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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.

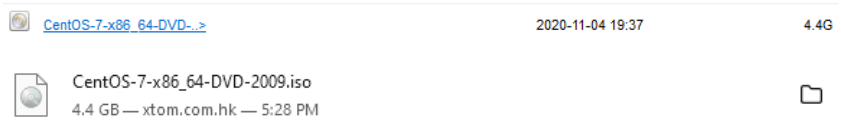
CentOS uses the RPM package format and YUM/DNF as the package manager.

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.

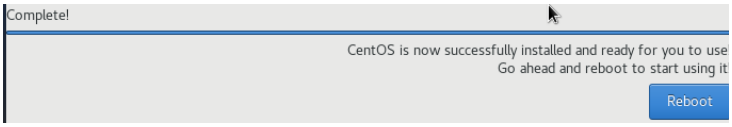
Task 1: Download the CentOS or RHEL-8 image (Create screenshots of the following)

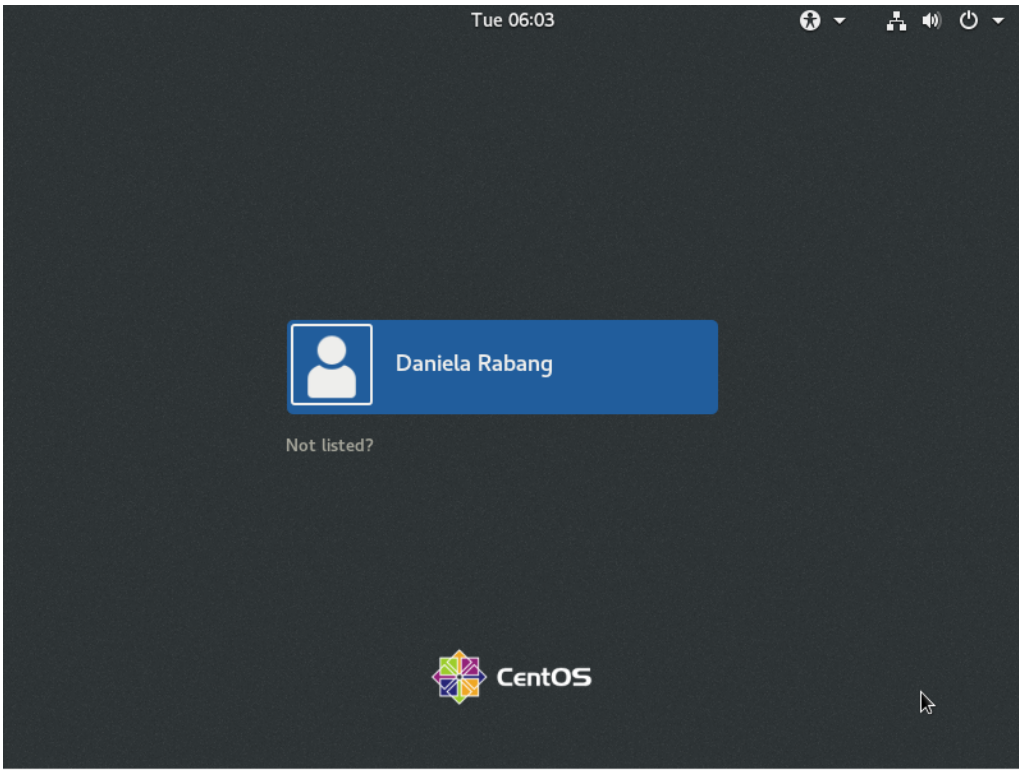
1. Download the image of the CentOS here: http://mirror.rise.ph/centos/7.9.2009/isos/x86_64/



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 ~]# yum install openssh-server
Loaded plugins: fastestmirror, langpacks
Loading mirror speeds from cached hostfile
 * base: mirror.rise.ph
 * extras: mirror.rise.ph
 * updates: mirror.rise.ph
Resolving Dependencies
--> Running transaction check
---> Package openssh-server.x86_64 0:7.4p1-21.el7 will be updated
---> Package openssh-server.x86_64 0:7.4p1-23.el7_9 will be an update
--> Processing Dependency: openssh = 7.4p1-23.el7_9 for package: openssh-server-7.4p1-2
3.el7_9.x86_64
--> Running transaction check
---> Package openssh.x86_64 0:7.4p1-21.el7 will be updated
--> Processing Dependency: openssh = 7.4p1-21.el7 for package: openssh-clients-7.4p1-21
.el7.x86_64
```

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

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

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

```
[root@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 2023-08-29 06:16:39 EDT; 1min 10s ago
     Docs: man:sshd(8)
           man:sshd_config(5)
 Main PID: 1062 (sshd)
    Tasks: 1
   CGroup: /system.slice/sshd.service
           └─1062 /usr/sbin/sshd -D

Aug 29 06:16:39 localhost.localdomain systemd[1]: Starting OpenSSH server daemon...
Aug 29 06:16:39 localhost.localdomain sshd[1062]: Server listening on 0.0.0.0 port 22.
Aug 29 06:16:39 localhost.localdomain sshd[1062]: Server listening on :: port 22.
Aug 29 06:16:39 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

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

   $ firewall-cmd --reload

```
[root@localhost ~]# 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

```
[root@localhost ~]# systemctl reload sshd
[root@localhost ~]# ls /etc/ssh/sshd_config
/etc/ssh/sshd_config
```

Task 3: Copy the Public Key to CentOS

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

```
daniela@workstation:~$ ssh -V
OpenSSH_7.6p1 Ubuntu-4ubuntu0.7, OpenSSL 1.0.2n  7 Dec 2017
```

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

```
daniela@workstation:~$ ssh-copy-id -i ~/.ssh/id_rsa daniela@centos
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/home/daniela/.ss
h/id_rsa.pub"
The authenticity of host 'centos (192.168.56.112)' can't be established.
ECDSA key fingerprint is SHA256:+gJwfZeMleoCd8rM06ra3K/vGMObhOyH6ElGxVUvnj8.
Are you sure you want to continue connecting (yes/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 prompt
ed now it is to install the new keys
daniela@centos's password:

Number of key(s) added: 1

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

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

```
[daniela@localhost ~]$ cat ~/.ssh/authorized_keys
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAACAQDJHbHxnPQZTJkGpW1dCXOaizP+t/xUFpbiZLE7MNn4V0w7mgQ
lZxB5i23huMwYnRHy8tXiOno15wEGAhNb5YCN17G0FUDZzhECAQpGx+Q4W72i1HncFn/YCxaEHqO7CT0El2Q63u
1IcQiI5QTuX0cZa4MdiIsivsoyNy8m6ghj2w1sQxWYf0VmG9SjMl9NQ8A7L79KwsU0qfLzEQwWGGm4U4o5/Xxm1
TMX3+iaHtj9F/i/3VPkieLSQKqqOWFNc+qI1G3YIpg0oYUmXvuOYwQSL36XSqoEvGj37G05jQJnpVS2+dKTT39l
TTuXr4VeM6eFq2LoBWGDP4BaEEzMF0Ixh4zqTKq7pwc88S7GYYfZOCD5qNr46HfJ3b7N7fpoifm8MwehTTkBQUA
ZRyd/H9YR1fZeIuYCd89OSHRCkPsTjoDFc8Oe2gO3UGK7NPbc3GF1kIrUzmV+1x5w5uau8a644mZV6XppMwRjsf
tlmHOd+R2oV0YrmKqd4Tryb7Hm3OdXIPEAGh9XcZFcl3KitJzi1O5JEF4CmgMFZPM3aeefWeiZAOusqWukmzW4Z
9V+9MA5tZwXToj4g6nfzf4479/ity+bAemRAHHT24ffVrbaDXAPTB8THmQml8dcSENkNrBRR6HixwBwcbVq/1gZ
m6Bj+LD8EvRPOqTqojjyngwPjQ== daniela@workstation
```

Task 4: Verify ssh remote connection

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

```
daniela@workstation:~$ ssh 'daniela@centos'
Last login: Tue Sep  5 04:50:35 2023
[daniela@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?
   - What we need to look for in choosing the best distribution between the two is that we need to look for many classifications. One is the usage, where will you

use it or what for. The specific requirements of the PC are also required to gain knowledge on choosing between the two distributions.

2. What are the main differences between Debian and Red Hat Linux distributions?
   - There are many differences between Debian and Red Hat Linux distribution, but one of the biggest differences is that Debian releases non-commercial products and on the other side, Red Hat Linux releases commercial products. Then the two use different software package management.

Conclusion:

In this hands-on activity that tackles the installation of ssh servers on centos, I have learned many things by reading and by simulating the tasks that are asked to be done. So we are asked to download the image of the CentOS that has a specific version which is the version 7. Then after downloading I had created a virtual machine that has a specification of 2GB RAM and 20 GB HD. The virtual machine had been run and the iso image that I downloaded before is being downloaded to the virtual machine. After all the steps that I had done to be able to finish my downloading steps in the procedure. I started on installing the ssh server package on my centos virtual machine. I installed the openssh-server then started sshd and enabled it. after that I ensured that I had enabled the sshd by printing the status. Then I had done task number 3. In this task I ensured that ssh was installed on my Ubuntu workstation. Then I added a key that is named centos so that I could access the centos workstation on my ubuntu workstation. I verified that I can connect to my CentOS using ssh. After all the tasks that I had done, I can say that I learned and simulated the step by step procedures that are needed in this hands-on activity.