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Activity 3: Install SSH server on CentOS or RHEL 8

1. **Objectives:**

1.1 Install Community Enterprise OS or Red Hat Linux OS

1.2 Configure remote SSH connection from remote computer to CentOS/RHEL-8

2. **Discussion:**

CentOS vs. Debian: Overview

CentOS and Debian are Linux distributions that spawn from opposite ends of the candle.

CentOS is a free downstream rebuild of the commercial Red Hat Enterprise Linux distribution where, in contrast, Debian is the free upstream distribution that is the base for other distributions, including the Ubuntu Linux distribution.

As with many Linux distributions, CentOS and Debian are generally more alike than different; it isn't until we dig a little deeper that we find where they branch.

CentOS vs. Debian: Architecture

The available supported architectures can be the determining factor as to whether a distro is a viable option or not. Debian and CentOS are both very popular for x86_64/AMD64, but what other archs are supported by each?

Both Debian and CentOS support AArch64/ARM64, armhf/armhfp , i386 , ppc64el/ppc64le. (Note: armhf/armhfp and i386 are supported in CentOS 7 only.)

CentOS 7 additionally supports POWER9 while Debian and CentOS 8 do not. CentOS 7 focuses on the x86_64/AMD64 architecture with the other archs released through the AltArch SIG (Alternate Architecture Special Interest Group) with CentOS 8 supporting x86_64/AMD64, AArch64 and ppc64le equally.

Debian supports MIPSel, MIPS64el and s390x while CentOS does not. Much like CentOS 8, Debian does not favor one arch over another —all supported architectures are supported equally.

CentOS vs. Debian: Package Management

Most Linux distributions have some form of package manager nowadays, with some more complex and feature-rich than others.

CentOS uses the RPM package format and YUM/DNF as the package manager.

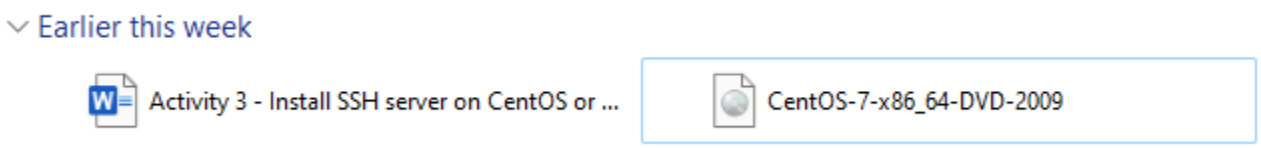
Debian uses the DEB package format and dpkg/APT as the package manager.

Both offer full-feature package management with network-based repository support, dependency checking and resolution, etc.. If you're familiar with one but not the other, you may have a little

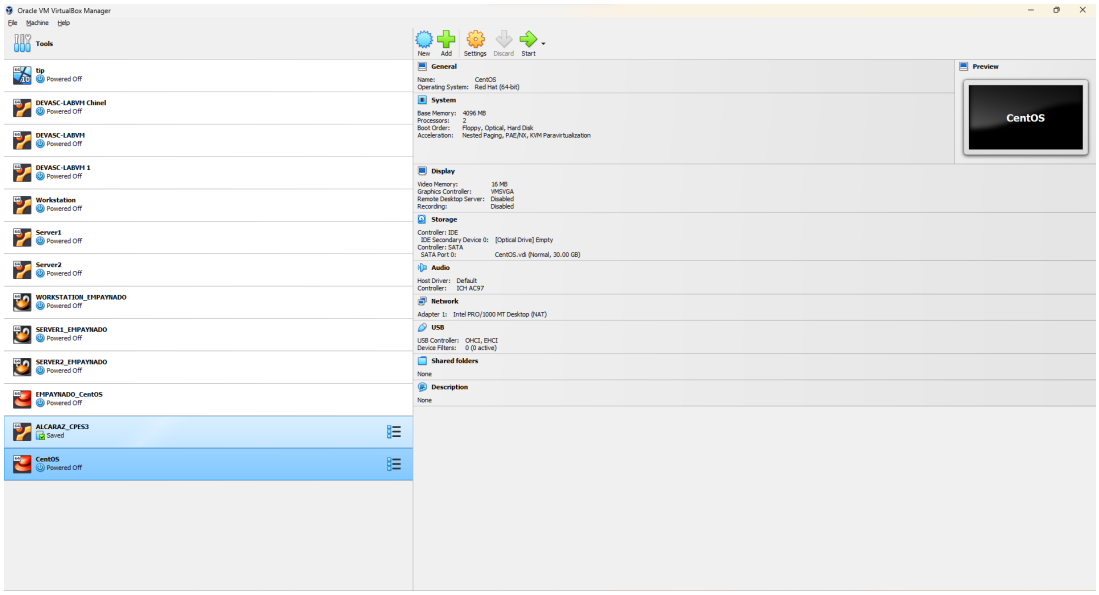
trouble switching over, but they're not overwhelmingly different. They both have similar features, just available through a different interface.

Task 1: Download the CentOS or RHEL-8 image (Create screenshots of the following)

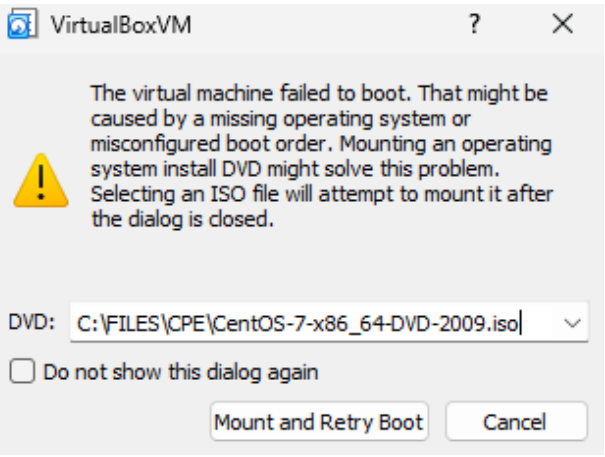
1. Download the image of the CentOS here: http://mirror.rise.ph/centos/7.9.2009/isos/x86_64/



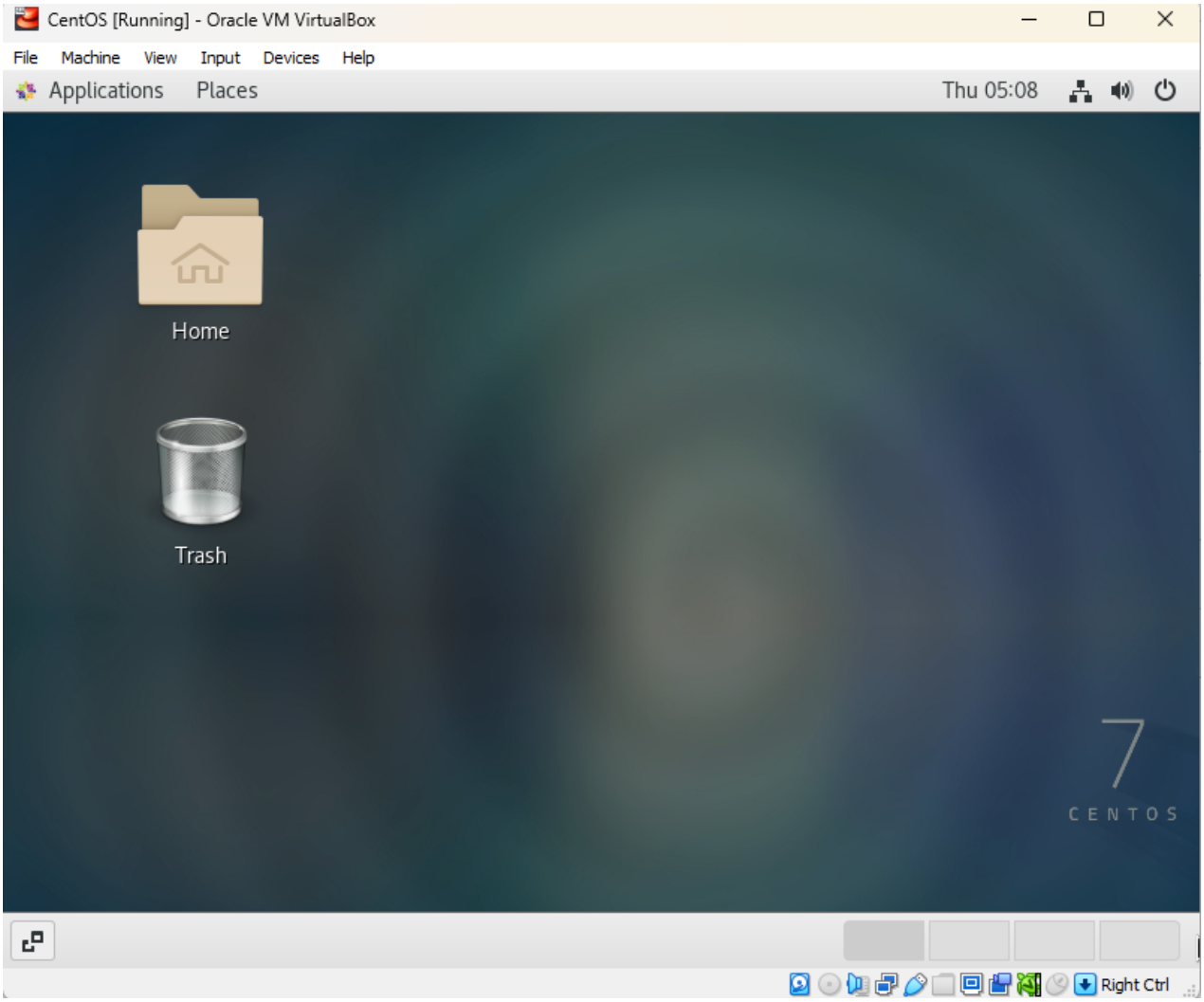
2. Create a VM machine with 2 Gb RAM and 20 Gb HD.



3. Install the downloaded image.



4. Show evidence that the OS was installed already.

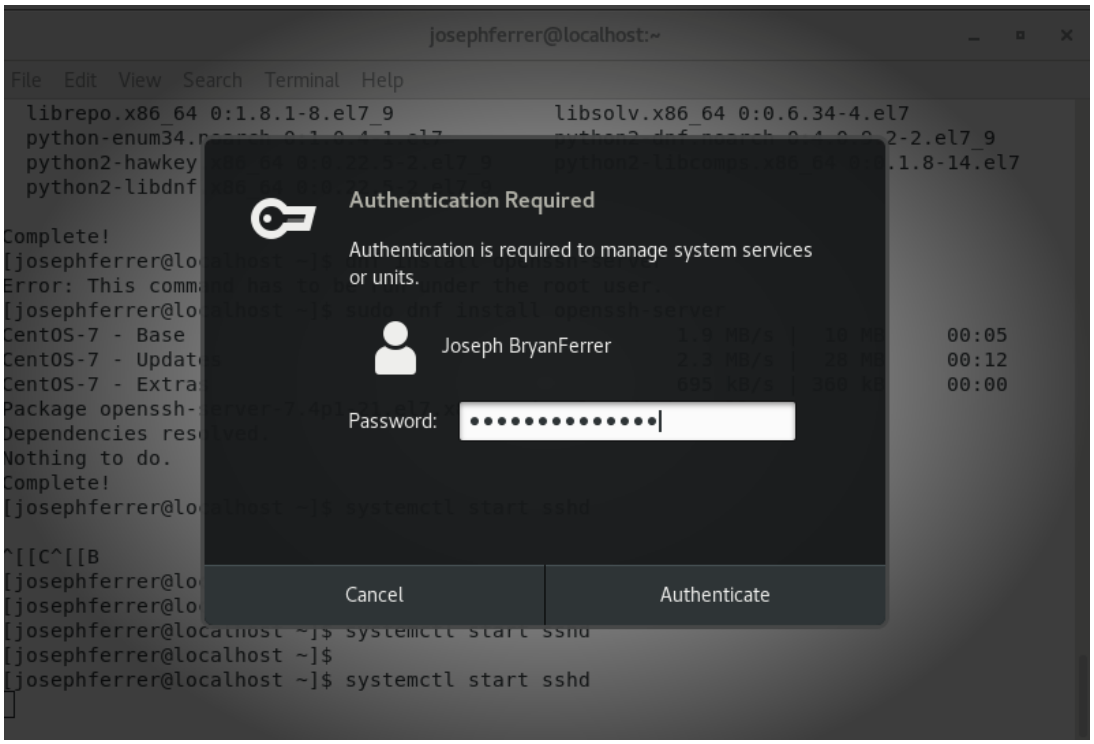


Task 2: Install the SSH server package *openssh*

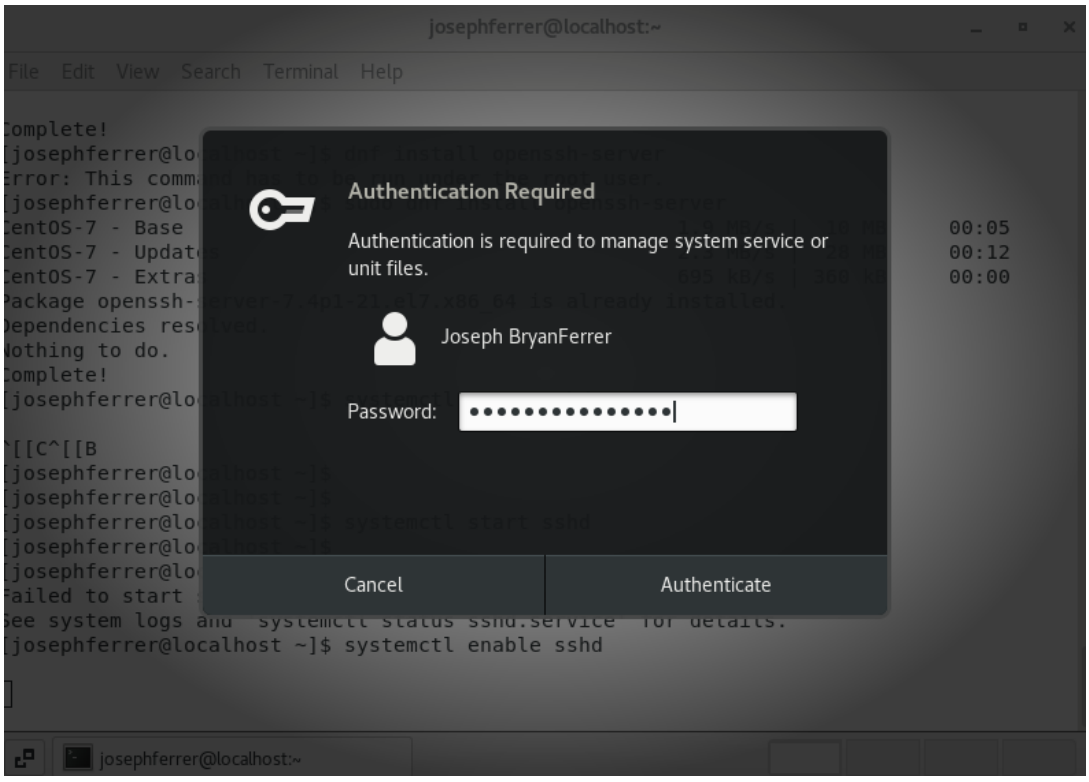
1. Install the ssh server package *openssh* by using the *dnf* command:
   $ dnf install openssh-server

```
[josephferrer@localhost ~]$ dnf install openssh-server
Error: This command has to be run under the root user.
[josephferrer@localhost ~]$ sudo dnf install openssh-server
CentOS-7 - Base                                  1.9 MB/s |  10 MB     00:05
CentOS-7 - Updates                               2.3 MB/s |  28 MB     00:12
CentOS-7 - Extras                                695 kB/s | 360 kB     00:00
Package openssh-server-7.4p1-21.el7.x86_64 is already installed.
Dependencies resolved.
Nothing to do.
Complete!
```

2. Start the *sshd* daemon and set to start after reboot:
   $ systemctl start sshd



   $ systemctl enable sshd

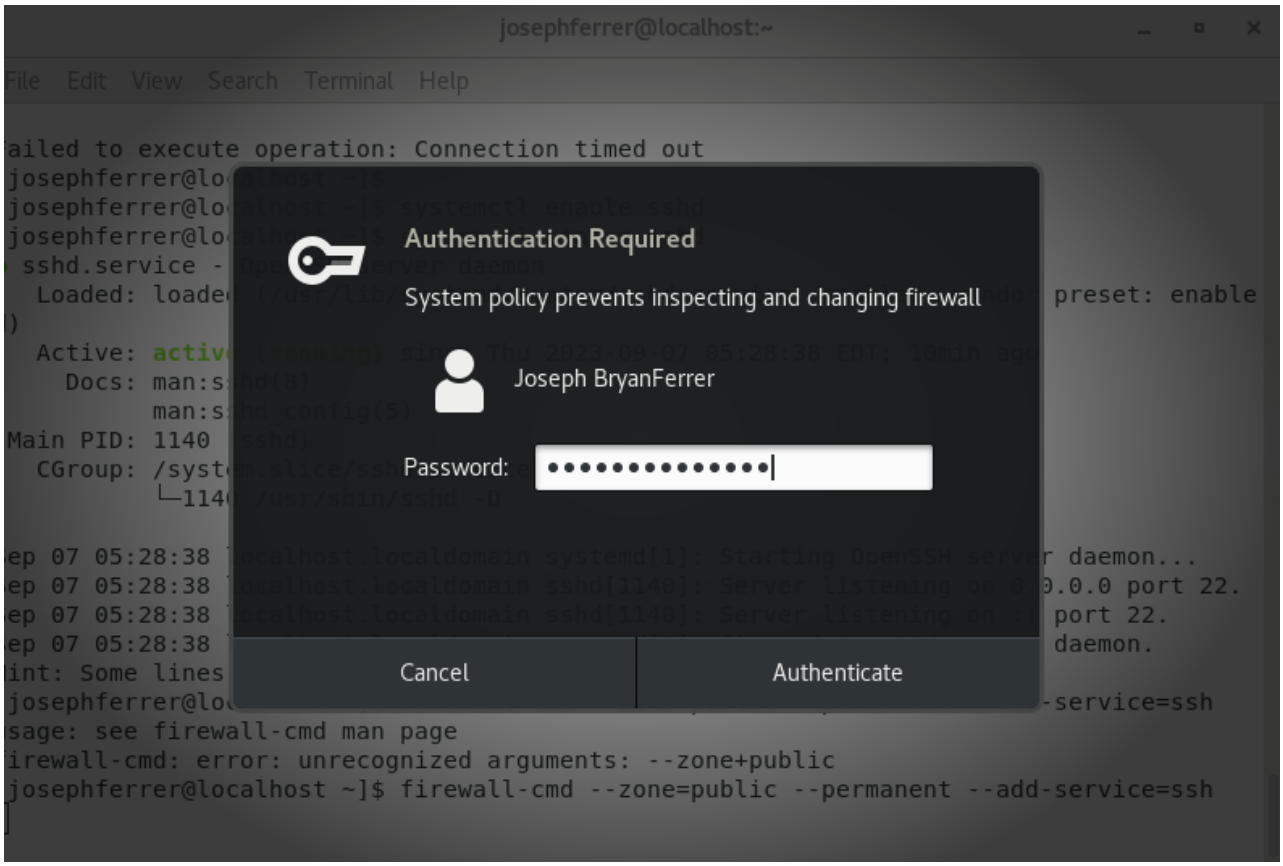


3. Confirm that the sshd daemon is up and running:
   $ systemctl status sshd

```
[josephferrer@localhost ~]$ systemctl status sshd
● sshd.service - OpenSSH server daemon
   Loaded: loaded (/usr/lib/systemd/system/sshd.service; enabled; vendor preset: enable
d)
   Active: active (running) since Thu 2023-09-07 05:28:38 EDT; 10min ago
     Docs: man:sshd(8)
           man:sshd_config(5)
 Main PID: 1140 (sshd)
   CGroup: /system.slice/sshd.service
           └─1140 /usr/sbin/sshd -D

Sep 07 05:28:38 localhost.localdomain systemd[1]: Starting OpenSSH server daemon...
Sep 07 05:28:38 localhost.localdomain sshd[1140]: Server listening on 0.0.0.0 port 22.
Sep 07 05:28:38 localhost.localdomain sshd[1140]: Server listening on :: port 22.
Sep 07 05:28:38 localhost.localdomain systemd[1]: Started OpenSSH server daemon.
Hint: Some lines were ellipsized, use -l to show in full.
```

4. Open the SSH port 22 to allow incoming traffic:
   $ firewall-cmd --zone=public --permanent --add-service=ssh




```
[josephferrer@localhost ~]$ firewall-cmd --zone=public --permanent --add-service=ssh
Warning: ALREADY_ENABLED: ssh
success
```

$ firewall-cmd --reload

```
[josephferrer@localhost ~]$ firewall-cmd --reload
success
```

5. Locate the ssh server man config file */etc/ssh/sshd_config* and perform custom configuration. Every time you make any change to the */etc/ssh/sshd-config* configuration file reload the *sshd* service to apply changes:
   $ systemctl reload sshd

```
[josephferrer@localhost ~]$ systemctl reload sshd
[josephferrer@localhost ~]$
```

Task 3: Copy the Public Key to CentOS

1. Make sure that *ssh* is installed on the local machine.

```
josephferrer@workstation:~$ cd .ssh
josephferrer@workstation:~/.ssh$
```

2. Using the command *ssh-copy-id*, connect your local machine to CentOS.

```
josephferrer@workstation:~$ ssh-copy-id -i ~/.ssh/id_rsa josephferrer@192.168.5
6.109
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/home/josephferr
er/.ssh/id_rsa.pub"
The authenticity of host '192.168.56.109 (192.168.56.109)' can't be established
.
ECDSA key fingerprint is SHA256:EM8Dlv6bHePmzjccpFdLXSoTUqf+j6bYKJDdQc02/6Q.
Are you sure you want to continue connecting (yes/no)? yes
/usr/bin/ssh-copy-id: INFO: attempting to log in with the new key(s), to filter
 out any that are already installed
/usr/bin/ssh-copy-id: INFO: 1 key(s) remain to be installed -- if you are promp
ted now it is to install the new keys
josephferrer@192.168.56.109's password:

Number of key(s) added: 1

Now try logging into the machine, with:   "ssh 'josephferrer@192.168.56.109'"
and check to make sure that only the key(s) you wanted were added.
```

3. On CentOS, verify that you have the *authorized_keys*.

```
[josephferrer@localhost ~]$ ls .ssh
authorized_keys
```

Task 4: Verify ssh remote connection

1. Using your local machine, connect to CentOS using ssh.

```
josephferrer@workstation:~$ ssh josephferrer@192.168.56.109

Last login: Thu Sep  7 06:06:27 2023 from 192.168.56.101
```

2. Show evidence that you are connected.

```
josephferrer@workstation:~$ ssh josephferrer@192.168.56.109
Last login: Thu Sep  7 06:11:32 2023 from 192.168.56.101
[josephferrer@localhost ~]$ ls .ssh
authorized_keys
[josephferrer@localhost ~]$ exit
logout
Connection to 192.168.56.109 closed.
```

Reflections:

Answer the following:

1. What do you think we should look for in choosing the best distribution between Debian and Red Hat Linux distributions?

   Choosing between Debian and Red Hat Linux distributions depends on your needs and preferences. Debian is a community-driven distribution that prioritizes user autonomy, open-source software, and personalization. It supports any architecture or platform that runs Linux, FreeBSD kernel, and any GNU tool sets such as GCC1. On the other hand, Red Hat Enterprise Linux or RHEL is the most popular commercially supported Linux distribution. It uses .rpm packages and a package manager called dnf , along with its own ecosystem of tools2. It supports Power ISA, IBM Z, ARM64, and x86-64 (both server and desktop versions)1. In choosing between the two distributions, you may want to consider the following factors such as purpose, ease of use, stability, security and community support.

2. What are the main difference between Debian and Red Hat Linux distributions?

   Debian provides free software products for anyone to access the licensed applications without any limitations for the accessible features. While RedHat releases products like Linux as a commercial distribution. Debian uses .deb packages and a package manager called apt-get. Red Hat uses .rpm packages and a package manager called dnf. Debian is a community-driven distribution that prioritizes user autonomy, open-source software, and personalization. On the other hand, Red Hat Enterprise Linux or RHEL is the most popular commercially supported Linux distribution

Conclusion:

- **In this activity, I have been able to fulfill the two objectives which are Installing of Community Enterprise OS or Red Hat Linux OS and Configuring remote SSH connection from remote computer to CentOS/RHEL-8. In order to complete the first objective, we need to download the CentOS dvd file. After downloading the file, we must create a new virtual machine and extract the downloaded CentOS file. By following the procedure, I correctly installed CentOS in my Ubuntu Virtual Machine. The second objective is satisfied by configuring and connecting the workstation server into CentOS. In order to connect this, we must copy the id or authorized keys and connect it into the ip address of the CentOS machine. In conclusion, installing an SSH server on CentOS or RHEL 8 is a straightforward process. Just follow the procedures given by the professor in order to install an ssh server on CentOS.**