Lab Number: 13 Date: 2025/08/27

Title: FTP Configuration and Implementation using Packet Tracer

Theory:

a. FTP (File Transfer Protocol): FTP is a standard network protocol used to transfer files between a client and a server over a TCP/IP network. It uses port 21 for control commands and port 20 for data transfer in active mode. Clients can access servers either anonymously or with authentication. FTP operates in two modes: active and passive, depending on whether the server or client initiates the data connection. For secure transfers, FTPs or SFTP can be used to encrypt data. FTP supports various file operations such as uploading, downloading, and managing files and directories operations such as uploading, downloading, and managing files and directories through specific commands like RETR, STOR, and DELE. In ASCII mode, it handles text files by converting line endings between different operating systems, while in binary mode, it preserves the exact byte sequence of files. Despite its functionality, FTP is considered less secure compared to modern protocols due to its lack of built-in encryption, making secure alternatives like FTPs and SFTP preferable for sensitive data transfers.

b. **Key Concepts of FTP**

1. **Client-Server Model:** FTP follows a client-server architecture where the client initiates request for file operations and the server responds. The client communicates with the server to request files, upload files, or perform other file management tasks.
2. **Ports:** FTP uses port 21 for the control connection, where commands and responses are exchanged. Port 20 is used for the data connection in activate mode, while passive mode uses a dynamically assigned port by the server for data transfer.
3. **Active and Passive Modes:** In active mode, the client opens a port for data transfer and the server connects to it. In passive mode, the server opens a port for and the client connects to it, which helps navigate firewalls and NAT issues.
4. **Authentication:** FTP can operate in anonymous mode, allowing users to access files without a password, or in authenticated mode, requiring a username and password for access. This distinction helps manage access and security.

5. **FTP Commands:** Common FTP commands include LIST to view files, RETR to download files, STOR to upload files, DELE to delete, and MKD to create directories.

c. **Network Diagram**

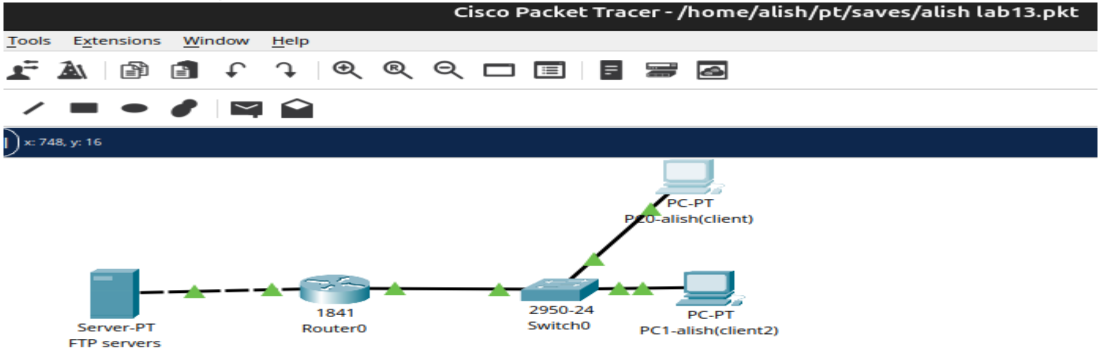


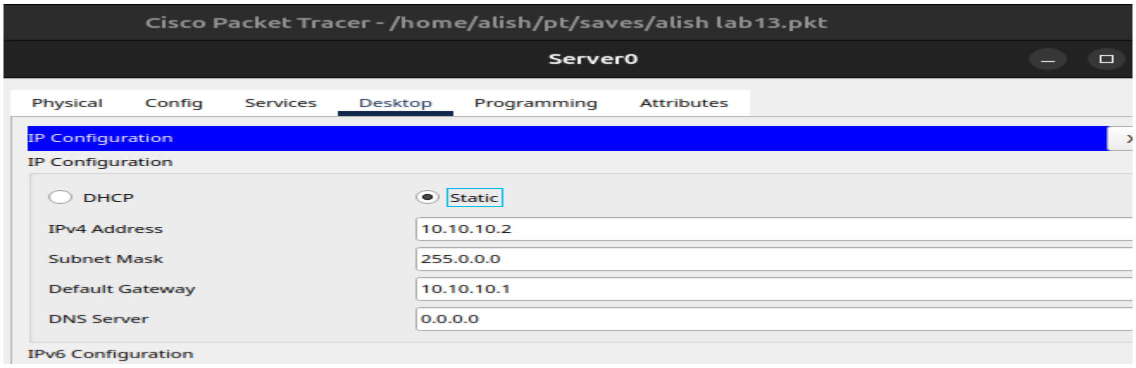
Fig: Network diagram

Implementation Sequence

a) Configuring FTP Server and FTP Client

FTP Server Configuration

Step 1: Click on server and go to IP configuration and set IP address and subnet mask.



IP Configuration

○ DHCP ● Static

IPv4 Address 10.10.10.2

Subnet Mask 255.0.0.0

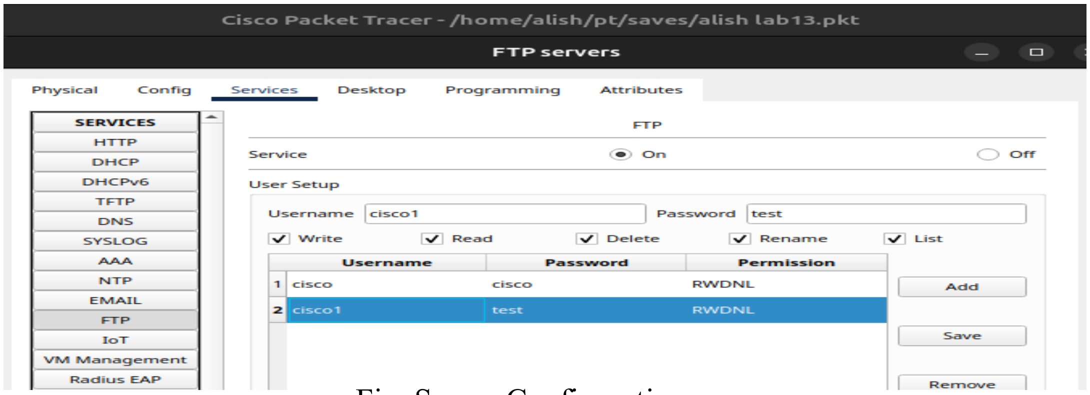
Default Gateway 10.10.10.1

DNS Server 0.0.0.0

Fig: IP configuration on Server

Step 2: Click on server go to service, click ftp and click on ON button.

Step 3: Set username, password, and tick write, read, delete, rename, and list. Click add.



FTP

Service ● On ○ Off

User Setup

Username cisco1 Password test

☑ Write ☑ Read ☑ Delete ☑ Rename ☑ List

	Username	Password	Permission
1	cisco	cisco	RWDNL
2	cisco1	test	RWDNL

Fig: Server Configuration

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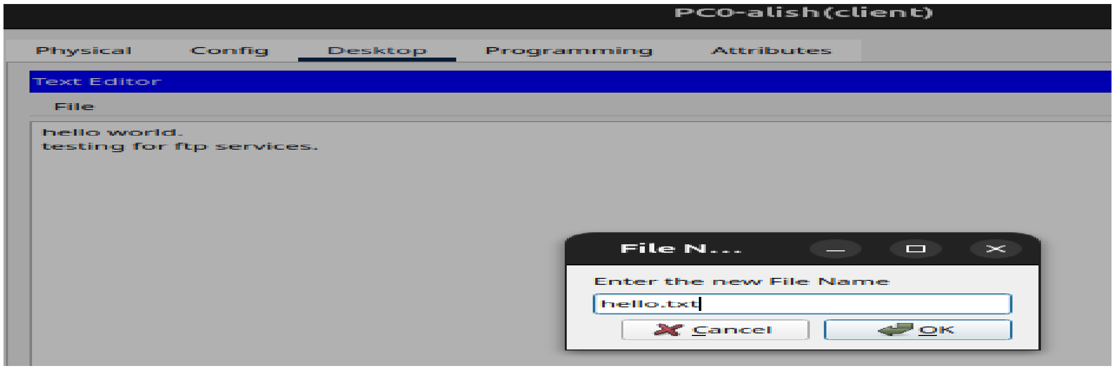
Step 4: Go to PC, click text editor write something and save the file as hello.txt

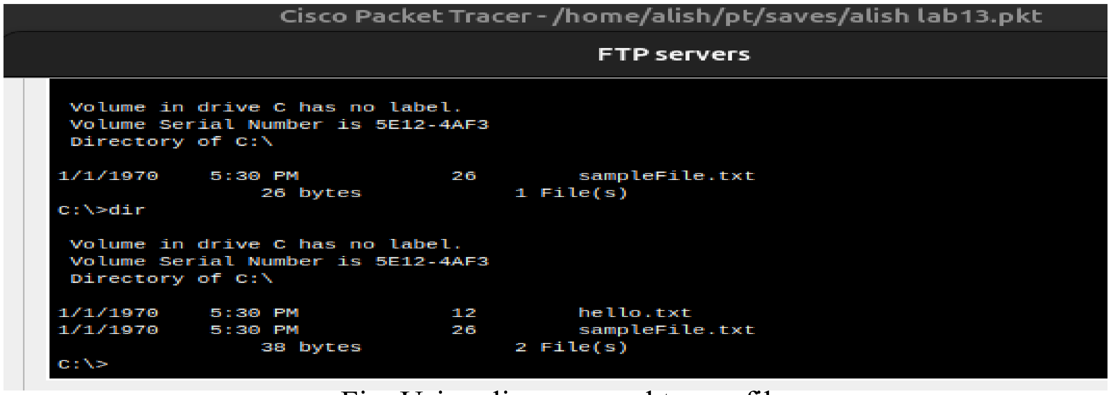


```
hello world.
testing for ftp services.
```

Enter the new File Name: hello.txt

Fig: Creating a file name hello.txt

Step 5: In desktop, open command prompt and type dir command, we can see the file.



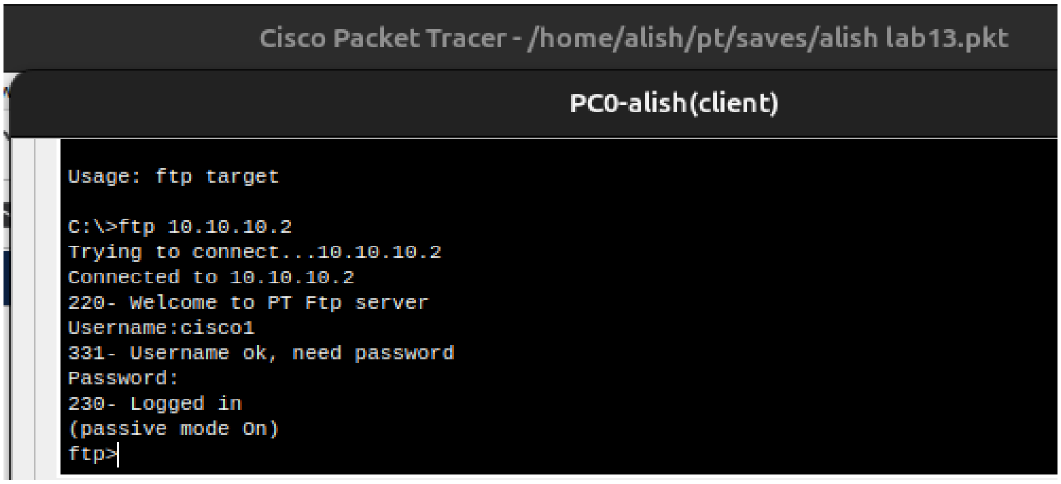
```
 Volume in drive C has no label.
 Volume Serial Number is 5E12-4AF3
 Directory of C:\

1/1/1970     5:30 PM            26         sampleFile.txt
                26 bytes             1 File(s)
C:\>dir

 Volume in drive C has no label.
 Volume Serial Number is 5E12-4AF3
 Directory of C:\

1/1/1970     5:30 PM            12         hello.txt
1/1/1970     5:30 PM            26         sampleFile.txt
                38 bytes             2 File(s)
C:\>
```

Fig: Using dir command to see file

i. FTP Server Configuration

In command prompt type command 'ftp 10.10.10.2' then insert username and password,

We will be connected to ftp server.



```
Usage: ftp target

C:\>ftp 10.10.10.2
Trying to connect...10.10.10.2
Connected to 10.10.10.2
220- Welcome to PT Ftp server
Username:cisco1
331- Username ok, need password
Password:
230- Logged in
(passive mode On)
ftp>
```

Fig: FTP Server Connection

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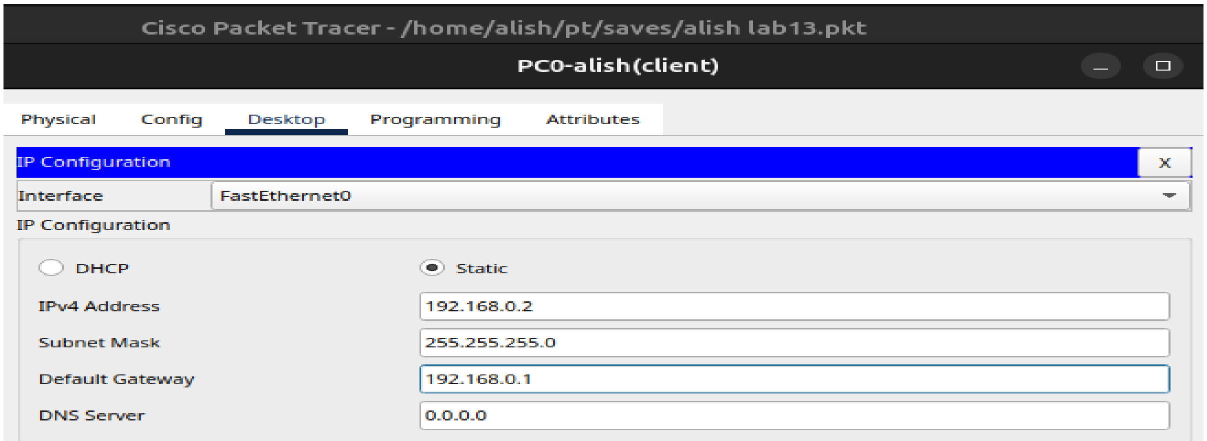
ii.FTP Client Configuration

Step 1: Click on pc and go to IP configuration and set IP address and subnet mask.



Interface: FastEthernet0

IP Configuration

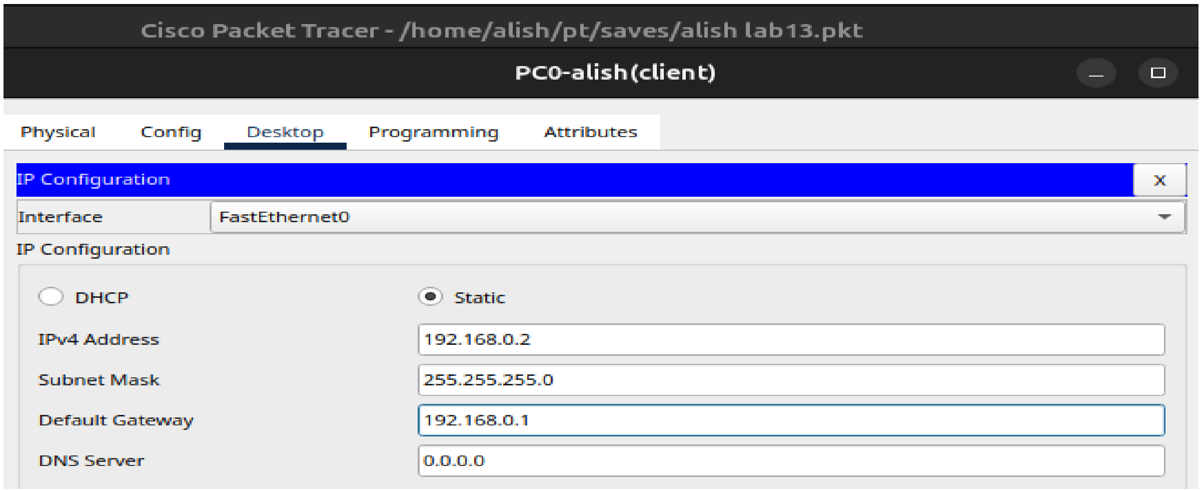
○ DHCP ● Static

IPv4 Address: 192.168.0.2

Subnet Mask: 255.255.255.0

Default Gateway: 192.168.0.1

DNS Server: 0.0.0.0



Interface: FastEthernet0

IP Configuration

○ DHCP ● Static

IPv4 Address: 192.168.0.2

Subnet Mask: 255.255.255.0

Default Gateway: 192.168.0.1

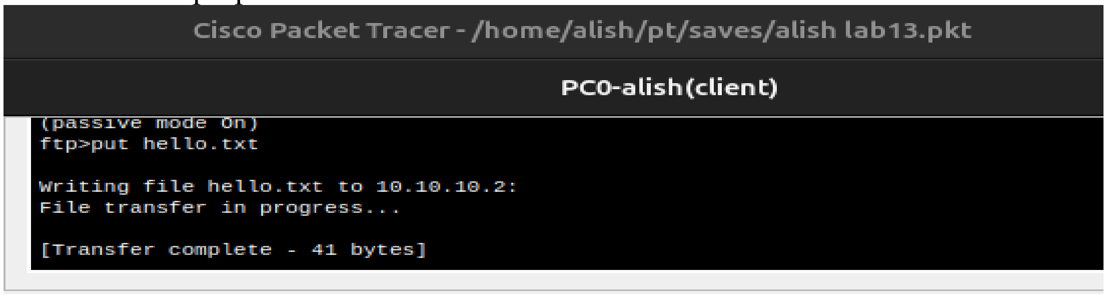
DNS Server: 0.0.0.0

Fig: IP Configuration in Clients

b) Implementation

Transferring File Using PUT Command

Command: Ftp> put hello.txt



```
(passive mode On)
ftp>put hello.txt

Writing file hello.txt to 10.10.10.2:
File transfer in progress...

[Transfer complete - 41 bytes]
```

Fig: Transferring file using PUT command

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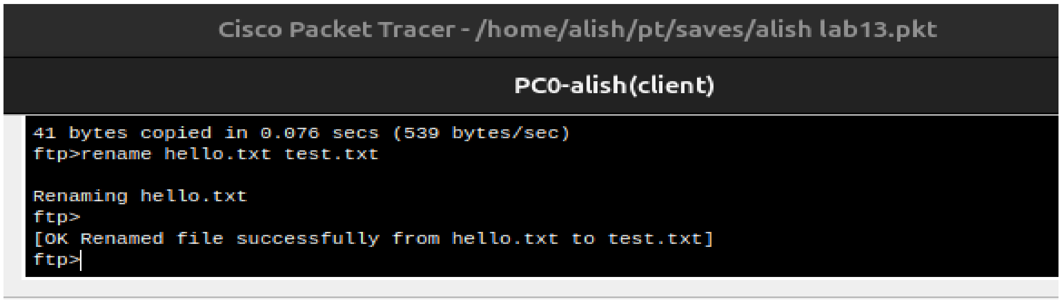
RENAME File

Command: Ftp>rename hello.txt test.txt



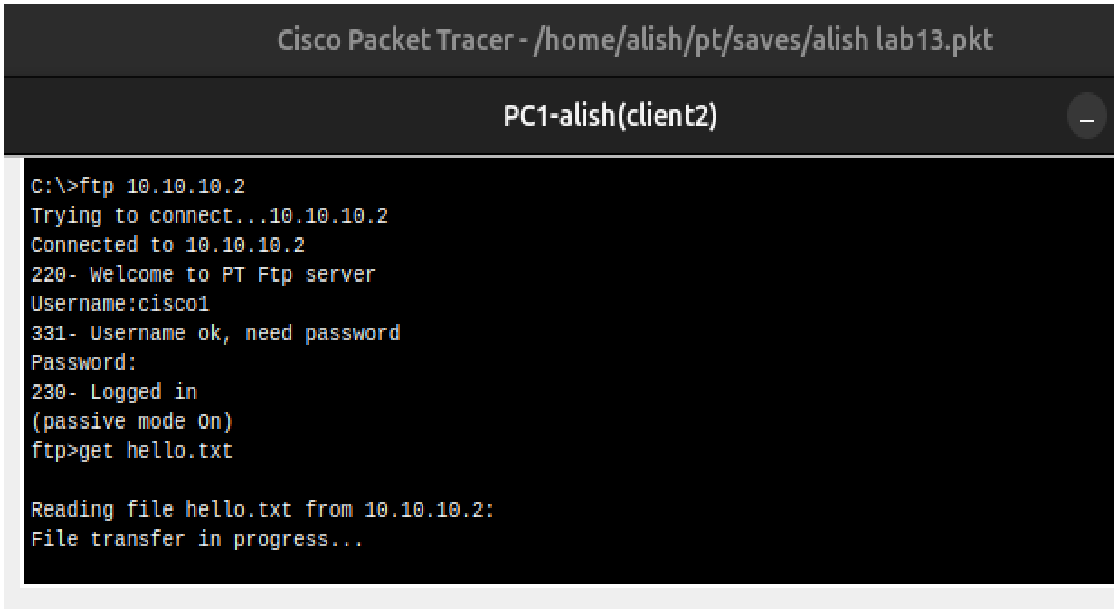
```
41 bytes copied in 0.076 secs (539 bytes/sec)
ftp>rename hello.txt test.txt

Renaming hello.txt
ftp>
[OK Renamed file successfully from hello.txt to test.txt]
ftp>
```

Fig: Renaming file

Get The File and Save The Copy on Our Machine

Command: Ftp> get hello.txt



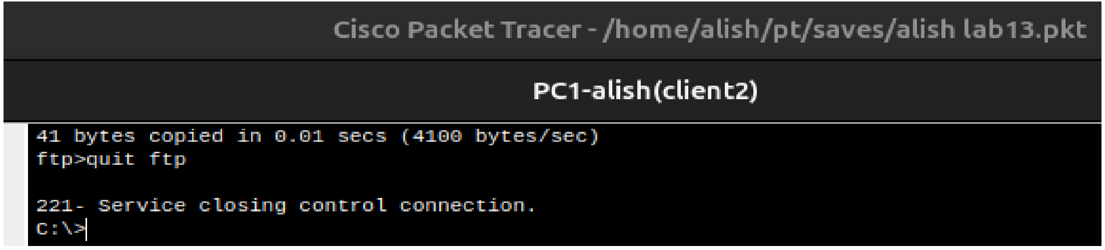
```
C:\>ftp 10.10.10.2
Trying to connect...10.10.10.2
Connected to 10.10.10.2
220- Welcome to PT Ftp server
Username:cisco1
331- Username ok, need password
Password:
230- Logged in
(passive mode On)
ftp>get hello.txt

Reading file hello.txt from 10.10.10.2:
File transfer in progress...
```

fig: Downloading file hello.txt in another client PC

Go To PC

Command: Ftp> quit ftp



```
41 bytes copied in 0.01 secs (4100 bytes/sec)
ftp>quit ftp

221- Service closing control connection.
C:\>
```

Fig: Quitting FTP

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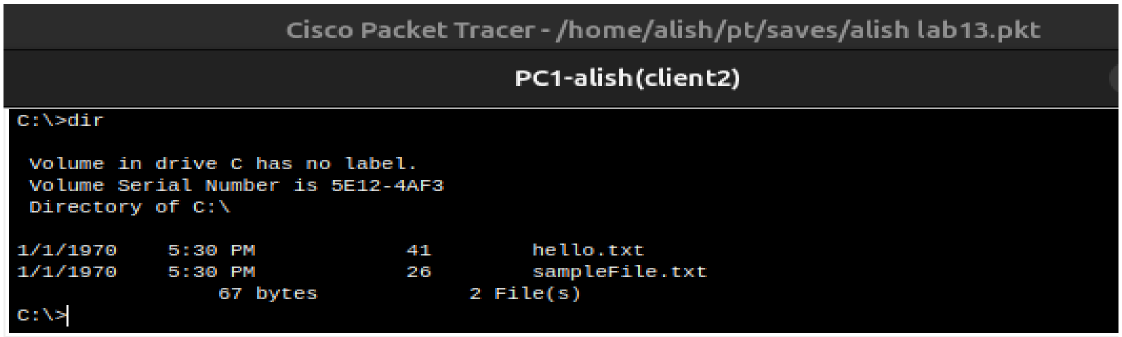
Displaying The Files

Command: PC> dir



```
C:\>dir

 Volume in drive C has no label.
 Volume Serial Number is 5E12-4AF3
 Directory of C:\

1/1/1970    5:30 PM            41        hello.txt
1/1/1970    5:30 PM            26        sampleFile.txt
                67 bytes            2 File(s)
C:\>
```

Fig: Displaying the file 'hello.txt' downloaded in Client-2

Addressing Table:

The addressing table of this lab is as follows:

Device	Interface	IPv4 Address	Subnet
Alish(client1)	NIC	192.168.0.2	255.255.255.0
Alish(Client 2)	NIC	192.168.0.3	255.255.255.0
Server(ftp)	NIC	10.10.10.2	255.0.0.0

Conclusion

In this lab, we successfully configured an FTP server and client using Packet Tracer. By following the step-by-step process, we understood how to set up an IP address,create user accounts with appropriate permissions, and demonstrated file management using FTP commands. This practical implementation helps in understanding of FTP's client-server model, the role of IP addressing, and the importance of secure file transfer operations in network environments.