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Instructor: Prof. Roman Richard	Semester and SY: 1st sem 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.

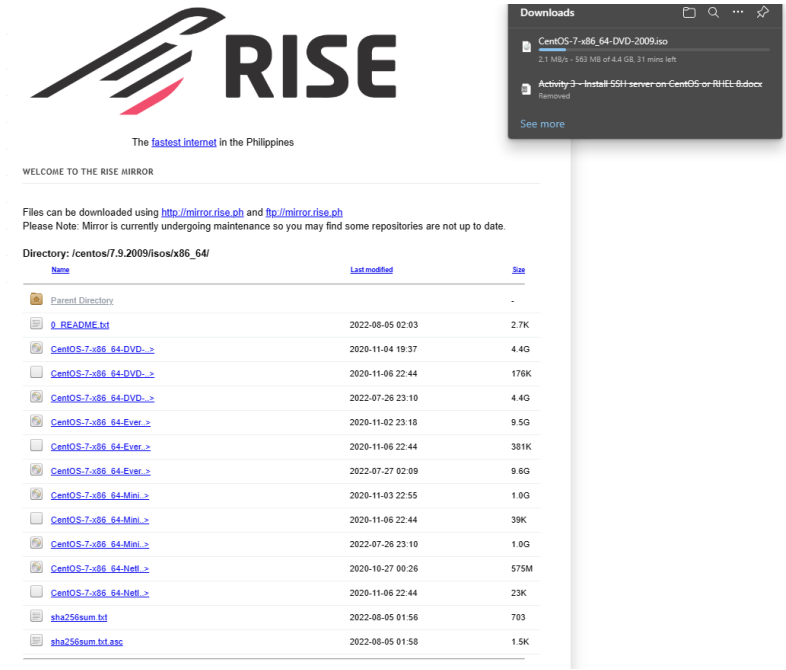
CentOS uses the RPM package format and YUM/DNF as the package manager.

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

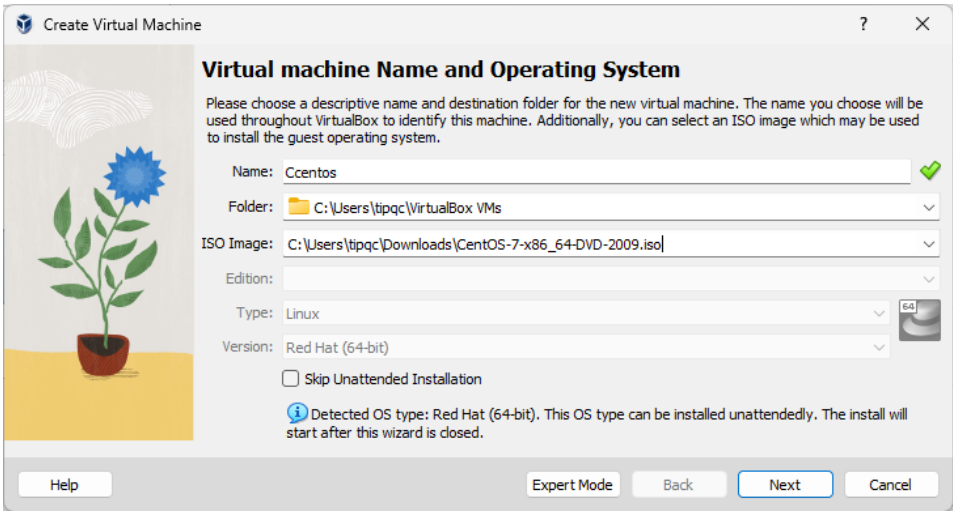
Both offer full-feature package management with network-based repository support, dependency checking and resolution, etc.. If you're familiar with one but not the other, you may have a little trouble switching over, but they're not overwhelmingly different. They both have similar features, just available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

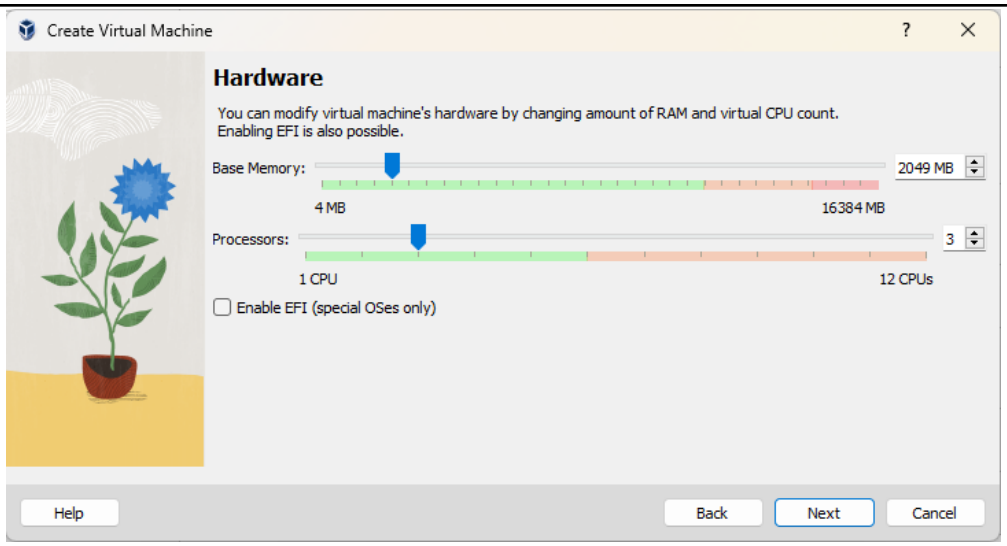
Task 1: Download the CentOS or RHEL-8 image (Create screenshots of the following)

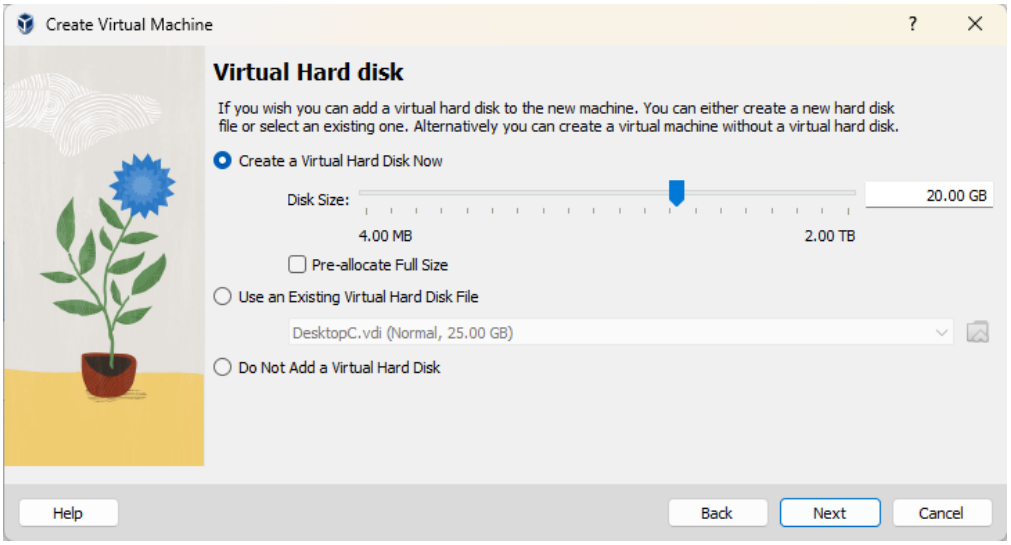
1. Download the image of the CentOS here: http://mirror.rise.ph/centos/7.9.2009/isos/x86_64/



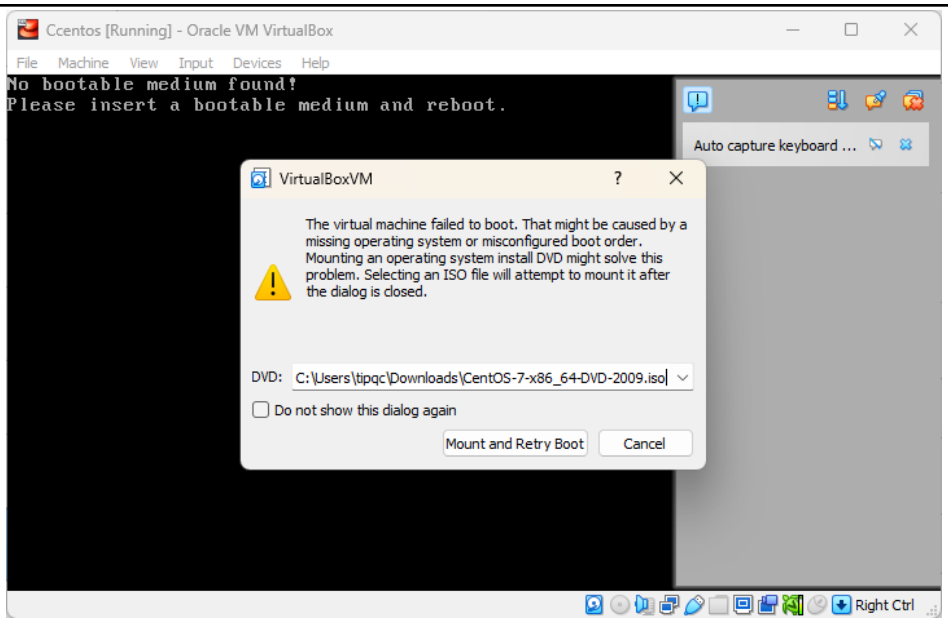
2. Create a VM machine with 2 Gb RAM and 20 Gb HD.

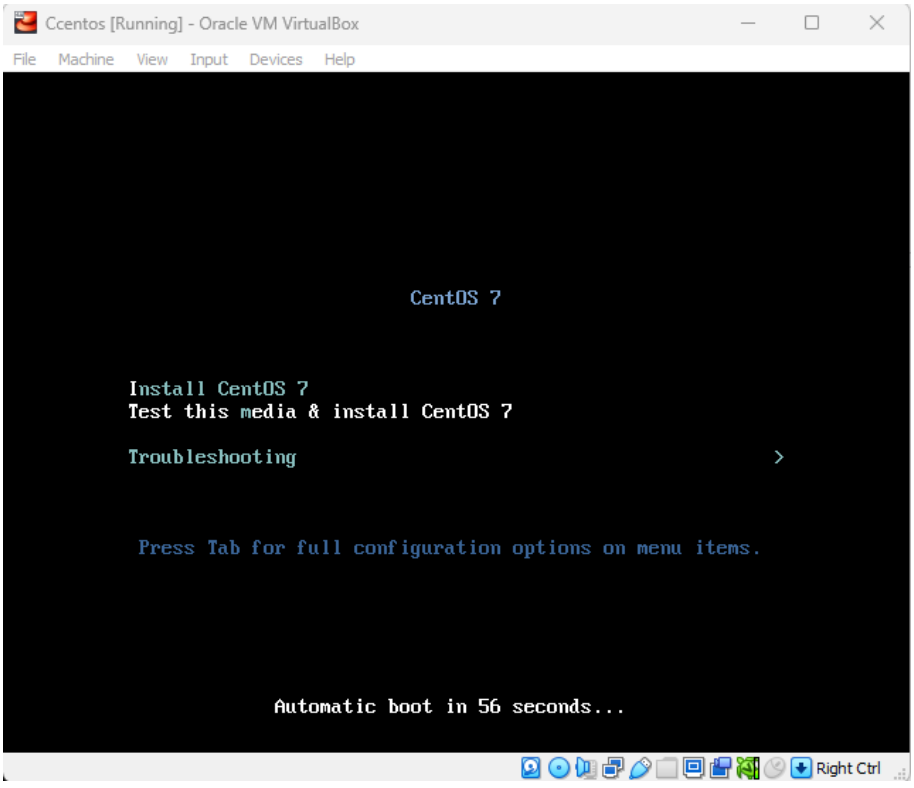


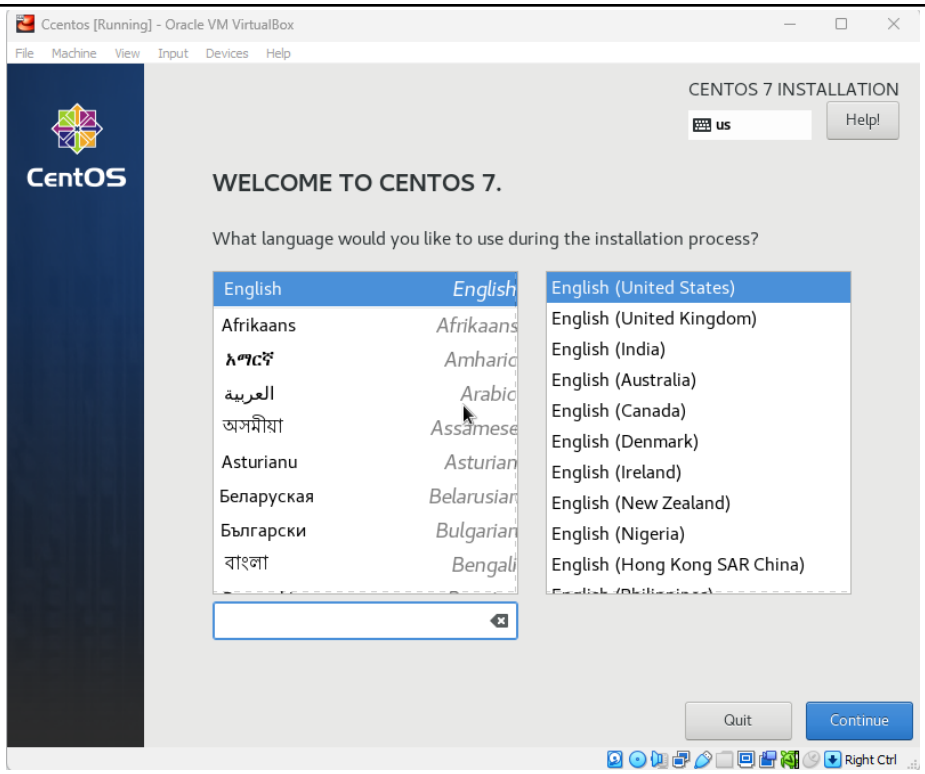


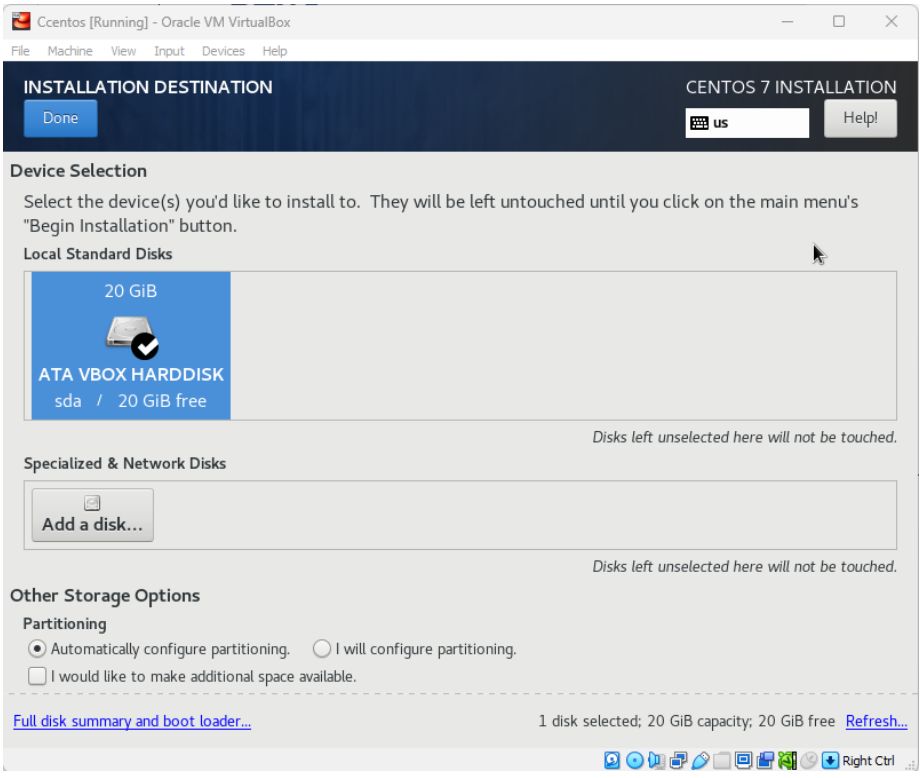


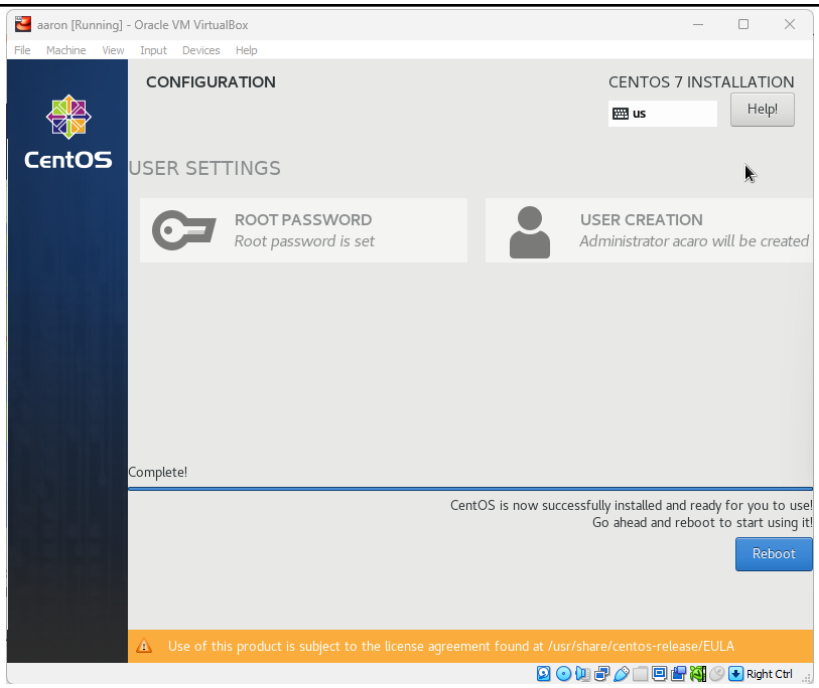
3. Install the downloaded image.

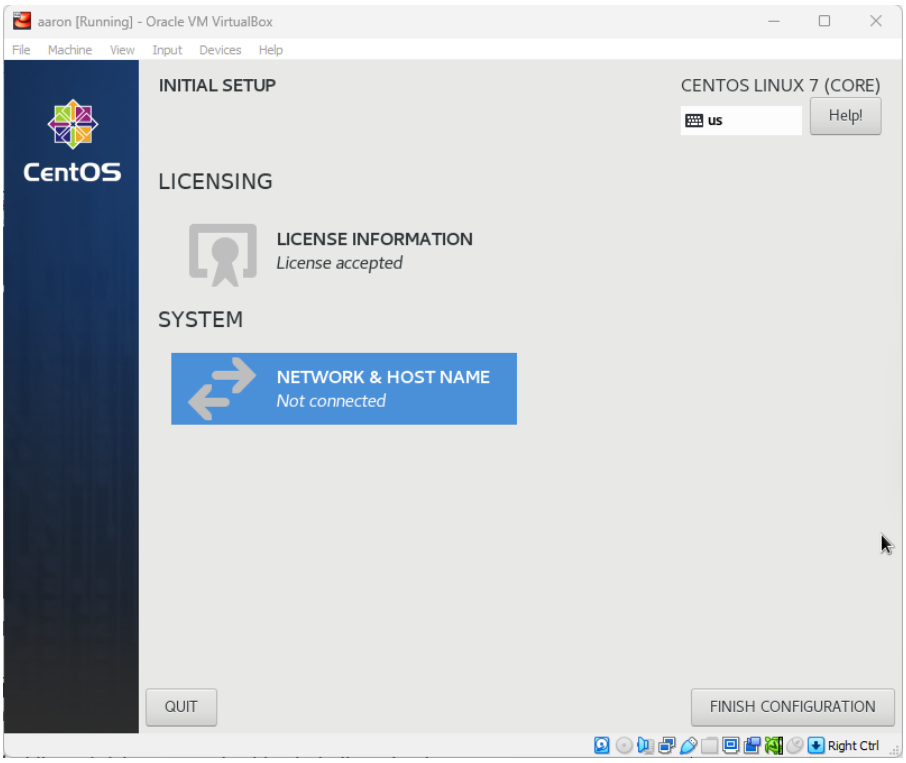

Ccentos [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
No bootable medium found!
Please insert a bootable medium and reboot.
Auto capture keyboard ...
VirtualBoxVM
The virtual machine failed to boot. That might be caused by a missing operating system or misconfigured boot order. Mounting an operating system install DVD might solve this problem. Selecting an ISO file will attempt to mount it after the dialog is closed.
DVD: C:\Users\tipqc\Downloads\CentOS-7-x86_64-DVD-2009.iso
Do not show this dialog again
Mount and Retry Boot
Cancel
Right Ctrl


Ccentos [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
CentOS 7
Install CentOS 7
Test this media & install CentOS 7
Troubleshooting
Press Tab for full configuration options on menu items.
Automatic boot in 56 seconds...
Right Ctrl

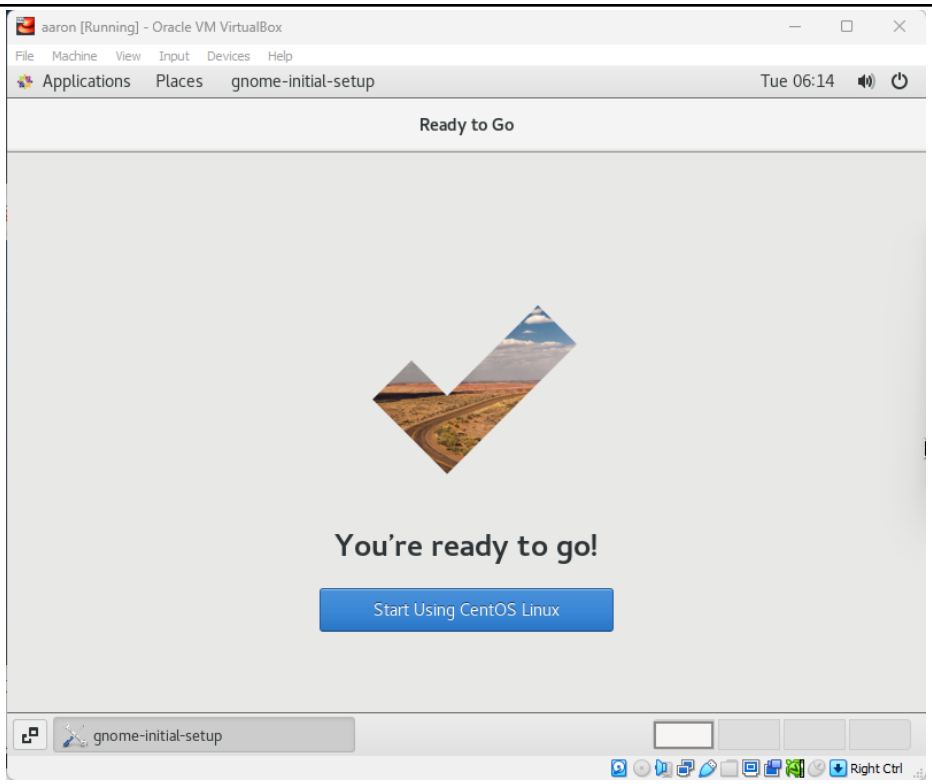

Ccentos [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
CentOS
CENTOS 7 INSTALLATION
us
Help!
WELCOME TO CENTOS 7.
What language would you like to use during the installation process?
English English
Afrikaans Afrikaans
አማርኛ Amharic
العربية Arabic
অসমীয়া Assamese
Asturianu Asturian
Беларуская Belarusian
Български Bulgarian
বাংলা Bengali
English (United States)
English (United Kingdom)
English (India)
English (Australia)
English (Canada)
English (Denmark)
English (Ireland)
English (New Zealand)
English (Nigeria)
English (Hong Kong SAR China)
Quit
Continue
Right Ctrl


Ccentos [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
INSTALLATION DESTINATION
Done
CENTOS 7 INSTALLATION
us
Help!
Device Selection
Select the device(s) you'd like to install to. They will be left untouched until you click on the main menu's "Begin Installation" button.
Local Standard Disks
20 GiB
ATA VBOX HARDDISK
sda / 20 GiB free
Disks left unselected here will not be touched.
Specialized & Network Disks
Add a disk...
Disks left unselected here will not be touched.
Other Storage Options
Partitioning
Automatically configure partitioning.
I will configure partitioning.
I would like to make additional space available.
Full disk summary and boot loader...
1 disk selected; 20 GiB capacity; 20 GiB free
Refresh...
Right Ctrl





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

```
Complete!
[acaro@localhost ~]$ dnf install openssh-server
Error: This command has to be run under the root user.
[acaro@localhost ~]$ sudo yum dnf install openssh-server
Loaded plugins: fastestmirror, langpacks
No such command: dnf. Please use /bin/yum --help
[acaro@localhost ~]$ sudo su
[root@localhost acaro]# 1221
bash: 1221: command not found...
[root@localhost acaro]# dnf install openssh-server
CentOS-7 - Base                                  1.9 MB/s |  10 MB     00:05
CentOS-7 - Updates                               2.0 MB/s |  28 MB     00:13
```

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

```
[root@localhost acaro]# systemctl start sshd
[root@localhost acaro]# systemctl enable sshd
[root@localhost acaro]#
```

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

```
[root@localhost acaro]# systemctl status sshd
● sshd.service - OpenSSH server daemon
   Loaded: loaded (/usr/lib/systemd/system/sshd.service; enabled; vendor preset:
d)
   Active: active (running) since Tue 2023-09-05 06:20:29 EDT; 10min ago
     Docs: man:sshd(8)
           man:sshd_config(5)
 Main PID: 1158 (sshd)
    Tasks: 1
   CGroup: /system.slice/sshd.service
           └─1158 /usr/sbin/sshd -D

Sep 05 06:20:29 localhost.localdomain systemd[1]: Starting OpenSSH server daemon.
Sep 05 06:20:29 localhost.localdomain sshd[1158]: Server listening on 0.0.0.0 por
Sep 05 06:20:29 localhost.localdomain sshd[1158]: Server listening on :: port 22.
Sep 05 06:20:29 localhost.localdomain systemd[1]: Started OpenSSH server daemon.
Hint: Some lines were ellipsized, use -l to show in full.
[root@localhost acaro]#
```

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

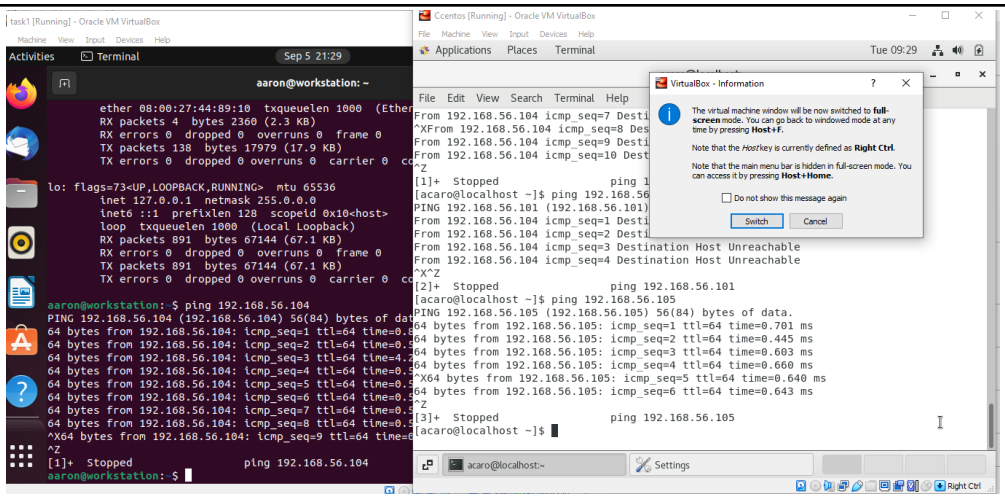
```
[root@localhost acaro]# firewall-cmd --zone=public --permanent --add-service=ssh
Warning: ALREADY_ENABLED: ssh
success
[root@localhost acaro]# firewall-cmd --reload
success
[root@localhost acaro]#
```

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

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*.



Task 4: Verify ssh remote connection

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

```
aaron@workstation:~$ ssh-copy-id -i ~/.ssh/id_rsa acaro@192.168.56.104
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/home/aaron/.ssh
/id_rsa.pub"
The authenticity of host '192.168.56.104 (192.168.56.104)' can't be established
.
ED25519 key fingerprint is SHA256:4Kb09vrm1QPOmDi1zkj+Gd8kBxWsFP1OmbJE+ZEsLhI.
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 promp
ted now it is to install the new keys
acaro@192.168.56.104's password:

Number of key(s) added: 1

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

```
aaron@workstation:~$ ssh acaro@192.168.56.104
Last login: Tue Sep  5 09:01:28 2023
[acaro@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 choosing the best distribution between Debian and RedHat Linux, there are several factors to consider. System administration, consider the ease of use and management of the distribution. The choice between Debian and RedHat typically comes down to factors like hardware architecture, system administration, support,

usability, and licensing. Both distributions are known for their stability and performance for enterprise-grade applications, but Red Hat Enterprise Linux (RHEL) comes out on top due to its excellent enterprise support and robust security which ensures data and application security to the highest degree. However, RHEL is costly, and Debian is a community-supported distribution that is known for its reliability and flexibility.

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

   CentOS and Debian are two popular Linux distributions that have key similarities and differences. CentOS is a free downstream rebuild of the commercial Red Hat Enterprise Linux distribution, while Debian is the free upstream distribution that is the base for other distributions, including the Ubuntu Linux distribution.