	Experiment No : 11	Date :
Title	**To Configuration of FTP Server**	
Aim	To Configuration of FTP server and transfer files to demonstrate the working of the same.	
Hardware Requirement	Personal Computer	
Software Requirement	Linux Operating System(Ubuntu 16.04) , Shell-Interpreter	
Theory	File Transfer Protocol (FTP) is a TCP protocol for downloading files between computers. In the past, it has also been used for uploading but, as that method does not use encryption, user credentials as well as data transferred in the clear and are easily intercepted. FTP works on a client/server model. The server component is called an *FTP daemon*. It continuously listens for FTP requests from remote clients. When a request is received, it manages the login and sets up the connection. For the duration of the session it executes any of commands sent by the FTP client. Access to an FTP server can be managed in two ways: • Anonymous • Authenticated In the **Anonymous mode**, remote clients can access the FTP server by using the default user account called "anonymous" or "ftp" and sending an email address as the password. In the **Authenticated mode** a user must have an account and a password. This latter choice is very insecure and should not be used except in special circumstances. If you are looking to transfer files securely see SFTP in the section on OpenSSH-Server. User access to the FTP server directories and files is dependent on the permissions defined for the account used at	

login. As a general rule, the FTP daemon will hide the root directory of the FTP server and change it to the FTP Home directory. This hides the rest of the file system from remote sessions.
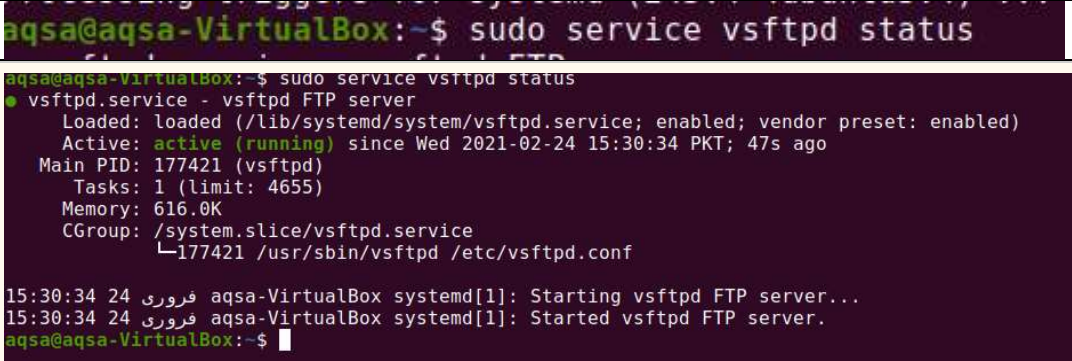
Working of FTP Servers

FTP servers are the solutions used to facilitate file transfers across the internet. If you send files using FTP, files are either uploaded or downloaded to the FTP server. When you're uploading files, the files are transferred from a personal computer to the server. When you're downloaded files, the files are transferred from the server to your personal computer. TCP/IP (Transmission Control Protocol/Internet Protocol), or the language the internet uses to execute commands, is used to transfer files via FTP.
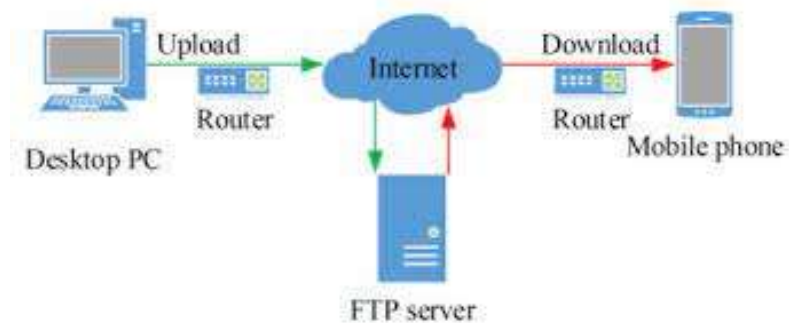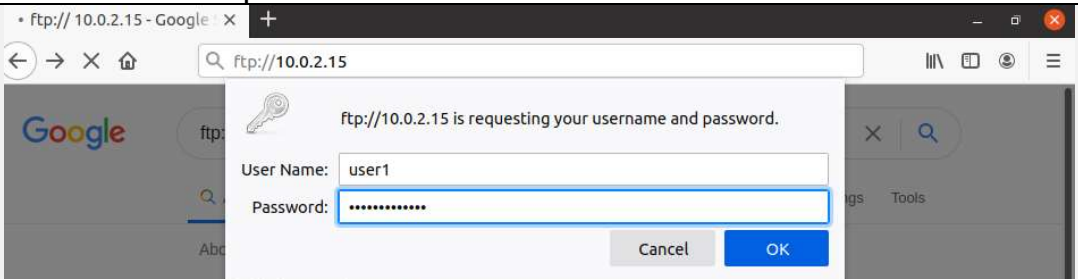

FTP servers can be considered the midpoint between the sender and the recipient of a file. For FTP servers to work, you need the server address. Here's an example of what this address may look like "ftp.examplecompany.net". Sometimes, the server address will be given as a numeric address, like "12.345.678.90".

Depending on the type of FTP server you use and the level of security that is needed, you may have to input a username and password. Some FTP servers allow for anonymous connection, which does not require you to enter a name or password to gain access.

Installation Step By Step	
Step-1	**Updating Linux system**
	Run the command given below to update system repositories
	$ sudo apt get update
| | ```
aqsa@aqsa-VirtualBox:~$ sudo apt get update
408 B]
Get:37 http://pk.archive.ubuntu.com/ubuntu focal-backports/universe amd64 DEP-11 Metadata [
768 B]
Fetched 4,417 kB in 22s (204 kB/s)
Reading package lists... Done
Building dependency tree
Reading state information... Done
4 packages can be upgraded. Run 'apt list --upgradable' to see them.
aqsa@aqsa-VirtualBox:~$
``` |
Step-2	**To install vsftpd (FTP Server)(very secure FTP daemon)**
	Firstly, we need to get vsftpd. The "vsftpd" is an FTP server that is secure, fast, and convenient for Linux systems.
	Run the command given below:
	$ sudo apt install vsftpd
| | ```
aqsa@aqsa-VirtualBox:~$ sudo apt install vsftpd
aqsa@aqsa-VirtualBox:~$ sudo apt install vsftpd
[sudo] password for aqsa:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  libfprint-2-tod1 libllvm10
Use 'sudo apt autoremove' to remove them.
The following NEW packages will be installed:
  vsftpd
0 upgraded, 1 newly installed, 0 to remove and 4 not upgraded.
Need to get 115 kB of archives.
After this operation, 338 kB of additional disk space will be used.
Get:1 http://pk.archive.ubuntu.com/ubuntu focal/main amd64 vsftpd amd64 3.0.3-12 [115 kB]
Fetched 115 kB in 3s (40.2 kB/s)
Preconfiguring packages ...
Selecting previously unselected package vsftpd.
(Reading database ... 186217 files and directories currently installed.)
Preparing to unpack .../vsftpd_3.0.3-12_amd64.deb ...
Unpacking vsftpd (3.0.3-12) ...
Setting up vsftpd (3.0.3-12) ...
Created symlink /etc/systemd/system/multi-user.target.wants/vsftpd.service → /lib/systemd/sys
tem/vsftpd.service.
vsftpd.conf:1: Line references path below legacy directory /var/run/, updating /var/run/vsftp
d/empty → /run/vsftpd/empty; please update the tmpfiles.d/ drop-in file accordingly.
Processing triggers for man-db (2.9.1-1) ...
Processing triggers for systemd (245.4-4ubuntu3.4) ...
aqsa@aqsa-VirtualBox:~$
``` |
	By default, it will start like all services in Debian
Step-3	**Checking the status of vsftpd**

		Once installed, vsftpd (FTP Server), run the command to check the status if it is running or not:
		$sudo service vsftpd status
		aqsa@aqsa-VirtualBox:~$ sudo service vsftpd status

		aqsa@aqsa-VirtualBox:~$ sudo service vsftpd status
		● vsftpd.service - vsftpd FTP server
		    Loaded: loaded (/lib/systemd/system/vsftpd.service; enabled; vendor preset: enabled)
		    Active: active (running) since Wed 2021-02-24 15:30:34 PKT; 47s ago
		  Main PID: 177421 (vsftpd)
		    Tasks: 1 (limit: 4655)
		   Memory: 616.0K
		   CGroup: /system.slice/vsftpd.service
		        └─177421 /usr/sbin/vsftpd /etc/vsftpd.conf
		
		15:30:34 24 فروری aqsa-VirtualBox systemd[1]: Starting vsftpd FTP server...
		15:30:34 24 فروری aqsa-VirtualBox systemd[1]: Started vsftpd FTP server.
		aqsa@aqsa-VirtualBox:~$

		It shows "FTP server is running correctly.
Step-4		**Configuring FTP server**
		All VSFTPD configurations are in the **/etc/vsftpd.conf** file, so it is easy to create a backup of it before changing it. If something unexpected happens, we can go back to the original and undo any mistakes.
		Use the command given command to make a backup:
		$ sudo cp /etc/vsftpd.conf /etc/vsftpd.conf.bak
		Type all the comments systematically.
		Let's begin by actively listening to the server. Type **listen =YES** If you do not use IPv6, then it must be disabled: **listen_ipv6=No** Also, it is not appropriate to give access to an anonymous user: **anonymous_enable=NO** By default, the client can only download the file, so let it remain active: **local_enable=YES** **write_enable=YES** FTP operates at port 20: **connect_from_port_20=YES.** The listen port can be changed:

	listen_port=XX Save changes by pressing "CTRL+o" and close the file by pressing "CTRL+ x".
	The terminal will look like this
| | ```
aqsa@aqsa-VirtualBox:~$ sudo cp /etc/vsftpd.conf /etc/vsftpd.conf.bak
aqsa@aqsa-VirtualBox:~$ listen=YES
aqsa@aqsa-VirtualBox:~$ listen_ipv6=NO
aqsa@aqsa-VirtualBox:~$ anonymous_enable=NO
aqsa@aqsa-VirtualBox:~$ local_enable=YES
aqsa@aqsa-VirtualBox:~$ write_enable=YES
aqsa@aqsa-VirtualBox:~$ connect_from_port_20=YES
aqsa@aqsa-VirtualBox:~$ listen_port=XX
aqsa@aqsa-VirtualBox:~$ listen=YES
aqsa@aqsa-VirtualBox:~$ listen_ipv6=NO
aqsa@aqsa-VirtualBox:~$ anonymous_enable=NO
aqsa@aqsa-VirtualBox:~$ local_enable=YES
aqsa@aqsa-VirtualBox:~$ write_enable=YES
aqsa@aqsa-VirtualBox:~$ local_umask=022
aqsa@aqsa-VirtualBox:~$ dirmessage_enable=YES
aqsa@aqsa-VirtualBox:~$ use_localtime=YES
aqsa@aqsa-VirtualBox:~$ xferlog_enable=YES
aqsa@aqsa-VirtualBox:~$ connect_from_port_20=YES
aqsa@aqsa-VirtualBox:~$ secure_chroot_dir=/var/run/vsftpd/empty
aqsa@aqsa-VirtualBox:~$ pam_service_name=vsftpd
aqsa@aqsa-VirtualBox:~$ rsa_cert_file=/etc/ssl/certs/ssl-cert-snakeoil.pem
aqsa@aqsa-VirtualBox:~$ rsa_private_key_file=/etc/ssl/private/ssl-cert-snakeoil.key
aqsa@aqsa-VirtualBox:~$ ssl_enable=NO
``` |
Step-5	**Type the mentioned command to view the file without comments:**
	$ sudo cat /etc/vsftpd.conf | grep –v "^#"
| | ```
aqsa@aqsa-VirtualBox:~$ sudo cat /etc/vsftpd.conf | grep -v "^#"
listen=NO
listen_ipv6=YES
anonymous_enable=NO
local_enable=YES
dirmessage_enable=YES
use_localtime=YES
xferlog_enable=YES
connect_from_port_20=YES
secure_chroot_dir=/var/run/vsftpd/empty
pam_service_name=vsftpd
rsa_cert_file=/etc/ssl/certs/ssl-cert-snakeoil.pem
rsa_private_key_file=/etc/ssl/private/ssl-cert-snakeoil.key
ssl_enable=NO
``` |
Step-6	**Creating a new user**
	Execute the command shown below to create a new user for the configuration of the server:
	$ sudo useradd –m user1
| | ```
aqsa@aqsa-VirtualBox:~$ sudo useradd -m user1
``` |
| | It will ask you to assign a password. Enter password: |
| | ```
aqsa@aqsa-VirtualBox:~$ sudo passwd user1
New password:
``` |

	Again, enter the password for confirmation. Your password has been updated.
| | ```
aqsa@aqsa-VirtualBox:~$ sudo passwd user1
New password:
Retype new password:
passwd: password updated successfully
aqsa@aqsa-VirtualBox:~$
``` |
	The user has created successfully on the FTP server.
Step-7	**Configure FTP server on Ubuntu 20.04**
	There are two ways to configure the FTP server: • Configure through terminal • Configure through browser We need an IP address to configure the server; check your IP address through the following command
	$ ifconfig
| | ```
aqsa@aqsa-VirtualBox:~$ ifconfig
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 10.0.2.15  netmask 255.255.255.0  broadcast 10.0.2.255
``` |
Step-8	**Configure through terminal:**
	Fire up the terminal and give access to it with Server's IP address:
	$ ftp 10.0.2.15
| | ```
aqsa@aqsa-VirtualBox:~$ ftp 10.0.2.15
Connected to 10.0.2.15.
220 (vsFTPd 3.0.3)
Name (10.0.2.15:aqsa):
``` |
Step-9	**Configure through Browser:**
	Open the browser and give access to the FTP server. The following address is:
	ftp://10.0.2.15
	Once the connection is established, you will be asked to enter your username and password:

	After entering the credentials, click on "OK", a connection will be established.
Conclusion	The FTP (File Transfer Protocol) server experiment has successfully demonstrated the process of setting up and configuring an FTP server on a Linux (Ubuntu) system to enable file sharing and transfer capabilities between the server and client systems. Through the completion of this FTP server experiment, the I have gained practical experience in setting up and configuring an FTP server in a Linux environment, enabling file sharing and transfer capabilities between Linux and Windows systems. This knowledge can be applied in various scenarios, such as software distribution, data backup, and collaborative file sharing, where a reliable and secure file transfer solution is required. Overall, this FTP server experiment has provided valuable hands-on experience in the setup and management of a widely-used file transfer protocol, equipping the me with the necessary skills to implement and troubleshoot similar FTP server deployments in the future.
Signature	

Date	
Grade	