A

LAB REPORT

ON

COMPUTER NETWORKING

By

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Submitted to:

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In partial fulfillment of the requirements for the Course

Computer Networking

Mid Baneshwor, Kathmandu

May 2023

Contents

Lab 1

Introduction to packet tracer and simulation

OBJECTIVES:

- To know about packet tracer
- To know the working environment of packet tracer and how to work on it.

BACKGROUND THEORY:

Packet Tracer is a cross-platform visual simulation tool developed by Cisco Systems that allows users to create network topologies and simulate Cisco routers and switches using a simulated command line interface. The software uses a drag and drop user interface, allowing users to add and remove simulated network devices as they see fit. Packet Tracer is a comprehensive, multi-faceted tool that provides simulation, visualization, and authoring, assessment, and collaboration capabilities and facilitates the teaching and learning of complex technology concepts.

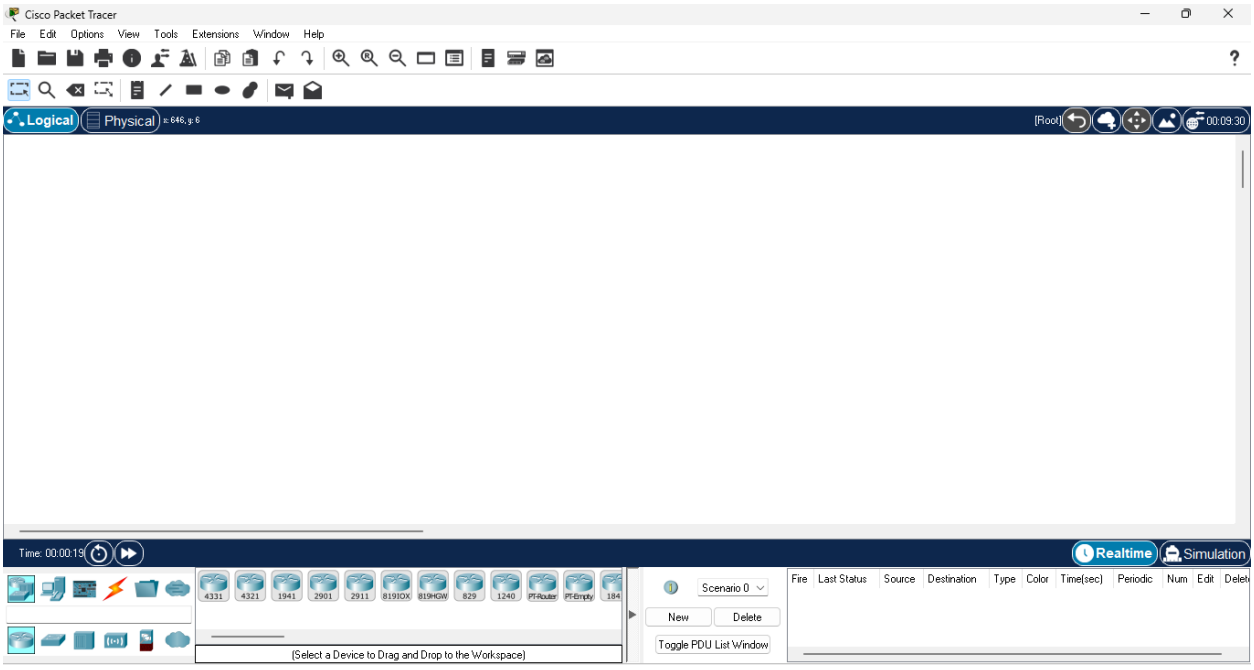


Fig: Interface of Cisco Packet Tracer

OBSERVATION AND FINDING

Connecting to Switch, PC, Laptop and Server.

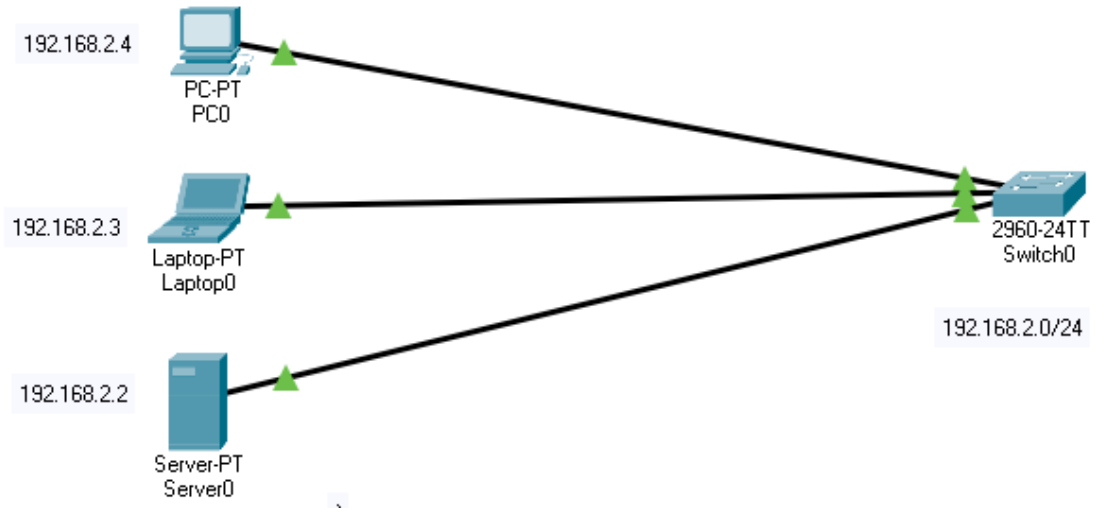


Fig: Connectivity between different devices

DISCUSSION:

The basic use of Cisco Packet Tracer is demonstrated in this lab. We use many tools like Switch, PC, Server, laptop to know about the working environment of this cisco packet tracer.

CONCLUSION:

In this lab, we know how to work on cisco packet tracer which will be helpful for upcoming lab work.

Lab 2

Assign IP Address to a device

OBJECTIVES:

- To know how to assign the IP address to the device.

BACKGROUND THEORY:

IP address is a string of numbers separated by periods and is used to identify hardware devices on a network, allowing them to connect to one another and transfer data on a local network or over the internet.

OBSERVATION AND FINDING:

Assigning IP address.

Fig: device

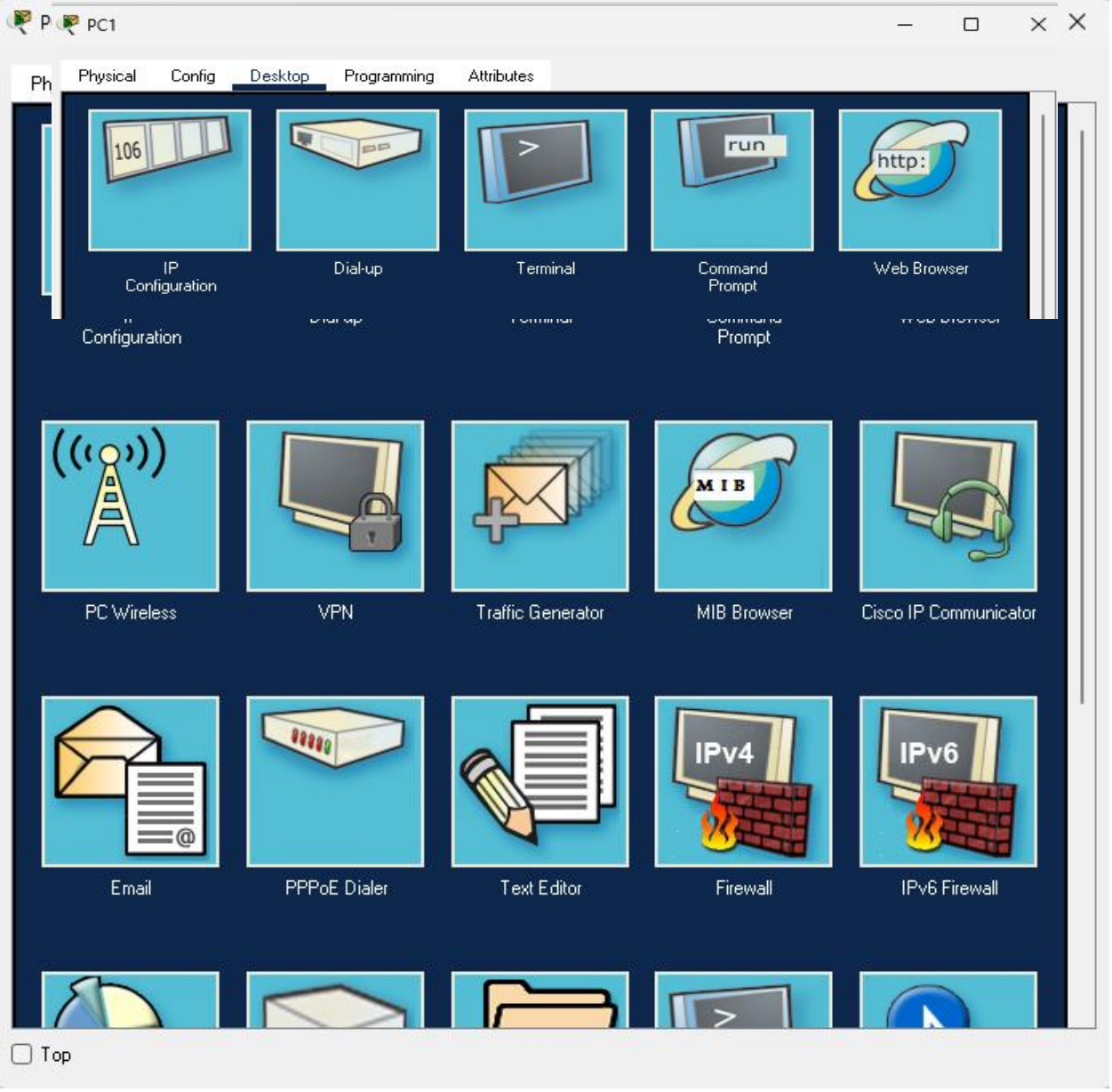


Fig: device configuration setting and tool

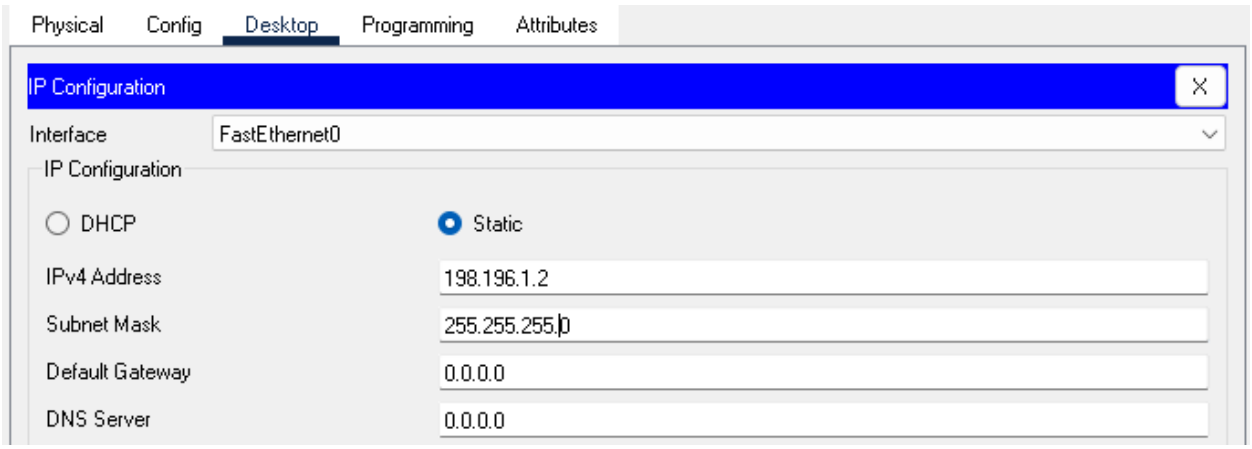


Fig: IP configuration

OUTPUT:

```
C:\>ipconfig

FastEthernet0 Connection:(default port)

   Connection-specific DNS Suffix..:
   Link-local IPv6 Address.....: FE80::260:2FFF:FE8E:E330
   IPv6 Address.....: ::
   IPv4 Address.....: 198.196.1.2
   Subnet Mask.....: 255.255.255.0
   Default Gateway.....: ::
                                 0.0.0.0

Bluetooth Connection:

   Connection-specific DNS Suffix..:
   Link-local IPv6 Address.....: ::
   IPv6 Address.....: ::
   IPv4 Address.....: 0.0.0.0
   Subnet Mask.....: 0.0.0.0
   Default Gateway.....: ::
                                 0.0.0.0
```

DISCUSSION:

We have assigned IP address to end device using GUI interface.

CONCLUSION:

In this lab we know how to assign the IP address to the end devices and provide unique identification of devices in the network

Lab 3

Creating and configuring a simple peer-to-peer network having two PC's and testing the connectivity between them.

OBJECTIVES:

- To implement peer-to-peer network using packet tracer.
- To test connectivity between different computers present in the network.

BACKGROUND THEORY:

A peer-to-peer (P2P) network is a distributed application architecture that partitions tasks or workloads between peers. It is created when two or more computers are connected and share resources without going through a separate server computer. Peers are equally privileged, equipotent participants in the network, and each connected machine has the same rights as its "peers" and can be used for the same purposes

OBSERVATIONS AND FINDING:

Implement peer-to-peer network in between two PCs and testing connectivity between them.

Fig: peer-to-peer network

OUTPUT

```
Packet Tracer PC Command Line 1.0
C:\>ping 198.196.1.4

Pinging 198.196.1.4 with 32 bytes of data:

Reply from 198.196.1.4: bytes=32 time=4ms TTL=128
Reply from 198.196.1.4: bytes=32 time<1ms TTL=128
Reply from 198.196.1.4: bytes=32 time=3ms TTL=128
Reply from 198.196.1.4: bytes=32 time=4ms TTL=128

Ping statistics for 198.196.1.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 4ms, Average = 2ms
```

DISCUSSION:

In this lab, we connect two different computer using peer to peer network where each computer can send and receive message without centralized control and test connectivity.

CONCLUSION:

In this lab we simulates peer-to-peer network using two PCs and test their connectivity using ping command.

Lab 4

Creating a local area network and testing the connectivity within the network.

OBJECTIVE:

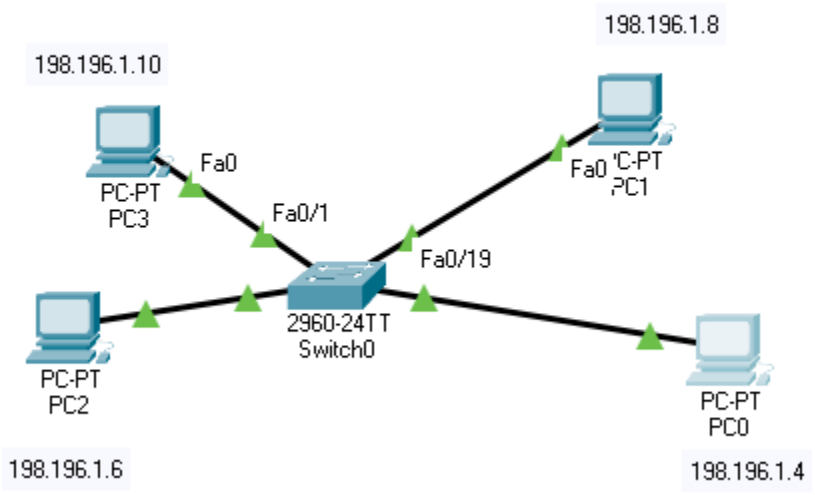
- To create a local area network
- To test connectivity within network.

BACKGROUND THEORY:

A local area network (LAN) is a collection of devices connected together in one physical location, such as a building, office, or home. A LAN can be small or large, ranging from a home network with one user to an enterprise network with thousands of users and devices in an office or school.

OBSERVATIONS AND FINDING

Implement a local area network and testing the connectivity within the network.



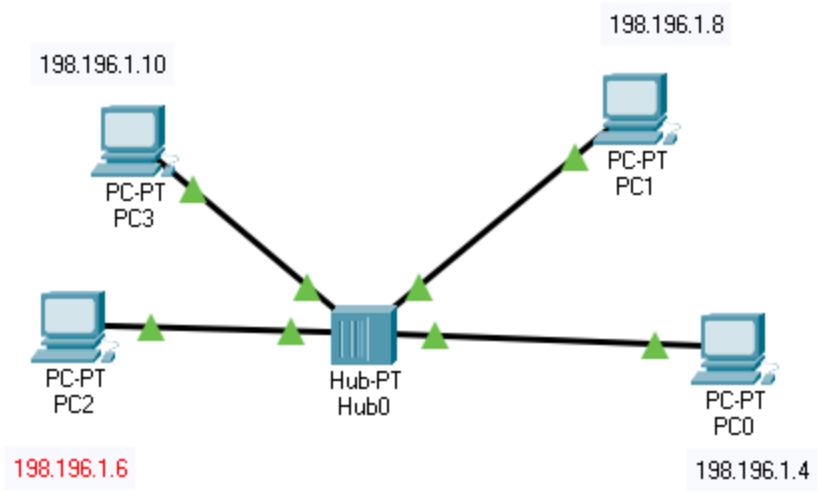


Fig: Local Area Network

OUTPUT

```
Packet Tracer PC Command Line 1.0
C:\>ping 198.196.1.10

Pinging 198.196.1.10 with 32 bytes of data:

Reply from 198.196.1.10: bytes=32 time<1ms TTL=128
Reply from 198.196.1.10: bytes=32 time<1ms TTL=128
Reply from 198.196.1.10: bytes=32 time<1ms TTL=128
Reply from 198.196.1.10: bytes=32 time<1ms TTL=128

Ping statistics for 198.196.1.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

DISCUSSION:

We create LAN network using both hub and switch and test the connectivity within the network. We also simulates the working method of hub and switches

CONCLUSION:

In this lab, we simulates the LAN using hub and switch.

Lab 5

Interconnecting two different LANs and testing the connectivity between them.

OBJECTIVES:

- To connect two different LANs using router.
- To send message from one LAN to another LAN.

BACKGROUND THEORY:

LAN interconnection or Internetworking is the process of interconnecting two different LANs. We use router for interconnecting two different LAN. In this lab, two different LANs are used to test the connectivity between them.

OBSERVATIONS AND FINDING

Interconnecting two different LANs and testing the connectivity between them.

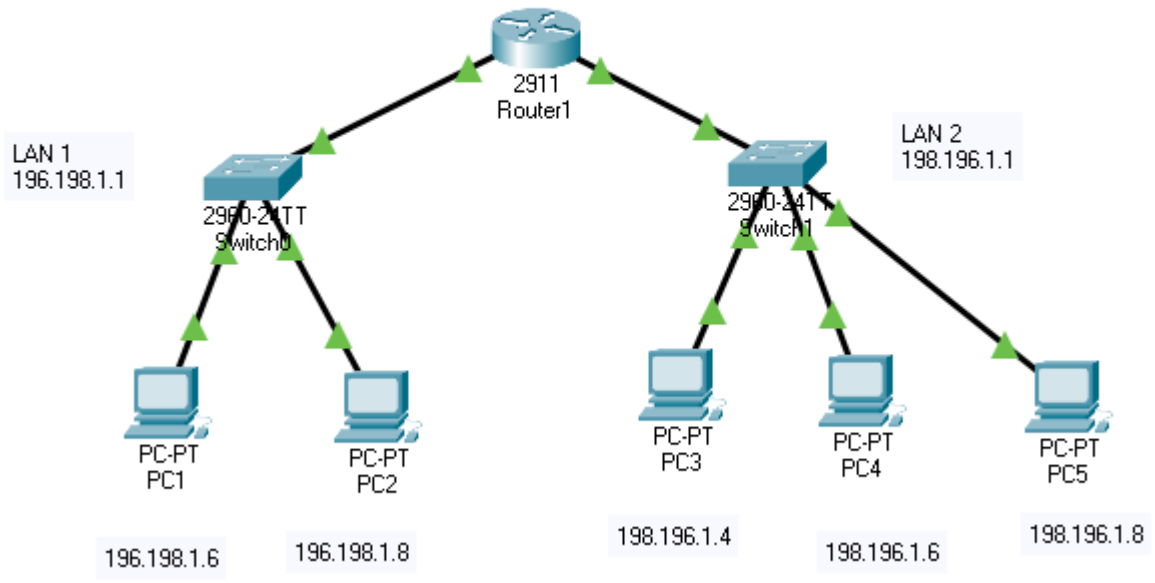
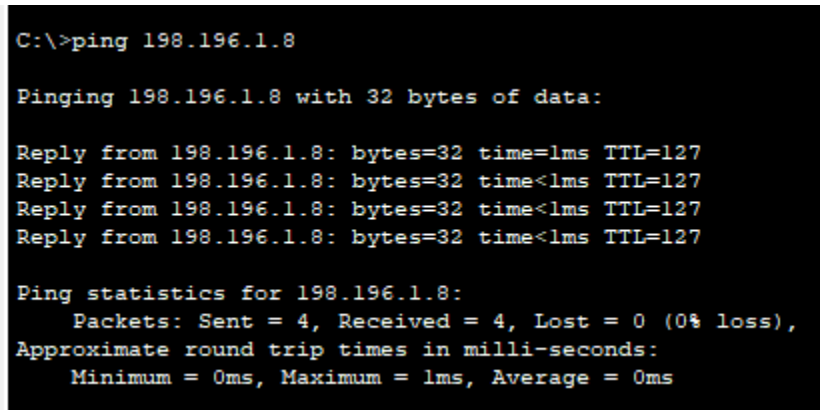


Fig: Interconnection of LAN

OUTPUT:



DISCUSSION:

We Interconnect two LANs using router and test the connectivity.

CONCLUSION:

We simulates the working process of router and interconnect two different network.

Lab 6

Configuring DHCP server to assign IP address dynamically.

OBJECTIVES:

- To know about DHCP server.
- To know how DHCP server assign IP address dynamically.

BACKGROUND THEORY:

DHCP (Dynamic Host Configuration Protocol) is a network management protocol used to dynamically assign an IP address to any device, or node, on a network so it can communicate using IP. DHCP automates and centrally manages these configurations rather than requiring network administrators to manually assign IP addresses to all network devices. DHCP can be implemented on small local networks, as well as large enterprise networks.

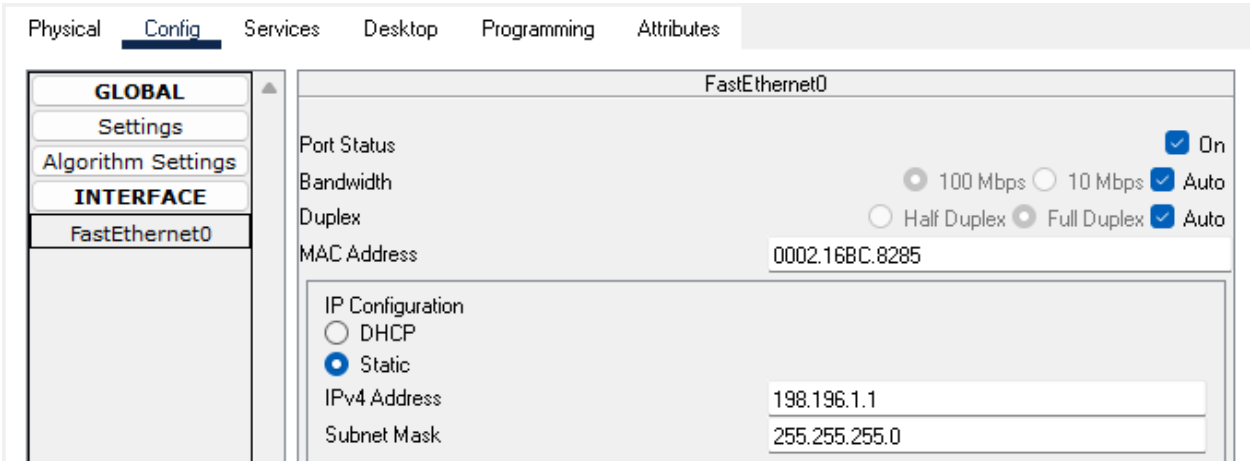
PROCESS FOR DHCP SERVER TO ASSIGN IP ADDRESSES:

Step 1: Set a switch with one server and set a desktop as required.

Step 2: Go to configuration of a server then click on interface and give the IP address of the server.

Step 3: Go to services of the server, click on DHCP option then on the DHCP service.

Step 4: Go to IP configuration of the desktop then turn on the DHCP server.



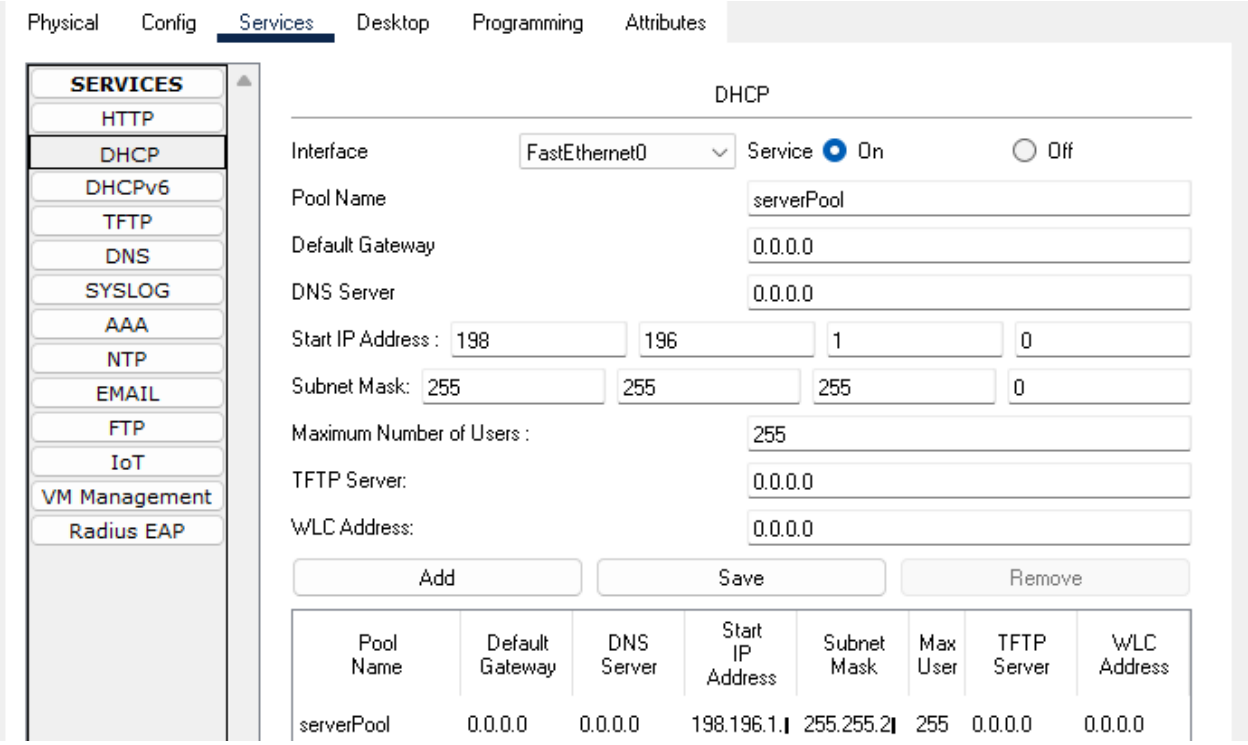


Fig: Server configuration

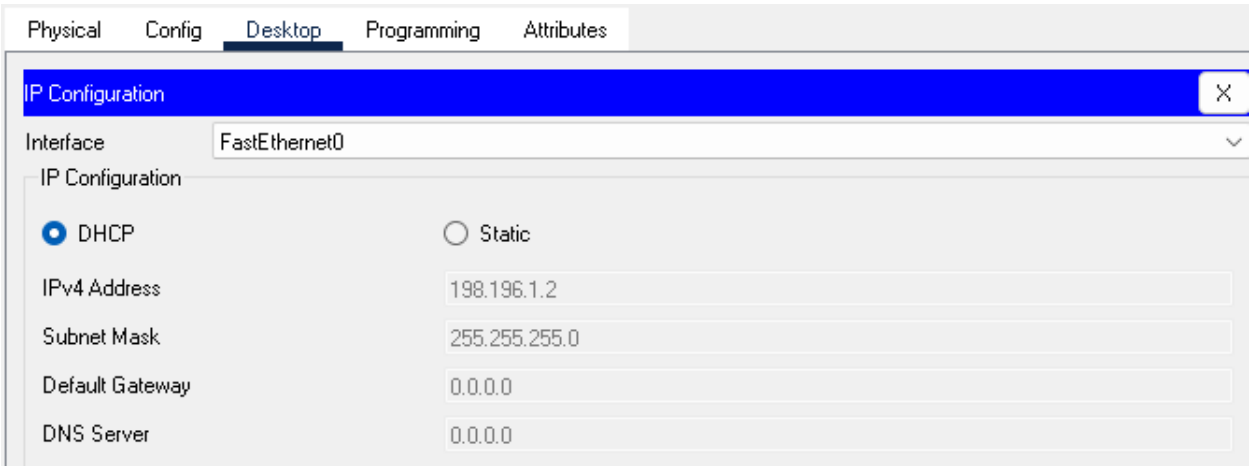
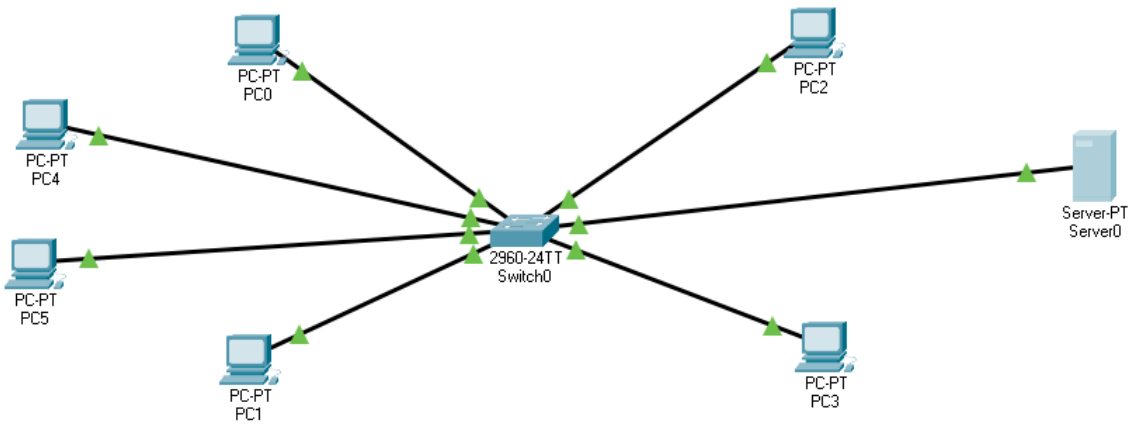


Fig: IP assignment directly to PCs.

OBSERVATION AND FINDING:

DHCP server IP assignment.



DISCUSSION:

We configure DHCP server and assign IP address to pc automatically.

CONCLUSION:

The aim of this lab is to become familiar with DHCP server.

Lab 7

Static Routing

OBJECTIVES:

- To know about static routing.
- To know how to give IP route to router.

BACKGROUND THEORY:

Static routing is process of adding routing pathway manually to the router. It is done by network administrator.

PROCESS FOR STATIC ROUTING

Step1: Set a router with IP address

Step2: Set up two LANs.

Step3: Set an another router with IP address

Step4: connect all the devices in the proper way.

Step5: Enable ports of routers

Step6: add a static router from configuration of both router

Step7: Communicate from one node to another

OBSERVATION AND FINDINGS:

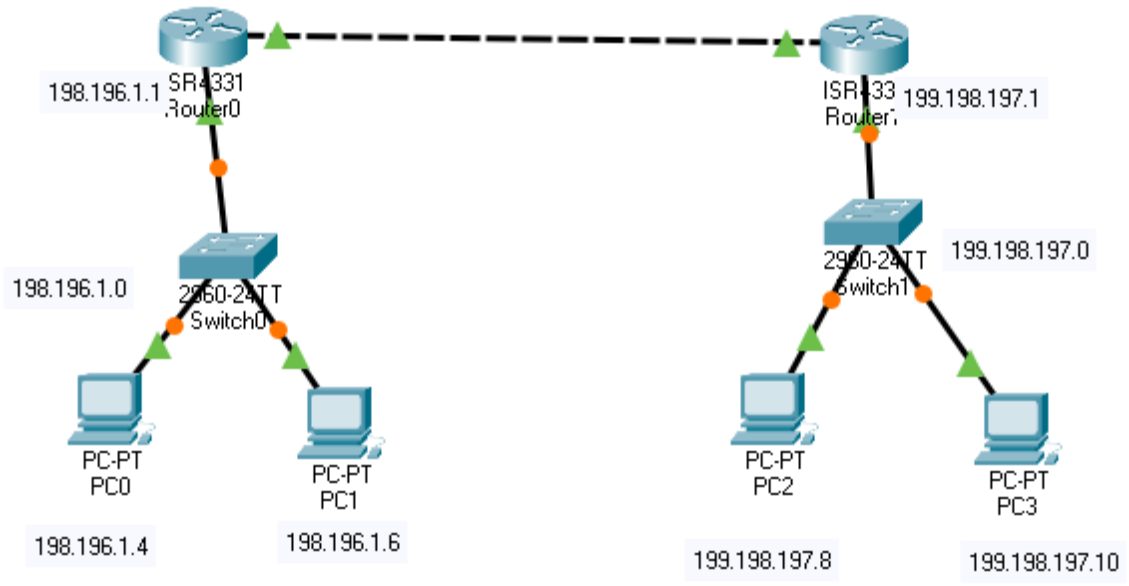


Fig: Static Routing

OUTPUT:

```
C:\>ping 199.198.197.10

Pinging 199.198.197.10 with 32 bytes of data:

Reply from 199.198.197.10: bytes=32 time<1ms TTL=126
Reply from 199.198.197.10: bytes=32 time<1ms TTL=126
Reply from 199.198.197.10: bytes=32 time<1ms TTL=126
Reply from 199.198.197.10: bytes=32 time<1ms TTL=126

Ping statistics for 199.198.197.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

DISCUSSION:

Static Routing using GUI is implemented in this lab. We provide manual route for the router and test connectivity.

CONCLUSION:

In this lab we add static route for router and test connectivity.

Lab 8

HTTP And DNS Server

OBJECTIVES:

- To know about DNS and Web server.
- To know how DNS server and Web server work.

BACKGROUND THEORY:

Domain Name System (DNS) connects URLs with their IP address. With DNS, it's possible to type words instead of a string of numbers into a browser, allowing people to search for websites and send emails using familiar names. When you search for a domain name in a browser, it sends a query over the internet to match the domain with its corresponding IP. Once located, it uses the IP to retrieve the website's content. Most impressively, this whole process takes just milliseconds.

A web server stores and delivers the content for a website – such as text, images, video, and application data – to clients that request it. The most common type of client is a web browser program, which requests data from your website when a user clicks on a link or downloads a document on a page displayed in the browser.

PROCESS FOR adding HTTP and DNS server

Step 1: drag and drop two server for each DNS and HTTP, one desktop, a switch and assign IP address to servers and pc.

Step 2: For http server enable the http services on configuration of server.

Step 3: enable DNS service and add domain name and its corresponding address.

Step 6: enter domain name in web browser

OBSERVATION AND FINDINGS:

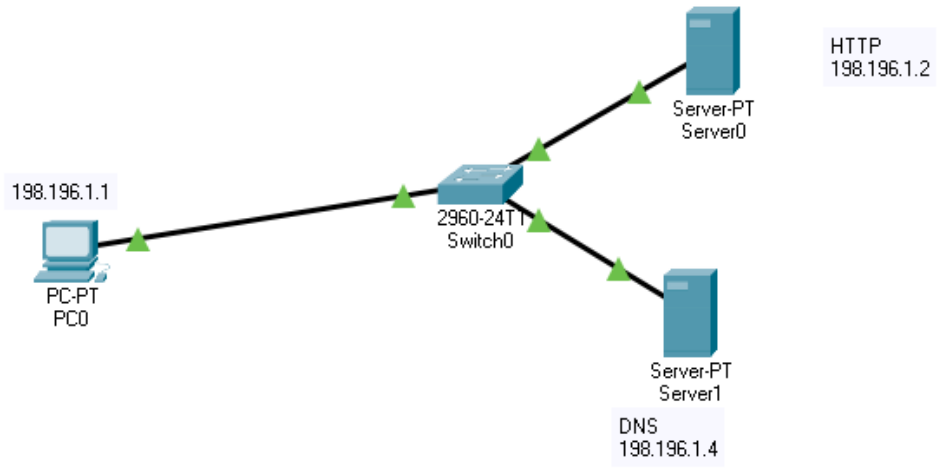
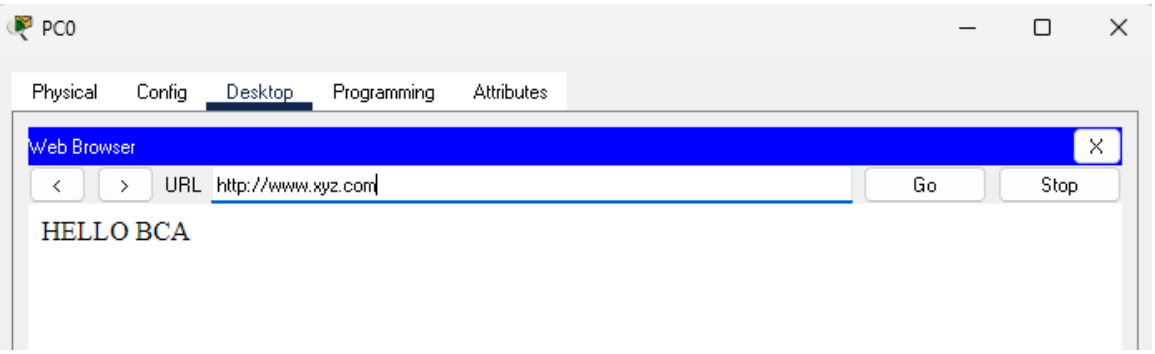


Fig: configuring HTTP and DNS server

OUTPUT:



DISCUSSION:

We communicate with web server using domain name in this lab.

CONCLUSION:

In this lab, we add web server address in DNS server with domain name xyz.com and access the http server with that domain.