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Course/Section: BSCPE	Date Submitted:
Instructor: Dr. Jonathan V. Taylar	Semester and SY: 2nd Semester 2023 – 2024

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.

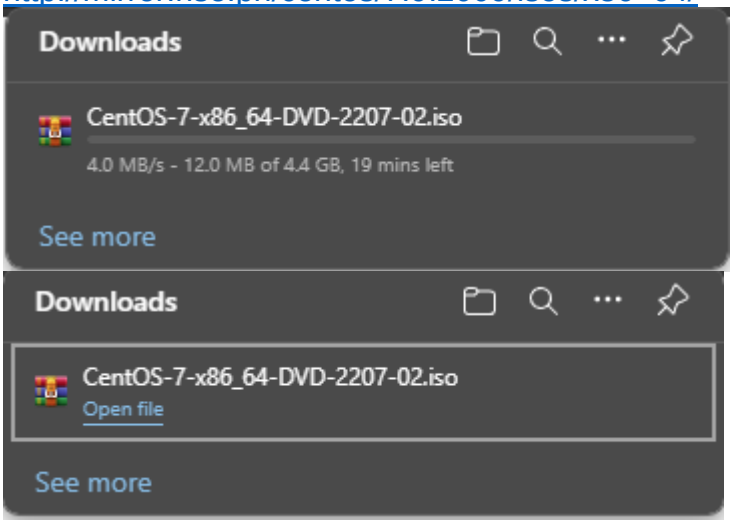
CentOS uses the RPM package format and YUM/DNF as the package manager.

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

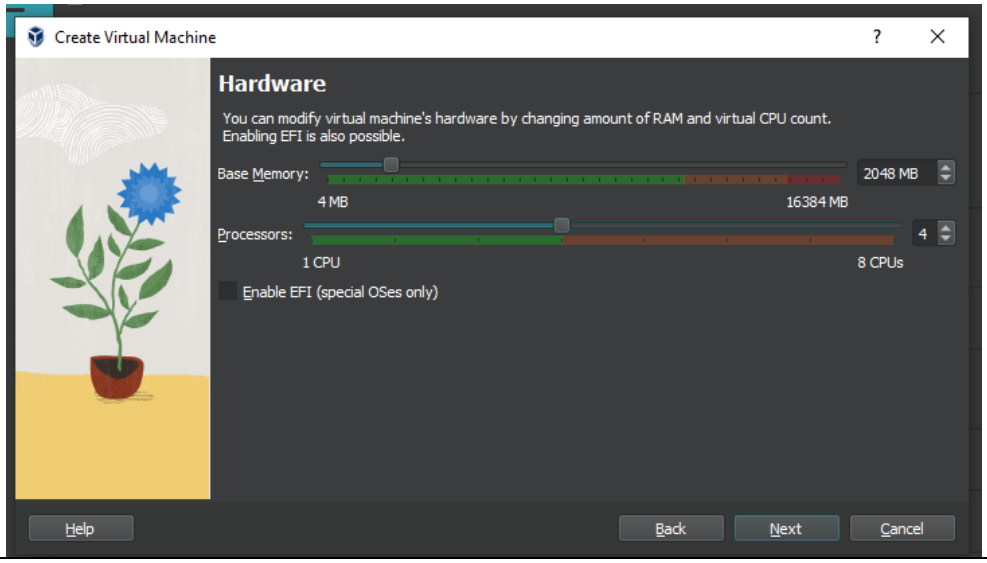
Both offer full-feature package management with network-based repository support, dependency checking and resolution, etc.. If you're familiar with one but not the other, you may have a little trouble switching over, but they're not overwhelmingly different. They both have similar features, just available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

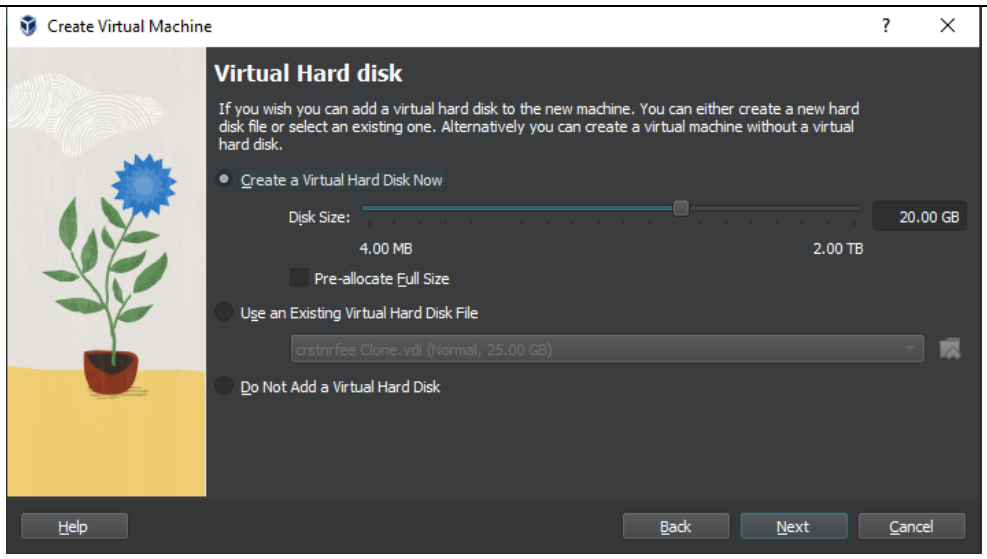
Task 1: Download the CentOS or RHEL-8 image (Create screenshots of the following)

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

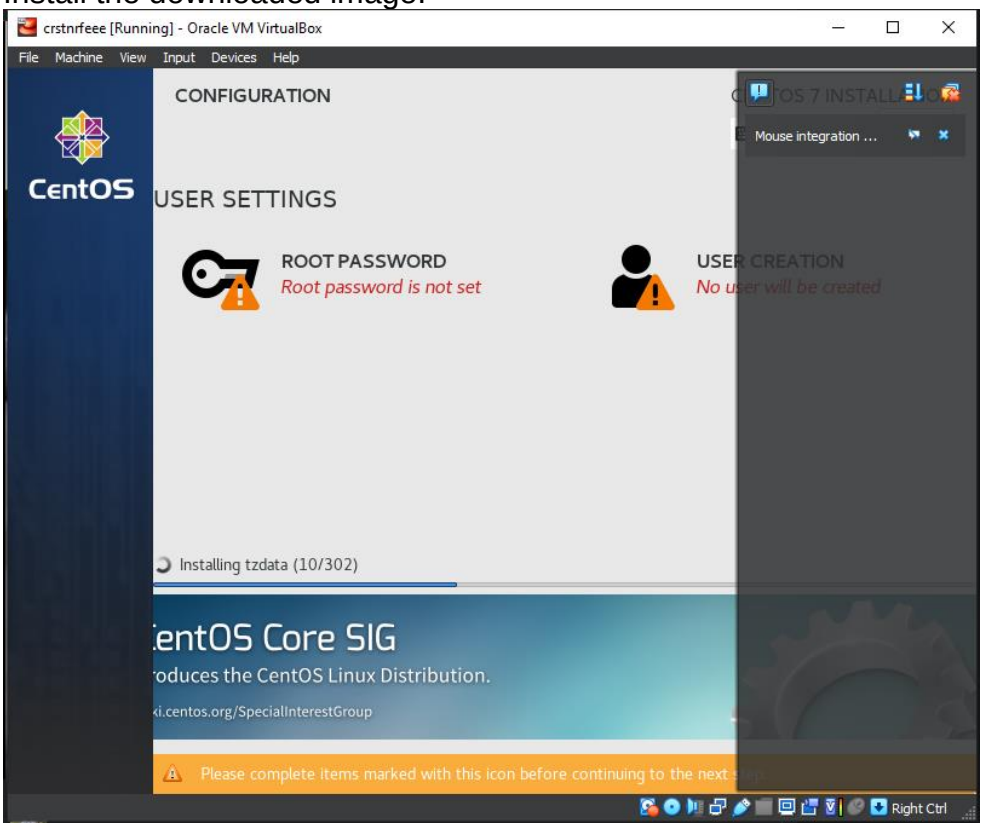


2. Create a VM machine with 2 Gb RAM and 20 Gb HD.

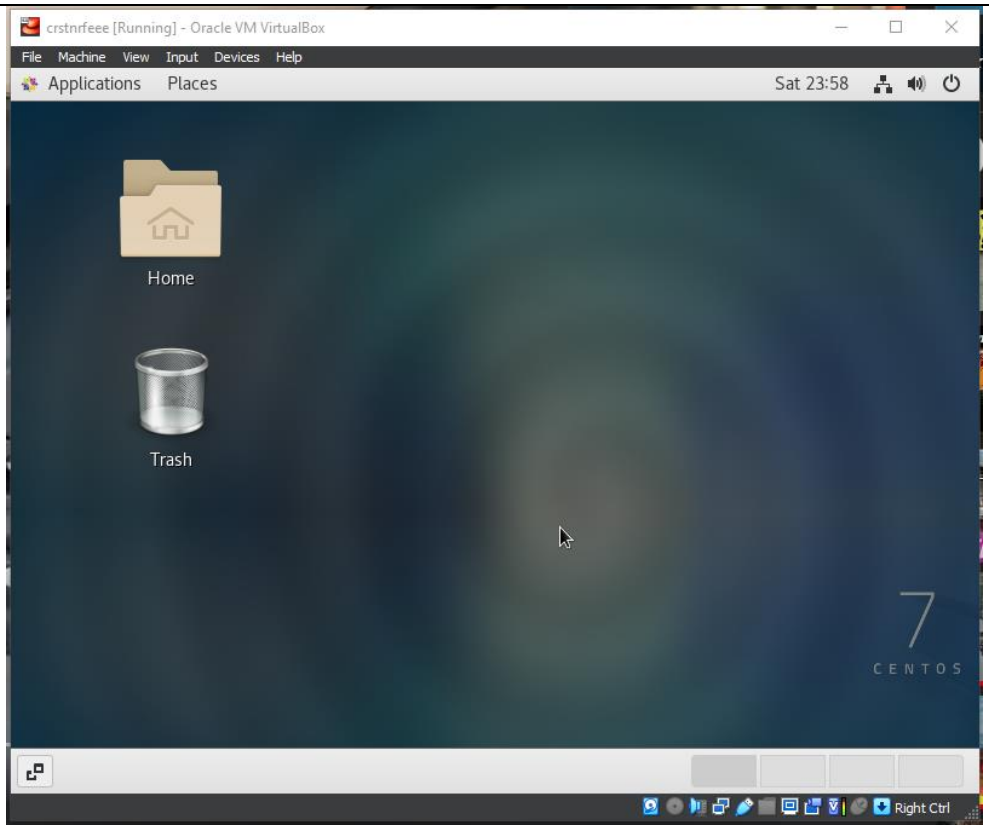




3. Install the downloaded image.



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

```
[crstnrfeee@localhost ~]$ dnf install openssh-server
Error: This command has to be run under the root user.
[crstnrfeee@localhost ~]$ sudo dnf install openssh-server
[sudo] password for crstnrfeee:
CentOS-7 - Base                                  8.8 MB/s |  10 MB     00:01
CentOS-7 - Updates                               9.9 MB/s |  31 MB     00:03
CentOS-7 - Extras                                1.7 MB/s | 360 kB     00:00
Package openssh-server-7.4p1-21.el7.x86_64 is already installed.
Dependencies resolved.
Nothing to do.
Complete!
[crstnrfeee@localhost ~]$
```

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

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

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

```
[crstnrfeee@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 Sun 2024-02-18 07:39:51 EST; 24min ago
     Docs: man:sshd(8)
           man:sshd_config(5)
 Main PID: 1118 (sshd)
   CGroup: /system.slice/sshd.service
           └─1118 /usr/sbin/sshd -D

Feb 18 07:39:51 localhost.localdomain systemd[1]: Starting OpenSSH server daemon...
Feb 18 07:39:51 localhost.localdomain sshd[1118]: Server listening on 0.0.0.0 port 22.
Feb 18 07:39:51 localhost.localdomain sshd[1118]: Server listening on :: port 22.
Feb 18 07:39:51 localhost.localdomain systemd[1]: Started OpenSSH server daemon.
Hint: Some lines were ellipsized, use -l to show in full.
[crstnrfeee@localhost ~]$
```

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

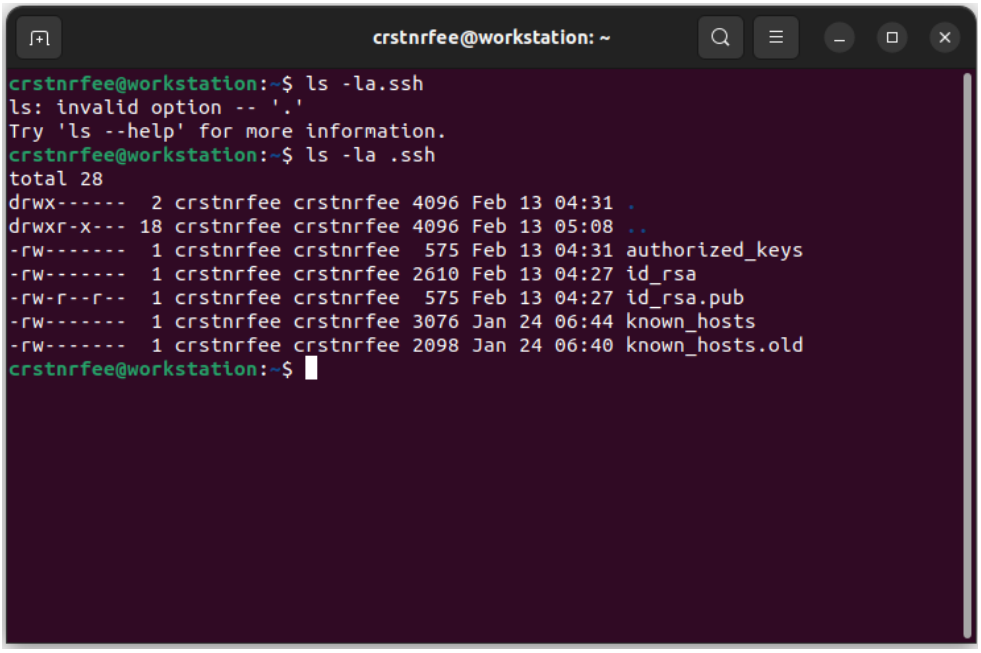
```
[crstnrfeee@localhost ~]$ firewall-cmd --zone=public --permanent --add-service=ssh
Warning: ALREADY_ENABLED: ssh
success
[crstnrfeee@localhost ~]$ firewall-cmd --reload
success
[crstnrfeee@localhost ~]$
```

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

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.

```
crstnrfee@workstation:~$ ssh crstnrfeee@192.168.56.8
The authenticity of host '192.168.56.8 (192.168.56.8)' can't be established.
ED25519 key fingerprint is SHA256:tHpqNMeLsS6tjJf+eeYgRL5qbeM5N/Wp7v+n3+Ukrxs.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '192.168.56.8' (ED25519) to the list of known hosts.
crstnrfeee@192.168.56.8's password:
Last login: Sun Feb 18 19:06:43 2024
[crstnrfeee@crstnrfeee ~]$
```

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

```
[crstnrfeee@crstnrfeee ~]$ cd ~/.ssh
[crstnrfeee@crstnrfeee .ssh]$ cat authorized_keys
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAACAQDDHcNzGYOwdvUBrNsXFrizjmfl3HCaxdAR49FqBKKA
/lARvTvRUVir0aMEiP42HEWU6rFxBPQ2miH7JAKVzbxpzonGlce5ihvl4JoHIfRo4wchbYz0oV4inuD5
IDR4tuKMBhu7vc2t+BbW8yt8wnx8Jk1ijhbb+CYHH9neKF7+iH0GoZtugr1JzxiVbf219Mm2PCvKmOvl
cBgWg3Rw1pynxCGUstxRwwA62/Od84plX5Lx9D3NN5UmSuyiUp1RFY5HmsSPvud8kTf2rnnpIED8YnQK
omrGq/2yzuJbRGBFKVlsqAs9vuxSf9IKF7ZRKqPA4hXNX3ZRTrldfJyxqwkwzNn0MY1dWJquoRUMzxhv
sNz/O7541gXzSX2cmGBwhTqJwHQ8Mj3BVbBXmbIXeKPjW4ue9co7UhEm1eb5POOTMud8RMx2WI3OE7se
1jr8JvWdX/hHQNCCswMFjGPF8KI6STIEoRX7Fb5AFbfwQjixLvo187P34djV4LJCIc+OxxnWXmFrMyfr
gPRQzrkClkatkcOc6i7nO6oORk+VgX/52jJ3v74C4a4vU5LCPtZkGvCpHz8Pyr6NGwAwbS0XAh6ZKFW+
oHalTw+QTHvIE2MSij6LdKb7xthYedun5H5pZRLXsk1eNuBLpaS7ZBV/wDJUFFUmqFOqeXR25C5Via8f
7w== root@crstnrfeee
[crstnrfeee@crstnrfeee .ssh]$
```

Task 4: Verify ssh remote connection

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

```
crstnrfee@workstation:~$ ssh crstnrfeee@192.168.56.8
crstnrfeee@192.168.56.8's password:
Last login: Sun Feb 18 19:28:35 2024 from 192.168.56.4
[crstnrfeee@crstnrfeee ~]$
```

2. Show evidence that you are connected.

```
[crstnrfeee@crstnrfeee ~]$ ls -la .ssh
total 16
drwx------.  2 crstnrfeee crstnrfeee   61 Feb 18 19:28 .
drwx------. 16 crstnrfeee crstnrfeee 4096 Feb 18 19:17 ..
-rw-------.  1 crstnrfeee crstnrfeee  741 Feb 18 19:28 authorized_keys
-rw-------.  1 crstnrfeee crstnrfeee 3243 Feb 18 19:17 id_rsa
-rw-r--r--.  1 crstnrfeee crstnrfeee  747 Feb 18 19:17 id_rsa.pub
[crstnrfeee@crstnrfeee ~]$ logout
Connection to 192.168.56.8 closed.
crstnrfee@workstation:~$
```

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 choosing between Debian and Red Hat Linux distributions, it's crucial to consider factors such as stability requirements, support options, package management preferences, community ecosystems, security features, hardware architecture support, licensing philosophies, and potential costs associated with subscriptions. Assessing these aspects in relation to your specific needs and priorities will help determine the best fit for your environment, whether it prioritizes stability, cutting-edge features, official support, or adherence to open-source principles.

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

The main differences between Debian and Red Hat Linux distributions lie in their approaches to stability, support models, package management systems, and philosophical orientations. Debian is renowned for its emphasis on stability, community-driven support, and adherence to free software principles, making it a solid choice for production environments. In contrast, Red Hat distributions like RHEL prioritize commercial support offerings, often provide newer software versions, and may include proprietary software, catering to enterprise needs while still maintaining robust stability. These distinctions influence factors such as system maintenance, security practices, and software availability, allowing users to select the distribution that best aligns with their requirements and preferences.