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| **Name** | Manish Shashikant Jadhav |
| **UID** | 2023301005 |
| **Subject** | Computer Communication and Networks (CCN) |
| **Experiment No.** | 6 |
| **Aim** | Installation and configuration of FTP server. |
| **Step1:** | **Steps to install vsftpd and check if the vsftpd service is active or not.** |
| **Step2:** | **Configure Firewall**  sudo ufw allow 20/tcp sudo ufw allow 21/tcp sudo ufw allow 990/tcp  sudo ufw allow 5000:10000/tcp  **This allows incoming connections to ports like 20, 21, 990 and 5000:10000/tcp**  **Configure users**  **Let’s start by creating our public user account. Type in**  sudo adduser ftpuser  **Enter your password, leave other values empty, and at last, enter Y to save changes.** |
| **Step 3:** | **Now, for security purposes, we will disable ssh permission for this user.**  **Type in**  sudo nano /etc/ssh/sshd\_config Add the following line in this file DenyUsers ftpuser  Press **Ctrl + x** then **y** then **enter.** Now, restart the SSH service so that these new settings take effect.  sudo systemctl restart sshd |
| **Step4:** | **Create the FTP folder and set permissions**  We will create our FTP folder. Type in  sudo mkdir /ftp  Now, we will change this directory’s owner to our admin user. Type in  sudo chown adminuser /ftp  If you want to upload files to any folder that is not owned by your admin user, you will have to change that folder’s owner using the above-mentioned command. |
| **Step5:** | Configure and secure vsftpd Open the vsftpd configuration file. Type in  sudo nano /etc/vsftpd.conf  Make sure the following lines are uncommented  ...  anonymous\_enable=NO  local\_enable=YES  write\_enable=YES  ...  Also, we opened ports 5000 to 10000 in step 2 for passive mode, so now we will let vsftpd know which ports to use for passive FTP connection. Add the following lines in vsftpd.conf file  pasv\_min\_port=5000  pasv\_max\_port=10000  Now, we will specify the default directory for FTP connections which will open when someone connects to our FTP server. Add the following line  local\_root=/ftp  Remember, do not put any space before and after = in this configuration file.  *Locking user into the home directory*  Now, for security reasons, we will lock the ftpuser to the default directory, as by default, a user can browse the whole Linux server. To do this, vsftpd uses chroot. To do this, un-comment the following lines  ...  chroot\_local\_user=YES  chroot\_list\_enable=YES  chroot\_list\_file=/etc/vsftpd.chroot\_list  ...  Also, add the following line as it is not in the configuration file by default  allow\_writeable\_chroot=YES  The first line enables chroot feature for local users which includes our admin user and our ftpuser. The second and third lines let us choose which users to apply to chroot to.  *Setting file permission*  local\_umask=0002  This line will set the modification permission of every new file created to 664(-rw-rw-r-) and of every new folder to 775(rwxrwxr-x). With this, the ftpuser can only read and download files from every sub-directory of our FTP directory, but it does not have permission to upload anything to our FTP directory since it is not the owner.  Press **Ctrl + x** then **y** then **enter.** Now, we need to create that list file. Type in  sudo touch /etc/vsftpd.chroot\_list sudo nano /etc/vsftpd.chroot\_list      Whatever users you specify in this file, will not be chroot-ed. So add your admin username in this file because we do not want to lock it. Press **Ctrl + x** then **y** then **enter**. Now we need to restart our vsftpd server so that all these settings get applied immediately. Type in  sudo systemctl restart --now vsftpd |
| **Step6:** | Securing vsftpd with SSL/TLS It is recommended to encrypt FTP traffic if you want to use it over the inter- net. We will encrypt our traffic with FTPS (file transfer protocol over SSL).  Let’s start by generating a self-signed certificate. Type in  *sudo openssl req -x509 -nodes -days 365 -newkey rsa:2048 -keyout*  */etc/ssl/private/vsftpd.pem -out /etc/ssl/private/vsftpd.pem* |
| **Step7:** | **Connecting to FTP Server:** |
| **Conclusion** | Hence, by completing this experiment I came to know about Installation and configuration of FTP server. |