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Course/Section: CPE31S5	Date Submitted: Sep 6, 2023
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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.

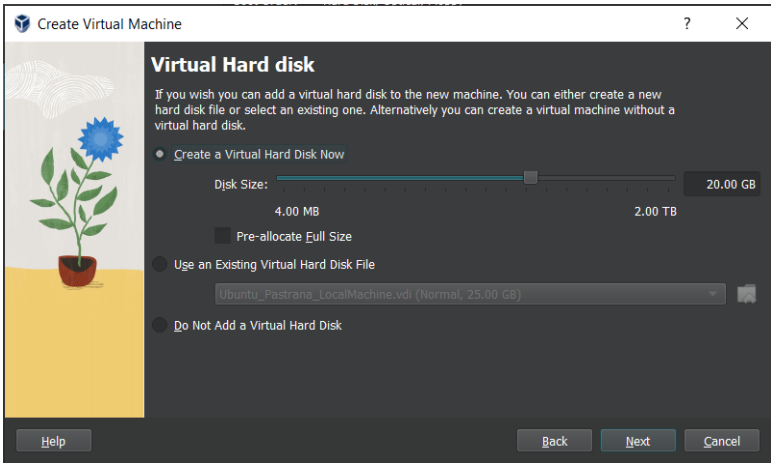
Debian uses the DEB package format and dpkg/APT as the package manager.

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.

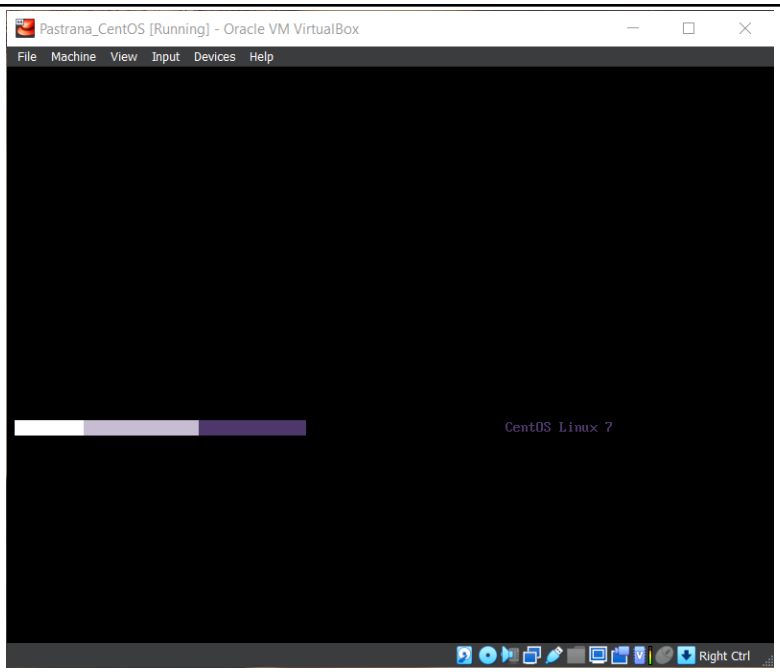
Task 1: Download the CentOS or RHEL-8 image (Create screenshots of the following)

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

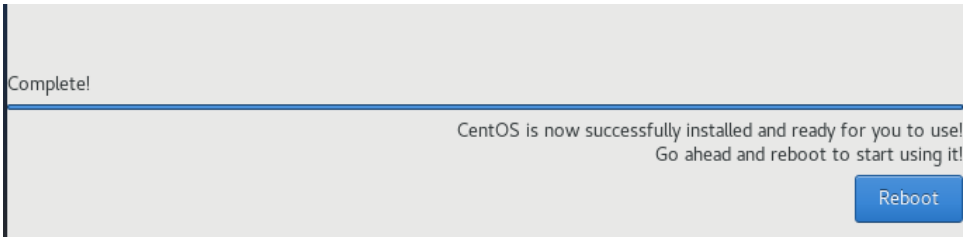
2. Create a VM machine with 2 Gb RAM and 20 Gb HD.

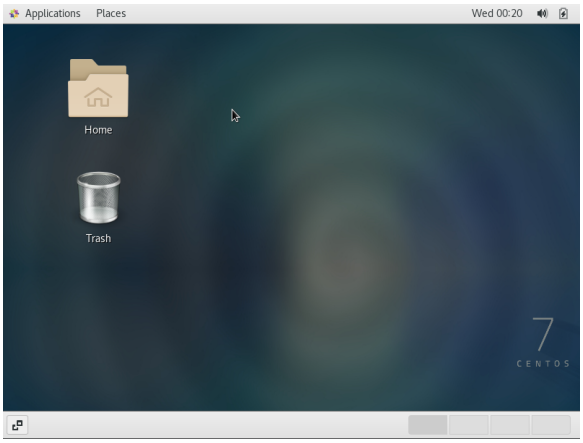


3. Install the downloaded image.



4. Show evidence that the OS was installed already.





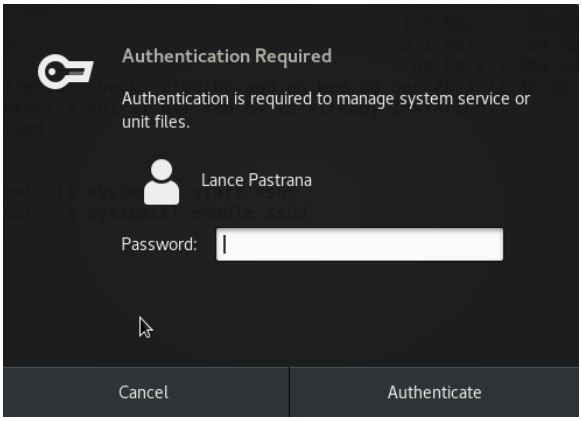
Task 2: Install the SSH server package *openssh*

1. Install the ssh server package *openssh* by using the *dnf* command:
   $ dnf install openssh-server

```
[lpastrana@localhost ~]$ sudo dnf install openssh-server
Extra Packages for Enterprise Linux 7 - x86_64         120 kB/s |  17 MB     02:21
CentOS-7 - Base                                        1.2 MB/s |  10 MB     00:08
CentOS-7 - Updates                                     2.1 MB/s |  28 MB     00:13
CentOS-7 - Extras                                       66 kB/s | 360 kB     00:05
Last metadata expiration check: 0:00:06 ago on Wed 06 Sep 2023 12:46:08 AM PST.
Package openssh-server-7.4p1-21.el7.x86_64 is already installed.
Dependencies resolved.
Nothing to do.
Complete!
```

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

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



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

```
[lpastrana@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 Wed 2023-09-06 00:19:40 PST; 48min ago
     Docs: man:sshd(8)
           man:sshd_config(5)
 Main PID: 1114 (sshd)
   CGroup: /system.slice/sshd.service
           └─1114 /usr/sbin/sshd -D
```

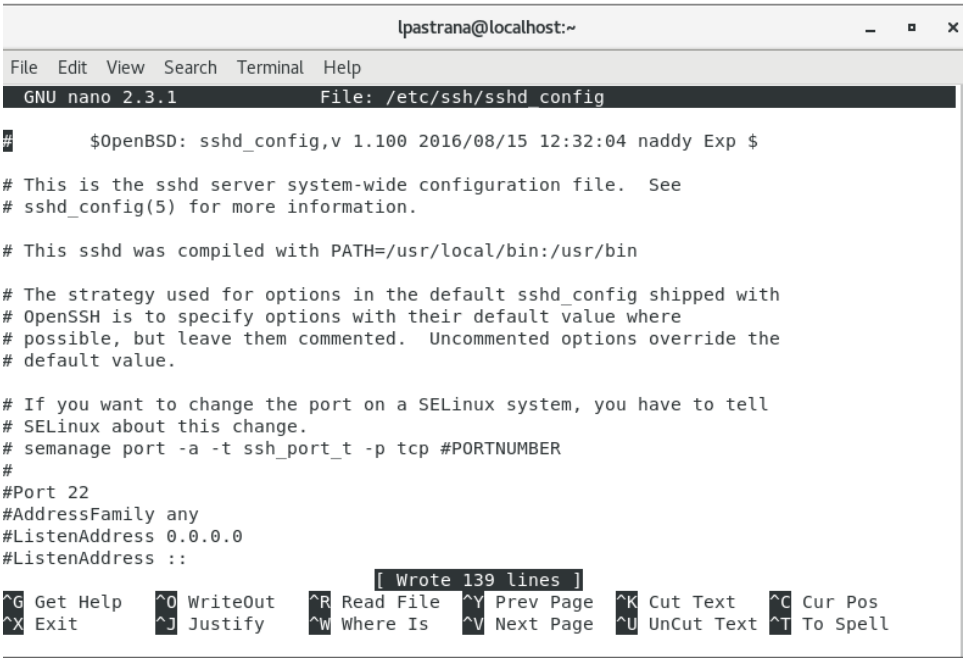
4. Open the SSH port 22 to allow incoming traffic:
   $ firewall-cmd --zone=public --permanent --add-service=ssh

```
Warning: ALREADY_ENABLED: ssh
success
```

   $ firewall-cmd --reload

```
[lpastrana@localhost ~]$ firewall-cmd --reload
success
```

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




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

Task 3: Copy the Public Key to CentOS

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

```
pastrana@localmachine:~$ sudo apt install openssh-server
[sudo] password for pastrana:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
openssh-server is already the newest version (1:8.9p1-3ubuntu0.3).
0 upgraded, 0 newly installed, 0 to remove and 209 not upgraded.
```

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

```
pastrana@localmachine:~$ ssh-copy-id lpastrana@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:HD1VAUM8TFm0PVnLf91PiDFK9w4O5Lz0Rc9txyczF3g.
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
lpastrana@192.168.56.104's password:

Number of key(s) added: 1

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

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

```
[lpastrana@localhost .ssh]$ cat authorized_keys
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAACAQDCQxyTmWBz271gM/nMelnGimL5qmDosq8v6BV7uucPFJP3Tny
lDpOl0kGdOp+kyiQmsHppUcwnEWmAWbrYyIc9XckQghNSGDI/XX1ixu9XAbYetY+txKhr1xI+IaEmsgMd9qXxC4
Ky1B6GPcvfakW7A8QOcg7a/iHj0x2NHP/ZptlduP5mKxwjWO3LXbKcB3aGPTxirdrD0G7bx5YRHOWH3O1+z9GUF
1YdfwaHus2G1Q/c0dVV1TnkZrwzngEqu/KLfEj3NnetkWxLWwmqLwlISoC519veEL/n4W2j48gkxSTT7X02FHuJ
eCRQQGewJusuj2v8PtuXCn9TxAsIfGpF1N0FrHaidSnwVub39vcjZmnKAKEl4uaZ5I9qdbmdOE1gW9meDKWRb7T
BHJNDFNQJ26FimxdqLKm7ChULY4m6KP+XWDfB+cYngugb8pjTbSQtDvsTPsMZQ4mLHWr7cHWB0UmMNRq2YmO87K
hoKCerZrZ5YAdwXATN79k48h8vcLB9pd9+XgvI+oALp65fa9N4GvwLxl/+JNOPOQN1MCaqruqY/E7mc5gRXGwY2
hSfpp0b1qGSXWZiNaqvuDYwcsOZYYH2ZF2DP70dm9kM73MmPGVDSYjmLiG/fUQGr9PBkFKmhZs3duU3EJgYB60h
7IY9HG0Vi8xr9cmbKU6BQru8lw== pastrana@localmachine
```

Task 4: Verify ssh remote connection

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

```
pastrana@localmachine:~$ ssh lpastrana@192.168.56.104
Last login: Wed Sep  6 10:35:56 2023
[lpastrana@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?**
   - Although I already have a little experience with CentOS, I learned that many developers like Debian and CentOS depending on their requirements. I prefer Debian linux distributions over red hats. Using debian linux is much more easy to use than Red Hat due to the fact that we don't need to click the capture every time you're going to input a code. Also, there are some syntax that I used to be familiar with in debian but I think cannot be used in CentOS.

2. What are the main differences between Debian and Red Hat Linux distributions?
   - Debian and RedHat are two well-known Linux distributions with significant differences. Debian makes use of "apt-get" and ".deb" packages to provide a diverse range of software, whereas Red Hat makes use of "yum" or "dnf" with ".rpm" packages and prioritizes reliability over software variety. Debian has a flexible release cycle that includes "stable," "testing," and "unstable" versions, whereas Red Hat offers long-term support (LTS) for major releases. Debian is supported by the community, whereas Red Hat provides commercial support.