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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.

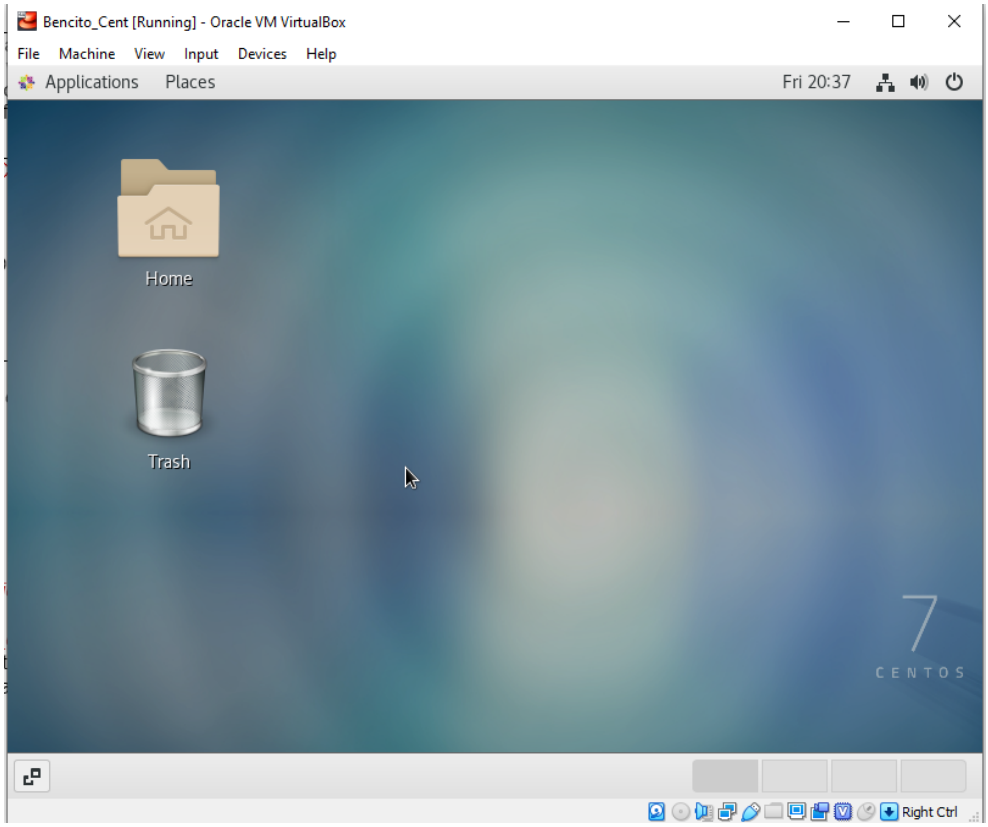
CentOS uses the RPM package format and YUM/DNF as the package manager.

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

```
[sbencito@localhost ~]$ sudo dnf install openssh-server

Extra Packages for Enterprise Linux 7 - x86_64         236 kB/s |  17 MB     01:13
CentOS-7 - Base                                        734 kB/s |  10 MB     00:14
CentOS-7 - Updates                                     968 kB/s |  21 MB     00:22
CentOS-7 - Extras                                      1.0 MB/s | 332 kB     00:00
Last metadata expiration check: 0:00:01 ago on Fri 02 Sep 2022 08:45:08 PM EDT.
Package openssh-server-7.4p1-22.el7_9.x86_64 is already installed.
Dependencies resolved.
Nothing to do.
Complete!
[sbencito@localhost ~]$
```

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

```
[sbencito@localhost ~]$ sudo systemctl start sshd
[sudo] password for sbencito:
Sorry, try again.
[sudo] password for sbencito:
[sbencito@localhost ~]$ systemctl enable sshd
[sbencito@localhost ~]$
```

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

```
[sbencito@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 Fri 2022-09-02 20:47:51 EDT; 3min 33s ago
     Docs: man:sshd(8)
           man:sshd_config(5)
 Main PID: 1169 (sshd)
   CGroup: /system.slice/sshd.service
           └─1169 /usr/sbin/sshd -D

Sep 02 20:47:50 localhost.localdomain systemd[1]: Starting OpenSSH server daemon...
Sep 02 20:47:51 localhost.localdomain sshd[1169]: Server listening on 0.0.0.0 port 22.
Sep 02 20:47:51 localhost.localdomain sshd[1169]: Server listening on :: port 22.
Sep 02 20:47:51 localhost.localdomain systemd[1]: Started OpenSSH server daemon.
Hint: Some lines were ellipsized, use -l to show in full.
[sbencito@localhost ~]$
```

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

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

```
[sbencito@localhost ~]$ sudo cat /etc/ssh/sshd_config
[sudo] password for sbencito:
#       $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 ::

HostKey /etc/ssh/ssh_host_rsa_key
#HostKey /etc/ssh/ssh_host_dsa_key
HostKey /etc/ssh/ssh_host_ecdsa_key
```

```
#UseDNS yes
#PidFile /var/run/sshd.pid
#MaxStartups 10:30:100
#PermitTunnel no
#ChrootDirectory none
#VersionAddendum none

# 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
[sbencito@localhost ~]$
```

$ systemctl reload sshd

```
[sbencito@localhost ~]$ sudo systemctl reload sshd
[sbencito@localhost ~]$
```

Task 3: Copy the Public Key to CentOS

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

```
bencito@bencito-VirtualBox:~$ ssh-keygen -t rsa -b 4096
Generating public/private rsa key pair.
Enter file in which to save the key (/home/bencito/.ssh/id_rsa):
/home/bencito/.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/bencito/.ssh/id_rsa
Your public key has been saved in /home/bencito/.ssh/id_rsa.pub
The key fingerprint is:
SHA256:tnVs4p2DzkcwiR/Ja2FA+EDDA+V4eAiTFi9khs2K/jE bencito@bencito-VirtualBox
The key's randomart image is:
+---[RSA 4096]----+
```

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

```
bencito@bencito-VirtualBox:~$ ssh-copy-id -i ~/.ssh/id_rsa sbencito@192.168.56.
102
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/home/bencito/.s
sh/id_rsa.pub"
The authenticity of host '192.168.56.102 (192.168.56.102)' can't be established
.
ED25519 key fingerprint is SHA256:iTf3cH+enJFx63nFsWectzrV6MgYsf5IHIGHCR3z0D8.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? 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 promp
ted now it is to install the new keys
sbencito@192.168.56.102's password:

Number of key(s) added: 1

Now try logging into the machine, with:   "ssh 'sbencito@192.168.56.102'"
and check to make sure that only the key(s) you wanted were added.
```

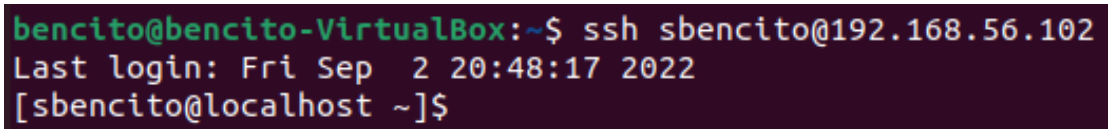
3. On CentOS, verify that you have the *authorized_keys*.

```
[sbencito@localhost ~]$ cd .ssh
[sbencito@localhost .ssh]$ cat authorized_keys
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAACAQDFl8DUEr0GLPcqfmvgydTiwAPcsb/CL76iezycUoO9HslQZfZ
Cz0VTC7GbS9Z7S9OQGf6e31mYsyVhnKg231nZ0FPPtvDbEQRzgxgCR2fUxFL3ky8zMev92UYZeJ/ymNtYGQ5UvP
nLacZVABSNANhQ9+QmczvpMG0ndVvz4muJ6HY8YF3rov5OZcKSUz8jSWa6aYFw9Tb5wi9I6cL4ET8uJzF0ifhaS
yLPLJjKsXyHBPKEPJ1r9Xs7g0taS1upUsDFCU4j1+TSCtpA4QCpaQAPXuxrYizRZE3fRLz49dpvHgj54R4Vrccq
O3cSjBhXfDzc+eyZu+TrmvRtD23cJ0Ndv+5TAOWeJ/grlYx9IXsL27DFTfq/U0XHeAMAQ8mj8v8xpiaUYLMHtXM
WJuC+N2wSJq0geEdicN5ggziF34sqCBkeCHpOw6zurJ5siOGlNXXM495WgUnC7casXqpatpnuJuwTJIyxxYfxHK
TWAWWJmYtSCfTcgfm/wfpLIeXOZuIxvdR3gMGR6idL3FhXI2u4fEBSbwyrbiOSxvxlCz9ACjhAb3lPQTZdVk/Nl
cQL1JUIpeqT4mGFYYUl51xoAqYqpg0KshoYDK8oytx7MtdKSqZndjXtkH3Ry4MYSzWzN/E7yH2BcO+BMMYc/joj
fwoz6mMfZPacm9y9u1dKVNFExw== bencito@bencito-VirtualBox
[sbencito@localhost .ssh]$
```

Task 4: Verify ssh remote connection

1. Using your local machine, connect to CentOS using ssh.

2. Show evidence that you are connected.



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?

   We are going to base on what distribution will do. because of the debian it uses for workstation. while the red hat linux some people use it for connecting to some servers. I will choose Debian because there's a lot of support and it is free.

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

   The biggest difference between the two of them is the technical support. because Debian has a technical support system unlike on the red hart linux only gives you an update that fixes just for a while. also the data of debian uses a .deb while the red hat uses a .rpm.

"I affirm that I shall not give or receive any unauthorized help on this activity and that all work shall be my own".