Name: Ian Carlo T. Bello	**Date Performed:** 09-03-2022
Course/Section: CPE232-CPE31S24	**Date Submitted:** 09-03-2022
Instructor: Dr. Jonathan V. Taylar	**Semester and SY:** 1st Sem – 3rd Year

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.

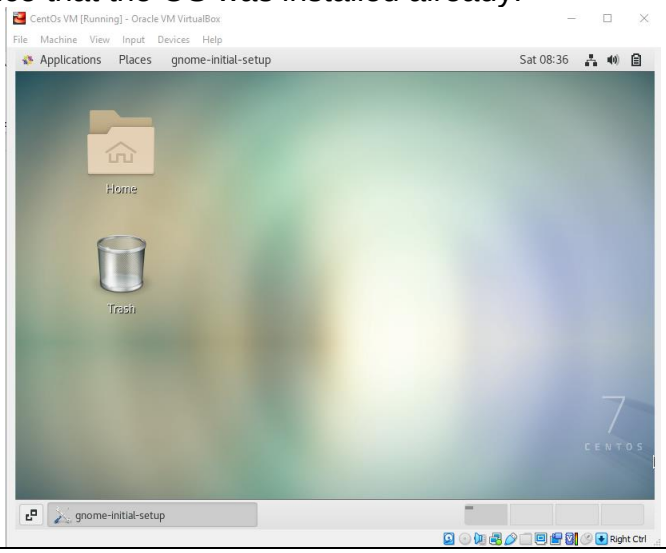
CentOS uses the RPM package format and YUM/DNF as the package manager.

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

```
[bello@localhost ~]$ sudo dnf install openssh-server


Extra Packages for Enterprise Linux 7 - x86_64         148 kB/s |  17 MB     01:56
CentOS-7 - Base                                        332 kB/s |  10 MB     00:31
CentOS-7 - Updates                                     537 kB/s |  21 MB     00:39
CentOS-7 - Extras                                      756 kB/s | 332 kB     00:00
Package openssh-server-7.4p1-22.el7_9.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
   $ systemctl enable sshd

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

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

```
[bello@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 Sat 2022-09-03 08:38:49 PST; 12min ago
     Docs: man:sshd(8)
           man:sshd_config(5)
 Main PID: 1166 (sshd)
   CGroup: /system.slice/sshd.service
           └─1166 /usr/sbin/sshd -D

Sep 03 08:38:48 localhost.localdomain systemd[1]: Starting OpenSSH server daemon...
Sep 03 08:38:48 localhost.localdomain sshd[1166]: Server listening on 0.0.0.0 port 22.
Sep 03 08:38:48 localhost.localdomain sshd[1166]: Server listening on :: port 22.
Sep 03 08:38:49 localhost.localdomain systemd[1]: Started OpenSSH server daemon.
Hint: Some lines were ellipsized, use -l to show in full.
[bello@localhost ~]$
```

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

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

```
[bello@localhost ~]$ systemctl reload sshd
[bello@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.

```
ubuntuhost@workstation:~$ ssh-copy-id -i ~/.ssh/id_rsa bello@192.168.56.104
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/home/ubuntuhost
/.ssh/id_rsa.pub"
The authenticity of host '192.168.56.104 (192.168.56.104)' can't be established
.
ED25519 key fingerprint is SHA256:Fd3pJzxvuA3/HSrMtofNSioZ4GpY/w9bWXuvXOv9y7Y.
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 promp
ted now it is to install the new keys
bello@192.168.56.104's password:

Number of key(s) added: 1

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

ubuntuhost@workstation:~$
```

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

```
[bello@localhost .ssh]$ cat authorized_keys
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAACZgKwJgJa56Xm4x5neW6r4OpxI1m1wkv1BAlEcbHQ/pInIw71AWb
CLsYUKCj8EbR4T92a+p0xpmYPo9PBA2Eo7IdC59+fge29qpZF/emmdZLnc8Ustv/n6jC2BSkVld/3Q0P1wjUFck
7+zSXwWMtz/ZJZWkMf0qCHQL6iwX1JV8hXXGYjjNzWtDONvx013vv2GXvqQyvQ7oKlWM/FCTqTooGZyj/lTDE6v
cYTrPMYps8WUSa5A90E+sofbd7pR/+5paXhmDzqThy/GoPbpB8TgJ+qJH5uvtmNjBaWKYLV1UqounRZUZTNcgGn
VD8GrPkRkrhI4imXhDSTHdKwcYNUSNBrcprvR5HgwZRjIxbZIkAoZNqX2On2Z3W/B7eHTiWnsVZPc9dMbFHIf2/
3Ek/RM38YPccGMI7yz8S8W5/2d6rtkAKZiZMNh8udWM1QQyZ6HZd7p5Ez4HBzzImxC9O+EkJq4FkX+dOtUj6re/
eIDuy9LLsrfQHupk0tvePwC5PDoZLoEte0MfzezkyNe/3zpPzN6ld98ZpMwPiG4+WqSPpzdMvO0WQ4KBXOcb1qn
nwgGfN2ysVVLh+XmVWJgIgHRx6+Dmfcozq5ygJdv2TxmPTqrxNMo9wAcciLvj0qhv23YfynoDfxO7LoJkHsoIMR
aWRCggfjMpHkTtwuSR+474JPE6T6kLHPj/YyWzUWH1NkIE6y3FCwQjb5wPM/gzouOJoQrW7ygLa222gO9ads6cI
icbfUTXRbC5XOIfbD8XIpCnd1d2A1RD3FsjPX3Mhi38+pdxeKvTHtMJRHsfDlTKkDuXjekheP ubuntuhost@wo
rkstation
[bello@localhost .ssh]$
```

Task 4: Verify ssh remote connection

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

```
ubuntuhost@workstation:~$ ssh bello@192.168.56.104
Last login: Sat Sep  3 08:39:20 2022
[bello@localhost ~]$
```

2. Show evidence that you are connected.

```
[bello@localhost ~]$ ls
Desktop  Documents  Downloads  Music  Pictures  Public  Templates  Videos
[bello@localhost ~]$ whoami
bello
[bello@localhost ~]$
```

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?

We should look at their compatibilities, such as x86_64 compatibility and having multiple versions and architectures. CentOS uses RPM packages while Debian uses the DEB package format. In conclusion, both distributions are mature, have their own package managers, and have a great community.

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

RedHat is a commercial Linux distribution, while Debian is a non-commercial distribution. In packages, Debian tenfold the packages available for RedHat. Whereas bugfixes are faster in Debian, they appear to be slower in Red Hat.