Name:Robin E. Valenzuela	**Date Performed: 9/3/2022**
Course/Section:CPE31S2	**Date Submitted: 9/3/2022**
Instructor: Engr. Jonathan Taylar	**Semester and SY: 1st Sem, 2022-2023**

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.

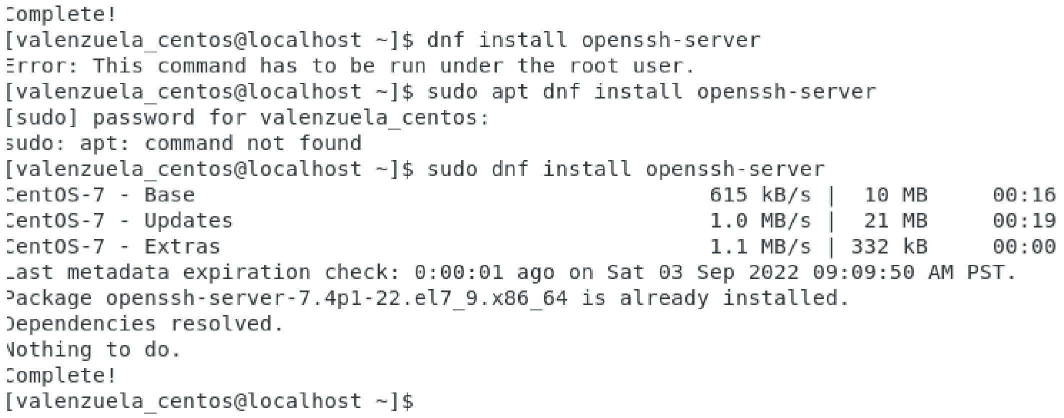
Both offer full-feature package management with network-based repository support, dependency checking and resolution, etc.. If you're familiar with one but not the other, you may have a little trouble switching over, but they're not overwhelmingly different. They both have similar features, just available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

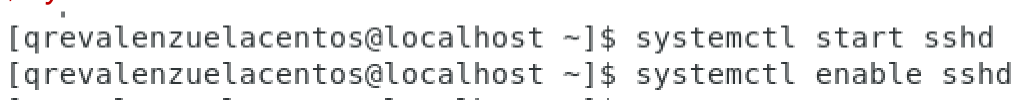
Task 2: Install the SSH server package *openssh*

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



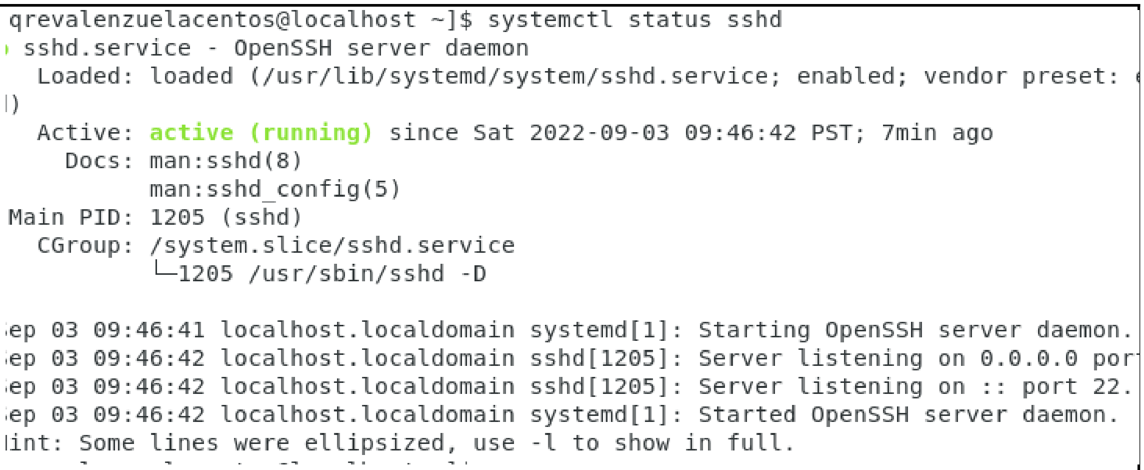
```
Complete!
[valenzuela_centos@localhost ~]$ dnf install openssh-server
Error: This command has to be run under the root user.
[valenzuela_centos@localhost ~]$ sudo apt dnf install openssh-server
[sudo] password for valenzuela_centos:
sudo: apt: command not found
[valenzuela_centos@localhost ~]$ sudo dnf install openssh-server
CentOS-7 - Base                                      615 kB/s |  10 MB     00:16
CentOS-7 - Updates                                   1.0 MB/s |  21 MB     00:19
CentOS-7 - Extras                                    1.1 MB/s | 332 kB     00:00
Last metadata expiration check: 0:00:01 ago on Sat 03 Sep 2022 09:09:50 AM PST.
Package openssh-server-7.4p1-22.el7_9.x86_64 is already installed.
Dependencies resolved.
Nothing to do.
Complete!
[valenzuela_centos@localhost ~]$
```

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



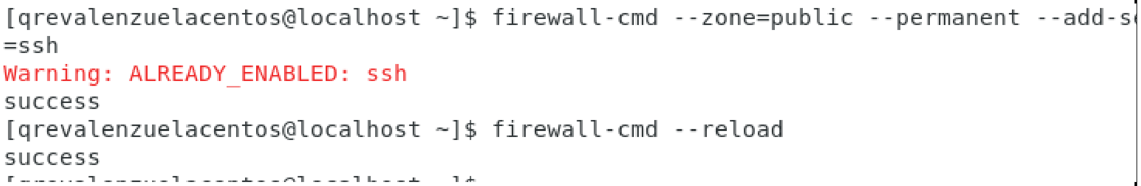
```
[qrevalenzuelacentos@localhost ~]$ systemctl start sshd
[qrevalenzuelacentos@localhost ~]$ systemctl enable sshd
```

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



```
qrevalenzuelacentos@localhost ~]$ systemctl status sshd
 sshd.service - OpenSSH server daemon
   Loaded: loaded (/usr/lib/systemd/system/sshd.service; enabled; vendor preset: e
l)
   Active: active (running) since Sat 2022-09-03 09:46:42 PST; 7min ago
     Docs: man:sshd(8)
           man:sshd_config(5)
 Main PID: 1205 (sshd)
   CGroup: /system.slice/sshd.service
           └─1205 /usr/sbin/sshd -D

ep 03 09:46:41 localhost.localdomain systemd[1]: Starting OpenSSH server daemon.
ep 03 09:46:42 localhost.localdomain sshd[1205]: Server listening on 0.0.0.0 port
ep 03 09:46:42 localhost.localdomain sshd[1205]: Server listening on :: port 22.
ep 03 09:46:42 localhost.localdomain systemd[1]: Started OpenSSH server daemon.
lint: 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
   $ firewall-cmd --reload

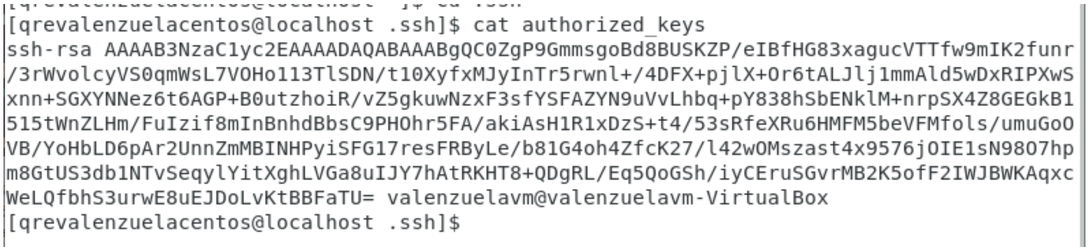


```
[qrevalenzuelacentos@localhost ~]$ firewall-cmd --zone=public --permanent --add-s
=ssh
Warning: ALREADY_ENABLED: ssh
success
[qrevalenzuelacentos@localhost ~]$ firewall-cmd --reload
success
```

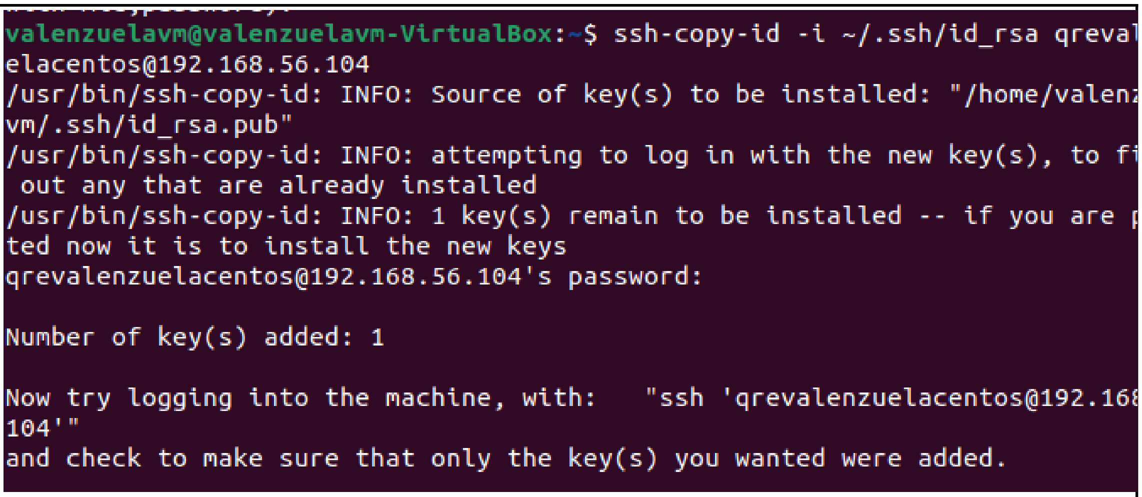
5. Locate the ssh server man config file /*etc/ssh/sshd_config* and perform custom configuration. Every time you make any change to the /*etc/ssh/sshd-config* configuration file reload the *sshd* service to apply changes:
   $ systemctl reload sshd

Task 3: Copy the Public Key to CentOS

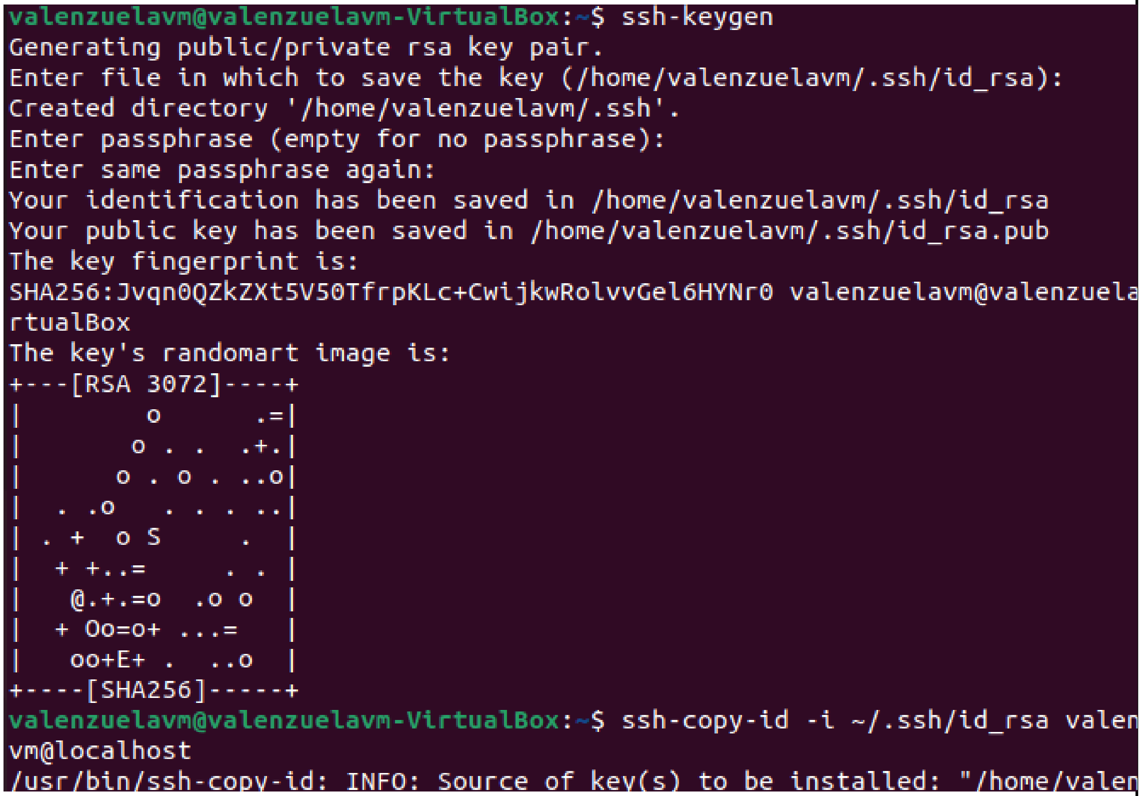
1. Make sure that *ssh* is installed on the local machine.
2. Using the command *ssh-copy-id*, connect your local machine to CentOS.
3. On CentOS, verify that you have the *authorized_keys*.



```
[qrevalenzuelacentos@localhost .ssh]$ cat authorized_keys
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAABgQC0ZgP9GmmsgoBd8BUSKZP/eIBfHG83xagucVTTfw9mIK2funr
/3rWvolcyVS0qmWsL7VOHo113TlSDN/t10XyfxMJyInTr5rwnl+/4DFX+pjlX+Or6tALJlj1mmAld5wDxRIPXwS
xnn+SGXYNNez6t6AGP+B0utzhoiR/vZ5gkuwNzxF3sfYSFAZYN9uVvLhbq+pY838hSbENklM+nrpSX4Z8GEGkB1
515tWnZLHm/FuIzif8mInBnhdBbsC9PHOhr5FA/akiAsH1R1xDzS+t4/53sRfeXRu6HMFM5beVFMfols/umuGoO
VB/YoHbLD6pAr2UnnZmMBINHPyiSFG17resFRByLe/b81G4oh4ZfcK27/l42wOMszast4x9576jOIE1sN9807hp
m8GtUS3db1NTvSeqylYitXghLVGa8uIJY7hAtRKHT8+QDgRL/Eq5QoGSh/iyCEruSGvrMB2K5ofF2IWJBWKAqxc
WeLQfbhS3urwE8uEJDoLvKtBBFaTU= valenzuelavm@valenzuelavm-VirtualBox
[qrevalenzuelacentos@localhost .ssh]$
```



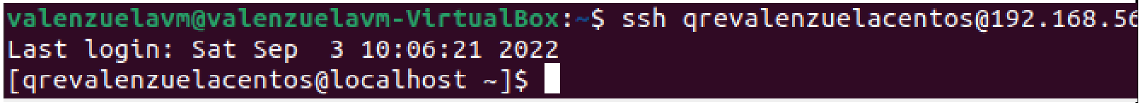
```
valenzuelavm@valenzuelavm-VirtualBox:~$ ssh-copy-id -i ~/.ssh/id_rsa qreval
elacentos@192.168.56.104
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/home/valenz
vm/.ssh/id_rsa.pub"
/usr/bin/ssh-copy-id: INFO: attempting to log in with the new key(s), to fi
 out any that are already installed
/usr/bin/ssh-copy-id: INFO: 1 key(s) remain to be installed -- if you are p
ted now it is to install the new keys
qrevalenzuelacentos@192.168.56.104's password:

Number of key(s) added: 1

Now try logging into the machine, with:   "ssh 'qrevalenzuelacentos@192.168
104'"
and check to make sure that only the key(s) you wanted were added.
```



```
valenzuelavm@valenzuelavm-VirtualBox:~$ ssh-keygen
Generating public/private rsa key pair.
Enter file in which to save the key (/home/valenzuelavm/.ssh/id_rsa):
Created directory '/home/valenzuelavm/.ssh'.
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /home/valenzuelavm/.ssh/id_rsa
Your public key has been saved in /home/valenzuelavm/.ssh/id_rsa.pub
The key fingerprint is:
SHA256:Jvqn0QZkZXt5V50TfrpKLc+CwijkwRolvvGel6HYNr0 valenzuelavm@valenzuela
rtualBox
The key's randomart image is:
+---[RSA 3072]----+
|        o      .=|
|       o . .  .+.|
|      o . o . ..o|
|  . .o   . . . ..|
| . +  o S     .  |
|  + +..=     . . |
|   @.+.=o  .o o  |
|  + Oo=o+ ...=   |
|   oo+E+ .  ..o  |
+----[SHA256]-----+
valenzuelavm@valenzuelavm-VirtualBox:~$ ssh-copy-id -i ~/.ssh/id_rsa valen
vm@localhost
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/home/valen
```

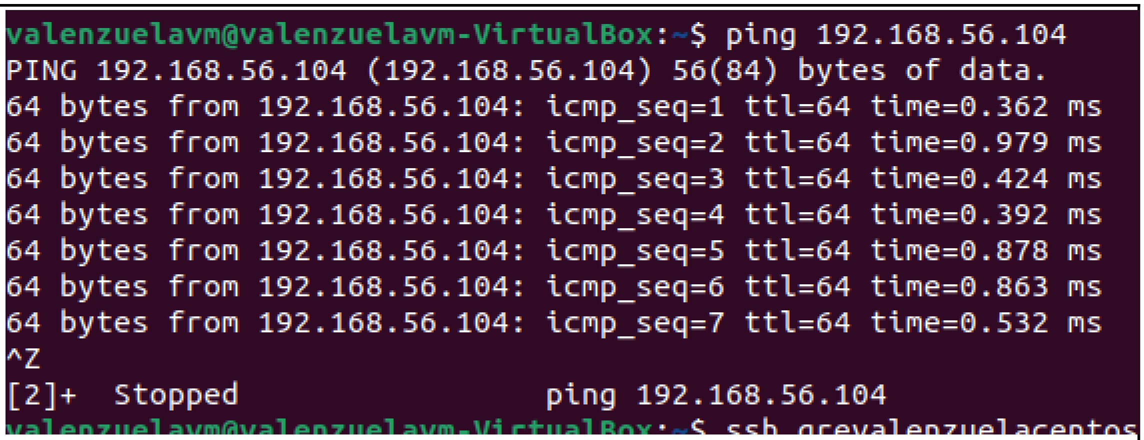
Task 4: Verify ssh remote connection

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



```
valenzuelavm@valenzuelavm-VirtualBox:~$ ssh qrevalenzuelacentos@192.168.56
Last login: Sat Sep  3 10:06:21 2022
[qrevalenzuelacentos@localhost ~]$ 
```

2. Show evidence that you are connected.



```
valenzuelavm@valenzuelavm-VirtualBox:~$ 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=0.362 ms
64 bytes from 192.168.56.104: icmp_seq=2 ttl=64 time=0.979 ms
64 bytes from 192.168.56.104: icmp_seq=3 ttl=64 time=0.424 ms
64 bytes from 192.168.56.104: icmp_seq=4 ttl=64 time=0.392 ms
64 bytes from 192.168.56.104: icmp_seq=5 ttl=64 time=0.878 ms
64 bytes from 192.168.56.104: icmp_seq=6 ttl=64 time=0.863 ms
64 bytes from 192.168.56.104: icmp_seq=7 ttl=64 time=0.532 ms
^Z
[2]+  Stopped                 ping 192.168.56.104
valenzuelavm@valenzuelavm-VirtualBox:~$ ssh arevalenzuela@centos
```

3.

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 for the accessibility and how user friendly redhat and debian linux distributions are.
2. What are the main diffence between Debian and Red Hat Linux distributions?
    - Management is the biggest difference I can see, redhat takes a considerable amount of time to update whilst debian takes everyday to update and manage bug fixes.

Conclusion: In this activity, we used CentOS which is under the Red hat linux distributor and have connected UBUNTU and CENTOS using SSH keys and a local private server under host-only. We have learned how to use our previous activities and incorporated them into a brand new OS.