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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*

```
[sumaya@localhost ~]$ dnf install openssh-server
bash: dnf: command not found...
[sumaya@localhost ~]$ yum install openssh-server
Loaded plugins: fastestmirror, langpacks
You need to be root to perform this command.
[sumaya@localhost ~]$ su
Password:
[root@localhost sumaya]# yum install openssh-server
Loaded plugins: fastestmirror, langpacks
Loading mirror speeds from cached hostfile
 * base: mirror.upsi.edu.my
 * extras: mirror.upsi.edu.my
 * updates: mirror.upsi.edu.my
base                                                      | 3.6 kB  00:00:00
extras                                                    | 2.9 kB  00:00:00
updates                                                   | 2.9 kB  00:00:00
(1/4): base/7/x86_64/group_gz                             | 153 kB  00:00:00
(2/4): extras/7/x86_64/primary_db                         | 250 kB  00:00:00
(3/4): base/7/x86_64/primary 32% [======            ] 1.1 MB/s | 9.2 MB  00:00:17 ETA
```

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

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

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

```
[sumaya@localhost ~]$ systemctl status sshd
● sshd.service - OpenSSH server daemon
   Loaded: loaded (/usr/lib/systemd/system/sshd.service; enabled; vendor preset:
d)
   Active: active (running) since Thu 2023-09-07 05:39:09 EDT; 1min 16s ago
     Docs: man:sshd(8)
           man:sshd_config(5)
 Main PID: 3303 (sshd)
   CGroup: /system.slice/sshd.service
           └─3303 /usr/sbin/sshd -D
[sumaya@localhost ~]$ S
```

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

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

```
[root@localhost sumaya]# 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.

```
kevin@Workstation:~$ ssh-copy-id
Usage: /usr/bin/ssh-copy-id [-h|-?|-f|-n] [-i [identity_file]] [-p port] [[
ssh -o options>] ...] [user@]hostname
        -f: force mode -- copy keys without trying to check if they are alr
 installed
        -n: dry run    -- no keys are actually copied
        -h|-?: print this help
kevin@Workstation:~$ ssh-copy-id sumaya@192.168.56.110
The authenticity of host '192.168.56.110 (192.168.56.110)' can't be establi
.
ECDSA key fingerprint is SHA256:+NgANEekAjXGqG8EZO4erwDK13Xau7lgrRvYXqkEIlw
Are you sure you want to continue connecting (yes/no)? yes
/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
sumaya@192.168.56.110's password:
```

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

```
cat: /home/sumaya/.ssh/authorized_keys: No such file or directory
[sumaya@localhost ~]$ cat ~/.ssh/authorized_keys
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAABAQDqyXw1e+KUO9RRG4ixUyv2s7wFJnYewg02wyvsCTcB6Zu5j8z
zhuwIt7XiJb9znWr63GDwK78nId7ypU4JTlTpGIIUQw73XgH6lxum4dAe7Z1vr7UX7sRVG0FUkvo1qjhUhEGUi5
3Hp/DvXW9HawviBQPCkZCMqA7SjLEDtsklLUs6VBPkUGNzHi8REiZI/g1uS2c4t5KkC7kEf8mp1qGUwKO0+bCGy
wkgLviIkg/Nk806C4TiHH07A0LSZdHec9pQ1j9rDU1xpaQfxabnewfBgJcaXAR1PjLwwVgZDeLO8bvDbYFZl+qw
YwCZu3eyskVCvsp2VS+bewNdhr9NEjoz kevin@Workstation
```

**Task 4: Verify ssh remote connection**

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

```
kevin@Workstation:~$ ssh sumaya@192.168.56.110

Last failed login: Thu Sep  7 06:06:09 EDT 2023 from 192.168.56.101 on ssh:nott
y
There were 3 failed login attempts since the last successful login.
Last login: Thu Sep  7 05:33:56 2023

[sumaya@localhost ~]$
[sumaya@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?

   **In my opinion the best distribution for you will depend on your specific needs and requirements. If you are looking for a free and open source distribution that is stable and secure then choose Debian and if you are needing a distribution with enterprise grade support then choose RHEL.**

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

   **Debian if you are needing a secure and stable open source distribution. RHEL if you are needing an enterprise grade support distribution**