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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.

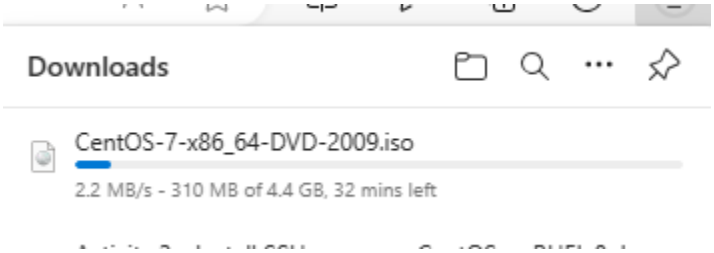
CentOS uses the RPM package format and YUM/DNF as the package manager.

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

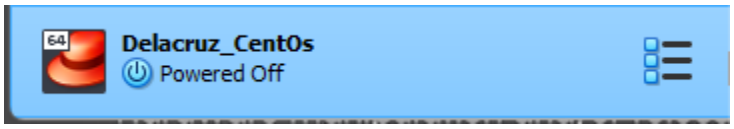
Both offer full-feature package management with network-based repository support, dependency checking and resolution, etc.. If you're familiar with one but not the other, you may have a little trouble switching over, but they're not overwhelmingly different. They both have similar features, just available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

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

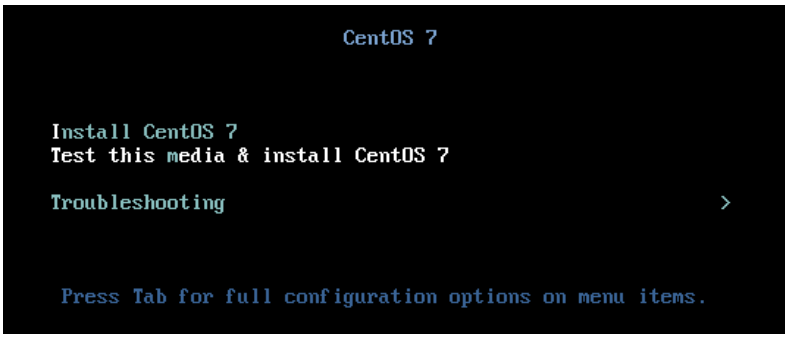
1. Download the image of the CentOS here: http://mirror.rise.ph/centos/7.9.2009/isos/x86_64/



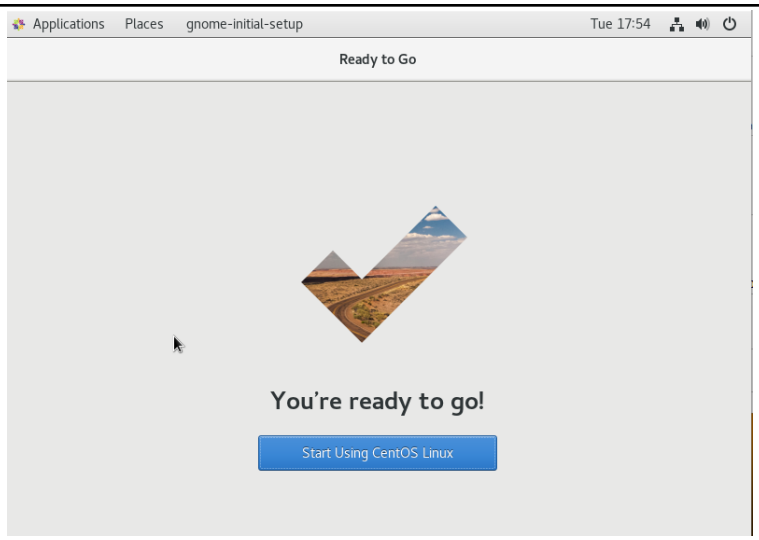
2. Create a VM machine with 2 Gb RAM and 20 Gb HD.



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 ivvan]# dnf install openssh-server
CentOS-7 - Base                                  763 kB/s |  10 MB     00:13
CentOS-7 - Updates                               1.6 MB/s |  28 MB     00:16
CentOS-7 - Extras                                472 kB/s | 360 kB     00:00
Package openssh-server-7.4p1-21.el7.x86_64 is already installed.
Dependencies resolved.
Nothing to do.
Complete!
[root@localhost ivvan]#
```

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

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

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

```
[root@localhost ivvan]# 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 17:53:31 PST; 20min ago
     Docs: man:sshd(8)
           man:sshd_config(5)
 Main PID: 1189 (sshd)
   CGroup: /system.slice/sshd.service
           └─1189 /usr/sbin/sshd -D

Sep 05 17:53:31 localhost.localdomain systemd[1]: Starting OpenSSH server daemon...
Sep 05 17:53:31 localhost.localdomain sshd[1189]: Server listening on 0.0.0.0 port 22.
Sep 05 17:53:31 localhost.localdomain sshd[1189]: Server listening on :: port 22.
Sep 05 17:53:31 localhost.localdomain systemd[1]: Started OpenSSH server daemon.
Hint: Some lines were ellipsized, use -l to show in full.
```

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

$ firewall-cmd --reload

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

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

```
  GNU nano 2.3.1            File: /etc/ssh/sshd_config

# no default banner path
#Banner none

# Accept locale-related environment variables
AcceptEnv LANG LC_CTYPE LC_NUMERIC LC_TIME LC_COLLATE LC_MONETARY LC_MESSAGES
AcceptEnv LC_PAPER LC_NAME LC_ADDRESS LC_TELEPHONE LC_MEASUREMENT
AcceptEnv LC_IDENTIFICATION LC_ALL LANGUAGE
AcceptEnv XMODIFIERS

# override default of no subsystems
Subsystem       sftp    /usr/libexec/openssh/sftp-server

# Example of overriding settings on a per-user basis
#Match User anoncvs
#       X11Forwarding no
#       AllowTcpForwarding no
#       PermitTTY no
#       ForceCommand cvs server
```

```
[root@localhost ivvan]# nano /etc/ssh/sshd_config
[root@localhost ivvan]# systemctl reload sshd
```

Task 3: Copy the Public Key to CentOS

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

```
ivan@Workstation_Delacruz:~$ sudo apt install openssh-server
[sudo] password for ivan:
Reading package lists... Done
Building dependency tree
Reading state information... Done
openssh-server is already the newest version (1:7.6p1-4ubuntu0.7).
The following package was automatically installed and is no longer required:
  libllvm7
Use 'sudo apt autoremove' to remove it.
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
```

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

```
ivan@Workstation_Delacruz:~$ ssh-copy-id ivvan@192.168.56.107
/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

ivvan@192.168.56.107's password:

Number of key(s) added: 1

Now try logging into the machine, with:   "ssh 'ivvan@192.168.56.107'"
and check to make sure that only the key(s) you wanted were added.
```

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

```
[ivvan@localhost ~]$ ls .ssh
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.

```
ivan@Workstation_Delacruz:~$ ssh ivvan@192.168.56.107
Last login: Tue Sep  5 18:28:27 2023
[ivvan@localhost ~]$ logout
Connection to 192.168.56.107 closed.
```

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?
   - In choosing the best distribution, the user must consider the purpose or the use between the two linux distributions. Both are different in terms of support but they are open source that can be used in linux The Red hat distribution is good in application, individual uses and business since it focuses on Enterprises, while Debian provides most of the package software and a wise choice in engineering team experiences. In addition, Linux has many distributions like debian and red hat, but consider what you need to maximize the package of it.

2. What are the main differences between Debian and Red Hat Linux distributions?
   - Debian and Red Hat are both linux distributions, They are distinct in terms of architecture support. Debian supports any architecture or platform that runs Linux, while Red hat supports few architectures like Power ISA. Debian used the deb package format, while Red hat used the RPM package format. In terms of community support, Debian is primarily supported that includes a bug tracker while Red hat accepts bug reports that are submitted by end users.