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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.

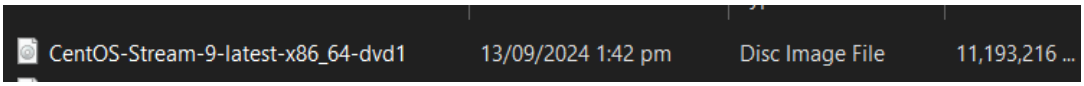
CentOS uses the RPM package format and YUM/DNF as the package manager.

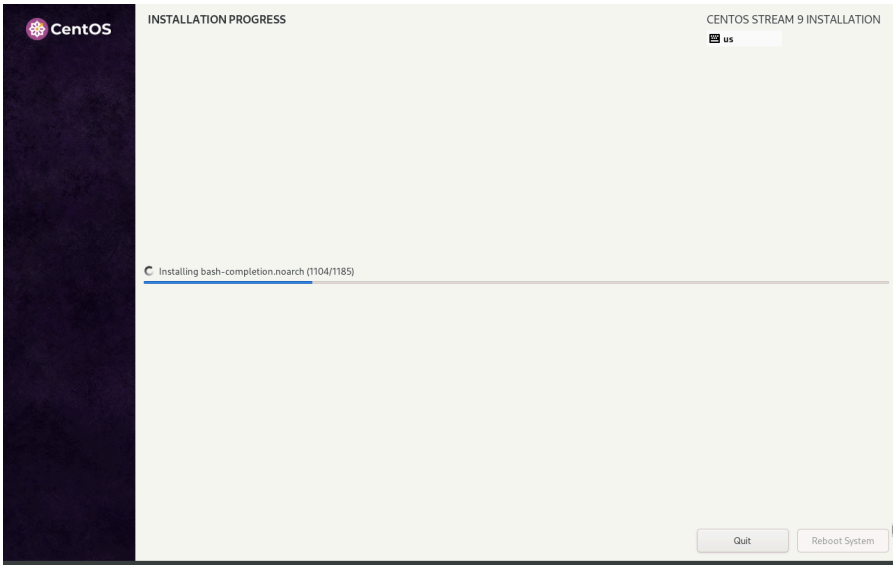
Debian uses the DEB package format and dpkg/APT as the package manager.

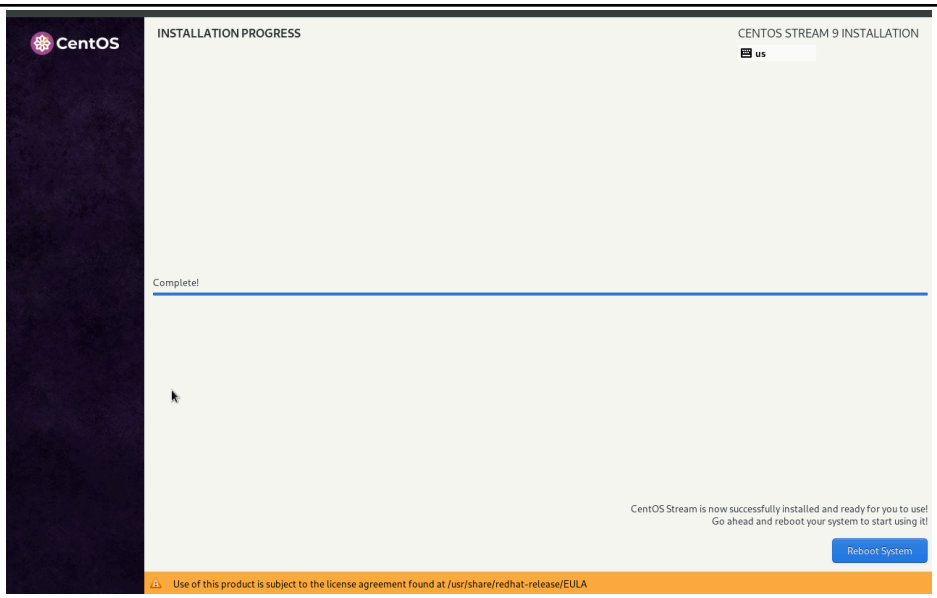
Both offer full-feature package management with network-based repository support, dependency checking and resolution, etc.. If you're familiar with one but not the other, you may have a little trouble switching over, but they're not overwhelmingly different. They both have similar features, just available through a different interface.

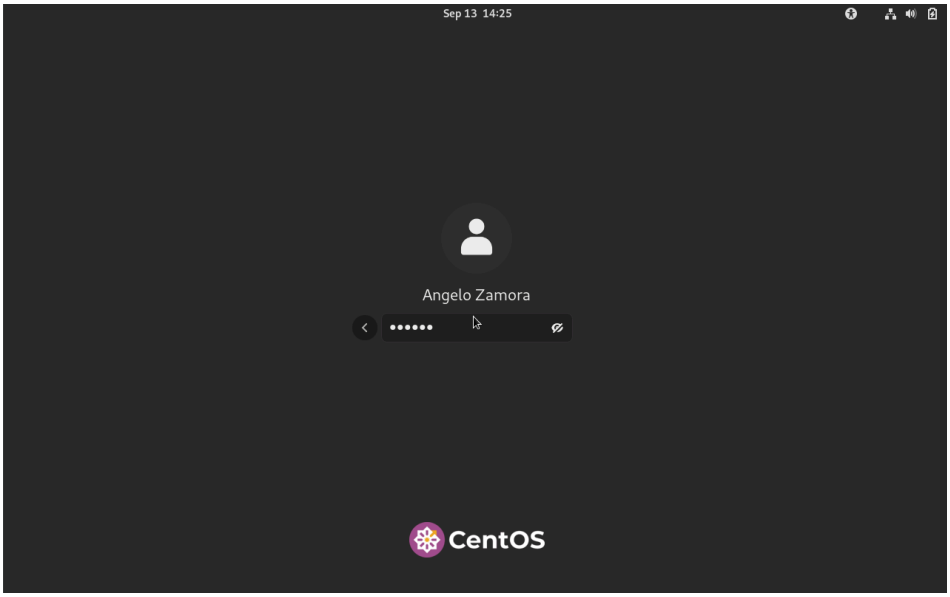
Task 1: Download the CentOS or RHEL-8 image (Create screenshots of the following)

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

```
[azamora@localhost ~]$ sudo dnf install openssh-server

We trust you have received the usual lecture from the local System
Administrator. It usually boils down to these three things:

    #1) Respect the privacy of others.
    #2) Think before you type.
    #3) With great power comes great responsibility.

[sudo] password for azamora:
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
CentOS Stream 9 - AppStream
CentOS Stream 9 - Extras packages
Package openssh-server-8.7p1-43.el9.x86_64 is already installed.
Dependencies resolved.
Nothing to do.
Complete!
[azamora@localhost ~]$
```

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

```
[azamora@localhost ~]$ systemctl start sshd
[azamora@localhost ~]$ systemctl enable sshd
[azamora@localhost ~]$
```

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

```
[azamora@localhost ~]$ systemctl status sshd
● sshd.service - OpenSSH server daemon
     Loaded: loaded (/usr/lib/systemd/system/sshd.service; enabled; preset: enabled)
     Active: active (running) since Fri 2024-09-13 14:25:07 PST; 7min ago
       Docs: man:sshd(8)
             man:sshd_config(5)
   Main PID: 936 (sshd)
      Tasks: 1 (limit: 23005)
     Memory: 2.3M
        CPU: 23ms
     CGroup: /system.slice/sshd.service
             └─936 "sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups"

Sep 13 14:25:07 localhost.localdomain systemd[1]: Starting OpenSSH server daemon...
Sep 13 14:25:07 localhost.localdomain sshd[936]: Server listening on 0.0.0.0 port 22.
Sep 13 14:25:07 localhost.localdomain sshd[936]: Server listening on :: port 22.
Sep 13 14:25:07 localhost.localdomain systemd[1]: Started OpenSSH server daemon.
[azamora@localhost ~]$
```

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

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

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

```
[azamora@localhost ~]$ systemctl reload sshd
[azamora@localhost ~]$
```

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*.

```
zamora@workstation:~$ ssh-copy-id -i ~/.ssh/id_rsa azamora@CentOS
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/home/zamora/.ssh/id_rsa.pub"
The authenticity of host 'centos (192.168.56.104)' can't be established.
ED25519 key fingerprint is SHA256:MUGPFZ1ykZqwRkUb19RJVLKautBIgfUi0gzn6zAaINc.
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 prompted now it is to install the new keys
azamora@centos's password:

Number of key(s) added: 1

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

zamora@workstation:~$
```

```
zamora@workstation:~$ ssh azamora@CentOS
Activate the web console with: systemctl enable --now cockpit.socket

Last login: Fri Sep 13 15:20:40 2024 from 192.168.56.101
[azamora@CentOS ~]$ cat ~/.ssh/authorized_keys
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAACAQC3Wd4Y1fNyViGHqww4PXj+foaNB44yW9k3kfe+chd75I6gCeeHQiVRMQ2j3erohU4SnaVrtTXskVTKoO2GXaDq8wroc6pU
dJXlCcsPscdKRPVK9DnzPHYqZs07PVHbH3OU1JqL3RlqugG7v0RDYtZs65MCj2X1upHRQDAndg1GjTizjBJ1C+zHu3u1esgIWAploFsiiwllVDShyxUT3sR6FPA3Q5477ov
SWLe02PkXprYIQxsBhFKLXhOuEYV5GEUK/92bwKdO0+Wp/wOc3IVJBxNsuVfkAtSr4SZhABpz2CM9NaR1HqabSycS3ThTL/dO51E6qdcfdj246FPnZqgPkibhy5mw0FHS1Hz
VRYCg1f6Vp4a0Y2qnUxaTPi3tPAeGdP1FQFMMUL7WB8ccVNk/30nSYsgeJoiWA/BTlf/2XgqqWwe6FMexj9FeV1uE7I95bPV3D5rtmH406RK53ESXD+XEeraKr4Lt4jtpex4
l4lh5f1yWOzzTA5dPFEHBBI8ZDF8oVofbNrOcXQ3VvaNy0csPSsAxlHfEEmeRq+KuynyvXQk2CL06mbrbaEfH8R4uJoAAtL3K1OvMJmSb7WATUWf1PiSyluufV+5ccZTCnjs
LgMLAeNRsitDB8daaVo+F4iuZzo7xIfW5NKqUcPGSxXx9OsF38tRPhZiYIMbEQ== zamora@workstation
[azamora@CentOS ~]$
```

Task 4: Verify ssh remote connection

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

```
zamora@workstation:~$ ssh azamora@CentOS
Activate the web console with: systemctl enable --now cockpit.socket

Last login: Fri Sep 13 15:18:24 2024
[azamora@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 deciding between Debian and Red Hat Linux, be sure that the mirror links

are still live so that the operating system can continue to be updated. In this activity, I previously utilized CentOS 7 and discovered that the mirror connections are no longer active, so I can't download anything. However, CentOS 9, thanks to Red Hat Linux support, can still download, perform updates, and operate, completing this task.

2. What are the main difference between Debian and Red Hat Linux distributions?
   The biggest distinction between Debian and Red Hat Linux is the package managers, with Red Hat using the RPM package and Debian utilizing the DEB package, similar to the apt manager. Another difference is that Debian is an upstream distribution that serves as the foundation for other Linux distributions, whereas Red Hat Linux is simply CentOS.