Name: Khelvin P. Nicolas	Date Performed: 9/11/2024
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Instructor: Engr. Robin Valenzuela	Semester and SY: 1st Sem - 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 arches 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 1 Documentation:

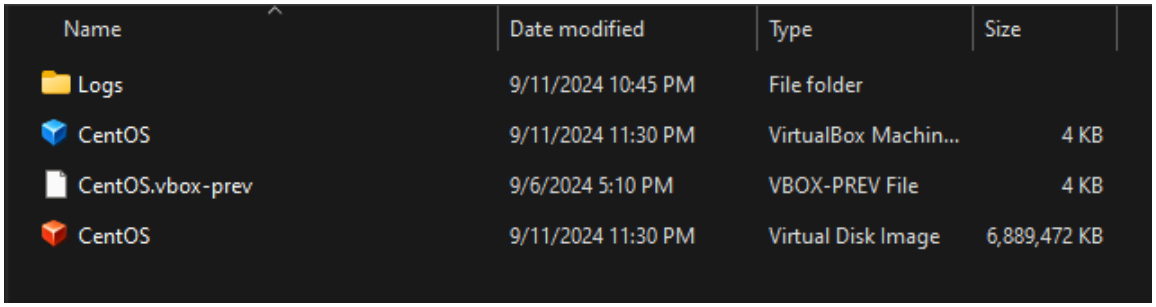

figure 1.1: CentOS VDI

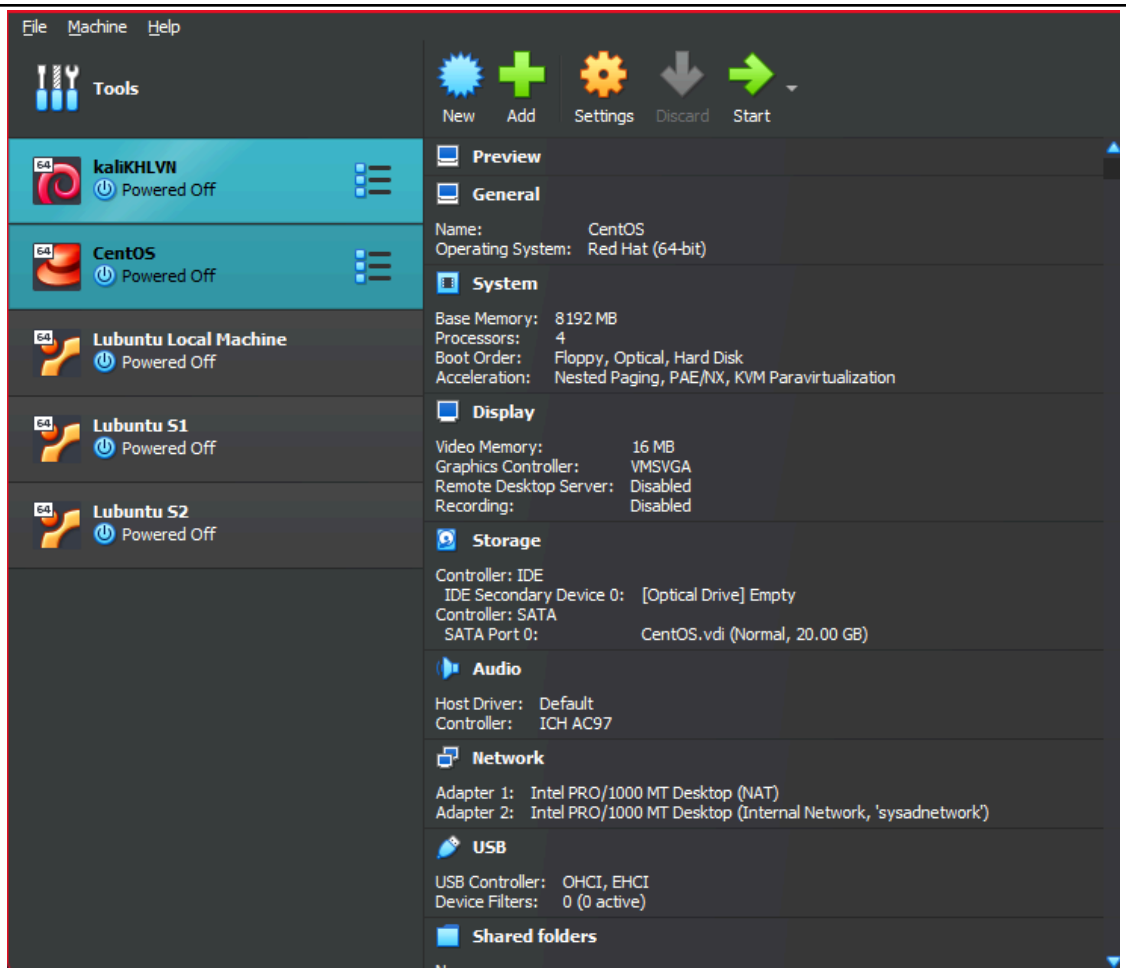

figure 1.2: CentOS VM Loaded in VirtualBox

Task 2: Install the SSH server package *openssh*

1. Install the ssh server package *openssh* by using the *dnf* command:
   $ dnf install openssh-server
2. Start the *sshd* daemon and set to start after reboot:
   $ systemctl start sshd
   $ systemctl enable sshd
3. Confirm that the sshd daemon is up and running:
   $ systemctl status sshd
4. Open the SSH port 22 to allow incoming traffic:
   $ firewall-cmd --zone=public --permanent --add-service=ssh
   $ firewall-cmd --reload
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*.

Task 4: Verify ssh remote connection

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

Task 2 3 4 Documentation

```
[user_khlvn@CentOSworkstation ~]$ sudo dnf install openssh-server
[sudo] password for user_khlvn:
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                        4.3 kB/s | 7.2 kB     00:01
CentOS Stream 9 - BaseOS                        1.1 MB/s | 8.2 MB     00:07
CentOS Stream 9 - AppStream                     4.9 kB/s | 8.0 kB     00:01
CentOS Stream 9 - AppStream                     5.3 MB/s |  20 MB     00:03
CentOS Stream 9 - Extras packages               9.1 kB/s | 8.6 kB     00:00
Extra Packages for Enterprise Linux 9 - x86_64   16 kB/s |  16 kB     00:00
Extra Packages for Enterprise Linux 9 - x86_64  3.4 MB/s |  23 MB     00:06
Extra Packages for Enterprise Linux 9 - Next -   15 kB/s |  19 kB     00:01
Package openssh-server-8.7p1-43.el9.x86_64 is already installed.
Dependencies resolved.
Nothing to do.
Complete!
[user_khlvn@CentOSworkstation ~]$
```

figure 2.1: downloading OpenSSH using DNF package manager

```
[user_khlvn@CentOSworkstation ~]$ sudo systemctl start sshd
[user_khlvn@CentOSworkstation ~]$ sudo systemctl enable sshd
[user_khlvn@CentOSworkstation ~]$ systemctl status sshd
● sshd.service - OpenSSH server daemon
     Loaded: loaded (/usr/lib/systemd/system/sshd.service; enabled; preset: en
     Active: active (running) since Fri 2024-09-13 00:14:50 PST; 9min ago
       Docs: man:sshd(8)
             man:sshd_config(5)
   Main PID: 932 (sshd)
      Tasks: 1 (limit: 48785)
     Memory: 2.8M
        CPU: 62ms
     CGroup: /system.slice/sshd.service
             └─932 "sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups"

Sep 13 00:14:49 CentOSworkstation systemd[1]: Starting OpenSSH server daemon..
Sep 13 00:14:50 CentOSworkstation sshd[932]: Server listening on 0.0.0.0 port
Sep 13 00:14:50 CentOSworkstation sshd[932]: Server listening on :: port 22.
Sep 13 00:14:50 CentOSworkstation systemd[1]: Started OpenSSH server daemon.
[user_khlvn@CentOSworkstation ~]$
```

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

figure 2.2: enabling SSHD service

```
khlvn@workstation:~$ ssh-copy-id user_khlvn@192.168.56.104
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/home/khlvn/.ssh/id_rsa.pub"
/usr/bin/ssh-copy-id: INFO: attempting to log in with the new key(s), to filter out any that
/usr/bin/ssh-copy-id: INFO: 1 key(s) remain to be installed -- if you are prompted now it is
user_khlvn@192.168.56.104's password:

Number of key(s) added: 1

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

khlvn@workstation:~$
```

figure 3.1: using ssh-copy-id command to copy the public key to CentOS VM

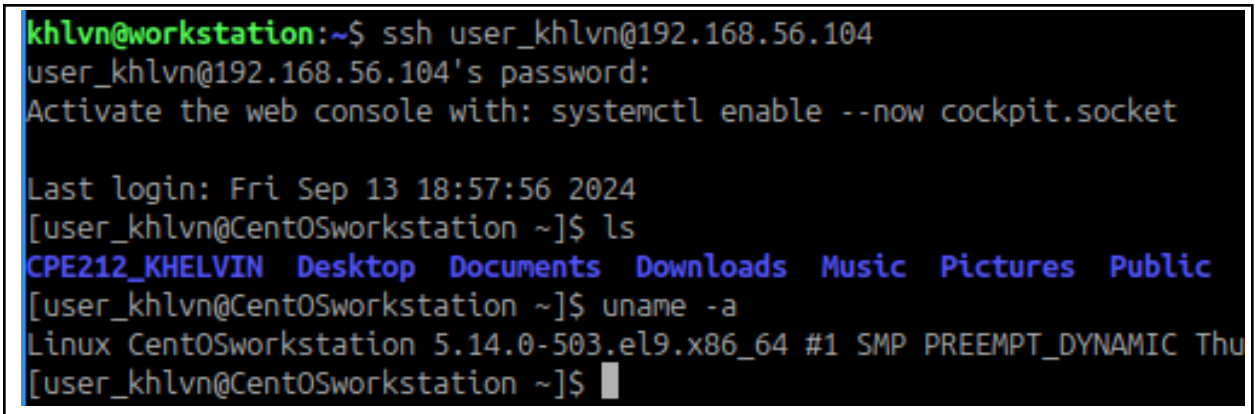

figure 4.1: SSH into CentOS VM using Local Machine

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?**
   - feature-rich, wide range of support and compatibility, however, both distributions are somewhat similar to each other, so there will be no difficulties in adapting to a different environment. Additionally, Red Hat Linux distributions require paid subscription because they are used for enterprise-level management and security, and as normal users, choosing free distros like the majority of linux distributions are necessary.

2. **What are the main differences between Debian and Red Hat Linux distributions?**
   - debian uses apt as its package manager and .deb as package format while red hat uses yum/dnf as its package manager and .rpm as package format. Red Hat distributions are usually used for enterprise level server management and require paid subscription for full support while debian distributions like Ubuntu are community-driven and are also free to use for everyone.