

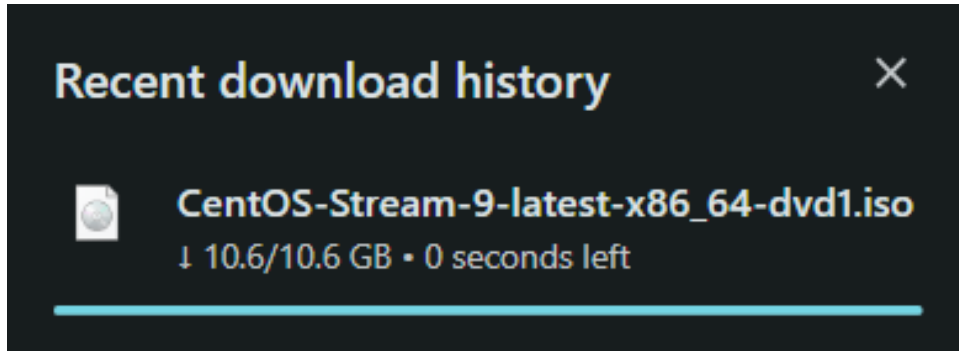
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| Course/Section: CPE212-CPE31S21 | Date Submitted: 09/ /24 |
| Instructor: Engr. Robin Valenzuela | Semester and SY: First 2024-2025 |
| Activity 3: Install SSH server on CentOS or RHEL 8 | |
| 1. Objectives: 1.1 Install Community Enterprise OS or 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.

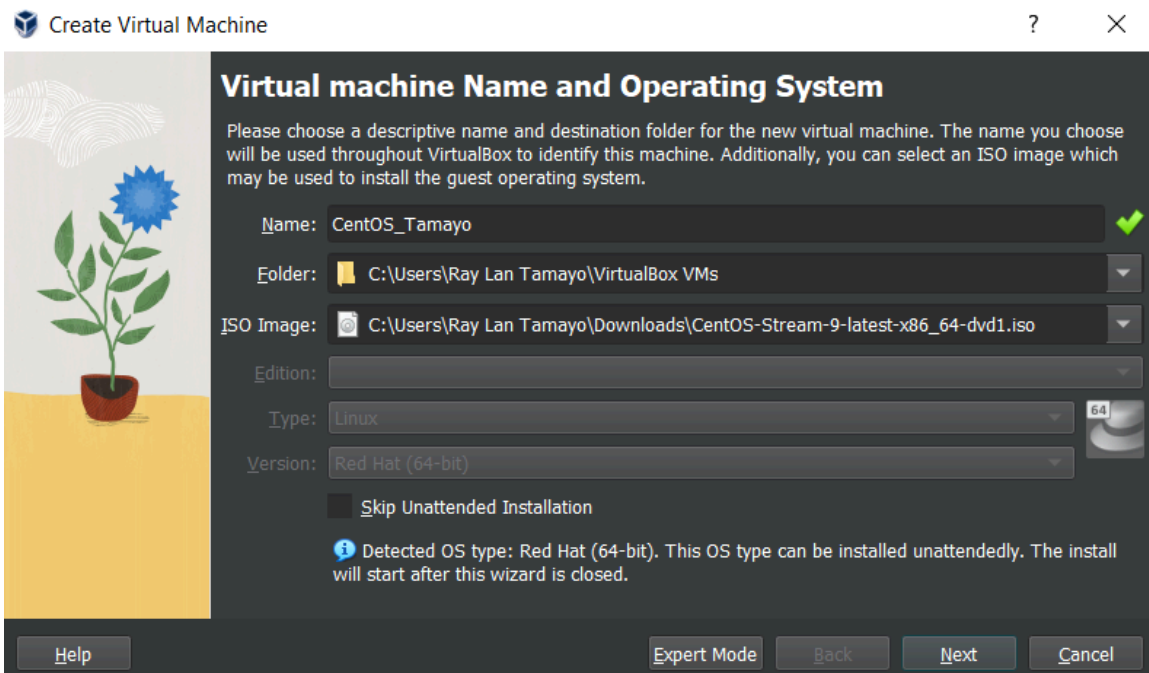
Task 1: Download the CentOS or RHEL-8 image (Create screenshots of the following)

1. Download the image of the CentOS here:

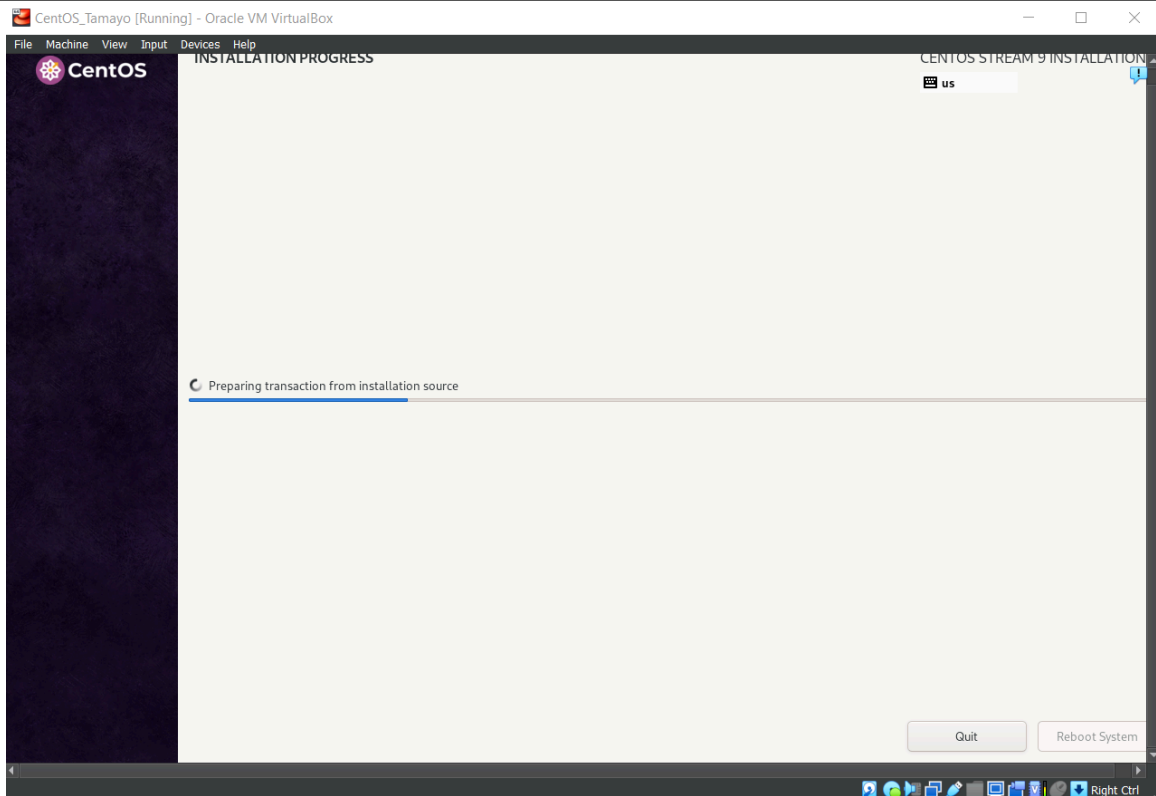
http://mirror.rise.ph/centos/7.9.2009/isos/x86_64/



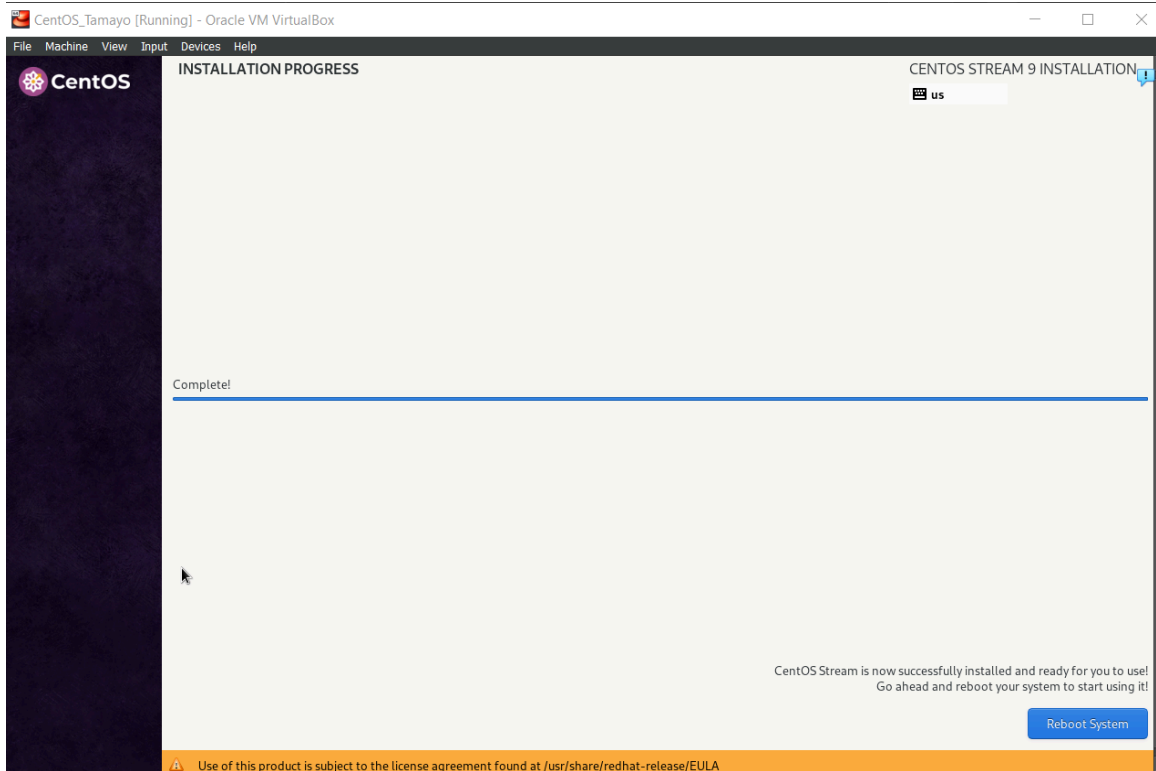
2. Create a VM machine with 2 Gb RAM and 20 Gb HD.



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 tamayo]# sudo dnf install openssh-server
Updating Subscription Management repositories.
Unable to read consumer identity

This system is not registered with an entitlement server. You can use "rhc" or "
subscription-manager" to register.

CentOS Stream 9 - BaseOS                3.0 MB/s | 8.2 MB      00:02
CentOS Stream 9 - AppStream              5.8 MB/s | 20 MB       00:03
CentOS Stream 9 - Extras packages        13 kB/s | 19 kB        00:01
Package openssh-server-8.7p1-43.el9.x86_64 is already installed.
Dependencies resolved.
Nothing to do.
Complete!
[root@localhost tamayo]#
```

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

\$ systemctl start sshd

\$ systemctl enable sshd

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

3. Confirm that the *sshd* daemon is up and running:

\$ systemctl status sshd

```
[root@localhost tamayo]# systemctl status sshd
● sshd.service - OpenSSH server daemon
   Loaded: loaded (/usr/lib/systemd/system/sshd.service; enabled; preset: ena>
   Active: active (running) since Thu 2024-09-12 18:31:46 PST; 17min ago
     Docs: man:sshd(8)
           man:sshd_config(5)
   Main PID: 903 (sshd)
    Tasks: 1 (limit: 23008)
   Memory: 2.3M
      CPU: 13ms
   CGroup: /system.slice/sshd.service
           └─903 "sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups"

Sep 12 18:31:46 localhost.localdomain systemd[1]: Starting OpenSSH server daemon>
Sep 12 18:31:46 localhost.localdomain sshd[903]: Server listening on 0.0.0.0 po>
Sep 12 18:31:46 localhost.localdomain sshd[903]: Server listening on :: port 22.
Sep 12 18:31:46 localhost.localdomain systemd[1]: Started OpenSSH server daemon.
```

4. Open the SSH port 22 to allow incoming traffic:

\$ firewall-cmd --zone=public --permanent --add-service=ssh

\$ firewall-cmd --reload

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

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`

```
tamayo@localhost:/home/tamayo — nano /etc/ssh/sshd_config
GNU nano 5.6.1 /etc/ssh/sshd_config
# $OpenBSD: sshd_config,v 1.104 2021/07/02 05:11:21 dtucker 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:/usr/local/sbin:/usr

# 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.

# To modify the system-wide sshd configuration, create a *.conf file under
# /etc/ssh/sshd_config.d/ which will be automatically included below
Include /etc/ssh/sshd_config.d/*.conf

# 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
#

^G Help      ^O Write Out ^W Where Is  ^K Cut       ^T Execute  ^C Location
^X Exit      ^R Read File ^\ Replace   ^U Paste     ^J Justify  ^_ Go To Line
```

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

Task 3: Copy the Public Key to CentOS

1. Make sure that `ssh` is installed on the local machine.

```

tamayo@workstation:~$ ssh-keygen -t rsa -b 4096
Generating public/private rsa key pair.
Enter file in which to save the key (/home/tamayo/.ssh/id_rsa):
/home/tamayo/.ssh/id_rsa already exists.
Overwrite (y/n)? y
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /home/tamayo/.ssh/id_rsa
Your public key has been saved in /home/tamayo/.ssh/id_rsa.pub
The key fingerprint is:
SHA256:YBgqRt0cqjmF8FXBI7PrMhhAppQtaCEhrULD9cQLfWE tamayo@workstation
The key's randomart image is:
+---[RSA 4096]-----+
|**B.=+oE.          |
|*@oB*=+.          |
|X==.o==.          |
|Boo .o .          |
|+o . S            |
|= .               |
| + .              |
|. o .             |
| o                |
+-----[SHA256]-----+

```

2. Using the command `ssh-copy-id`, connect your local machine to CentOS.

```

tamayo@workstation:~$ ssh-copy-id -i ~/.ssh/id_rsa tamayo@127.0.0.1
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/home/tamayo/.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
tamayo@127.0.0.1's password:

Number of key(s) added: 1

Now try logging into the machine, with:  "ssh 'tamayo@127.0.0.1'"
and check to make sure that only the key(s) you wanted were added.

```

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

```

tamayo@workstation:~/ssh$ cat authorized_keys
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQACWNN15vDBZBo04sFamNLEOfcEAEebsXLSHYCSDEL+qG
b3bnLK6B6PubaHXBoem7I6N4FauYZFlyyFl0kccR5MnfYwdnXVMGXFABJLm9GFIagGPfIiJrzotsD+q
sIZAXUT85HljZtiuIatl3NXHtMYJJEGDUhwSqCLNKSJ+8pncmABUUmRNGwZtRf+Ded8XK5jem3rabf15
SEYHc9059Kfzpgt+q2DjjNdhrAR1DRhldw526cPIGM+MwtlF+GyLv2otVQFXVa66I6v16ASTT6SrE3T
4+SzKZbquCpjw6QmCX2GYIYVRVALZCi4epy2PTMibV93FUozRQcBK9Pxud5I8Ek6M0mh3JlCuLBYC/df
U7Dm6hJFcHeMfZUjjQeG2SCDLY+nhuwanJ+CCeZQevgDg5N3kY0R3ezqyEPwnjqW20yzF9XW/ZoArrpn
MUceMNueVG02/3w/aJVZZvuEiaASiFeMvvc0f6uEcy04hz173tinEYVieTh71pSEVqMfJ20PhW6XBsVb
j75/N6c5QmKrWkWNRMbh7fGp3xe/VPPRZefwpMgeyPNLEm7cSOL9hJf+QmGWbk5tY1X9UuWdBsqPav3S
Mhi43VXoJuR7QsA1uGj+6QgJbCq850Wa72m5LZNyj6+ANDwL22uWihuAbeePUV94BUf4ke0t+IdERVZ/
5w== tamayo@workstation

```

Task 4: Verify ssh remote connection

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

```
tamayo@workstation:~$ ssh tamayo@127.0.0.1
Welcome to Ubuntu 23.10 (GNU/Linux 6.5.0-44-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/pro

0 updates can be applied immediately.

The list of available updates is more than a week old.
To check for new updates run: sudo apt update
Your Ubuntu release is not supported anymore.
For upgrade information, please visit:
http://www.ubuntu.com/releaseendoflife

New release '24.04.1 LTS' available.
Run 'do-release-upgrade' to upgrade to it.

Last login: Wed Sep  4 03:41:17 2024 from 127.0.0.1
```

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?

Considerations like your unique use case, the amount of support you need, your experience with package management systems, the trade-off between stability and cutting-edge features, licensing preferences, ecosystem integration, community vs. commercial backing, financial constraints, security concerns, and hardware compatibility should all be taken into account when choosing between Debian and Red Hat Linux distributions. Ultimately, since both Red Hat and Debian are extensively utilized in different contexts and each has advantages, your decision should be based on your own needs and objectives.

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

The licensing and origins of the Debian and Red Hat Linux distributions are different. Package management systems, support networks, cutting-edge features versus stability, ecosystems, pricing, security strategies, community support versus commercial backing, and release cycles are some of the differences between Red Hat and Debian. Red Hat provides a commercial product, such as Red Hat Enterprise Linux (RHEL), with a balanced approach to new features and stability, supported by commercial support options and a well-established ecosystem.