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Instructor: Dr. Jonathan Taylar	Semester and SY: 2022-2023

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.

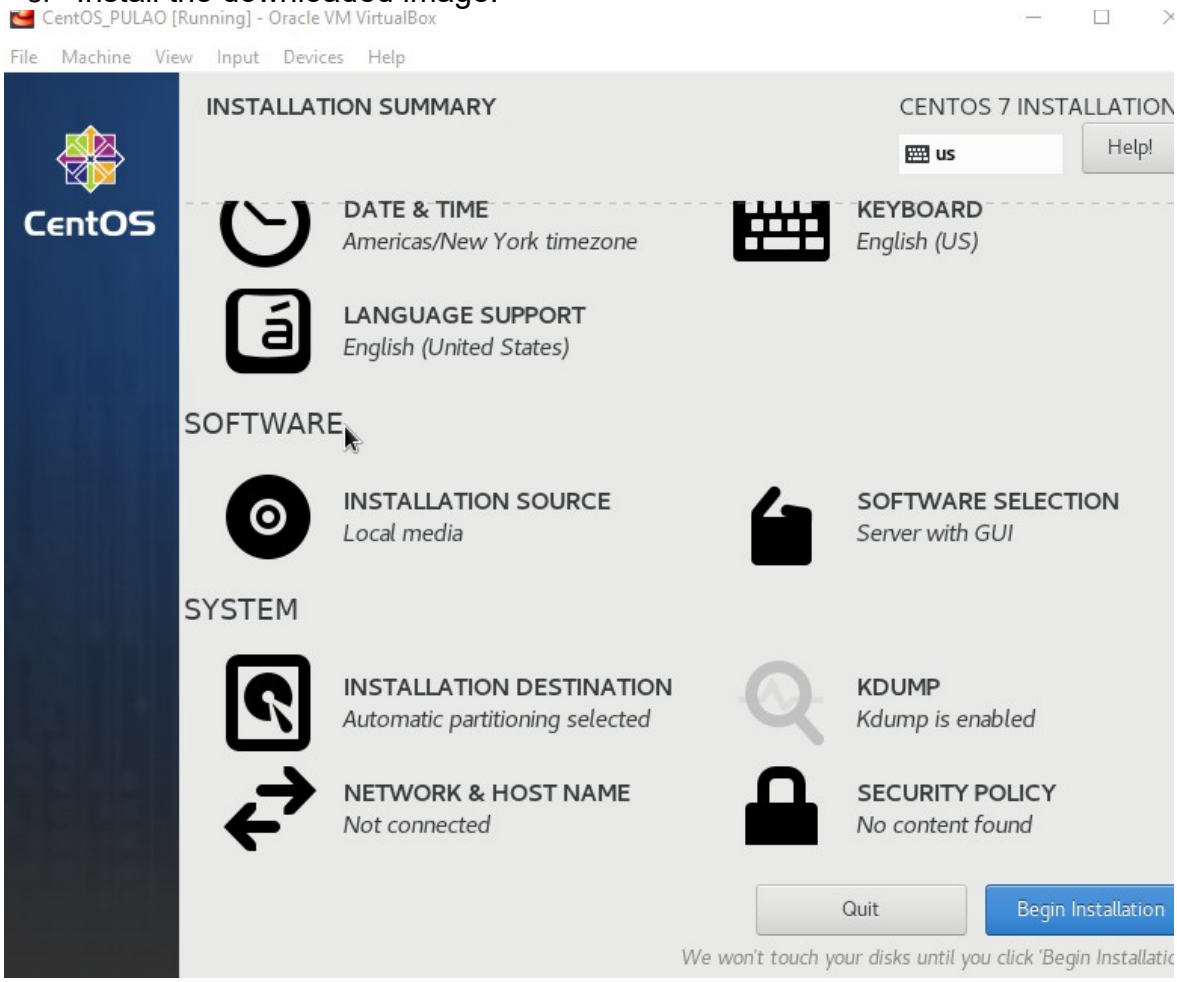
CentOS uses the RPM package format and YUM/DNF as the package manager.

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

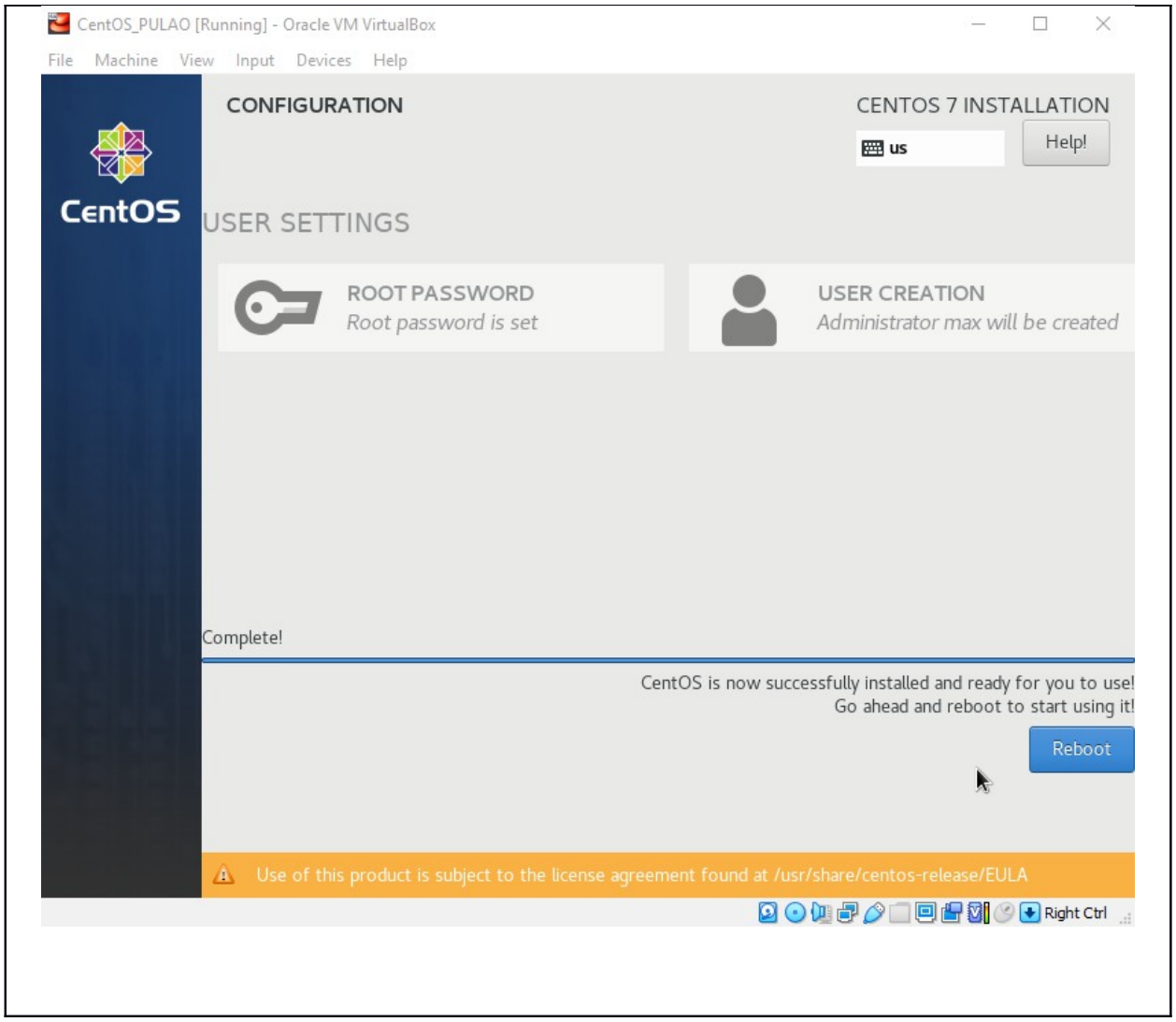
Both offer full-feature package management with network-based repository support, dependency checking and resolution, etc.. If you're familiar with one but not the other, you may have a little trouble switching over, but they're not overwhelmingly different. They both have similar features, just available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

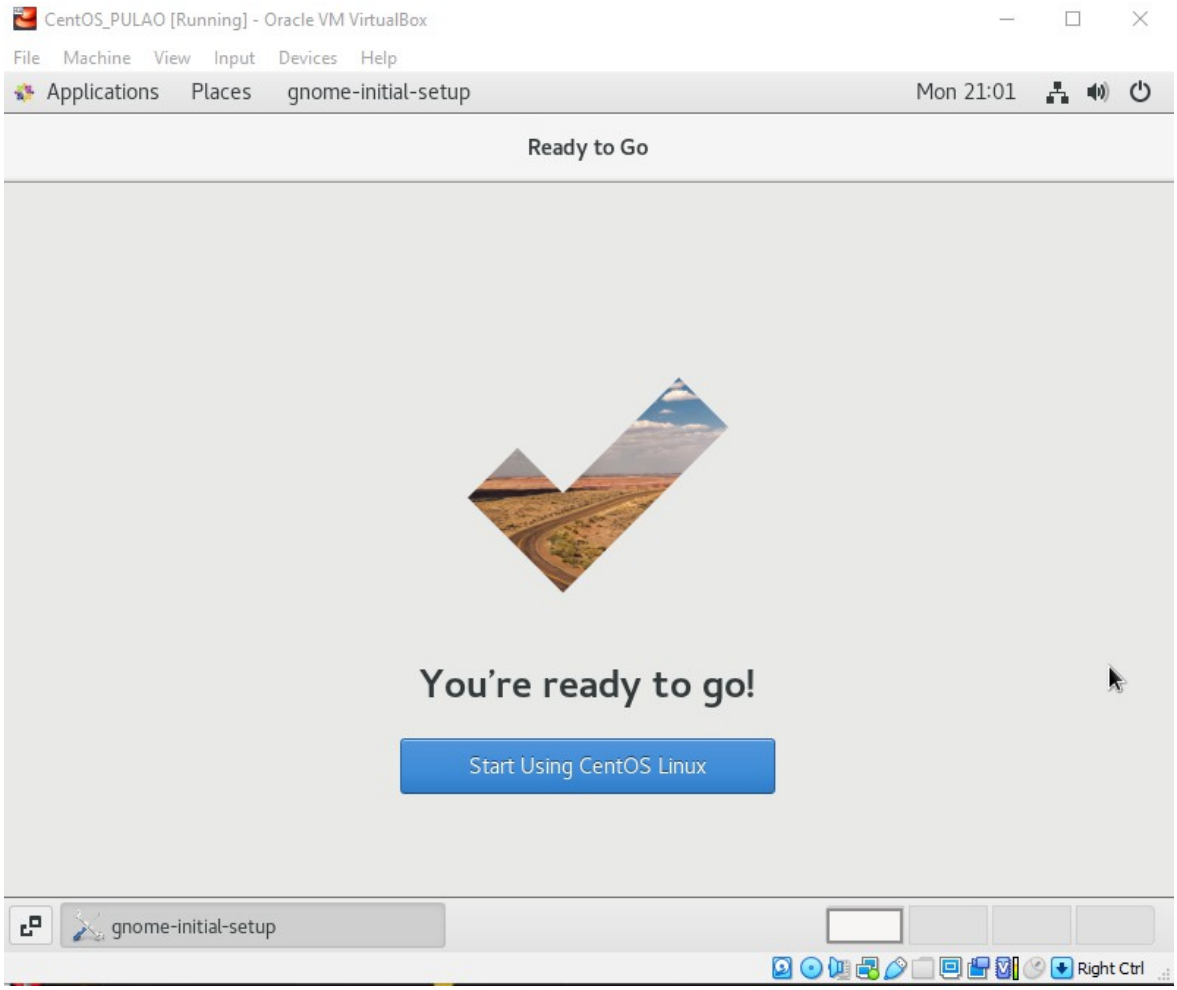
Task 1: Download the CentOS or RHEL-8 image (Create screenshots of the following)

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.


CentOS_PULAO [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
CONFIGURATION
CENTOS 7 INSTALLATION
us
Help!
CentOS
USER SETTINGS
ROOT PASSWORD
Root password is set
USER CREATION
Administrator max will be created
Complete!
CentOS is now successfully installed and ready for you to use!
Go ahead and reboot to start using it!
Reboot
Use of this product is subject to the license agreement found at /usr/share/centos-release/EULA
Right Ctrl



Task 2: Install the SSH server package *openssh*

1. Install the ssh server package *openssh* by using the *dnf* command:
   $ dnf install openssh-server

```
[max@localhost ~]$ sudo dnf install opensshs-serve
CentOS-7 - Base                                  809 kB/s |  10 MB     00:12
```

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

```
[max@localhost ~]$ systemctl start sshd
[max@localhost ~]$ systemctl enable sshd
[max@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 Mon 2022-08-29 21:16:46 EDT; 9min ago
     Docs: man:sshd(8)
           man:sshd_config(5)
 Main PID: 1349 (sshd)
   CGroup: /system.slice/sshd.service
           └─1349 /usr/sbin/sshd -D

Aug 29 21:16:46 localhost.localdomain systemd[1]: Starting OpenSSH server daemon...
Aug 29 21:16:46 localhost.localdomain sshd[1349]: Server listening on 0.0.0.0 port 22.
Aug 29 21:16:46 localhost.localdomain sshd[1349]: Server listening on :: port 22.
Aug 29 21:16:46 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

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

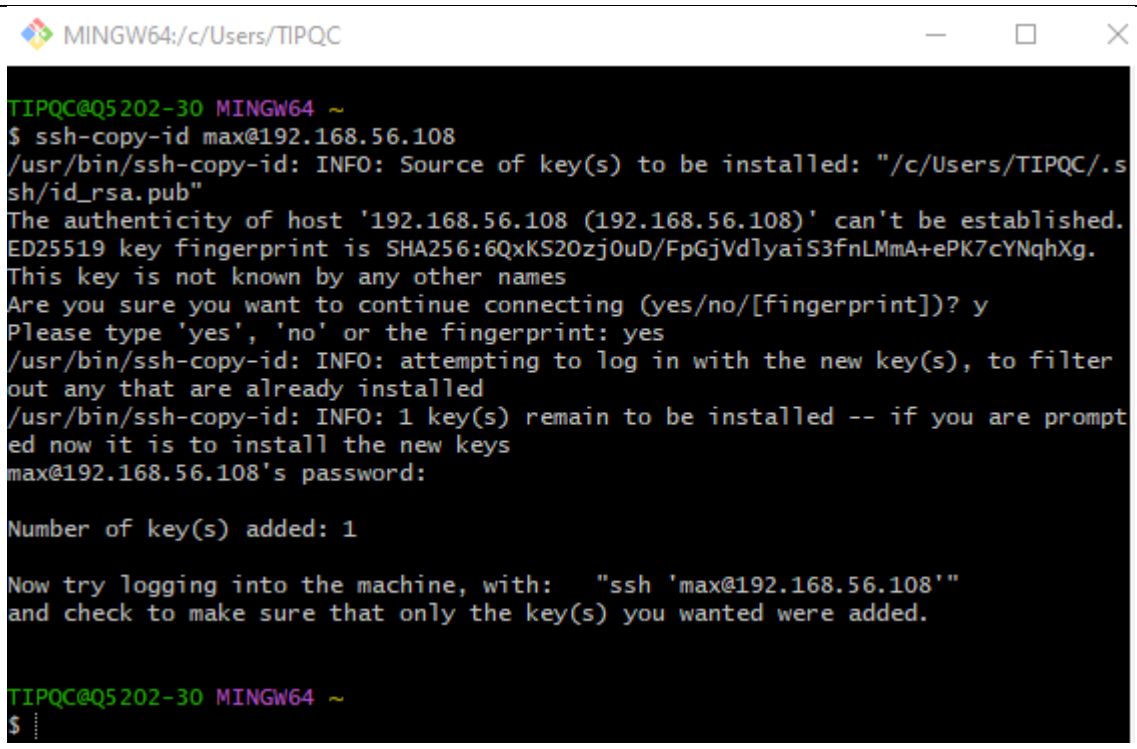
```
[max@localhost ~]$ systemctl reload sshd
[max@localhost ~]$ systemctl status sshd
● sshd.service - OpenSSH server daemon
   Loaded: loaded (/usr/lib/systemd/system/sshd.service; enabled; vendor preset: enable
d)
   Active: active (running) since Mon 2022-08-29 21:16:46 EDT; 21min ago
     Docs: man:sshd(8)
           man:sshd_config(5)
  Process: 23660 ExecReload=/bin/kill -HUP $MAINPID (code=exited, status=0/SUCCESS)
 Main PID: 1349 (sshd)
    Tasks: 1
   CGroup: /system.slice/sshd.service
           └─1349 /usr/sbin/sshd -D

Aug 29 21:16:46 localhost.localdomain systemd[1]: Starting OpenSSH server daemon...
Aug 29 21:16:46 localhost.localdomain sshd[1349]: Server listening on 0.0.0.0 port 22.
Aug 29 21:16:46 localhost.localdomain sshd[1349]: Server listening on :: port 22.
Aug 29 21:16:46 localhost.localdomain systemd[1]: Started OpenSSH server daemon.
Aug 29 21:36:40 localhost.localdomain systemd[1]: Reloading OpenSSH server daemon.
Aug 29 21:36:40 localhost.localdomain sshd[1349]: Received SIGHUP; restarting.
Aug 29 21:36:40 localhost.localdomain systemd[1]: Reloaded OpenSSH server daemon.
Aug 29 21:36:40 localhost.localdomain sshd[1349]: Server listening on 0.0.0.0 port 22.
Aug 29 21:36:40 localhost.localdomain sshd[1349]: Server listening on :: port 22.
Hint: Some lines were ellipsized, use -l to show in full.
```

Task 3: Copy the Public Key to CentOS

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

```
[max@localhost ~]$ sudo dnf install openssh-server
[sudo] password for max:
Last metadata expiration check: 0:29:18 ago on Mon 29 Aug 2022 09:24:26 PM EDT.
Package openssh-server-7.4p1-22.el7_9.x86_64 is already installed.
Dependencies resolved.
Nothing to do.
Complete!
```

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



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

```
[max@localhost ~]$ ls
Desktop  Documents  Downloads  Music  Pictures  Public  Templates  Videos
[max@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.

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?

   - When looking for a better distributor either Debian or Red Hat Linux, we shuld always look for what it matches in our own personal preference. Red Hat has better corprate support, and has stuff for big enterprise business type things. Debians got a huge ecosystem and lots of stuff for smaller companies and personal use. Both can be useful in the others role. But first, I would learn Debian since it is more popular and most used then red Hat so I can get familiar with how

it works. To summarize, why choose the best distribution when we can learn both worlds.

2. What are the main diffence between Debian and Red Hat Linux distributions?
   - Developers define Debian as "The Universal Operating System". Currently, the Linux kernel or the FreeBSD kernel are used in Debian systems. A piece of software called Linux was created by Linus Torvalds and is backed by hundreds of programmers all around the world. An operating system called FreeBSD comes with a kernel and other programs. Red Hat Enterprise Linux, on the other hand, is referred to as a "Secure Operating System and Platform for Enterprise Hybrid Clouds." To stop invasions and safeguard your data, Red Hat Enterprise Linux comes with military-grade security tools, such as secure containers for application separation and network firewall control.