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Course/Section: CPE31S5	**Date Submitted:** September 06, 2023
Instructor: Engr. Roman Richard	**Semester and SY:** 1st Semester 2023-2024

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.

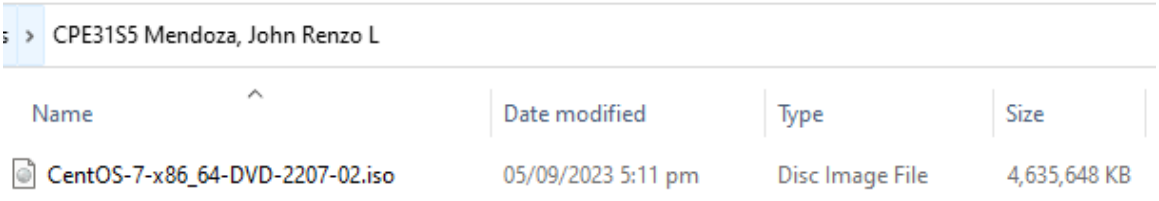
CentOS uses the RPM package format and YUM/DNF as the package manager.

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

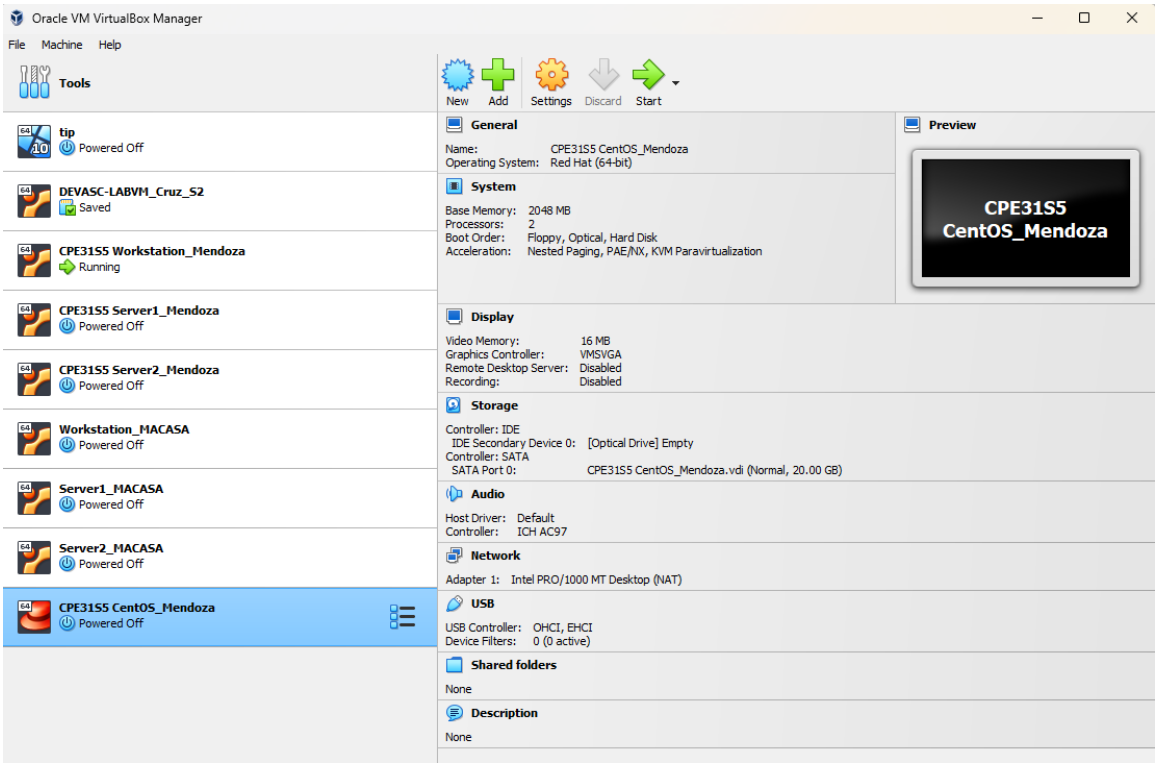
Both offer full-feature package management with network-based repository support, dependency checking and resolution, etc.. If you're familiar with one but not the other, you may have a little trouble switching over, but they're not overwhelmingly different. They both have similar features, just available through a different interface.

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

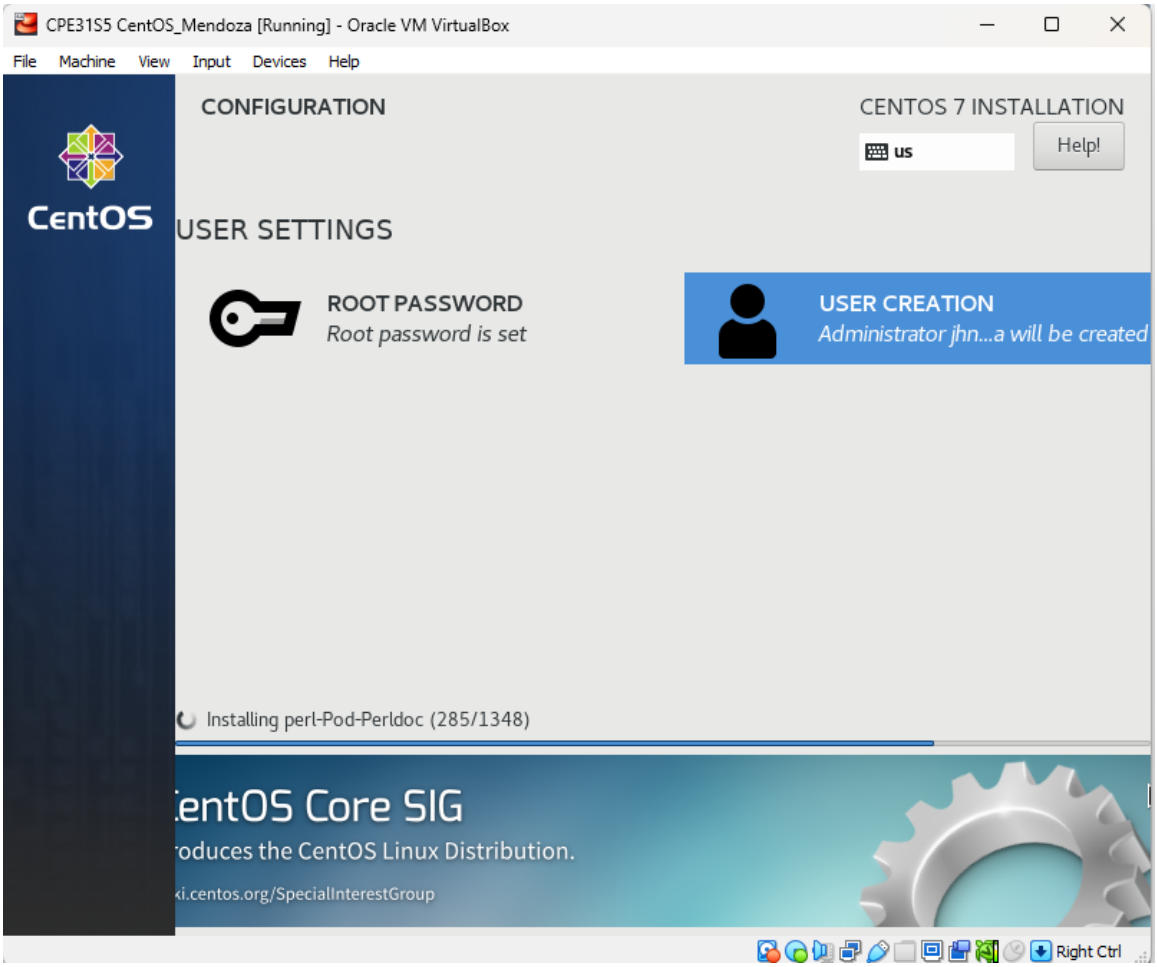
1. Download the image of the CentOS here: http://mirror.rise.ph/centos/7.9.2009/isos/x86_64/



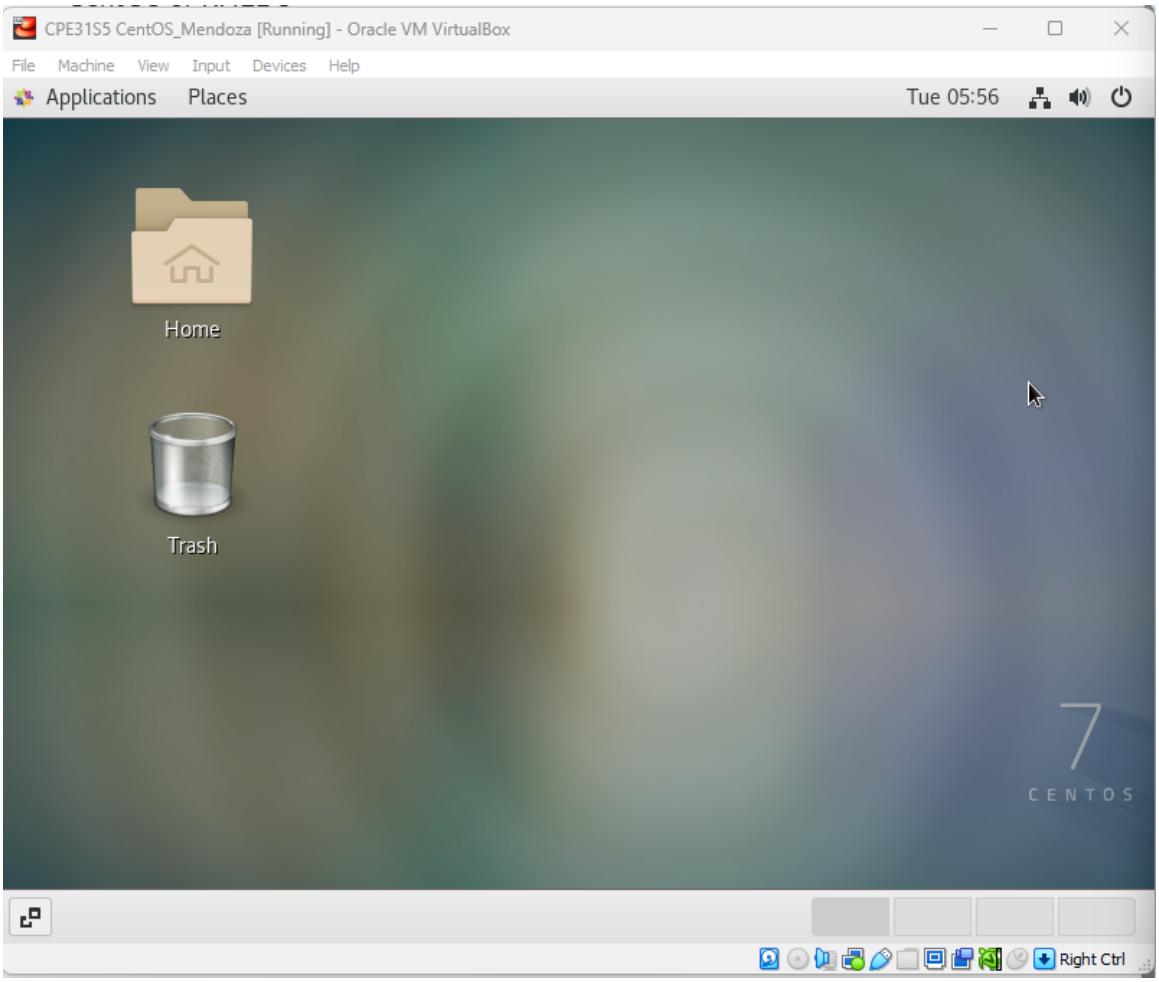
2. Create a VM machine with 2 Gb RAM and 20 Gb HD.



3. Install the downloaded image.

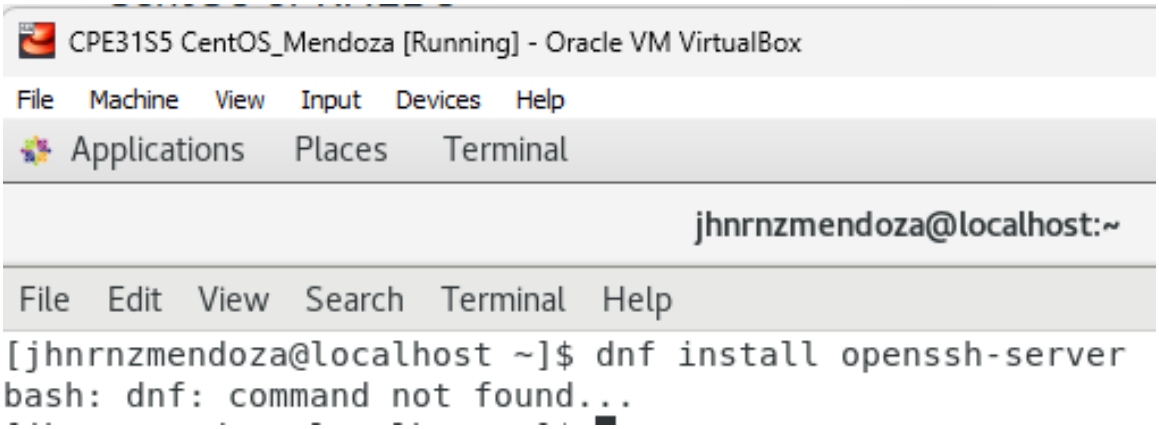


4. Show evidence that the OS was installed already.

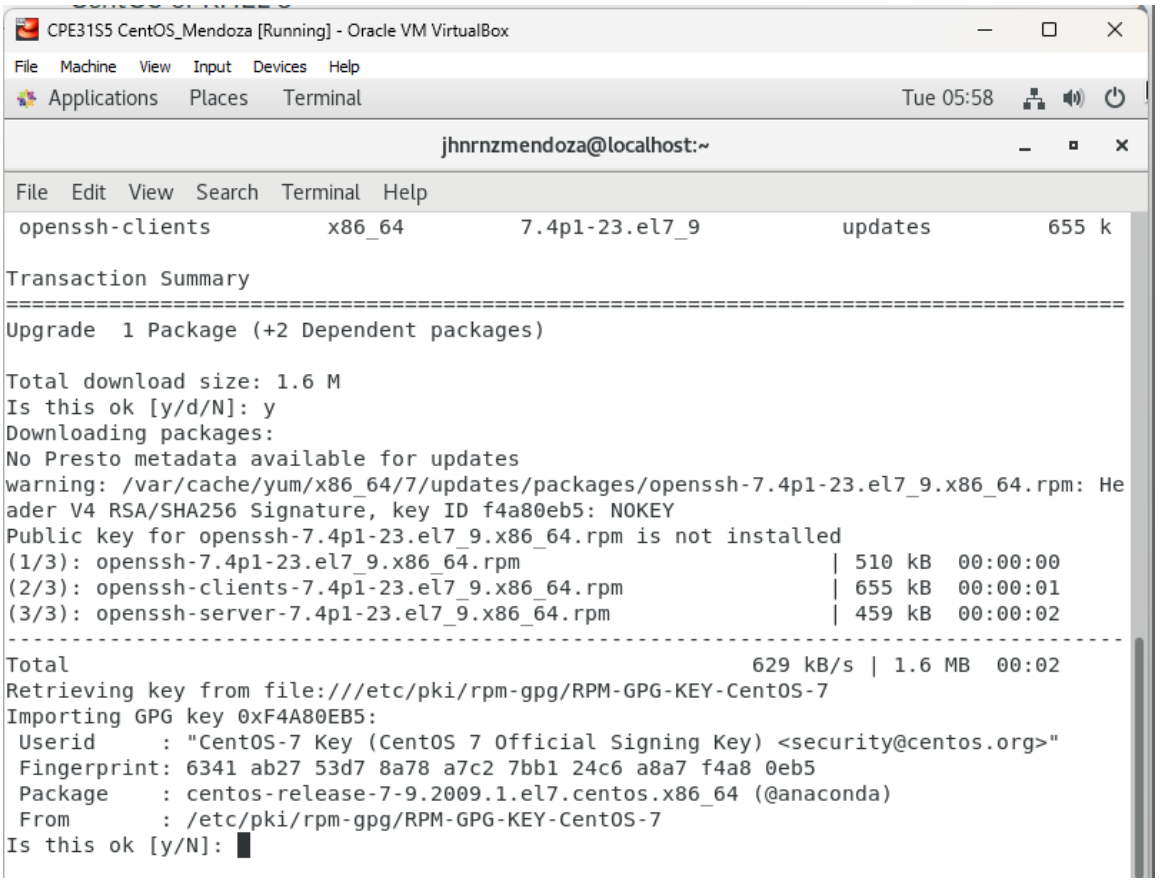


Task 2: Install the SSH server package *openssh*

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



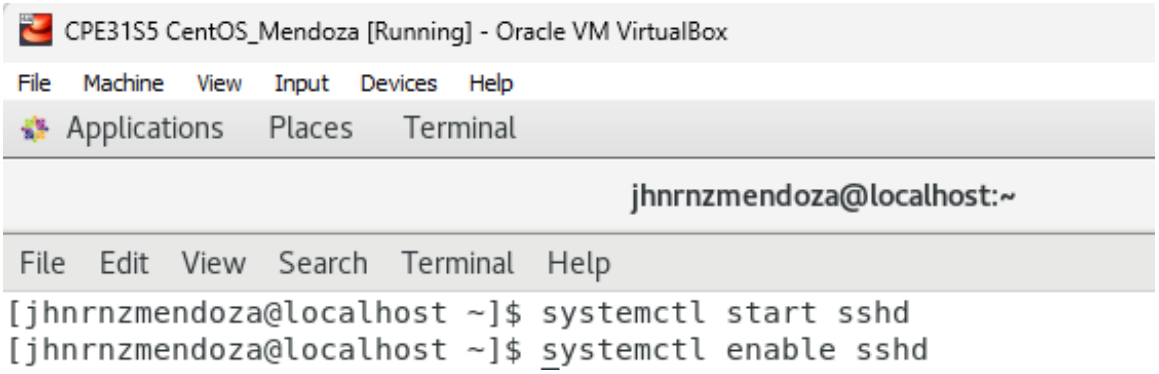
Using the Command **sudo yum install openssh-server**.



Observation:

Since the given command dnf install openssh-server does not work. I have used the yum command as centOS is within the RedHat distribution family and its package management tool to install packages is YUM.

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

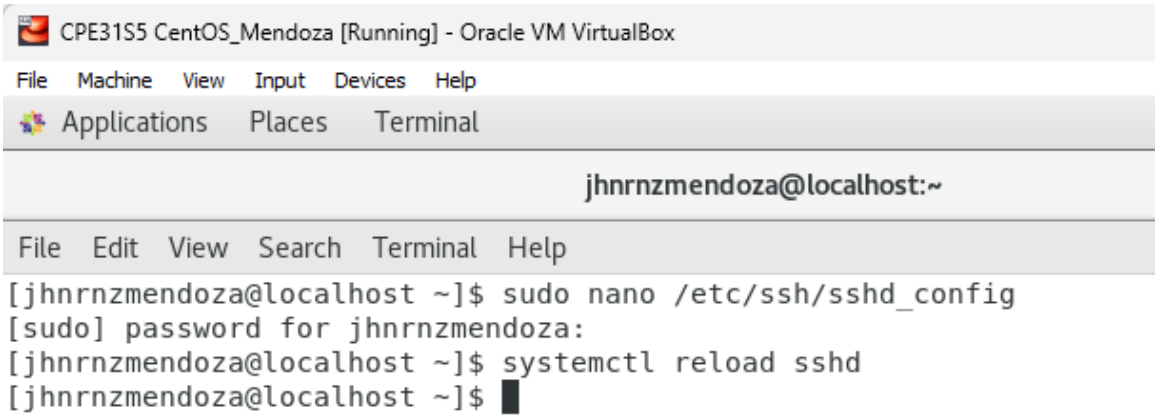
```
[jhnrnzmendoza@localhost ~]$ systemctl status sshd
● sshd.service - OpenSSH server daemon
   Loaded: loaded (/usr/lib/systemd/system/sshd.service; enabled; vendor preset: enable
d)
   Active: active (running) since Tue 2023-09-05 05:58:12 EDT; 2min 52s ago
     Docs: man:sshd(8)
           man:sshd_config(5)
 Main PID: 10132 (sshd)
   CGroup: /system.slice/sshd.service
           └─10132 /usr/sbin/sshd -D

Sep 05 05:58:12 localhost.localdomain systemd[1]: Starting OpenSSH server daemon...
Sep 05 05:58:12 localhost.localdomain sshd[10132]: Server listening on 0.0.0.0 port 22.
Sep 05 05:58:12 localhost.localdomain sshd[10132]: Server listening on :: port 22.
Sep 05 05:58:12 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
   $ firewall-cmd --reload

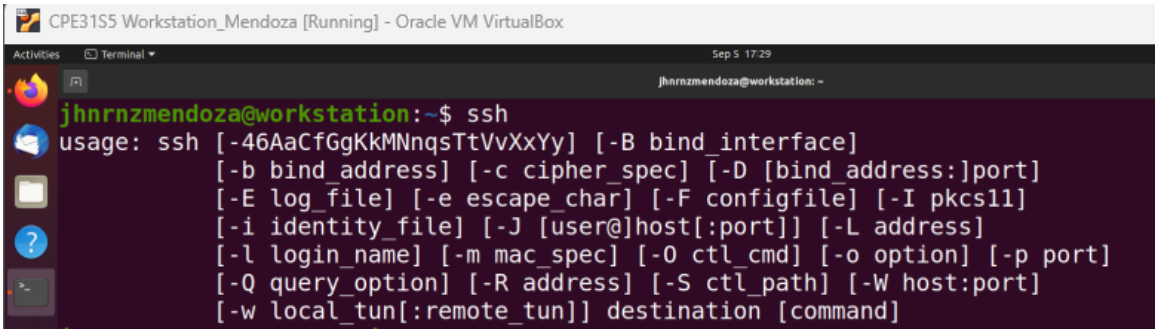
```
[jhnrnzmendoza@localhost ~]$ firewall-cmd --zone=public --permanent --add-service=ssh
Warning: ALREADY_ENABLED: ssh
success
[jhnrnzmendoza@localhost ~]$ firewall-cmd --reload
success
```

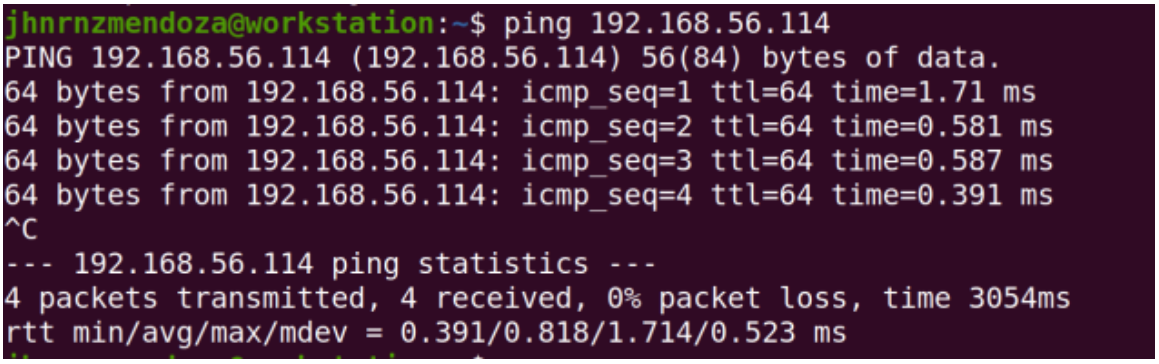
5. Locate the ssh server man config file */etc/ssh/sshd_config* and perform custom configuration. Every time you make any change to the */etc/ssh/sshd-config* configuration file reload the *sshd* service to apply changes:
   $ systemctl reload sshd

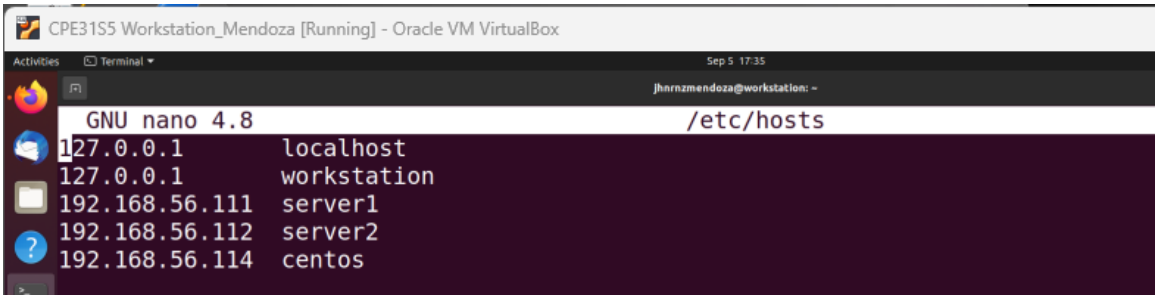


Task 3: Copy the Public Key to CentOS

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








```
jhnrnzmendoza@workstation:~$ ssh jhnrnzmendoza@centos
The authenticity of host 'centos (192.168.56.114)' can't be established.
ECDSA key fingerprint is SHA256:4xE+3a6ImgZCr4Vzdmxh6qjuCzRuxHSbdfvsRYcG3x4.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'centos,192.168.56.114' (ECDSA) to the list of known hosts.
jhnrnzmendoza@centos's password:
Last login: Tue Sep  5 06:13:02 2023
[jhnrnzmendoza@localhost ~]$
```

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

```
jhnrnzmendoza@workstation:~$ ssh-copy-id 192.168.56.114
/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 prompted now it is to
install the new keys
jhnrnzmendoza@192.168.56.114's password:

Number of key(s) added: 1

Now try logging into the machine, with:   "ssh '192.168.56.114'"
and check to make sure that only the key(s) you wanted were added.
```

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

```
[jhnrnzmendoza@localhost ~]$ ls -la .ssh
total 8
drwx------.  2 jhnrnzmendoza jhnrnzmendoza   29 Sep  5 06:20 .
drwx------. 16 jhnrnzmendoza jhnrnzmendoza 4096 Sep  5 06:20 ..
-rw-------.  1 jhnrnzmendoza jhnrnzmendoza  757 Sep  5 06:20 authorized_keys
```

Observation:

The command ls -la .ssh is used to display the authorized-keys file which stores the copied public key.

Task 4: Verify ssh remote connection

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

```
jhnrnzmendoza@workstation:~$ ssh jhnrnzmendoza@192.168.56.114
Last login: Tue Sep  5 06:17:53 2023 from 192.168.56.113
[jhnrnzmendoza@localhost ~]$
```

Observation:

Using the local machine, we remotely accessed the centOS to prove that the previous configurations are working.

2. Show evidence that you are connected.

```
jhnrnzmendoza@workstation:~$ ping 192.168.56.114
PING 192.168.56.114 (192.168.56.114) 56(84) bytes of data.
64 bytes from 192.168.56.114: icmp_seq=1 ttl=64 time=0.498 ms
64 bytes from 192.168.56.114: icmp_seq=2 ttl=64 time=0.584 ms
64 bytes from 192.168.56.114: icmp_seq=3 ttl=64 time=0.478 ms
64 bytes from 192.168.56.114: icmp_seq=4 ttl=64 time=0.509 ms
```

Observation:

Using the local machine, we have pinged the CentOS by pinging its IP address. As we can observe, the terminal showed connectivity.

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?

   In selecting the best Linux distribution to use, we must consider the software support, the performance, and the purpose on where we will use it. These are some of the things that we also consider in selecting an Operating System together with the cost constraint.

   Software Support because some distributions have a constant update cycle while others get updated randomly or rarely. System administrators or users in general might also have a hard time as they are not compatible or not used to the linux distribution as some only work on command line interface or graphical user interface.

   Performance because some distributions are supported by developers which makes the distribution tested and the updates are stable. On the contrary, other distributions may not have a good support which makes it inefficient or unstable.

   Purpose because some distributions are beginner friendly since the GUI or the syntaxes are easier to adapt. Other distributions require advanced knowledge about the syntax and may take time to learn especially the beginners.

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

   The main difference between Debian and RedHat distributions are given on the bulleted format below:

   Debian:

   - The package management is DPKG (Debian Package) and APT (Advance Package Tool).
   - Can be used as a Server and a Desktop
   - Software License is Free

   Red Hat:

   - The package management is RPM (Red Hat Package Manager) and YUM (Yellowdog Updater, Modified).
   - Can only be used as Server
   - Software License is Open Source