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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.

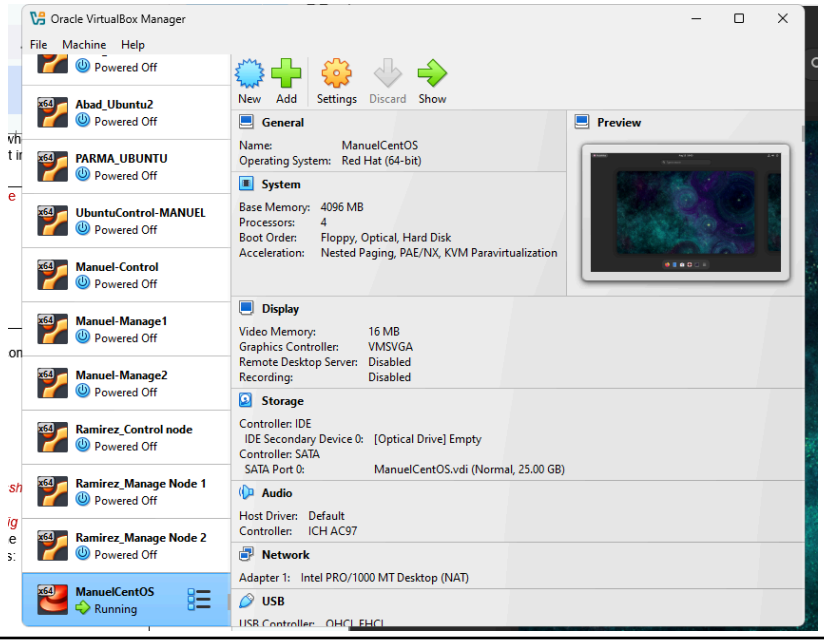
CentOS uses the RPM package format and YUM/DNF as the package manager.

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

```
[hazelm3@vbox ~]$ sudo dnf install openssh-server
[sudo] password for hazelm3:
Updating Subscription Management repositories.
Unable to read consumer identity

This system is not registered with an entitlement server. You can use "rhc" or
subscription-manager" to register.

CentOS Stream 9 - BaseOS                        6.5 kB/s | 4.5 kB     00:00
CentOS Stream 9 - BaseOS                        1.5 MB/s | 8.8 MB     00:05
CentOS Stream 9 - AppStream                     6.6 kB/s | 4.6 kB     00:00
CentOS Stream 9 - AppStream                     288 kB/s |  25 MB     01:27
CentOS Stream 9 - Extras packages               1.5 kB/s | 5.2 kB     00:03
CentOS Stream 9 - Extras packages               3.5 kB/s |  19 kB     00:05
Package openssh-server-8.7p1-46.el9.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

```
[hazelm3@vbox ~]$ sudo systemctl start sshd
[hazelm3@vbox ~]$ sudo systemctl enable sshd
[hazelm3@vbox ~]$
```

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

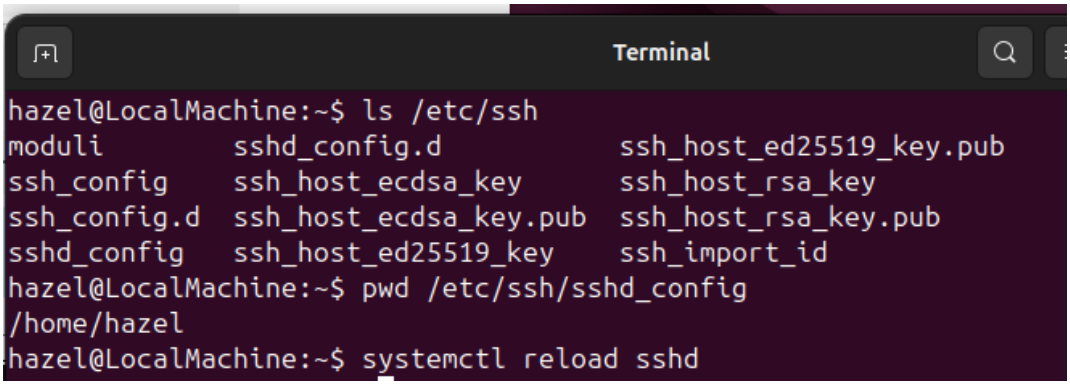
```
hazelm3@vbox:~ — sudo systemctl status sshd
● sshd.service - OpenSSH server daemon
     Loaded: loaded (/usr/lib/systemd/system/sshd.service; enabled; preset: enabled)
     Active: active (running) since Fri 2025-08-15 16:02:18 PST; 5min ago
       Docs: man:sshd(8)
             man:sshd_config(5)
   Main PID: 958 (sshd)
      Tasks: 1 (limit: 22984)
     Memory: 3.5M
        CPU: 21ms
     CGroup: /system.slice/sshd.service
             └─958 "sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups"

Aug 15 16:02:18 localhost.localdomain systemd[1]: Starting OpenSSH server daemon...
Aug 15 16:02:18 localhost.localdomain sshd[958]: Server listening on 0.0.0.0 port 22.
Aug 15 16:02:18 localhost.localdomain sshd[958]: Server listening on :: port 22.
Aug 15 16:02:18 localhost.localdomain systemd[1]: Started OpenSSH server daemon.
~
~
~
~
~
~
~
lines 1-16/16 (END)
```

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

$ firewall-cmd --reload

```
[hazelm3@vbox ~]$ sudo firewall-cmd --zone=public --permanent --add-service=s
Warning: ALREADY_ENABLED: ssh
success
[hazelm3@vbox ~]$ sudo 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.

```
hazel@LocalMachine:~$ sshd -V
OpenSSH_9.6p1 Ubuntu-3ubuntu13.13, OpenSSL 3.0.13 30 Jan 2024
```

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

```
hazel@LocalMachine:~$ ssh hazelm3@CentOS
hazelm3@centos's password:
Permission denied, please try again.
hazelm3@centos's password:
Activate the web console with: systemctl enable --now cockpit.socket

Last failed login: Fri Sep  5 14:26:00 PST 2025 from 192.168.56.107 on ssh:notty
There was 1 failed login attempt since the last successful login.
Last login: Fri Sep  5 14:25:33 2025 from 192.168.56.107
```

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

```
hazel@LocalMachine:~$ ssh-copy-id hazelm3@CentOS
/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 prompt
ed now it is to install the new keys
hazelm3@centos's password:

Number of key(s) added: 1

Now try logging into the machine, with:   "ssh 'hazelm3@CentOS'"
and check to make sure that only the key(s) you wanted were added.
```

Task 4: Verify ssh remote connection

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

```
hazel@LocalMachine:~$ ssh hazelm3@CentOS
Activate the web console with: systemctl enable --now cockpit.socket

Last login: Fri Sep  5 14:26:04 2025 from 192.168.56.107
[hazelm3@CentOS ~]$ ssh hazelm3@CentOS
ssh: Could not resolve hostname centos: Name or service not known
[hazelm3@CentOS ~]$ ssh hazelm3@CentOS
ssh: Could not resolve hostname centos: Name or service not known
[hazelm3@CentOS ~]$ exit
logout
Connection to centos closed.
hazel@LocalMachine:~$ ssh hazelm3@CentOS
Activate the web console with: systemctl enable --now cockpit.socket

Last login: Fri Sep  5 14:35:16 2025 from 192.168.56.107
[hazelm3@CentOS ~]$ whoami
hazelm3
[hazelm3@CentOS ~]$ hostname
CentOS
```

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?**

   When choosing what's the best Linux distribution for you, you should consider your intended use case, support needs, and how familiar you may be with the system tools. If you're in an enterprise or academic setting, a Red Hat distribution is ideal as it's more for enterprise level. However, if you want to be more flexible and have full control over the configurations, Debian distribution is more ideal. Overall, Red Hat is more structured and professionally supported while Debian is good for personal projects or systems.

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

   The difference between the two is that Debian is a free Linux distribution that is known for its stability and wide hardware support. It uses DEB packages and apt systems. Red Hat distribution, however, is a commercial downstream distribution which is more focused on enterprise use. It uses RPM packages and a yum/dnf system.