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Course/Section: CPE 232 - CPE31S22	Date Submitted: 8/30/2022
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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.

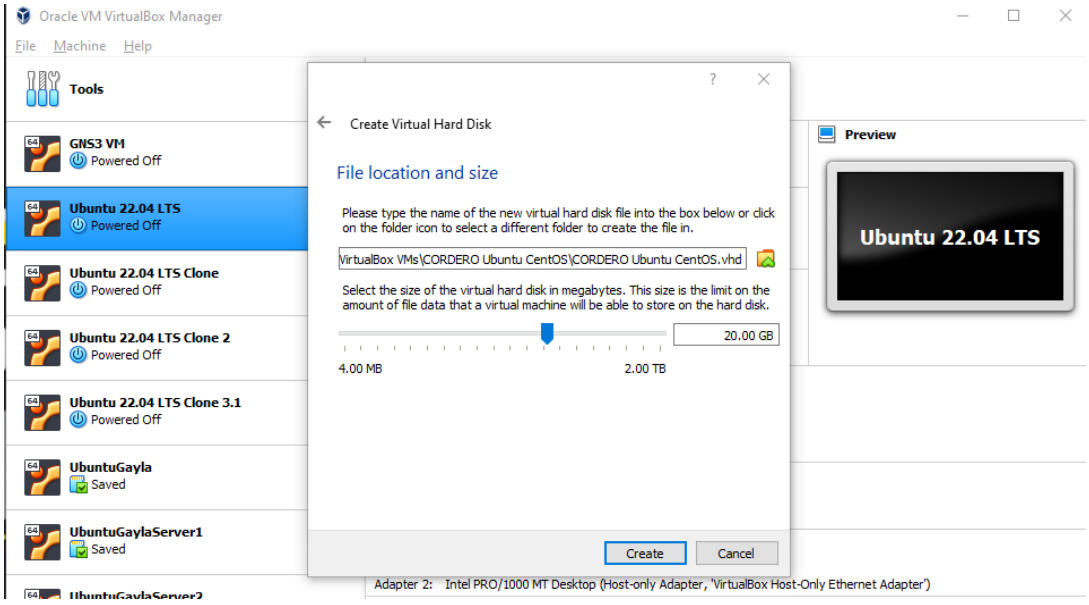
CentOS uses the RPM package format and YUM/DNF as the package manager.

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

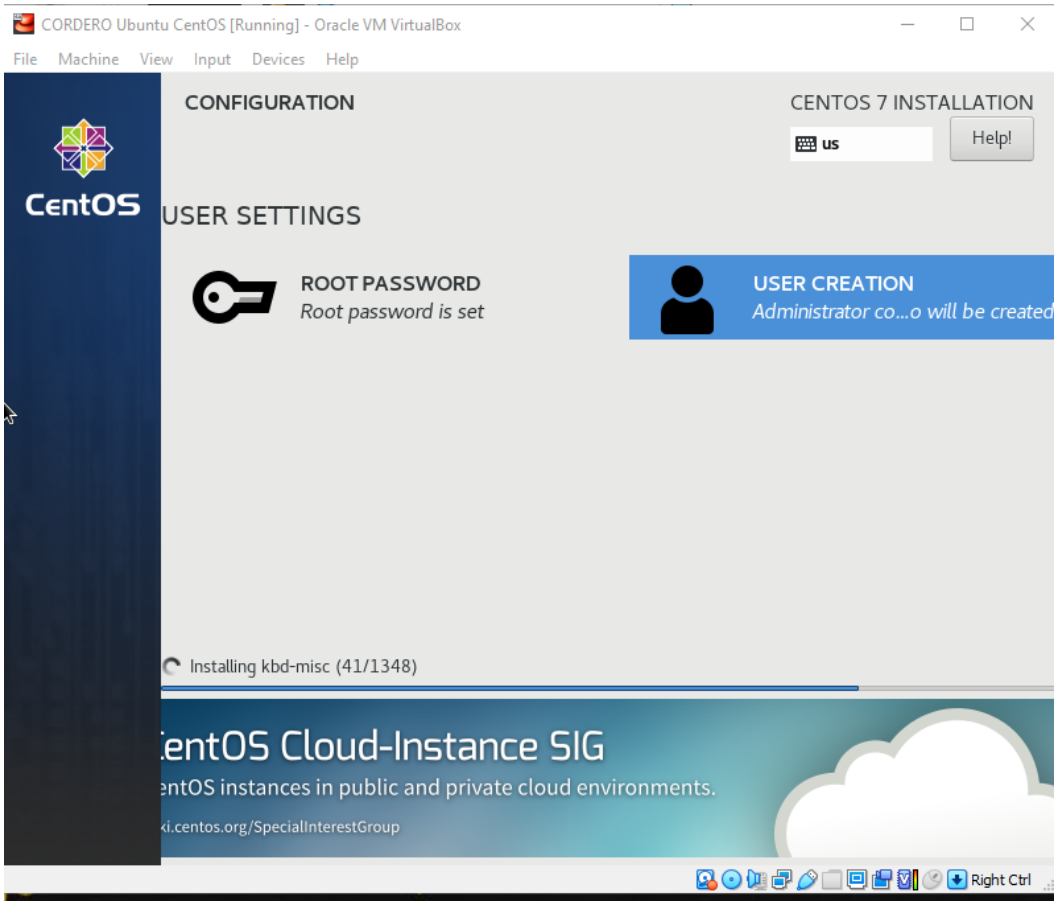
Both offer full-feature package management with network-based repository support, dependency checking and resolution, etc.. If you're familiar with one but not the other, you may have a little trouble switching over, but they're not overwhelmingly different. They both have similar features, just available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

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

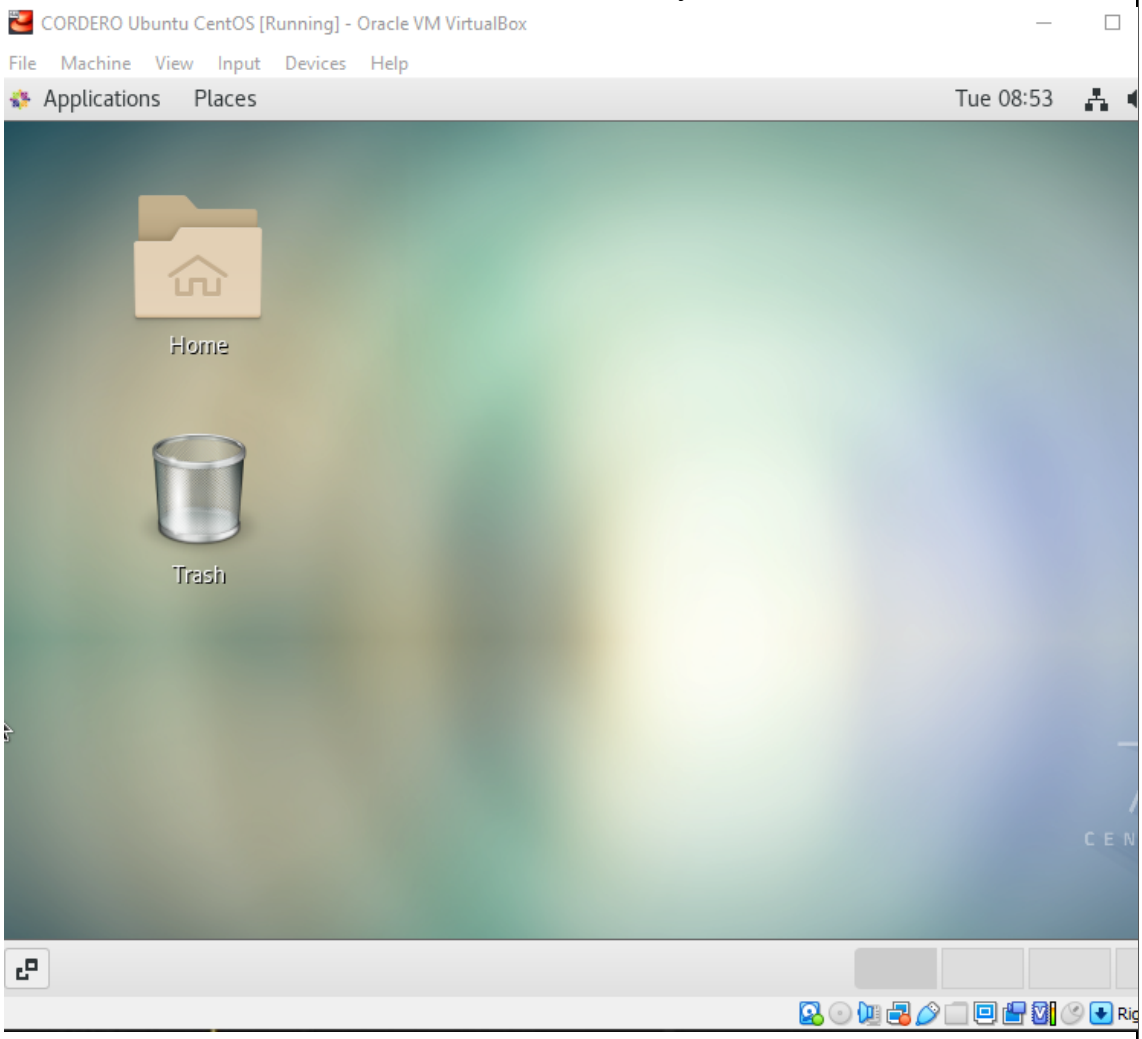
1. Download the image of the CentOS here: http://mirror.rise.ph/centos/7.9.2009/isos/x86_64/
2. Create a VM machine with 2 Gb RAM and 20 Gb HD.



3. Install the downloaded image.



4. Show evidence that the OS was installed already.



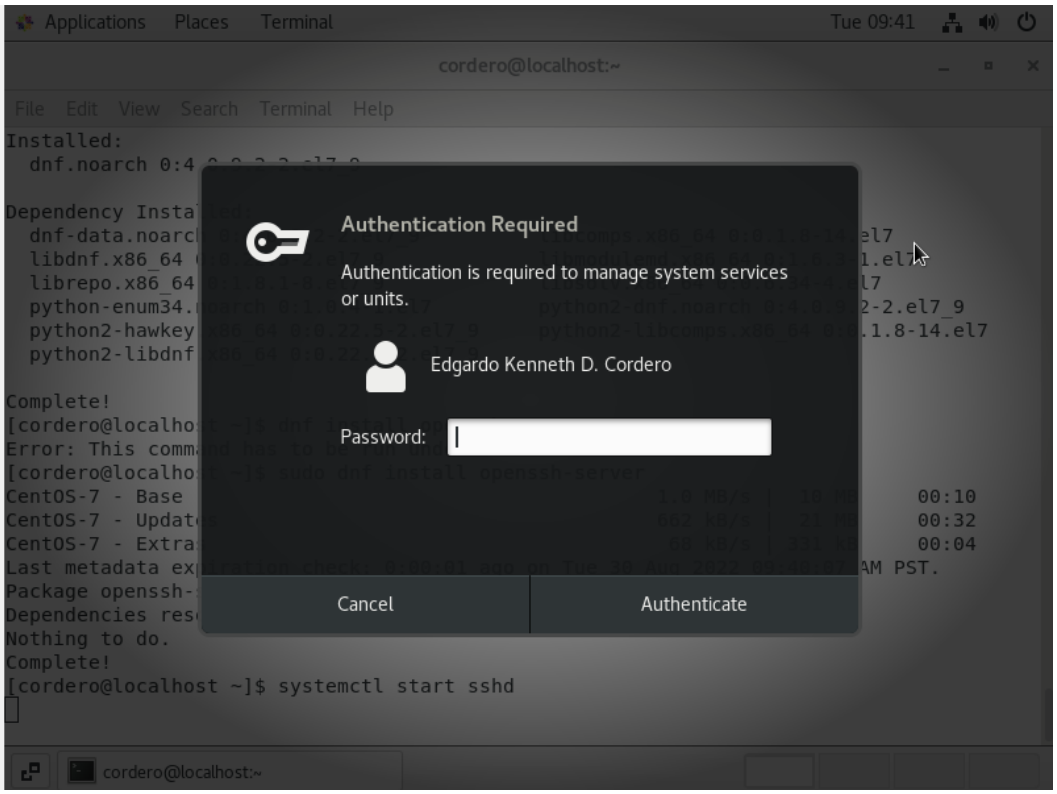
Task 2: Install the SSH server package *openssh*

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

```
[cordero@localhost ~]$ sudo dnf install openssh-server
CentOS-7 - Base                                  1.0 MB/s |  10 MB     00
CentOS-7 - Updates                               662 kB/s |  21 MB     00
CentOS-7 - Extras                                 68 kB/s | 331 kB     00
Last metadata expiration check: 0:00:01 ago on Tue 30 Aug 2022 09:40:07 AM PST.
Package openssh-server-7.4p1-22.el7_9.x86_64 is already installed.
Dependencies resolved.
Nothing to do.
Complete!
[cordero@localhost ~]$
```

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

$ systemctl start sshd



$ systemctl enable sshd

```
[cordero@localhost ~]$ systemctl start sshd
[cordero@localhost ~]$ systemctl enable sshd
[cordero@localhost ~]$
```

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

$ systemctl status sshd

```
[cordero@localhost ~]$ systemctl status sshd
● sshd.service - OpenSSH server daemon
   Loaded: loaded (/usr/lib/systemd/system/sshd.service; enabled; vendor preset: e
d)
   Active: active (running) since Tue 2022-08-30 09:23:52 PST; 19min ago
     Docs: man:sshd(8)
           man:sshd_config(5)
 Main PID: 1853 (sshd)
   CGroup: /system.slice/sshd.service
           └─1853 /usr/sbin/sshd -D

Aug 30 09:23:51 localhost.localdomain systemd[1]: Starting OpenSSH server daemon..
Aug 30 09:23:52 localhost.localdomain sshd[1853]: Server listening on 0.0.0.0 port
Aug 30 09:23:52 localhost.localdomain sshd[1853]: Server listening on :: port 22.
Aug 30 09:23:52 localhost.localdomain systemd[1]: Started OpenSSH server daemon.
Hint: Some lines were ellipsized, use -l to show in full.
[cordero@localhost ~]$
```

4. Open the SSH port 22 to allow incoming traffic:

$ firewall-cmd --zone=public --permanent --add-service=ssh

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

$ firewall-cmd --reload

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

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

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

Task 3: Copy the Public Key to CentOS

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

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

```
TIPQC@Q5202-01 MINGW64 ~
$ ssh-copy-id -i ~/.ssh/id_rsa cordero@192.168.56.112
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be instal
lled: "/c/Users/TIPQC/.ssh/id_rsa.pub"
The authenticity of host '192.168.56.112 (192.168.56.112
)' can't be established.
ED25519 key fingerprint is SHA256:Eryk9E3duP7yuIptbYOp5Z
SOr5iy1v4Tgn34syjVXi3U.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fi
ngerprint])? yes
/usr/bin/ssh-copy-id: INFO: attempting to log in with th
e new key(s), to filter out any that are already install
ed
/usr/bin/ssh-copy-id: INFO: 1 key(s) remain to be instal
led -- if you are prompted now it is to install the new
keys
cordero@192.168.56.112's password:

Number of key(s) added: 1

Now try logging into the machine, with:   "ssh 'cordero@
192.168.56.112'"
and check to make sure that only the key(s) you wanted w
ere added.


TIPQC@Q5202-01 MINGW64 ~
$ ssh cordero@192.168.56.112
Last login: Tue Aug 30 09:53:17 2022
[cordero@localhost ~]$
```

```
TIPQC@Q5202-01 MINGW64 ~
$ ssh cordero@192.168.56.112
Last login: Tue Aug 30 09:53:17 2022
[cordero@localhost ~]$ logout
Connection to 192.168.56.112 closed.
```

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

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

Task 4: Verify ssh remote connection

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

```
TIPQC@Q5202-01 MINGW64 ~
$ ssh cordero@192.168.56.112
Last login: Tue Aug 30 10:18:22 2022 from 192.168.56.1
[cordero@localhost ~]$ ifconfig
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        ether 08:00:27:2d:db:35  txqueuelen 1000  (Ethernet)
        RX packets 0  bytes 0 (0.0 B)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 0  bytes 0 (0.0 B)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

enp0s8: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 192.168.56.112  netmask 255.255.255.0  broadcast 192.168.56.255
        inet6 fe80::3096:4865:8c94:13c2  prefixlen 64  scopeid 0x20<link>
        ether 08:00:27:0e:b8:67  txqueuelen 1000  (Ethernet)
        RX packets 408  bytes 56785 (55.4 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 197  bytes 36675 (35.8 KiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

CORDERO Ubuntu CentOS [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Applications Places Terminal Tue 10:40

cordero@localhost:~

File Edit View Search Terminal Help

```
Loading mirror speeds from cached hostfile
 * base: mirror.xtom.com.hk
 * extras: mirror.xtom.com.hk
 * updates: mirror.xtom.com.hk
Package openssh-server-7.4p1-22.el7_9.x86_64 already installed and latest version
Package openssh-clients-7.4p1-22.el7_9.x86_64 already installed and latest version
Nothing to do
[cordero@localhost ~]$ ifconfig
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        ether 08:00:27:2d:db:35  txqueuelen 1000  (Ethernet)
        RX packets 0  bytes 0 (0.0 B)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 0  bytes 0 (0.0 B)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

enp0s8: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 192.168.56.112  netmask 255.255.255.0  broadcast 192.168.56.255
        inet6 fe80::3096:4865:8c94:13c2  prefixlen 64  scopeid 0x20<link>
        ether 08:00:27:0e:b8:67  txqueuelen 1000  (Ethernet)
        RX packets 94  bytes 10214 (9.9 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 51  bytes 7515 (7.3 KiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

2. Show evidence that you are connected.

```
[cordero@localhost ~]$ ifconfig
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        ether 08:00:27:2d:db:35  txqueuelen 1000  (Ethernet)
        RX packets 0  bytes 0 (0.0 B)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 0  bytes 0 (0.0 B)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

enp0s8: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 192.168.56.112  netmask 255.255.255.0  broadcast 192.168.56.255
        inet6 fe80::3096:4865:8c94:13c2  prefixlen 64  scopeid 0x20<link>
        ether 08:00:27:0e:b8:67  txqueuelen 1000  (Ethernet)
        RX packets 455  bytes 60915 (59.4 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 210  bytes 41159 (40.1 KiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

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?

   The things that we should look for in choosing the best distribution between Debian and Red Hat Linux distributions are depends depends on what you want to do with it like the Red Hat Linux Distributions is suitable for beginner to advanced server which is it is easy to use and a good installer but Red Hat Linux is a non-free Enterprise version and it is secured with regards of security. While the Debian Distribution is a much more established linux distro and its combined with DEB packages and apt-get system and it is more easier to use in distributions such as Ubuntu and Linux Mint. The disadvantage of the Debian distribution with regards to security is that it is less secure.

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

   The difference between Debian and Red Hat Linux distributions is that Debian gives free software products for anyone to access the licensed application without any limitation for the accessible features. While the Red Hat Linux it gives open source products for any to buy and use. The licenses of the Red Hat Linux can be free up until some extended time. The Red Hat Linux released on commercial distribution while Debian on non-commercial products. Red Hat is much more secure compared to Debian that is less secure.