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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.

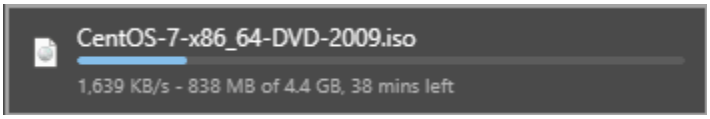
CentOS uses the RPM package format and YUM/DNF as the package manager.

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

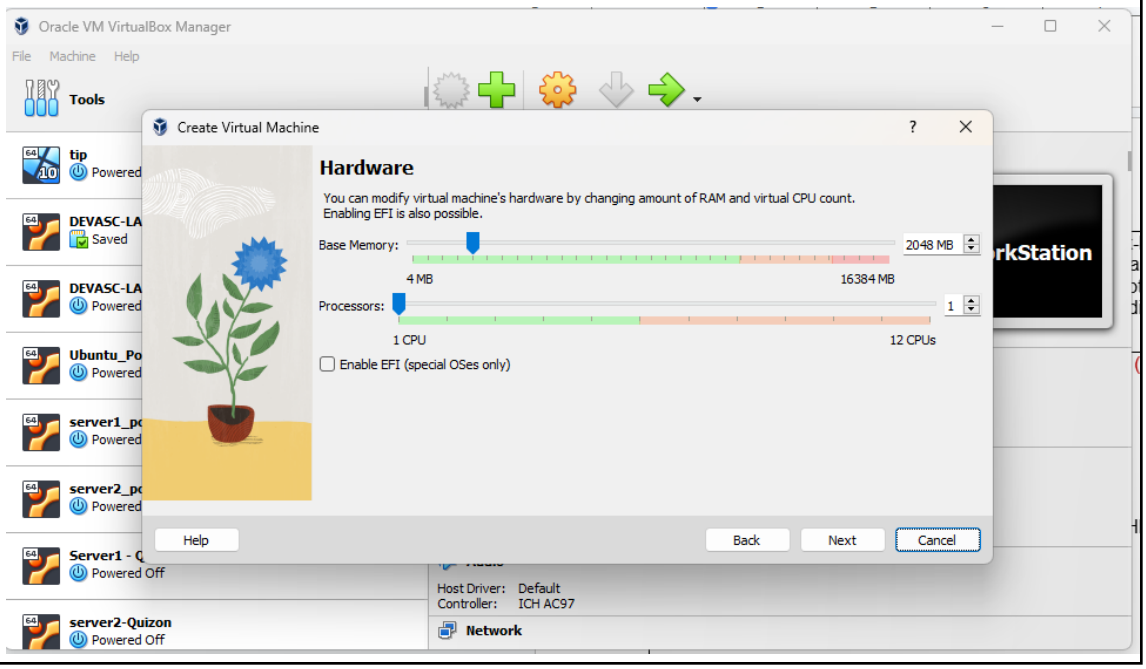
Both offer full-feature package management with network-based repository support, dependency checking and resolution, etc.. If you're familiar with one but not the other, you may have a little trouble switching over, but they're not overwhelmingly different. They both have similar features, just available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

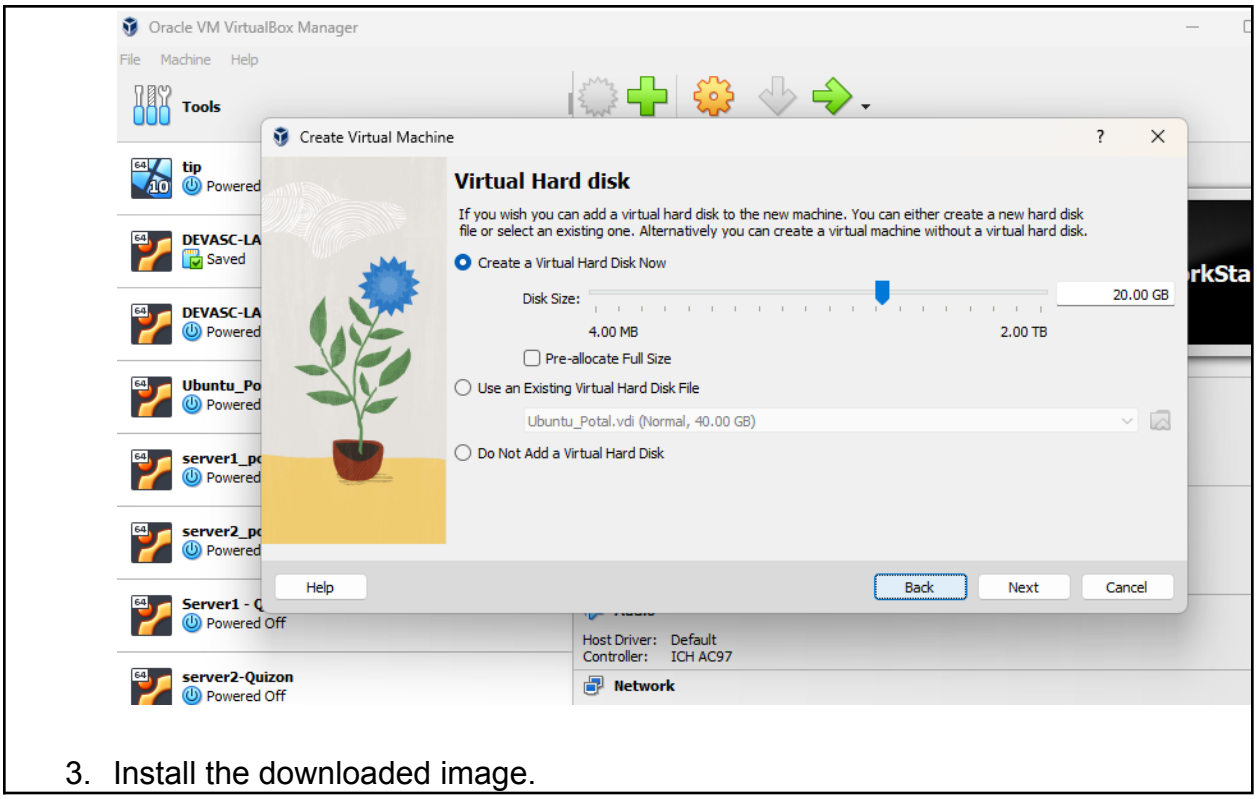
Task 1: Download the CentOS or RHEL-8 image (Create screenshots of the following)

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

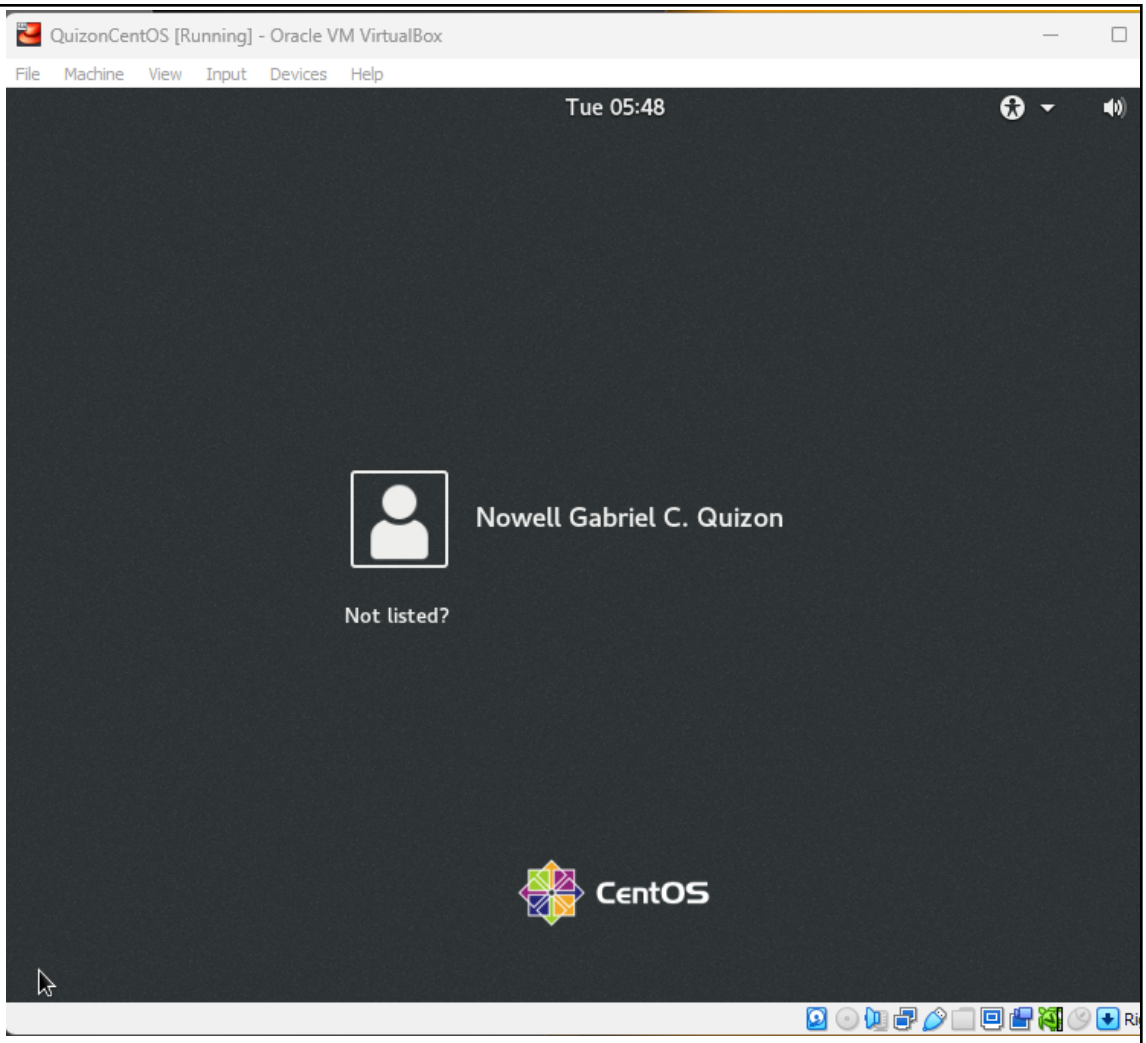


2. Create a VM machine with 2 Gb RAM and 20 Gb HD.

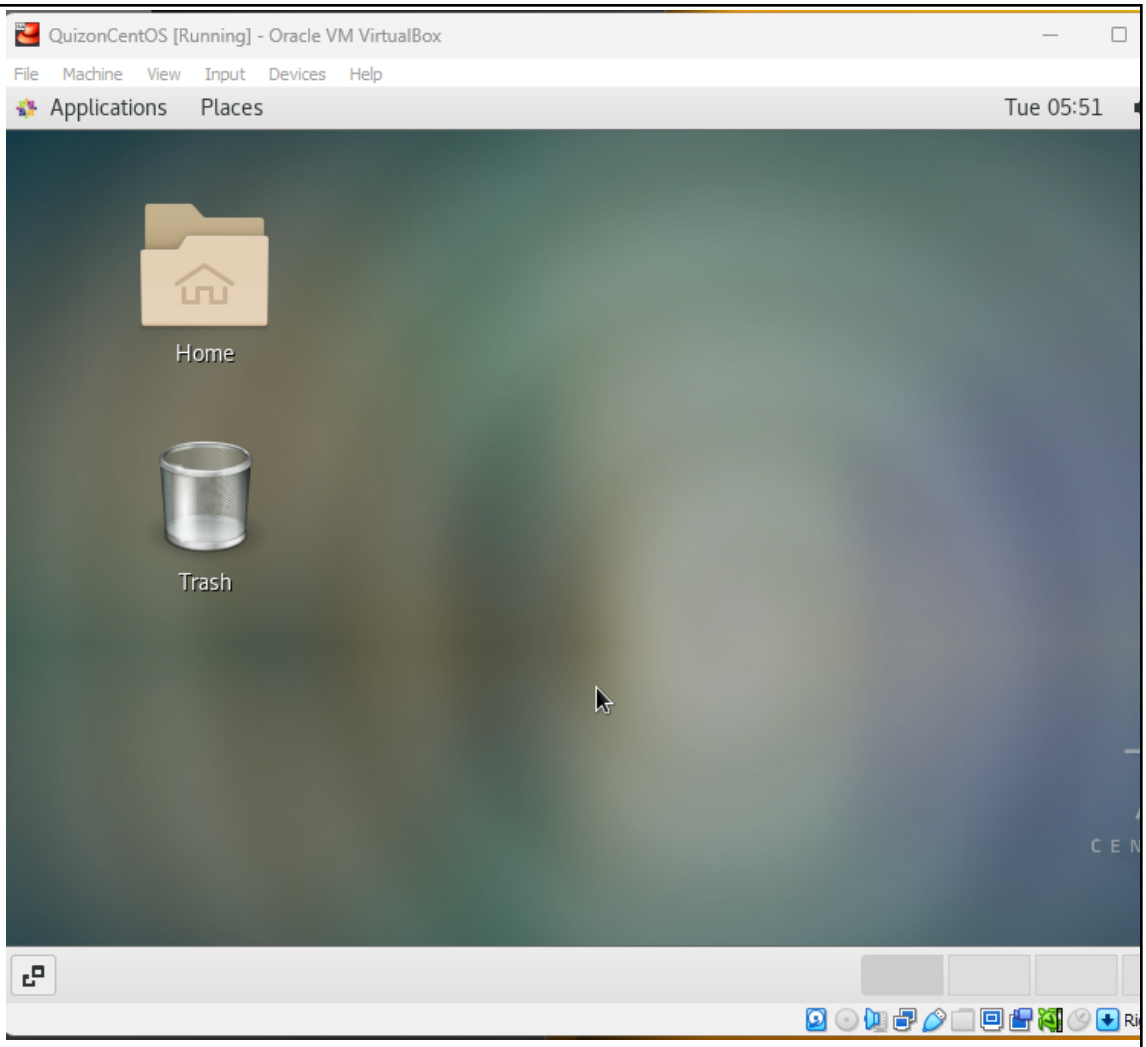




3. Install the downloaded image.



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

```
[root@localhost ~]# dnf install openssh-server
CentOS-7 - Base                                  5.3 MB/s |  10 MB     00:01
CentOS-7 - Updates                               8.1 MB/s |  28 MB     00:03
CentOS-7 - Extras                                860 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

```
[root@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 12:31:07 EDT; 16h ago
     Docs: man:sshd(8)
           man:sshd_config(5)
 Main PID: 1115 (sshd)
   CGroup: /system.slice/sshd.service
           └─1115 /usr/sbin/sshd -D

Sep 05 12:31:07 localhost.localdomain systemd[1]: Starting OpenSSH server daemon...
Sep 05 12:31:07 localhost.localdomain sshd[1115]: Server listening on 0.0.0.0 port 22.
Sep 05 12:31:07 localhost.localdomain sshd[1115]: Server listening on :: port 22.
Sep 05 12:31:07 localhost.localdomain systemd[1]: Started OpenSSH server daemon.
Hint: Some lines were ellipsized, use -l to show in full.
```

$ systemctl enable sshd

```
[root@localhost ~]# systemctl enable sshd
```

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

   $ systemctl status sshd

```
[root@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 12:31:07 EDT; 16h ago
     Docs: man:sshd(8)
           man:sshd_config(5)
 Main PID: 1115 (sshd)
   CGroup: /system.slice/sshd.service
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Sep 05 12:31:07 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

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

   $ firewall-cmd --reload

```
[root@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

```
[root@localhost ~]# systemctl reload sshd
```

Task 3: Copy the Public Key to CentOS

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

```
[root@localhost ~]# ssh
usage: ssh [-1246AaCfGgKkMNnqsTtVvXxYy] [-b bind_address] [-c cipher_spec]
           [-D [bind_address:]port] [-E log_file] [-e escape_char]
           [-F configfile] [-I pkcs11] [-i identity_file]
           [-J [user@]host[:port]] [-L address] [-l login_name] [-m mac_spec]
           [-O ctl_cmd] [-o option] [-p port] [-Q query_option] [-R address]
           [-S ctl_path] [-W host:port] [-w local_tun[:remote_tun]]
           [user@]hostname [command]
```

```
quizon24@workstation:~$ ssh
usage: ssh [-46AaCfGgKkMNnqsTtVvXxYy] [-B bind_interface]
           [-b bind_address] [-c cipher_spec] [-D [bind_address:]port]
           [-E log_file] [-e escape_char] [-F configfile] [-I pkcs11]
           [-i identity_file] [-J [user@]host[:port]] [-L address]
           [-l login_name] [-m mac_spec] [-O ctl_cmd] [-o option] [-p port]
           [-Q query_option] [-R address] [-S ctl_path] [-W host:port]
           [-w local_tun[:remote_tun]] destination [command [argument ...]]
```

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

```
quizon24@workstation:~$ ssh-copy-id -i ~/.ssh/id_rsa nowellgabriel@192.168.56.10
4
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/home/quizon24/.s
sh/id_rsa.pub"
The authenticity of host '192.168.56.104 (192.168.56.104)' can't be established.
ED25519 key fingerprint is SHA256:mFKAfxpH4XWy0bMg9zOlKLwJuj12duUoy7N5NnHvIoo.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? 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 prompt
ed now it is to install the new keys
nowellgabriel@192.168.56.104's password:

Number of key(s) added: 1

Now try logging into the machine, with:   "ssh 'nowellgabriel@192.168.56.104'"
and check to make sure that only the key(s) you wanted were added.
```

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

```
[nowellgabriel@localhost ~]$ ls -la .ssh
total 8
drwx------.  2 nowellgabriel nowellgabriel   29 Sep  6 05:17 .
drwx------. 16 nowellgabriel nowellgabriel 4096 Sep  6 05:17 ..
-rw-------.  1 nowellgabriel nowellgabriel  574 Sep  6 05:17 authorized_keys
```

Task 4: Verify ssh remote connection

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

```
quizon24@workstation:~$ ssh nowellgabriel@192.168.56.104
Last login: Wed Sep  6 05:15:12 2023
[nowellgabriel@localhost ~]$
```

2. Show evidence that you are connected.

```
[nowellgabriel@localhost ~]$ ping 192.168.56.103
PING 192.168.56.103 (192.168.56.103) 56(84) bytes of data.
64 bytes from 192.168.56.103: icmp_seq=1 ttl=64 time=0.377 ms
64 bytes from 192.168.56.103: icmp_seq=2 ttl=64 time=0.481 ms
64 bytes from 192.168.56.103: icmp_seq=3 ttl=64 time=0.227 ms
64 bytes from 192.168.56.103: icmp_seq=4 ttl=64 time=0.237 ms
```

```
quizon24@workstation:~$ 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=0.325 ms
64 bytes from 192.168.56.104: icmp_seq=2 ttl=64 time=0.244 ms
64 bytes from 192.168.56.104: icmp_seq=3 ttl=64 time=0.380 ms
64 bytes from 192.168.56.104: icmp_seq=4 ttl=64 time=0.459 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?

   Choose Debian for free open-source solutions. Choose for Red Hat (RHEL) when commercial support, enterprise-grade reliability, and compatibility with specific software are vital. Consider Debian for flexibility, while RHEL offers comprehensive support, certification, and security features, but with subscription costs.

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

   Debian and Red Hat Linux distributions differ in package management , release cycles, licensing, support, ecosystems, and package availability. The choice depends on user and preferences.