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Course/Section: CPE31S2	**Date Submitted: 9/12/25**
Instructor: Engr. Robin Valenzuela	**Semester and SY: 1st Sem 2025-2026**

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.

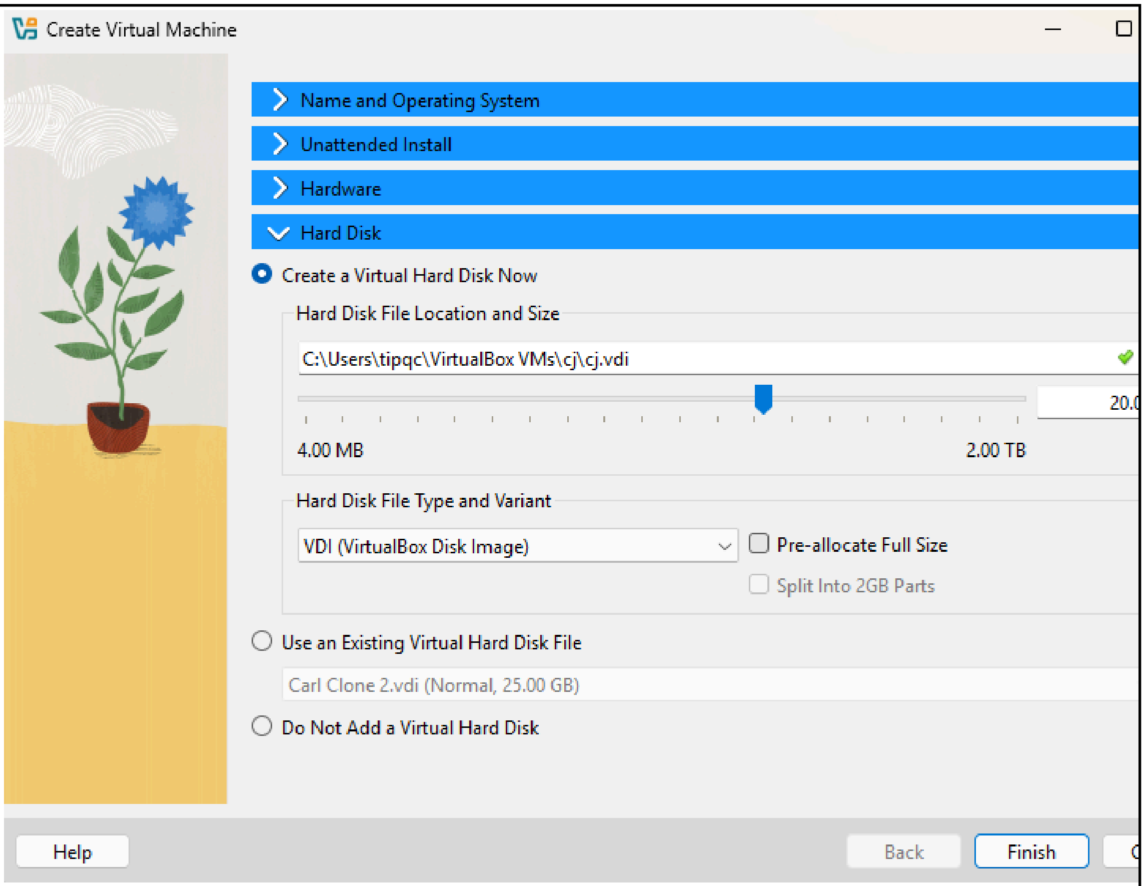
CentOS uses the RPM package format and YUM/DNF as the package manager.

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.



Create Virtual Machine

● Create a Virtual Hard Disk Now

Hard Disk File Location and Size

C:\Users\tipqc\VirtualBox VMs\cj\cj.vdi

4.00 MB 2.00 TB 20.0

Hard Disk File Type and Variant

VDI (VirtualBox Disk Image)

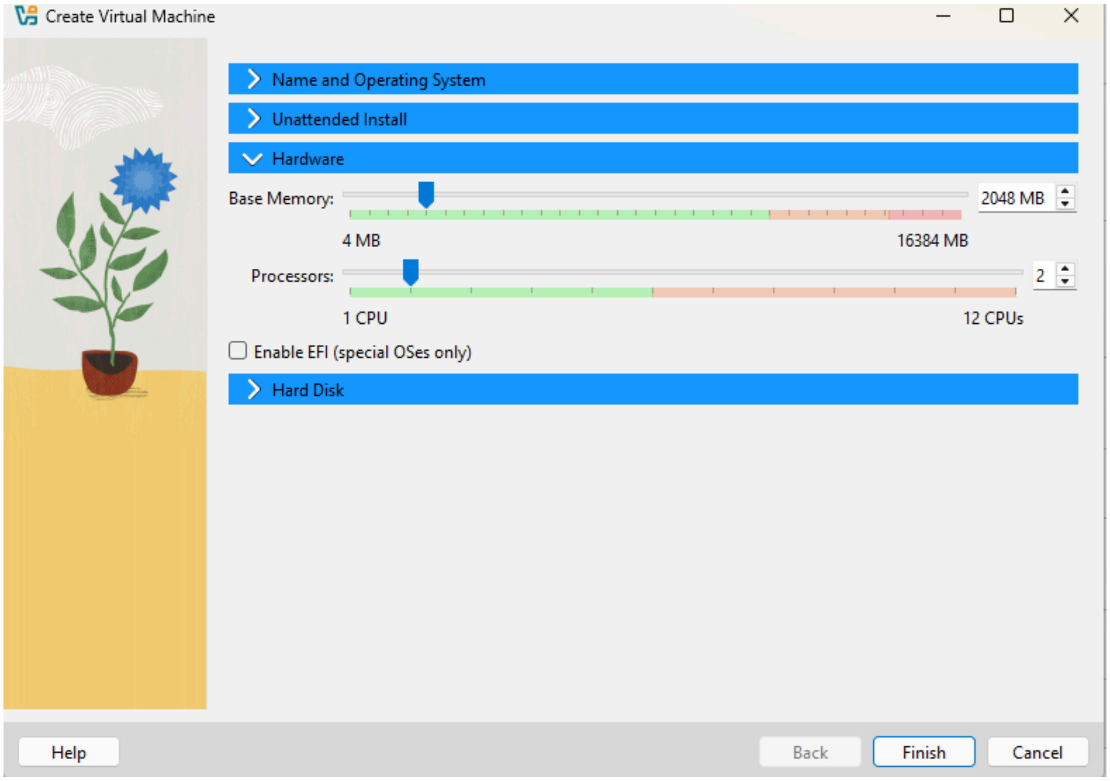
□ Pre-allocate Full Size

□ Split Into 2GB Parts

○ Use an Existing Virtual Hard Disk File

Carl Clone 2.vdi (Normal, 25.00 GB)

○ Do Not Add a Virtual Hard Disk



Create Virtual Machine

Base Memory: 2048 MB

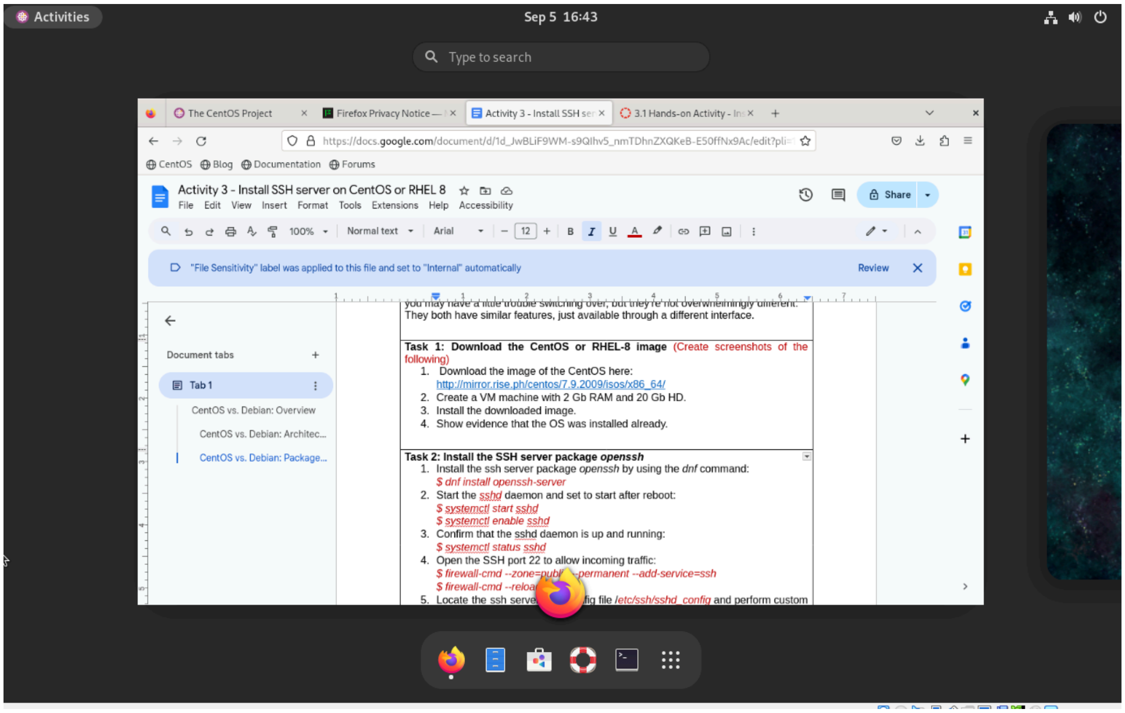
4 MB 16384 MB

Processors: 2

1 CPU 12 CPUs

□ Enable EFI (special OSes only)

3. Install the downloaded image.
4. Show evidence that the OS was installed already.



Activities
Sep 5 16:43
Type to search
The CentOS Project
Firefox Privacy Notice
Activity 3 - Install SSH se
3.1 Hands-on Activity - In
https://docs.google.com/document/d/1d_JwBLiF9WM-s9QIhv5_nmTDhnZXQKeB-E50fFNx9Ac/edit?pli
CentOS
Blog
Documentation
Forums
Activity 3 - Install SSH server on CentOS or RHEL 8
File
Edit
View
Insert
Format
Tools
Extensions
Help
Accessibility
Share
100%
Normal text
Arial
12
"File Sensitivity" label was applied to this file and set to "Internal" automatically
Review
Document tabs
Tab 1
CentOS vs. Debian: Overview
CentOS vs. Debian: Architec...
CentOS vs. Debian: Package...

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3. Install the downloaded image.
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Task 2: Install the SSH server package *openssh*

1. Install the ssh server package *openssh* by using the *dnf* command:
   $ dnf install openssh-server
2. Start the sshd daemon and set to start after reboot:
   $ systemctl start sshd
   $ systemctl enable sshd
3. Confirm that the sshd daemon is up and running:
   $ systemctl status sshd
4. Open the SSH port 22 to allow incoming traffic:
   $ firewall-cmd --zone=publ --permanent --add-service=ssh
   $ firewall-cmd --reloa
5. Locate the ssh serve fig file */etc/ssh/sshd_config* and perform custom

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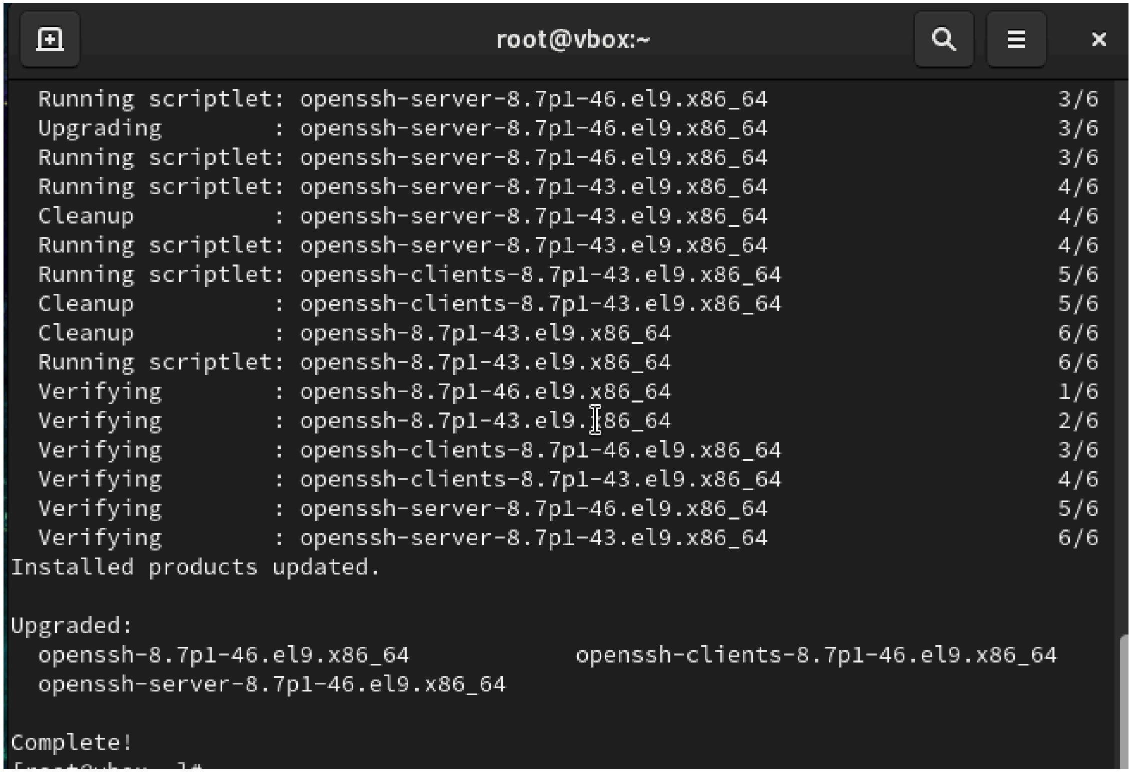
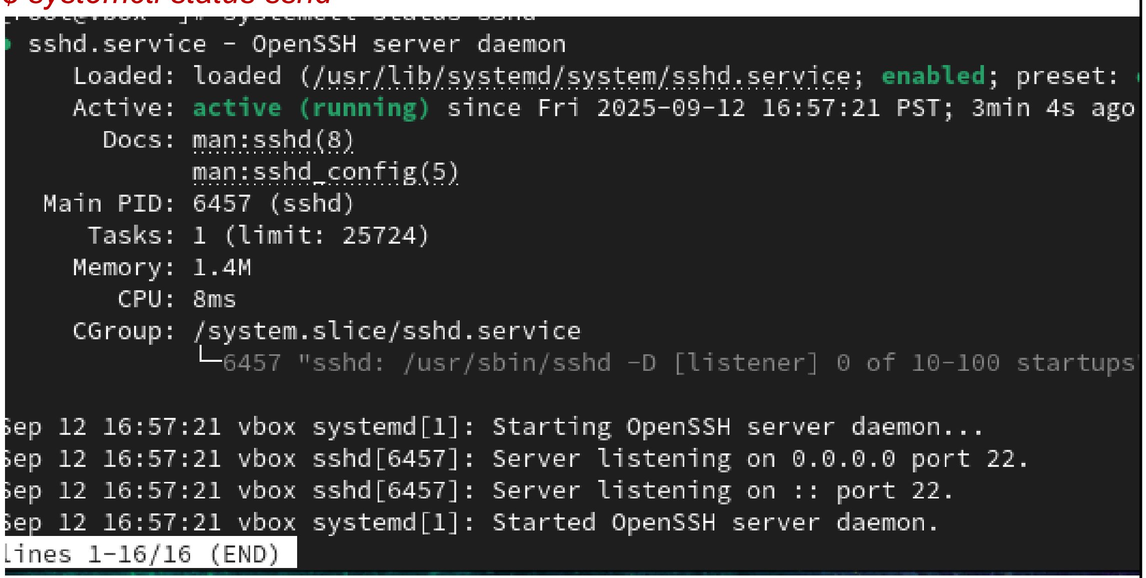


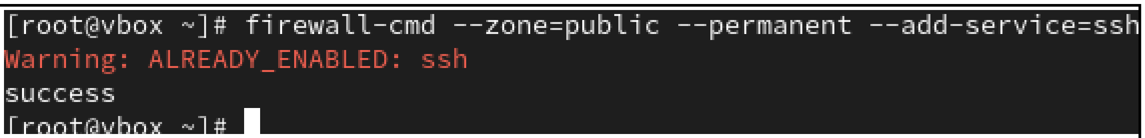
```
  Running scriptlet: openssh-server-8.7p1-46.el9.x86_64                    3/6
  Upgrading        : openssh-server-8.7p1-46.el9.x86_64                    3/6
  Running scriptlet: openssh-server-8.7p1-46.el9.x86_64                    3/6
  Running scriptlet: openssh-server-8.7p1-43.el9.x86_64                    4/6
  Cleanup          : openssh-server-8.7p1-43.el9.x86_64                    4/6
  Running scriptlet: openssh-server-8.7p1-43.el9.x86_64                    4/6
  Running scriptlet: openssh-clients-8.7p1-43.el9.x86_64                   5/6
  Cleanup          : openssh-clients-8.7p1-43.el9.x86_64                   5/6
  Cleanup          : openssh-8.7p1-43.el9.x86_64                           6/6
  Running scriptlet: openssh-8.7p1-43.el9.x86_64                           6/6
  Verifying        : openssh-8.7p1-46.el9.x86_64                           1/6
  Verifying        : openssh-8.7p1-43.el9.x86_64                           2/6
  Verifying        : openssh-clients-8.7p1-46.el9.x86_64                   3/6
  Verifying        : openssh-clients-8.7p1-43.el9.x86_64                   4/6
  Verifying        : openssh-server-8.7p1-46.el9.x86_64                    5/6
  Verifying        : openssh-server-8.7p1-43.el9.x86_64                    6/6
Installed products updated.

Upgraded:
  openssh-8.7p1-46.el9.x86_64           openssh-clients-8.7p1-46.el9.x86_64
  openssh-server-8.7p1-46.el9.x86_64

Complete!
[root@vbox ~]#
```

2. Start the *sshd* daemon and set to start after reboot:
   $ systemctl start sshd
   $ systemctl enable sshd
3. Confirm that the sshd daemon is up and running:
   $ systemctl status sshd



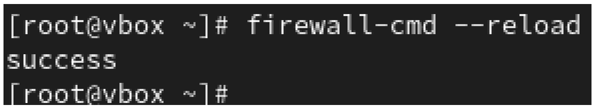
```
[root@vbox ~]# systemctl status sshd
● sshd.service - OpenSSH server daemon
     Loaded: loaded (/usr/lib/systemd/system/sshd.service; enabled; preset:
     Active: active (running) since Fri 2025-09-12 16:57:21 PST; 3min 4s ago
       Docs: man:sshd(8)
             man:sshd_config(5)
   Main PID: 6457 (sshd)
      Tasks: 1 (limit: 25724)
     Memory: 1.4M
        CPU: 8ms
     CGroup: /system.slice/sshd.service
             └─6457 "sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups

Sep 12 16:57:21 vbox systemd[1]: Starting OpenSSH server daemon...
Sep 12 16:57:21 vbox sshd[6457]: Server listening on 0.0.0.0 port 22.
Sep 12 16:57:21 vbox sshd[6457]: Server listening on :: port 22.
Sep 12 16:57:21 vbox 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



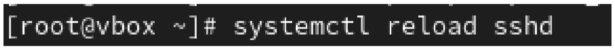
```
[root@vbox ~]# firewall-cmd --zone=public --permanent --add-service=ssh
Warning: ALREADY_ENABLED: ssh
success
[root@vbox ~]#
```

$ firewall-cmd --reload



```
[root@vbox ~]# firewall-cmd --reload
success
[root@vbox ~]#
```

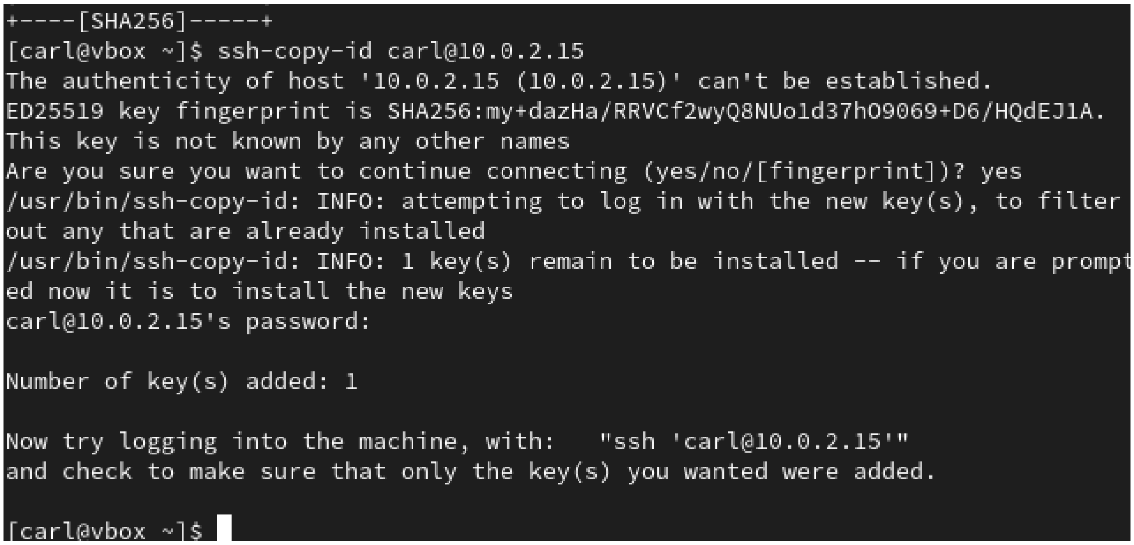
5. Locate the ssh server man config file /*etc/ssh/sshd_config* and perform custom configuration. Every time you make any change to the /*etc/ssh/sshd-config* configuration file reload the *sshd* service to apply changes:
   $ systemctl reload sshd



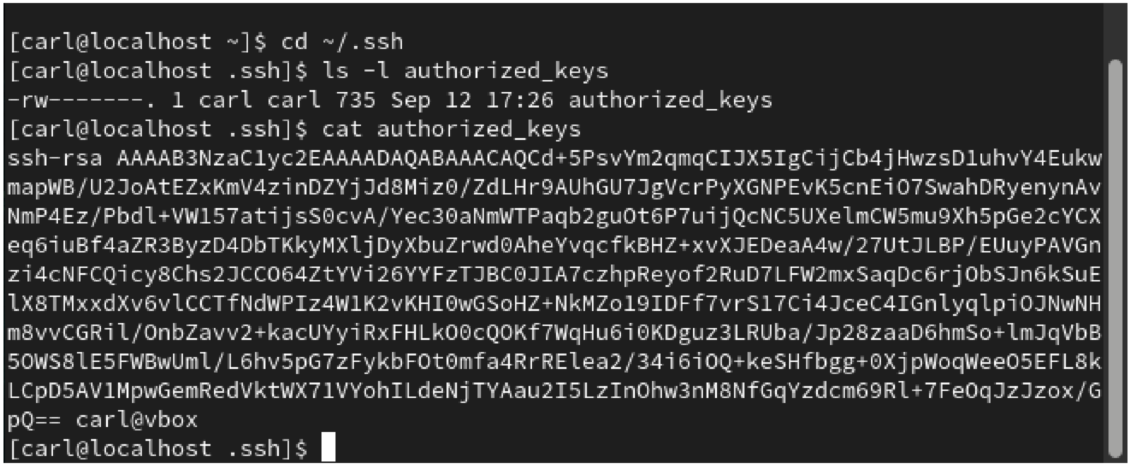
```
[root@vbox ~]# systemctl reload sshd
```

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*.



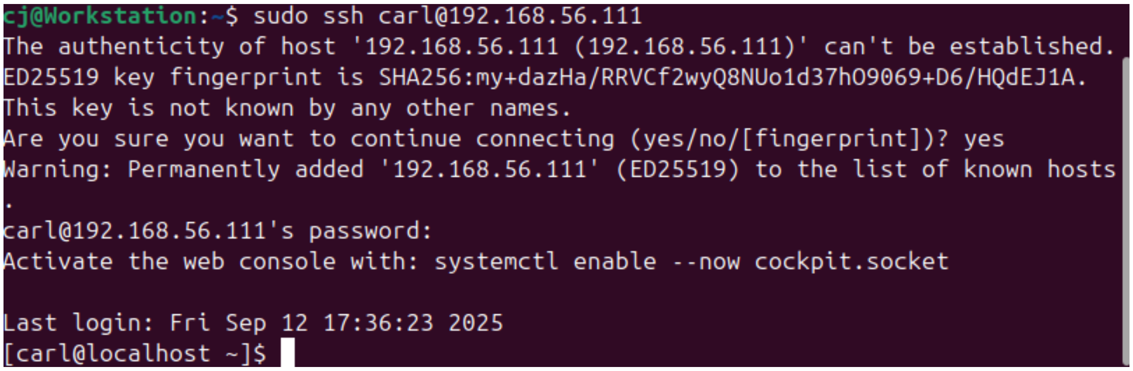
```
+----[SHA256]-----+
[carl@vbox ~]$ ssh-copy-id carl@10.0.2.15
The authenticity of host '10.0.2.15 (10.0.2.15)' can't be established.
ED25519 key fingerprint is SHA256:my+dazHa/RRVCf2wyQ8NUo1d37hO9069+D6/HQdEJ1A.
This key is not known by any other names
Are you sure you want to continue connecting (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 prompt
ed now it is to install the new keys
carl@10.0.2.15's password:

Number of key(s) added: 1

Now try logging into the machine, with:   "ssh 'carl@10.0.2.15'"
and check to make sure that only the key(s) you wanted were added.

[carl@vbox ~]$
```



```
[carl@localhost ~]$ cd ~/.ssh
[carl@localhost .ssh]$ ls -l authorized_keys
-rw-------. 1 carl carl 735 Sep 12 17:26 authorized_keys
[carl@localhost .ssh]$ cat authorized_keys
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAACAQCd+5PsvYm2qmqCIJX5IgCijCb4jHwzsD1uhvY4Eukw
mapWB/U2JoAtEZxKmV4zinDZYjJd8Miz0/ZdLHr9AUhGU7JgVcrPyXGNPEvK5cnEiO7SwahDRyenynAv
NmP4Ez/Pbdl+VW157atijsS0cvA/Yec30aNmWTPaqb2guOt6P7uijQcNC5UXelmCW5mu9Xh5pGe2cYCX
eq6iuBf4aZR3ByzD4DbTKkyMXljDyXbuZrwd0AheYvqcfkBHZ+xvXJEDeaA4w/27UtJLBP/EUuyPAVGn
zi4cNFCQicy8Chs2JCCO64ZtYVi26YYFzTJBC0JIA7czhpReyof2RuD7LFW2mxSaqDc6rjObSJn6kSuE
lX8TMxxdXv6vlCCTfNdWPIz4W1K2vKHI0wGSoHZ+NkMZo19IDFf7vrS17Ci4JceC4IGnlyqlpiOJNwNH
m8vvCGRil/OnbZavv2+kacUYyiRxFHLkO0cQOKf7WqHu6i0KDguz3LRUba/Jp28zaaD6hmSo+lmJqVbB
5OWS8lE5FWBwUml/L6hv5pG7zFykbFOt0mfa4RrRElea2/34i6iOQ+keSHfbgg+0XjpWoqWeeO5EFL8k
LCpD5AV1MpwGemRedVktWX71VYohILdeNjTYAau2I5LzInOhw3nM8NfGqYzdcm69Rl+7FeOqJzJzox/G
pQ== carl@vbox
[carl@localhost .ssh]$
```

Task 4: Verify ssh remote connection

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



```
cj@Workstation:~$ sudo ssh carl@192.168.56.111
The authenticity of host '192.168.56.111 (192.168.56.111)' can't be established.
ED25519 key fingerprint is SHA256:my+dazHa/RRVCf2wyQ8NUo1d37hO9069+D6/HQdEJ1A.
This key is not known by any other names.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '192.168.56.111' (ED25519) to the list of known hosts
.
carl@192.168.56.111's password:
Activate the web console with: systemctl enable --now cockpit.socket

Last login: Fri Sep 12 17:36:23 2025
[carl@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?
   - First of all we should consider the cost and budget between the two distributions. The Red Hat Enterprise offers plans for their services and products while the Debian is totally free.
2. What are the main diffence between Debian and Red Hat Linux distributions?
   - Debian uses the **`.deb`** package format and the **APT** (Advanced Package Tool) system. APT is well-regarded for its robust dependency resolution and ease of use.
   - While Red Hat Uses the **`.rpm`** package format and the **DNF** (Dandified YUM) package manager. DNF is the successor to YUM and is also very capable, with a focus on enterprise-level management tools.