

CSIT Department

Bhaktapur Multiple Campus

Doodhpati, Bhaktapur



Lab sheet -8

A LAB REPORT OF Computer Networks (CSC258)

Submitted By:

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Roll No:70

Submitted To

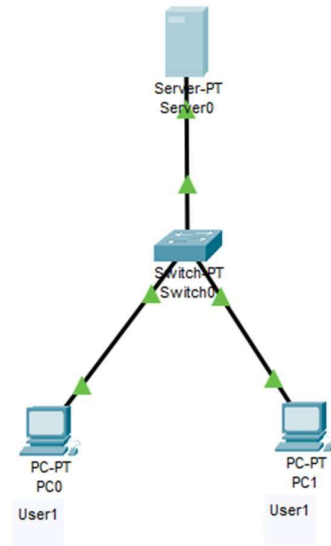
Ramesh Kharbuja

Lab sheet- 8

OBJECTIVES:

1. To implement DNS, HTTP, DHCP, Email and FTP services of server.

Network Configuration



Theory

Server

A server is a computer or system that provides resources, data, services, or programs to other computers, known as clients, over a network. It receives the request for a web document from the client and sends the requested information to the client computer on the Internet. There are different types of servers that have their own specific purpose like web server, FTP server, Proxy server, Mail server etc. Some of the services of a server are:

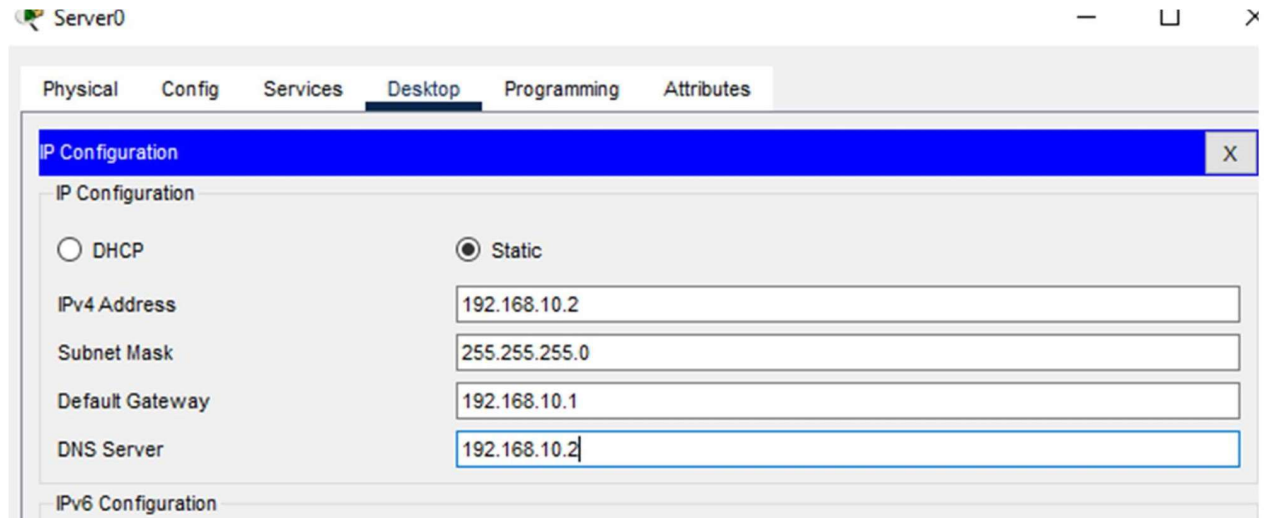
1. DHCP
2. DNS
3. HTTP
4. FTP
5. MAIL

1. Dynamic Host Configuration Protocol (DHCP)

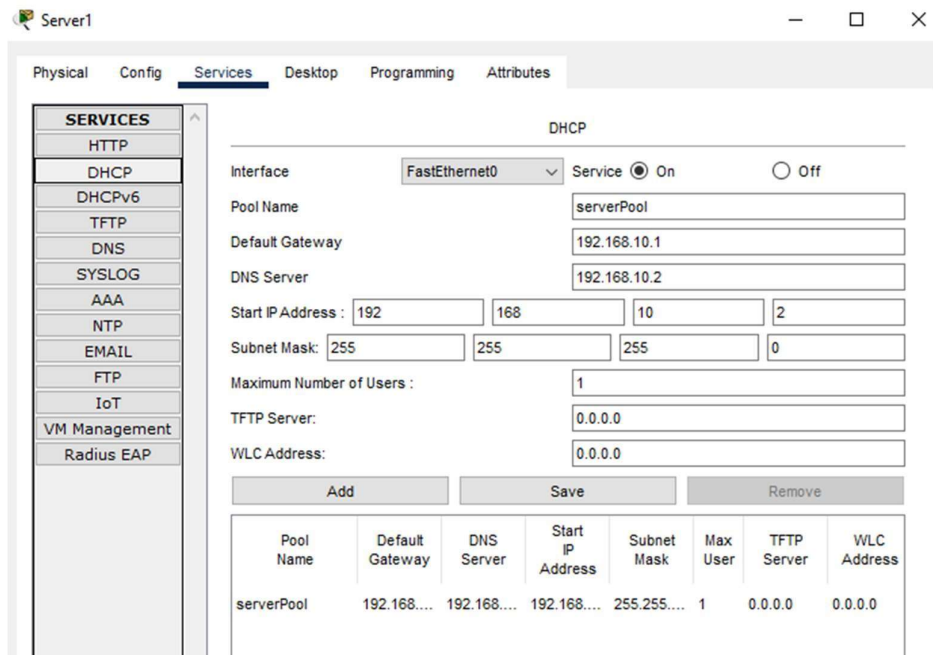
DHCP is a network management protocol used on Internet Protocol (IP) networks for automatically assigning IP addresses and other communication parameters to devices connected to the network using a client-server architecture. Server automatically assigns clients with IP addresses that is defined in IP pool.

Procedure

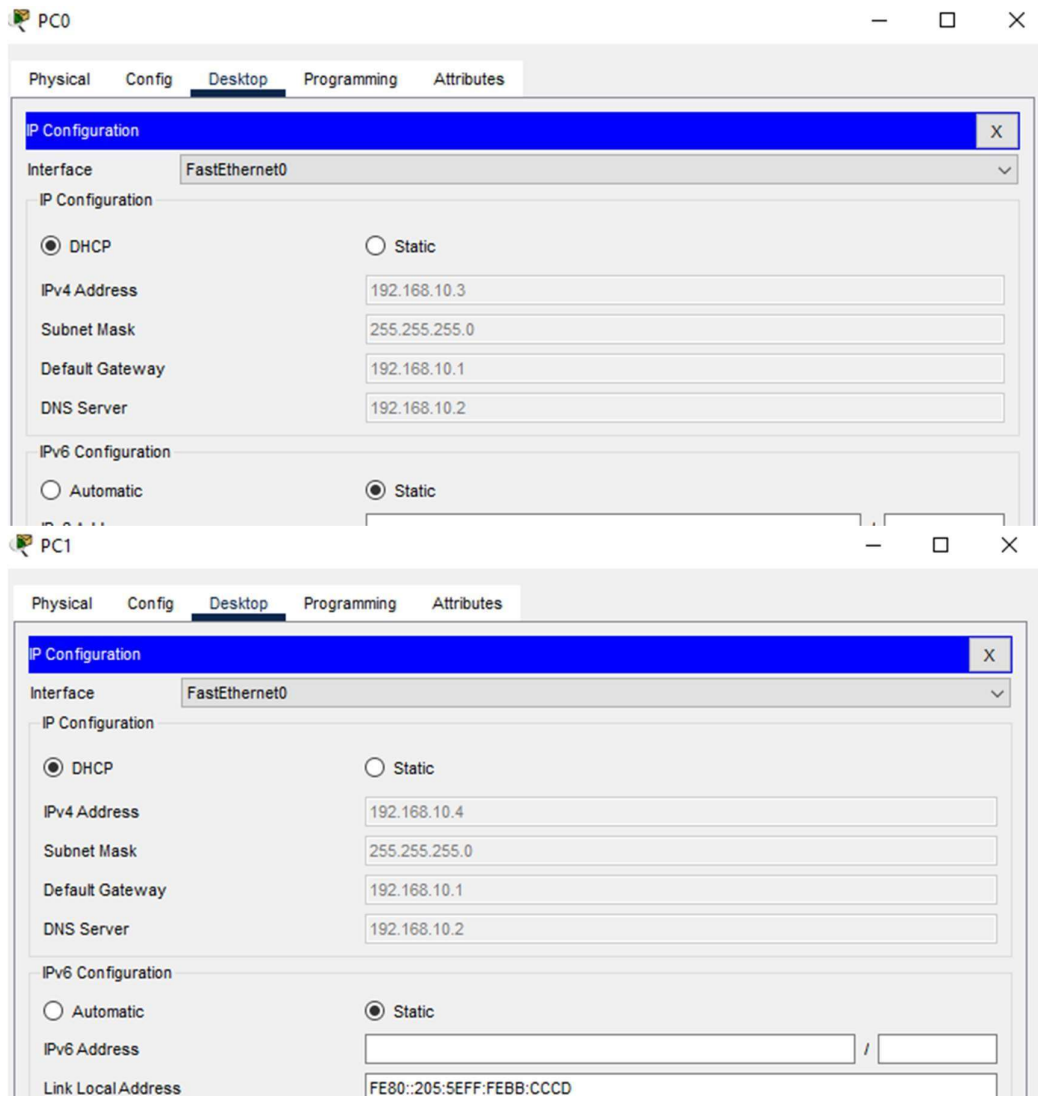
- a. Assign an IP address, gateway, DNS server IP to the server.



- b. Click on Services tab of the server and then choose DHCP option. Create a server pool giving the default gateway, DNS server, starting IP address and a subnet mask. And enable the service.



- c. Now apply DHCP on the client computers and they will be assigned with IP automatically.



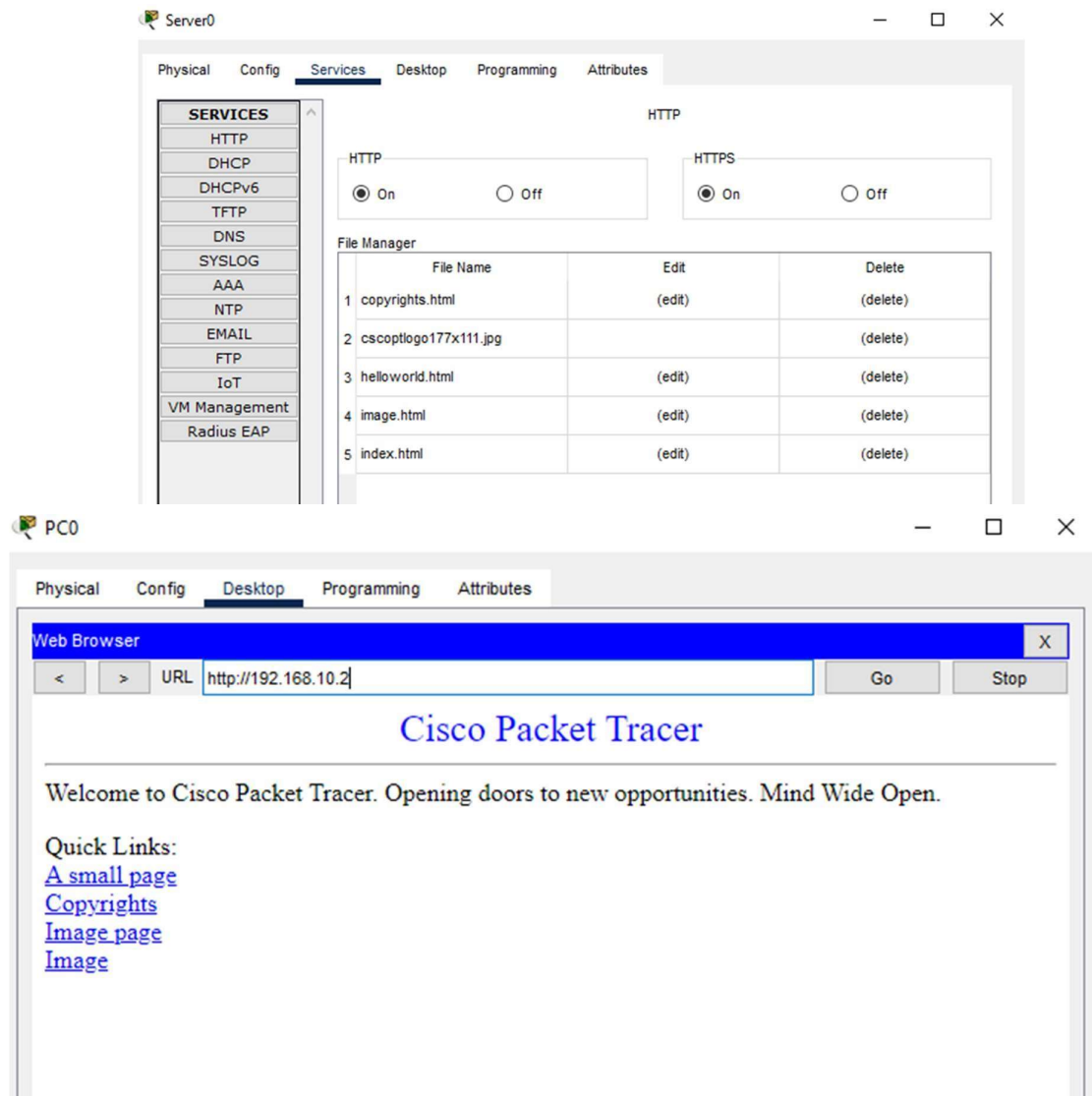
2. HyperText Transfer Protocol

It is a protocol used to access the data on the World Wide Web (www). The HTTP protocol can be used to transfer the data in the form of plain text, hypertext, audio, video, and so on. HTTP is a connectionless, media independent and stateless protocol. HTTP messages are of two types: request and response.

It can be implemented on a CISCO server as:

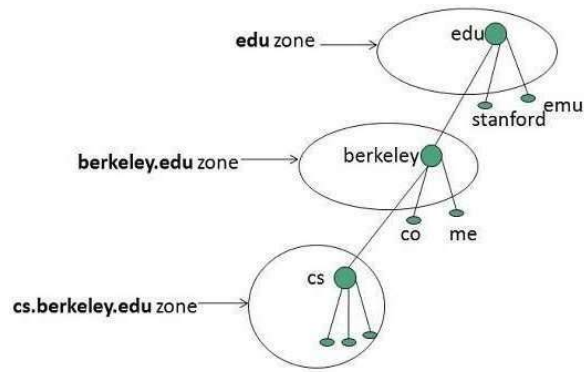
Procedure

- Go to the services option of server and choose HTTP.
- Import HTML files along with images of your website.
- Enable both http and https service.
- Now we can view our website from connected client computers by simply typing in the IP address of server on web browser.



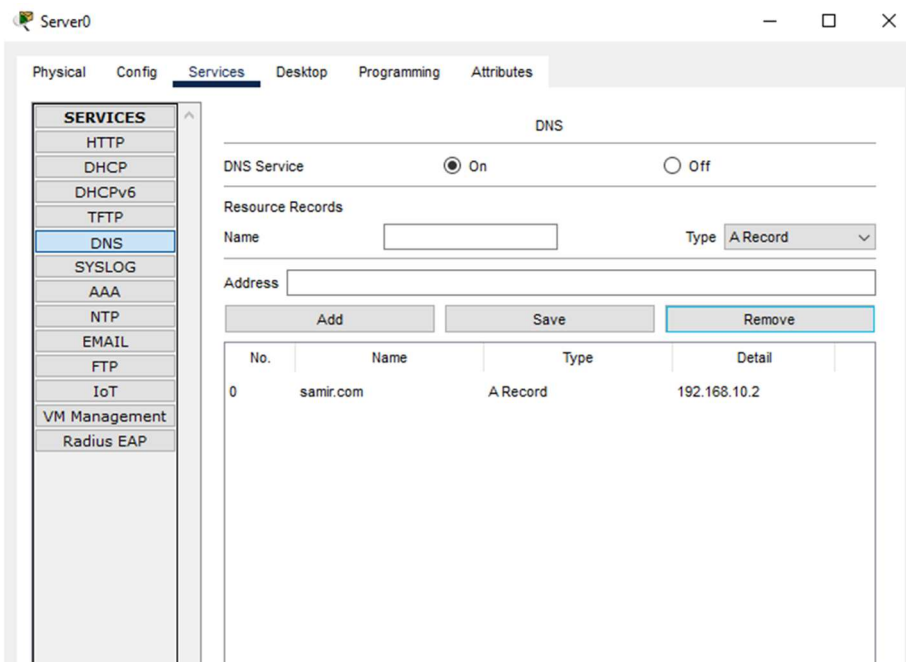
3. Domain Name System (DNS)

The Domain Name System is the hierarchical and decentralized naming system used to map names to IP addresses on Internet or other Internet Protocol networks. DNS translates domain names to IP addresses so browsers can load Internet resources. DNS is for user convenience to remember a website by its name as remembering website by its IP is not an easy task. Domain Names are hierarchical, and each part of a domain name is referred to as either the root, top level, second level or as a sub-domain.

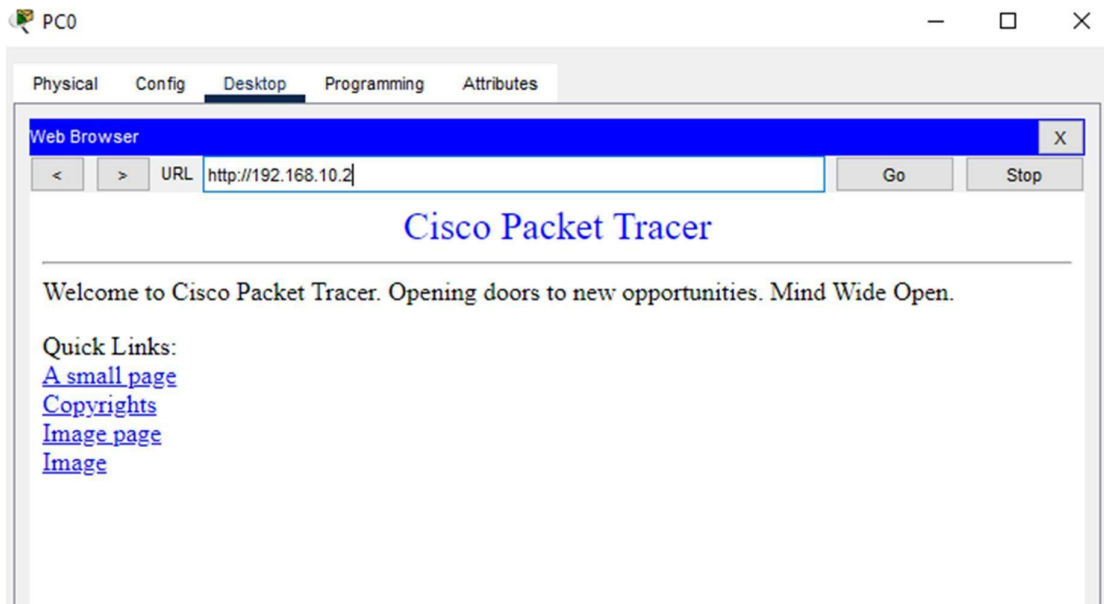


Procedure

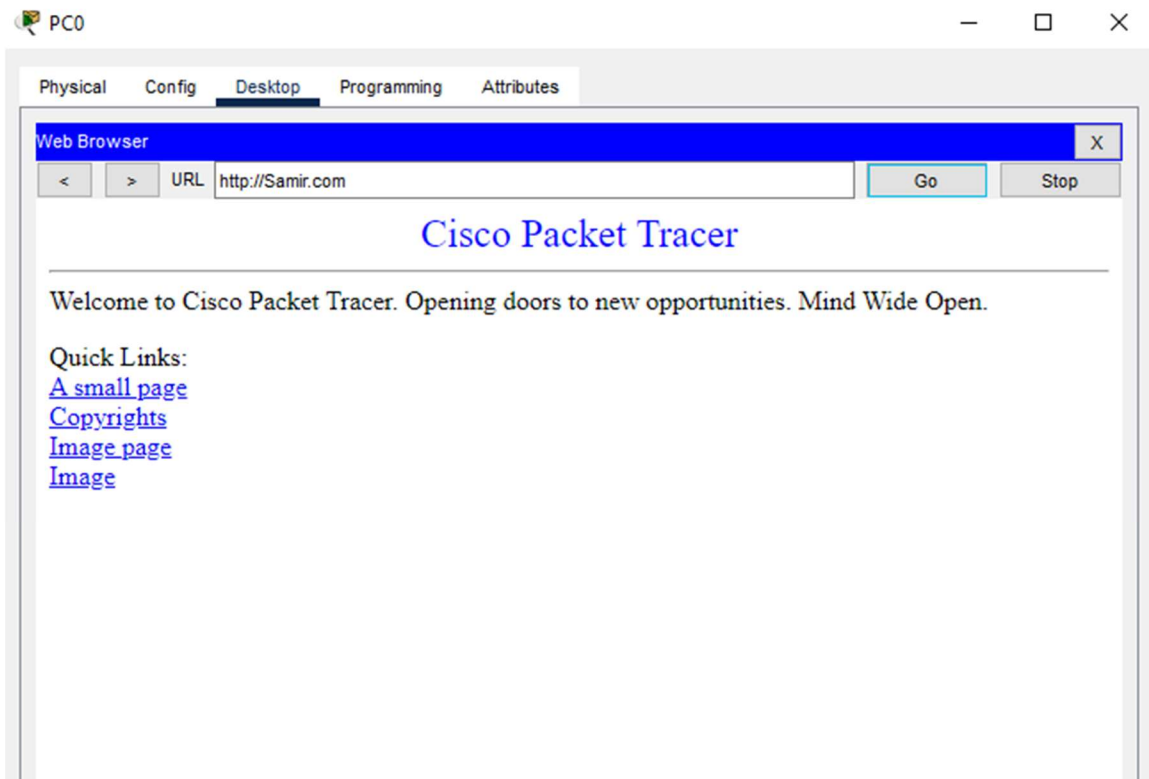
- Go to the services option on the server and choose DNS service.
- Enter a name and choose an appropriate type of the name: A Record: points a name to a specific IP.
CNAME: points a name to another name instead of to an IP.
SOA (Start of Authority): Contains important information about domain or zone such as administrator's email address, when the domain was last updated and how long the server should wait between refreshes.
NS (Name Server) record: Indicated which DNS server is authoritative for that domain. (Which means a server that contains the actual DNS records.)
- Assign the server IP with the name and enable the DNS service.



Before assigning DNS(i.e accessing website by typing in IP address on Web browser)



After assigning DNS(i.e accessing website by typing in Domain name on Web browser)



4. Email

Email is the service of server that enable users in the network to send and receive emails. An email server, also called a mail server, is essentially a computer system that sends and receives emails. Email communication involves complex protocols and processes. The most common protocols are SMPT and POP3.

SMTP

Simple Mail Transfer Protocol (SMTP) is a protocol used for sending email messages. SMTP transfers the mail from sender's computer to the mailbox present on receiver's mail server, so it is also called PUSH protocol. SMTP is also known as PUSH protocol. It is a MTA (Message Transfer Agent). The port number of SMTP is 25, 465, and 587 for secured connection (TLS connection).

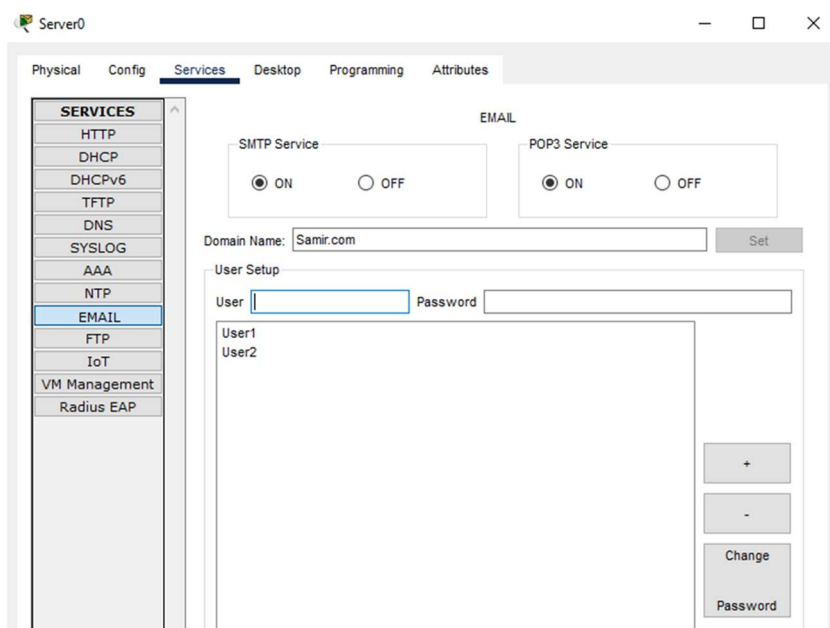
POP3

Post Office Protocol (POP) version 3 is a protocol used for receiving email messages. POP3 allows to retrieve and organize mails from mailbox on receiver mail server to receiver's computer, so it is also called POP protocol. The port number of POP3 is 110 or port 995 for SSL/TLS connection.

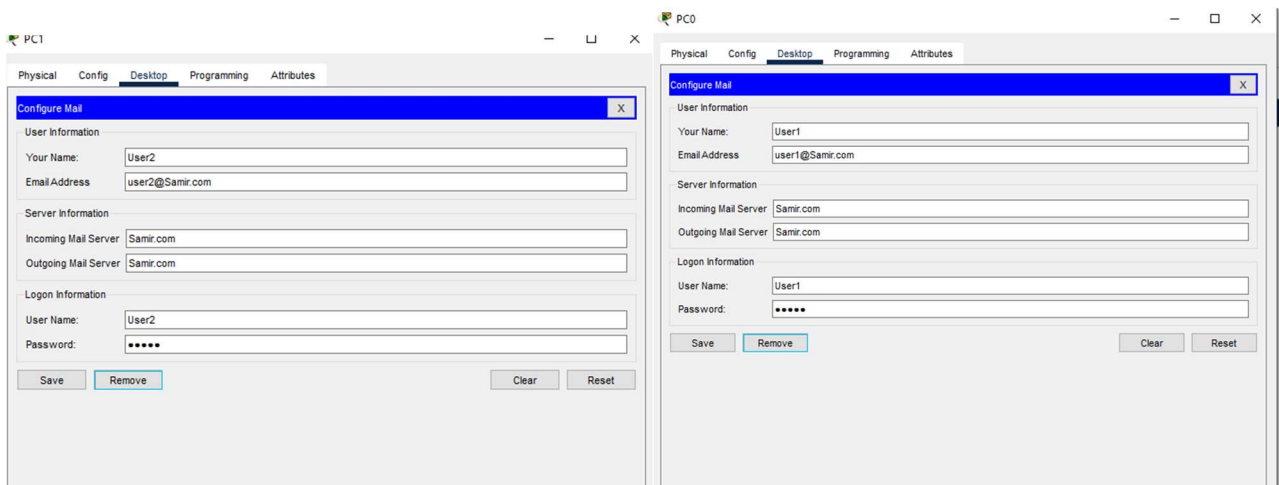
Email service can be set up as:

Procedure

- a. Go to the services option on the server and choose EMAIL service.
- b. Enable both SMTP and POP3 services
- c. Enter the domain name of the mail server.
- d. Setup the users by providing username and password to each user.

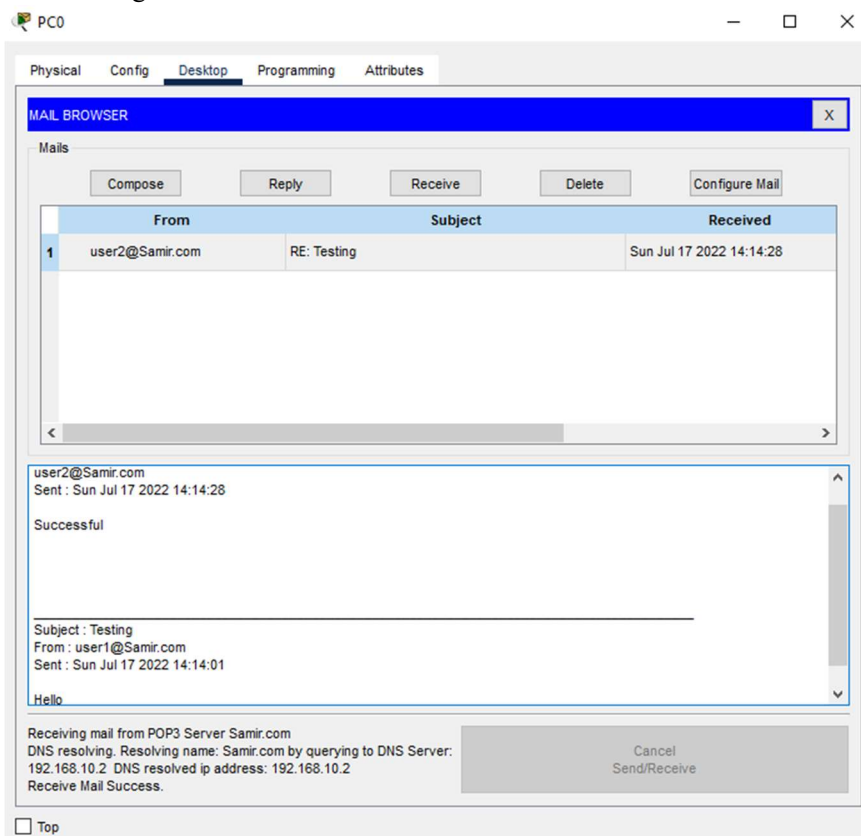


- e. Now assign the created user credentials to clients.

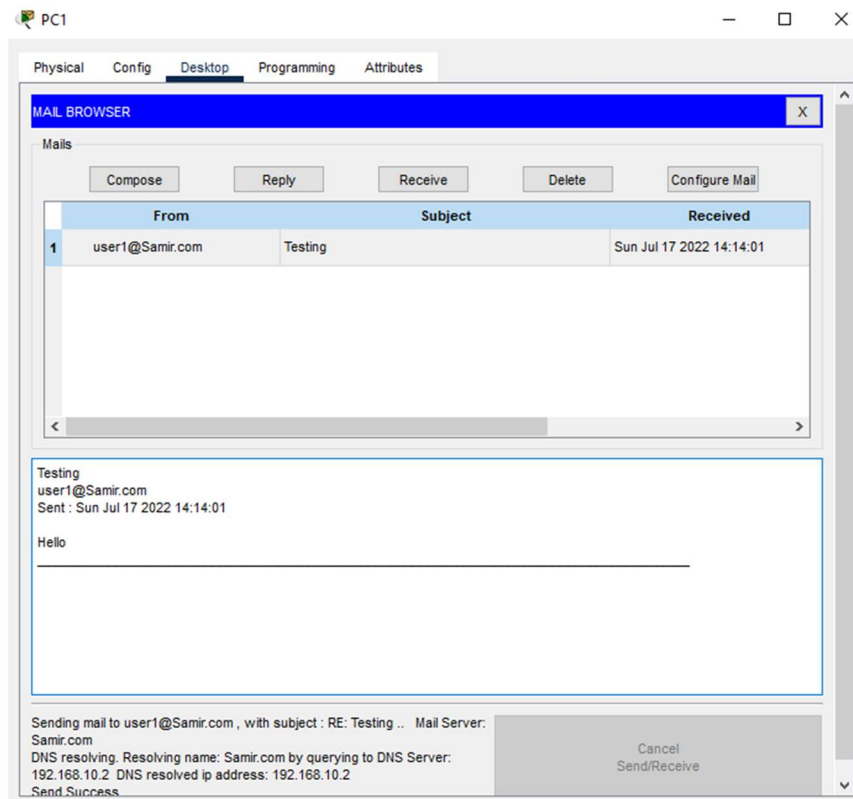


f. Now clients can send and receive emails.

Sending mail



Receiving mail



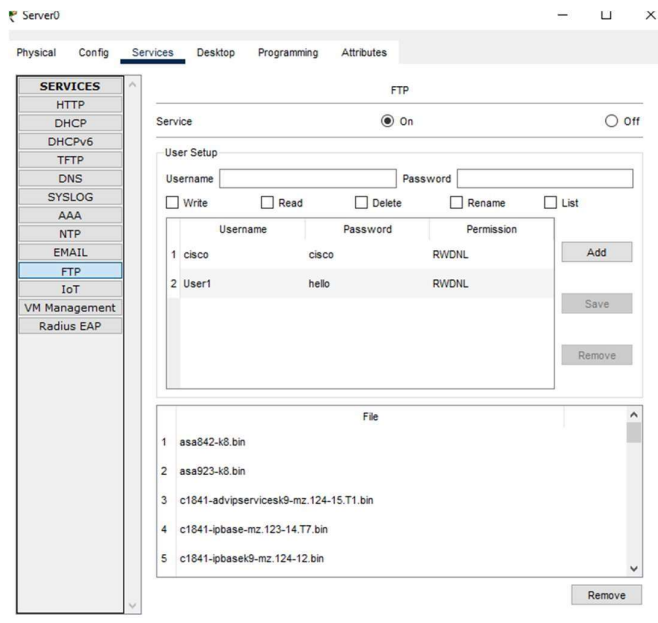
5. FTP

FTP stands for File Transfer Protocol. FTP is used to transport a file from one location to another. For transporting a file, FTP uses TCP services. It uses two TCP connections, i.e. control connection and data connection. Both control connection and data connection use well-known port 21 and well-known port 20, respectively.

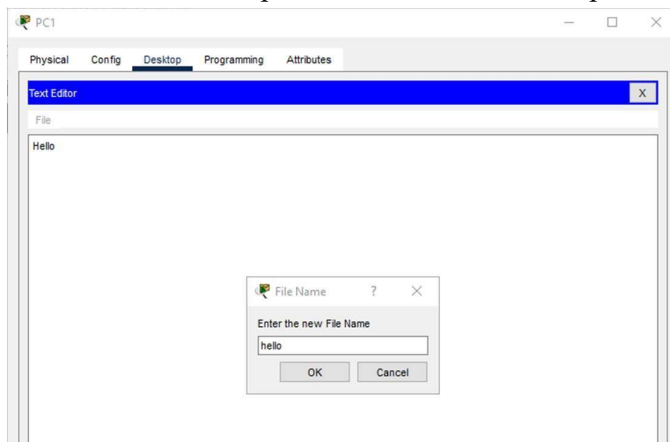
FTP service can be set up as:

Procedure

- Go to services option on server and choose FTP service.
- Enable the FPT service by setting up the user by providing it with username , password and appropriate authority (i.e. read, write, delete, edit etc).



c. Create multiple files on client PC to implement FTP commands.



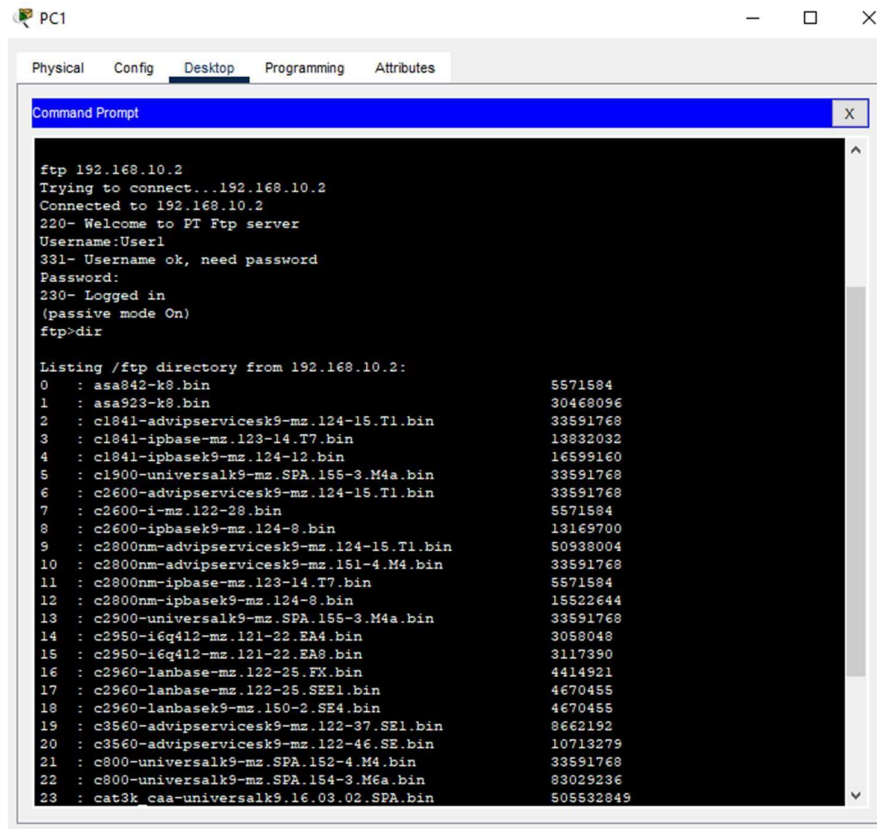
d. Now go to the command line of the client PC and type in following commands to enable FTP

FTP <IP address the server>

Enter the previously created username and password. Now the FTP service is enabled on client PC and client can perform ftp operations.

Basic FTP commands

- dir
It displays the list of directories in the server.
Syntax: ftp > dir



The screenshot shows a PC1 window with a tabbed interface. The 'Desktop' tab is active, displaying a Command Prompt window. The Command Prompt shows the execution of an FTP command to connect to 192.168.10.2. The connection is successful, and the user 'User1' is logged in. The user then enters the 'dir' command to list the contents of the remote directory. The output shows a list of files and their sizes, including various .bin files.

```
ftp 192.168.10.2
Trying to connect...192.168.10.2
Connected to 192.168.10.2
220- Welcome to PT Ftp server
Username:User1
331- Username ok, need password
Password:
230- Logged in
(passive mode On)
ftp>dir

Listing /ftp directory from 192.168.10.2:
0  : asa842-k8.bin                               5571584
1  : asa923-k8.bin                               30468096
2  : cl841-advipservicesk9-mz.124-15.T1.bin      33591768
3  : cl841-ipbase-mz.123-14.T7.bin               13832032
4  : cl841-ipbasek9-mz.124-12.bin                 16599160
5  : cl900-universalk9-mz.SPA.155-3.M4a.bin       33591768
6  : c2600-advipservicesk9-mz.124-15.T1.bin       33591768
7  : c2600-i-mz.122-28.bin                       5571584
8  : c2600-ipbasek9-mz.124-8.bin                  13169700
9  : c2800nm-advipservicesk9-mz.124-15.T1.bin     50938004
10 : c2800nm-advipservicesk9-mz.151-4.M4a.bin     33591768
11 : c2800nm-ipbase-mz.123-14.T7.bin              5571584
12 : c2800nm-ipbasek9-mz.124-8.bin                15522644
13 : c2900-universalk9-mz.SPA.155-3.M4a.bin       33591768
14 : c2950-i6q412-mz.121-22.EA4.bin              3058048
15 : c2950-i6q412-mz.121-22.EA8.bin              3117390
16 : c2960-lanbase-mz.122-25.FX.bin               4414921
17 : c2960-lanbase-mz.122-25.SEE1.bin             4670455
18 : c2960-lanbasek9-mz.150-2.SE4.bin             4670455
19 : c3560-advipservicesk9-mz.122-37.SE1.bin      8662192
20 : c3560-advipservicesk9-mz.122-46.SE.bin       10713279
21 : c800-universalk9-mz.SPA.152-4.M4a.bin        33591768
22 : c800-universalk9-mz.SPA.154-3.M6a.bin        83029236
23 : cat3k_caa-universalk9.16.03.02.SPA.bin       505532849
```

- put
It is used to upload the file/directory to server .
Syntax: ftp > put <file/directory_name>

```

PC1
Physical Config Desktop Programming Attributes

Command Prompt

ftp>
ftp>put hello.txt

Writing file hello.txt to 192.168.5.2:
File transfer in progress...

[Transfer complete - 5 bytes]

5 bytes copied in 0.028 secs (178 bytes/sec)
ftp>put world.txt

Writing file world.txt to 192.168.5.2:
File transfer in progress...

[Transfer complete - 5 bytes]

5 bytes copied in 0.025 secs (200 bytes/sec)
ftp>dir

Listing /ftp directory from 192.168.5.2:
0 : asa842-k8.bin 5571584
1 : asa923-k8.bin 30468096
2 : c1841-advipservicesk9-mz.124-15.T1.bin 33591768
3 : c1841-ipbase-mz.123-14.T7.bin 13832032
4 : c1841-ipbasek9-mz.124-12.bin 16599160
5 : c1900-universalk9-mz.SPA.155-3.M4a.bin 33591768
6 : c2600-advipservicesk9-mz.124-15.T1.bin 33591768
7 : c2600-i-mz.122-28.bin 5571584
8 : c2600-ipbasek9-mz.124-8.bin 13169700
9 : c2800nm-advipservicesk9-mz.124-15.T1.bin 50938004
10 : c2800nm-advipservicesk9-mz.151-4.M4.bin 33591768
11 : c2800nm-ipbase-mz.123-14.T7.bin 5571584
12 : c2800nm-ipbasek9-mz.124-8.bin 15522644
13 : c2900-universalk9-mz.SPA.155-3.M4a.bin 33591768
14 : c2950-i6q412-mz.121-22.EA4.bin 3058048
15 : c2950-i6q412-mz.121-22.EA8.bin 3117390
16 : c2960-lanbase-mz.122-25.FX.bin 4414921

```

```

PC1
Physical Config Desktop Programming Attributes

Command Prompt

0 : asa842-k8.bin 5571584
1 : asa923-k8.bin 30468096
2 : c1841-advipservicesk9-mz.124-15.T1.bin 33591768
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12 : c2800nm-ipbasek9-mz.124-8.bin 15522644
13 : c2900-universalk9-mz.SPA.155-3.M4a.bin 33591768
14 : c2950-i6q412-mz.121-22.EA4.bin 3058048
15 : c2950-i6q412-mz.121-22.EA8.bin 3117390
16 : c2960-lanbase-mz.122-25.FX.bin 4414921
17 : c2960-lanbase-mz.122-25.SE1.bin 4670455
18 : c2960-lanbasek9-mz.150-2.SE4.bin 4670455
19 : c3560-advipservicesk9-mz.122-37.SE1.bin 8662192
20 : c3560-advipservicesk9-mz.122-46.SE.bin 10713279
21 : c800-universalk9-mz.SPA.152-4.M4.bin 33591768
22 : c800-universalk9-mz.SPA.154-3.M6a.bin 83029236
23 : cat3k_caa-universalk9.16.03.02.SPA.bin 505532849
24 : cgr1000-universalk9-mz.SPA.154-2.CG 159487552
25 : cgr1000-universalk9-mz.SPA.156-3.CG 184530138
26 : hello.txt 5
27 : ir800-universalk9-bundle.SPA.156-3.M.bin 160968869
28 : ir800-universalk9-mz.SPA.155-3.M 61750062
29 : ir800-universalk9-mz.SPA.156-3.M 63753767
30 : ir800_yocto-1.7.2.tar 2877440
31 : ir800_yocto-1.7.2_python-2.7.3.tar 6912000
32 : pt1000-i-mz.122-28.bin 5571584
33 : pt3000-i6q412-mz.121-22.EA4.bin 3117390
34 : sunrise.txt 6
35 : world.txt 5

ftp>

```

- cd
It is used to change the directory.

Syntax: ftp> cd <directory_name>

- delete

It is used to delete the file/directory on the server.

Syntax: ftp> delete <file/directory_name>

- passive

It is used to toggle between Active FTP mode and Passive FTP mode. In Active FTP, FTP client sends PORT command. FTP client provides IP and Port for server to connect data channel.

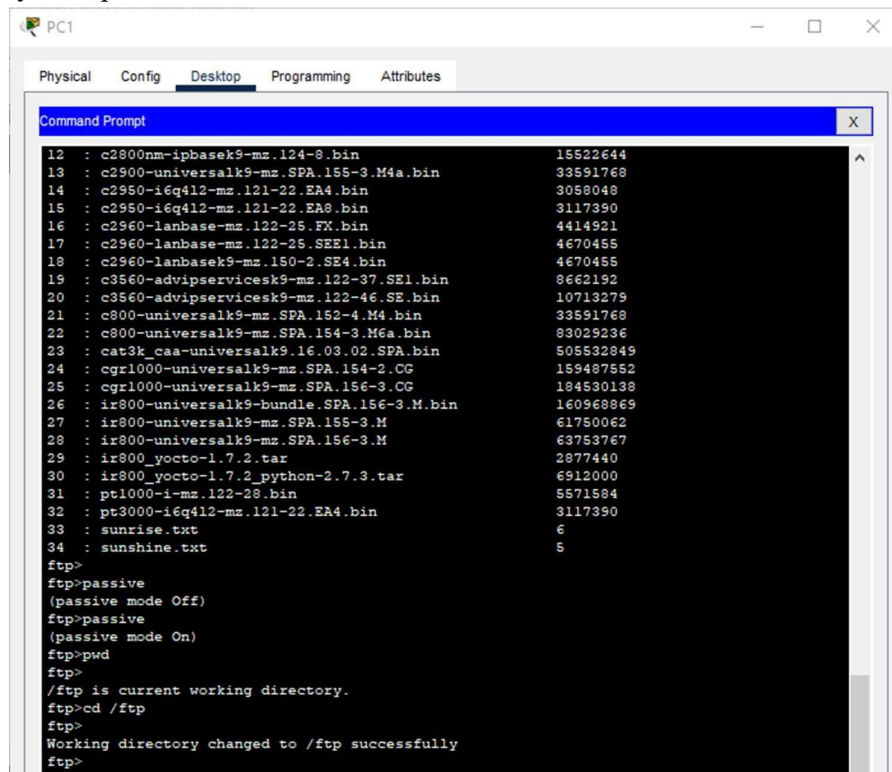
In Passive FTP, FTP client sends PASV command. FTP server provides IP and Port for client to connect data channel.

Syntax: ftp> passive

- pwd

It returns current directory name.

Syntax: pwd



The screenshot shows a Windows PC1 window with a Command Prompt. The Command Prompt displays a directory listing of files and their sizes, followed by several FTP commands and their outputs. The directory listing includes files like c2800nm-ipbasek9-mz.124-8.bin, c2900-universalk9-mz.SPA.155-3.M4a.bin, etc. The FTP commands include ftp>, ftp>passive, ftp>passive, ftp>pwd, and ftp>, with outputs indicating passive mode status and the current directory.

```
12 : c2800nm-ipbasek9-mz.124-8.bin 15522644
13 : c2900-universalk9-mz.SPA.155-3.M4a.bin 33591768
14 : c2950-i6q4l2-mz.121-22.EA4.bin 3058048
15 : c2950-i6q4l2-mz.121-22.EA8.bin 3117390
16 : c2960-lanbase-mz.122-25.FX.bin 4414921
17 : c2960-lanbase-mz.122-25.SE1.bin 4670455
18 : c2960-lanbasek9-mz.150-2.SE4.bin 4670455
19 : c3560-advipervicesk9-mz.122-37.SE1.bin 8662192
20 : c3560-advipervicesk9-mz.122-46.SE1.bin 10713279
21 : c800-universalk9-mz.SPA.152-4.M4.bin 33591768
22 : c800-universalk9-mz.SPA.154-3.M6a.bin 83029236
23 : cat3k_caa-universalk9.16.03.02.SPA.bin 505532849
24 : cg1000-universalk9-mz.SPA.154-2.CG 159487552
25 : cg1000-universalk9-mz.SPA.156-3.CG 184530138
26 : ir800-universalk9-bundle.SPA.156-3.M.bin 160968869
27 : ir800-universalk9-mz.SPA.155-3.M 61750062
28 : ir800-universalk9-mz.SPA.156-3.M 63753767
29 : ir800_yocto-1.7.2.tar 2877440
30 : ir800_yocto-1.7.2_python-2.7.3.tar 6912000
31 : pt1000-i-mz.122-28.bin 5571584
32 : pt3000-i6q4l2-mz.121-22.EA4.bin 3117390
33 : sunrise.txt 6
34 : sunshine.txt 5

ftp>
ftp>passive
(passive mode Off)
ftp>passive
(passive mode On)
ftp>pwd
ftp>
/ftp is current working directory.
ftp>cd /ftp
ftp>
Working directory changed to /ftp successfully
ftp>
```

- get

It is used to download the file/directory from server.

Syntax: ftp> get <file/directory_name>

- rename

It is used to rename the file/directory name.

Syntax: ftp> rename <old_name> <new_name>

The image shows two screenshots of a PC1 Command Prompt window. The window has tabs for Physical, Config, Desktop, Programming, and Attributes, with 'Desktop' selected. The Command Prompt shows an FTP session where the user renames 'hello.txt' to 'sunshine.txt' and then lists the directory. The first screenshot shows the directory listing from line 0 to 27. The second screenshot shows the same listing from line 0 to 35, with additional files like 'sunrise.txt', 'sunshine.txt', and 'world.txt' appearing at the bottom.

```
PC1
Physical Config Desktop Programming Attributes
Command Prompt
ftp>
ftp>rename hello.txt sunshine.txt
Renaming hello.txt
ftp>
[OK Renamed file successfully from hello.txt to sunshine.txt]
ftp>dir

Listing /ftp directory from 192.168.5.2:
 0 : asa842-k8.bin 5571584
 1 : asa923-k8.bin 30468096
 2 : c1841-advipservicesk9-mz.124-15.T1.bin 33591768
 3 : c1841-ipbase-mz.123-14.T7.bin 13832032
 4 : c1841-ipbasek9-mz.124-12.bin 16599160
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22 : c800-universalk9-mz.SPA.154-3.M6a.bin 83029236
23 : cat3k_caa-universalk9.16.03.02.SPA.bin 505532849
24 : cgr1000-universalk9-mz.SPA.154-2.CG 159487552
25 : cgr1000-universalk9-mz.SPA.156-3.CG 184530138
26 : ir800-universalk9-bundle.SPA.156-3.M.bin 160968869
27 : ir800-universalk9-mz.SPA.155-3.M 61750062

PC1
Physical Config Desktop Programming Attributes
Command Prompt
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 4 : c1841-ipbasek9-mz.124-12.bin 16599160
 5 : c1900-universalk9-mz.SPA.155-3.M4a.bin 33591768
 6 : c2600-advipservicesk9-mz.124-15.T1.bin 33591768
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15 : c2950-i6q412-mz.121-22.EA8.bin 3117390
16 : c2960-lanbase-mz.122-25.FX.bin 4414921
17 : c2960-lanbase-mz.122-25.SE1.bin 4670455
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21 : c800-universalk9-mz.SPA.152-4.M4.bin 33591768
22 : c800-universalk9-mz.SPA.154-3.M6a.bin 83029236
23 : cat3k_caa-universalk9.16.03.02.SPA.bin 505532849
24 : cgr1000-universalk9-mz.SPA.154-2.CG 159487552
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28 : ir800-universalk9-mz.SPA.156-3.M 63753767
29 : ir800_yocto-1.7.2.tar 2877440
30 : ir800_yocto-1.7.2_python-2.7.3.tar 6912000
31 : pt1000-i-mz.122-28.bin 5571584
32 : pt3000-i6q412-mz.121-22.EA4.bin 3117390
33 : sunrise.txt 6
34 : sunshine.txt 5
35 : world.txt 5
ftp>
```

- quit
It is used to disconnect the FTP connection.
Syntax: quit