Name: Chrisitian Dave L. Berja	Date Performed: 05/08/2023
Course/Section: CPE31S5	Date Submitted: 06/09/2023
Instructor: Engr. Roman	Semester and SY: 1st sem 2023

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.

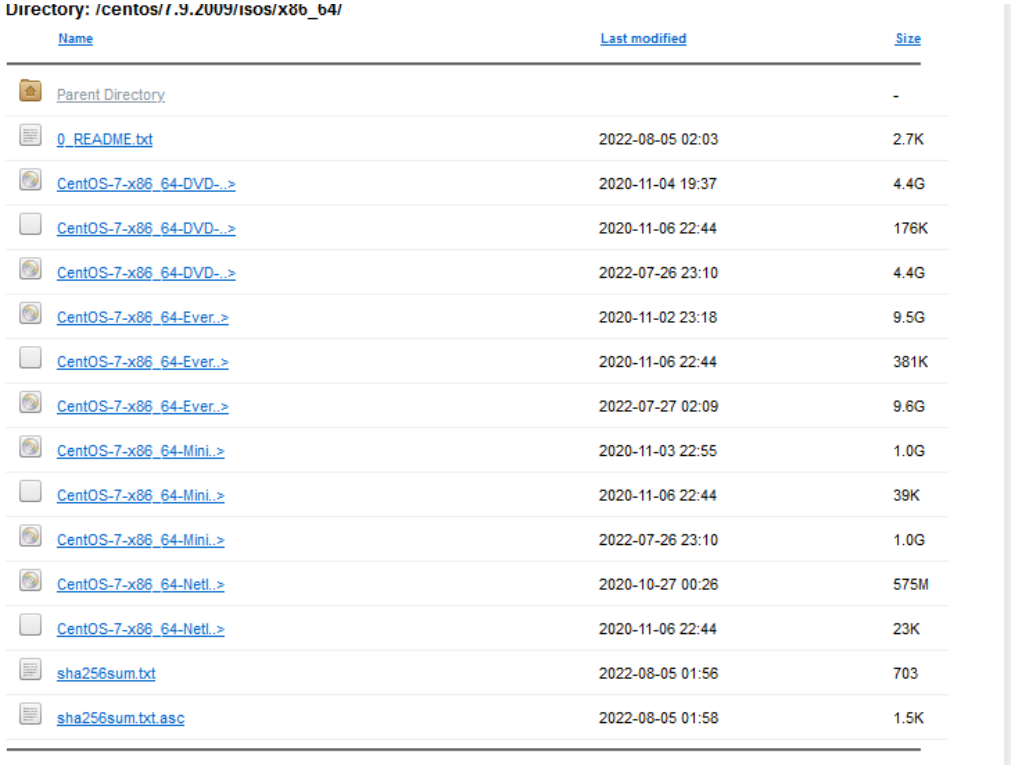
CentOS uses the RPM package format and YUM/DNF as the package manager.

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)

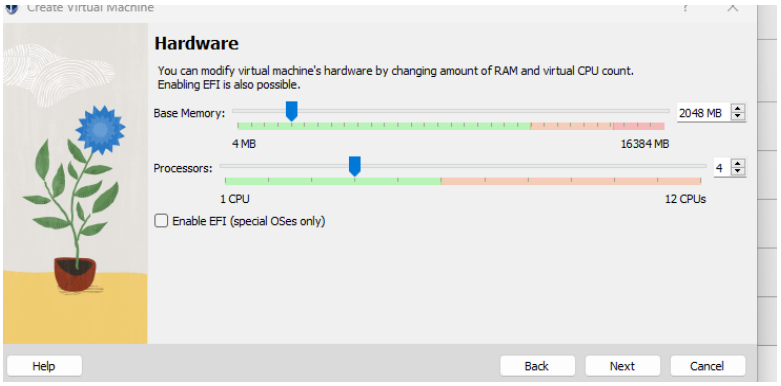
1. Download the image of the CentOS here: http://mirror.rise.ph/centos/7.9.2009/isos/x86_64/

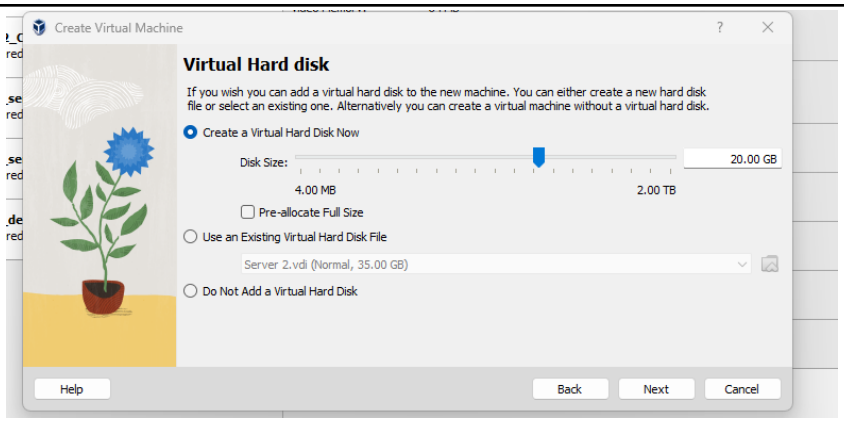


Directory: /centos/7.9.2009/isos/x86_64/

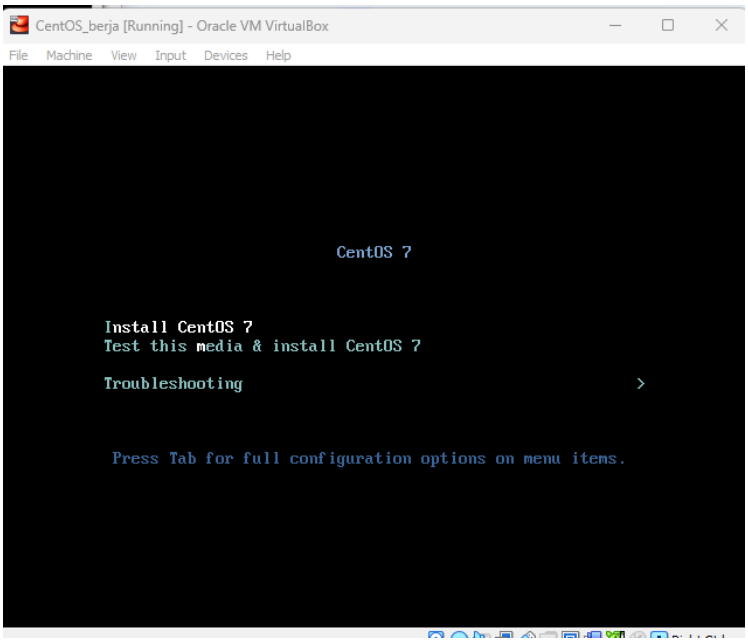
Name	Last modified	Size
Parent Directory		-
0_README.txt	2022-08-05 02:03	2.7K
CentOS-7-x86_64-DVD-..>	2020-11-04 19:37	4.4G
CentOS-7-x86_64-DVD-..>	2020-11-06 22:44	176K
CentOS-7-x86_64-DVD-..>	2022-07-26 23:10	4.4G
CentOS-7-x86_64-Ever..>	2020-11-02 23:18	9.5G
CentOS-7-x86_64-Ever..>	2020-11-06 22:44	381K
CentOS-7-x86_64-Ever..>	2022-07-27 02:09	9.6G
CentOS-7-x86_64-Mini..>	2020-11-03 22:55	1.0G
CentOS-7-x86_64-Mini..>	2020-11-06 22:44	39K
CentOS-7-x86_64-Mini..>	2022-07-26 23:10	1.0G
CentOS-7-x86_64-NetI..>	2020-10-27 00:26	575M
CentOS-7-x86_64-NetI..>	2020-11-06 22:44	23K
sha256sum.txt	2022-08-05 01:56	703
sha256sum.txt.asc	2022-08-05 01:58	1.5K

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

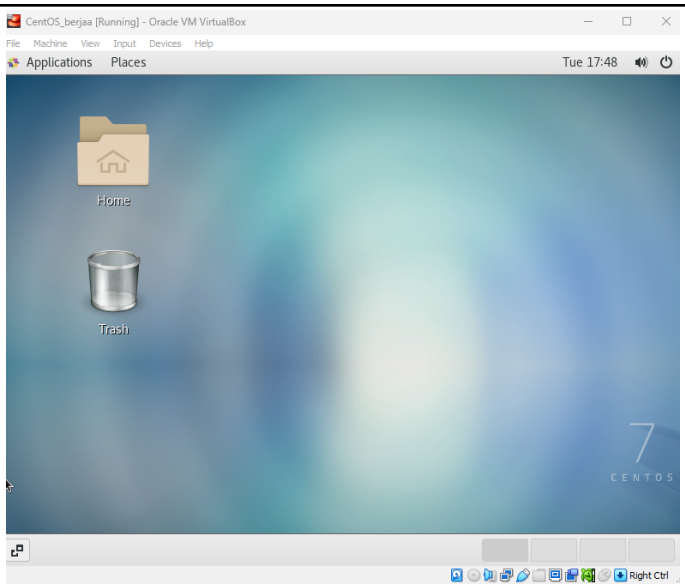




3. Install the downloaded image.



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

```
[berja@localhost ~]$ sudo install openssg-server
install: missing destination file operand after ‘openssg-server’
Try 'install --help' for more information.
[berja@localhost ~]$ sudo install openssh-server
install: missing destination file operand after ‘openssh-server’
Try 'install --help' for more information.
[berja@localhost ~]$ dnf install openssh-server
Error: This command has to be run under the root user.
[berja@localhost ~]$ sudo dnf install openssh-server
CentOS-7 - Base                                  1.2 MB/s |  10 MB     00:08
CentOS-7 - Updates                               1.6 MB/s |  28 MB     00:17
CentOS-7 - Extras                                714 kB/s | 360 kB     00:00
Last metadata expiration check: 0:00:01 ago on Tue 05 Sep 2023 11:26:30 AM EDT.
Package openssh-server-7.4p1-22.el7_9.x86_64 is already installed.
Dependencies resolved.
Nothing to do.
Complete!
[berja@localhost ~]$
```

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

```
Complete!
[berja@localhost ~]$ systemctl start sshd
[berja@localhost ~]$ systemctl enable sshd
[berja@localhost ~]$
```

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

```
[berja@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 Tue 2023-09-05 11:17:04 EDT; 20min ago
     Docs: man:sshd(8)
           man:sshd_config(5)
 Main PID: 1153 (sshd)
    Tasks: 1
   CGroup: /system.slice/sshd.service
           └─1153 /usr/sbin/sshd -D

Sep 05 11:17:04 localhost.localdomain systemd[1]: Starting OpenSSH server daemon...
Sep 05 11:17:04 localhost.localdomain sshd[1153]: Server listening on 0.0.0.0 port 22.
Sep 05 11:17:04 localhost.localdomain sshd[1153]: Server listening on :: port 22.
Sep 05 11:17:04 localhost.localdomain systemd[1]: Started OpenSSH server daemon.
Hint: Some lines were ellipsized, use -l to show in full.
[berja@localhost ~]$
```

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

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

   $ firewall-cmd --reload

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

```
#       $OpenBSD: sshd_config,v 1.100 2016/08/15 12:32:04 naddy Exp $

# This is the sshd server system-wide configuration file.  See
# sshd_config(5) for more information.

# This sshd was compiled with PATH=/usr/local/bin:/usr/bin

# The strategy used for options in the default sshd_config shipped with
# OpenSSH is to specify options with their default value where
# possible, but leave them commented.  Uncommented options override the
# default value.

# If you want to change the port on a SELinux system, you have to tell
# SELinux about this change.
# semanage port -a -t ssh_port_t -p tcp #PORTNUMBER
#
#Port 22
#AddressFamily any
#ListenAddress 0.0.0.0
#ListenAddress ::
                                [ Read 139 lines ]
^G Get Help   ^O WriteOut   ^R Read File  ^Y Prev Page  ^K Cut Text   ^C Cur Pos
^X Exit       ^J Justify    ^W Where Is   ^V Next Page  ^U UnCut Text ^T To Spell
```

```
success
[berja@localhost ~]$ sudo nano /etc/ssh/sshd_config
[sudo] password for berja:
[berja@localhost ~]$ systemctl reload sshd
[berja@localhost ~]$
```

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*.

```
[berja@CentOS ~]$ ssh-copy-id -i ~/.ssh/id_rsa berja@CentOS
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/home/berja/.ssh/id_rsa.
pub"
The authenticity of host 'centos (127.0.0.1)' can't be established.
ECDSA key fingerprint is SHA256:r1lrGYqAGTxs5bhHFxuqxbvGU38Yv2SxekCLBVQhpYc.
ECDSA key fingerprint is MD5:cb:8e:c5:aa:86:45:8e:a1:c5:01:8f:3d:c6:f4:73:92.
Are you sure you want to continue connecting (yes/no)? y
Please type 'yes' or 'no': 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
berja@centos's password:

Number of key(s) added: 1

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

[berja@CentOS ~]$
```

Task 4: Verify ssh remote connection

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

```
berja@localmachine:~$ ssh berja@CentOS
The authenticity of host 'centos (192.168.56.111)' can't be established.
ED25519 key fingerprint is SHA256:I6iTzk6h0pYRu1Q1rBHRjUycqzvDwd/37Ctc2EqtQR4.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'centos' (ED25519) to the list of known hosts.
berja@centos's password:
Last login: Tue Sep  5 14:00:17 2023
[berja@CentOS ~]$
```

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 and looking for the best distribution for Debian and Red Hat Linux. The user must choose the best and can a good specs and has a good stability. Reliability helps to choose both Debian and Red Hat has both handle those distributions.

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

   The CentOS came from the code to Red Hat and this is available the same as the Red Hat in open source licenses, while the Debian is an open source software and it is a very known community driven distribution. The configuration management on CentOS is often paired with the tools like the ansible for the use of configuration management. Debian shows how it is commonly used for tools like puppet and chef for configuration management. In the upgrading system CentOS almost only supports the minor versions only, while the Debian is great for the major versions of upgrades.