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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

```
[root@vbox atian]# 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.

CentOS Stream 9 - BaseOS                        137 kB/s | 8.8 MB     01:05
CentOS Stream 9 - AppStream                     1.9 MB/s |  25 MB     00:12
CentOS Stream 9 - Extras packages               3.4 kB/s |  19 kB     00:05
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
```

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

```
[root@vbox atian]# systemctl start sshd
[root@vbox atian]# systemctl enable sshd
[root@vbox atian]#
```

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

```
[root@vbox atian]# 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 14:07:01 PST; 2min 53s ago
       Docs: man:sshd(8)
             man:sshd_config(5)
   Main PID: 3681 (sshd)
      Tasks: 1 (limit: 10948)
     Memory: 1.4M
        CPU: 9ms
     CGroup: /system.slice/sshd.service
             └─3681 "sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups"

Sep 05 14:07:01 vbox systemd[1]: Starting OpenSSH server daemon...
Sep 05 14:07:01 vbox sshd[3681]: Server listening on 0.0.0.0 port 22.
Sep 05 14:07:01 vbox sshd[3681]: Server listening on :: port 22.
Sep 05 14:07:01 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
   $ firewall-cmd --reload

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

```
[atian@vbox ~]$ systemctl reload sshd
[atian@vbox ~]$
```

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*.

```
atian@ATIAN-Workstation:~$ ssh-copy-id atian@192.168.56.107
The authenticity of host '192.168.56.107 (192.168.56.107)' can't be established.
ED25519 key fingerprint is SHA256:67We3FTqseFjhiq1QiIj7OtOM7Py4Wk850VzqlujHF4.
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
atian@192.168.56.107's password:

Number of key(s) added: 1

Now try logging into the machine, with:   "ssh 'atian@192.168.56.107'"
and check to make sure that only the key(s) you wanted were added.

atian@ATIAN-Workstation:~$
```

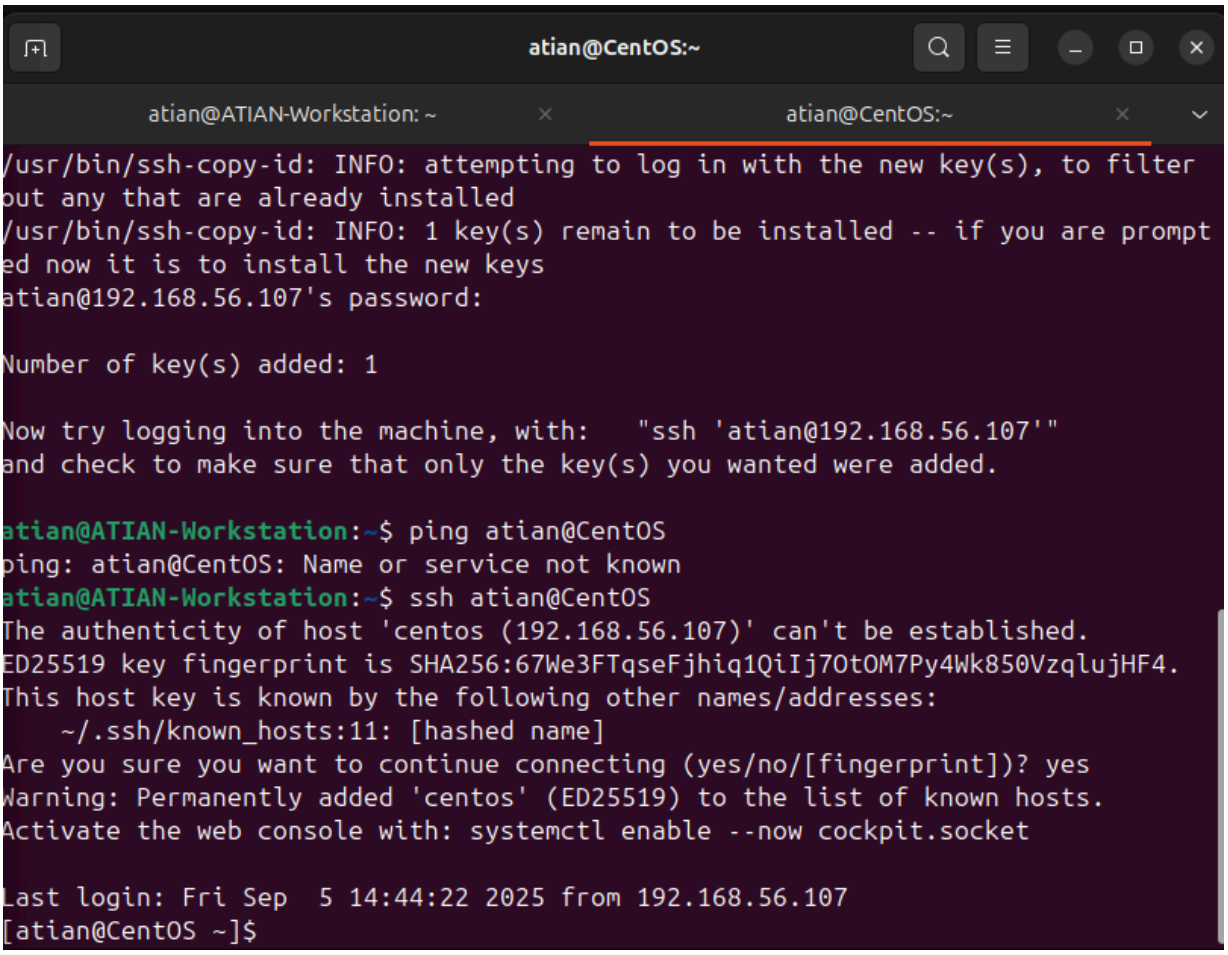
```
[atian@CentOS ~]$ cd ~/.ssh
[atian@CentOS .ssh]$ ls -la
total 16
drwx------.  2 atian atian   71 Sep  5 14:51 .
drwx------. 15 atian atian 4096 Sep  5 14:41 ..
-rw-------.  1 atian atian  749 Sep  5 14:51 authorized_keys
-rw-------.  1 atian atian  840 Sep  5 14:42 known_hosts
-rw-r--r--.  1 atian atian   96 Sep  5 14:41 known_hosts.old
[atian@CentOS .ssh]$
```

Task 4: Verify ssh remote connection

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

```
atian@ATIAN-Workstation:~$ ping 192.168.56.107
PING 192.168.56.107 (192.168.56.107) 56(84) bytes of data.
64 bytes from 192.168.56.107: icmp_seq=1 ttl=64 time=0.898 ms
64 bytes from 192.168.56.107: icmp_seq=2 ttl=64 time=0.471 ms
64 bytes from 192.168.56.107: icmp_seq=3 ttl=64 time=0.425 ms
64 bytes from 192.168.56.107: icmp_seq=4 ttl=64 time=0.409 ms
64 bytes from 192.168.56.107: icmp_seq=5 ttl=64 time=0.526 ms
^Z
[1]+  Stopped                 ping 192.168.56.107
```

```
[atian@CentOS ~]$ ping 192.168.56.101
PING 192.168.56.101 (192.168.56.101) 56(84) bytes of data.
64 bytes from 192.168.56.101: icmp_seq=1 ttl=64 time=0.495 ms
64 bytes from 192.168.56.101: icmp_seq=2 ttl=64 time=0.503 ms
64 bytes from 192.168.56.101: icmp_seq=3 ttl=64 time=0.414 ms
64 bytes from 192.168.56.101: icmp_seq=4 ttl=64 time=0.790 ms
^Z
[2]+  Stopped                 ping 192.168.56.101
[atian@CentOS ~]$ cd ~/.ssh
```



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?
   - *Debian and Red Hat are two major Linux distributions, each designed with different goals and users in mind. Debian is a community-driven project that is completely free and open-source, making it ideal for personal use, education, and experimentation. It emphasizes stability and simplicity, often using older but well-tested software packages. Debian uses .deb files and the apt package manager, which is known for being straightforward and efficient for installing and*

updating software. On the other hand, Red Hat Enterprise Linux (RHEL) is a commercially supported distribution developed by Red Hat, now owned by IBM. It is designed for enterprise environments where reliability, security, and professional support are critical. RHEL uses .rpm files and the dnf or yum package managers, and it offers certified updates, compliance tools, and long-term support contracts for businesses.

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

    - *When choosing between the two, the most important factors to consider are your goals and environment. If learning Linux, building personal projects, or working in a non-commercial setting, Debian is often the better choice due to its accessibility and strong community support. If you're deploying servers in a business or production environment where downtime is costly and support is essential, Red Hat is more appropriate because of its enterprise-grade tools and professional assistance. Debian is also more flexible for customization, while Red Hat focuses on consistency and certified configurations. Both are stable and secure, but Red Hat's paid model includes guarantees and services that Debian does not. Ultimately, the best distribution depends on prioritizing freedom and learning or reliability and support*.