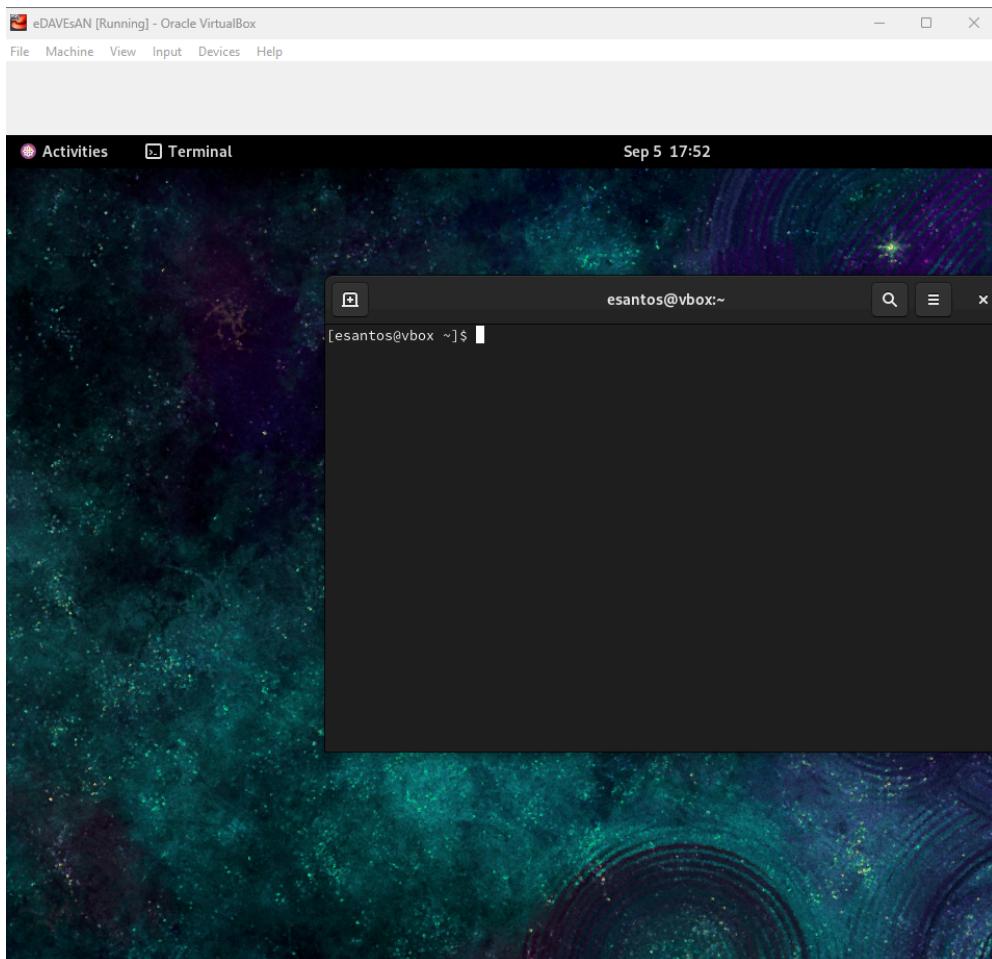


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| Course/Section: CPE31S2 | Date Submitted: 09/05/2025 |
| Instructor: Engr. Robin Valenzuela | Semester and SY: |
| Activity 3: Install SSH server on CentOS or RHEL 8 | |
| 1. Objectives: <ul style="list-style-type: none"> 1.1 Install Community Enterprise OS or Red Hat Linux OS 1.2 Configure remote SSH connection from remote computer to CentOS/RHEL-8 | |
| 2. Discussion: <p>CentOS vs. Debian: Overview</p> <p>CentOS and Debian are Linux distributions that spawn from opposite ends of the candle.</p> <p>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.</p> <p>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.</p> <p>CentOS vs. Debian: Architecture</p> <p>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?</p> <p>Both Debian and CentOS support AArch64/ARM64, armhf/armhfp , i386 , ppc64el/ppc64le. (Note: armhf/armhfp and i386 are supported in CentOS 7 only.)</p> <p>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.</p> <p>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.</p> <p>CentOS vs. Debian: Package Management</p> <p>Most Linux distributions have some form of package manager nowadays, with some more complex and feature-rich than others.</p> <p>CentOS uses the RPM package format and YUM/DNF as the package manager.</p> <p>Debian uses the DEB package format and dpkg/APT as the package manager.</p> | |

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

```
[esantos@vbox ~]$ sudo dnf install openssh-server
[sudo] password for esantos:
esantos is not in the sudoers file. This incident will be reported.
[esantos@vbox ~]$ su
Password:
[root@vbox esantos]# sudo dnf install openssh-server
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.

Waiting for process with pid 6300 to finish.
^CKeyboardInterrupt: Terminated
```

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

```
$ systemctl start sshd
$ systemctl enable sshd
```

```
[root@vbox esantos]# systemctl status sshd
● sshd.service - OpenSSH server daemon
  Loaded: loaded (/usr/lib/systemd/system/sshd.service; enabled; preset: enabled)
  Active: active (running) since Fri 2025-09-05 17:11:32 PST; 49min ago
    Docs: man:sshd(8)
          man:sshd_config(5)
   Main PID: 861 (sshd)
      Tasks: 1 (limit: 10949)
     Memory: 2.3M
        CPU: 16ms
      CGroup: /system.slice/sshd.service
              └─861 "sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups"

Sep 05 17:11:31 localhost.localdomain systemd[1]: Starting OpenSSH server daemon...
Sep 05 17:11:32 localhost.localdomain sshd[861]: Server listening on 0.0.0.0 port 22.
Sep 05 17:11:32 localhost.localdomain sshd[861]: Server listening on :: port 22.
Sep 05 17:11:32 localhost.localdomain systemd[1]: Started OpenSSH server daemon.
lines 1-16/16 (END)
[root@vbox esantos]# systemctl start sshd
bash: systemctl: command not found...
Similar command is: 'systemctl'
[root@vbox esantos]# systemctl start sshd
[root@vbox esantos]# systemctl enable sshd
[root@vbox esantos]#
```

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

```
$ systemctl status sshd
```

```
esantos@vbox:/home/esantos — systemctl status sshd
bash: systemctl: command not found...
Similar command is: 'systemctl'
[root@vbox esantos]# systemctl start sshd
[root@vbox esantos]# systemctl enable sshd
[root@vbox esantos]# system status sshd
bash: system: command not found...
[root@vbox esantos]# systemctl status sshd
● sshd.service - OpenSSH server daemon
    Loaded: loaded (/usr/lib/systemd/system/sshd.service; enabled; preset: ena>
    Active: active (running) since Fri 2025-09-05 17:11:32 PST; 53min ago
      Docs: man:sshd(8)
             man:sshd_config(5)
        Main PID: 861 (sshd)
          Tasks: 1 (limit: 10949)
         Memory: 2.3M
            CPU: 16ms
          CGroup: /system.slice/sshd.service
                  └─861 "sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups"

Sep 05 17:11:31 localhost.localdomain systemd[1]: Starting OpenSSH server daemon...
Sep 05 17:11:32 localhost.localdomain sshd[861]: Server listening on 0.0.0.0 po>
Sep 05 17:11:32 localhost.localdomain sshd[861]: Server listening on :: port 22.
Sep 05 17:11:32 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
```

```
[root@vbox esantos]# firewall-cmd --zone=public --permanent --add-service=ssh
Warning: ALREADY_ENABLED: ssh
success
[root@vbox esantos]# firewall-cmd --reload
success
[root@vbox esantos]#
```

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
```

```
esantos@vbox:~$ systemctl status sshd.service
● sshd.service - OpenSSH server daemon
   Loaded: loaded (/usr/lib/systemd/system/sshd.service; enabled; preset: enabled)
   Active: active (running) since Fri 2025-09-05 17:11:32 PST; 53min ago
     Docs: man:sshd(8)
           man:sshd_config(5)
     Main PID: 861 (sshd)
        Tasks: 1 (limit: 10949)
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Sep 05 17:11:31 localhost.localdomain systemd[1]: Starting OpenSSH server daemon...
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Sep 05 17:11:32 localhost.localdomain sshd[861]: Server listening on :: port 22.
Sep 05 17:11:32 localhost.localdomain systemd[1]: Started OpenSSH server daemon.
lines 1-16/16 (END)

[root@vbox esantos]# firewall-cmd --zone=public --permanent --add-service=ssh
Warning: ALREADY_ENABLED: ssh
success
[root@vbox esantos]# firewall-cmd --reload
success
[root@vbox esantos]# systemctl reload sshd
[root@vbox esantos]#
```

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**.

```
vboxuser@workstation:~ TX packets 292 bytes 29516 (29.5 KB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

vboxuser@workstation:~$ ls
CPE23S2  Downloads  id_rsa.pub      Pictures  Templates  yes.pub
Desktop   dvS        inventory.yaml  Public    Videos
Documents  id_rsa    Music          snap      yes

vboxuser@workstation:~$ ssh-copy-id esantos@192.168.56.104
The authenticity of host '192.168.56.104 (192.168.56.104)' can't be established.
ED25519 key fingerprint is SHA256:dqDn2Vh089WZNrATNJd0b9PchbHZCloKlV1l4UWkato.
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: 2 key(s) remain to be installed -- if you are prompt
ed now it is to install the new keys
esantos@192.168.56.104's password:

Number of key(s) added: 2

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

vboxuser@workstation:~$
```

Task 4: Verify ssh remote connection

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

```
vboxuser@workstation:~$ ls
CPE23S2    Downloads  id_rsa.pub      Pictures  Templates  yes.pub
Desktop     dvS       inventory.yaml  Public    Videos
Documents   id_rsa   Music          snap      yes
vboxuser@workstation:~$ ssh-copy-id esantos@192.168.56.104
The authenticity of host '192.168.56.104 (192.168.56.104)' can't be established.
ED25519 key fingerprint is SHA256:dqDn2Vh089WZNrATNjd0b9PchbHZCloKlV1l4UWkato.
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: 2 key(s) remain to be installed -- if you are prompt
ed now it is to install the new keys
esantos@192.168.56.104's password:

Number of key(s) added: 2

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

vboxuser@workstation:~$ ssh esantos@192.168.56.104
Last login: Fri Sep  5 18:15:47 2025
[esantos@vbox ~]$
```

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?

Choose Debian if you want community support, flexibility, and many supported devices.

Choose Red Hat-based if you need enterprise stability, longer support, and paid help for servers.

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

Debian is community-driven with DEB/APT, while Red Hat is enterprise-focused with RPM/YUM.