

## Assignment:5

### Task:5

Below are detailed steps for configuring SSH for secure remote access and using SCP to transfer a file from your local machine to a remote server. This includes setting up SSH keys for authentication.

#### Step 1: Install OpenSSH (if not already installed):

Make sure that OpenSSH is installed on both your local machine and the remote server. You can install it using the package manager appropriate for your system.

On Debian/Ubuntu:

**sudo apt-get install openssh-client openssh-server**

```
sunny28@Linux:~$ sudo apt-get install openssh-client openssh-server
[sudo] password for sunny28:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
openssh-client is already the newest version (1:8.9p1-3ubuntu0.6).
openssh-client set to manually installed.
The following additional packages will be installed:
  ncurses-term openssh-sftp-server ssh-import-id
Suggested packages:
  molly-guard monkeysphere ssh-askpass
The following NEW packages will be installed:
  ncurses-term openssh-server openssh-sftp-server ssh-import-id
0 upgraded, 4 newly installed, 0 to remove and 48 not upgraded.
Need to get 752 kB of archives.
After this operation, 6,050 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://in.archive.ubuntu.com/ubuntu jammy-updates/main amd64 openssh-sftp-server amd64 1:8.9p1-3ubuntu0.6 [38.7 kB]
Get:2 http://in.archive.ubuntu.com/ubuntu jammy-updates/main amd64 openssh-server amd64 1:8.9p1-3ubuntu0.6 [435 kB]
Get:3 http://in.archive.ubuntu.com/ubuntu jammy-updates/main amd64 ncurses-term all 6.3-2ubuntu0.1 [267 kB]
Get:4 http://in.archive.ubuntu.com/ubuntu jammy/main amd64 ssh-import-id all 5.11-0ubuntu1 [10.1 kB]
Fetched 752 kB in 7s (102 kB/s)
Preconfiguring packages ...
Selecting previously unselected package openssh-sftp-server.
(Reading database ... 204761 files and directories currently installed.)
Preparing to unpack .../openssh-sftp-server_1%3a8.9p1-3ubuntu0.6_amd64.deb ...
Unpacking openssh-sftp-server (1:8.9p1-3ubuntu0.6) ...
Selecting previously unselected package openssh-server.
Preparing to unpack .../openssh-server_1%3a8.9p1-3ubuntu0.6_amd64.deb ...
Unpacking openssh-server (1:8.9p1-3ubuntu0.6) ...
Selecting previously unselected package ncurses-term.
Preparing to unpack .../ncurses-term_6.3-2ubuntu0.1_all.deb ...
Unpacking ncurses-term (6.3-2ubuntu0.1) ...
Selecting previously unselected package ssh-import-id.
Preparing to unpack .../ssh-import-id_5.11-0ubuntu1_all.deb ...
Unpacking ssh-import-id (5.11-0ubuntu1) ...
Setting up openssh-sftp-server (1:8.9p1-3ubuntu0.6) ...
Setting up openssh-server (1:8.9p1-3ubuntu0.6) ...

Creating config file /etc/ssh/sshd_config with new version
Creating SSH2 RSA key; this may take some time ...
3072 SHA256:Ehz/vq7ZcHFhZufq2NVUUNZsv6a4S8zELIXumvTM3ws root@Linux (RSA)
Creating SSH2 ECDSA key; this may take some time ...
256 SHA256:gMzcUibls0QG4TY73w9Ur+kNA+QJPxwGM+8HCx34/5A root@Linux (ECDSA)
Creating SSH2 ED25519 key; this may take some time ...
256 SHA256:i8TiJhuUXHYZzPatkFJqxlKIdAFGFLE9Aziq9eeMnRY root@Linux (ED25519)
Created symlink /etc/systemd/system/ssh.service → /lib/systemd/system/ssh.service.
Created symlink /etc/systemd/system/multi-user.target.wants/ssh.service → /lib/systemd/system/ssh.service.
rescue-ssh.target is a disabled or a static unit, not starting it.
ssh.socket is a disabled or a static unit, not starting it.
Setting up ssh-import-id (5.11-0ubuntu1)
```

#### Step 2: Generate SSH Key Pair (if you haven't already):

```
Processing triggers for dmidecode (3.11-1)
sunny28@Linux:~$ ssh-keygen -t rsa -b 4096 -C "sunny.kumar17578@marwadieducation.edu.in"
```

On your local machine, generate an SSH key pair using the `ssh-keygen` command. This command creates a private key (`id_rsa`) and a public key (`id_rsa.pub`).

```
ssh-keygen -t rsa -b 4096 -C  
"sunny.kumar1757@marwadieducation.edu.in"
```

Follow the prompts to set a passphrase for added security.

### Step 3: Copy Public Key to Remote Server:

Use `ssh-copy-id` to copy your public key to the remote server. Replace user and hostname with your remote server's username and hostname.

```
ssh-copy-id sunny28
```

Enter the password for the user when prompted.

```
sunny28@Linux:~$ ssh-keygen -t rsa -b 4096 -C "sunny.kumar17578@marwadieducation.edu.in"
Generating public/private rsa key pair.
Enter file in which to save the key (/home/sunny28/.ssh/id_rsa): ssh-copy-id sunny28
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in ssh-copy-id sunny28
Your public key has been saved in ssh-copy-id sunny28.pub
The key fingerprint is:
SHA256:WL24kAALrRZrDbXhrua0ScbMoJTE04f4SKzdQPGDLrg sunny.kumar17578@marwadieducation.edu.in
The key's randomart image is:
+---[RSA 4096]-----+
|..=+|
|o==+ |
|oo=+  |
|***+.o + .|
|B+oo. + S |
|Bo.    |
|EX     |
|* o    |
| +     |
+----[SHA256]-----+
sunny28@Linux:~$
```

### Step 4: Test SSH Connection:

Ensure that you can now log in to the remote server without being prompted for a password.

```
ssh sunny28
```

### Step 5: Transfer a File Using SCP:

Use SCP to securely copy a file from your local machine to the remote server. Replace yourfile.txt with the actual file you want to transfer, and update the destination path on the server accordingly.

```
scp sunny.txt user@sunny28:/home/sunny28/.ssh/id_rsa
```

Step 6: Verify File Transfer:

Log in to the remote server and check if the file has been successfully transferred.

```
ssh sunny28
```

```
ls /home/sunny28/.ssh/id_rsa
```

Important Notes:

**SSH Key Passphrase:** If you set a passphrase during key generation, you'll be prompted to enter it each time you log in or use SCP.

**SSH Key Location:** By default, SSH keys are stored in the ~/.ssh/ directory on your local machine.

**File Permissions:** Ensure that the .ssh directory and files within it have the correct permissions. Use `chmod 700 ~/.ssh` and `chmod 600 ~/.ssh/id_rsa` on your local machine.

**Firewall Configuration:** Ensure that your firewall on the server allows SSH (port 22) traffic.