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Course/Section: CPE 232-CPE31S24	**Date Submitted:** Sept. 3, 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.

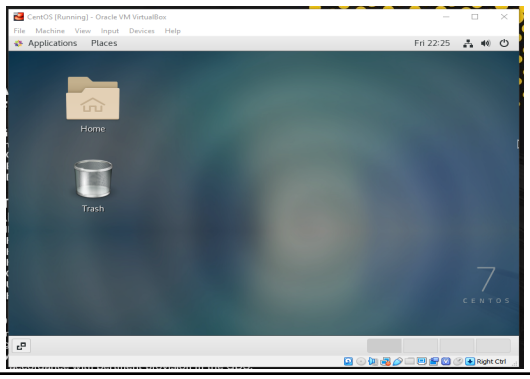
CentOS uses the RPM package format and YUM/DNF as the package manager.

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

```
[bolivar@localhost ~]$ sudo dnf install openssh-server
CentOS-7 - Base                                  928 kB/s |  10 MB     00:11
CentOS-7 - Updates                               1.0 MB/s |  21 MB     00:20
CentOS-7 - Extras                                355 kB/s | 332 kB     00:00
Package openssh-server-7.4p1-21.el7.x86_64 is already installed.
Dependencies resolved.
Nothing to do.
Complete!
[bolivar@localhost ~]$
```

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

```
[bolivar@localhost ~]$ sudo systemctl start sshd
[bolivar@localhost ~]$ sudo systemctl enable sshd
[bolivar@localhost ~]$
```

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

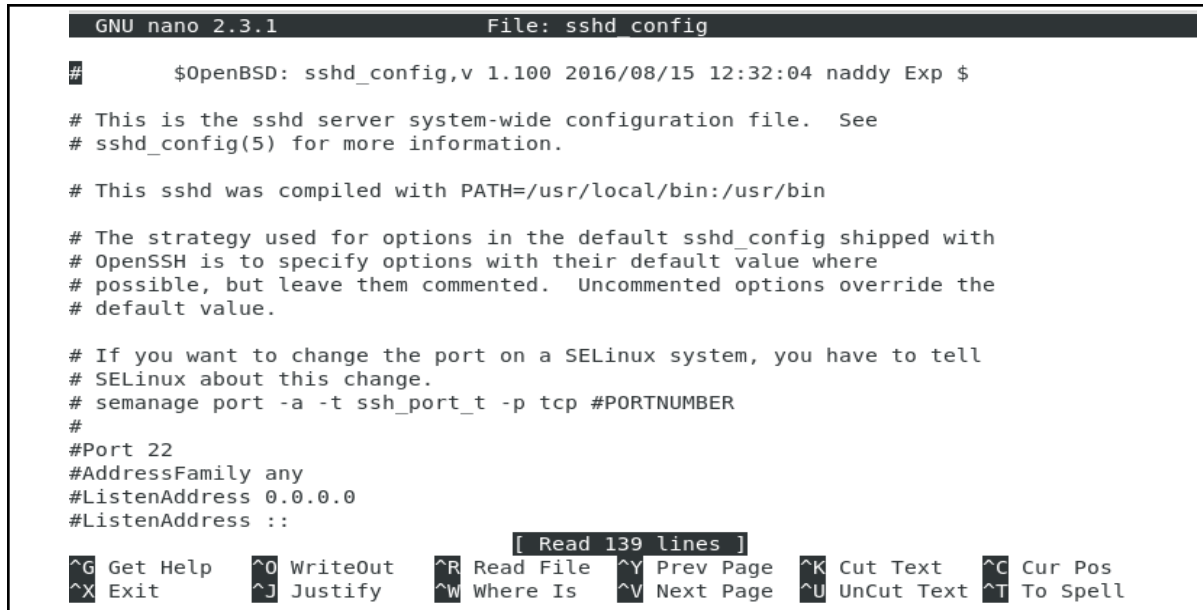
```
[bolivar@localhost ~]$ sudo systemctl status sshd
● sshd.service - OpenSSH server daemon
   Loaded: loaded (/usr/lib/systemd/system/sshd.service; enabled; vendor preset: enable
d)
   Active: active (running) since Fri 2022-09-02 22:20:16 EDT; 20min ago
     Docs: man:sshd(8)
           man:sshd_config(5)
 Main PID: 1220 (sshd)
    Tasks: 1
   CGroup: /system.slice/sshd.service
           └─1220 /usr/sbin/sshd -D

Sep 02 22:20:16 localhost.localdomain systemd[1]: Starting OpenSSH server daemon...
Sep 02 22:20:16 localhost.localdomain sshd[1220]: Server listening on 0.0.0.0 port 22.
Sep 02 22:20:16 localhost.localdomain sshd[1220]: Server listening on :: port 22.
Sep 02 22:20:16 localhost.localdomain systemd[1]: Started OpenSSH server daemon.
Hint: Some lines were ellipsized, use -l to show in full.
[bolivar@localhost ~]$
```

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

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

```
[bolivar@localhost ~]$ cd /etc/ssh/
[bolivar@localhost ssh]$ ls
moduli              ssh_host_ecdsa_key      ssh_host_ed25519_key.pub
ssh_config          ssh_host_ecdsa_key.pub  ssh_host_rsa_key
sshd_config         ssh_host_ed25519_key    ssh_host_rsa_key.pub
[bolivar@localhost ssh]$ nano sshd_config
[bolivar@localhost ssh]$ sudo nano sshd_config
[bolivar@localhost ssh]$ systemctl reload sshd
[bolivar@localhost ssh]$
```



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.

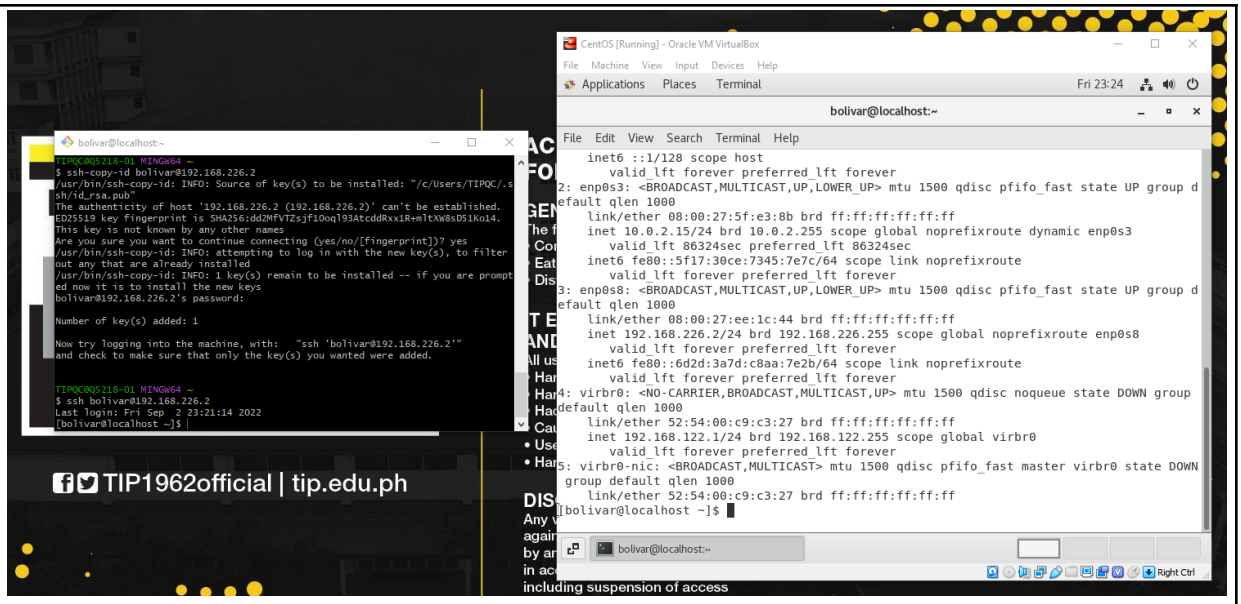
```
TIPQC@Q5218-01 MINGW64 ~
$ ssh-copy-id bolivar@192.168.56.104
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/c/Users/TIPQC/.s
sh/id_rsa.pub"
/usr/bin/ssh-copy-id: INFO: attempting to log in with the new key(s), to filter
out any that are already installed

/usr/bin/ssh-copy-id: ERROR: ssh: connect to host 192.168.56.104 port 22: Connec
tion timed out
```

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

Task 4: Verify ssh remote connection

1. Using your local machine, connect to CentOS using ssh.
2. Show evidence that you are connected.

Final requirement:



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 me I should look for the ease of use or accessibility. Also I know that both distributions are useful for activities like this.

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

   -It means Debian contains nearly 80% more packages than RedHat and this is the reason Debian contains packages like openoffice, Transmission bittorrent client, mp3 codecs, etc which a RedHat like distribution lacks and is required to be installed manually or from 3rd party repository

Conclusion:

After doing this activity, learned how to install the CenOS in virtual machine or virtual box. I successfully install the CentOS as well as install the ssh server. Also I encountered many errors on the installation of CentOS but I manage to fix it and also I was able to connect the CentOS on the local machine which is the help of git bash.