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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.

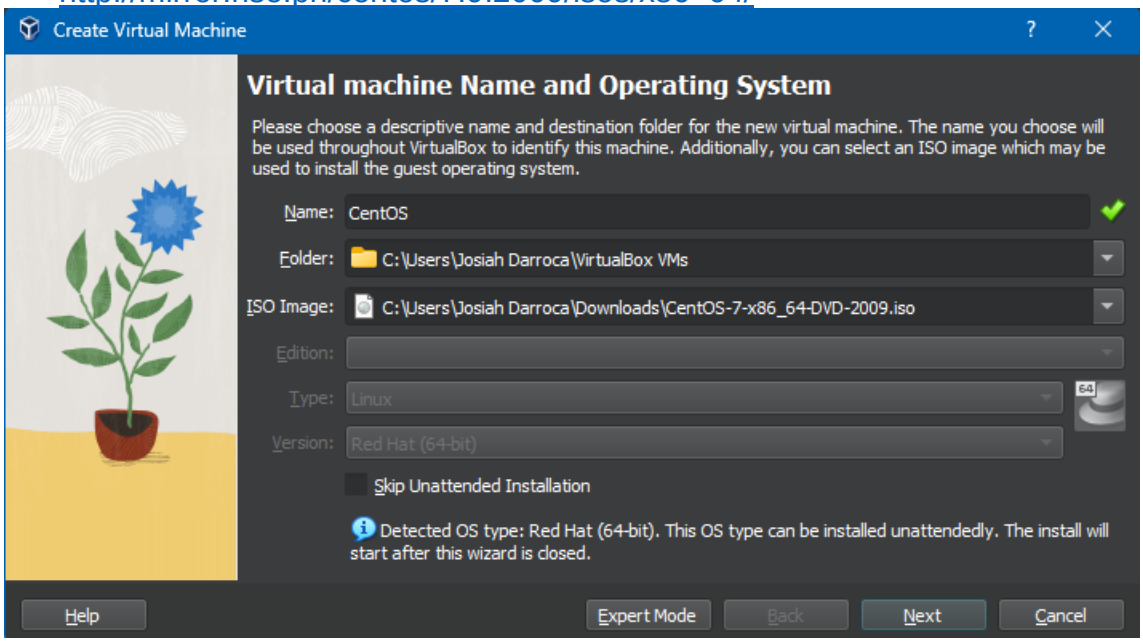
CentOS uses the RPM package format and YUM/DNF as the package manager.

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

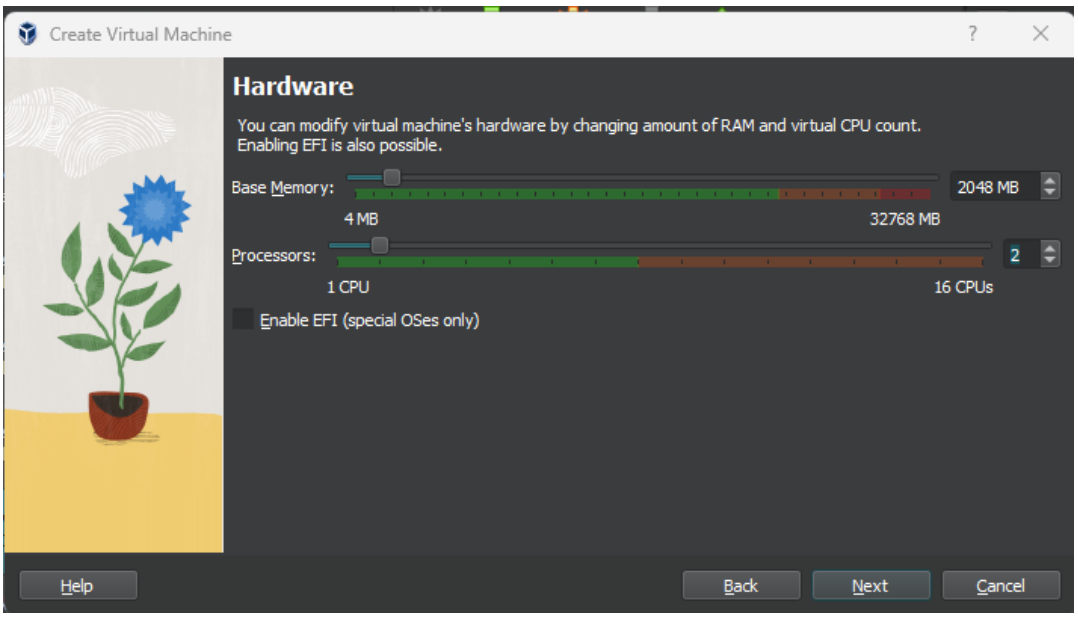
Both offer full-feature package management with network-based repository support, dependency checking and resolution, etc.. If you're familiar with one but not the other, you may have a little trouble switching over, but they're not overwhelmingly different. They both have similar features, just available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

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

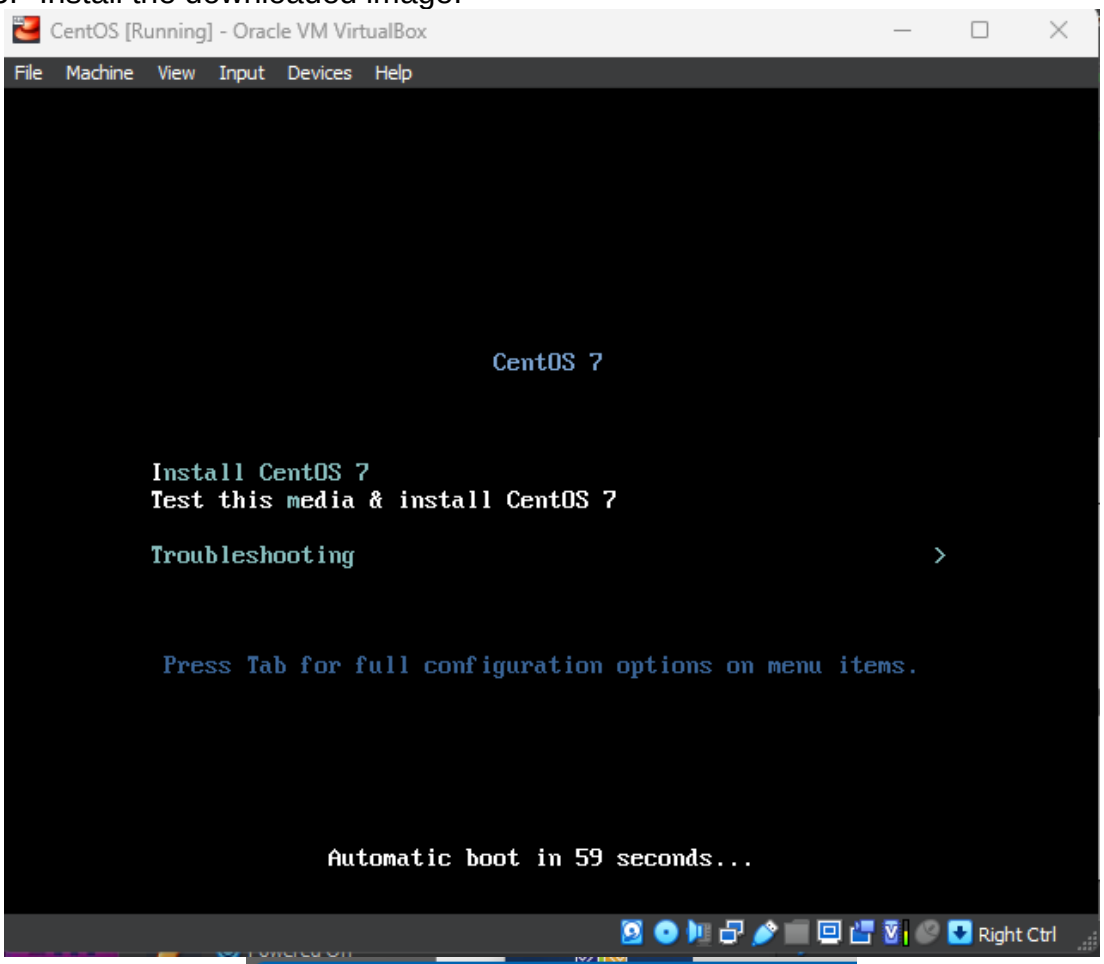
1. Download the image of the CentOS here: http://mirror.rise.ph/centos/7.9.2009/isos/x86_64/

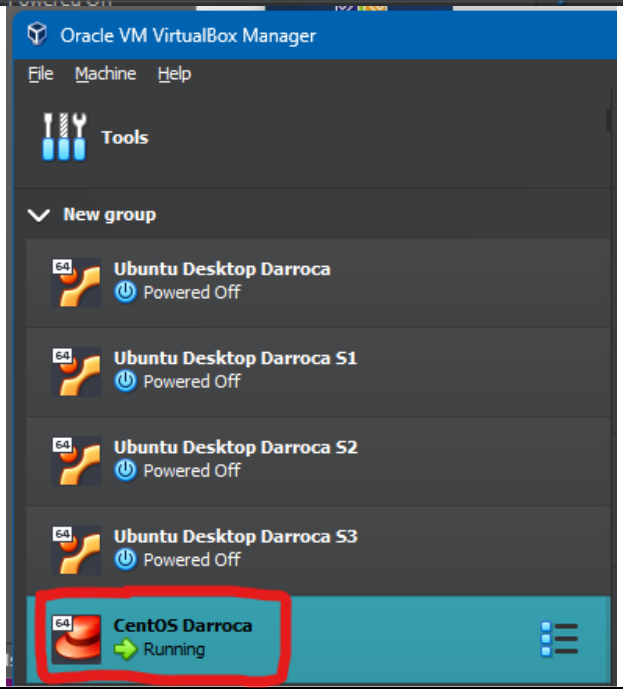


2. Create a VM machine with 2 Gb RAM and 20 Gb HD.

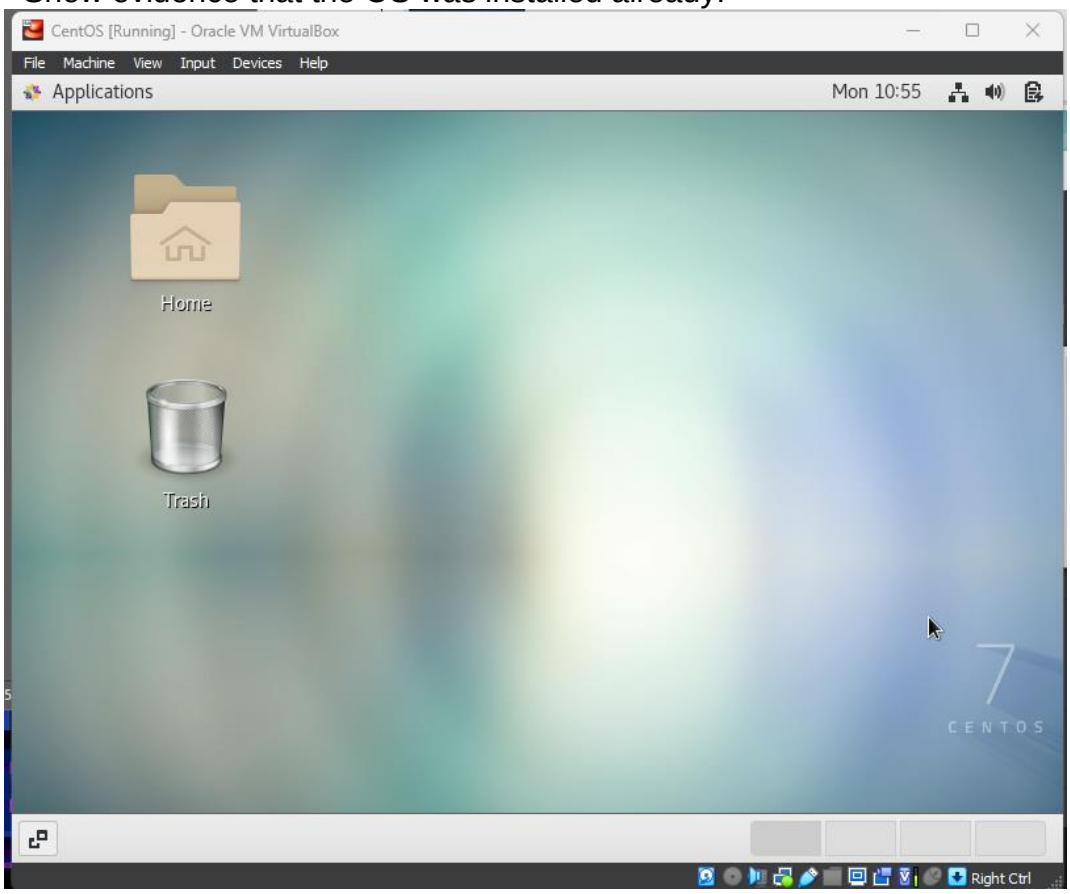


3. Install the downloaded image.





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 joshxh]# dnf install openssh-server
bash: dnf: command not found...
[root@localhost joshxh]# #dnf install openssh-server
[root@localhost joshxh]# exit
exit
[joshxh@localhost ~]$ firewall-cmd --zone=public --permanent --add-service=ssh
Warning: ALREADY_ENABLED: ssh
success

Updated:
  openssh-server.x86_64 0:7.4p1-23.el7_9

Dependency Updated:
  openssh.x86_64 0:7.4p1-23.el7_9        openssh-clients.x86_64 0:7.4p1-23.el7_9

Complete!
[root@localhost joshxh]#
```

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

```
[joshxh@localhost ~]$ systemctl enable sshd
[joshxh@localhost ~]$ #systemctl startup-sshd
[joshxh@localhost ~]$ #systemcli status sshd
[joshxh@localhost ~]$ systemctl startup-sshd
Unknown operation 'startup-sshd'.
[joshxh@localhost ~]$ systemctl start sshd
```

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

```
[joshxh@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 Mon 2023-09-04 10:54:44 EDT; 6min ago
     Docs: man:sshd(8)
           man:sshd_config(5)
 Main PID: 1134 (sshd)
    Tasks: 1
   CGroup: /system.slice/sshd.service
           └─1134 /usr/sbin/sshd -D
```

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

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

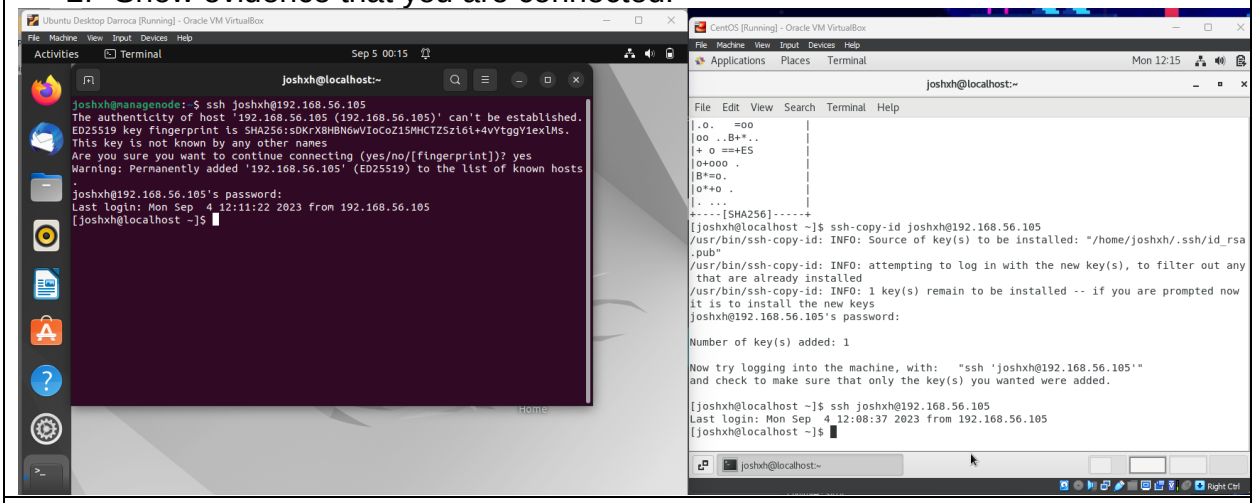
Task 3: Copy the Public Key to CentOS

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*.

```
[joshxh@localhost ~]$ ssh-copy-id joshxh@192.168.56.105
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/home/joshxh/.ssh/id_rsa
.pub"
/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
joshxh@192.168.56.105's password:

Number of key(s) added: 1

Now try logging into the machine, with:   "ssh 'joshxh@192.168.56.105'"
and check to make sure that only the key(s) you wanted were added.

[joshxh@localhost ~]$
```

Task 4: Verify ssh remote connection

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



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?

   - Both are good in my opinion. However, since we are using Ubuntu or one of the Debian distributions of Linux since last semester, I can say that I am most knowledgeable about that. Although I could also say that, with given time using CentOS or one of the Red Hat Linux distributions, my preference could change in the long run. Putting biases aside, Debian is good especially for beginners that want to take up the world of Linux. Debian is the friendliest by far regarding its guide on how to user can interact with the terminal and gives more on-point guide if there is something wrong with your syntax. Therefore, Debian is the best in terms of starting fresh in the Unix industry.

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

    - There are many differences of Debian and Red Hat Linux distributions, to break apart in which they diverse are: In development, Debian is a community-driven project while Red Hat is a commercial distribution. Regarding stability, Debian is most known for its stability and Red Hat is known for enterprise-grade support. Lastly, in terms of cost Debian is a free and open-source, on the other hand Red Hat is requiring its users for subscription that you need to pay for.

Conclusion:

In this activity, I have learned how to install one of Red Hat Linux's distributions in the form of CentOS, and I have also learned how to configure remote SSH connection from CentOS. A good thing to add is that I have also achieved connection between 2 distributions, CentOS and Ubuntu as seen in Task 4. I have achieved this by installing SSH in CentOS and generating a key through the command keygen. After that I copied its IP together with the username and connected both distinguished distributions via SSH. All in all, this activity helped me be more knowledgeable in Linux with this activity letting me interact with another distribution beside Debian in the form of Ubuntu. I am glad to be able to perform this laboratory activity and I am hoping to learn more in the future