DAYANANDA SAGAR COLLEGE OF ENGINEERING

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Mini Project Report

on

"Demonstrate and Analyze FTP"

Submitted By

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Computer Networks(18CS5DLCNL)

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ABSTRACT

Our project is about FTP (FILE TRANSFER PROTOCOL). It provides the sharing of files.

It is used to encourage the use of remote computers. It transfers the data more reliably and efficiently. We learn building network topology and employing client – server architecture in configuring FTP server.

We have 7 networks with 15 systems each from Class C IP configuration.

FTP is a standard internet protocol provided by TCP/IP used for transmitting the files from one host to another. It is mainly used for transferring the web page files from their creator to the computer that acts as a server for other computers on the internet. It is also used for downloading the files to computer from other servers.

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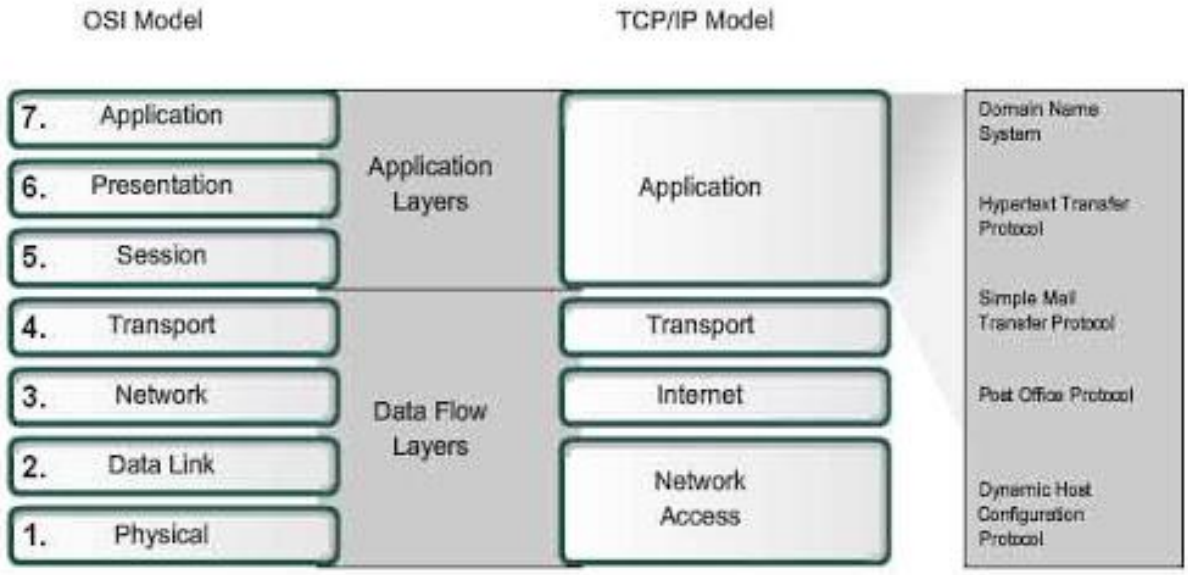
CHAPTER 1

INTRODUCTION

1.1 Application Layer

The application layer of the seven-layer OSI model is the top layer that approaches protocols for application interaction with the network.

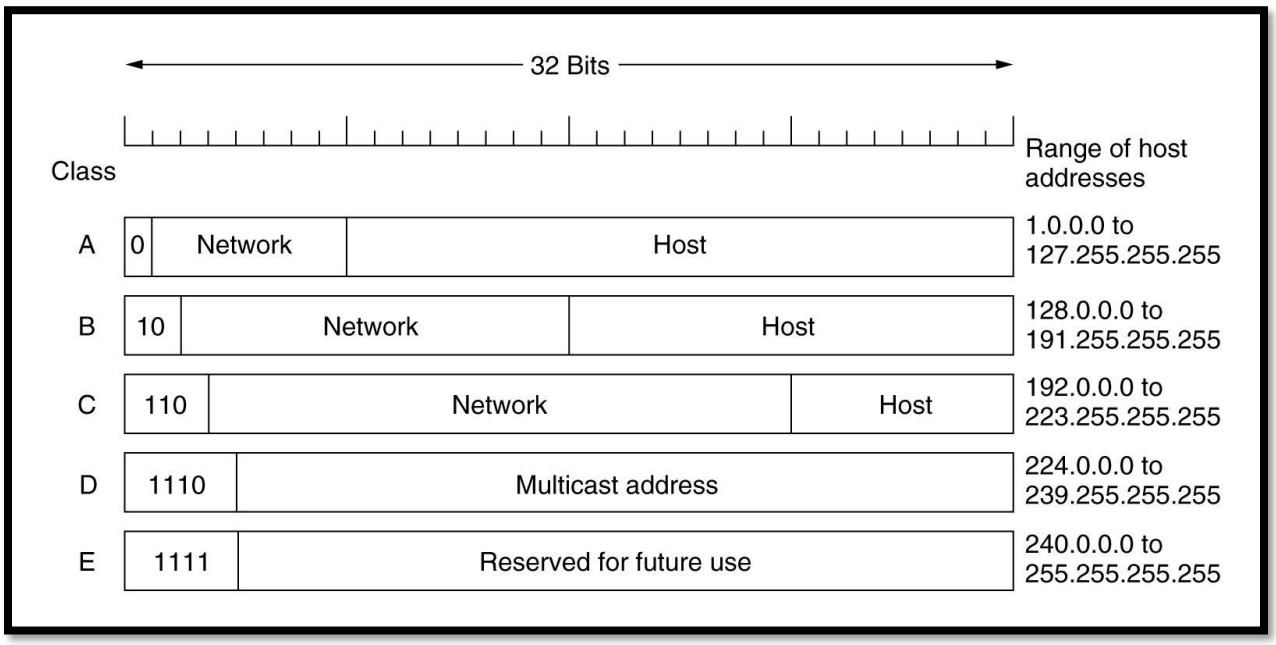


1.1.1 Protocols in Application Layer

- SMTP (Simple Mail Transfer Protocol)
- TELNET (Terminal Network)
- FTP (File Transfer Protocol)
- MIME (Multipurpose Internet Mail Extensions)
- POP (Post Office Protocol)
- HTTP (Hyper Text Transfer Protocol)
- DNS (Domain Name System)

1.2 Network Class

The first step in planning for IP addressing on your network is to determine which network class is appropriate for your network.



1.2.1 Class C Addressing

The first octet of Class C IP address has its first 3 bits set to 110

11000000 – 11011111
192 – 223

Class C IP addresses range from 192.0.0.x to 223.255.255.x. The default subnet mask for Class C is 255.255.255.x.

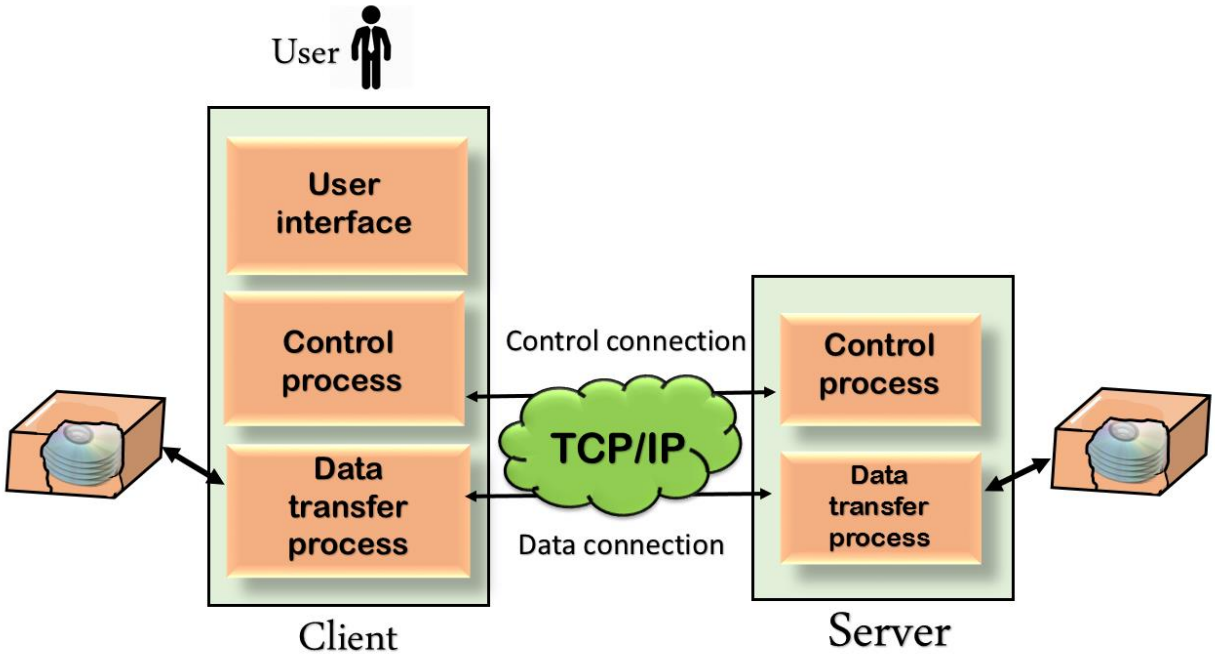
Class C gives 2097152 (2^{21}) Network addresses and 254 (2^{8}-2) Host addresses

1.3 FTP

The File Transfer Protocol is a standard network protocol used for the transfer of computer files between a client and server on a computer network. FTP is built on a client-server

model architecture using separate control and data connections between the client and the server.

Although transferring files from one system to another is very simple and straightforward, but sometimes it can cause problems. For example, two systems may have different file conventions. Two systems may have different ways to represent text and data. Two systems may have different directory structures. FTP protocol overcomes these problems by establishing two connections between hosts. One connection is used for data transfer, and another connection is used for the control connection.



The above figure shows the basic model of the FTP. The FTP client has three components: the user interface, control process, and data transfer process. The server has two components: the server control process and the server data transfer process.

1.3.1 FTP CLIENT AND SERVERS

One computer acts as the server to store information and the other acts as the client to send or request files from the server. The FTP protocol typically uses port 21 as its main means of communication. An FTP server will listen for client connections on port 21.

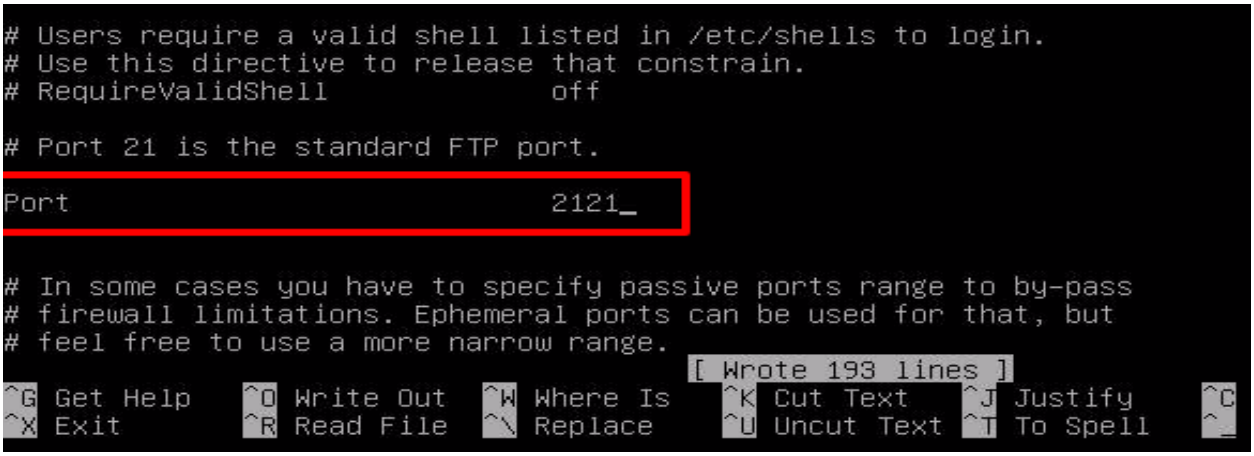
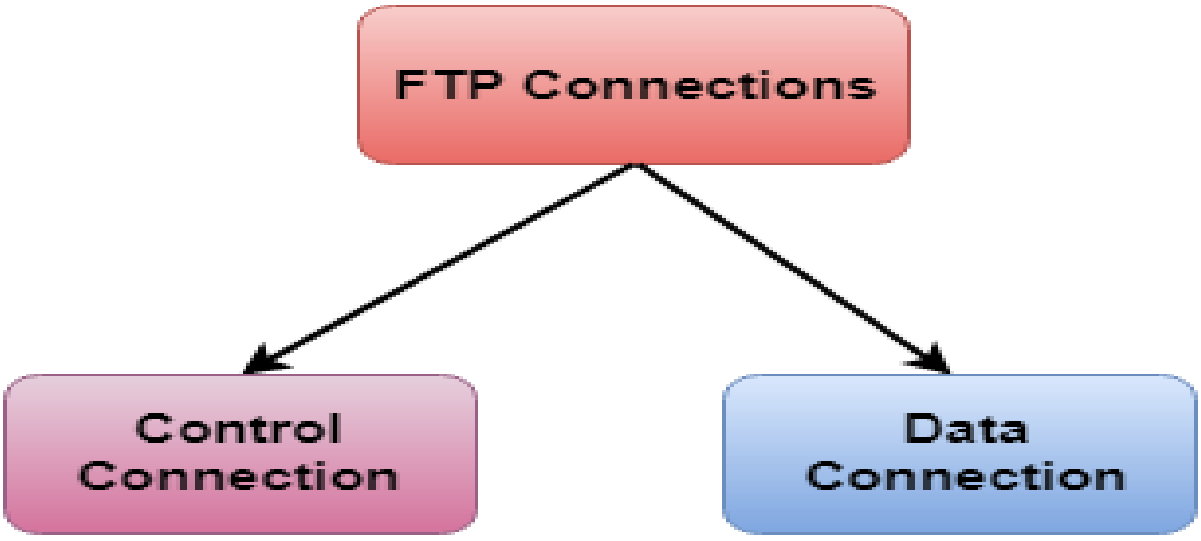


Fig1.1 FTP showing its port number

There are two types of connections in FTP:

- **Control Connection:** The control connection uses very simple rules for communication. Through control connection, we can transfer a line of command or line of response at a time. The control connection is made between the control processes. The control connection remains connected during the entire interactive FTP session.
- **Data Connection:** The Data Connection uses very complex rules as data types may vary. The data connection is made between data transfer processes. The data connection opens when a command comes for transferring the files and closes when the file is transferred.



1.3.2 Advantages of FTP:

- Speed: One of the biggest advantages of FTP is speed. The FTP is one of the fastest ways to transfer the files from one computer to another computer.
- Efficient: It is more efficient as we do not need to complete all the operations to get the entire file.
- Security: To access the FTP server, we need to login with the username and password. Therefore, we can say that FTP is more secure.
- Back & forth movement: FTP allows us to transfer the files back and forth. Suppose you are a manager of the company, you send some information to all the employees, and they all send information back on the same server.

1.3.3 Disadvantages of FTP

- The standard requirement of the industry is that all the FTP transmissions should be encrypted. However, not all the FTP providers are equal and not all the providers offer encryption. So, we will have to look out for the FTP providers that provides encryption.
- FTP serves two operations, i.e., to send and receive large files on a network. However, the size limit of the file is 2GB that can be sent. It also doesn't allow you to run simultaneous transfers to multiple receivers.
- Passwords and file contents are sent in clear text that allows unwanted eavesdropping. So, it is quite possible that attackers can carry out the brute force attack by trying to guess the FTP password.
- It is not compatible with every system.

CHAPTER 2

DESIGN AND CONFIGURATION

2.1 Implementation of FTP

Fig 2.1.1: Simple FTP connection shown between a Laptop and Server

```
C:\>
C:\>ftp 192.168.1.2
Trying to connect...192.168.1.2
Connected to 192.168.1.2
220- Welcome to PT Ftp server
Username:cisco
331- Username ok, need password
Password:
230- Logged in
(passive mode On)
ftp>
```

Fig 2.1.2: Connecting to FTP server

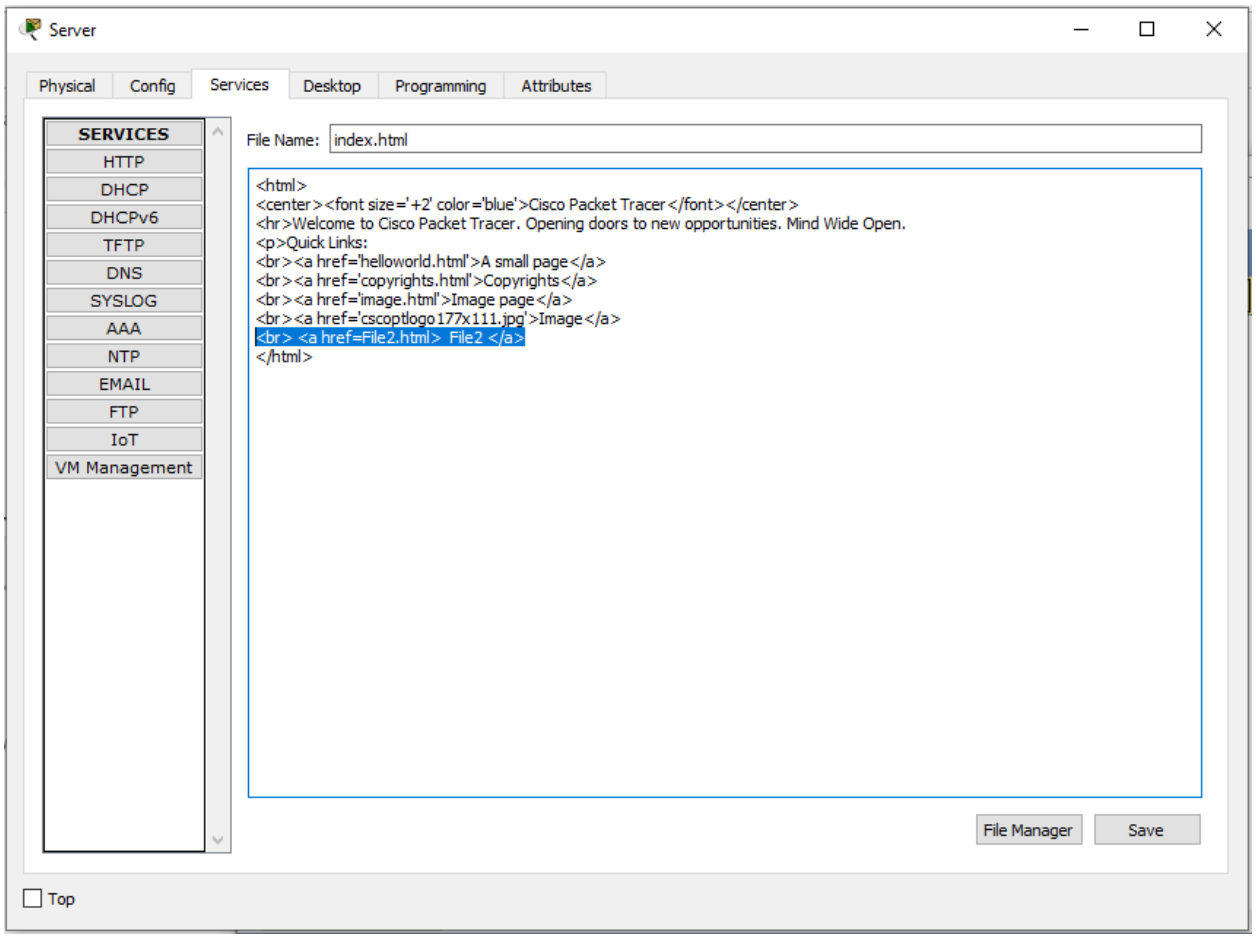


Fig 2.1.3: FTP server is found in services

Our project configuration is 7 networks with 15 systems each and also configured telnet protocol with it.

2.2 Configuration

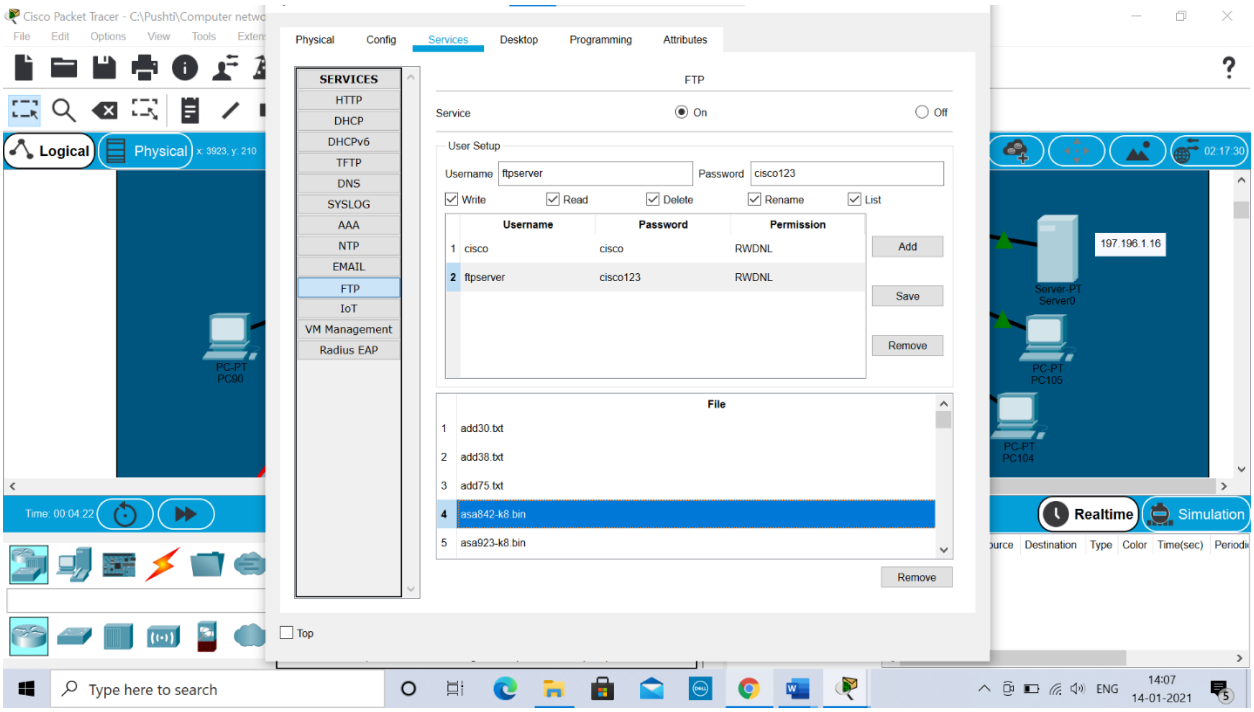


Fig 2.2.1 Configurating the ftp server

CHAPTER 3

TOPOLOGY

The topology with 7 networks and 15 subsystems each. With FTP and Telnet configured.

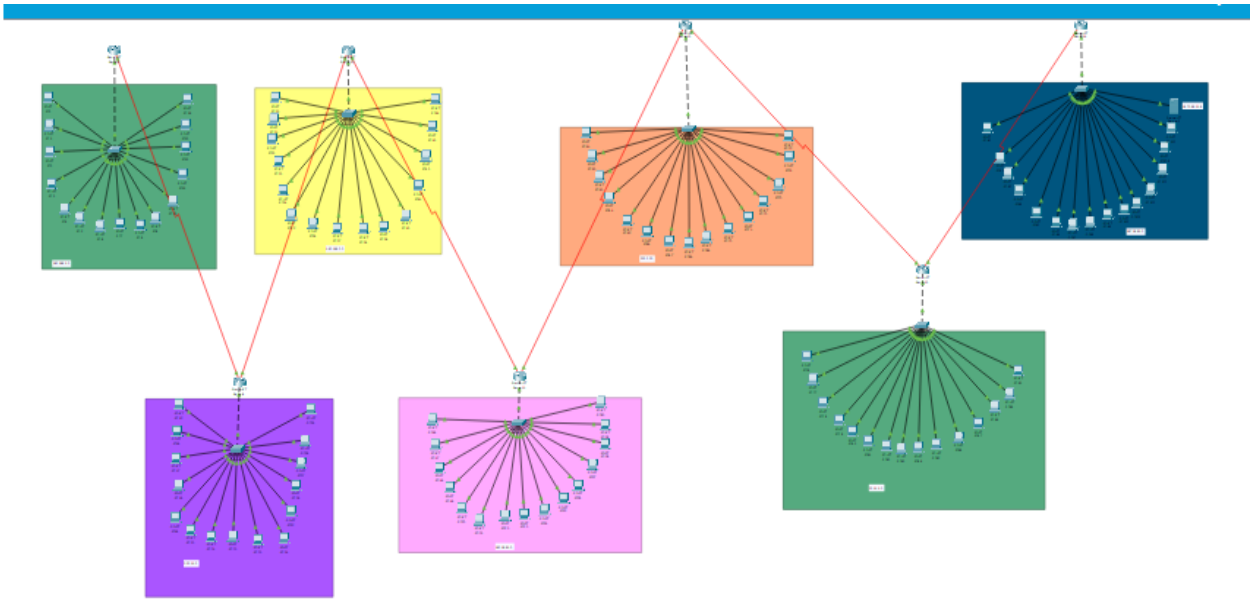


Fig 3.1:The topology as per our objectives

TELNET Configuration

We have enhanced our project by activating the TELNET service to the routers of our configuration.

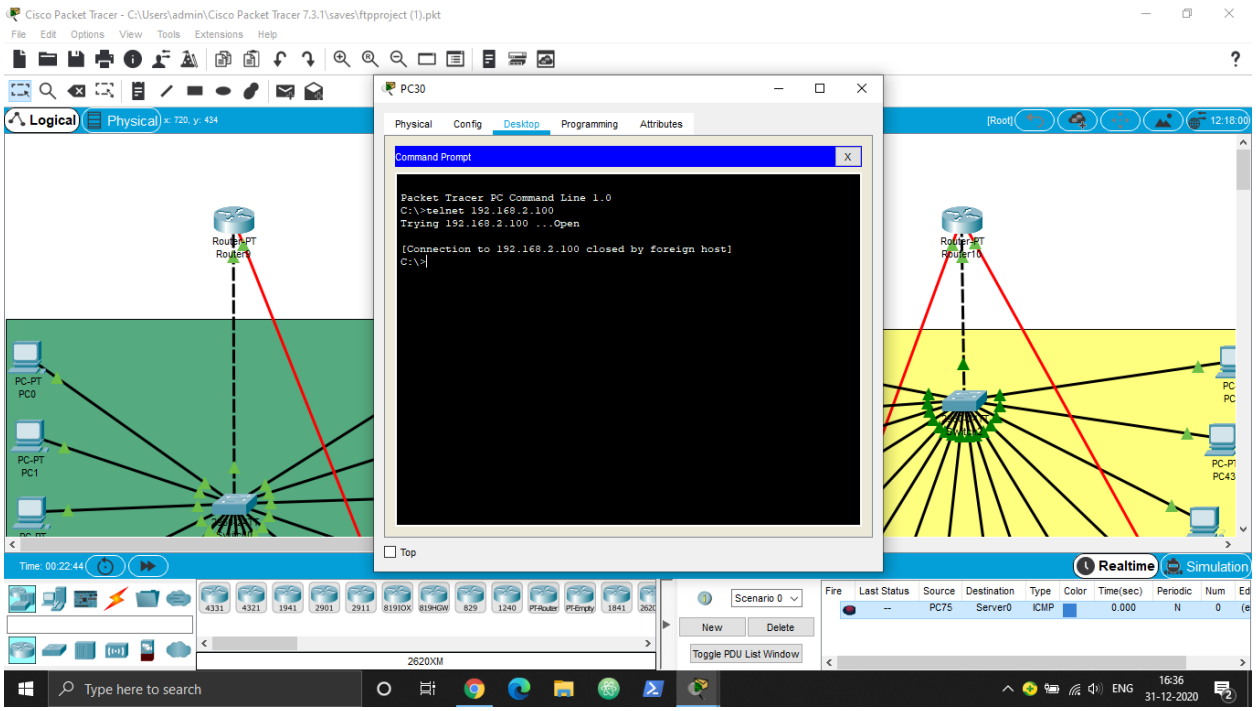


Fig 3.2Working of Telnet in FTP

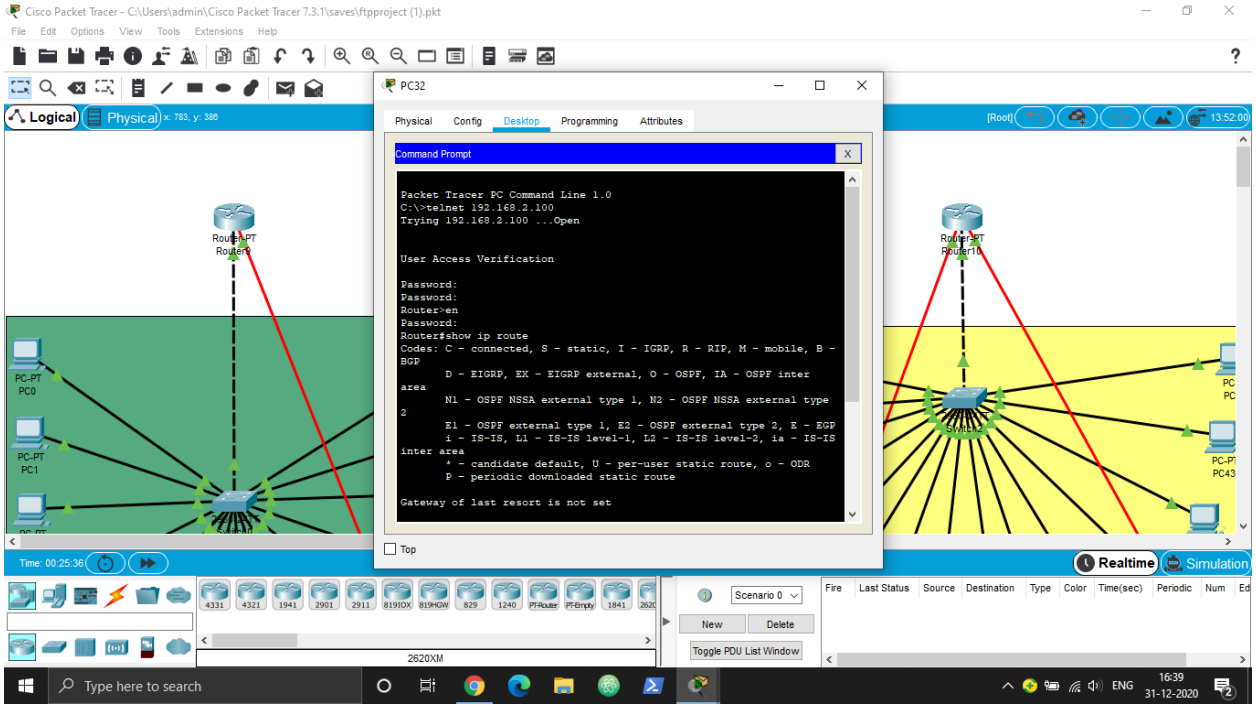


Fig 3.3 pinging from one pc in one network to other pc

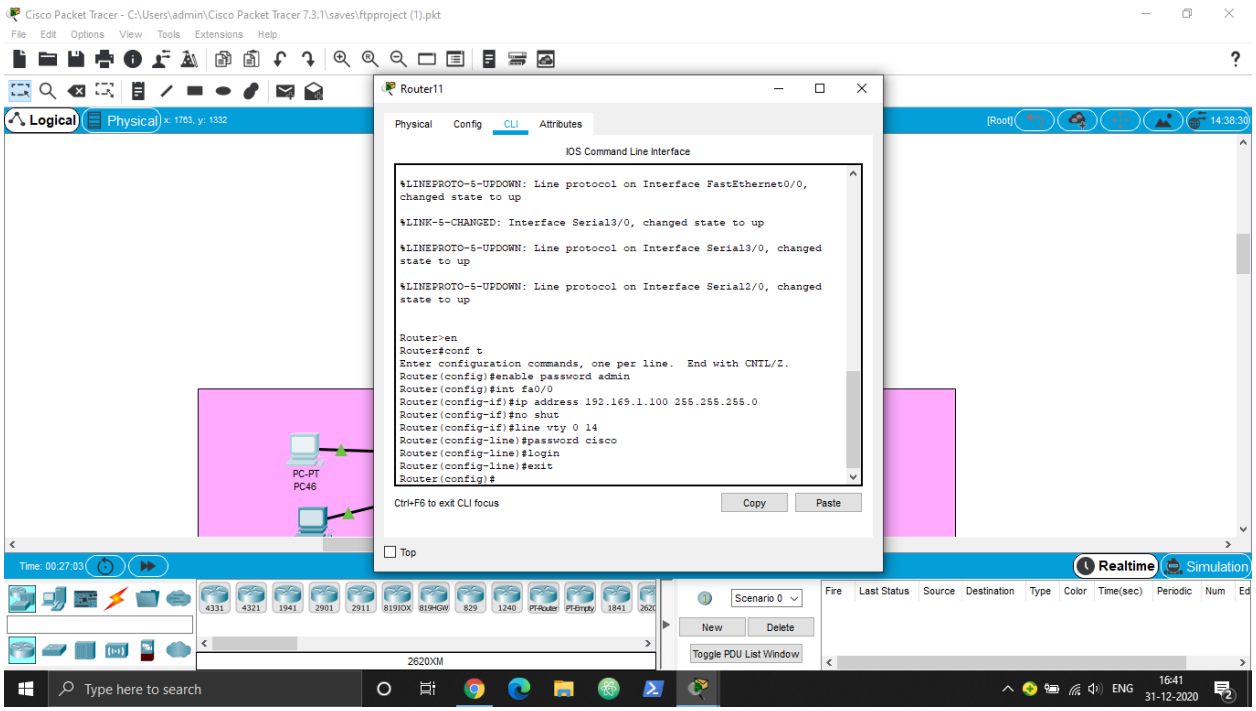


Fig 3.4 Configurations in command line interface

CHAPTER 4

RESULTS

The results obtained after the execution of the project-FTP and telnet

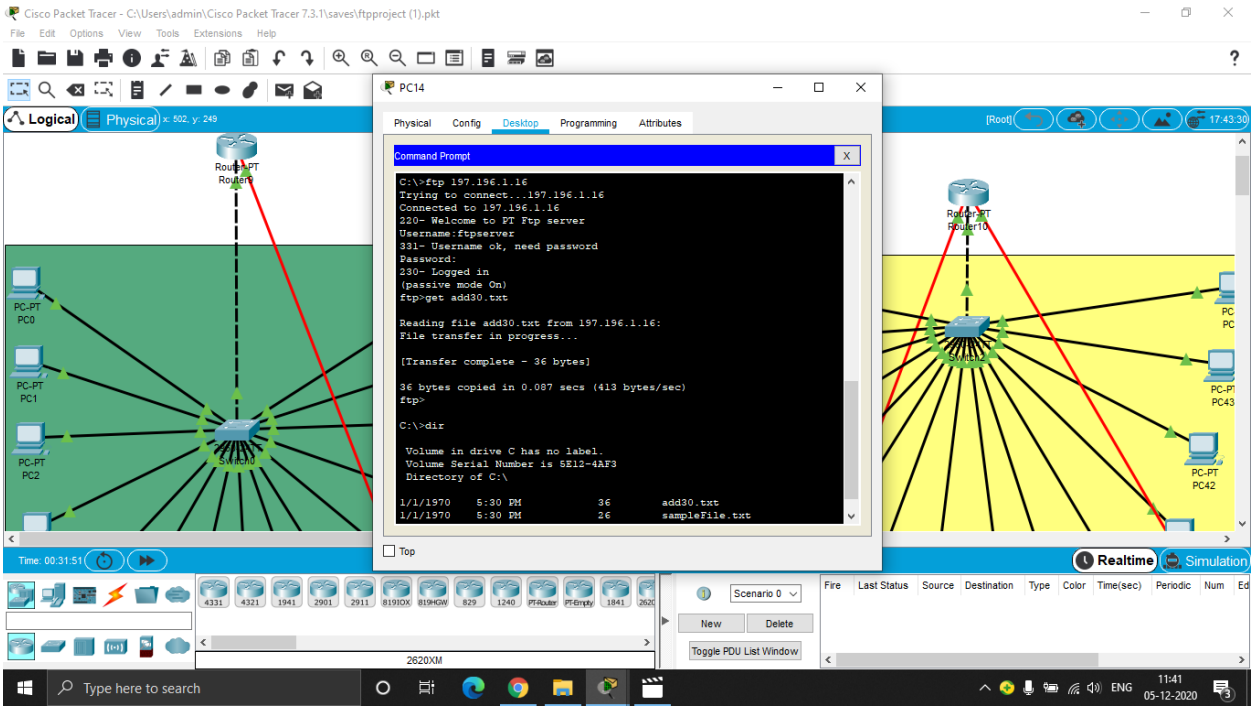


Fig 4.1 This is the screenshot of the get command executed and dir command executed which shows the files the pc extracted from the ftp server

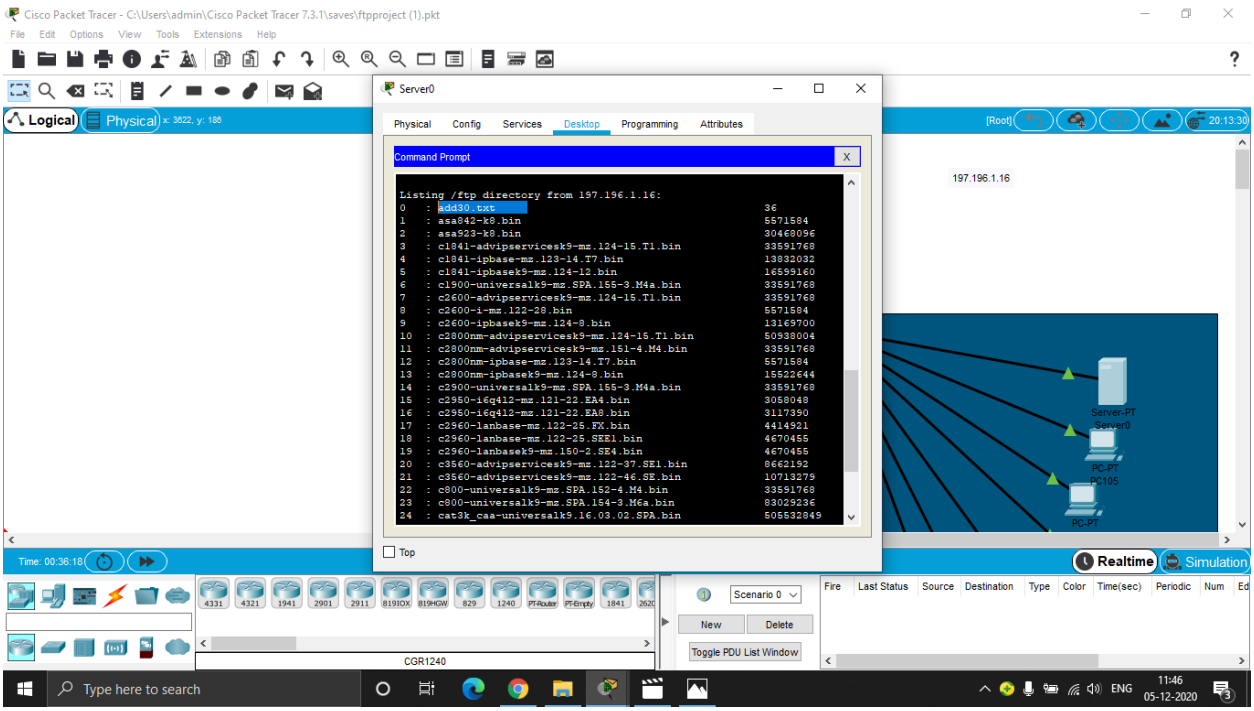


Fig 4.2 After logging into server we list the number of files it contains or added to the server

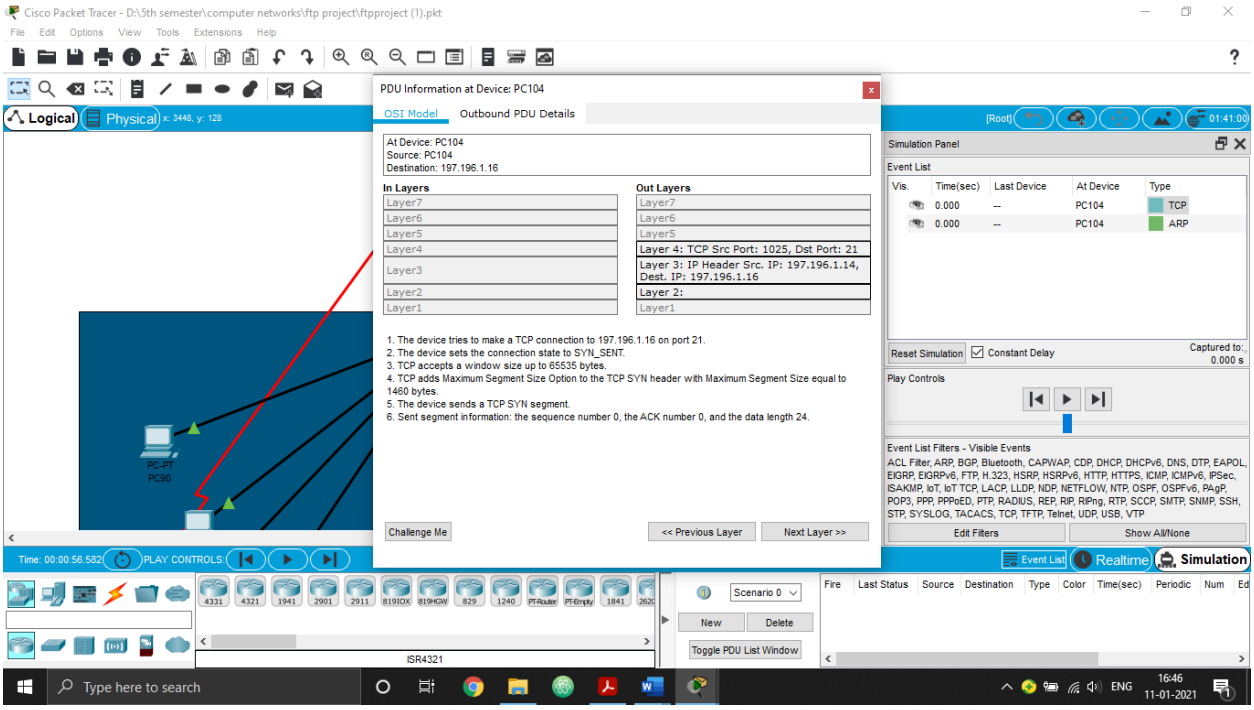


Fig 4.3 This shows the simulation part of the ftp and the port used by ftp which is 21

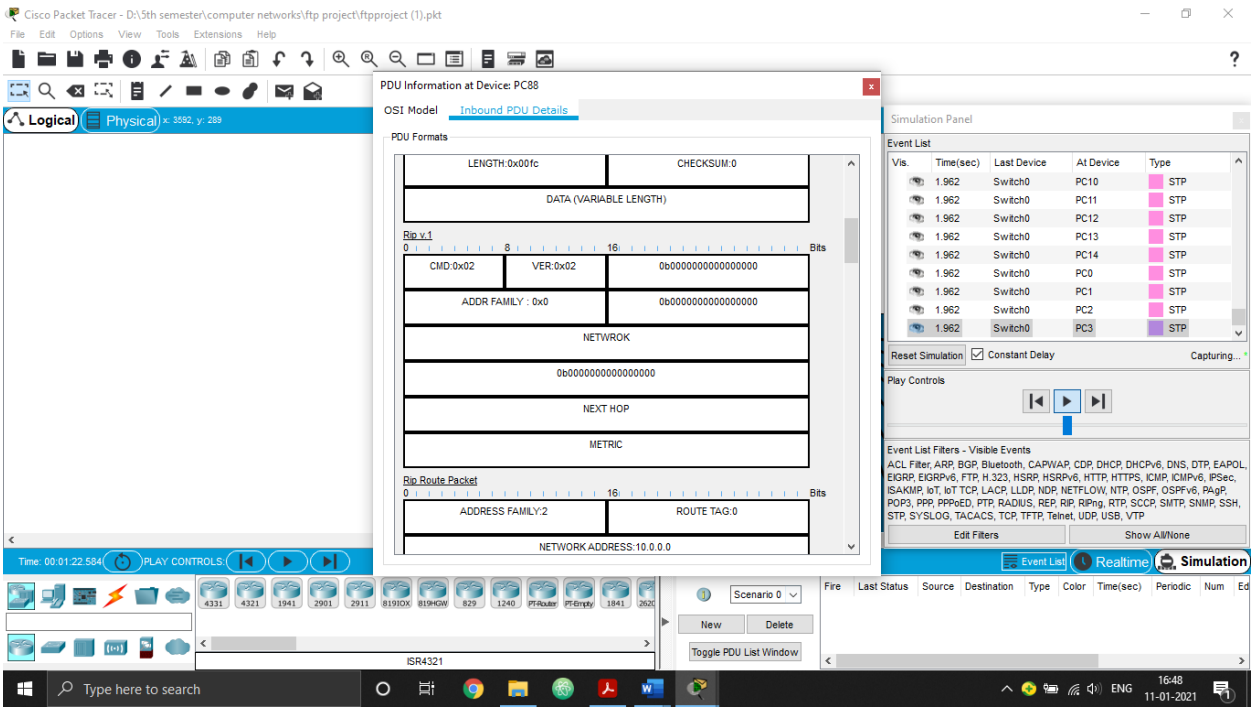


Fig 4.4 This is the RIPv2 header format captured from the simulation of ftp

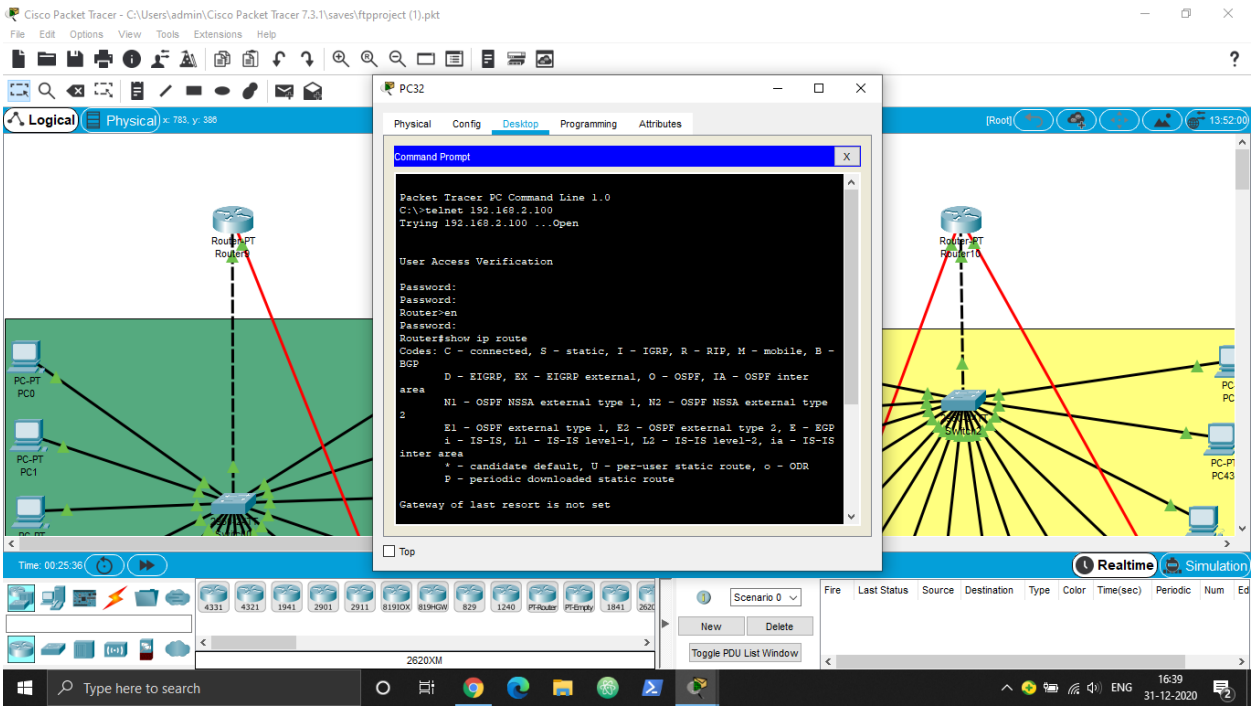


Fig 4.5 This picture shows the demonstration of telnet where the passwords and usernames are masked and the output we get after executing show ip route.

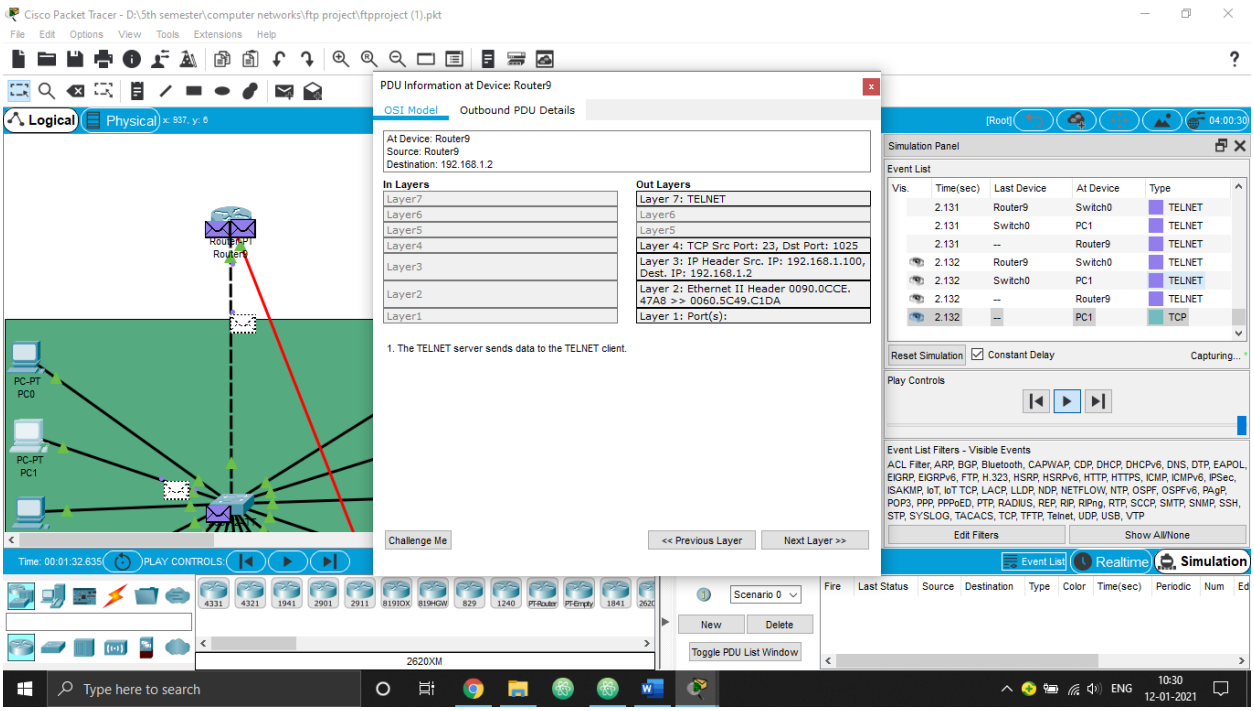


Fig 4.6 This shows the the port used for Telnet which is port 23

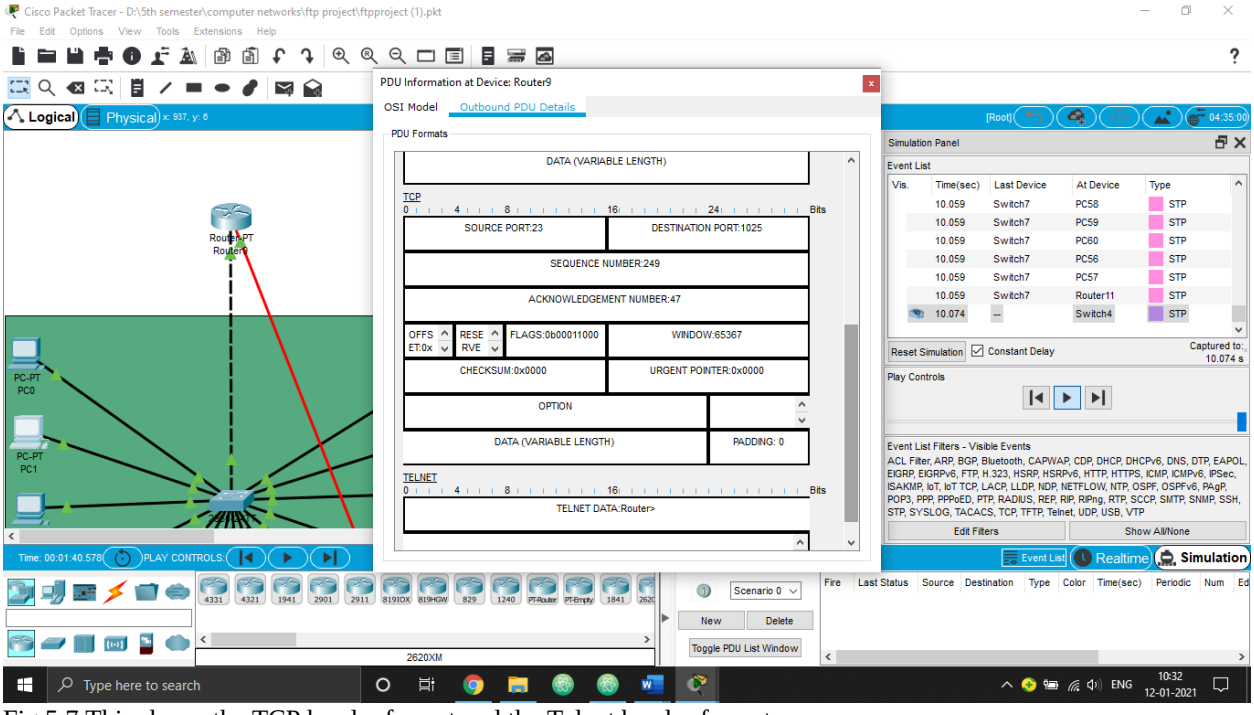
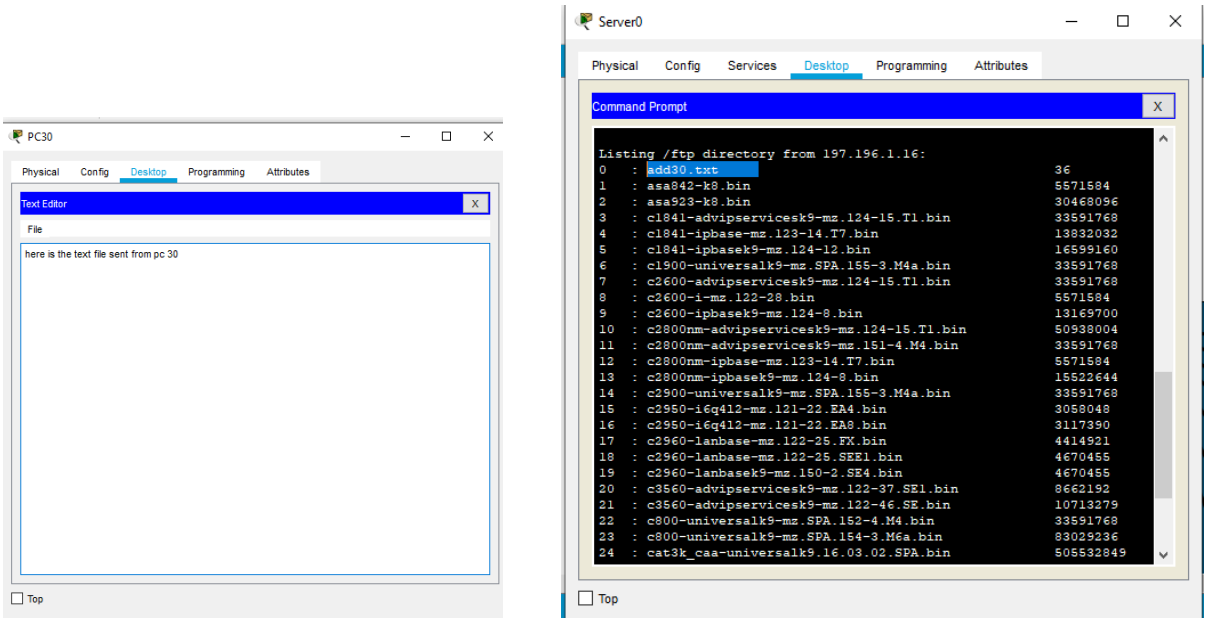


Fig 5.7 This shows the TCP header format and the Telnet header format

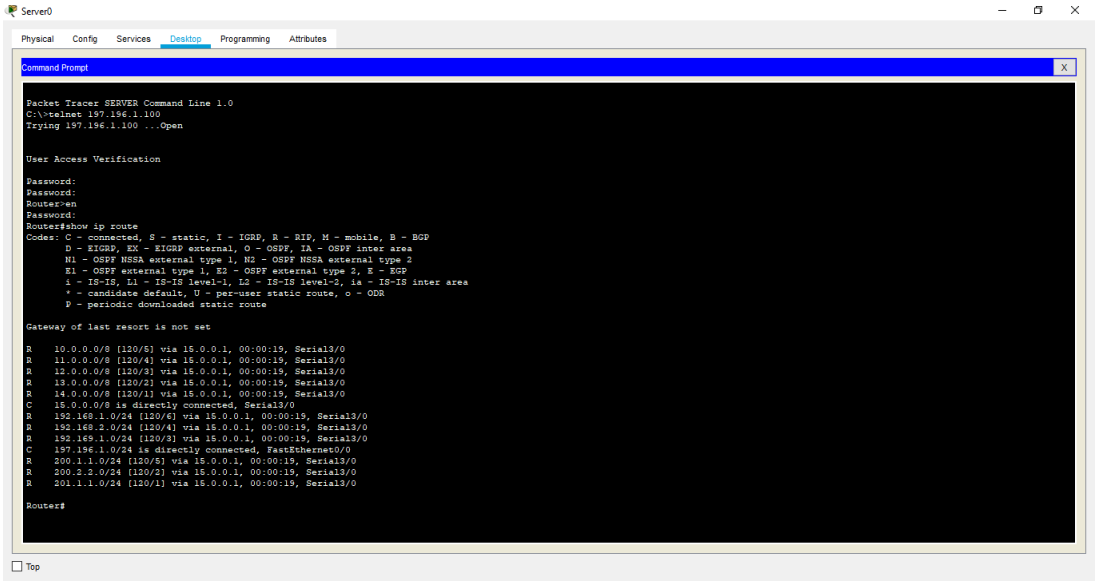
CHAPTER 5

CONCLUSION AND FUTURE ENHANCEMENTS

5.1 CONCLUSION



As we can see in the figure above, we have successfully transferred a file from PC30 which is in the third network (192.168.2.0) to the server which is in the seventh network (197.196.1.0) using File Transfer Protocol (FTP)



We have configured telnet for remote access on each of the seven routers successfully in our project. We can now remotely access the command line of the server through any pc just by entering the username and password

5.2 FUTURE ENHANCEMENTS

As a part of enhancement to the current project we can make the process of FTP even secure by adding SSH (secure shell).

An Email server can be added to provide extra facility to deliver mails among the systems.

FTP firewall can be implemented as a future enhancement.

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