Computer Networks-Lab 06

Instructor: Engr. Khuram Shahzad

CL30001 – Computer Networks-Lab

SEMESTER Fall 2021

JANUARY 28, 2022

NATIONAL UNIVERSTIY OF COMPUTER AND EMERGING SCIENCES, FAST- PESHAWAR CAMPUS
Department of Computer Science & Software Engineering

Computer Networks - Lab 06

OBJECTIVES

After these Lab students shall be able to perform

- **Introduction with SMTP, IMAP, POP3, FTP**
- **Configure the of SMTP and POP3 on generic server.**
    - Send email from client1 to client2 and analyze them.
- **Practical example of SMTP in C# application for understanding SMTP protocol**
- **Configure Ftp on generic server**
    - Send files from client to sever and analyze them (Delete, Update and rename these files)
    - Send .html files to http directory of server through ftp.
    - Open these html file from client PC

PRE-LAB READING ASSIGNMENT

Remember the delivered lecture carefully.

Table of Contents

Computer Networks - Lab 06 1
OBJECTIVES 1
PRE-LAB READING ASSIGNMENT 1
Configuring an email server in Packet Tracer 3
1. Build the network topology: 3
2. Configure IP addresses on the PCs, DNS Server and the Mail Server. 3
3. Now configure mail clients on the PCs and mail service on the generic server. 4
A. How to configure an FTP server in Packet Tracer 12
1. Build the network topology. 12
2. Configure static IP addresses on the Laptop and the server. 12
3. Now try using an FTP client built in the Laptop to send files to an FTP server configured in the Server. 12
4. Create a file in the Laptop then upload it to the server using FTP. 13
5. Now upload the file from the Laptop to the server using FTP. (An FTP connection has to be started first. But this is what we've done in step 3) 14
6. Go to the Server FTP directory to verify if the file sent has been received 15
7. Something extra: To check other FTP commands 16
8. Open HTTP directory and upload file there. 16
SMTP Demo using C# Application 28
C# Application interface. 28
Email Received in Gmail: 28
Tasks for students: 29
1. Configure Mail server, Ftp Server, DHCP Server, DNS Server and web Server in a single topology, use router and switch. 29

Configuring an email server in Packet Tracer

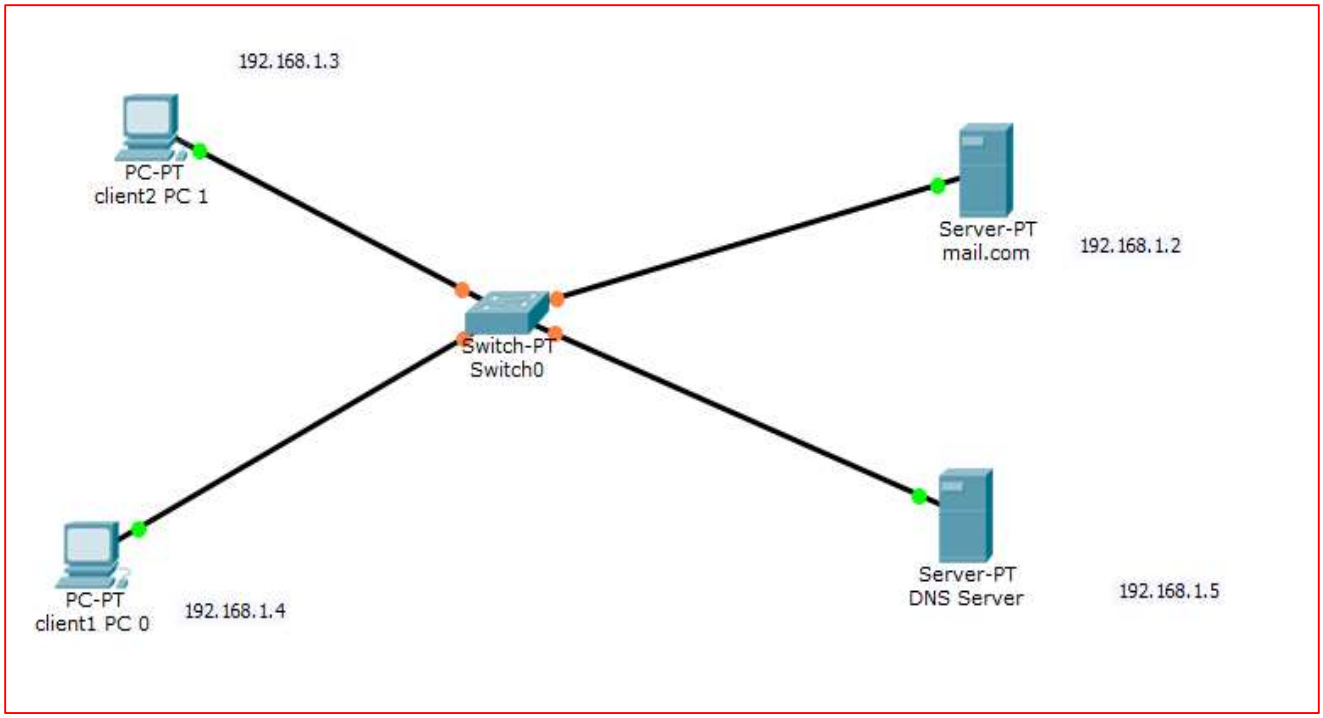
We'll do a simple configuration of an **email server** in Packet Tracer.

An *email server*, such as Gmail stores and sends email messages to email clients on request. We often send and receive emails on our mobile devices or computers. Have you ever imagined how this happens? Well, whenever you compose and send an email to another person, the message you send first goes to a mail server. It's the mail server which then sends the email when it is requested from the email client(e.g. Gmail App) of the recipient's device.

So now, let's configure a mail server in Packet Tracer. And have in mind that although our main focus is configuring an email server, we'll still need services of a *DNS server* at one point.

Let's dive right in.

1. Build the network topology:



2. Configure IP addresses on the PCs, DNS Server and the Mail Server.

Mail Server IP address: 192.168.1.2

PC0 **IP address**: 192.168.1.4

PC1 **IP address:** 192.168.1.3

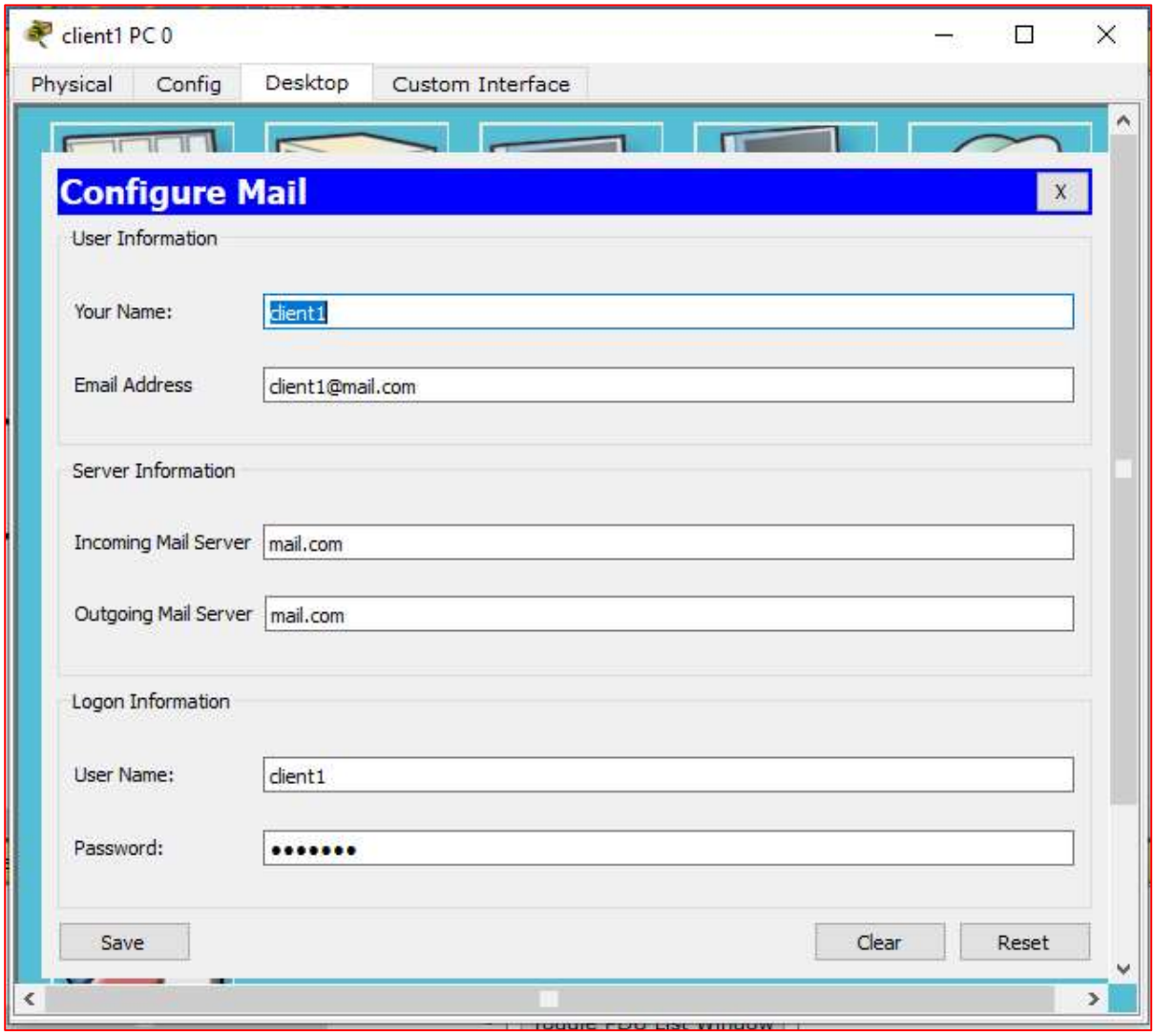
DNS server **IP address**: 192.168.1.5

3. **Now configure mail clients on the PCs and mail service on the generic server.**

Mail Clients:

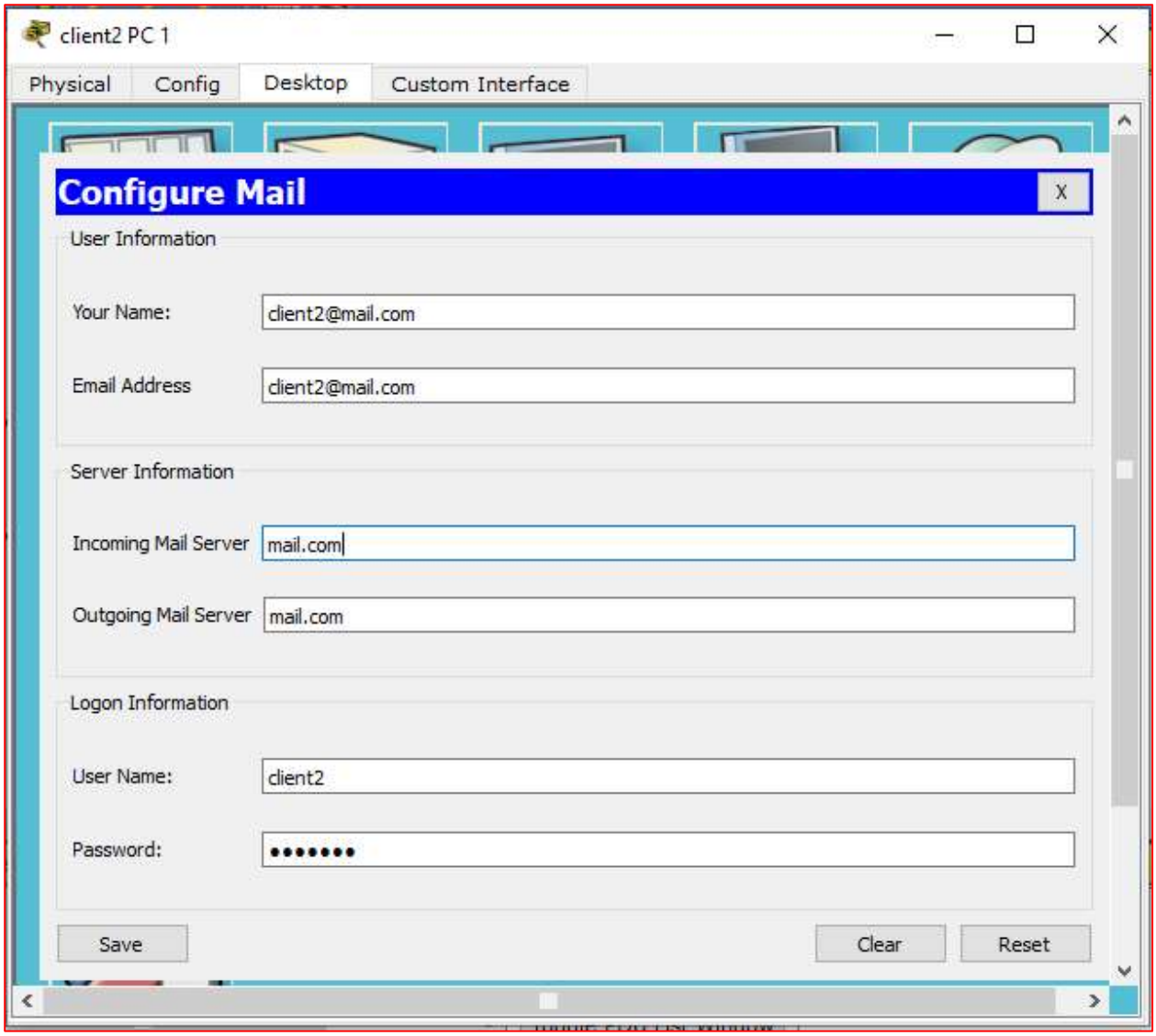
Click on **PC0**. Go to its **Desktop** tab, and click on **Email.** Configure the email client by filling in the user, server and login information. Be sure to **Save.**

PC0:



PC1:

Configure mail client on PC1 in a similar way we did for PC0.



Mail Server:

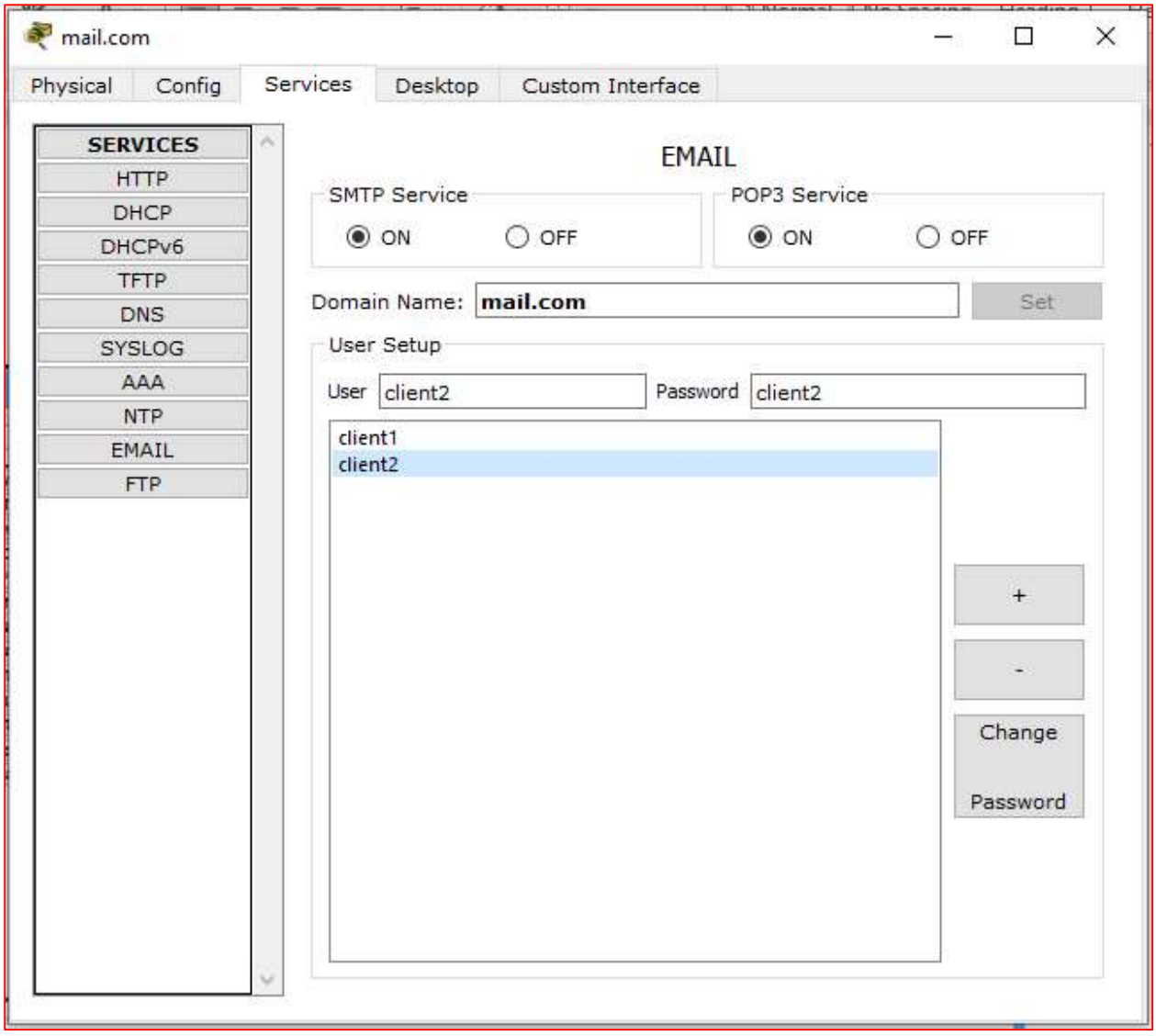
Next, we'll configure the **email server.**

To do this, click on the server, then click **Services** tab, pick **email** server from the menu.

Provide the **Domain name** of the server then click on **Set** to set it. In this example I've used the name 'mail.com' .

Proceed and add **users** and provide their **passwords**. I have two email clients(users) with usernames 'client1' and 'client2' with a common password 'admin'

After entering a username and password, click on **Add(+)** to add the user to the server. You can optionally remove a user by clicking on **Remove (-).** You can change a user's password by clicking on **change password.**

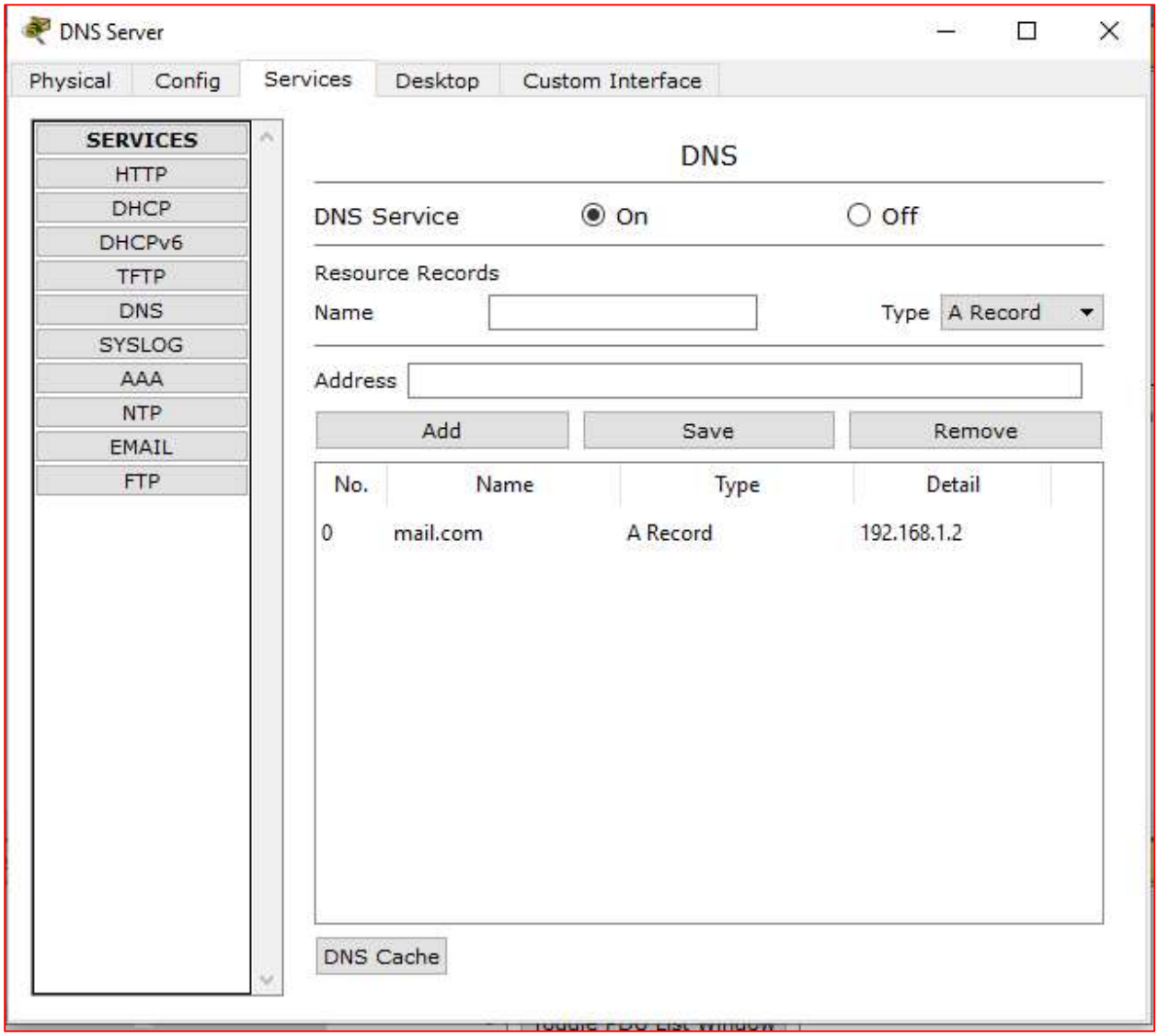


Try to relate this process to what happens when you register an email account with a mail service provider(mail server) like Gmail. The processes appear to agree, isn't it?

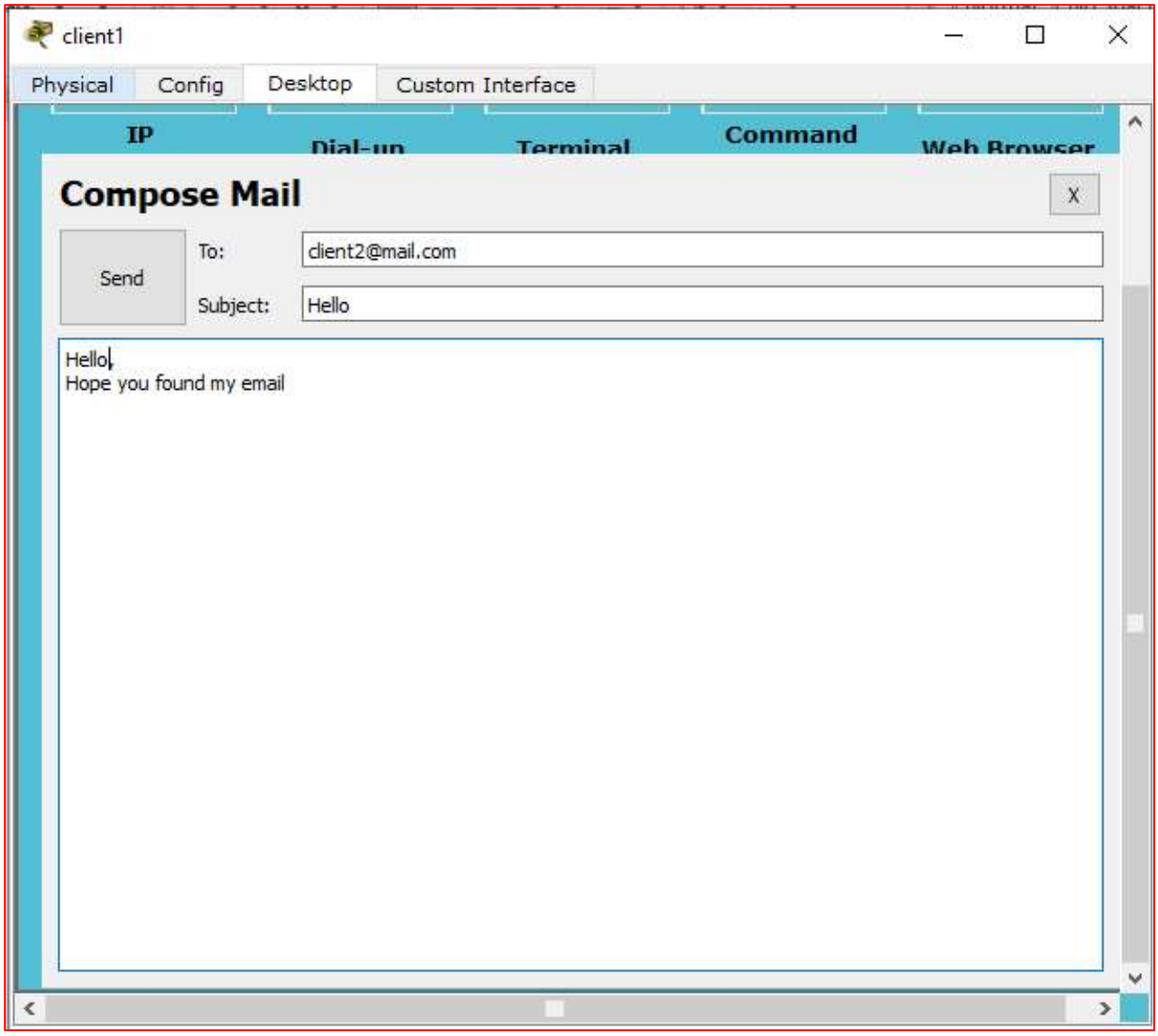
Now, notice that we set a **domain name** for the email server. For that reason, we should have a **DNS server** that will resolve this domain name (plus other domain names if there were) to an IP address.

So let's configure a DNS server.

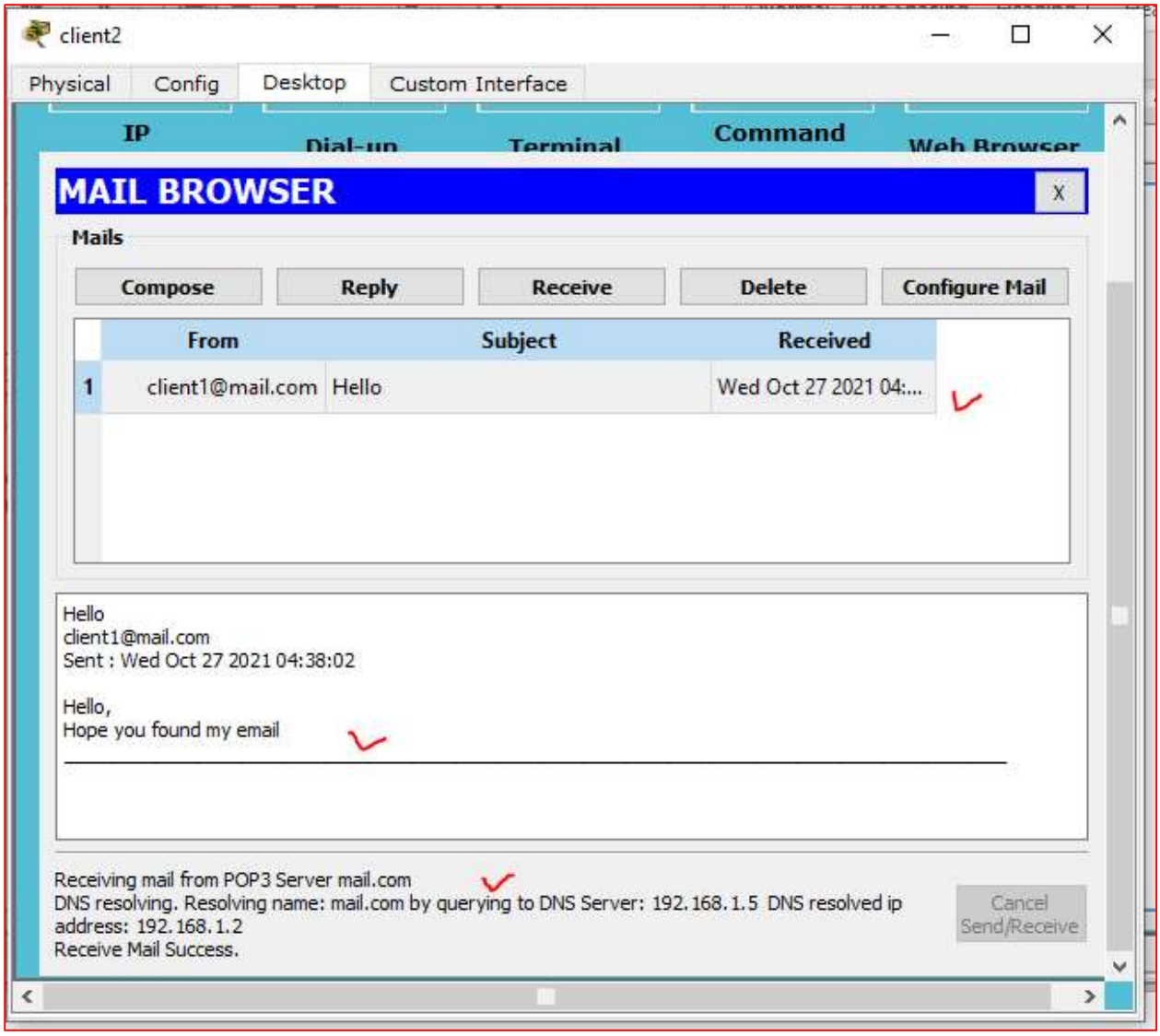
Click DNS server, click **Services** tab, then pick **DNS**. Turn the service **ON.** Set name-address pairs and add them to the server. You can view the DNS entry below:



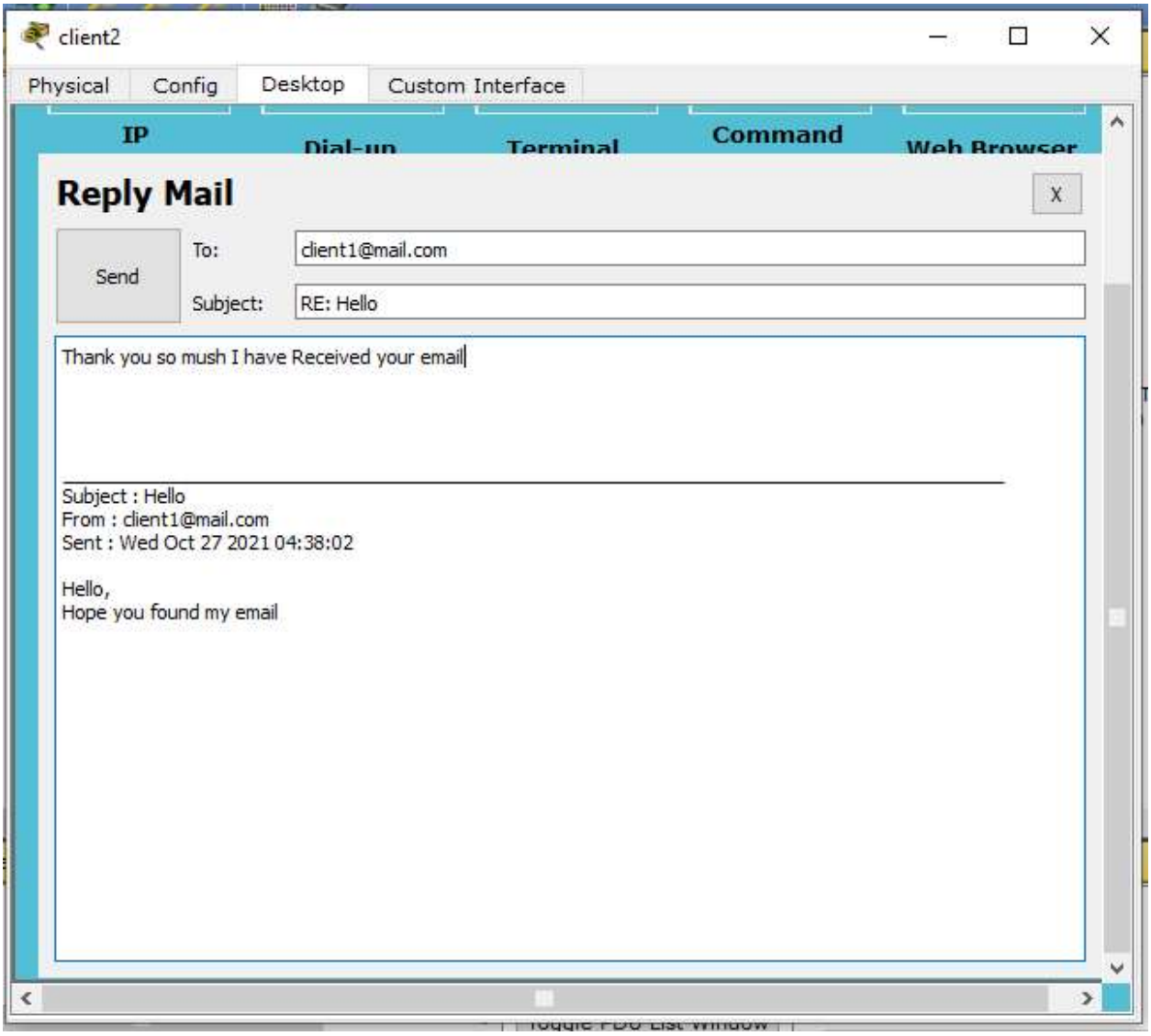
4. Lastly test the email service. Go to **PC0** **email** client, **compose** an email and **send** its to **PC1** email address (client2@mail.com).

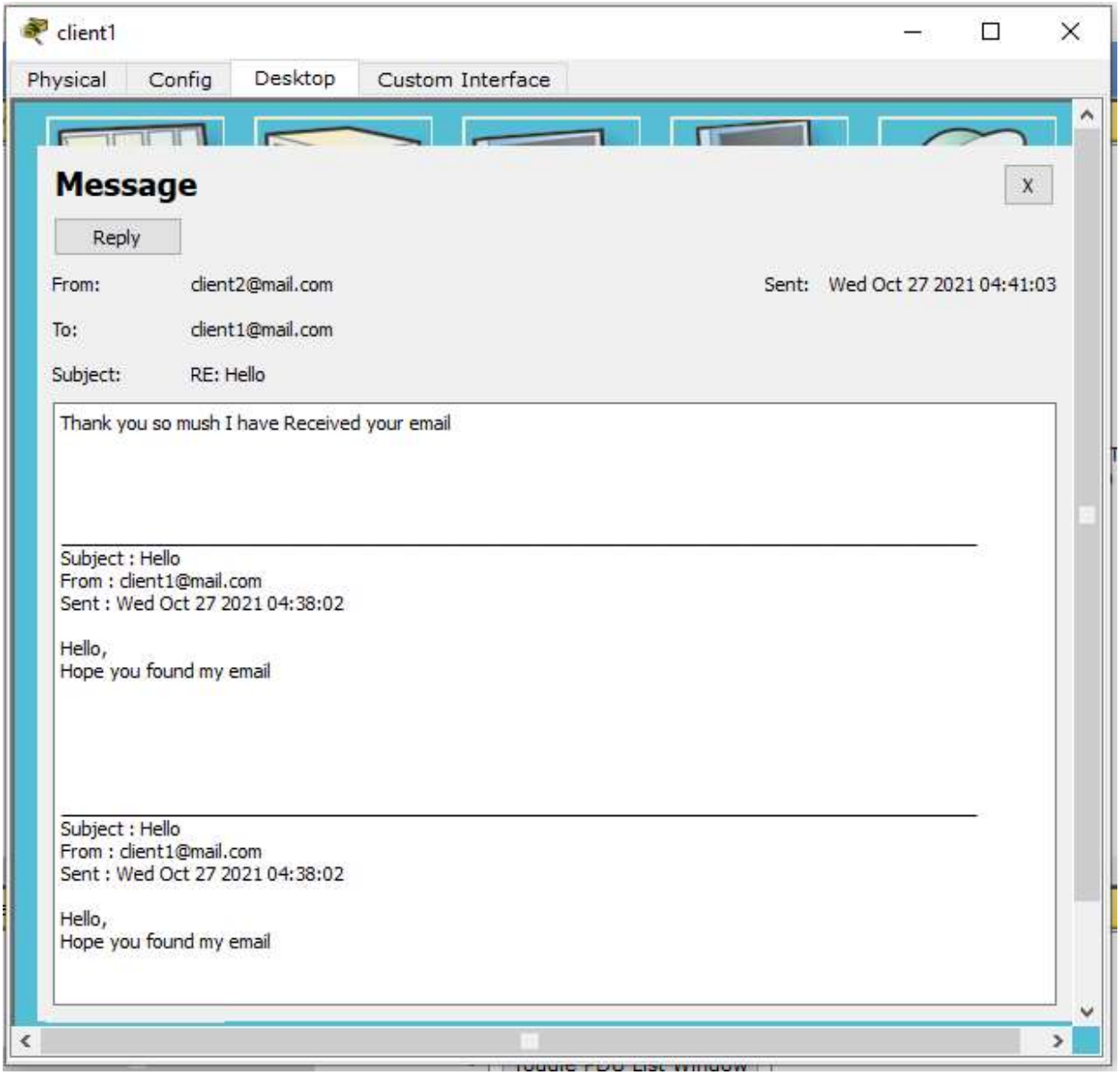


Try to see whether the email from **PC0** is received on **PC1**. On the **email** client of PC1, click on **Receive.**



If everything is well set up, the email from **PC0** will be well received on **PC1**.


client2
Physical
Config
Desktop
Custom Interface
IP
Dial-up
Terminal
Command
Web Browser
Reply Mail
X
Send
To:
client1@mail.com
Subject:
RE: Hello
Thank you so mush I have Received your email
Subject : Hello
From : client1@mail.com
Sent : Wed Oct 27 2021 04:38:02
Hello,
Hope you found my email


client1
Physical
Config
Desktop
Custom Interface
Message
X
Reply
From: client2@mail.com
Sent: Wed Oct 27 2021 04:41:03
To: client1@mail.com
Subject: RE: Hello
Thank you so mush I have Received your email
Subject : Hello
From : client1@mail.com
Sent : Wed Oct 27 2021 04:38:02
Hello,
Hope you found my email
Subject : Hello
From : client1@mail.com
Sent : Wed Oct 27 2021 04:38:02
Hello,
Hope you found my email

A. How to configure an FTP server in Packet Tracer

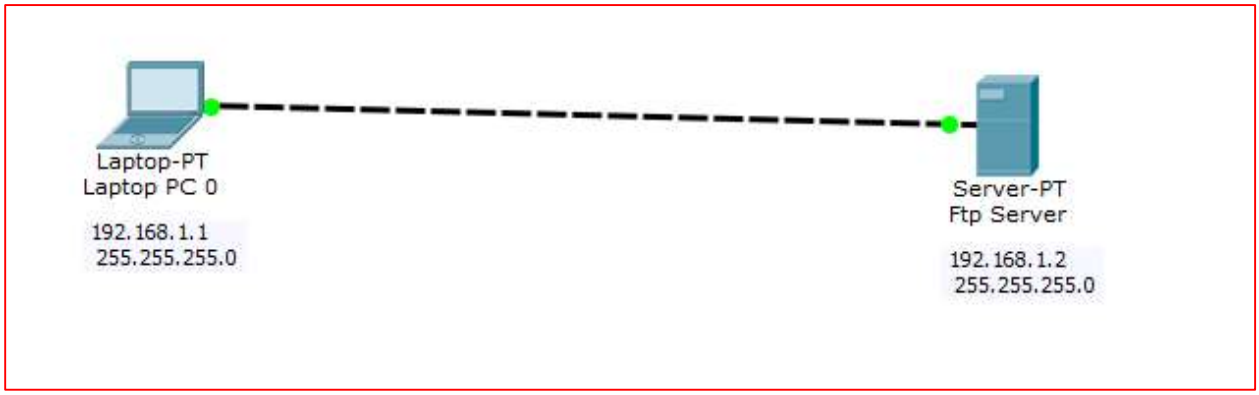
The **File Transfer Protocol (FTP)** is a standard network protocol used for the transfer of computer files between a client and server on a computer network.

FTP employs a **client-server** architecture whereby the client machine has an **FTP client** installed and establishes a connection to an **FTP server** running on a remote machine. After the connection has been established and the user is successfully authenticated, the data transfer phase can begin.

Worth noting**:** Although FTP does support **user authentication**, all data is sent in clear text, including usernames and passwords. For **secure** transmission that protects the username and password, and encrypts the content, FTP is often secured with SSL/TLS (FTPS) or replaced with SSH File Transfer Protocol (SFTP).

Let's now do FTP configuration in Packet Tracer:

1. Build the network topology.



2. Configure static IP addresses on the Laptop and the server.

Laptop: **IP address:** 192.168.1.1 **Subnet Mask:** 255.255.255.0

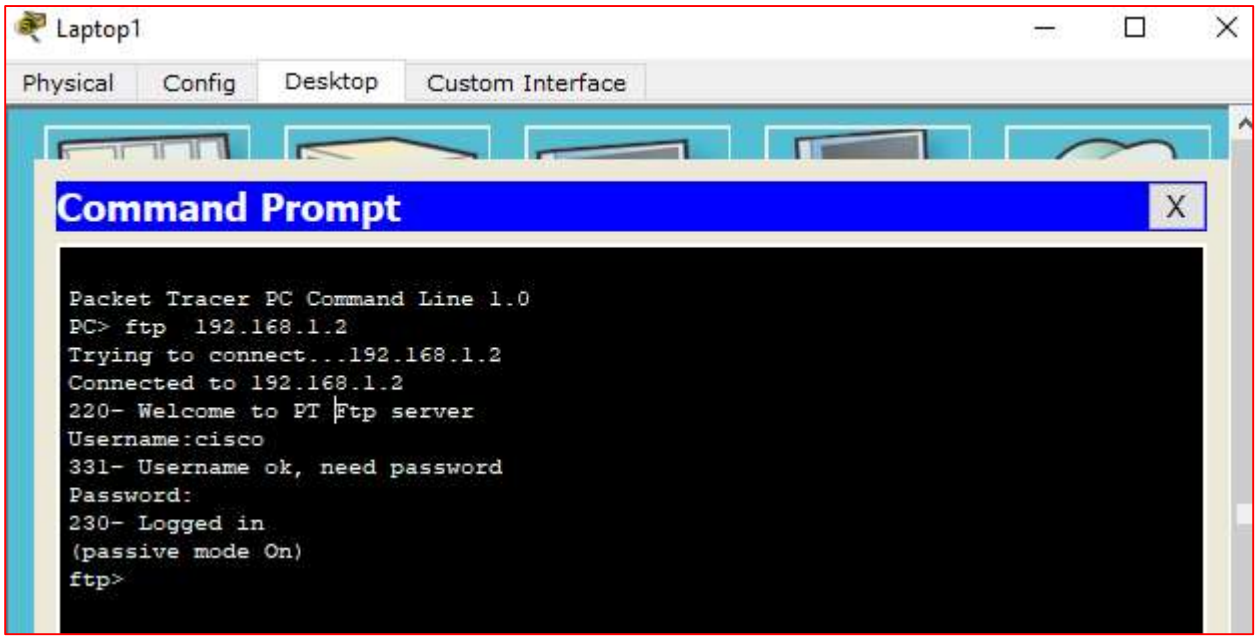
Server: **IP address:** 192.168.1.2 **Subnet Mask:** 255.255.255.0

3. Now try using an FTP client built in the Laptop to send files to an FTP server configured in the Server.

From the Laptop's command prompt, FTP the server using the server IP address by typing:

```
ftp  192.168.1.2
```

Provide the **username**(cisco) and **password**(cisco) [which are the defaults] for ftp login.



You are now in the FTP prompt .

PC0 has an **FTP client** which can be used to read, write, delete and rename files present in the FTP server.

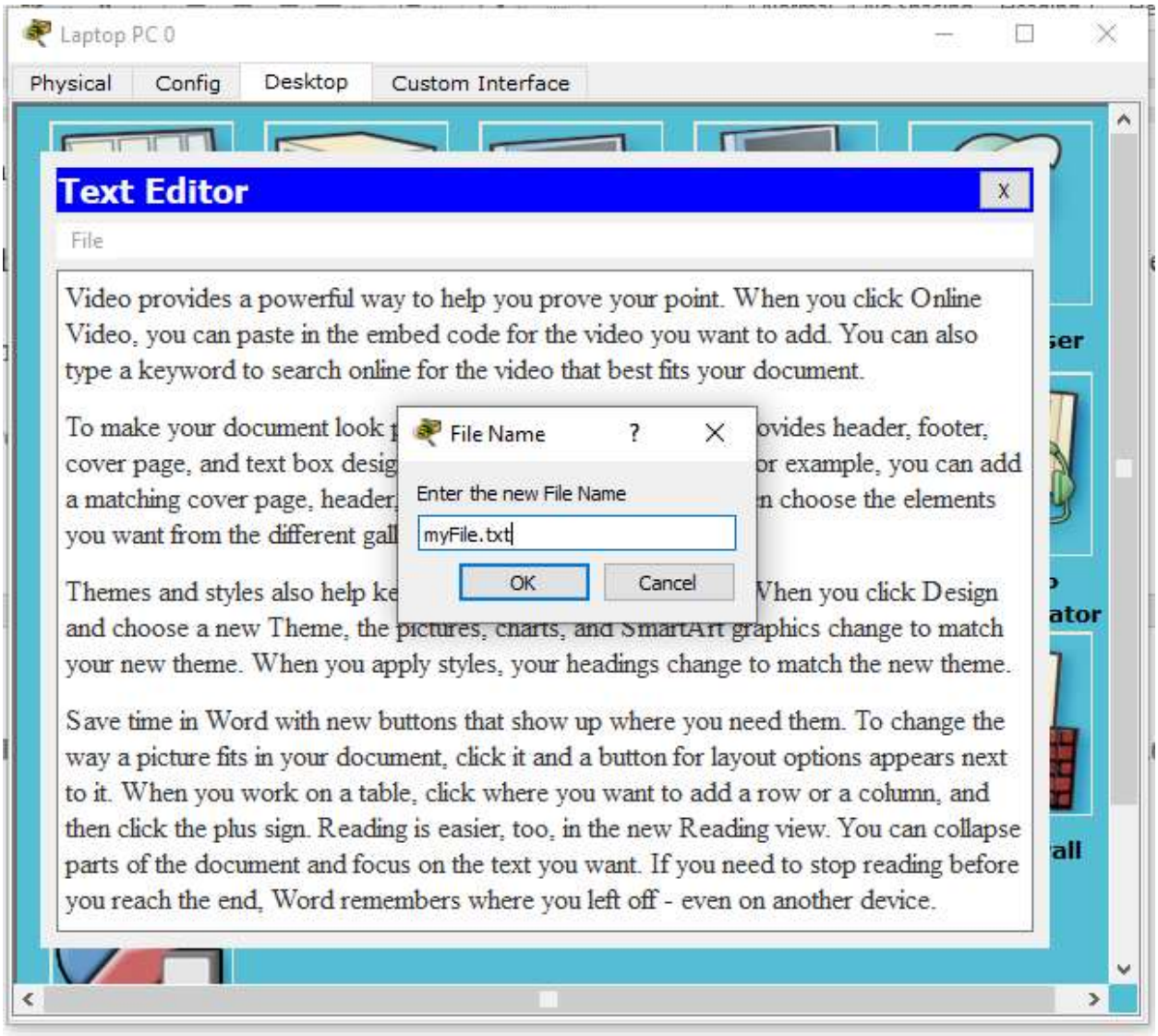
The **FTP server** can be used to read and write configuration files as well as IOS images. Additionally, the FTP server also supports file operations such rename, delete and listing directory.

With that in mind, we can do something extra. So let's do this:

4. Create a file in the Laptop then upload it to the server using FTP.

To do this, open the **Text Editor** in the Laptop, create a file and give it your name of choice.

Type any text in the editor then **save** your file. e.g. myFile.txt.



5. Now upload the file from the Laptop to the server using FTP. (An FTP connection has to be started first. But this is what we've done in step 3)

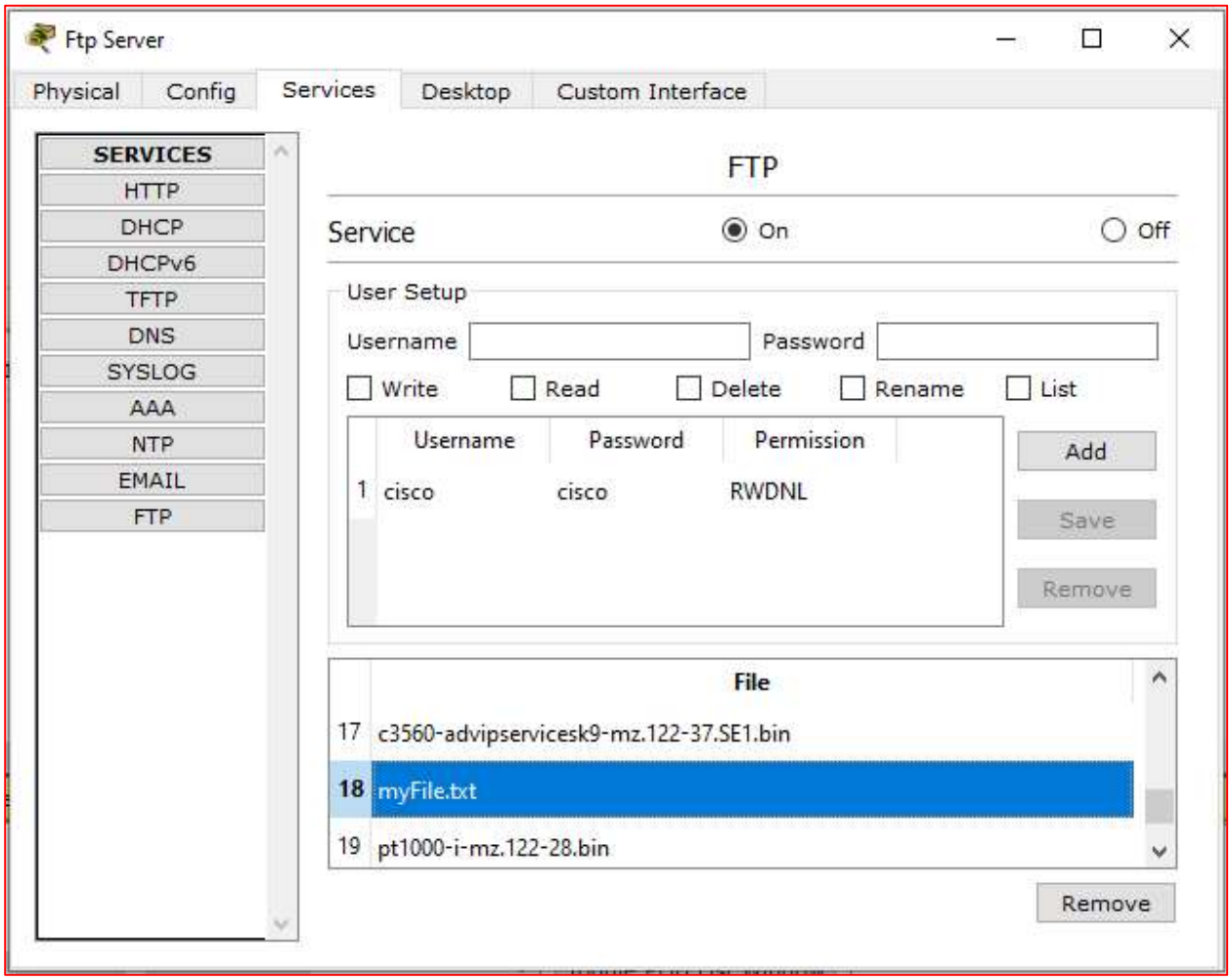
So to do an FTP upload, we'll type:

```
put myFile.txt
```

```
ftp>put myFile.txt

Writing file myFile.txt to 192.168.1.2:
File transfer in progress...

[Transfer complete - 1304 bytes]

1304 bytes copied in 0.019 secs (68631 bytes/sec)
ftp>
```

6. Go to the Server FTP directory to verify if the file sent has been received

Once file upload is successful, go to the Server **FTP directory** to verify if the file sent has been received . To do this, go to **Server-> Services->FTP**. Here look for myFile.txt sent from the laptop.



7. Something extra: To check other FTP commands supported by the FTP client running on the Laptop(or PC), you can use a question mark (**?**) on the Laptop's command prompt as shown below:

You can see the put command that we used to upload our file to the FTP server. Other commands listed include:

get-used to get(download) a file from the server.
For example: get myFile.txt

delete– to delete a file in the FTP directory with the server
For example: delete myFile.txt

Rename– used to Rename a file
cd – used to change directory.

8. Open HTTP directory and upload file there.

For example, we can open an **HTTP directory** in the server by typing: cd /http. This will change the current directory from FTP directory to HTTP directory

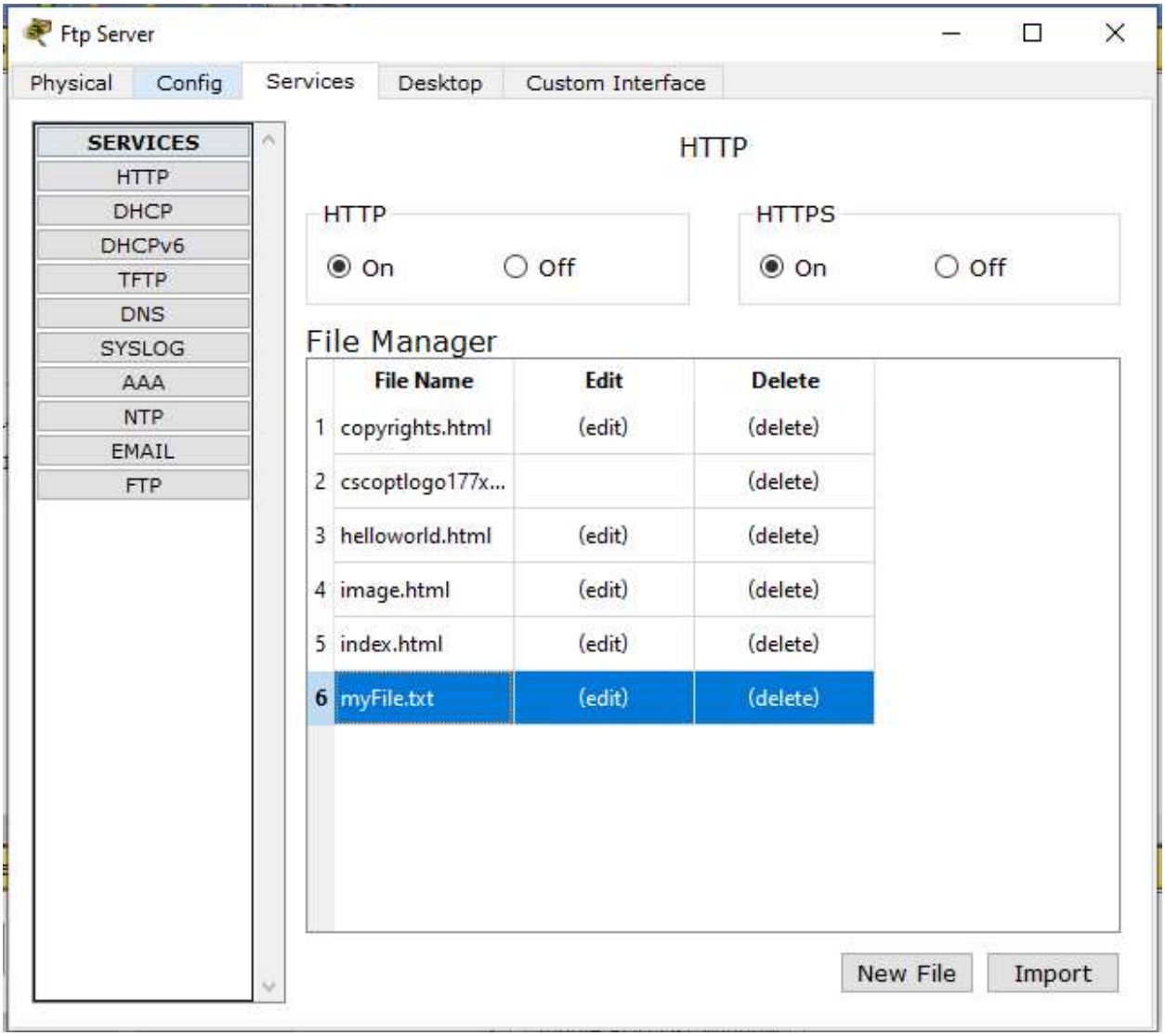
Once the http directory is open, you can upload a file to the HTTP server. You're now uploading a file to an HTTP folder(directory) using FTP.

For example: put myFile.txt

To see this working, let's **open** an **HTTP directory** and upload(**put**) a file to it using FTP:

```
ftp>cd /http
ftp>
Working directory changed to /http successfully
ftp>put myFile.txt

Writing file myFile.txt to 192.168.1.2:
File transfer in progress...

[Transfer complete - 1304 bytes]

1304 bytes copied in 0.028 secs (46571 bytes/sec)
ftp>
```

You can now check up in the **HTTP directory** in the server and verify that the file uploaded from the Laptop(myFile.txt) is well received:



Notice that we are uploading files to an HTTP Server directory using File Transfer Protocol.(FTP). This is what actually happens when you use an **FTP client** such as FileZilla client to upload files to a website. In our case here, we are using an FTP client **built-in** the Laptop.

This may interest you*: T*he first FTP client applications were command-line programs developed before operating systems had graphical user interfaces, and are still shipped with most Windows and Linux operating systems. (Actually this is what we have been using this far). Many FTP clients(e.g. FileZilla) and automation utilities have since been developed for desktops, servers, mobile devices, and hardware. FTP has also been incorporated into productivity applications, such as HTML *editors.*

Well done for reading this topic up to this point! You now have more than a foundation regarding working with FTP to upload, download, delete, rename…files.

If you're okay so far, then let's do something even more interesting…

We'll **create** an html file in our Laptop, **upload** it to HTTP server directory using FTP, then try to **access** the file from the Laptop's browser.

So psych up and let's move on!

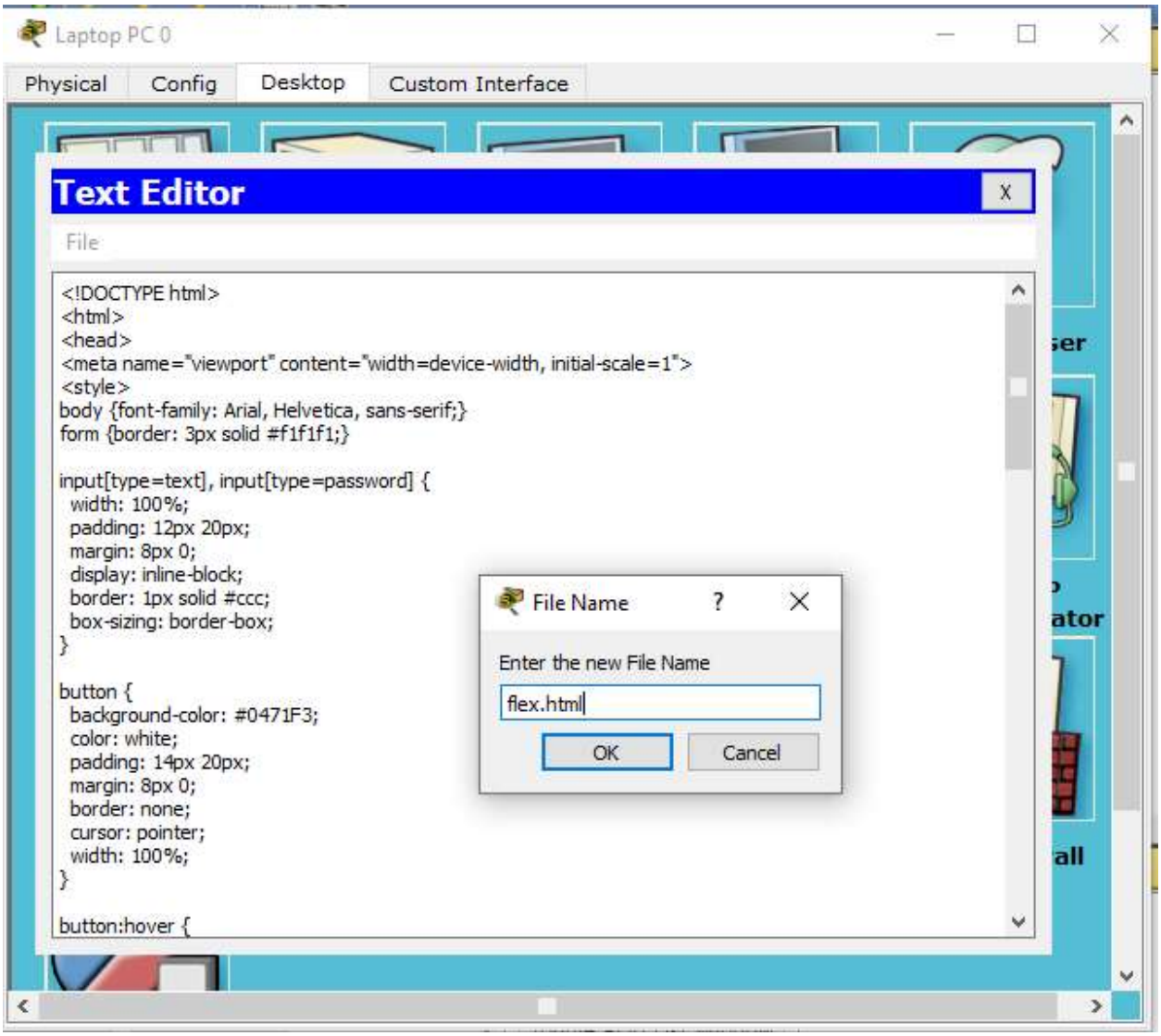
On the Laptop, open the **text editor**, then type some markup(html) and save the file with the extension *.html*. See all this below:

```
<!DOCTYPE html>
<html>
<head>
<meta name="viewport" content="width=device-width, initial-scale=1">
<style>
body {font-family: Arial, Helvetica, sans-serif;}
form {border: 3px solid #f1f1f1;}

input[type=text], input[type=password] {
width: 100%;
padding: 12px 20px;
margin: 8px 0;
display: inline-block;
border: 1px solid #ccc;
```

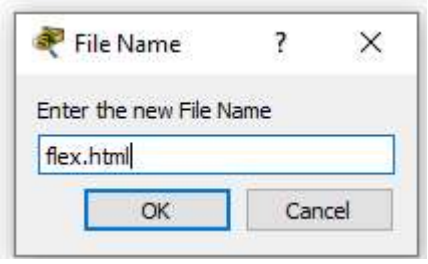
```
box-sizing: border-box;
}

button {
background-color: #0471F3;
color: white;
padding: 14px 20px;
margin: 8px 0;
border: none;
cursor: pointer;
width: 100%;
}

button:hover {
opacity: 0.8;
}
.cancelbtn {
width: auto;
padding: 10px 18px;
background-color: #f44336;
}
.imgcontainer {
text-align: center;
margin: 24px 0 12px 0;
}
img.avatar {
width: 30%;
height: 30%;

}
.container {
padding: 16px;
}
```

```
span.psw {
float: right;
padding-top: 16px;
}

/* Change styles for span and cancel button on extra small screens */
@media screen and (max-width: 300px) {
span.psw {
display: block;
float: none;
}
.cancelbtn {
width: 100%;
}
}
</style>
</head>
<body>
<form action="/action_page.php" method="post">
<div class="container">
<h2>Flex Academic Suite</h2>
</div>
<div class="imgcontainer">
<img src="Flex-Login-3.png" alt="Avatar" class="avatar">
</div>
<div class="container">
<label for="uname"><b>Username</b></label>
<input type="text" placeholder="Enter Username" name="uname" required>

<label for="psw"><b>Password</b></label>
<input type="password" placeholder="Enter Password" name="psw" required>
<button type="submit">Login</button>
<label>
<input type="checkbox" checked="checked" name="remember"> Remember me
```

```
</label>
</div>

<div class="container" style="background-color:#f1f1f1">
<button type="button" class="cancelbtn">Cancel</button>
<span class="psw">Forgot <a href="#">password?</a></span>
</div>
</form>

</body>
</html>
```

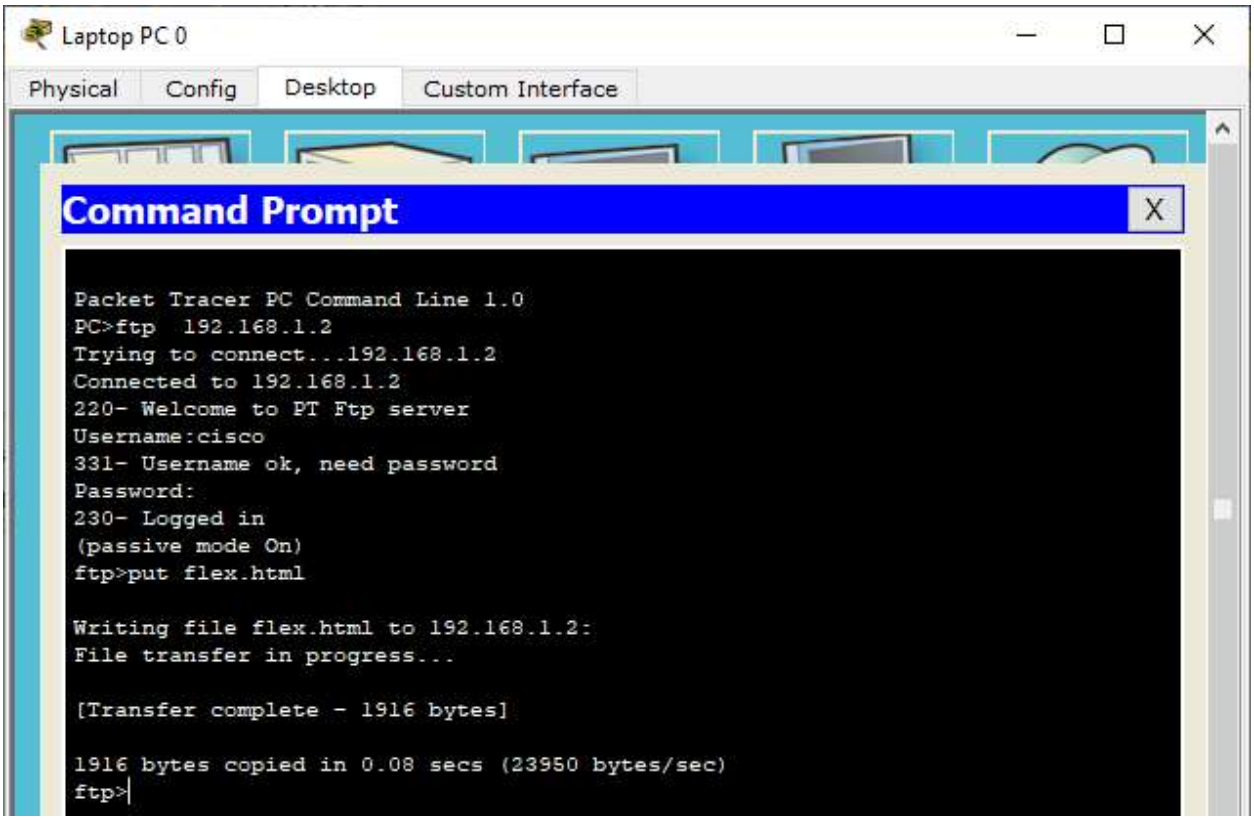


Save your file as an html file like this:



Now upload the file(flex.html) to the HTTP server using FTP. This is easy. We've already done it previously!

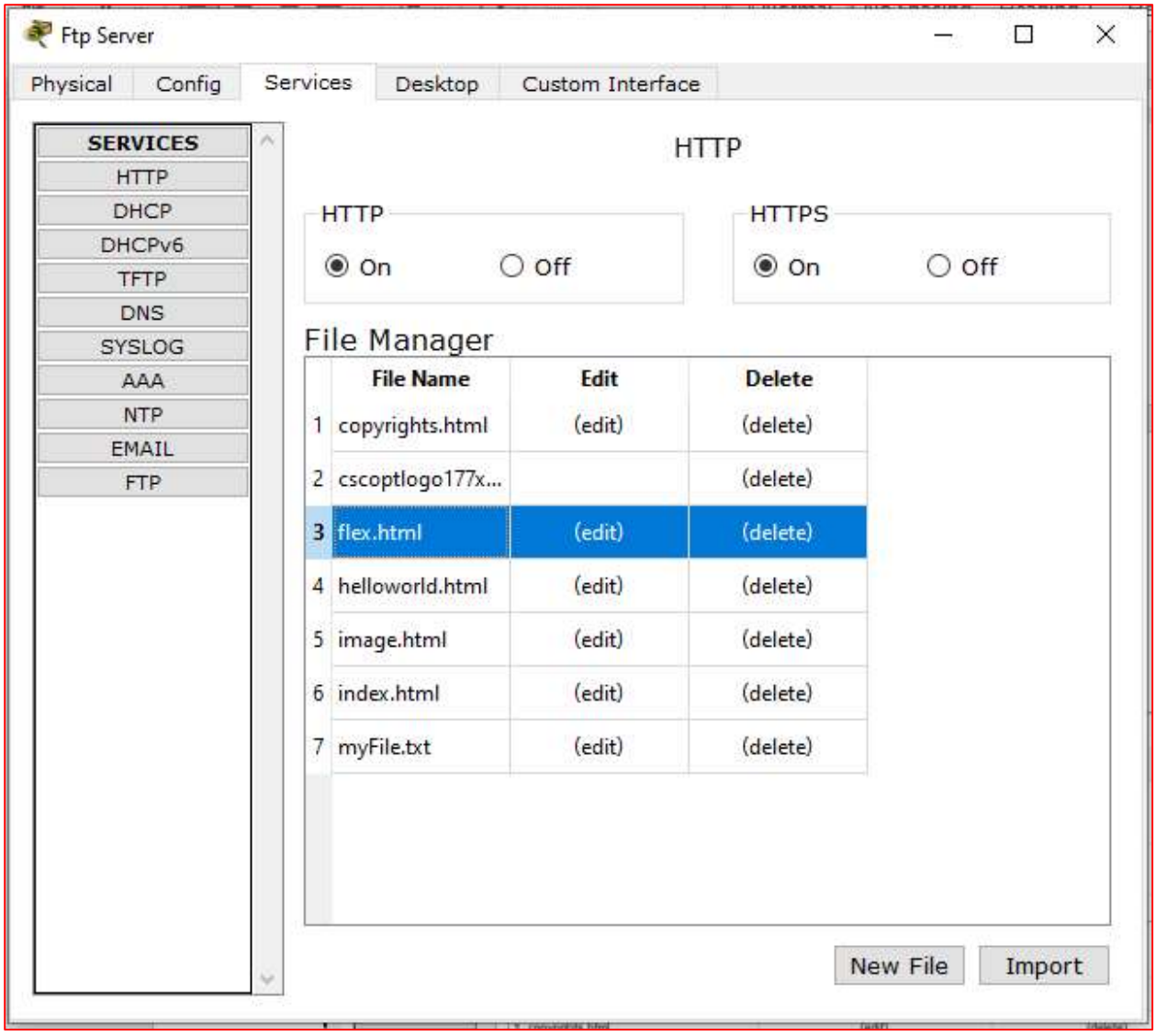
If you're already in the HTTP directory, you just need to type: put flex.html. If no, first ftp the server(ftp 192.168.1.2), provide the login username(cisco) and password(cisco); change the current directory to HTTP(cd /http) , and finally upload the html file onto the HTTP directory(put flex.html)



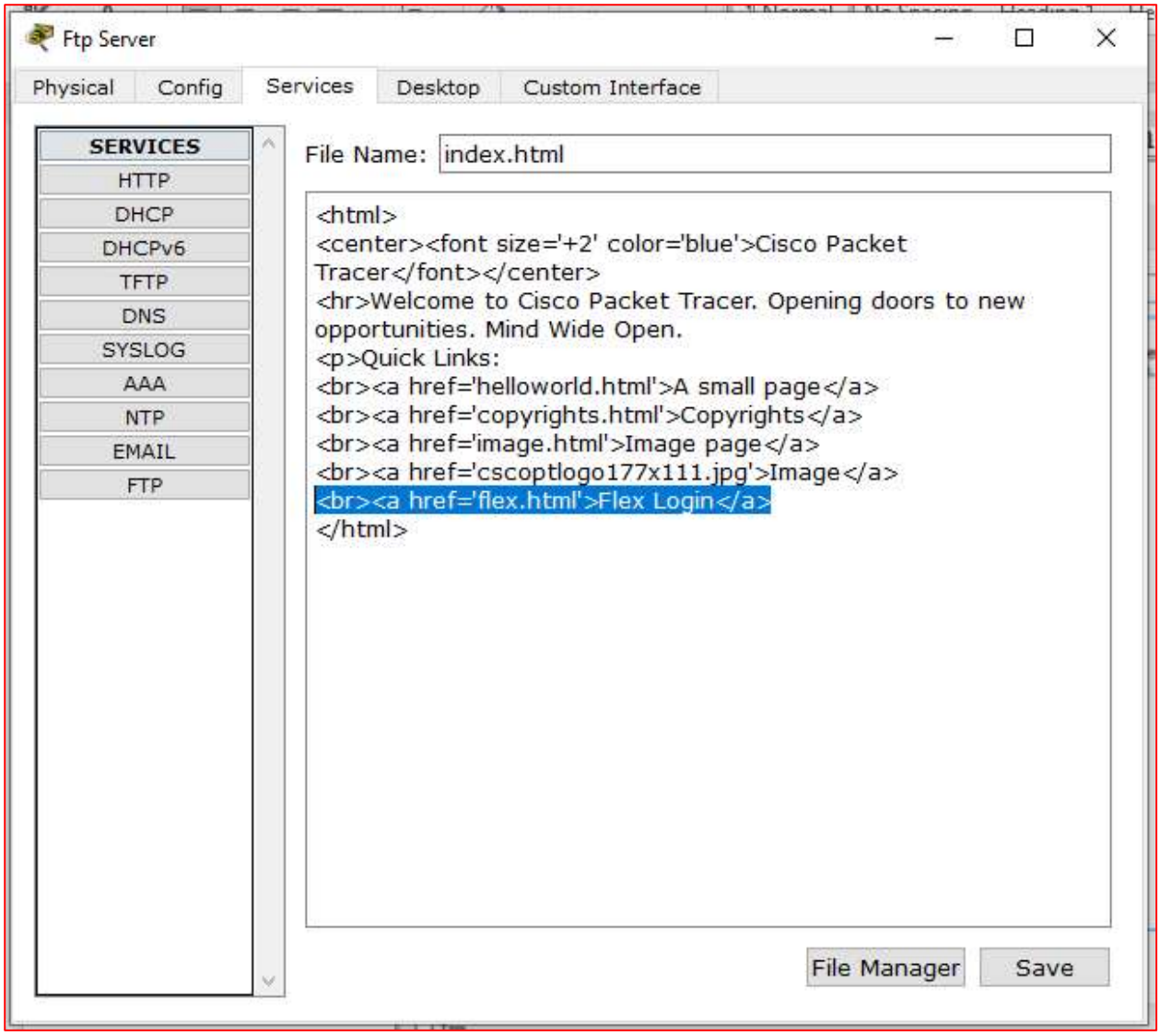
Moving on…

Check whether the html file uploaded has been received in the HTTP directory:

Go to **Server->Services-> HTTP**. Then look up for the file in the File Manager.

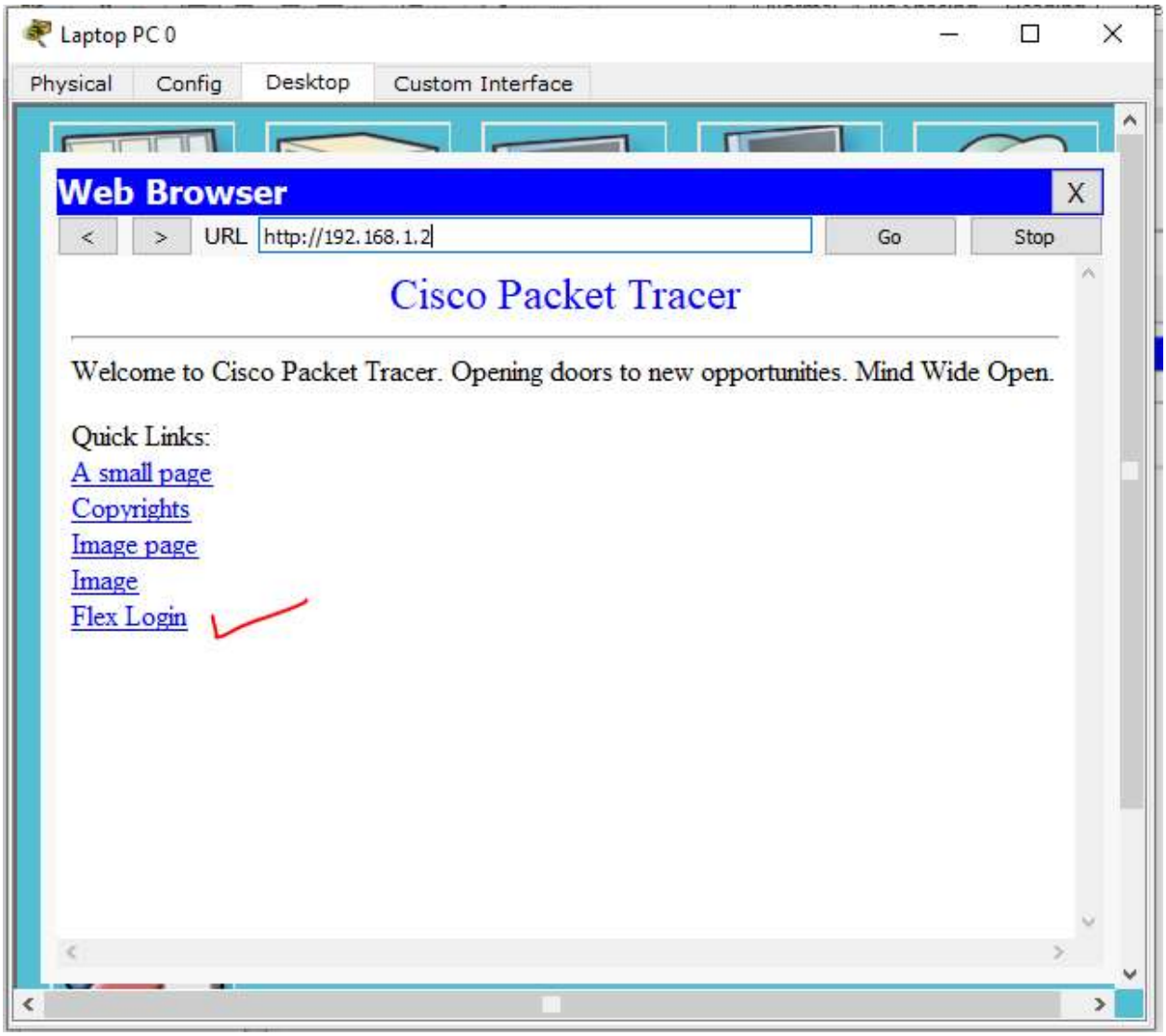


Now edit index.html file in the **HTTP directory** so as to include a link to flex that we've just uploaded. This will make flex accessible from the Laptop's browser. To do this, locate index.html then click **edit**. Proceed to edit it as shown below. Then **save** and accept overwrite.

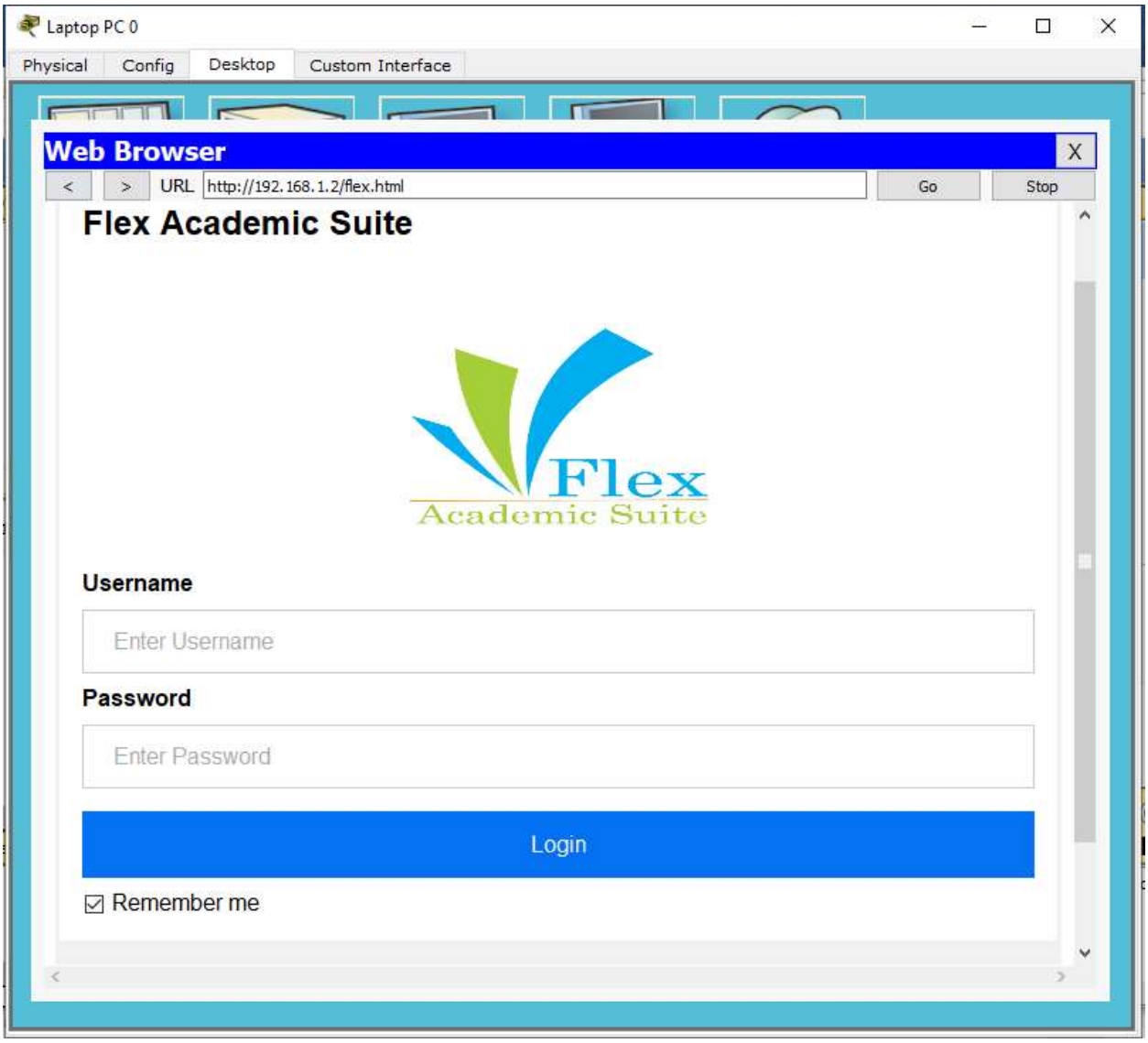


Finally, try to access the newly uploaded file from the Laptop's browser.

So go to the Laptop's browser and access the server using the server's IP address. By doing this, the browser is making an http request to the server. The server will respond to the Laptop with the index.html file containing a **link** to flex which we've uploaded from the Laptop using FTP.

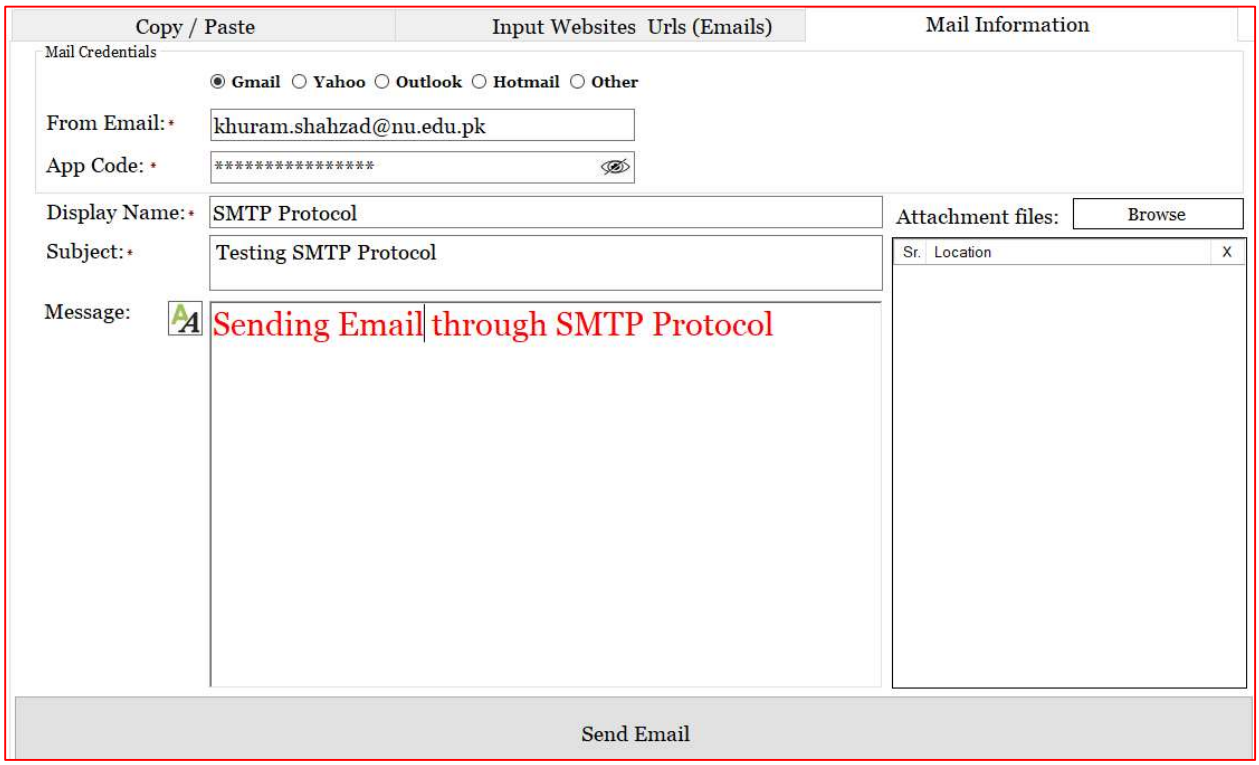


Click **flex** link to view the contents of the file in the browser.

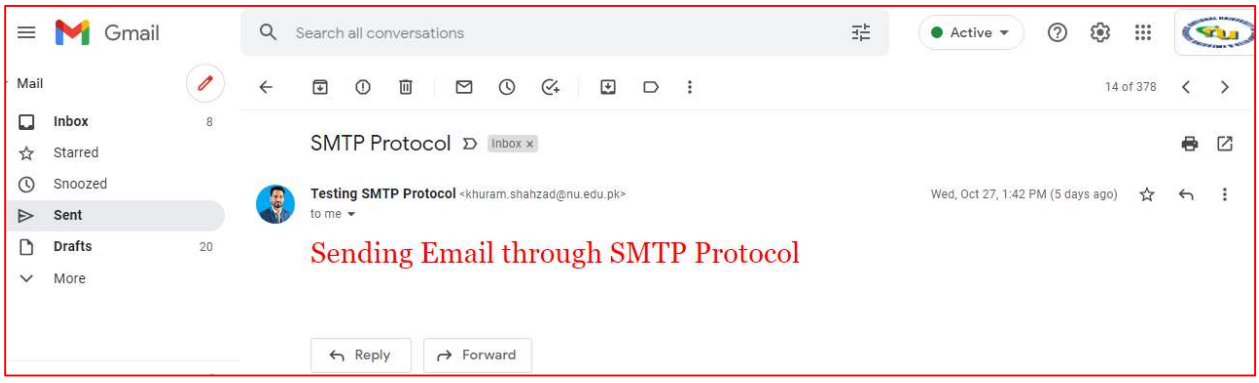

Laptop PC 0
Physical
Config
Desktop
Custom Interface
Web Browser
X
URL
http://192.168.1.2/flex.html
Go
Stop
Flex Academic Suite
Flex
Academic Suite
Username
Enter Username
Password
Enter Password
Login
Remember me

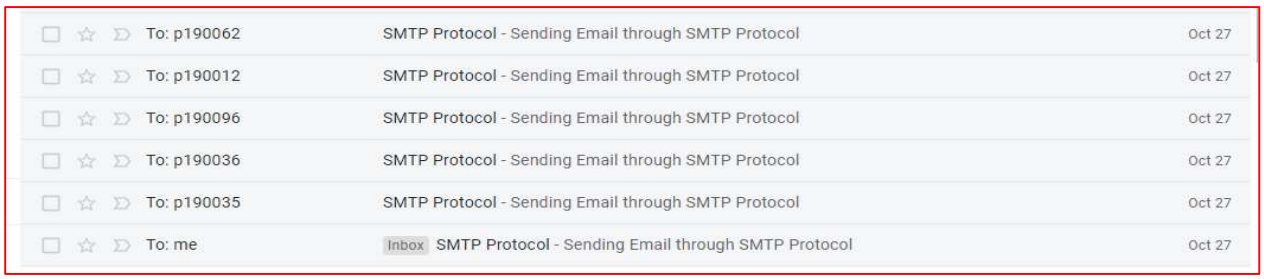
SMTP Demo using C# Application

C# Application interface.



Email Received in Gmail:





Prepared by: Engr. Khuram Shahzad

Tasks for students:

1. **Configure Mail server, Ftp Server, DHCP Server, DNS Server and web Server in a single topology, use router and switch.**