

Practical 7

Configuring server and client

Aim: Configure the following Servers using a suitable topology

- a) Configure DHCP
- b) Configure DNS
- c) Configure HTTP
- d) Configure Telnet
- e) Configure FTP

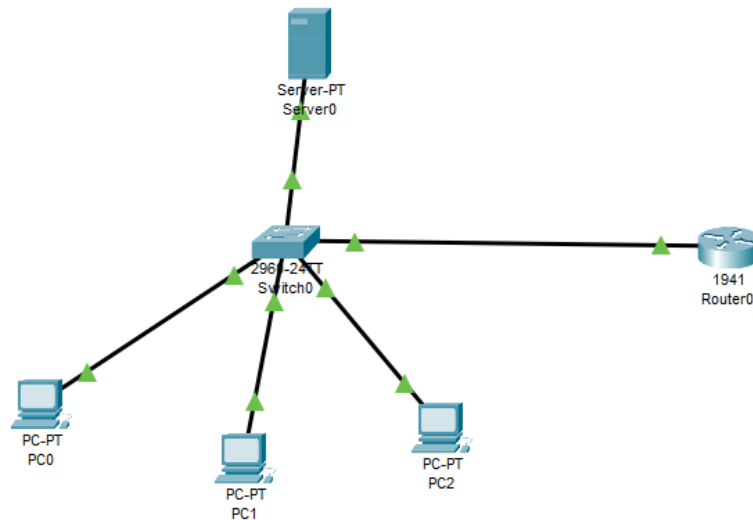
a) Configure DHCP

DHCP, which stands for Dynamic Host Configuration Protocol, is a standardized network protocol used to automatically assign and manage IP addresses and other network configuration parameters to devices on a network. It is an essential component of most modern computer networks, including local area networks (LANs) and larger networks such as the Internet.

The primary purpose of DHCP is to simplify the process of configuring IP addresses and related network settings for devices, such as computers, smartphones, tablets, and other network-enabled devices. Without DHCP, network administrators would need to manually assign unique IP addresses to each device on the network, which could be time-consuming and prone to errors.

In order to configure the DHCP server, we do the following

We use the following topology



We assign the following IP addresses

	IP address	Subnet Mask
Router Interface G0/0	10.0.0.1	255.0.0.0
Server	10.0.0.2	
PC0	Will be assigned by DHCP server	
PC1		
PC2		

Configuring the Devices:

Router0:

The screenshot shows the configuration window for Router0, specifically the 'Config' tab for the GigabitEthernet0/0 interface. The left sidebar contains a tree view with categories: GLOBAL, ROUTING, SWITCHING, and INTERFACE. Under the INTERFACE category, 'GigabitEthernet0/0' is selected. The main configuration area for GigabitEthernet0/0 includes the following settings:

- Port Status: ☒ On
- Bandwidth: ☐ 1000 Mbps ☒ 100 Mbps ☐ 10 Mbps
- Duplex: ☐ Half Duplex ☒ Full Duplex
- MAC Address: 0009.7C92.3401
- IP Configuration:
 - IPv4 Address: 10.0.0.1
 - Subnet Mask: 255.0.0.0
- Tx Ring Limit: 10

Server:

Server0

Physical Config Services **Desktop** Programming Attributes

IP Configuration

IP Configuration

☐ DHCP ☒ Static

IPv4 Address: 10.0.0.2

Subnet Mask: 255.0.0.0

Default Gateway: 10.0.0.1

DNS Server: 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address: /

Link Local Address: FE80::207:ECFF:FE74:59D4

Default Gateway:

DNS Server:

802.1X

☐ Use 802.1X Security

Setting the Server for DHCP service:

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: Pool

Default Gateway: 10.0.0.1

DNS Server: 0.0.0.0

Start IP Address: 10 0 0 3

Subnet Mask: 255 0 0 0

Maximum Number of Users: 512

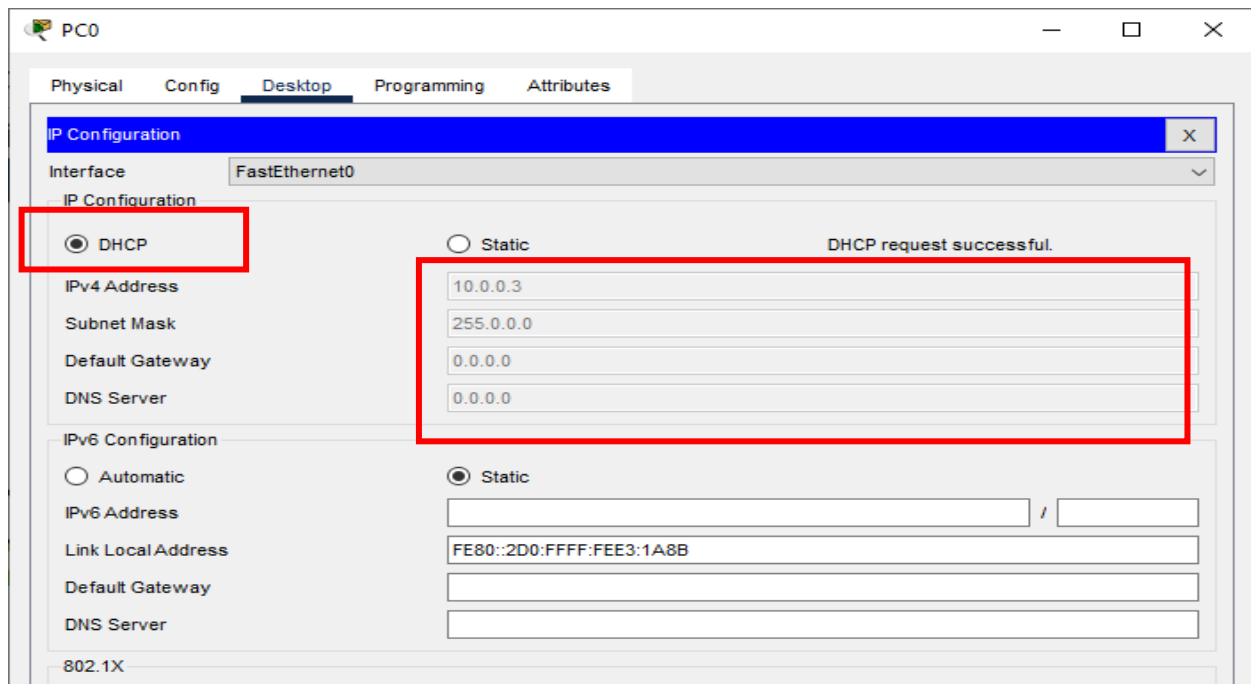
TFTP Server: 0.0.0.0

WLC Address: 0.0.0.0

Add Save Remove

Pool Name	Default Gateway	DNS Server	Start IP Address	Subnet Mask	Max User	TFTP Server	WLC Address
Pool	10.0.0.1	0.0.0.0	10.0.0.3	255.0.0.0	512	0.0.0.0	0.0.0.0
serverPool	0.0.0.0	0.0.0.0	10.0.0.0	255.0.0.0	512	0.0.0.0	0.0.0.0

In order to verify the working of the DHCP protocol, we do the following for all the PCs



Hence DHCP protocol is verified

For Video
demonstration of
the DHCP, scan
the QR-code

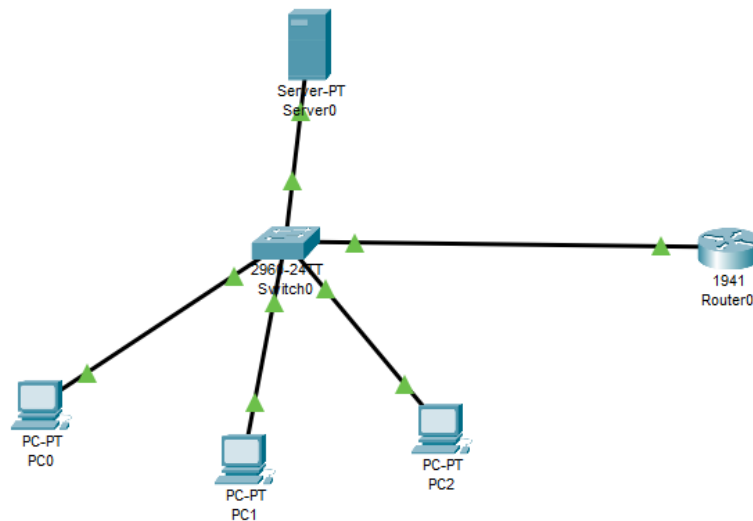


b) Configure DNS

DNS stands for Domain Name System. It is a fundamental part of the internet infrastructure and serves as a decentralized system for translating human-readable domain names into IP addresses, which are used by computers to identify each other on the internet.

When we type a website's domain name into your web browser (e.g., www.ismile.com), the DNS comes into play. The DNS acts as a phonebook for the internet, converting the domain name into the corresponding IP address (e.g., 192.0.2.1) that represents the actual location of the website's server on the internet.

We use the following topology



We use the following IP addresses for the given topology

	IP address	Default Gateway	Subnet Mask	DNS Server
Router Interface G0/0	10.0.0.1	10.0.0.1	255.0.0.0	10.0.0.2
Server	10.0.0.2			
PC0	10.0.0.3			
PC1	10.0.0.4			
PC2	10.0.0.5			

Configuring the Devices:**Router0:**

The screenshot shows the configuration window for Router0. The 'Config' tab is selected, and the 'GigabitEthernet0/0' interface is chosen from the left sidebar. The interface settings are as follows:

Setting	Value
Port Status	<input checked="" type="checkbox"/> On
Bandwidth	<input type="radio"/> 1000 Mbps <input checked="" type="radio"/> 100 Mbps <input type="radio"/> 10 Mbps <input checked="" type="checkbox"/> Auto
Duplex	<input type="radio"/> Half Duplex <input checked="" type="radio"/> Full Duplex <input checked="" type="checkbox"/> Auto
MAC Address	0009.7C92.3401
IP Configuration	
IPv4 Address	10.0.0.1
Subnet Mask	255.0.0.0
Tx Ring Limit	10

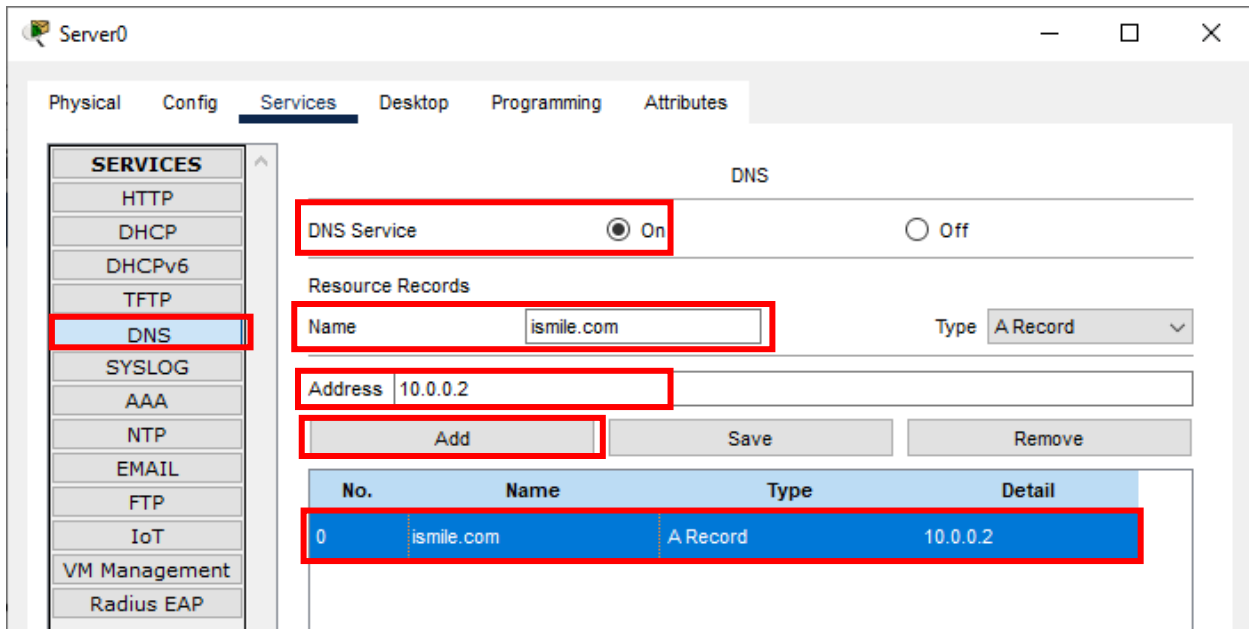
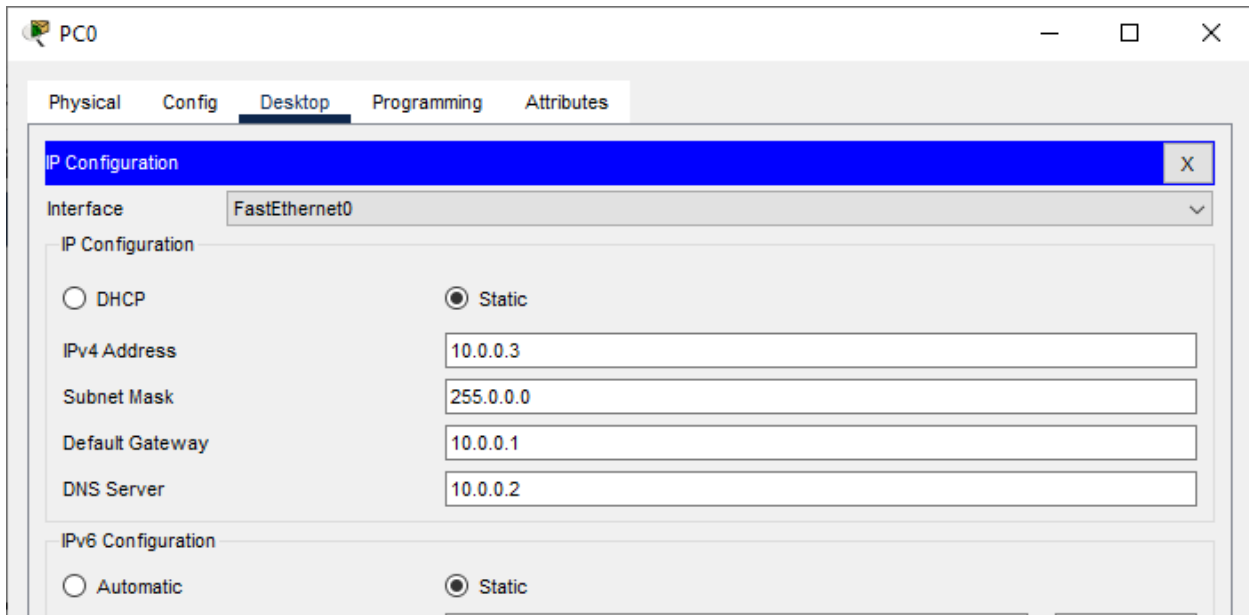
Server:

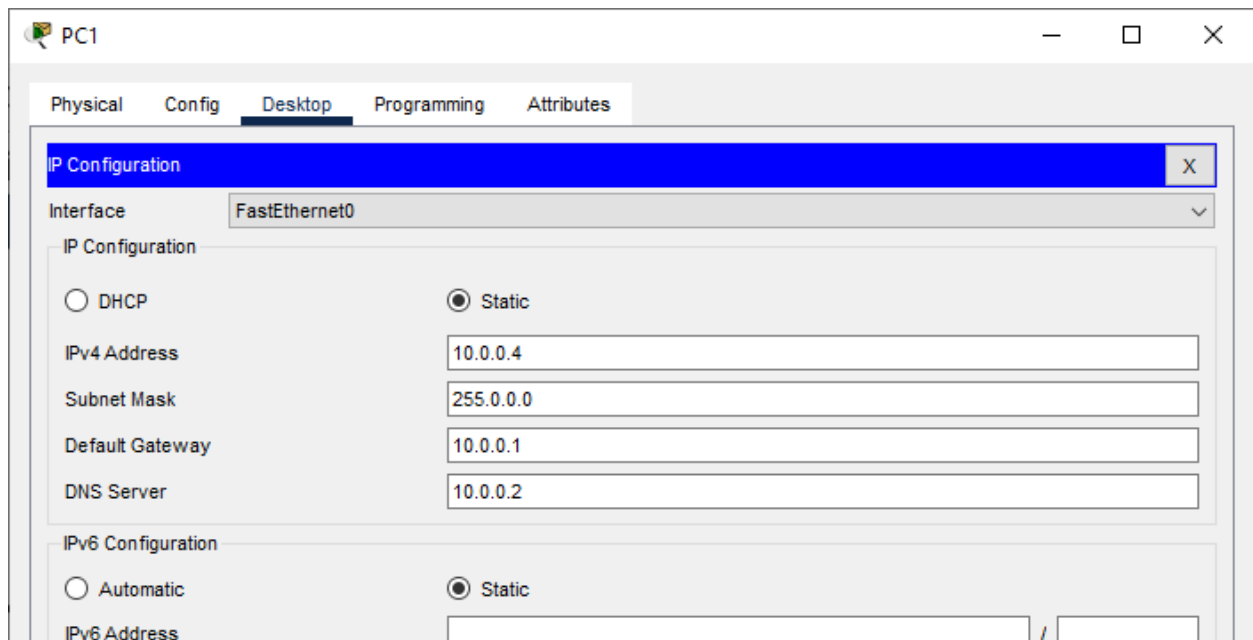
The screenshot shows the configuration window for Server0. The 'Desktop' tab is selected, and the 'IP Configuration' window is open. The settings are as follows:

Setting	Value
IP Configuration	<input checked="" type="radio"/> DHCP <input checked="" type="radio"/> Static
IPv4 Address	10.0.0.2
Subnet Mask	255.0.0.0
Default Gateway	10.0.0.1
DNS Server	10.0.0.2
IPv6 Configuration	<input type="radio"/> Automatic <input checked="" type="radio"/> Static
IPv6 Address	
Link Local Address	FE80::260:3EFF:FEE3:EA2B
Default Gateway	
DNS Server	

Setting the Server for DNS service:

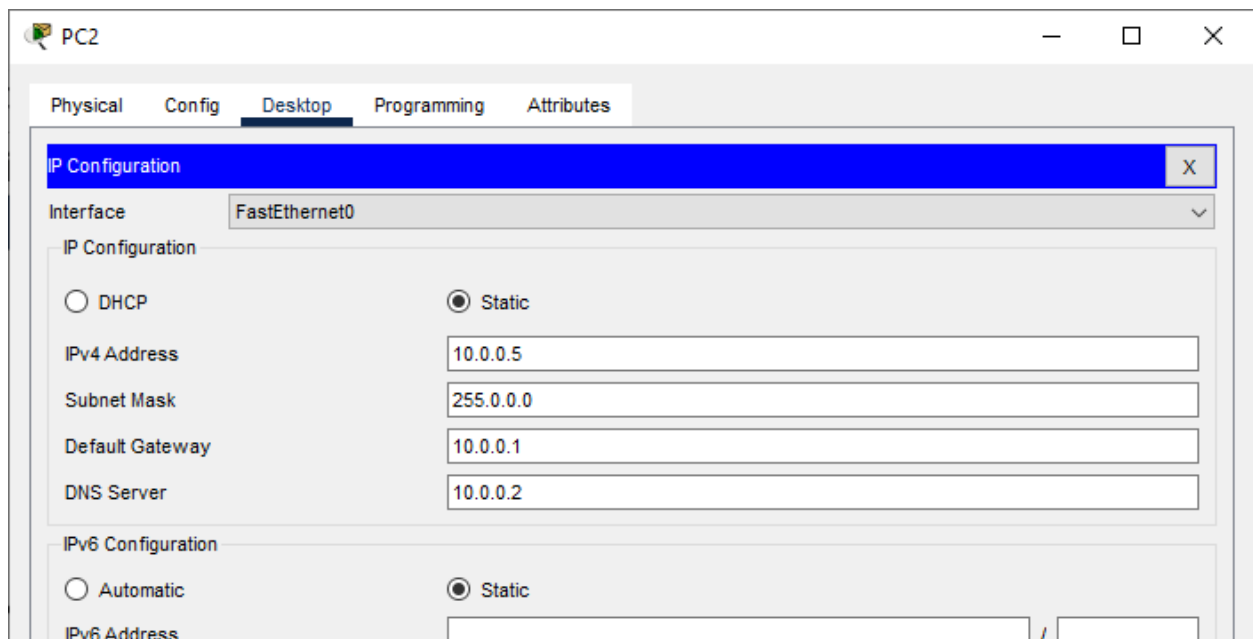
We set the website ismile.com on the Server (10.0.0.2)

**PC0:**

PC1:

The screenshot shows the configuration window for PC1. The 'Desktop' tab is selected. The 'IP Configuration' section is highlighted in blue. The 'Interface' dropdown is set to 'FastEthernet0'. Under 'IP Configuration', the 'Static' radio button is selected. The fields are filled with: IPv4 Address: 10.0.0.4, Subnet Mask: 255.0.0.0, Default Gateway: 10.0.0.1, and DNS Server: 10.0.0.2. The 'IPv6 Configuration' section is also visible, with 'Static' selected and the IPv6 Address field empty.

Field	Value
Interface	FastEthernet0
IP Configuration	Static
IPv4 Address	10.0.0.4
Subnet Mask	255.0.0.0
Default Gateway	10.0.0.1
DNS Server	10.0.0.2
IPv6 Configuration	Static
IPv6 Address	

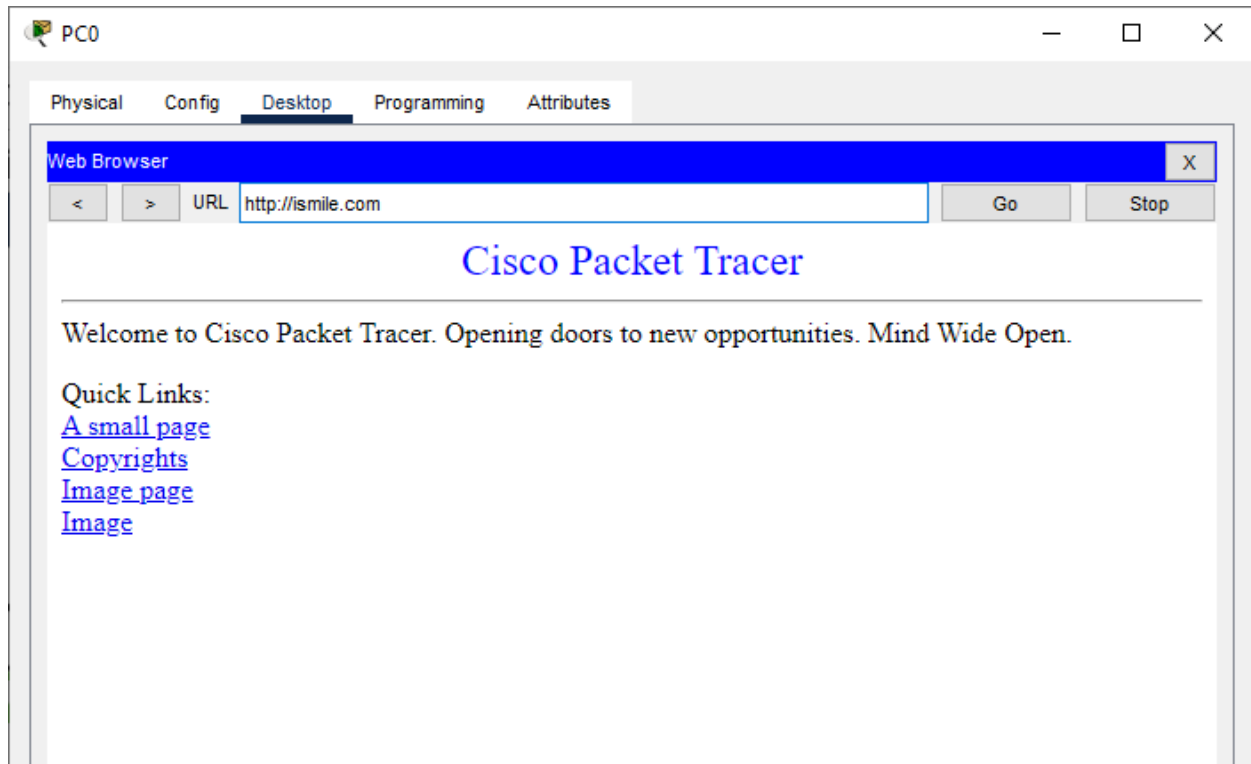
PC2:

The screenshot shows the configuration window for PC2. The 'Desktop' tab is selected. The 'IP Configuration' section is highlighted in blue. The 'Interface' dropdown is set to 'FastEthernet0'. Under 'IP Configuration', the 'Static' radio button is selected. The fields are filled with: IPv4 Address: 10.0.0.5, Subnet Mask: 255.0.0.0, Default Gateway: 10.0.0.1, and DNS Server: 10.0.0.2. The 'IPv6 Configuration' section is also visible, with 'Static' selected and the IPv6 Address field empty.

Field	Value
Interface	FastEthernet0
IP Configuration	Static
IPv4 Address	10.0.0.5
Subnet Mask	255.0.0.0
Default Gateway	10.0.0.1
DNS Server	10.0.0.2
IPv6 Configuration	Static
IPv6 Address	

We verify the working of DNS as follows:

(Open the web browser of any PC and type ismile.com in the address bar)



For Video
demonstration of
the DNS, scan
the QR-code

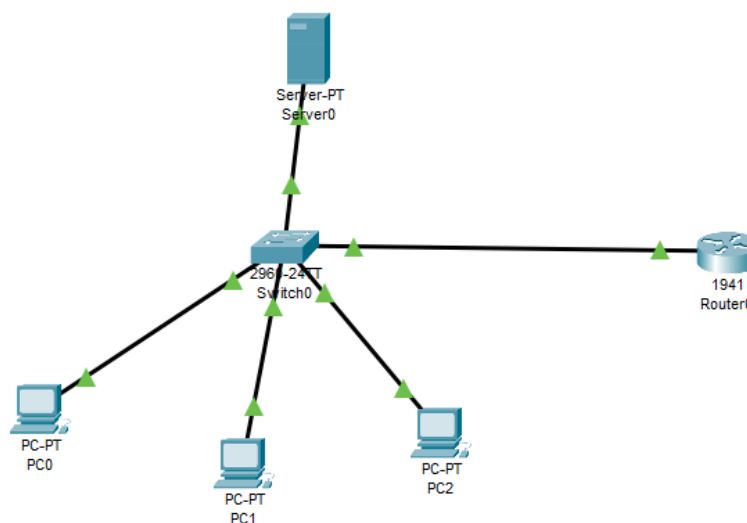


c) Configure HTTP

HTTP stands for Hypertext Transfer Protocol. It is an application layer protocol used for transmitting and receiving data over the internet. HTTP is the foundation of data communication on the World Wide Web and is the standard protocol used for accessing websites, retrieving resources, and interacting with web servers.

When we type a URL (Uniform Resource Locator) into your web browser and press Enter, the browser uses HTTP to communicate with the web server hosting the website and request the specified resource (such as a web page, image, video, etc.). The server then responds by sending back the requested resource, and the browser interprets the data received to display the web page or resource to the user

We use the following topology



We use the following IP addresses for the given topology

	IP address	Default Gateway	Subnet Mask	DNS Server
Router Interface G0/0	10.0.0.1	10.0.0.1	255.0.0.0	10.0.0.2
Server	10.0.0.2			
PC0	10.0.0.3			
PC1	10.0.0.4			
PC2	10.0.0.5			

Configuring the Devices:**Router0:**

The screenshot shows the configuration window for Router0. The 'Config' tab is selected. On the left, a tree view shows the configuration hierarchy: GLOBAL (Settings, Algorithm Settings), ROUTING (Static, RIP), SWITCHING (VLAN Database), and INTERFACE (GigabitEthernet0/0, GigabitEthernet0/1). The 'GigabitEthernet0/0' interface is selected. The main area shows the following settings:

- Port Status: ☒ On
- Bandwidth: ☐ 1000 Mbps ☒ 100 Mbps ☐ 10 Mbps ☒ Auto
- Duplex: ☐ Half Duplex ☒ Full Duplex ☒ Auto
- MAC Address: 0009.7C92.3401
- IP Configuration:
 - IPv4 Address: 10.0.0.1
 - Subnet Mask: 255.0.0.0
- Tx Ring Limit: 10

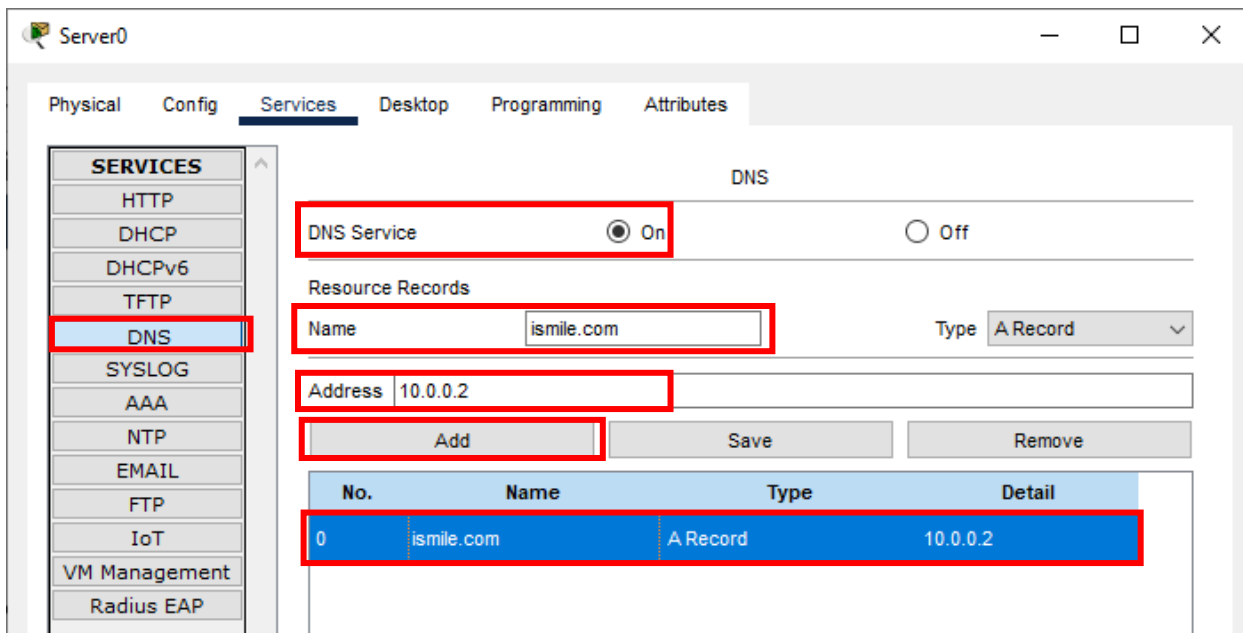
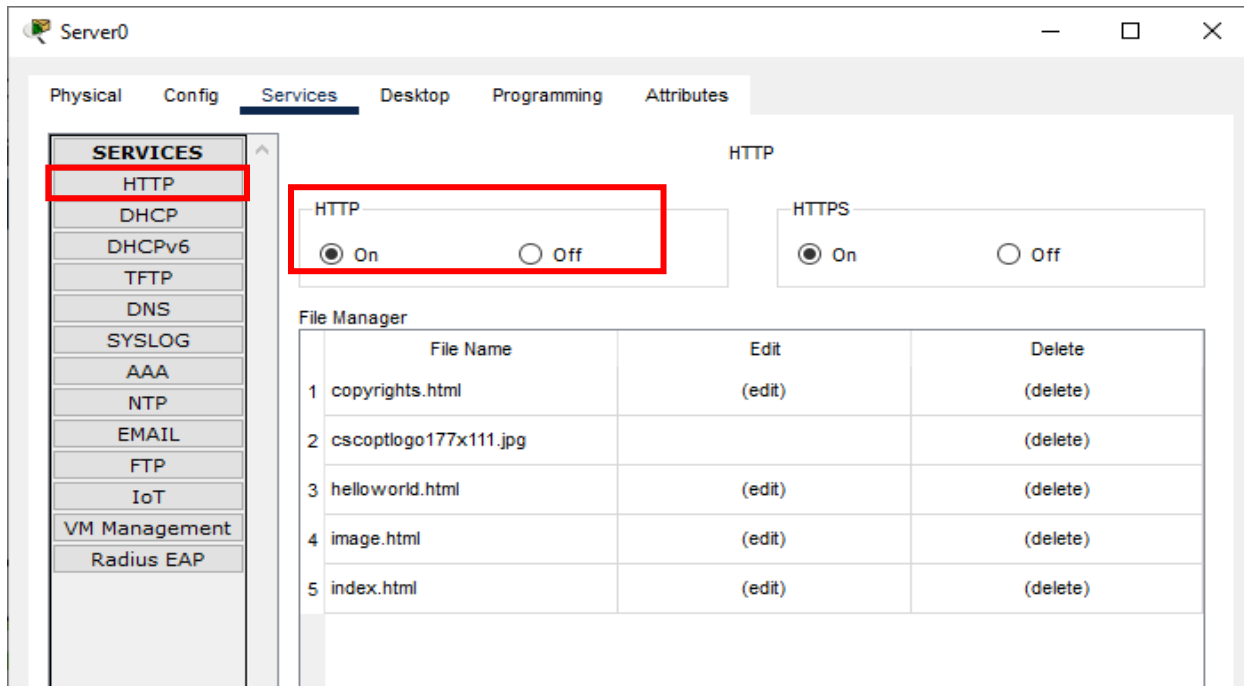
Server:

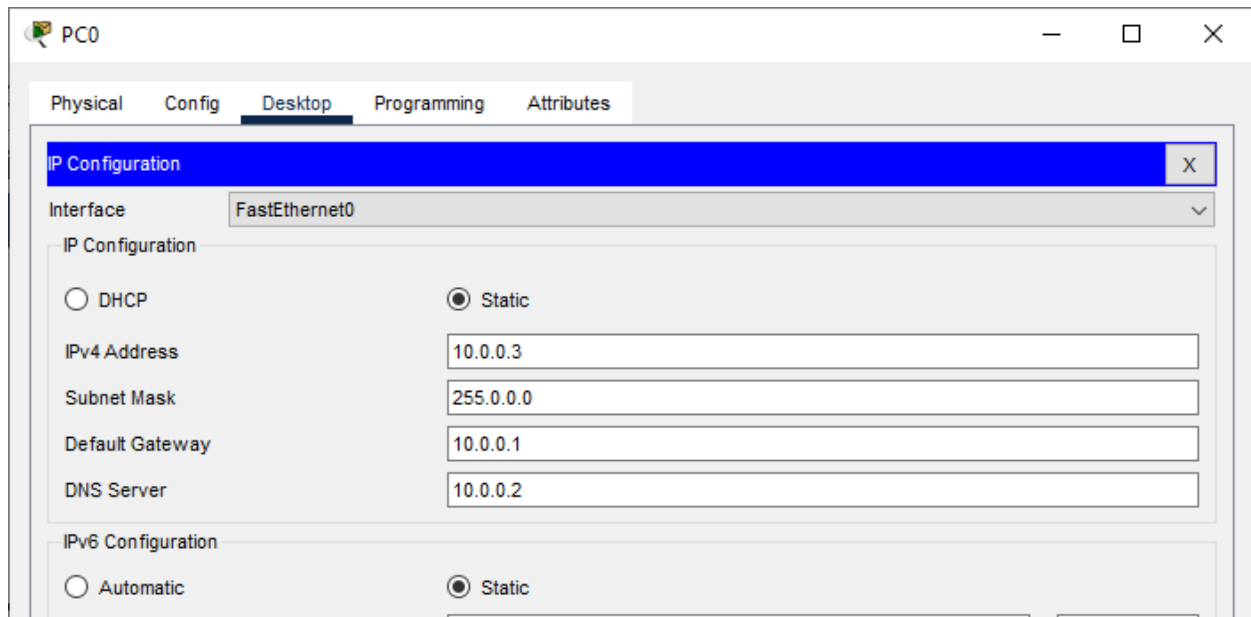
The screenshot shows the configuration window for Server0. The 'Desktop' tab is selected. The 'IP Configuration' window is open, showing the following settings:

- IP Configuration: ☐ DHCP ☒ Static
- IPv4 Address: 10.0.0.2
- Subnet Mask: 255.0.0.0
- Default Gateway: 10.0.0.1
- DNS Server: 10.0.0.2
- IPv6 Configuration: ☐ Automatic ☒ Static
- IPv6 Address: /
- Link Local Address: FE80::260:3EFF:FEE3:EA2B
- Default Gateway:
- DNS Server:

Setting the Server for DNS service: (For HTTP we need to do set a website)

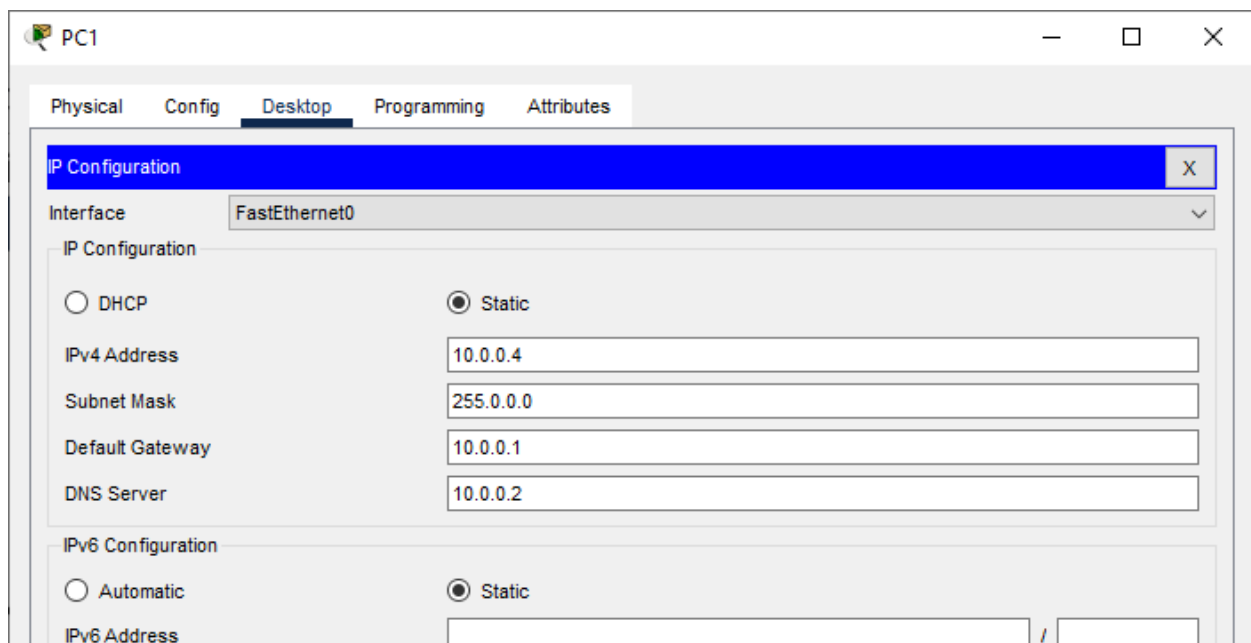
We set the website ismile.com on the Server (10.0.0.2)

**Setting the Server for HTTP service:**

PC0:

The screenshot shows the configuration window for PC0. The 'Desktop' tab is selected. The 'IP Configuration' section is highlighted with a blue bar. The 'Interface' dropdown is set to 'FastEthernet0'. Under 'IP Configuration', the 'Static' radio button is selected. The fields are filled with: IPv4 Address: 10.0.0.3, Subnet Mask: 255.0.0.0, Default Gateway: 10.0.0.1, and DNS Server: 10.0.0.2. The 'IPv6 Configuration' section is also visible, with the 'Static' radio button selected.

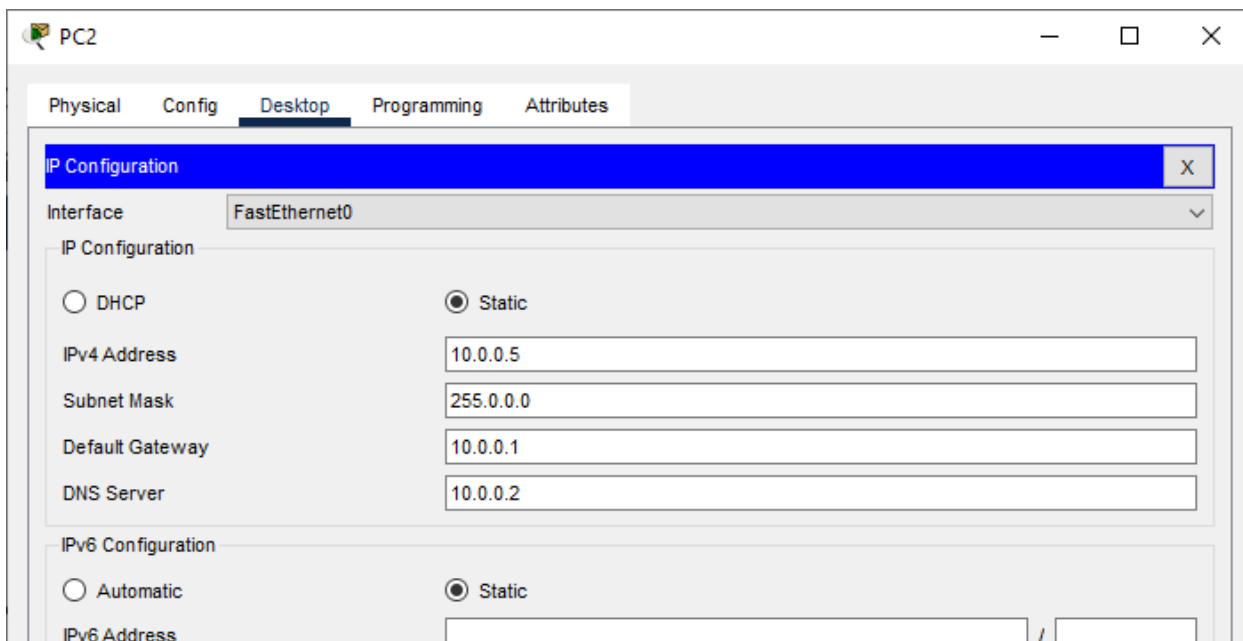
Field	Value
Interface	FastEthernet0
IP Configuration	Static
IPv4 Address	10.0.0.3
Subnet Mask	255.0.0.0
Default Gateway	10.0.0.1
DNS Server	10.0.0.2
IPv6 Configuration	Static

PC1:

The screenshot shows the configuration window for PC1. The 'Desktop' tab is selected. The 'IP Configuration' section is highlighted with a blue bar. The 'Interface' dropdown is set to 'FastEthernet0'. Under 'IP Configuration', the 'Static' radio button is selected. The fields are filled with: IPv4 Address: 10.0.0.4, Subnet Mask: 255.0.0.0, Default Gateway: 10.0.0.1, and DNS Server: 10.0.0.2. The 'IPv6 Configuration' section is also visible, with the 'Static' radio button selected.

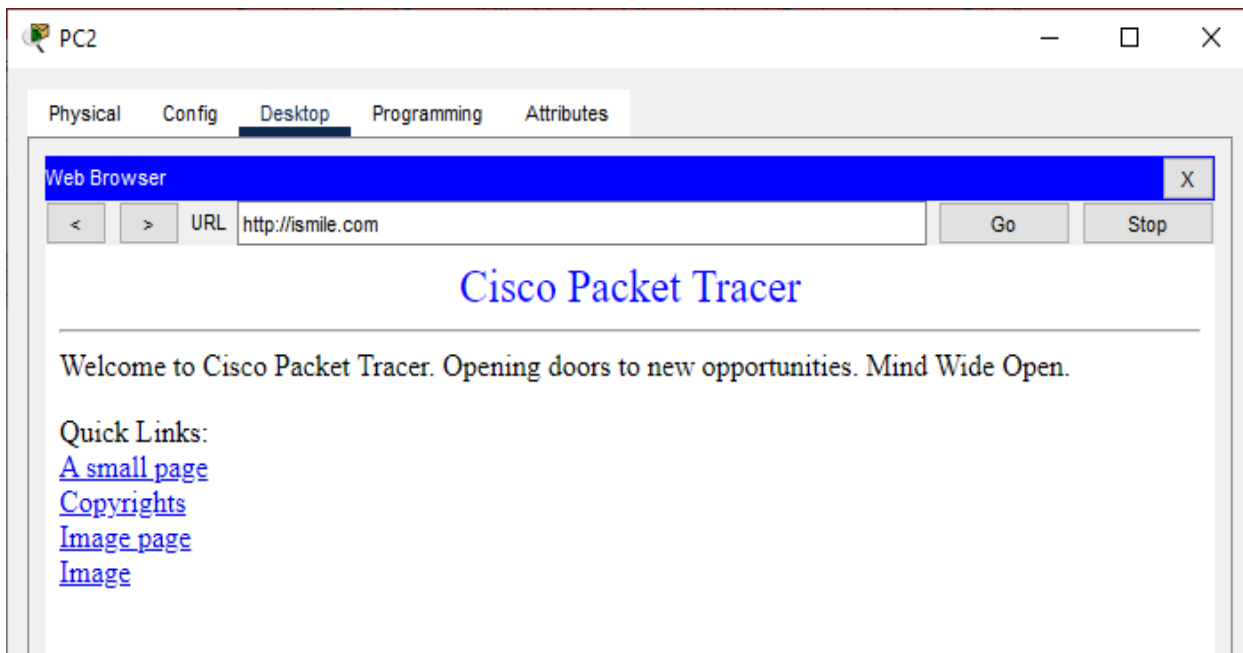
Field	Value
Interface	FastEthernet0
IP Configuration	Static
IPv4 Address	10.0.0.4
Subnet Mask	255.0.0.0
Default Gateway	10.0.0.1
DNS Server	10.0.0.2
IPv6 Configuration	Static

PC2:

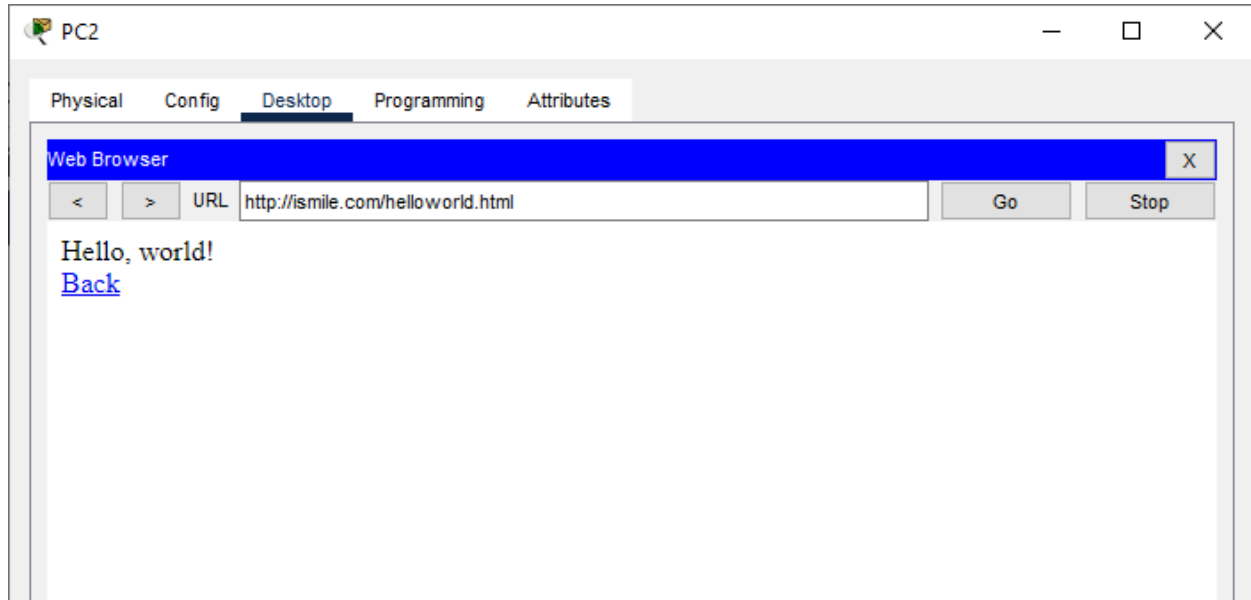


We verify the working of HTTP as follows:

(Open the web browser of any PC and type ismile.com in the address bar)



If we click on [A small page](#) we get the following.



For Video
demonstration
of the HTTP,
scan the QR-
code



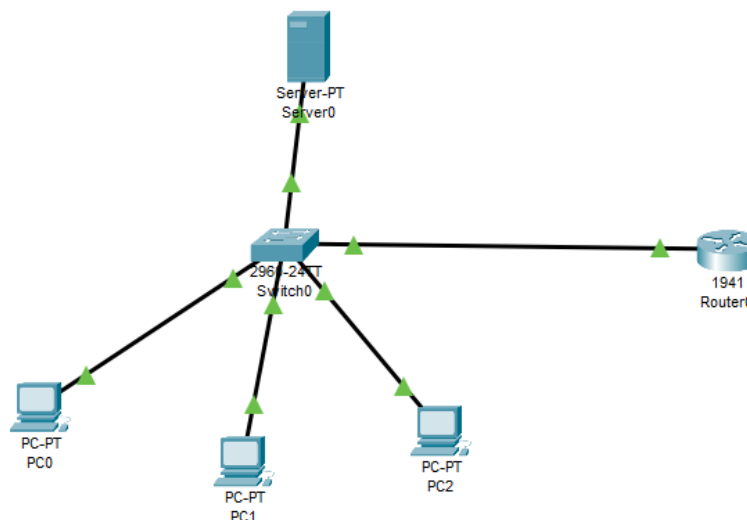
d) Configure TELNET

TELNET stands for "TERminal NETwork," and it is a network protocol used to establish a text-based interactive communication session between two devices over a computer network. It was one of the earliest protocols used to connect and communicate with remote computers.

In a TELNET session, one device acts as the client, and the other as the server. The client device initiates the connection to the server, and once the connection is established, the client can interact with the server through a command-line interface.

Originally, TELNET was primarily used for remote login and terminal access to mainframe computers and other multi-user systems. It allowed users to access resources and services on a remote machine as if they were sitting in front of it. However, due to security concerns, TELNET has largely been replaced by more secure protocols like SSH (Secure Shell), which encrypts the data transmitted over the network and provides better protection against unauthorized access and eavesdropping.

We use the following topology



We use the following IP addresses for the given topology

	IP address	Default Gateway	Subnet Mask
Router Interface G0/0	10.0.0.1	10.0.0.1	255.0.0.0
Server	10.0.0.2		
PC0	10.0.0.3		
PC1	10.0.0.4		
PC2	10.0.0.5		

Configuring the Devices:**Router0:**

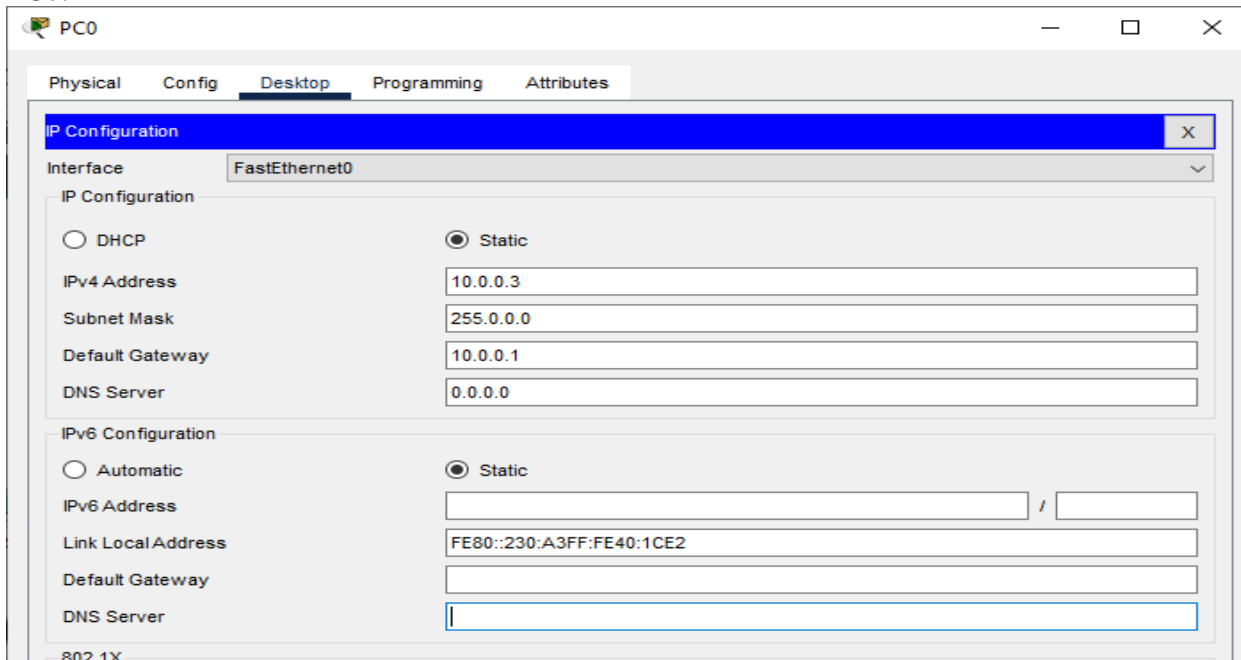
The screenshot shows the configuration window for Router0. The 'Config' tab is selected. On the left, a tree view shows the configuration hierarchy: GLOBAL (Settings, Algorithm Settings), ROUTING (Static, RIP), SWITCHING (VLAN Database), and INTERFACE (GigabitEthernet0/0, GigabitEthernet0/1). The 'GigabitEthernet0/0' interface is selected. The main area shows the following settings:

- Port Status: ☒ On
- Bandwidth: ☐ 1000 Mbps ☒ 100 Mbps ☐ 10 Mbps ☒ Auto
- Duplex: ☐ Half Duplex ☒ Full Duplex ☒ Auto
- MAC Address: 0009.7C92.3401
- IP Configuration:
 - IPv4 Address: 10.0.0.1
 - Subnet Mask: 255.0.0.0
- Tx Ring Limit: 10

Server:

The screenshot shows the configuration window for Server0. The 'Desktop' tab is selected. The 'IP Configuration' window is open, showing the following settings:

- IP Configuration:
 - ☐ DHCP ☒ Static
 - IPv4 Address: 10.0.0.2
 - Subnet Mask: 255.0.0.0
 - Default Gateway: 10.0.0.1
 - DNS Server: (empty field)
- IPv6 Configuration:
 - ☐ Automatic ☒ Static
 - IPv6 Address: (empty field) / (empty field)
 - Link Local Address: FE80::260:3EFF:FEE3:EA2B
 - Default Gateway: (empty field)
 - DNS Server: (empty field)

PC0:

PC0

Physical Config **Desktop** Programming Attributes

IP Configuration

Interface: FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address: 10.0.0.3

Subnet Mask: 255.0.0.0

Default Gateway: 10.0.0.1

DNS Server: 0.0.0.0

IPv6 Configuration

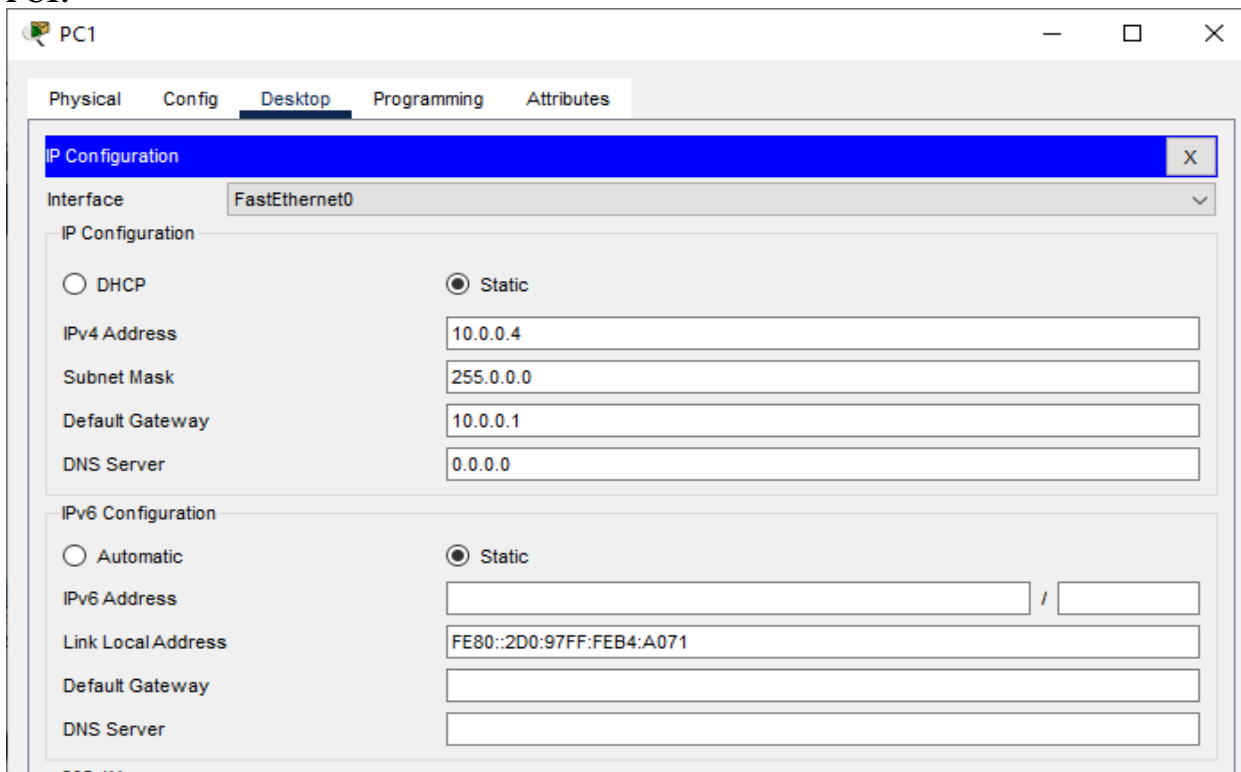
☐ Automatic ☒ Static

IPv6 Address: /

Link Local Address: FE80::230:A3FF:FE40:1CE2

Default Gateway:

DNS Server:

PC1:

PC1

Physical Config **Desktop** Programming Attributes

IP Configuration

Interface: FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address: 10.0.0.4

Subnet Mask: 255.0.0.0

Default Gateway: 10.0.0.1

DNS Server: 0.0.0.0

IPv6 Configuration

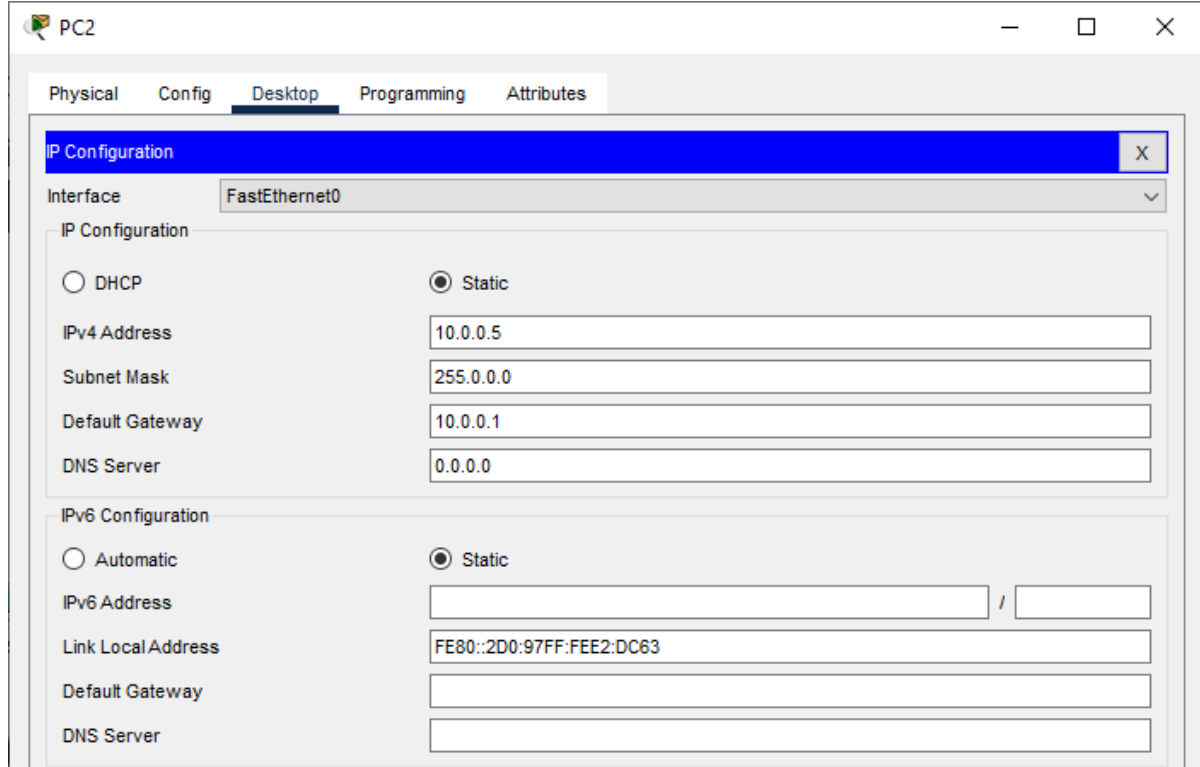
☐ Automatic ☒ Static

IPv6 Address: /

Link Local Address: FE80::2D0:97FF:FEB4:A071

Default Gateway:

DNS Server:

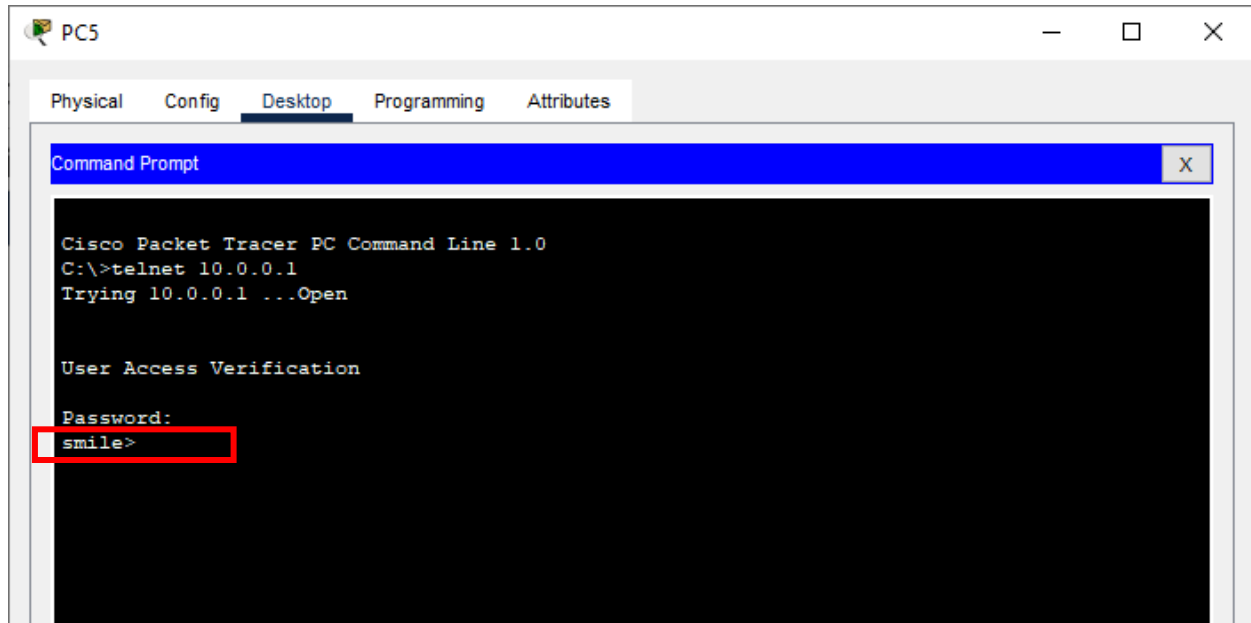
PC2:

Type the following command in the CLI mode of the Router

```
Router>enable
Router#
Router#configure terminal
Router(config)#
Router(config)#hostname smile
smile(config)#
smile(config)#line vty 0 4
smile(config-line)#
smile(config-line)#password cisco
smile(config-line)#login
smile(config-line)#enable secret cisco
smile(config)#exit
smile#
```

To verify the TELNET protocol, we type the following commands in any of the PCs

```
telnet 10.0.0.1
Password: cisco
```



For Video
demonstration
of the TELNET,
scan the
QR-code

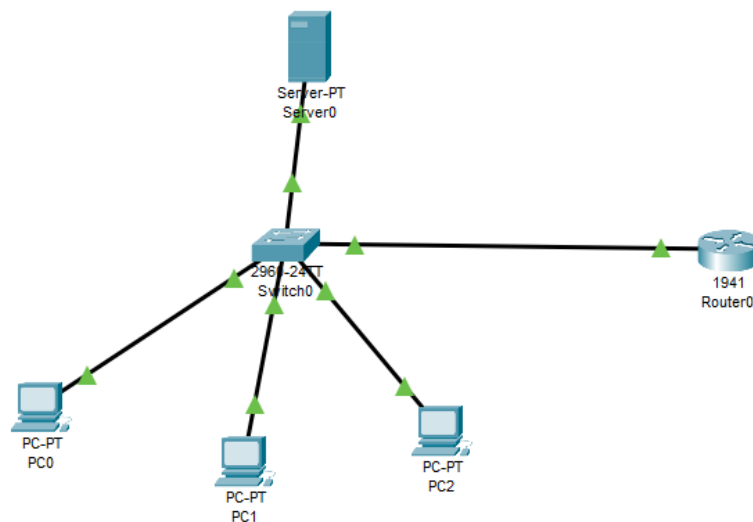


e) Configure FTP

FTP stands for "File Transfer Protocol." It is a standard network protocol used to transfer files between a client and a server on a computer network, such as the Internet or an intranet. FTP allows users to upload and download files, as well as perform various file operations on remote systems.

The FTP communication typically involves two entities: the FTP client and the FTP server. The FTP client is the software running on the user's local computer that initiates the file transfer request, and the FTP server is the remote system that stores and manages the files.

We use the following topology



We use the following IP addresses for the given topology

	IP address	Default Gateway	Subnet Mask
Router Interface G0/0	10.0.0.1	10.0.0.1	255.0.0.0
Server	10.0.0.2		
PC0	10.0.0.3		
PC1	10.0.0.4		
PC2	10.0.0.5		

Configuring the Devices:**Router0:**

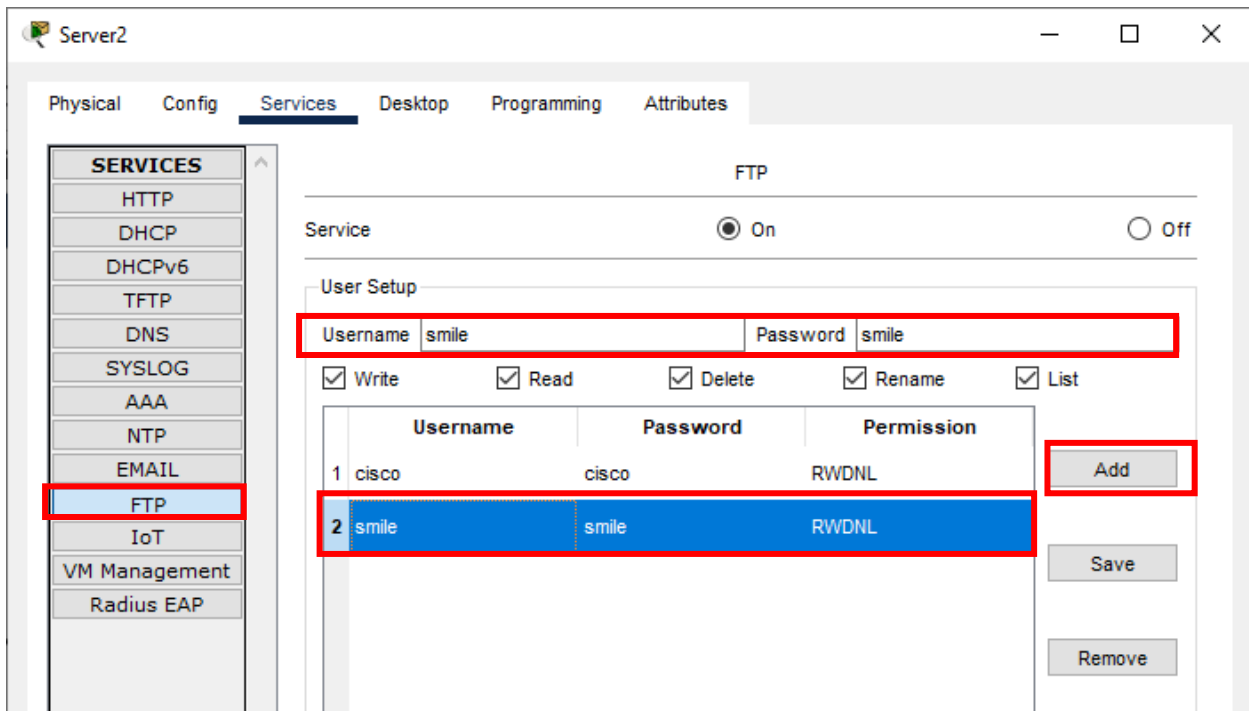
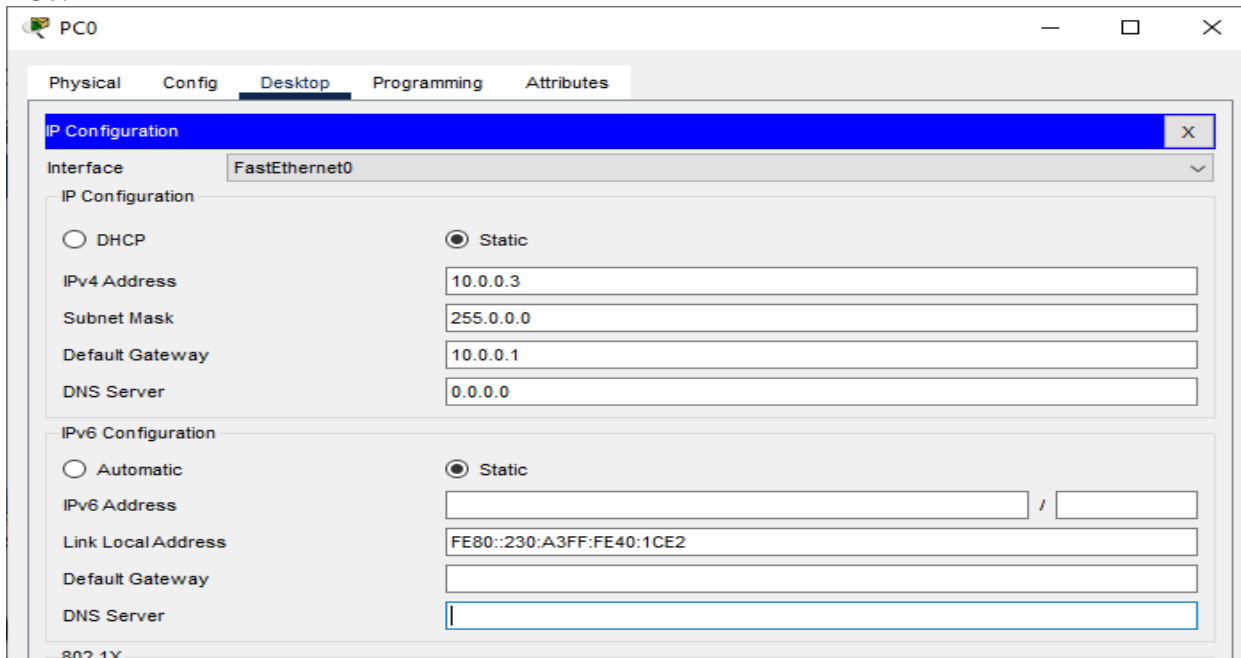
The screenshot shows the configuration window for Router0. The 'Config' tab is selected. On the left, a tree view shows the configuration hierarchy: GLOBAL (Settings, Algorithm Settings), ROUTING (Static, RIP), SWITCHING (VLAN Database), and INTERFACE (GigabitEthernet0/0, GigabitEthernet0/1). The 'GigabitEthernet0/0' interface is selected. The main area shows the following settings:

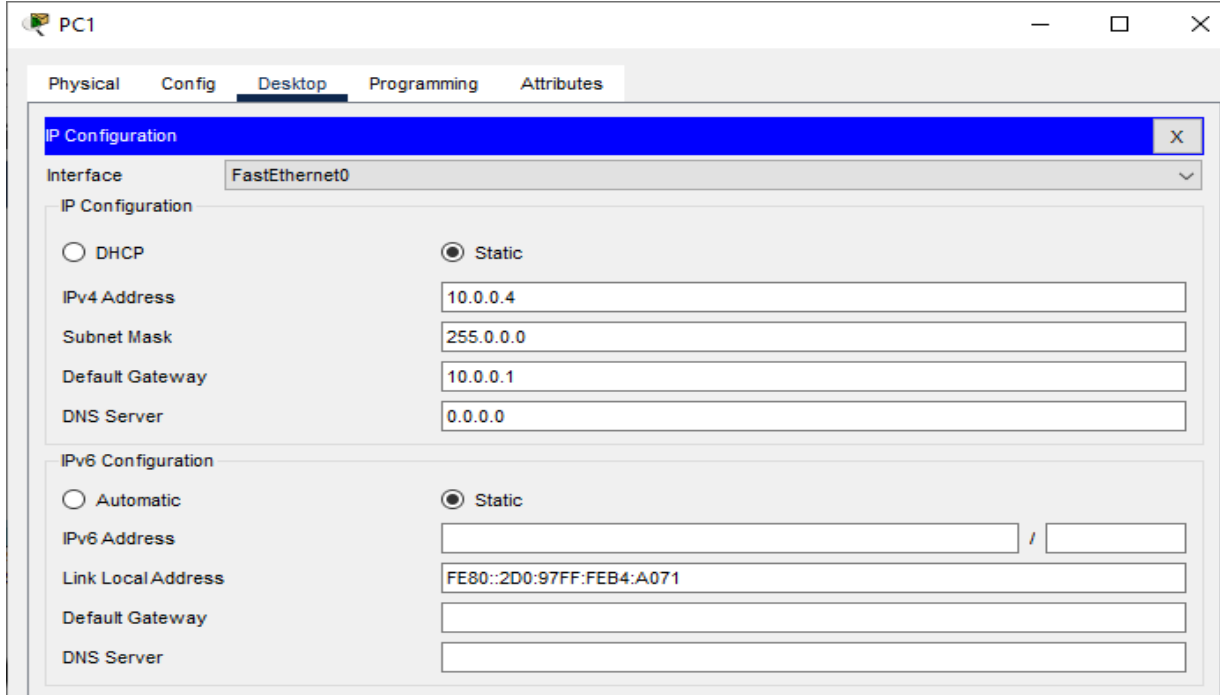
- Port Status: ☒ On
- Bandwidth: ☐ 1000 Mbps ☒ 100 Mbps ☐ 10 Mbps ☒ Auto
- Duplex: ☐ Half Duplex ☒ Full Duplex ☒ Auto
- MAC Address: 0009.7C92.3401
- IP Configuration:
 - IPv4 Address: 10.0.0.1
 - Subnet Mask: 255.0.0.0
- Tx Ring Limit: 10

Server:

The screenshot shows the configuration window for Server0. The 'Desktop' tab is selected. The 'IP Configuration' window is open, showing the following settings:

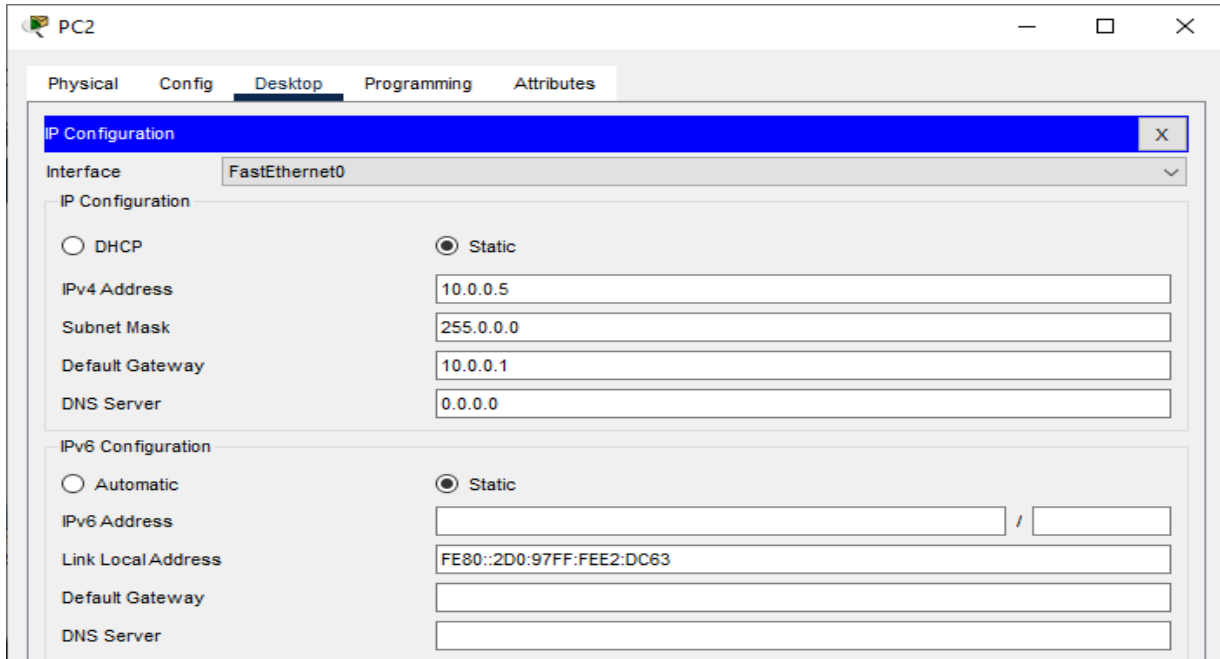
- IP Configuration:
 - ☐ DHCP ☒ Static
 - IPv4 Address: 10.0.0.2
 - Subnet Mask: 255.0.0.0
 - Default Gateway: 10.0.0.1
 - DNS Server: (empty)
- IPv6 Configuration:
 - ☐ Automatic ☒ Static
 - IPv6 Address: (empty) / (empty)
 - Link Local Address: FE80::260:3EFF:FEE3:EA2B
 - Default Gateway: (empty)
 - DNS Server: (empty)

Configure the Server for FTP service as follows**PC0:**

PC1:

The screenshot shows the configuration window for PC1. The 'Desktop' tab is selected. The 'IP Configuration' section is expanded, showing the 'FastEthernet0' interface. The 'Static' radio button is selected for both IPv4 and IPv6 configurations. The IPv4 configuration fields are filled with: IPv4 Address: 10.0.0.4, Subnet Mask: 255.0.0.0, Default Gateway: 10.0.0.1, and DNS Server: 0.0.0.0. The IPv6 configuration fields are: IPv6 Address: (empty), Link Local Address: FE80::2D0:97FF:FEB4:A071, Default Gateway: (empty), and DNS Server: (empty).

Interface	FastEthernet0
IP Configuration	
<input type="radio"/> DHCP <input checked="" type="radio"/> Static	
IPv4 Address	10.0.0.4
Subnet Mask	255.0.0.0
Default Gateway	10.0.0.1
DNS Server	0.0.0.0
IPv6 Configuration	
<input type="radio"/> Automatic <input checked="" type="radio"/> Static	
IPv6 Address	
Link Local Address	FE80::2D0:97FF:FEB4:A071
Default Gateway	
DNS Server	

PC2:

The screenshot shows the configuration window for PC2. The 'Desktop' tab is selected. The 'IP Configuration' section is expanded, showing the 'FastEthernet0' interface. The 'Static' radio button is selected for both IPv4 and IPv6 configurations. The IPv4 configuration fields are filled with: IPv4 Address: 10.0.0.5, Subnet Mask: 255.0.0.0, Default Gateway: 10.0.0.1, and DNS Server: 0.0.0.0. The IPv6 configuration fields are: IPv6 Address: (empty), Link Local Address: FE80::2D0:97FF:FEE2:DC63, Default Gateway: (empty), and DNS Server: (empty).

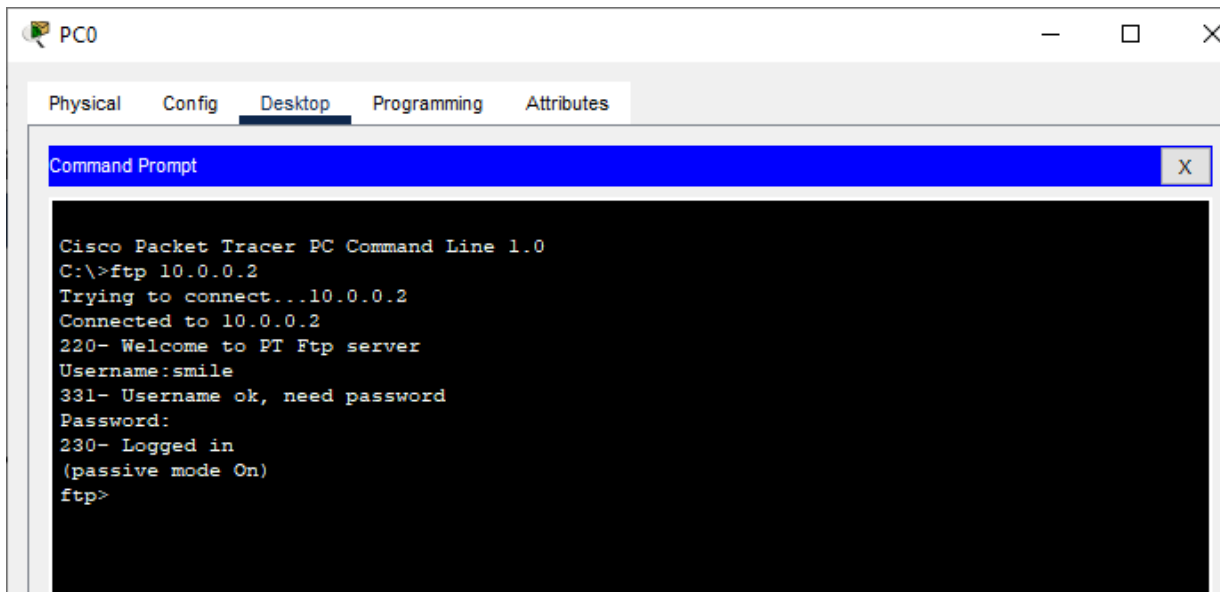
Interface	FastEthernet0
IP Configuration	
<input type="radio"/> DHCP <input checked="" type="radio"/> Static	
IPv4 Address	10.0.0.5
Subnet Mask	255.0.0.0
Default Gateway	10.0.0.1
DNS Server	0.0.0.0
IPv6 Configuration	
<input type="radio"/> Automatic <input checked="" type="radio"/> Static	
IPv6 Address	
Link Local Address	FE80::2D0:97FF:FEE2:DC63
Default Gateway	
DNS Server	

To verify the FTP protocol, we type the following commands in any of the PCs

[ftp 10.0.0.2](#)

Username: smile

Password: smile



For Video
demonstration
of the FTP,
scan the QR-
code

