms, Average = 23ms
C:\>



Conclusion:

In this experiment, we successfully established a basic network topology and implemented static routing using Cisco Packet Tracer. This involved configuring IP addressing, subnetting, and masking. Static routing, which involves manual configuration of router routing tables, was employed to define specific routing paths within the network.

Our configuration process included assigning IP addresses to routers and devices, utilizing the ip route command to add static routes in router routing tables, ensuring connectivity by testing with pings between hosts.

In conclusion, this experiment provided valuable insights into setting up static routing within a Cisco network, as well as network setup and IP configuration.