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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.

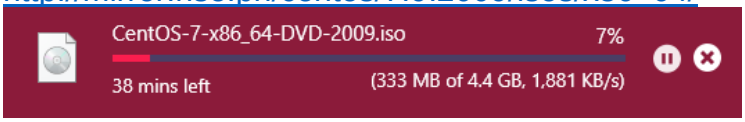
CentOS uses the RPM package format and YUM/DNF as the package manager.

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

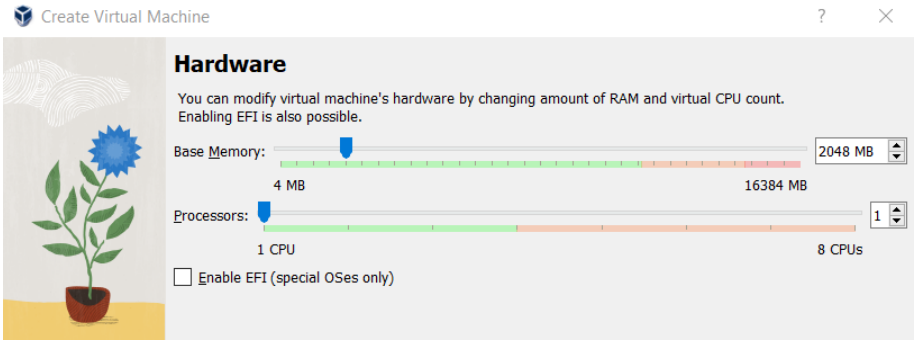
Both offer full-feature package management with network-based repository support, dependency checking and resolution, etc.. If you're familiar with one but not the other, you may have a little trouble switching over, but they're not overwhelmingly different. They both have similar features, just available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

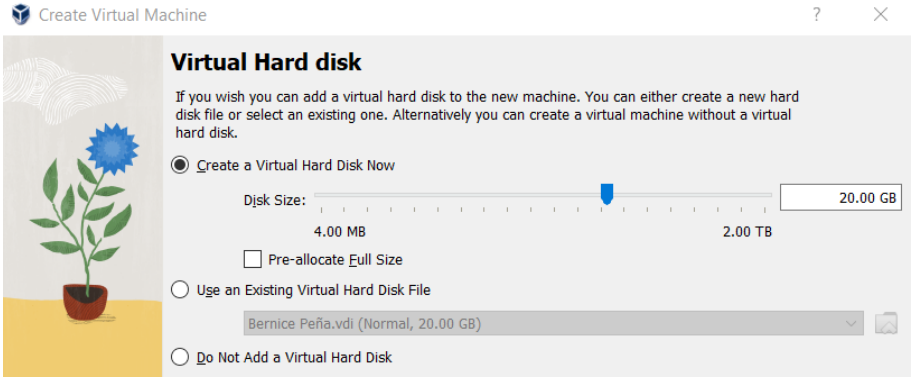
Task 1: Download the CentOS or RHEL-8 image (Create screenshots of the following)

1. Download the image of the CentOS here: http://mirror.rise.ph/centos/7.9.2009/isos/x86_64/

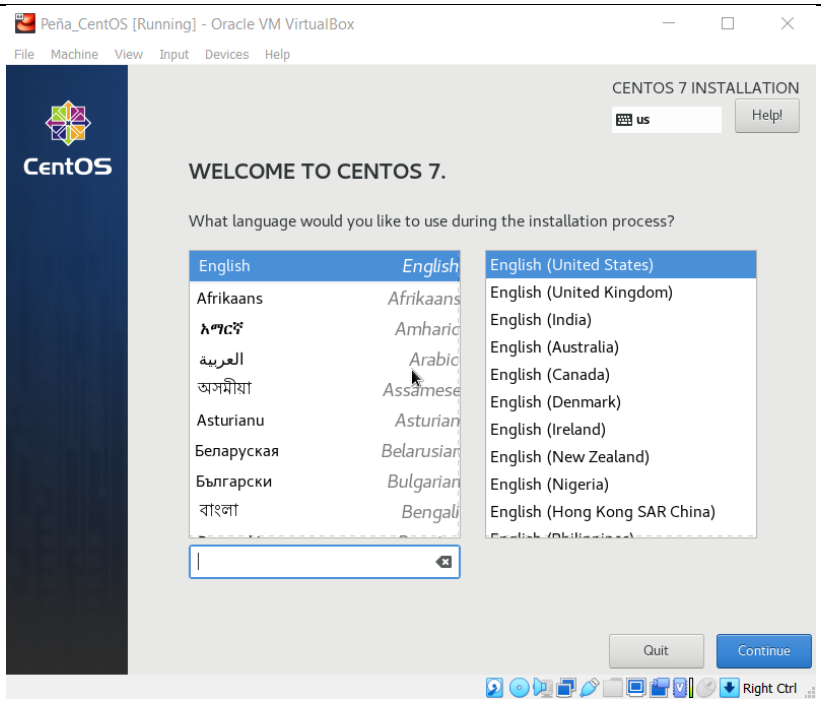


2. Create a VM machine with 2 Gb RAM and 20 Gb HD.

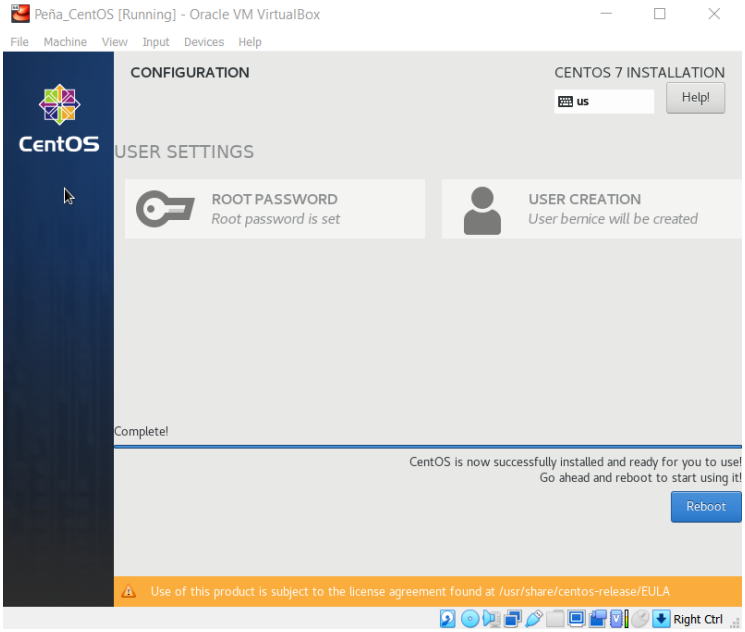




3. Install the downloaded image.



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@localhost ~]# dnf install openssh-server
CentOS-7 - Base                                  1.3 MB/s |  10 MB     00:07
CentOS-7 - Updates                               1.8 MB/s |  28 MB     00:15
CentOS-7 - Extras                                474 kB/s | 360 kB     00:00
Last metadata expiration check: 0:00:01 ago on Tue 05 Sep 2023 11:12:23 PM PST.
Package openssh-server-7.4p1-23.el7_9.x86_64 is already installed.
Dependencies resolved.
Nothing to do.
Complete!
[root@localhost ~]#
```

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

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

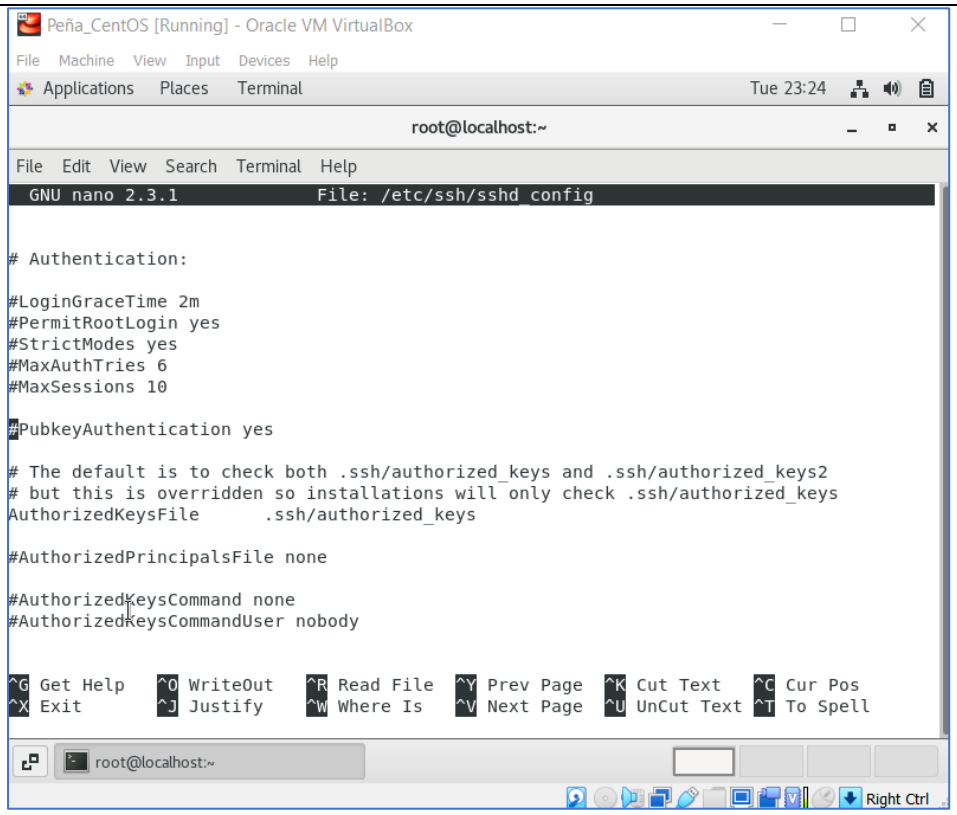
3. Confirm that the sshd daemon is up and running:
   $ systemctl status sshd

```
[bernice@localhost ~]$ systemctl status sshd
● sshd.service - OpenSSH server daemon
   Loaded: loaded (/usr/lib/systemd/system/sshd.service; enabled; vendor preset: enable
d)
   Active: active (running) since Tue 2023-09-05 23:04:27 PST; 11min ago
     Docs: man:sshd(8)
           man:sshd_config(5)
 Main PID: 1093 (sshd)
   CGroup: /system.slice/sshd.service
           └─1093 /usr/sbin/sshd -D
[bernice@localhost ~]$
```

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

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




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

Task 3: Copy the Public Key to CentOS

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

```
[bernice@localhost ~]$ ssh -V
OpenSSH_7.4p1, OpenSSL 1.0.2k-fips  26 Jan 2017
[bernice@localhost ~]$
```

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

```
bernice@Workstation-Pena:~$ ssh-copy-id bernice@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:AOC6vYlfbnp7ObBIkmkeltFrzJ5O9A/XyuhPA/VS4lw.
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
bernice@192.168.56.104's password:

Number of key(s) added: 1

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

bernice@Workstation-Pena:~$ ssh bernice@192.168.56.104
Last login: Tue Sep  5 23:04:40 2023
[bernice@localhost ~]$
```

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

```
[bernice@localhost ~]$ cd ~/.ssh
[bernice@localhost .ssh]$ ls
authorized_keys
[bernice@localhost .ssh]$ cat authorized_keys
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAACAQDvWbzSuoH0FE2d1ZqrojN1SvR5Ob8HP+P1+Nx8hnAdbgo5ixw
cfg+mF6swJSTTER7dgyR5AVD/d8AtCKYyf1jDinYchxyyyUPs/zTR7/vWSVcwFdfcq66+VEcTIjiPI+pERi1lbH
SV1LY0o0d1PqypFieXIQHkP3eOuOG1cGea1bwg0sYF/DliJ98iM3fpqLHQPBgMk1K2235Po14YelEaxAKG+TtzG
SJDGPNXSKRMtuGgDPyz3Bab34ptT15TdUNLU7wVTe8fIrQTEDBj09NxioMwglUOIvJm6GOh4UVNIPRpPjESIhc9
yd7T18uzhy1upqP/WpVy0L/kCYUGH/wAUkcinS2g4EX/kg6TWQRVM75NDKKKozY0AQMDZeMZGgniXoArGRNl2wN
Xk+j4DPDeFM3rsiltG2EaB343WlYsGKQloCg9JGzq9NU+0kMm2gQX5KhxfkOygjq3jfDE32do8f34eXxm35wggQ
p8npilGvnwhMoh4DNa/c/HP/9ZinjfFvjt9Ln4krB91FVkEpzXlTQKETD/45hmXCElJBWbS77VO0lApKoWjzb5q
CHNiXMwexVzTURRbrvw9gGVky9/TSBcpvrOKk2KbnkuUw7SwsNMtJR9NcszSZ22Bjb+8rV/IBIgOISbpP3+703W
hmVLSTk3jexGs8TU8DFcTiSsrw== bernquinn2001@gmail.com
[bernice@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.

```
bernice@Workstation-Pena:~$ ssh bernice@192.168.56.104
Last login: Tue Sep  5 23:37:54 2023 from 192.168.56.1
[bernice@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?
   When deciding between Debian and Red Hat Linux distributions, it's crucial to consider the unique requirements and objectives. Debian is known for its exceptional stability making it an excellent choice for environments where system reliability is paramount such as production servers, its extensive repository of software packages caters to a wide range of needs. On the other hand, Red Hat-based distributions like CentOS, are often preferred in enterprise settings due to their robust support, security features, and compatibility with enterprise software solutions. The decision ultimately revolves around the balance between stability and access to cutting-edge features, with Debian offering steadfast dependability and Red Hat options providing a strong foundation for business-critical applications.

2. What are the main diffence between Debian and Red Hat Linux distributions?
   Debian and Red Hat are two major types of Linux-based computer operating systems with significant differences. Debian manages software through the "apt" tool, which makes it simple to install and update packages. In contrast, Red Hat uses "yum" or "dnf" for the same purpose, which is equivalent to using a different tool. Debian is noted for its stability and lack of rapid change. Red Hat has CentOS, which is also reliable and updates more frequently to meet the demands of diverse users. So, based on what a user chooses or requires, it's like deciding between a stable and reliable alternative (Debian or CentOS).