

Name:	Date Performed:
Course/Section:	Date Submitted:
Instructor:	Semester and SY:
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.

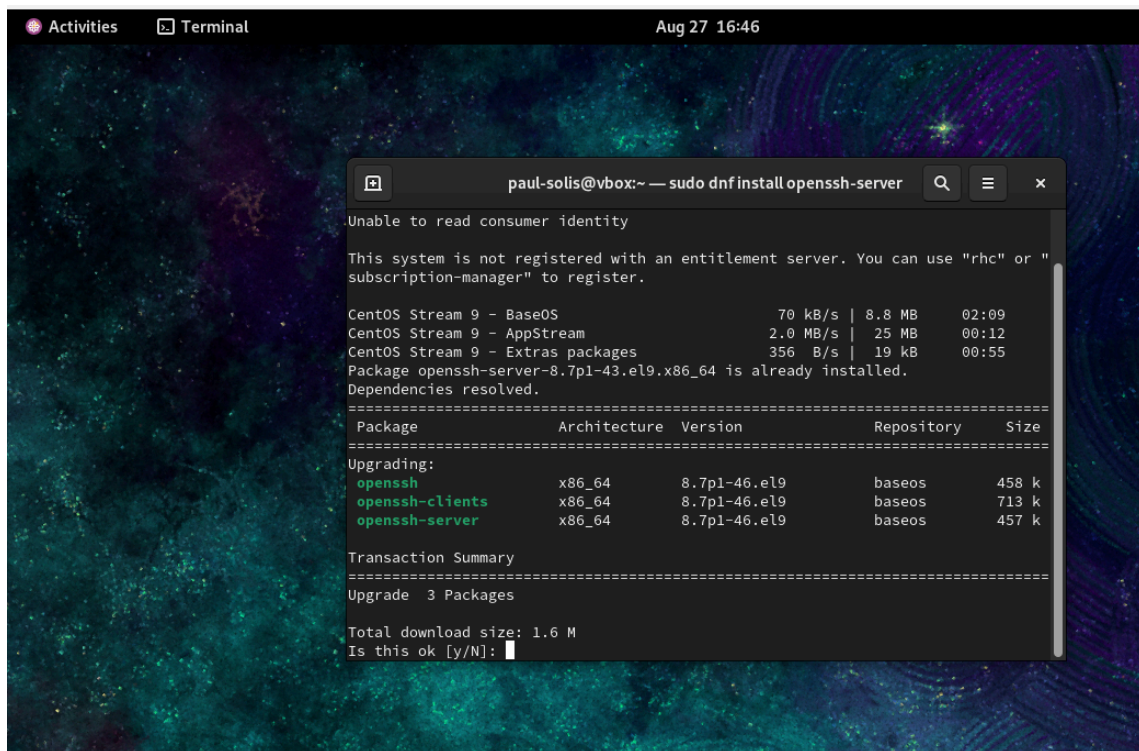
Task 1: Download the CentOS or RHEL-8 image (Create screenshots of the following)

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



```
Activities Terminal Aug 27 16:46

paul-solis@vbox:~ — sudo dnf install openssh-server

Unable to read consumer identity

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

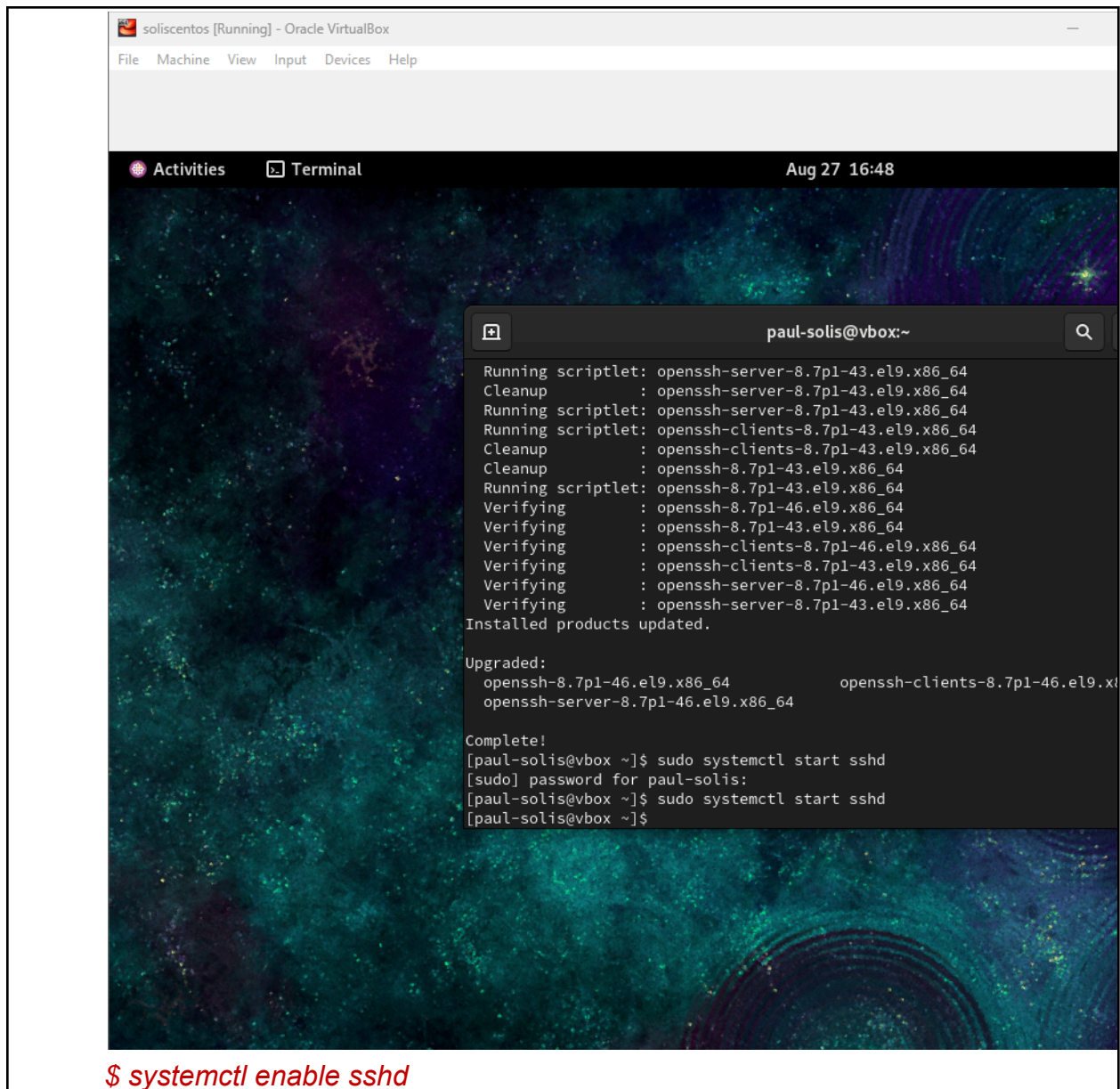
CentOS Stream 9 - BaseOS                70 kB/s | 8.8 MB    02:09
CentOS Stream 9 - AppStream              2.0 MB/s | 25 MB    00:12
CentOS Stream 9 - Extras packages        356 B/s | 19 kB     00:55
Package openssh-server-8.7p1-43.el9.x86_64 is already installed.
Dependencies resolved.
=====
Package                Architecture Version      Repository    Size
=====
Upgrading:
openssh                 x86_64      8.7p1-46.el9 baseos        458 k
openssh-clients         x86_64      8.7p1-46.el9 baseos        713 k
openssh-server          x86_64      8.7p1-46.el9 baseos        457 k
=====

Transaction Summary
=====
Upgrade 3 Packages

Total download size: 1.6 M
Is this ok [y/N]:
```

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

\$ systemctl start sshd



The screenshot shows a VirtualBox window titled "soliscentos [Running] - Oracle VirtualBox". The interface includes a menu bar (File, Machine, View, Input, Devices, Help) and a top bar with "Activities" and "Terminal" tabs. The date and time "Aug 27 16:48" are displayed. The terminal window, titled "paul-solis@vbox:~", shows the following output:

```
Running scriptlet: openssh-server-8.7p1-43.el9.x86_64
Cleanup      : openssh-server-8.7p1-43.el9.x86_64
Running scriptlet: openssh-server-8.7p1-43.el9.x86_64
Running scriptlet: openssh-clients-8.7p1-43.el9.x86_64
Cleanup      : openssh-clients-8.7p1-43.el9.x86_64
Cleanup      : openssh-8.7p1-43.el9.x86_64
Running scriptlet: openssh-8.7p1-43.el9.x86_64
Verifying    : openssh-8.7p1-46.el9.x86_64
Verifying    : openssh-8.7p1-43.el9.x86_64
Verifying    : openssh-clients-8.7p1-46.el9.x86_64
Verifying    : openssh-clients-8.7p1-43.el9.x86_64
Verifying    : openssh-server-8.7p1-46.el9.x86_64
Verifying    : openssh-server-8.7p1-43.el9.x86_64
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!
[paul-solis@vbox ~]$ sudo systemctl start sshd
[sudo] password for paul-solis:
[paul-solis@vbox ~]$ sudo systemctl enable sshd
[paul-solis@vbox ~]$
```

\$ systemctl enable sshd

```
paul-solis@vbox:~  
Cleanup      : openssh-server-8.7p1-43.el9.x86_64  
Running scriptlet: openssh-server-8.7p1-43.el9.x86_64  
Running scriptlet: openssh-clients-8.7p1-43.el9.x86_64  
Cleanup      : openssh-clients-8.7p1-43.el9.x86_64  
Cleanup      : openssh-8.7p1-43.el9.x86_64  
Running scriptlet: openssh-8.7p1-43.el9.x86_64  
Verifying    : openssh-8.7p1-46.el9.x86_64  
Verifying    : openssh-8.7p1-43.el9.x86_64  
Verifying    : openssh-clients-8.7p1-46.el9.x86_64  
Verifying    : openssh-clients-8.7p1-43.el9.x86_64  
Verifying    : openssh-server-8.7p1-46.el9.x86_64  
Verifying    : openssh-server-8.7p1-43.el9.x86_64  
Installed products updated.  
  
Upgraded:  
  openssh-8.7p1-46.el9.x86_64      openssh-clients-8.7p1-46.el9.x86_6  
  openssh-server-8.7p1-46.el9.x86_64  
  
Complete!  
[paul-solis@vbox ~]$ sudo systemctl start sshd  
[sudo] password for paul-solis:  
[paul-solis@vbox ~]$ sudo systemctl start sshd  
[paul-solis@vbox ~]$ systemctl enable sshd  
[paul-solis@vbox ~]$
```

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

\$ systemctl status sshd

```
paul-solis@vbox:~ — systemctl status sshd

Complete!
[paul-solis@vbox ~]$ sudo systemctl start sshd
[sudo] password for paul-solis:
[paul-solis@vbox ~]$ sudo systemctl start sshd
[paul-solis@vbox ~]$ systemctl enable sshd
[paul-solis@vbox ~]$ systemctl status sshd
● sshd.service - OpenSSH server daemon
   Loaded: loaded (/usr/lib/systemd/system/ssh.service; enabled; preset:
   Active: active (running) since Wed 2025-08-27 16:47:18 PST; 1min 55s a
     Docs: man:ssh(8)
           man:ssh_config(5)
   Main PID: 3256 (sshd)
     Tasks: 1 (limit: 23004)
    Memory: 1.4M
       CPU: 8ms
    CGroup: /system.slice/ssh.service
           └─3256 "sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startup

Aug 27 16:47:17 vbox systemd[1]: Starting OpenSSH server daemon...
Aug 27 16:47:17 vbox sshd[3256]: Server listening on 0.0.0.0 port 22.
Aug 27 16:47:17 vbox sshd[3256]: Server listening on :: port 22.
Aug 27 16:47:18 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

```
paul-solis@vbox:~  
[paul-solis@vbox ~]$ systemctl enable sshd  
[paul-solis@vbox ~]$ systemctl status sshd  
● sshd.service - OpenSSH server daemon  
   Loaded: loaded (/usr/lib/systemd/system/sshd.service; enabled; preset:  
   Active: active (running) since Wed 2025-08-27 16:47:18 PST; 1min 55s ago  
     Docs: man:sshd(8)  
           man:sshd_config(5)  
   Main PID: 3256 (sshd)  
     Tasks: 1 (limit: 23004)  
    Memory: 1.4M  
       CPU: 8ms  
    CGroup: /system.slice/sshd.service  
            └─3256 "sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startup:  
  
Aug 27 16:47:17 vbox systemd[1]: Starting OpenSSH server daemon...  
Aug 27 16:47:17 vbox sshd[3256]: Server listening on 0.0.0.0 port 22.  
Aug 27 16:47:17 vbox sshd[3256]: Server listening on :: port 22.  
Aug 27 16:47:18 vbox systemd[1]: Started OpenSSH server daemon.  
  
[1]+  Stopped                  systemctl status sshd  
[paul-solis@vbox ~]$ firewall-cmd --zone=public --permanent --add-service=ssh  
Warning: ALREADY_ENABLED: ssh  
success  
[paul-solis@vbox ~]$
```

\$ firewall-cmd --reload

```
paul-solis@vbox:~
• sshd.service - OpenSSH server daemon
  Loaded: loaded (/usr/lib/systemd/system/ssh.service; enabled; preset:
  Active: active (running) since Wed 2025-08-27 16:47:18 PST; 1min 55s a
  Docs: man:ssh(8)
        man:ssh_config(5)
  Main PID: 3256 (sshd)
  Tasks: 1 (limit: 23004)
  Memory: 1.4M
  CPU: 8ms
  CGroup: /system.slice/ssh.service
          └─3256 "sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startup

Aug 27 16:47:17 vbox systemd[1]: Starting OpenSSH server daemon...
Aug 27 16:47:17 vbox sshd[3256]: Server listening on 0.0.0.0 port 22.
Aug 27 16:47:17 vbox sshd[3256]: Server listening on :: port 22.
Aug 27 16:47:18 vbox systemd[1]: Started OpenSSH server daemon.

[1]+  Stopped                  systemctl status sshd
[paul-solis@vbox ~]$ firewall-cmd --zone=public --permanent --add-service=s
Warning: ALREADY_ENABLED: ssh
success
[paul-solis@vbox ~]$ firewall-cmd --reload
success
[paul-solis@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


```
paul-solis@vbox:~  
Active: active (running) since Wed 2025-08-27 16:47:18 PST; 1min 55s  
Docs: man:sshd(8)  
      man:sshd_config(5)  
Main PID: 3256 (sshd)  
Tasks: 1 (limit: 23004)  
Memory: 1.4M  
CPU: 8ms  
CGroup: /system.slice/sshd.service  
        └─3256 "sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startu  
Aug 27 16:47:17 vbox systemd[1]: Starting OpenSSH server daemon...  
Aug 27 16:47:17 vbox sshd[3256]: Server listening on 0.0.0.0 port 22.  
Aug 27 16:47:17 vbox sshd[3256]: Server listening on :: port 22.  
Aug 27 16:47:18 vbox systemd[1]: Started OpenSSH server daemon.  
  
[1]+  Stopped                  systemctl status sshd  
[paul-solis@vbox ~]$ firewall-cmd --zone=public --permanent --add-services=  
Warning: ALREADY_ENABLED: ssh  
success  
[paul-solis@vbox ~]$ firewall-cmd --reload  
success  
[paul-solis@vbox ~]$ systemctl reload sshd  
[paul-solis@vbox ~]$ systemctl reload sshd  
[paul-solis@vbox ~]$
```

Task 3: Copy the Public Key to CentOS

1. Make sure that **ssh** is installed on the local machine.

```
[paul-solis@vbox ~]$ ssh -V  
OpenSSH_8.7p1, OpenSSL 3.2.2 4 Jun 2024  
[paul-solis@vbox ~]$
```

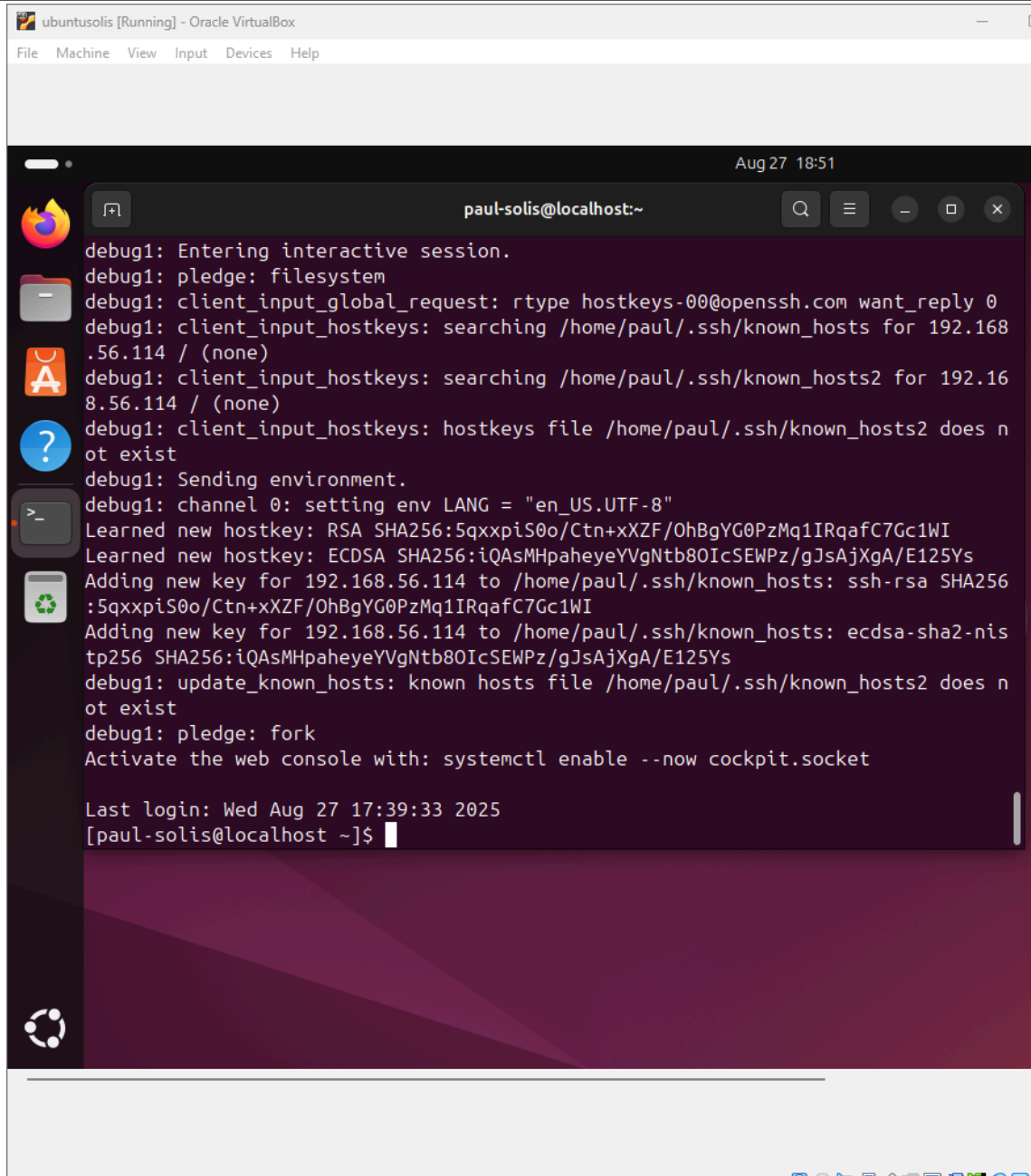
2. Using the command **ssh-copy-id**, connect your local machine to CentOS.


```
paul-solis@vbox:~  
RX packets 1  bytes 60 (60.0 B)  
RX errors 0  dropped 0  overruns 0  frame 0  
TX packets 0  bytes 0 (0.0 B)  
TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0  
  
lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536  
    inet 127.0.0.1  netmask 255.0.0.0  
    inet6 ::1  prefixlen 128  scopeid 0x10<host>  
    loop txqueuelen 1000  (Local Loopback)  
    RX packets 19  bytes 2155 (2.1 KiB)  
    RX errors 0  dropped 0  overruns 0  frame 0  
    TX packets 19  bytes 2155 (2.1 KiB)  
    TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0  
  
[paul-solis@vbox ~]$ ssh-copy-id  
Usage: /usr/bin/ssh-copy-id [-h|-?|-f|-n|-s] [-i [identity_file]] [-p port]  
alternative ssh_config file] [[-o <ssh -o options>] ...] [user@]hostname  
    -f: force mode -- copy keys without trying to check if they are al  
installed  
    -n: dry run    -- no keys are actually copied  
    -s: use sftp   -- use sftp instead of executing remote-commands. C  
useful if the remote only allows sftp  
    -h|-?: print this help
```

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

Task 4: Verify ssh remote connection

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

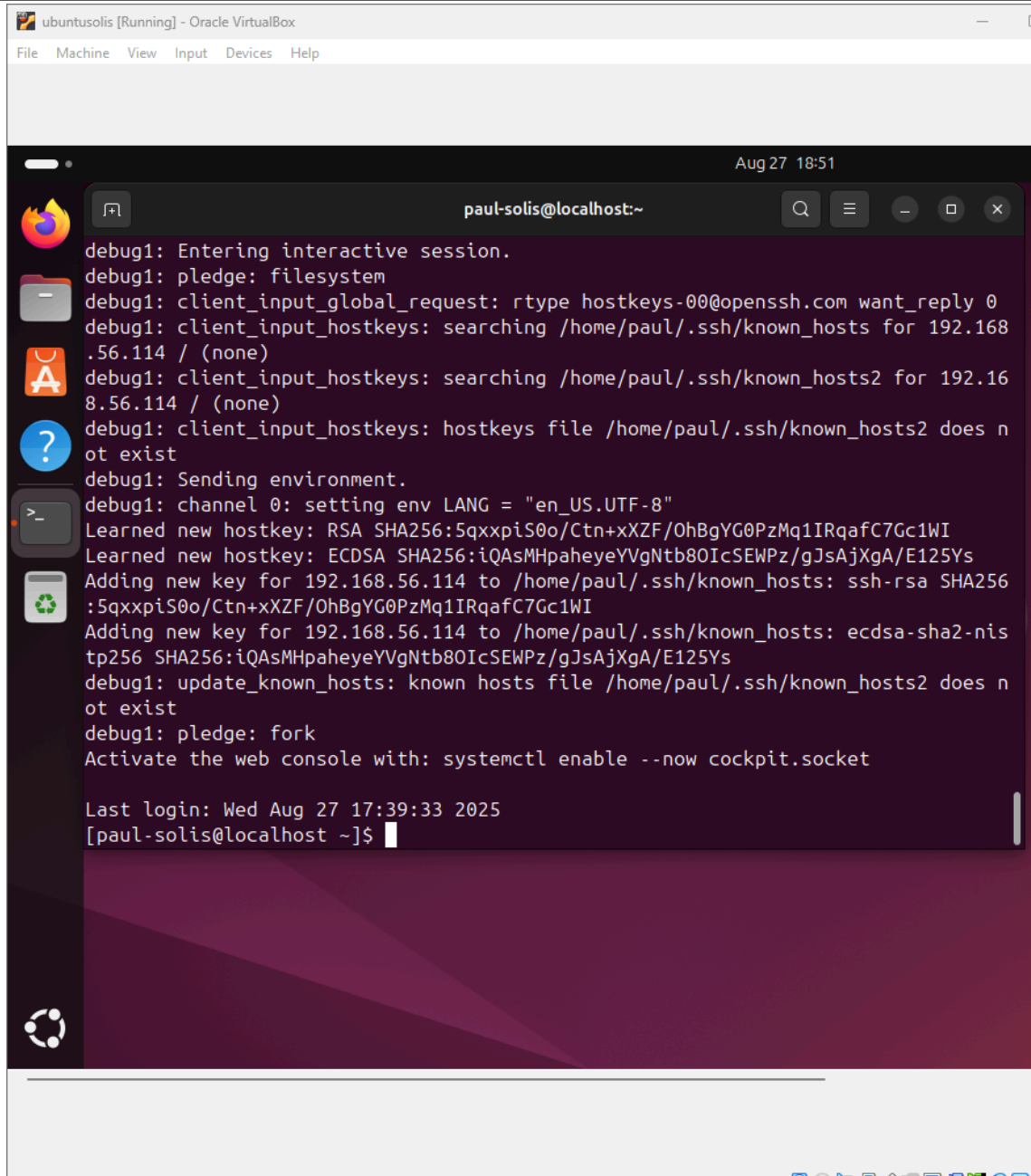


The screenshot shows a terminal window titled 'paul-solis@localhost:~' with a dark purple background. The terminal displays the following output:

```
debug1: Entering interactive session.
debug1: pledge: filesystem
debug1: client_input_global_request: rtype hostkeys-00@openssh.com want_reply 0
debug1: client_input_hostkeys: searching /home/paul/.ssh/known_hosts for 192.168
.56.114 / (none)
debug1: client_input_hostkeys: searching /home/paul/.ssh/known_hosts2 for 192.16
8.56.114 / (none)
debug1: client_input_hostkeys: hostkeys file /home/paul/.ssh/known_hosts2 does n
ot exist
debug1: Sending environment.
debug1: channel 0: setting env LANG = "en_US.UTF-8"
Learned new hostkey: RSA SHA256:5qxxpiS0o/Ctn+xXZF/OhBgYG0PzMq1IRqafC7Gc1WI
Learned new hostkey: ECDSA SHA256:iQAsMHpaheyeYVgNtb80IcSEWPz/gJsAjXgA/E125Ys
Adding new key for 192.168.56.114 to /home/paul/.ssh/known_hosts: ssh-rsa SHA256
:5qxxpiS0o/Ctn+xXZF/OhBgYG0PzMq1IRqafC7Gc1WI
Adding new key for 192.168.56.114 to /home/paul/.ssh/known_hosts: ecdsa-sha2-nis
tp256 SHA256:iQAsMHpaheyeYVgNtb80IcSEWPz/gJsAjXgA/E125Ys
debug1: update_known_hosts: known hosts file /home/paul/.ssh/known_hosts2 does n
ot exist
debug1: pledge: fork
Activate the web console with: systemctl enable --now cockpit.socket

Last login: Wed Aug 27 17:39:33 2025
[paul-solis@localhost ~]$
```

2. Show evidence that you are connected



The screenshot shows a terminal window titled 'paul-solis@localhost:~' with a dark purple background. The terminal output displays the following messages:

```
debug1: Entering interactive session.
debug1: pledge: filesystem
debug1: client_input_global_request: rtype hostkeys-00@openssh.com want_reply 0
debug1: client_input_hostkeys: searching /home/paul/.ssh/known_hosts for 192.168.56.114 / (none)
debug1: client_input_hostkeys: searching /home/paul/.ssh/known_hosts2 for 192.168.56.114 / (none)
debug1: client_input_hostkeys: hostkeys file /home/paul/.ssh/known_hosts2 does not exist
debug1: Sending environment.
debug1: channel 0: setting env LANG = "en_US.UTF-8"
Learned new hostkey: RSA SHA256:5qxxpiS0o/Ctn+xXZF/OhBgYG0PzMq1IRqafC7Gc1WI
Learned new hostkey: ECDSA SHA256:iQAsMHpaheyeYVgNtb80IcSEWPz/gJsAjXgA/E125Ys
Adding new key for 192.168.56.114 to /home/paul/.ssh/known_hosts: ssh-rsa SHA256:5qxxpiS0o/Ctn+xXZF/OhBgYG0PzMq1IRqafC7Gc1WI
Adding new key for 192.168.56.114 to /home/paul/.ssh/known_hosts: ecdsa-sha2-nistp256 SHA256:iQAsMHpaheyeYVgNtb80IcSEWPz/gJsAjXgA/E125Ys
debug1: update_known_hosts: known hosts file /home/paul/.ssh/known_hosts2 does not exist
debug1: pledge: fork
Activate the web console with: systemctl enable --now cockpit.socket

Last login: Wed Aug 27 17:39:33 2025
[paul-solis@localhost ~]$
```

On the left side of the terminal window, there is a vertical sidebar with several icons: a Firefox logo, a folder icon, an application icon, a question mark icon, a terminal icon, and a recycling icon. At the bottom left of the terminal window, there is a circular icon with three dots.

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?

Consider whether you require professional or community support while deciding between Red Hat and Debian. If you like a free, adaptable system and don't mind managing things independently, Debian is fantastic. It is well-liked for servers and personal projects. Red Hat is superior if you require dependable assistance and

security upgrades from a corporation, particularly in commercial settings or enterprises where certified software and uptime are essential.

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

Debian is a community-run operating system with many options and flexibility that installs software using APT. Although you have to handle everything yourself, it is renowned for being steady and dependable. RPM is used for software management in Red Hat, which is designed for companies. It offers paid assistance, frequent security upgrades, and is frequently utilized in large organizations where dependability and official support are crucial.