PRACTICAL 7

Aim: To install SSH (Secure Shell) server on you Ubuntu machine and configure it.

Step 1: It is always necessary to keep your machine up-to-date before you install any type of server or service in it.

sudo apt-get update

```
atharva@Atharva:~$ sudo apt-get update
[sudo] password for atharva:
Hit:1 http://in.archive.ubuntu.com/ubuntu jammy InRelease
Get:2 http://in.archive.ubuntu.com/ubuntu jammy-updates InRelease [119 kB]
Get:3 http://security.ubuntu.com/ubuntu jammy-security InRelease [110 kB]
Get:4 http://in.archive.ubuntu.com/ubuntu jammy-backports InRelease [109 kB]
Get:5 http://in.archive.ubuntu.com/ubuntu jammy-updates/main i386 Packages [471 kB]
Get:6 http://security.ubuntu.com/ubuntu jammy-security/main amd64 Packages [680 kB]
Get:7 http://in.archive.ubuntu.com/ubuntu jammy-updates/main amd64 Packages [894 kB]
Get:8 http://in.archive.ubuntu.com/ubuntu jammy-updates/main Translation-en [214 kB]
Get:9 http://in.archive.ubuntu.com/ubuntu jammy-updates/main amd64 DEP-11 Metadata [100 kB]
Get:10 http://in.archive.ubuntu.com/ubuntu jammy-updates/main DEP-11 48x48 Icons [36.1 kB]
Get:11 http://in.archive.ubuntu.com/ubuntu jammy-updates/main DEP-11 64x64 Icons [55.1 kB]
Get:12 http://in.archive.ubuntu.com/ubuntu jammy-updates/main amd64 c-n-f Metadata [15.6 kB]
Get:13 http://in.archive.ubuntu.com/ubuntu jammy-updates/restricted i386 Packages [30.3 kB]
Get:14 http://in.archive.ubuntu.com/ubuntu jammy-updates/restricted amd64 Packages [714 kB]
Get:15 http://security.ubuntu.com/ubuntu jammy-security/main i386 Packages [305 kB]
Get:16 http://security.ubuntu.com/ubuntu jammy-security/main Translation-en [155 kB]
Get:17 http://in.archive.ubuntu.com/ubuntu jammy-updates/restricted Translation-en [114 kB]
Get:18 http://security.ubuntu.com/ubuntu jammy-security/main amd64 DEP-11 Metadata [42.8 kB]
Get:19 http://security.ubuntu.com/ubuntu jammy-security/main DEP-11 48x48 Icons [16.9 kB]
Get:20 http://in.archive.ubuntu.com/ubuntu jammy-updates/restricted amd64 c-n-f Metadata [536 B]
```

sudo apt-get upgrade

```
atharva@Atharva:~$ sudo apt-get upgrade
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Calculating upgrade... Done
The following packages have been kept back:
  gir1.2-javascriptcoregtk-4.0 gir1.2-webkit2-4.0 gjs initramfs-tools initramfs-tools-bin initramfs-tools-core libgjs0g libjavascriptcoregtk-4.0-18 libwebkit2gtk-4.0-37 linux-generic-hwe-22.04
  linux-headers-generic-hwe-22.04 linux-image-generic-hwe-22.04 ubuntu-desktop ubuntu-desktop-minimal
The following packages will be upgraded:
  accountsservice alsa-ucm-conf amd64-microcode apparmor apport apport-gtk apt apt-utils avahi-autoipd avahi-daemon avahi-utils base-files bind9-dnsutils bind9-host bind9-libs binutils binutils-common
  binutils-x86-64-linux-gnu ca-certificates cpp-11 cpp-12 cups cups-browsed cups-bsd cups-client cups-common cups-core-drivers cups-daemon cups-filters cups-filters-core-drivers cups-ipp-utils cups-ppdc
  cups-server-common distro-info distro-info-data dnsmasq-base dpkg evince evince-common evolution-data-server evolution-data-server-common fonts-opensymbol fwupd fwupd-signed g++-11 gcc-11 gcc-11-base gcc-12
  gcc-12-base gdm3 ghostscript ghostscript-x gir1.2-accountsservice-1.0 gir1.2-adw-1 gir1.2-gdm-1.0 gir1.2-gnomedesktop-3.0 gir1.2-gst-plugins-base-1.0 gir1.2-gtk-4.0 gir1.2-mutter-10 gir1.2-pango-1.0
  gir1.2-rsvg-2.0 gnome-control-center gnome-control-center-data gnome-control-center-faces gnome-desktop3-data gnome-session-canberra gnome-settings-daemon gnome-settings-daemon-common gnome-shell
  gnome-shell-common gnome-shell-extension-ubuntu-dock gstreamer1.0-alsa gstreamer1.0-gl gstreamer1.0-gtk3 gstreamer1.0-plugins-base gstreamer1.0-plugins-base-apps gstreamer1.0-plugins-good
  gstreamer1.0-pulseaudio gstreamer1.0-x im-config intel-microcode ipp-usb iptables isc-dhcp-client isc-dhcp-common language-pack-en language-pack-en-base language-pack-gnome-en language-pack-gnome-en-base
  libaccountsservice0 libadwaita-1-0 libapparmor1 libapt-pkg6.0 libasan6 libasan8 libatomic1 libavahi-client3 libavahi-common-data libavahi-common3 libavahi-core7 libavahi-glib1 libavahi-ui-gtk3-0 libbinutils
  libcamel-1.2-63 libcanberra-gtk3-0 libcanberra-gtk3-module libcanberra-pulse libcanberra0 libcap2 libcap2-bin libcc1-0 libctf-nobfd0 libctf0 libcups2 libcupsfilters1 libcupsimage2 libcurl3-gnutls libcurl4
  libebackend-1.2-10 libebook-1.2-20 libebook-contacts-1.2-3 libecal-2.0-1 libedata-book-1.2-26 libedata-cal-2.0-1 libedataserver-1.2-26 libedataserverui-1.2-3 libegl-mesa0 libevdocument3-4 libevview3-3
  libfontembed1 libfprint-2-2 libfreetype6 libfwupd2 libfwupdplugin5 libgbm1 libgcc-11-dev libgcc-12-dev libgcc-s1 libgdm1 libgfortran5 libgl1-amber-dri libgl1-mesa-dri libglapi-mesa libglib2.0-0
  libglib2.0-bin libglib2.0-data libglx-mesa0 libgnome-bg-4-1 libgnome-desktop-3-19 libgnome-desktop-4-1 libgnutls30 libgomp1 libgpgme11 libgpgmepp6 libgs9 libgs9-common libgssapi-krb5-2 libgstreamer-gl1.0-0
  libgstreamer-plugins-base1.0-0 libgstreamer-plugins-good1.0-0 libgtk-4-1 libgtk-4-bin libgtk-4-common libidn12 libinput-bin libinput10 libip4tc2 libip6tc2 libitm1 libk5crypto3 libkpathsea6 libkrb5-3
  libkrb5support0 libldap-2.5-0 libldap-common libldb2 libllvm13 libllvm15 liblouis-data liblouis20 liblsan0 libmbim-glib4 libmbim-proxy libmm-glib0 libmutter-10-0 libnautilus-extension1a libncurses6
  libncursesw6 libnetplan0 libnss3 libpam-cap libpango-1.0-0 libpangocairo-1.0-0 libpangoft2-1.0-0 libpangoxft-1.0-0 libpcsclite1 libperl5.34 libpoppler-cpp0v5 libpoppler-glib8 libpoppler118 libprotobuf23
  libpulse-mainloop-glib0 libpulse0 libpulsedsp libpython3.10 libpython3.10-minimal libpython3.10-stdlib libqmi-glib5 libqmi-proxy libquadmath0 libraw20 libreoffice-base-core libreoffice-calc
  libreoffice-common libreoffice-core libreoffice-draw libreoffice-gnome libreoffice-gtk3 libreoffice-impress libreoffice-math libreoffice-ogltrans libreoffice-pdfimport libreoffice-style-breeze
  libreoffice-style-colibre libreoffice-style-elementary libreoffice-style-yaru libreoffice-writer librsvg2-2 librsvg2-common libsasl2-2 libsasl2-modules libsasl2-modules-db libsasl2-modules-gssapi-mit
  libsmbclient libsnmp-base libsnmp40 libspeechd2 libssh-4 libssl3 libstdc++-11-dev libstdc++6 libsynctex2 libtiff5 libtinfo6 libtsan0 libtsan2 libubsan1 libuno-cppu3 libuno-cppuhelpergcc3-3
  libuno-purpenvhelpergcc3-3 libuno-sal3 libuno-salhelpergcc3-3 libunwind8 libwbclient0 libwebp7 libwebpdemux2 libwebpmux3 libx11-6 libx11-data libx11-xcb1 libxatracker2 libxml2 libxtables12 linux-firmware
  linux-libc-dev mesa-va-drivers mesa-vdpau-drivers mesa-vulkan-drivers modemmanager mokutil mutter-common nautilus nautilus-data ncurses-base ncurses-bin netplan.io open-vm-tools open-vm-tools-desktop
  openssh-client openssl perl perl-base perl-modules-5.34 poppler-utils printer-driver-foo2zjs printer-driver-foo2zjs-common printer-driver-splix pulseaudio pulseaudio-module-bluetooth pulseaudio-utils
  python-apt-common python3-apport python3-apt python3-debian python3-distro-info python3-distupgrade python3-gdbm python3-ldb python3-lib2to3 python3-louis python3-macaroonbakery python3-problem-report
  python3-protobuf python3-renderpm python3-reportlab python3-reportlab-accel python3-requests python3-software-properties python3-speechd python3-tz python3-uno python3.10 python3.10-minimal remmina
  remmina-common remmina-plugin-rdp remmina-plugin-secret remmina-plugin-vnc rsync samba-libs snapd software-properties-common software-properties-gtk speech-dispatcher speech-dispatcher-audio-plugins
  speech-dispatcher-espeak-ng sudo systemd-hwe-hwdb tar tcpdump thermald tzdata ubuntu-advantage-tools ubuntu-drivers-common ubuntu-minimal ubuntu-release-upgrader-core ubuntu-release-upgrader-gtk
  ubuntu-standard ufw uno-libs-private update-notifier update-notifier-common ure vim-common vim-tiny xserver-common xserver-xephyr xserver-xorg-core xserver-xorg-legacy xwayland xxd yaru-theme-gnome-shell
  yaru-theme-gtk yaru-theme-icon yaru-theme-sound
```

Step 2: Now we have to install the SSH server, so we use the following command.

sudo apt-get-y install openssh-client

```
atharva@Atharva:~$ sudo apt-get -y install openssh-client
[sudo] password for atharva:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
openssh-client is already the newest version (1:8.9p1-3ubuntu0.3).
openssh-client set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 5 not upgraded.
```

sudo apt-get-y install openssh-server

```
atharva@Atharva:~$ sudo apt-get -y install openssh-server
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
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 5 not upgraded.
Need to get 751 kB of archives.
After this operation, 6,046 kB of additional disk space will be used.
Get:1 http://in.archive.ubuntu.com/ubuntu jammy-updates/main amd64 openssh-sftp-server amd64 1:8.9p1-3ubuntu0.3 [38.8 kB]
Get:2 http://in.archive.ubuntu.com/ubuntu jammy-updates/main amd64 openssh-server amd64 1:8.9p1-3ubuntu0.3 [434 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 751 kB in 2s (320 kB/s)
```

Step 3: Now we have to configure the file SSH server which can be done by editing the 'sshd_config' file for that we have to use the following command.

sudo nano /etc/ssh/sshd_config

```
# Authentication:

LoginGraceTime 120
PermitRootLogin yes
StrictModes yes
#MaxAuthTries 6
#MaxSessions 10
```

Step 4: Now we have to restart the ssh server which can be done by following command.

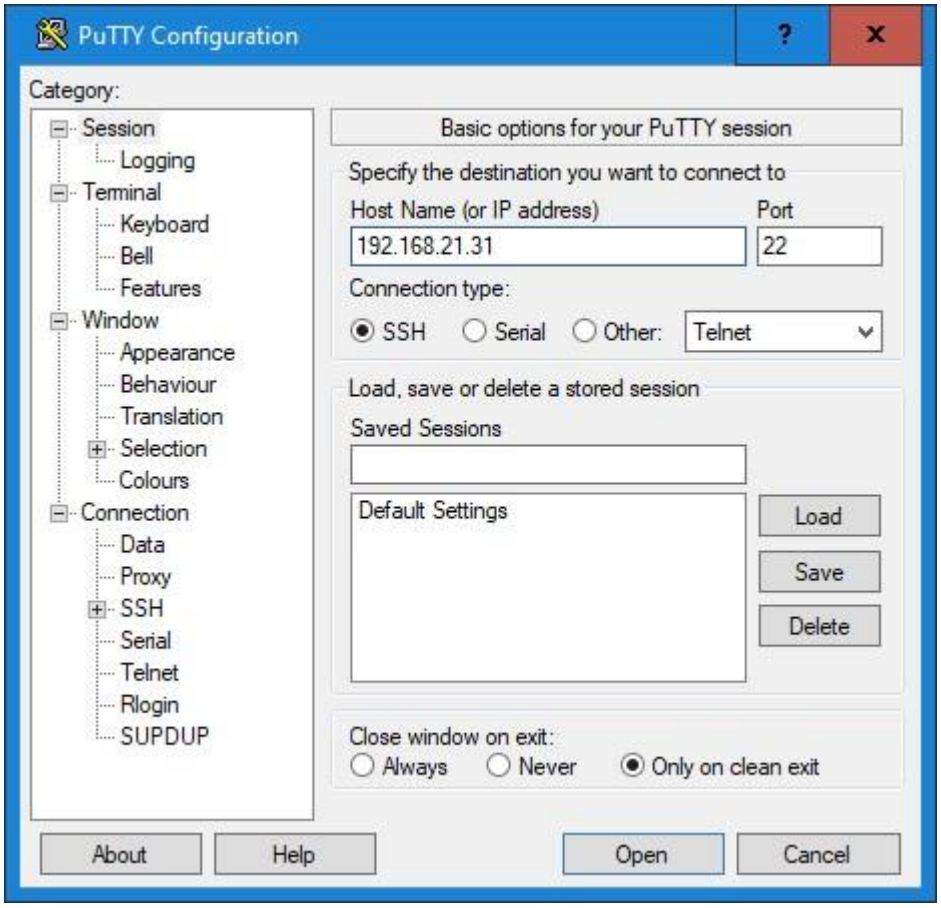
sudo systemctl restart ssh

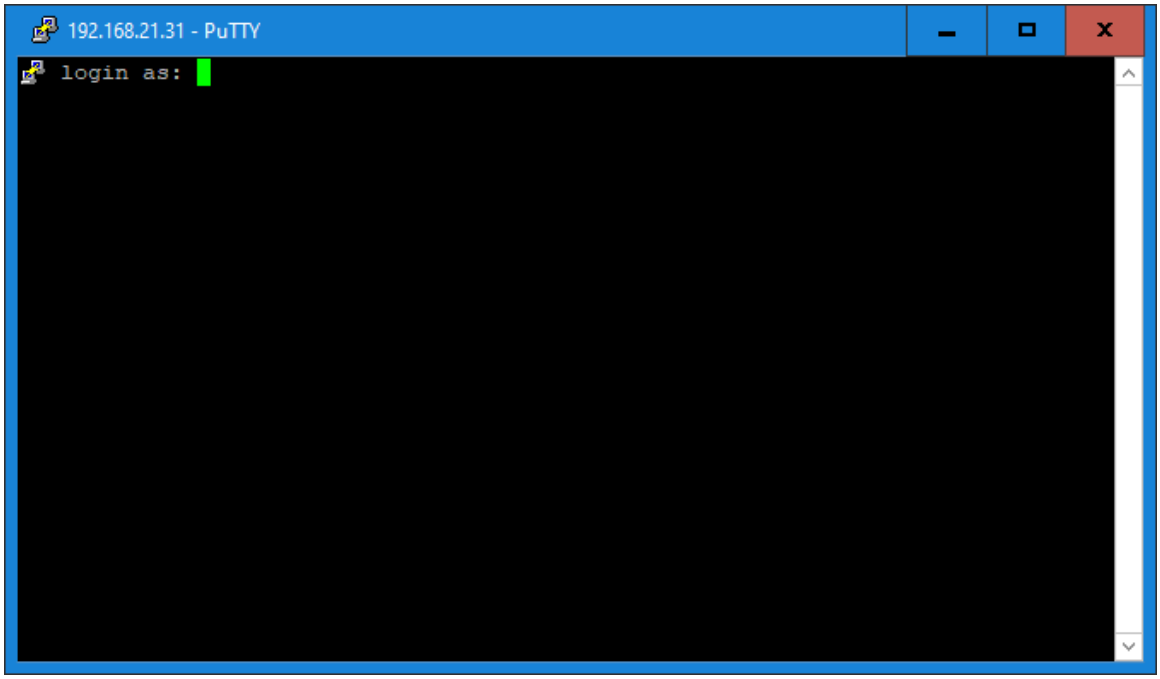
```
atharva@Atharva:~$ sudo systemctl restart ssh
```

```
atharva@Atharva:~$ sudo systemctl status ssh
● ssh.service - OpenBSD Secure Shell server
     Loaded: loaded (/lib/systemd/system/ssh.service; enabled; vendor preset: enabled)
     Active: active (running) since Fri 2023-08-18 22:44:10 IST; 37s ago
       Docs: man:sshd(8)
             man:sshd_config(5)
    Process: 4593 ExecStartPre=/usr/sbin/sshd -t (code=exited, status=0/SUCCESS)
   Main PID: 4595 (sshd)
      Tasks: 1 (limit: 9421)
     Memory: 1.7M
        CPU: 24ms
     CGroup: /system.slice/ssh.service
             └─4595 "sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups"

Aug 18 22:44:10 Atharva systemd[1]: Starting OpenBSD Secure Shell server...
Aug 18 22:44:10 Atharva sshd[4595]: Server listening on 0.0.0.0 port 22.
Aug 18 22:44:10 Atharva sshd[4595]: Server listening on :: port 22.
Aug 18 22:44:10 Atharva systemd[1]: Started OpenBSD Secure Shell server.
```

Step 5: After installing all the necessary servers on your ubuntu machine install Putty on your Windows client and open it put your ubuntu machine's ip address which can be known by using ifconifg command.

```
atharva@Atharva:~$ ifconfig
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 192.168.225.102  netmask 255.255.255.0  broadcast 192.168.225.255
        inet6 fe80::3322:f7a3:448a:72b1  prefixlen 64  scopeid 0x20<link>
        inet6 2409:4040:e97:4fce:940a:8d97:dee2:3819  prefixlen 64  scopeid 0x0<global>
        inet6 2409:4040:e97:4fce:59d4:4c7a:392b:31c7  prefixlen 64  scopeid 0x0<global>
        ether 08:00:27:ca:a6:36  txqueuelen 1000  (Ethernet)
        RX packets 14292  bytes 18328818 (18.3 MB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 4832  bytes 483656 (483.6 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536
        inet 127.0.0.1  netmask 255.0.0.0
        inet6 ::1  prefixlen 128  scopeid 0x10<host>
        loop  txqueuelen 1000  (Local Loopback)
        RX packets 160  bytes 21070 (21.0 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 160  bytes 21070 (21.0 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```


PuTTY Configuration
Category:
Session
Logging
Terminal
Keyboard
Bell
Features
Window
Appearance
Behaviour
Translation
Selection
Colours
Connection
Data
Proxy
SSH
Serial
Telnet
Rlogin
SUPDUP
Basic options for your PuTTY session
Specify the destination you want to connect to
Host Name (or IP address)
Port
192.168.21.31
22
Connection type:
SSH
Serial
Other:
Telnet
Load, save or delete a stored session
Saved Sessions
Default Settings
Load
Save
Delete
Close window on exit:
Always
Never
Only on clean exit
About
Help
Open
Cancel


192.168.21.31 - PuTTY
login as: