Name: Cariño, Rustom C.	**Date Performed: 09/05/2023**
Course/Section: CPE232 S5	**Date Submitted:09/06/2023**
Instructor: Engr. Roman Richard	**Semester and SY: 1st sem / 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.

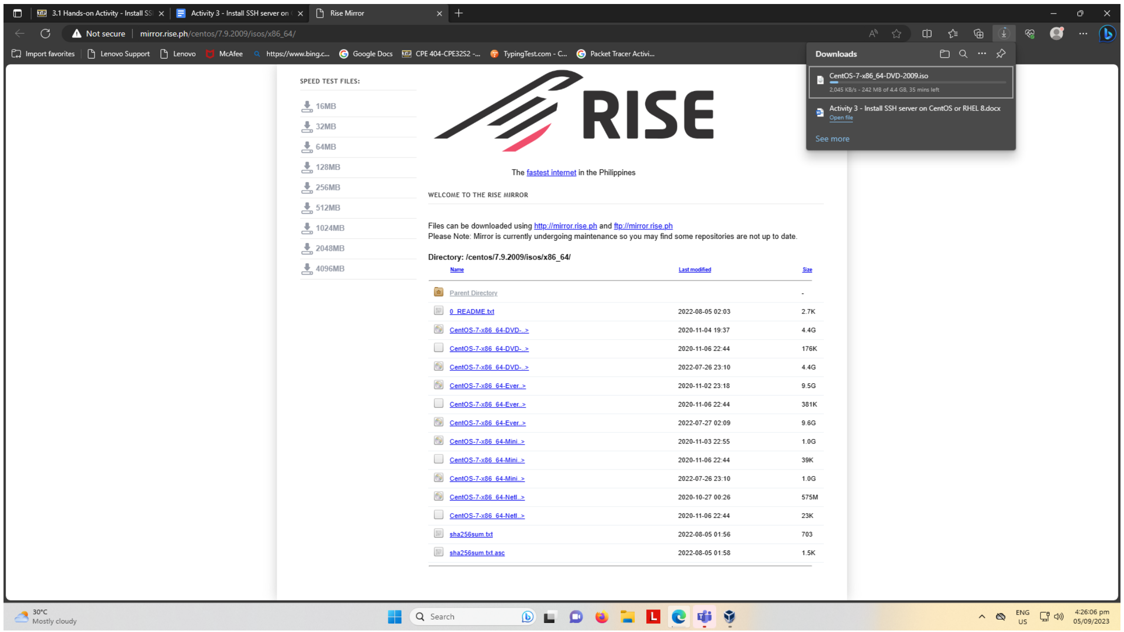
CentOS uses the RPM package format and YUM/DNF as the package manager.

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/



mirror.rise.ph/centos/7.9.2009/isos/x86_64/

Downloads

CentOS-7-x86_64-DVD-2009.iso
2,045 KB/s - 242 MB of 4.4 GB, 35 mins left

Activity 3 - Install SSH server on CentOS or RHEL 8.docx
Open file

See more

SPEED TEST FILES:

16MB
32MB
64MB
128MB
256MB
512MB
1024MB
2048MB
4096MB

The fastest internet in the Philippines

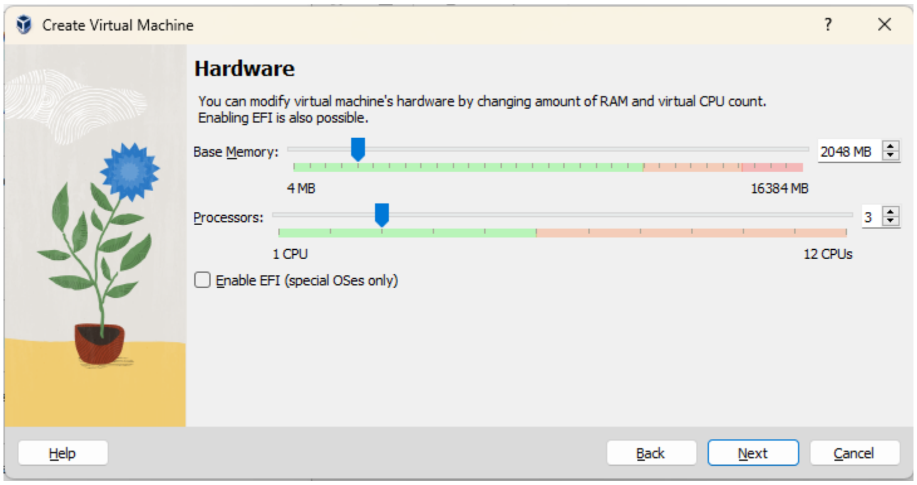
WELCOME TO THE RISE MIRROR

Files can be downloaded using http://mirror.rise.ph and ftp://mirror.rise.ph
Please Note: Mirror is currently undergoing maintenance so you may find some repositories are not up to date.

Directory: /centos/7.9.2009/isos/x86_64/

Name	Last modified	Size
Parent Directory		-
0_README.txt	2022-08-05 02:03	2.7K
CentOS-7-x86_64-DVD-..>	2020-11-04 19:37	4.4G
CentOS-7-x86_64-DVD-..>	2020-11-06 22:44	176K
CentOS-7-x86_64-DVD-..>	2022-07-26 23:10	4.4G
CentOS-7-x86_64-Ever..>	2020-11-02 23:18	9.5G
CentOS-7-x86_64-Ever..>	2020-11-06 22:44	381K
CentOS-7-x86_64-Ever..>	2022-07-27 02:09	9.6G
CentOS-7-x86_64-Mini..>	2020-11-03 22:55	1.0G
CentOS-7-x86_64-Mini..>	2020-11-06 22:44	39K
CentOS-7-x86_64-Mini..>	2022-07-26 23:10	1.0G
CentOS-7-x86_64-Netl..>	2020-10-27 00:26	575M
CentOS-7-x86_64-Netl..>	2020-11-06 22:44	23K
sha256sum.txt	2022-08-05 01:56	703
sha256sum.txt.asc	2022-08-05 01:58	1.5K

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



Create Virtual Machine

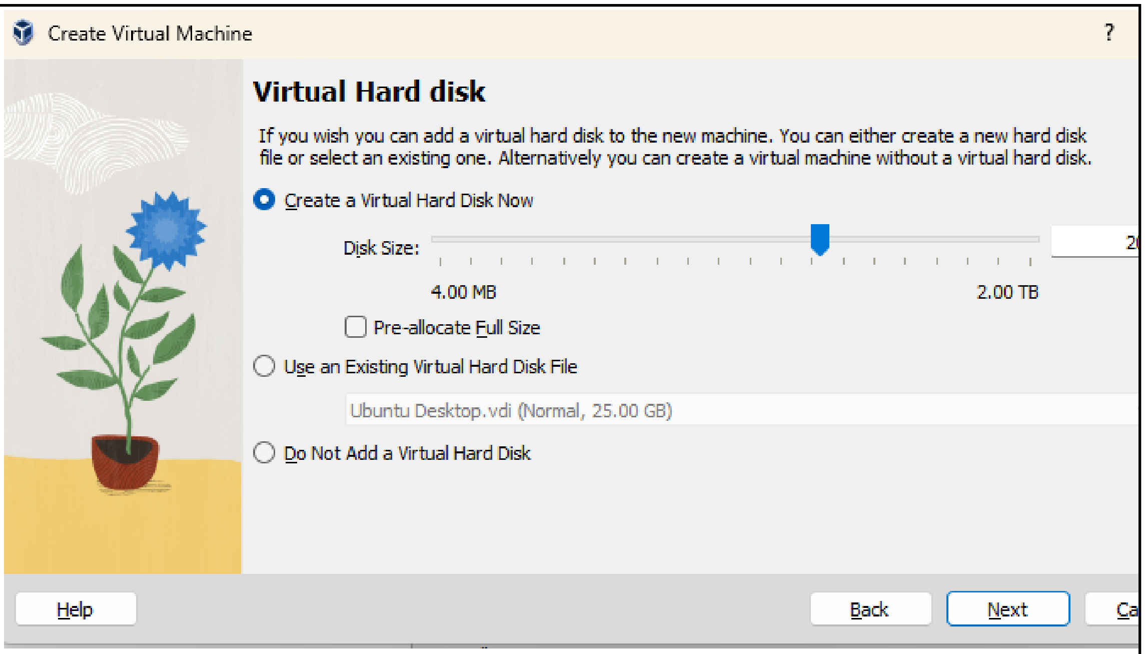
Hardware

You can modify virtual machine's hardware by changing amount of RAM and virtual CPU count. Enabling EFI is also possible.

Base Memory: 2048 MB

Processors: 3

□ Enable EFI (special OSes only)



Create Virtual Machine

Virtual Hard disk

If you wish you can add a virtual hard disk to the new machine. You can either create a new hard disk file or select an existing one. Alternatively you can create a virtual machine without a virtual hard disk.

● Create a Virtual Hard Disk Now

Disk Size: 2

4.00 MB 2.00 TB

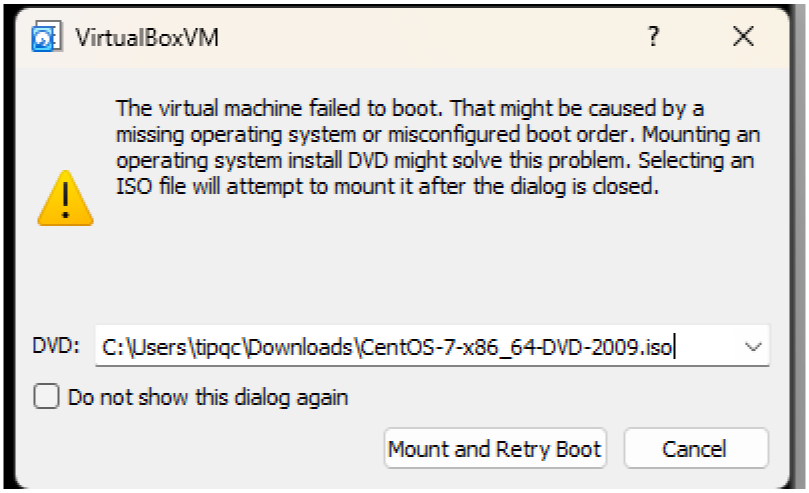
□ Pre-allocate Full Size

○ Use an Existing Virtual Hard Disk File

Ubuntu Desktop.vdi (Normal, 25.00 GB)

○ Do Not Add a Virtual Hard Disk

3. Install the downloaded image.

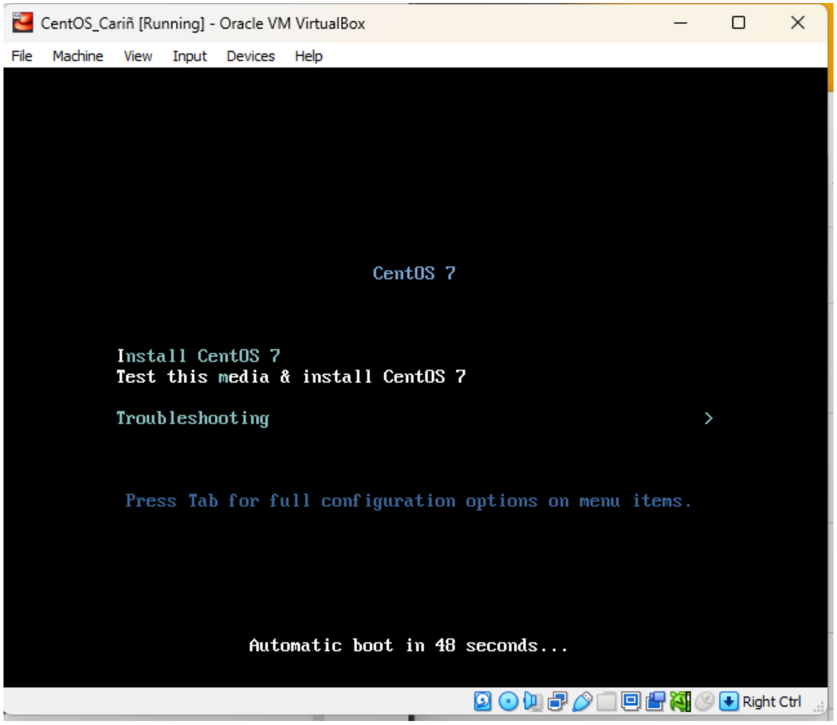


VirtualBoxVM

The virtual machine failed to boot. That might be caused by a missing operating system or misconfigured boot order. Mounting an operating system install DVD might solve this problem. Selecting an ISO file will attempt to mount it after the dialog is closed.

DVD: C:\Users\tipqc\Downloads\CentOS-7-x86_64-DVD-2009.iso

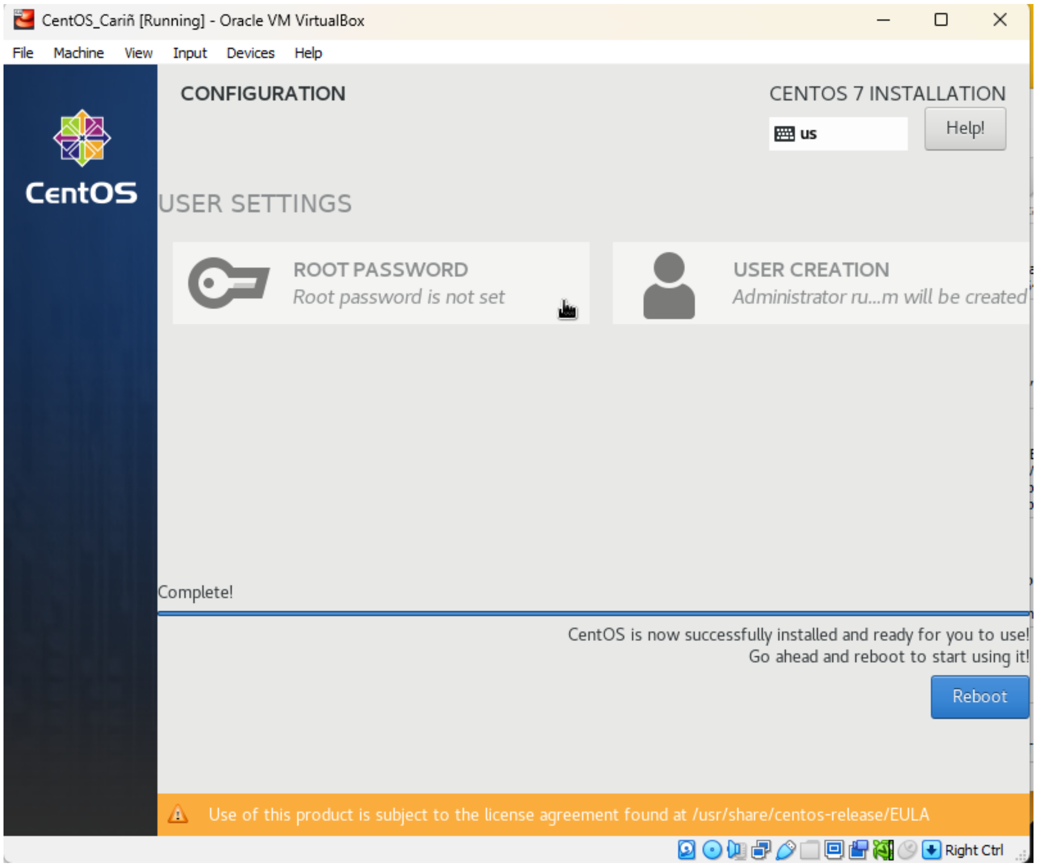
□ Do not show this dialog again



CentOS_Cariñ [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Right Ctrl

```
CentOS 7

Install CentOS 7
Test this media & install CentOS 7

Troubleshooting                                        >

Press Tab for full configuration options on menu items.

Automatic boot in 48 seconds...
```

4. Show evidence that the OS was installed already.



Complete!

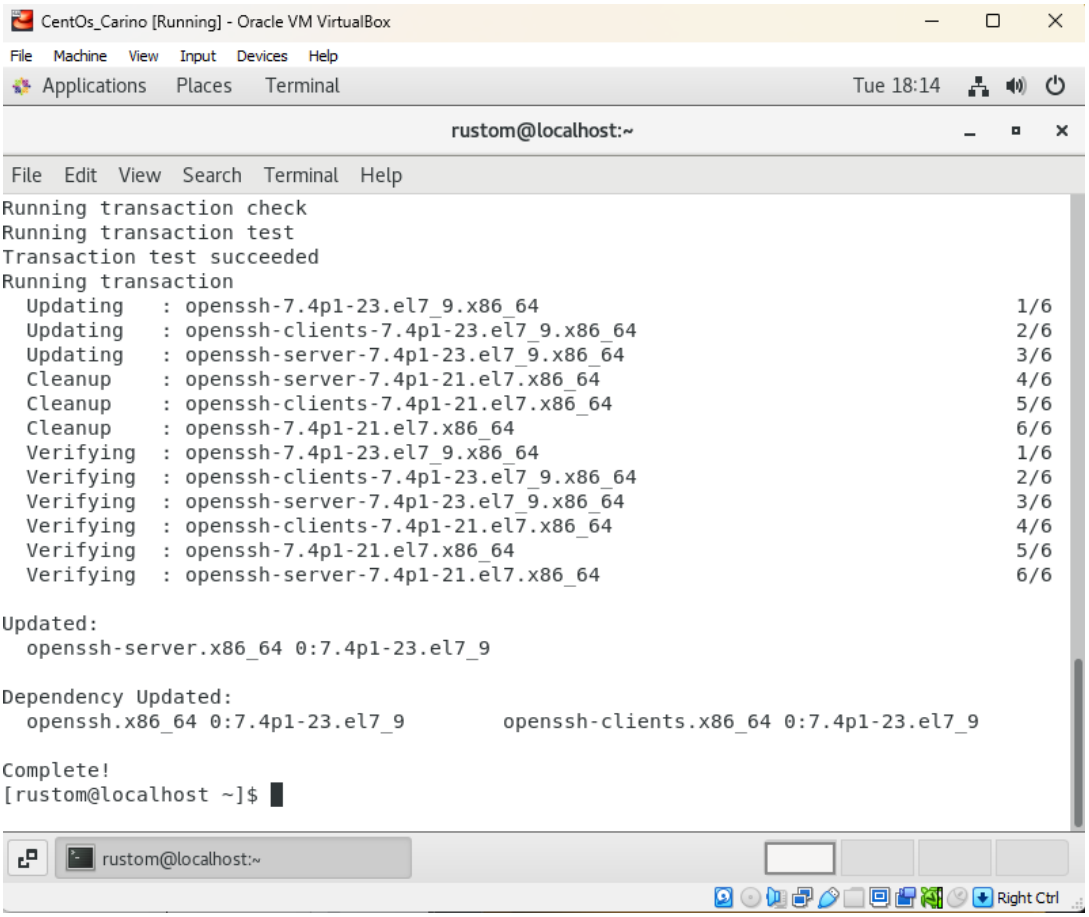
CentOS is now successfully installed and ready for you to use!
Go ahead and reboot to start using it!

Use of this product is subject to the license agreement found at /usr/share/centos-release/EULA

Task 2: Install the SSH server package *openssh*

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

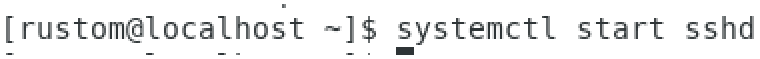
   $ dnf install openssh-server


CentOs_Carino [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Applications Places Terminal
Tue 18:14
rustom@localhost:~
File Edit View Search Terminal Help
rustom@localhost:~
Right Ctrl

```
Running transaction check
Running transaction test
Transaction test succeeded
Running transaction
  Updating    : openssh-7.4p1-23.el7_9.x86_64                              1/6
  Updating    : openssh-clients-7.4p1-23.el7_9.x86_64                      2/6
  Updating    : openssh-server-7.4p1-23.el7_9.x86_64                       3/6
  Cleanup     : openssh-server-7.4p1-21.el7.x86_64                         4/6
  Cleanup     : openssh-clients-7.4p1-21.el7.x86_64                        5/6
  Cleanup     : openssh-7.4p1-21.el7.x86_64                                6/6
  Verifying   : openssh-7.4p1-23.el7_9.x86_64                              1/6
  Verifying   : openssh-clients-7.4p1-23.el7_9.x86_64                      2/6
  Verifying   : openssh-server-7.4p1-23.el7_9.x86_64                       3/6
  Verifying   : openssh-clients-7.4p1-21.el7.x86_64                        4/6
  Verifying   : openssh-7.4p1-21.el7.x86_64                                5/6
  Verifying   : openssh-server-7.4p1-21.el7.x86_64                         6/6

Updated:
  openssh-server.x86_64 0:7.4p1-23.el7_9

Dependency Updated:
  openssh.x86_64 0:7.4p1-23.el7_9        openssh-clients.x86_64 0:7.4p1-23.el7_9

Complete!
[rustom@localhost ~]$
```

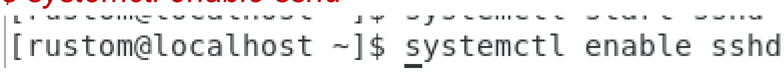
2. Start the *sshd* daemon and set to start after reboot:

   $ systemctl start sshd



```
[rustom@localhost ~]$ systemctl start sshd
```

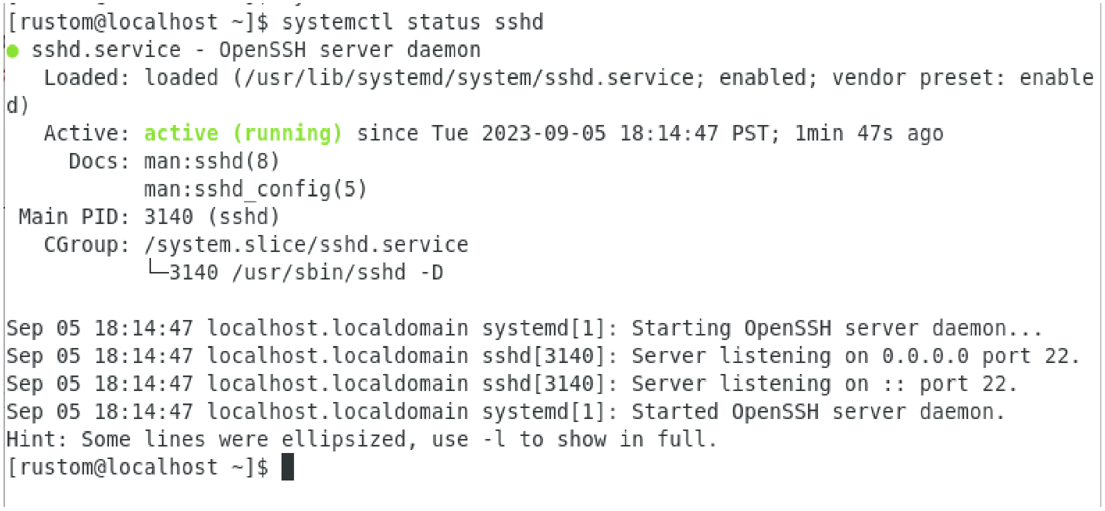
   $ systemctl enable sshd



```
[rustom@localhost ~]$ systemctl enable sshd
```

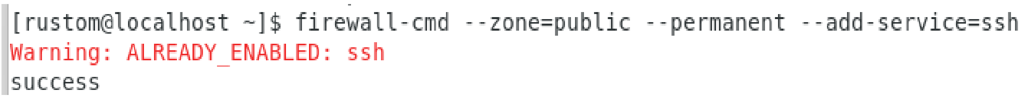
3. Confirm that the sshd daemon is up and running:

   $ systemctl status sshd



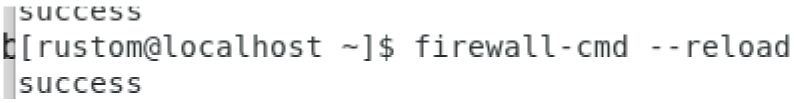
```
[rustom@localhost ~]$ systemctl status sshd
● sshd.service - OpenSSH server daemon
   Loaded: loaded (/usr/lib/systemd/system/sshd.service; enabled; vendor preset: enable
d)
   Active: active (running) since Tue 2023-09-05 18:14:47 PST; 1min 47s ago
     Docs: man:sshd(8)
           man:sshd_config(5)
 Main PID: 3140 (sshd)
   CGroup: /system.slice/sshd.service
           └─3140 /usr/sbin/sshd -D

Sep 05 18:14:47 localhost.localdomain systemd[1]: Starting OpenSSH server daemon...
Sep 05 18:14:47 localhost.localdomain sshd[3140]: Server listening on 0.0.0.0 port 22.
Sep 05 18:14:47 localhost.localdomain sshd[3140]: Server listening on :: port 22.
Sep 05 18:14:47 localhost.localdomain systemd[1]: Started OpenSSH server daemon.
Hint: Some lines were ellipsized, use -l to show in full.
[rustom@localhost ~]$ █
```

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



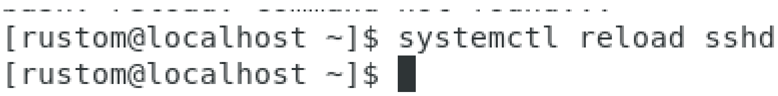
```
[rustom@localhost ~]$ firewall-cmd --zone=public --permanent --add-service=ssh
Warning: ALREADY_ENABLED: ssh
success
```

   $ firewall-cmd --reload



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

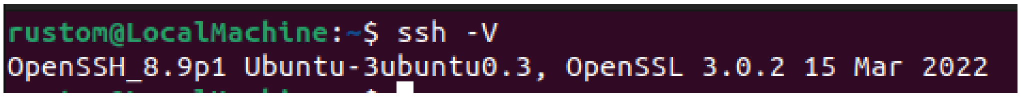
5. Locate the ssh server man config file /*etc/ssh/sshd_config* and perform custom configuration. Every time you make any change to the /*etc/ssh/sshd-config* configuration file reload the *sshd* service to apply changes:
   $ systemctl reload sshd



```
[rustom@localhost ~]$ systemctl reload sshd
[rustom@localhost ~]$ █
```

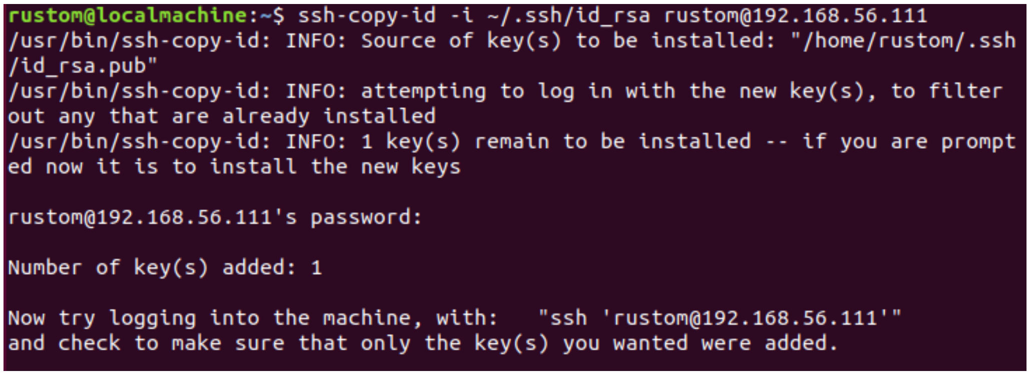
Task 3: Copy the Public Key to CentOS

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



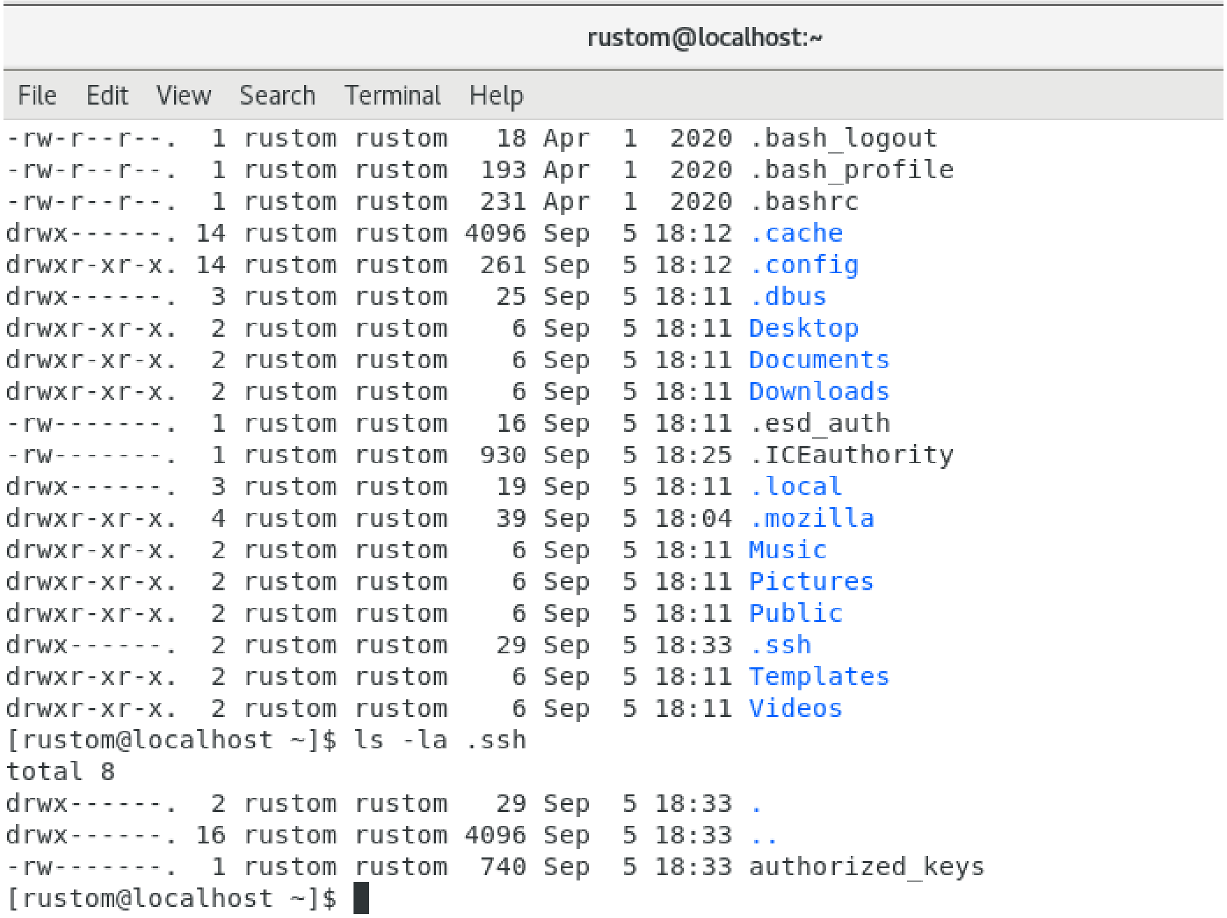
```
rustom@LocalMachine:~$ ssh -V
OpenSSH_8.9p1 Ubuntu-3ubuntu0.3, OpenSSL 3.0.2 15 Mar 2022
```

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



```
rustom@localmachine:~$ ssh-copy-id -i ~/.ssh/id_rsa rustom@192.168.56.111
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/home/rustom/.ssh
/id_rsa.pub"
/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 prompt
ed now it is to install the new keys

rustom@192.168.56.111's password:

Number of key(s) added: 1

Now try logging into the machine, with:   "ssh 'rustom@192.168.56.111'"
and check to make sure that only the key(s) you wanted were added.
```

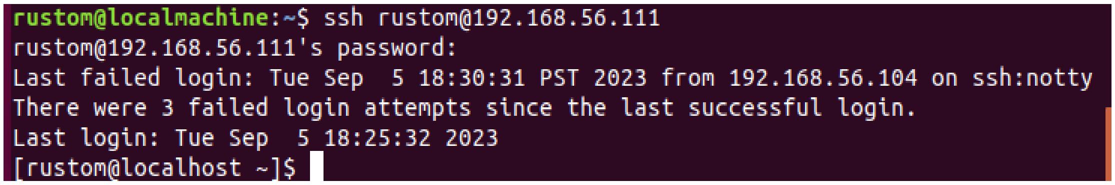
3. On CentOS, verify that you have the *authorized_keys*.



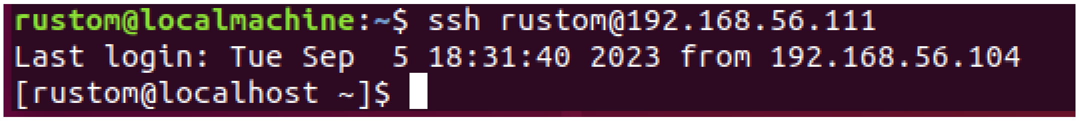
```
-rw-r--r--.  1 rustom rustom   18 Apr  1  2020 .bash_logout
-rw-r--r--.  1 rustom rustom  193 Apr  1  2020 .bash_profile
-rw-r--r--.  1 rustom rustom  231 Apr  1  2020 .bashrc
drwx------. 14 rustom rustom 4096 Sep  5 18:12 .cache
drwxr-xr-x. 14 rustom rustom  261 Sep  5 18:12 .config
drwx------.  3 rustom rustom   25 Sep  5 18:11 .dbus
drwxr-xr-x.  2 rustom rustom    6 Sep  5 18:11 Desktop
drwxr-xr-x.  2 rustom rustom    6 Sep  5 18:11 Documents
drwxr-xr-x.  2 rustom rustom    6 Sep  5 18:11 Downloads
-rw-------.  1 rustom rustom   16 Sep  5 18:11 .esd_auth
-rw-------.  1 rustom rustom  930 Sep  5 18:25 .ICEauthority
drwx------.  3 rustom rustom   19 Sep  5 18:11 .local
drwxr-xr-x.  4 rustom rustom   39 Sep  5 18:04 .mozilla
drwxr-xr-x.  2 rustom rustom    6 Sep  5 18:11 Music
drwxr-xr-x.  2 rustom rustom    6 Sep  5 18:11 Pictures
drwxr-xr-x.  2 rustom rustom    6 Sep  5 18:11 Public
drwx------.  2 rustom rustom   29 Sep  5 18:33 .ssh
drwxr-xr-x.  2 rustom rustom    6 Sep  5 18:11 Templates
drwxr-xr-x.  2 rustom rustom    6 Sep  5 18:11 Videos
[rustom@localhost ~]$ ls -la .ssh
total 8
drwx------.  2 rustom rustom   29 Sep  5 18:33 .
drwx------. 16 rustom rustom 4096 Sep  5 18:33 ..
-rw-------.  1 rustom rustom  740 Sep  5 18:33 authorized_keys
[rustom@localhost ~]$
```

ask 4: Verify ssh remote connection

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

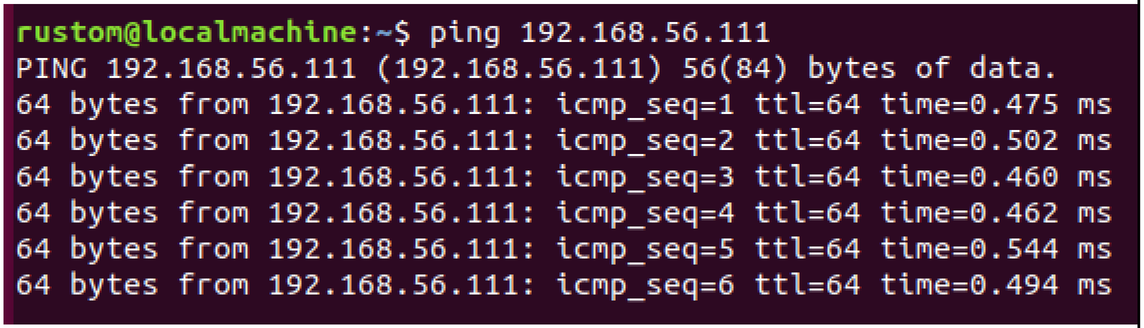


```
rustom@localmachine:~$ ssh rustom@192.168.56.111
rustom@192.168.56.111's password:
Last failed login: Tue Sep  5 18:30:31 PST 2023 from 192.168.56.104 on ssh:notty
There were 3 failed login attempts since the last successful login.
Last login: Tue Sep  5 18:25:32 2023
[rustom@localhost ~]$ 
```

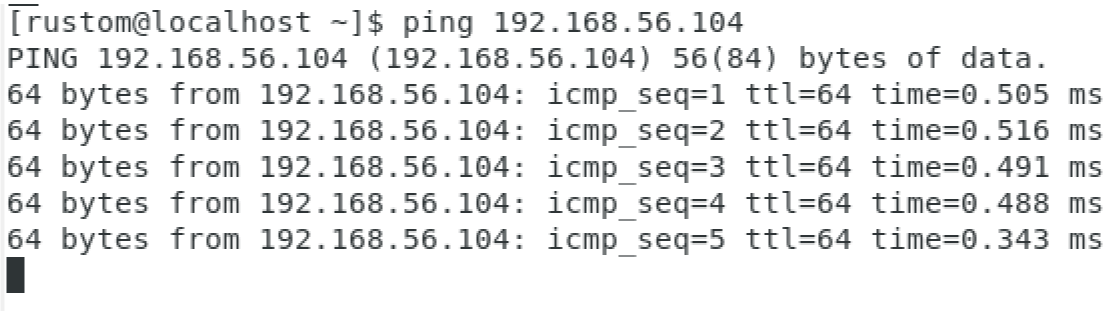


```
rustom@localmachine:~$ ssh rustom@192.168.56.111
Last login: Tue Sep  5 18:31:40 2023 from 192.168.56.104
[rustom@localhost ~]$ 
```

2. Show evidence that you are connected.



```
rustom@localmachine:~$ ping 192.168.56.111
PING 192.168.56.111 (192.168.56.111) 56(84) bytes of data.
64 bytes from 192.168.56.111: icmp_seq=1 ttl=64 time=0.475 ms
64 bytes from 192.168.56.111: icmp_seq=2 ttl=64 time=0.502 ms
64 bytes from 192.168.56.111: icmp_seq=3 ttl=64 time=0.460 ms
64 bytes from 192.168.56.111: icmp_seq=4 ttl=64 time=0.462 ms
64 bytes from 192.168.56.111: icmp_seq=5 ttl=64 time=0.544 ms
64 bytes from 192.168.56.111: icmp_seq=6 ttl=64 time=0.494 ms
```



```
[rustom@localhost ~]$ ping 192.168.56.104
PING 192.168.56.104 (192.168.56.104) 56(84) bytes of data.
64 bytes from 192.168.56.104: icmp_seq=1 ttl=64 time=0.505 ms
64 bytes from 192.168.56.104: icmp_seq=2 ttl=64 time=0.516 ms
64 bytes from 192.168.56.104: icmp_seq=3 ttl=64 time=0.491 ms
64 bytes from 192.168.56.104: icmp_seq=4 ttl=64 time=0.488 ms
64 bytes from 192.168.56.104: icmp_seq=5 ttl=64 time=0.343 ms
```

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?
   - For choosing the best distribution between Debian and Red Hat Linux distributions it will be determined by your own particular use case and requirements. If you want enterprise-level assistance and security, Red Hat may be a better option. Debian may be a better choice if you appreciate open-source and community assistance.

2. What are the main difference between Debian and Red Hat Linux distributions?
    - The main difference between Debian and Red Hat Linux distributions is that Debian is a community driven operating system that stresses software freedom and is noted for its steady releases. Red Hat, on the other hand is a for profit enterprise software firm that focuses on long term maintenance and regular release cycles.