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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.

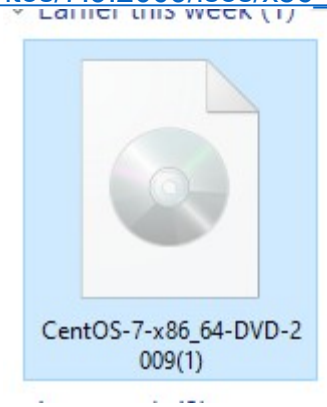
CentOS uses the RPM package format and YUM/DNF as the package manager.

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

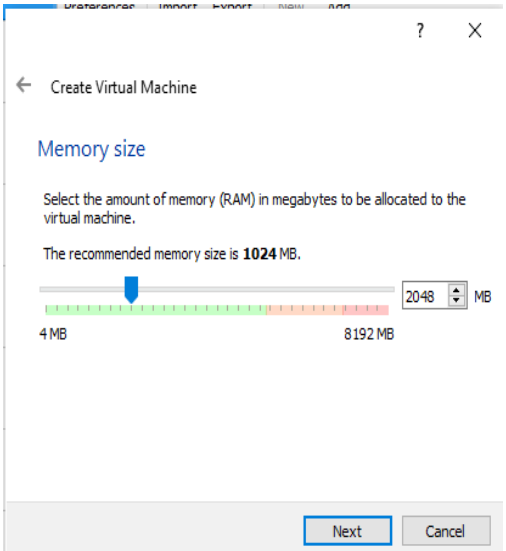
Both offer full-feature package management with network-based repository support, dependency checking and resolution, etc.. If you're familiar with one but not the other, you may have a little trouble switching over, but they're not overwhelmingly different. They both have similar features, just available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

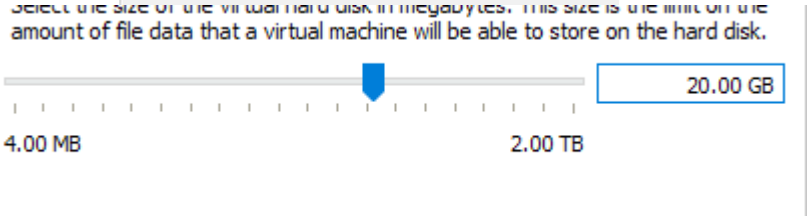
Task 1: Download the CentOS or RHEL-8 image (Create screenshots of the following)

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

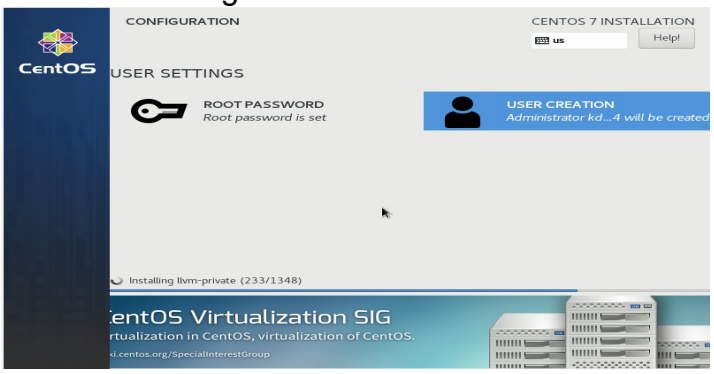


2. Create a VM machine with 2 Gb RAM and 20 Gb HD.

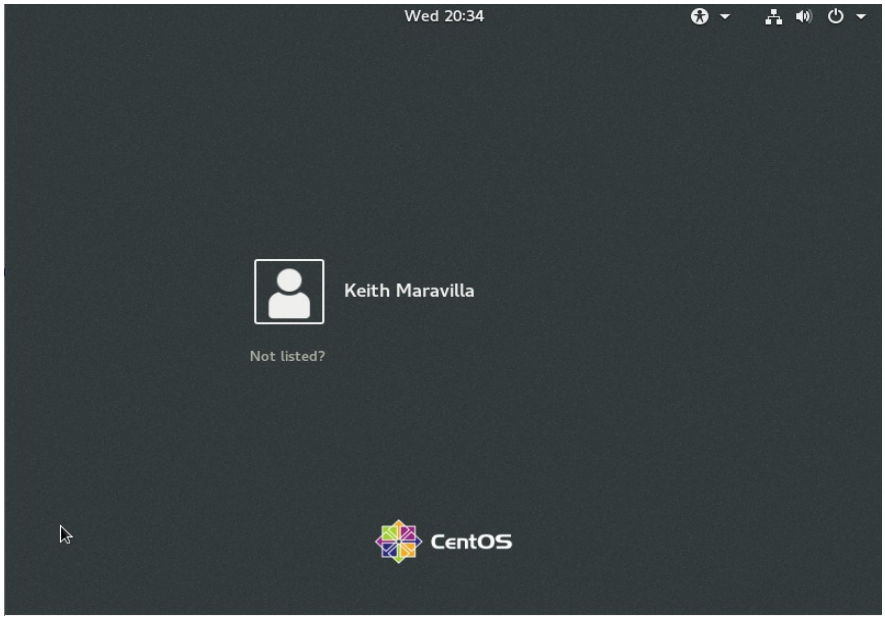


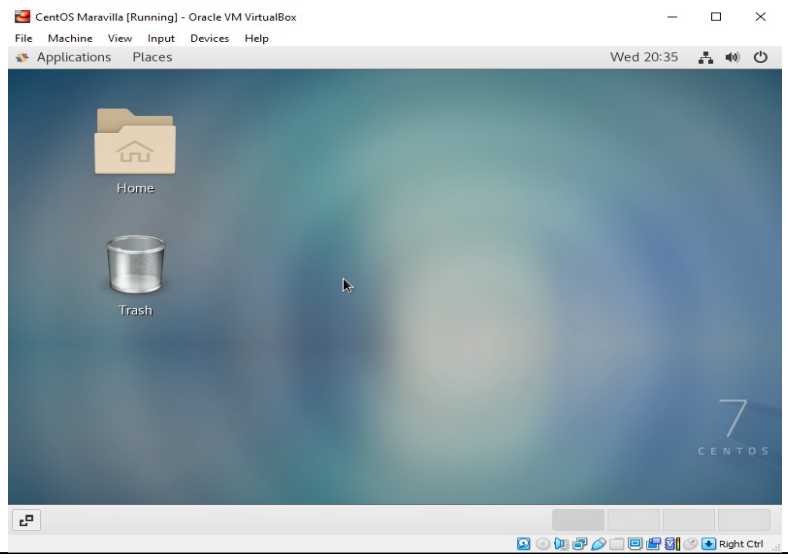


3. Install the downloaded image.



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

```
[kdm24@localhost ~]$ sudo dnf install openssh-server

CentOS-7 - Base                                          66 kB/s |  10 MB     02:37
CentOS-7 - Updates                                      145 kB/s |  21 MB     02:27
CentOS-7 - Extras                                       251 kB/s | 331 kB     00:01
Package openssh-server-7.4p1-21.el7.x86_64 is already installed.
Dependencies resolved.
Nothing to do.
Complete!
[kdm24@localhost ~]$
```

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

```
[kdm24@localhost ~]$ sudo systemctl start sshd
[sudo] password for kdm24:
[kdm24@localhost ~]$ sudo systemctl enable sshd
[kdm24@localhost ~]$
```

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

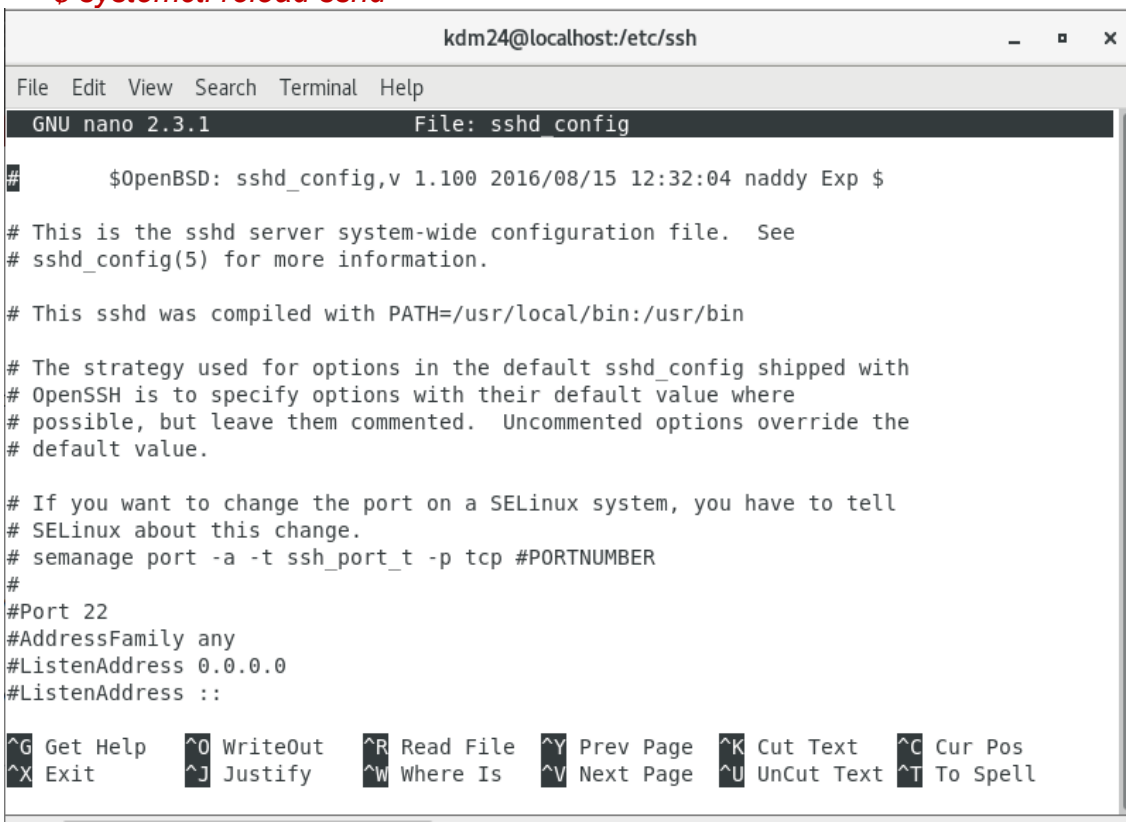
```
[kdm24@localhost ~]$ sudo systemctl status sshd
● sshd.service - OpenSSH server daemon
   Loaded: loaded (/usr/lib/systemd/system/sshd.service; enabled; vendor preset: enable
d)
   Active: active (running) since Wed 2022-08-31 20:33:14 EDT; 19min ago
     Docs: man:sshd(8)
           man:sshd_config(5)
 Main PID: 1208 (sshd)
   CGroup: /system.slice/sshd.service
           └─1208 /usr/sbin/sshd -D

Aug 31 20:33:14 localhost.localdomain systemd[1]: Starting OpenSSH server daemon...
Aug 31 20:33:14 localhost.localdomain sshd[1208]: Server listening on 0.0.0.0 port 22.
Aug 31 20:33:14 localhost.localdomain sshd[1208]: Server listening on :: port 22.
Aug 31 20:33:14 localhost.localdomain systemd[1]: Started OpenSSH server daemon.
Hint: Some lines were ellipsized, use -l to show in full.
[kdm24@localhost ~]$
```

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

```
[kdm24@localhost ~]$ sudo firewall-cmd --zone=public --permanent --add-service=ssh
Warning: ALREADY_ENABLED: ssh
success
[kdm24@localhost ~]$ sudo firewall-cmd --reload
success
[kdm24@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




```
[kdm24@localhost ~]$ cd /etc/ssh/
[kdm24@localhost ssh]$ ls
moduli       ssh_host_ecdsa_key      ssh_host_ed25519_key.pub
ssh_config   ssh_host_ecdsa_key.pub  ssh_host_rsa_key
sshd_config  ssh_host_ed25519_key    ssh_host_rsa_key.pub
[kdm24@localhost ssh]$ nano sshd_config
[kdm24@localhost ssh]$ sudo nano sshd_config
[kdm24@localhost ssh]$ systemctl reload sshd
[kdm24@localhost ssh]$
```

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.

```
TIPQC@Q5202-28 MINGW64 ~
$ ssh-copy-id kdm24@192.168.56.108
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/c/Users/TIPQC/.s
sh/id_rsa.pub"
The authenticity of host '192.168.56.108 (192.168.56.108)' can't be established.
ED25519 key fingerprint is SHA256:+zYwoU2BJQAnOgzblhJZSQvZIG+EuOrFObS/3NWcMl8.
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
kdm24@192.168.56.108's password:

Number of key(s) added: 1

Now try logging into the machine, with:   "ssh 'kdm24@192.168.56.108'"
and check to make sure that only the key(s) you wanted were added.
```

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

```
[kdm24@localhost ~]$ cd .ssh
[kdm24@localhost .ssh]$ ls
authorized_keys
```

Task 4: Verify ssh remote connection

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

```
inet 192.168.56.108/24
```

2. Show evidence that you are connected.

```
TIPQC@Q5202-28 MINGW64 ~
$ ssh kdm24@192.168.56.108
Last login: Wed Aug 31 21:14:14 2022
[kdm24@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?

   For me, we should look for the ease of use or accessibility. The user depends on how he will use a certaine distribution like debian or Red Hat. In my opinion, both Debian (Ubuntu) and CentOS which is a red hat distribution are good for beginners and can focus to servers. Therefore, I think we should also look on the usage or purpose of our work besides the function is similar even if the commands have slight changes. We should also consider the performance of each distribution like the speed on running such applications.

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

   The differences are the package management wherein Debian uses apt as package manager while red hat linux distributions such as CentOS used yum or dnf as its package manager. Debian is non commercial distributed linux while Red Hat is commercial distributed. When it comes to updates, Debian updates frequently while Red Hat does not update frequently usually takes month or more time. Debian is more advanced in red hat in a way that it updates the untouched files automatically and the configuration files can be updated depending on the user's choice which red hat lacks this kind of feature. Lastly, debian community is much larger than red hat community, that is why bug fixing or any issues can be resolve quicker than the red hat issues or bugs.

CONCLUSION/LEARNING:

After doing this activity, I learned how to install CentOS on Oracle Virtual Box. I managed to install the CentOS properly as well as installing ssh server in CentOS. I encountered errors in the process but I was able to troubleshoot or fix my issue. Overall, this activity will help me prepare and do activities in the future related to CentOS.

I affirm that I will not give or receive any unauthorized help on this activity/exam and that all work will be my own.
-Keith Maravilla