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**Assignment No: 7. Introduction to server administration (server administration commands and their applications) and configuration any three of below Server : (Study/Demonstration Only)**

FTP, Web Server, DHCP, Telnet, Mail, DNS

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**Title of the Assignment: Introduction to server administration: A study of server administration commands and their applications: FTP protocol**

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----- **Objective of the Assignment:** To understand the concept of file transfer protocol & it's working

**Theory:**

**What is FTP ?**

File Transfer Protocol, or FTP, is a protocol used for transferring files from one computer to another - typically from your computer to a web server. FTP is the preferred method of exchanging files because it's faster than other protocols like HTTP or POP. If you need to exchange large files, you should consider FTP.

FTP data is sent and received through computer port 21 and under the TCP protocol. The transfer is asynchronous, meaning not at the same time, and therefore faster than other protocols.

Objectives of FTP were:

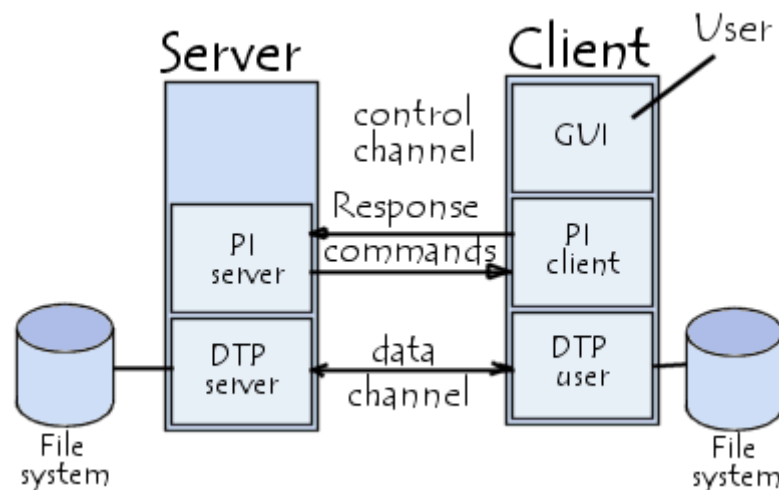
1. to promote sharing of files (computer programs and/or data),
2. to encourage indirect or implicit (via programs) use of remote computers,
3. to shield a user from variations in file storage systems among hosts, and
4. to transfer data reliably and efficiently.

**The FTP model**

FTP protocol falls within a client-server model, i.e. one machine sends orders (the client) and the other awaits requests to carry out actions (the server).

During an FTP connection, two transmission channels are open:

- A channel for commands (control channel)
- A channel for data



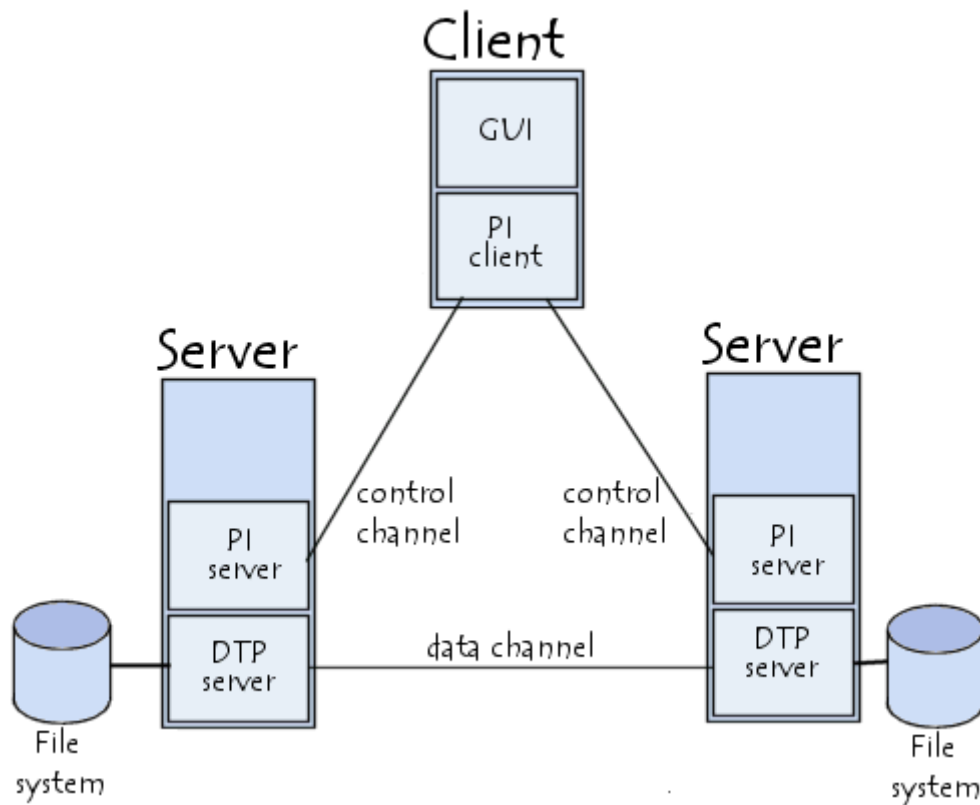
**Fig 1: FTP Client-Server Model**

So, both the client and server have two processes allowing these two types of information to be managed:

- **DTP** (*Data Transfer Process*) is the process in charge of establishing the connection and managing the data channel. The server side DTP is called *SERVER-DTP*, the client side DTP is called *USER-DTP*
- **PI** (*Protocol Interpreter*) interprets the protocol allowing the DTP to be controlled using commands received over the control channel. It is different on the client and the server:
  - The **SERVER-PI** is responsible for listening to the commands coming from a **USER-PI** over the control channel on a [data port](#), establishing the connection for the control channel, receiving FTP commands from the **USER-PI** over this, responding to them and running the **SERVER-DTP**.

- The USER-PI is responsible for establishing the connection with the FTP server, sending FTP commands, receiving responses from the SERVER-PI and controlling the USER-DTP if needed.
- When an FTP client is connected to a FTP server, the USER-PI initiates the connection to the server according to the Telnet protocol. The client sends FTP commands to the server, the server interprets them, runs its DTP, then sends a standard response. Once the connection is established, the server-PI gives the port on which data will be sent to the Client DTP. The client DTP then listens on the specified port for data coming from the server. It is important to note that since the control and data ports are separate channels, it is possible to send commands from one machine and receive data on another. So, for example it is possible to transfer data between FTP servers by passing through a client to send control instructions and by transferring information between two server processes connected on the right port.

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**Fig 2: FTP imposes control channel**

In this configuration, the protocol imposes that the control channels remain open throughout the data transfer. So a server can stop a transmission if the control channel is broken during transmission

**Conclusion:** -Thus we practically performed the trunking between two switches and also implemented various commands for trunking.

**Title of the Assignment: Introduction to server administration: A study of server administration commands and their applications: DHCP protocol**

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**Objective of the Assignment:** To understand configuration and different commands to configure dynamic addresses to PC's.

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**Prerequisite: Students must have knowledge of Packet tracer simulator.**

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**Theory :**

**What is DHCP ?**

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**What is DHCP ?**

The Dynamic Host Configuration Protocol (DHCP) is a network protocol used to assign IP addresses and provide configuration information to devices such as servers, desktops, or mobile devices, so they can communicate on a network using the Internet Protocol (IP). ISC DHCP is a collection of software that implements all aspects of the DHCP (Dynamic Host Configuration Protocol) suite. It includes:

- A DHCP server, which receives clients' requests and replies to them.
- A DHCP client, which can be bundled with the operating system of a client computer or other IP capable device and which sends configuration requests to the server. Most devices and operating systems already have DHCP clients included.
- A DHCP relay agent, which passes DHCP requests from one LAN to another so that there need not be a DHCP server on every LAN.

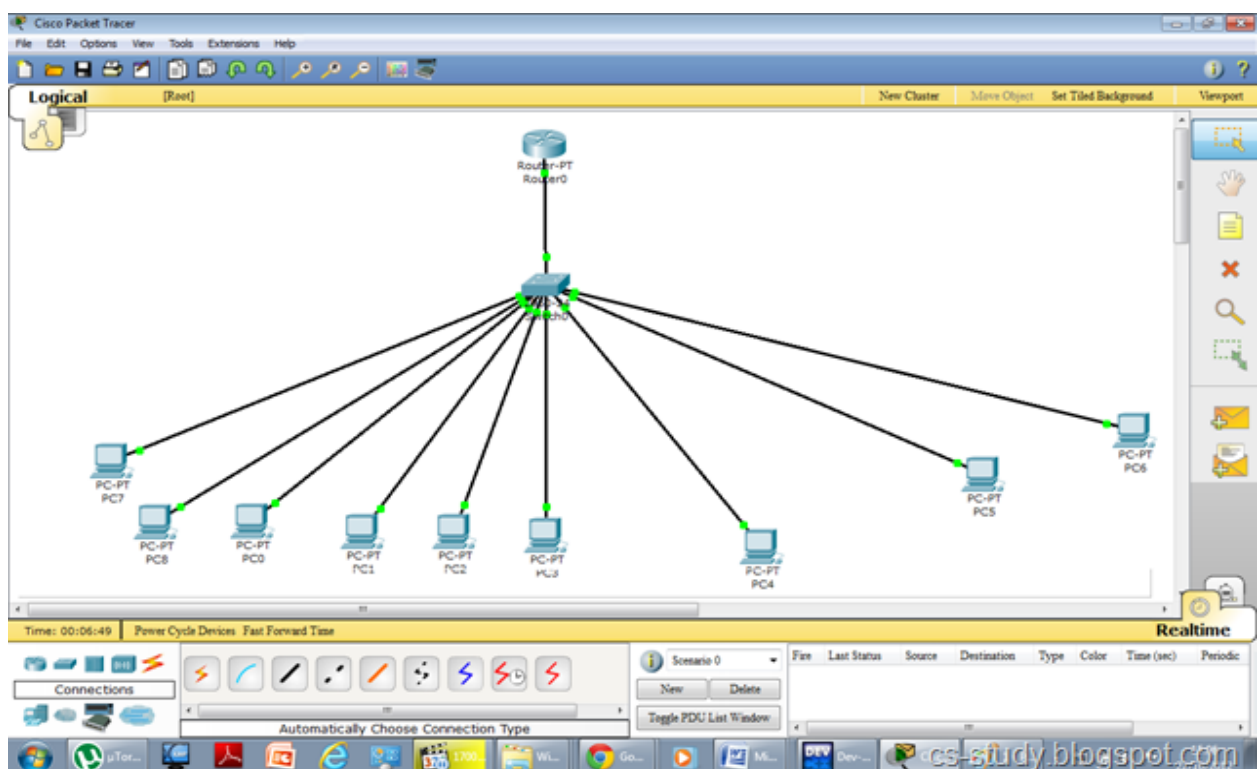
The DHCP server, client and relay agent are provided both as reference implementations of the protocol and as working, fully-featured sample implementations. Both the client and the server provide functionality that, while not strictly required by the protocol, is very useful in practice. The DHCP server also makes allowances for non-compliant clients that need to be supported. The ISC DHCP server will answer requests from any client that complies with the protocol standards, and the ISC DHCP client can interact with any server that complies with those standards. The components of ISC DHCP need not all be used together. That is, after all, the purpose behind the published standards. The latest ISC DHCP software includes cryptographic software .

## **IMPLEMENTING DHCP USING PACKET TRACER:**

This tutorial is about how to configure dhcp on cisco router in packet tracer. The Dynamic Host Configuration Protocol (DHCP) is a network protocol that is used to configure network devices. DHCP allows a computer to join an IP-based network without having a pre-configured IP address. DHCP is a protocol that assigns unique IP addresses to devices, then releases and renews these addresses as devices leave and re-join the network. Internet Service Providers (ISPs) usually use DHCP to allow customers to join the Internet with minimum effort. The DHCP server maintains a database of available IP addresses and configuration information. When it receives a request from a client, the DHCP server determines the network to which the DHCP client is connected, and then allocates an IP address. DHCP servers typically grant IP addresses to clients only for a limited interval.

Lets apply DHCP on packet tracer.

First, let us make a topology with one router on which we will apply DHCP and several client PCs. More like this one,



Now, we will apply DHCP on the router.  
The commands in sequence are as follows.

In the following command “ip dhcp pool cisco”, we are creating a pool for DHCP called cisco. cisco is the name here and we can name it whatever we want.

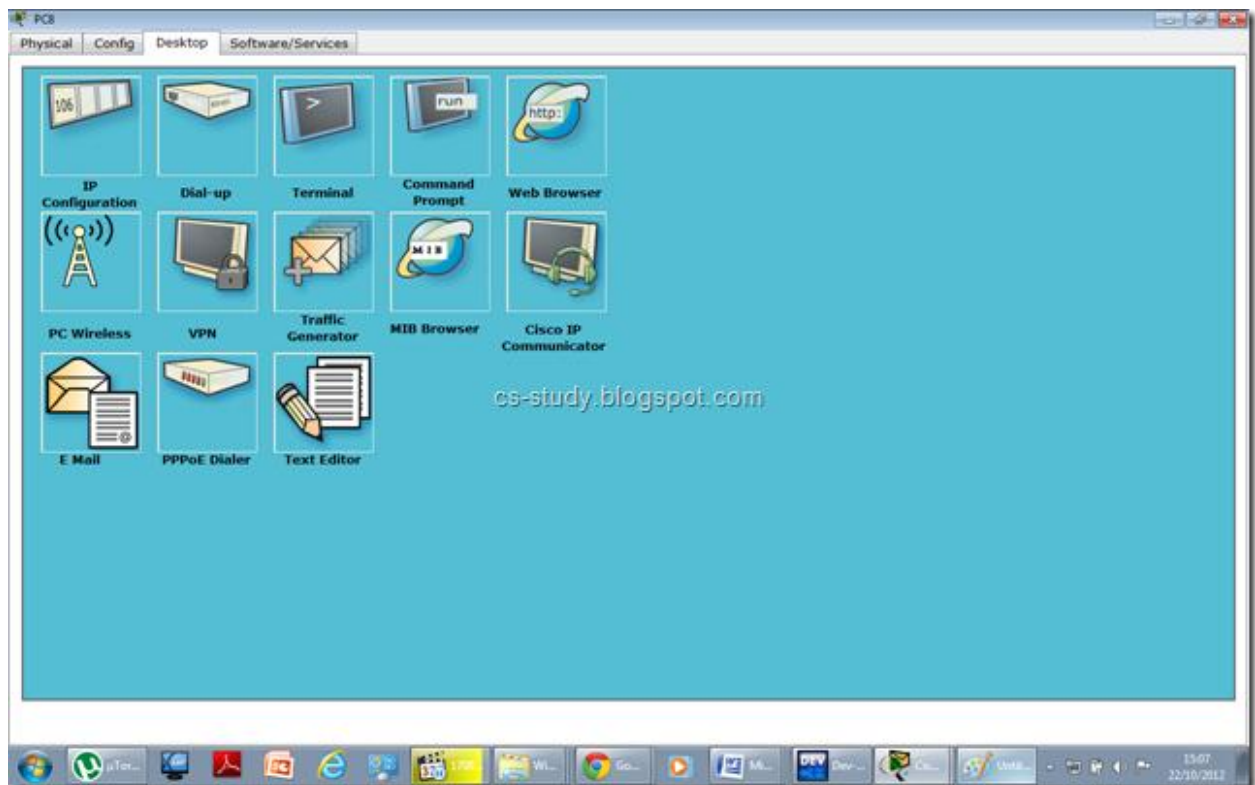
Similarly, in the command “default-router “ we are telling the DHCP about the default route to follow.

Notice, after we exit from DHCP mode, we are excluding some IP addresses by applying this command “ip dhcp excluded-addresses x-x”, where x is the starting and ending IP address respectively.

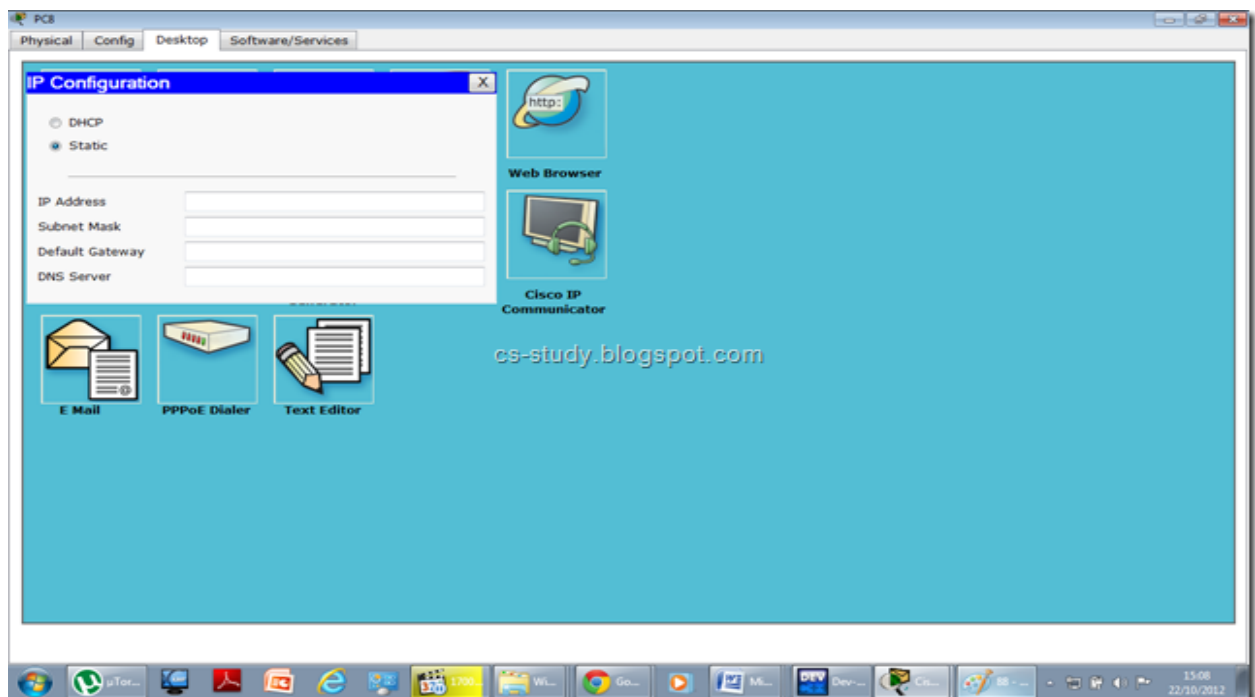
We are basically reserving some IPs for our use. It can be used to attach printers, or assign it to some specific users for security purposes.

You can also give dns address in dhcp by using the following command.  
dns-server 192.168.1.15.

Now, open the PC.

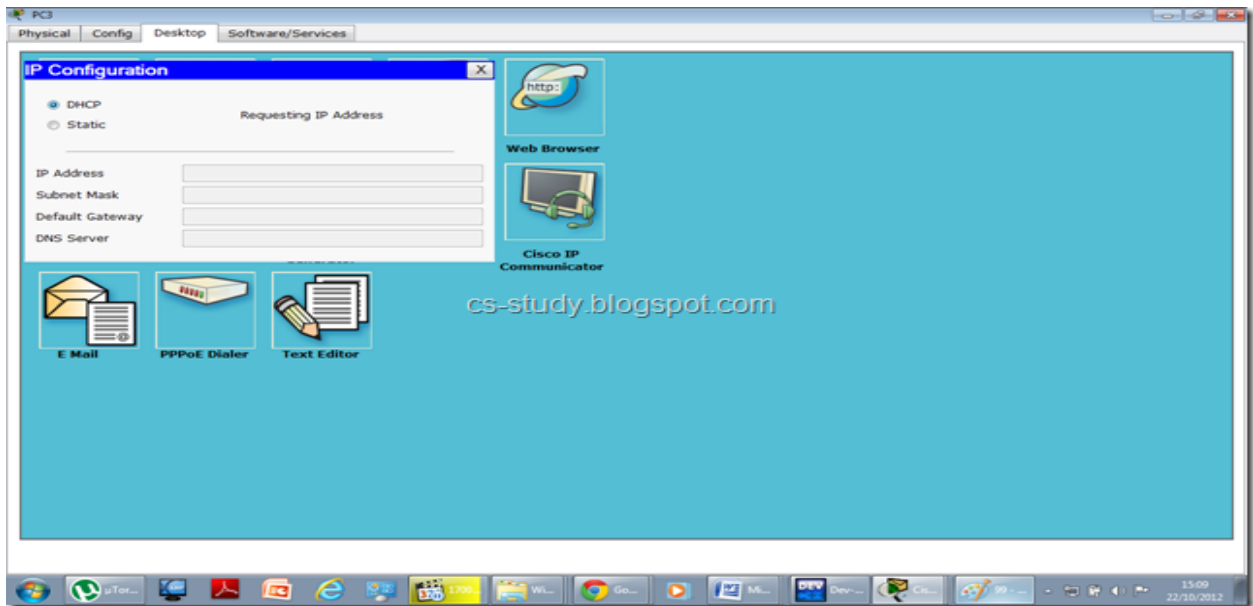


Click on IP Configuration

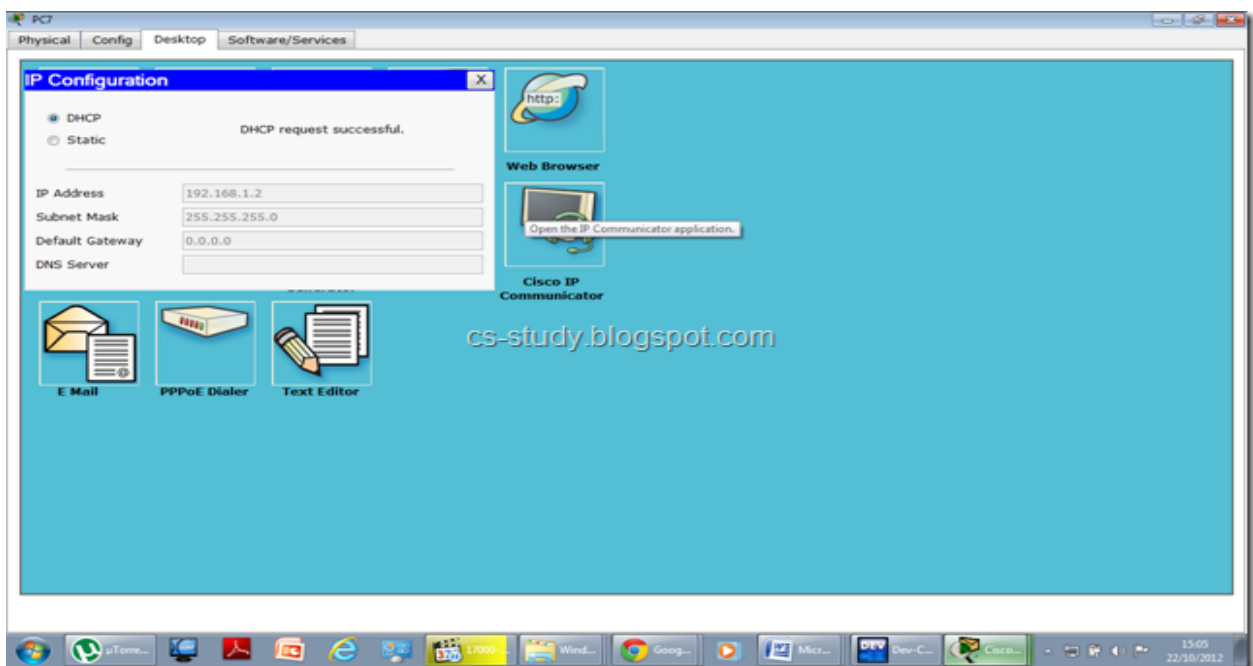


Select from Static to DHCP

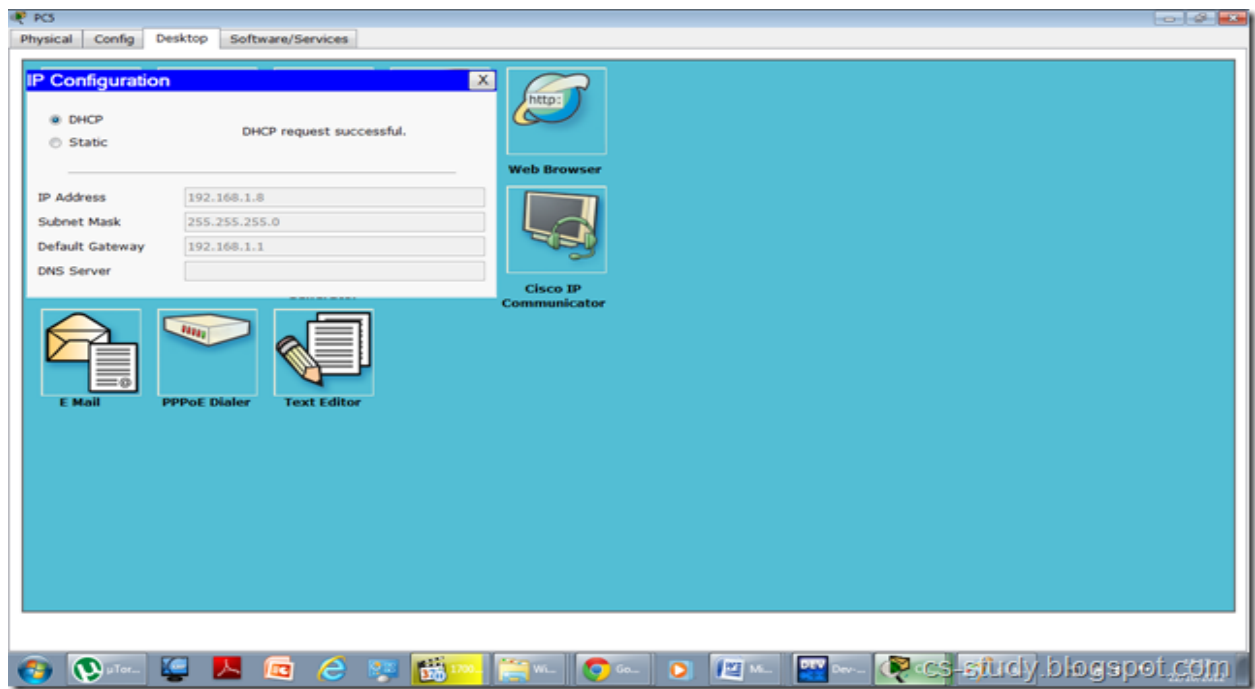




And after DHCP request is completed you will see the following screen.



Now, after applying some IPs in sequence, DHCP will skip the IPs that we have excluded from our DHCP pool.



That is all, we have applied DHCP on packet tracer

**Conclusion:** -Thus we practically performed the DHCP configuration using router and also implemented various commands for DHCP.

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## Assignment No: 7

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**Title of the Assignment:** Introduction to server administration: A study of server administration commands and their application using TELNET configuration

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**Objective of the Assignment:** To understand TELNET configuration

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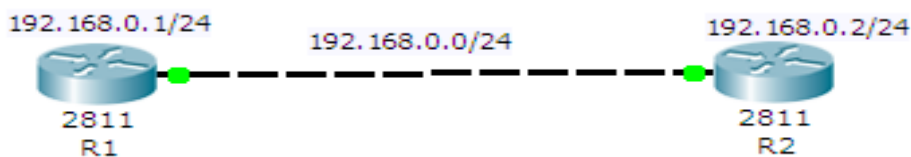
**Prerequisite:** Students must have knowledge of TELNET configuration Commands.

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### What is TELNET ?

A terminal emulation program for TCP/IP networks such as the Internet. The Telnet program runs on your computer and connects your PC to a server on the network. You can then enter commands through the Telnet program and they will be executed as if you were entering them directly on the server console. This enables you to control the server and communicate with other servers on the network. To start a Telnet session, you must log in to a server by entering a valid username and password. Telnet is a common way to remotely control Web servers. Totelnet means to establish a connection with the Telnet protocol, either with command line client or with a programmatic interface

### Telnet lab with Packet Tracer



Let's configure R1 router.

```
Router>en
```

```
Router#conf t
```

Enter configuration commands, one per line. End with CNTL/Z.

```
Router(config)#host R1
```

```
R1(config)#int fa 0/0
```

```
R1(config-if)#ip address 192.168.0.1 255.255.255.0
```

```
R1(config-if)#no shut
```

```
R1(config-if)#^Z
R1#
```

Let's configure R2 router.

```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#host R2
R2(config)#int fa 0/0
R2(config-if)#ip address 192.168.0.2 255.255.255.0
R2(config-if)#no shut
R2(config-if)#exit
R2(config-if)#
```

Now configure for telnet.

```
R2(config)#line vty 0 4
R2(config-line)#no login
R2(config-line)#^ZR2#
```

**no login** means that no login on vty lines i.e. no password require.

Let's test that by telnet from R1.

```
R1#
R1#telnet 192.168.0.2
Trying 192.168.0.2 ...Open
R2>exit
[Connection to 192.168.0.2 closed by foreign host]
R1#
```

Notice, no password require.

Go back to R2 router and change rule to telnet using password.

```
R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#line vty 0 4
R2(config-line)#login
% Login disabled on line 66, until 'password' is set
% Login disabled on line 67, until 'password' is set
% Login disabled on line 68, until 'password' is set
% Login disabled on line 69, until 'password' is set
% Login disabled on line 70, until 'password' is set
R2(config-line)#
```

**login** says that if you require to telnet, you have to set password.

If there's no password, you can't telnet.

```
R2(config-line)#password 1234
R2(config-line)#exit
Go back to R1 router and try to telnet.
R1#telnet 192.168.0.2
Trying 192.168.0.2 ...Open
User Access Verification
```

```
Password:  
R2>exit  
[Connection to 192.168.0.2 closed by foreign host]  
R1#
```

Entire department know this password. How do we fix this?

Let's go to R2 router.

Train the router to identify people and it should prompt username and password.

```
R2(config)#username Aspell password Aspell123  
R2(config)#  
We could use the keyword secret instead of password.  
R2(config)#line vty 0 4  
R2(config-line)#login local  
R2(config-line)#
```

**login local** means that R2 router will use local database.

When telnet anyone, R2 prompts username and password for authentication.

Go to R1 router.

```
R1#telnet 192.168.0.2  
Trying 192.168.0.2 ...Open  
User Access Verification  
Username: Aspell  
Password:  
R2>exit  
[Connection to 192.168.0.2 closed by foreign host]  
R1#
```

Conclusion : Hence we have successfully implemented and learnt how to give password to router using TELNET commands.