

WEEK 1 ASSIGNMENT

Large-Scale Data Storage Systems – DATA-5400 | Spring 2020

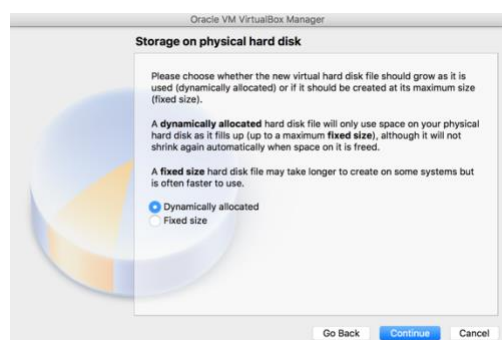
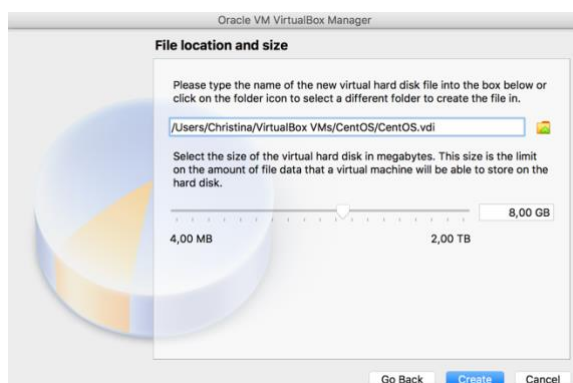
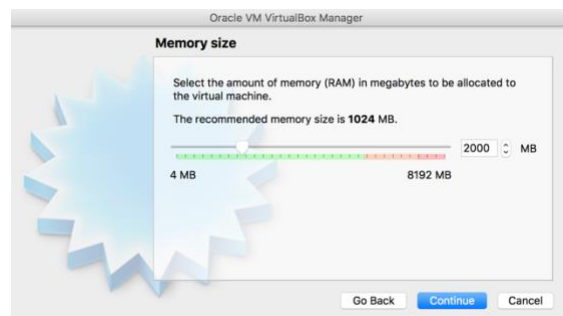
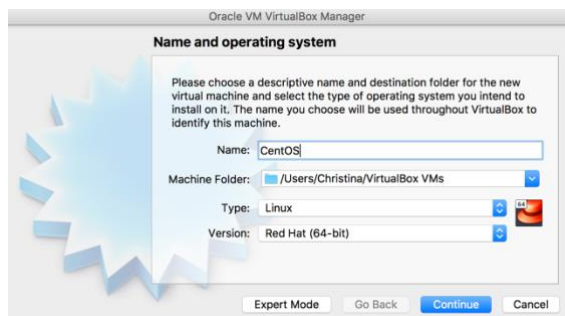
Christina Morgenstern

The goal of this exercise was to create a CentOS virtual machine (VM) using Oracle's VirtualBox. I am using a Mac with 8 GB RAM. Thus, I have downloaded the appropriate software tools: VirtualBox 6.1.2 from <https://www.virtualbox.org> and CentOS V7 from <https://www.centos.org> (CentOS-7-x86_64-Minimal-1908.iso).

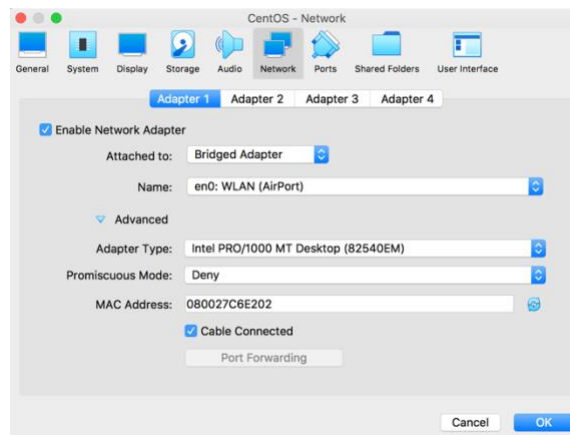
After starting VirtualBox, I created a new instance for the CentOS VM. Using the new button in the Oracle VirtualBox Manager, I set up the new Linux VM instance "CentOS". (I previously created a VM termed "MyCentos" but didn't document the process using screenshots).



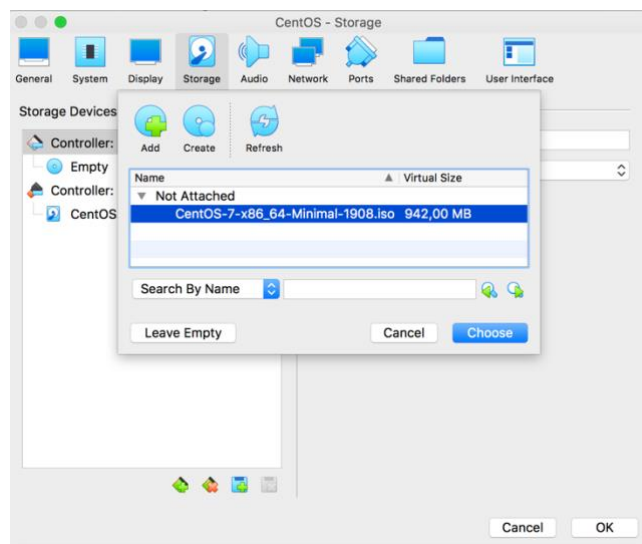
The following screenshots document the steps taken to specify the VM. 2 GB of memory was allocated to the VM.



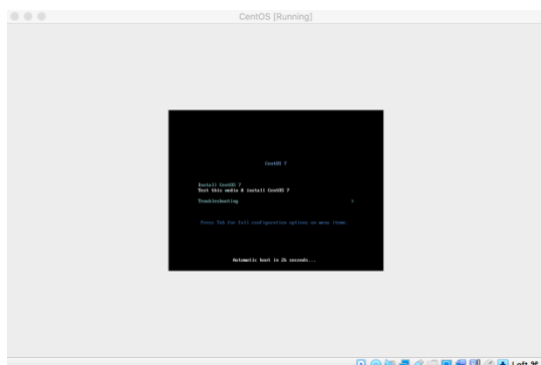
In the Network settings of the newly created CentOS instance, I selected “Bridged Adapter”:



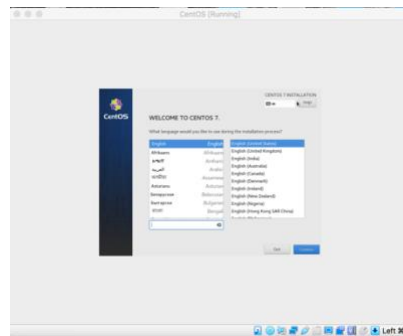
In the Storage settings, the previously downloaded CentOS-7 .iso file was selected:



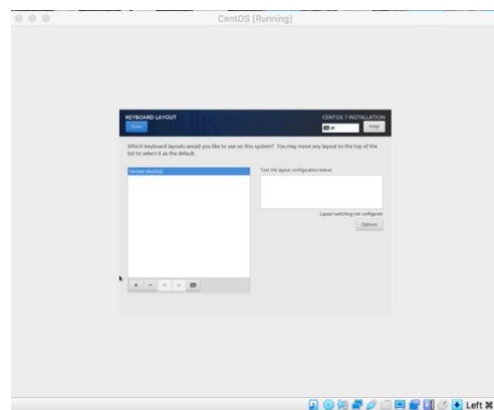
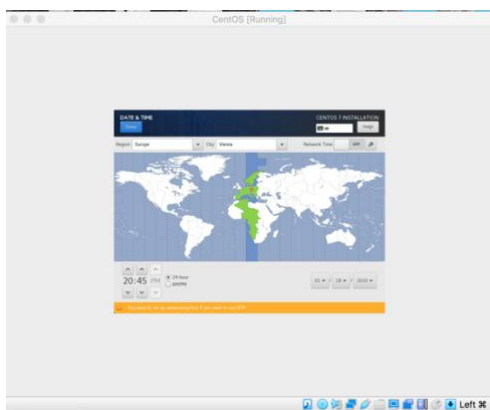
Starting the VM and installing CentOS 7. During the installation process the mouse is captured within the window and released using the left Command key (⌘) on my Mac Book.



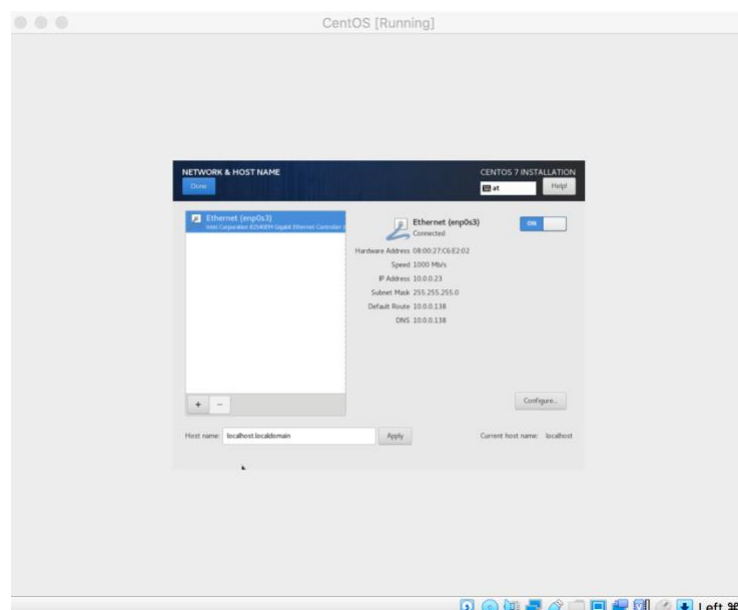
I selected the language English and English (United States):



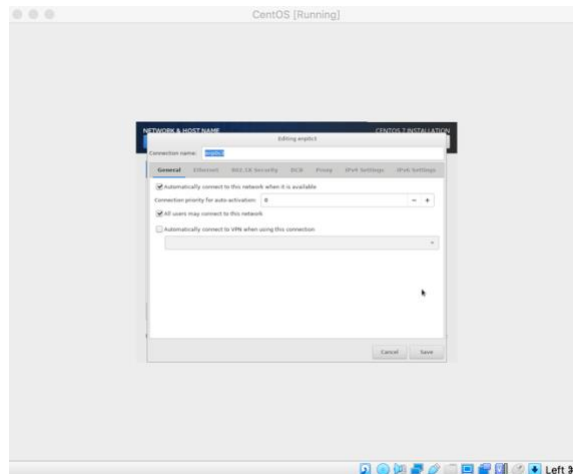
As for time zone, I selected Europe, Vienna, as I am living in Austria. I also changed the keyboard layout to German (Austria):



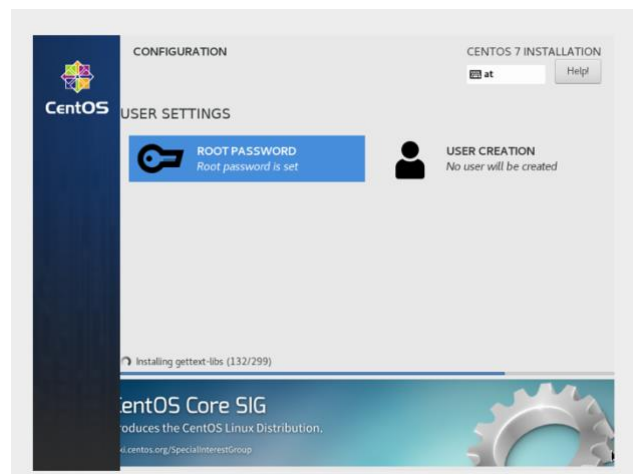
In the Network & Host Name settings, I turned on the Ethernet switch and made sure that an IP address shows up.



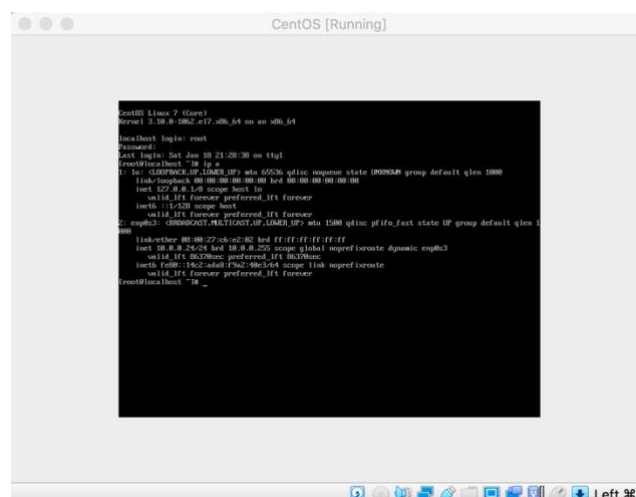
In the Configure settings, I enabled the automatic connection to the network when available and all users may connect to this network.



A root password was provided, and the installation finalized.



Running the VM CentOS from Virtual Box works through hitting the start arrow. CentOS boots up and I login to the root using my password.



Check for IP address using the `ip a` command and ping IP address:

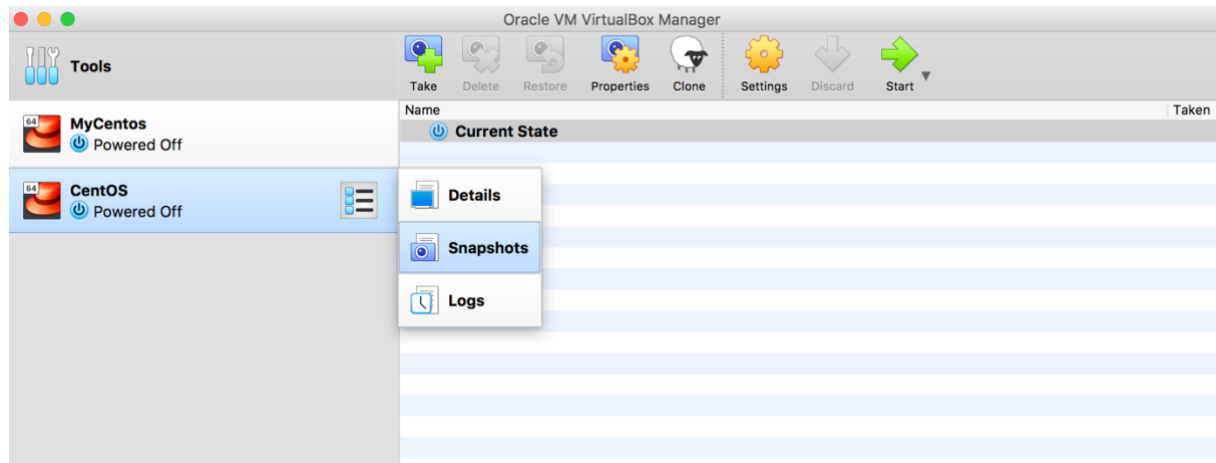
```
CentOS [Running]
Password:
Last login: Sat Jan 18 21:28:38 on tty1
[root@localhost ~]# ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: enp8s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 1000
    link/ether 00:00:27:c6:e2:02 brd ff:ff:ff:ff:ff:ff
    inet 10.0.0.24/24 brd 10.0.0.255 scope global noprefixroute dynamic enp8s3
        valid_lft 86370sec preferred_lft 86370sec
    inet6 fe80::14c2:ada8:f9a2:40e3/64 scope link noprefixroute
        valid_lft forever preferred_lft forever
[root@localhost ~]# ping 10.0.0.24
PING 10.0.0.24 (10.0.0.24) 56(84) bytes of data.
64 bytes from 10.0.0.24: icmp_seq=1 ttl=64 time=0.040 ms
64 bytes from 10.0.0.24: icmp_seq=2 ttl=64 time=0.168 ms
64 bytes from 10.0.0.24: icmp_seq=3 ttl=64 time=0.042 ms
64 bytes from 10.0.0.24: icmp_seq=4 ttl=64 time=0.102 ms
64 bytes from 10.0.0.24: icmp_seq=5 ttl=64 time=0.061 ms
64 bytes from 10.0.0.24: icmp_seq=6 ttl=64 time=0.042 ms
64 bytes from 10.0.0.24: icmp_seq=7 ttl=64 time=0.041 ms
64 bytes from 10.0.0.24: icmp_seq=8 ttl=64 time=0.392 ms
64 bytes from 10.0.0.24: icmp_seq=9 ttl=64 time=0.043 ms
64 bytes from 10.0.0.24: icmp_seq=10 ttl=64 time=0.061 ms
64 bytes from 10.0.0.24: icmp_seq=11 ttl=64 time=0.043 ms
64 bytes from 10.0.0.24: icmp_seq=12 ttl=64 time=0.059 ms
64 bytes from 10.0.0.24: icmp_seq=13 ttl=64 time=0.064 ms
64 bytes from 10.0.0.24: icmp_seq=14 ttl=64 time=0.068 ms
^C
--- 10.0.0.24 ping statistics ---
14 packets transmitted, 14 received, 0% packet loss, time 1300ms
rtt min/avg/max/mdev = 0.040/0.087/0.392/0.091 ms
[root@localhost ~]#
```

Ping www.google.com and explore the OS with different Linux commands:

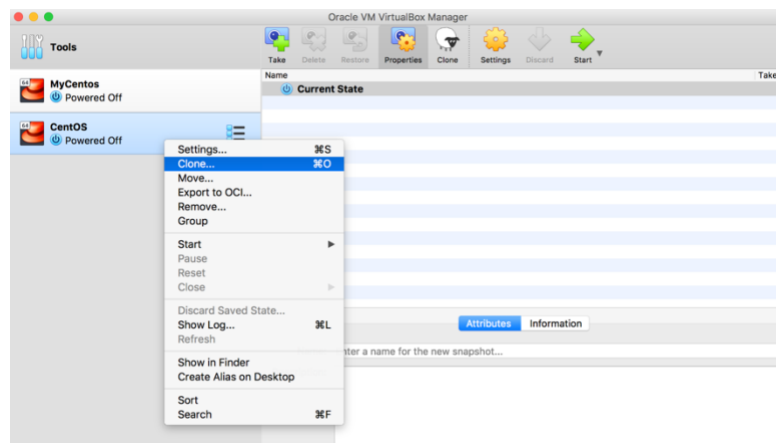
- `pwd` – prints current working directory
- `cd ..` – changes working directory
- `ls` – lists files within the directory

```
CentOS [Running]
64 bytes from 10.0.0.24: icmp_seq=7 ttl=64 time=0.041 ms
64 bytes from 10.0.0.24: icmp_seq=8 ttl=64 time=0.392 ms
64 bytes from 10.0.0.24: icmp_seq=9 ttl=64 time=0.043 ms
64 bytes from 10.0.0.24: icmp_seq=10 ttl=64 time=0.061 ms
64 bytes from 10.0.0.24: icmp_seq=11 ttl=64 time=0.043 ms
64 bytes from 10.0.0.24: icmp_seq=12 ttl=64 time=0.059 ms
64 bytes from 10.0.0.24: icmp_seq=13 ttl=64 time=0.064 ms
64 bytes from 10.0.0.24: icmp_seq=14 ttl=64 time=0.068 ms
^C
--- 10.0.0.24 ping statistics ---
14 packets transmitted, 14 received, 0% packet loss, time 1300ms
rtt min/avg/max/mdev = 0.040/0.087/0.392/0.091 ms
[root@localhost ~]# ping www.google.com
PING www.google.com (172.217.18.68) 56(84) bytes of data.
64 bytes from bud02s26-in-f4.1e100.net (172.217.18.68): icmp_seq=1 ttl=56 time=24.7 ms
64 bytes from bud02s26-in-f4.1e100.net (172.217.18.68): icmp_seq=2 ttl=56 time=25.2 ms
64 bytes from bud02s26-in-f4.1e100.net (172.217.18.68): icmp_seq=3 ttl=56 time=26.0 ms
64 bytes from bud02s26-in-f4.1e100.net (172.217.18.68): icmp_seq=4 ttl=56 time=26.3 ms
64 bytes from bud02s26-in-f4.1e100.net (172.217.18.68): icmp_seq=5 ttl=56 time=25.2 ms
64 bytes from bud02s26-in-f4.1e100.net (172.217.18.68): icmp_seq=6 ttl=56 time=25.2 ms
64 bytes from bud02s26-in-f4.1e100.net (172.217.18.68): icmp_seq=7 ttl=56 time=24.6 ms
64 bytes from bud02s26-in-f4.1e100.net (172.217.18.68): icmp_seq=8 ttl=56 time=25.3 ms
64 bytes from bud02s26-in-f4.1e100.net (172.217.18.68): icmp_seq=9 ttl=56 time=25.6 ms
64 bytes from bud02s26-in-f4.1e100.net (172.217.18.68): icmp_seq=10 ttl=56 time=27.1 ms
^C
--- www.google.com ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9024ms
rtt min/avg/max/mdev = 24.649/25.571/27.163/0.746 ms
[root@localhost ~]# pwd
/root
[root@localhost ~]# cd ..
[root@localhost /]# pwd
/
[root@localhost /]# ls
bin  dev  home  lib64  mnt  proc  run  srv  tmp  var
boot  etc  lib  media  opt  root  sbin  sys  usr
[root@localhost /]# init 0
```

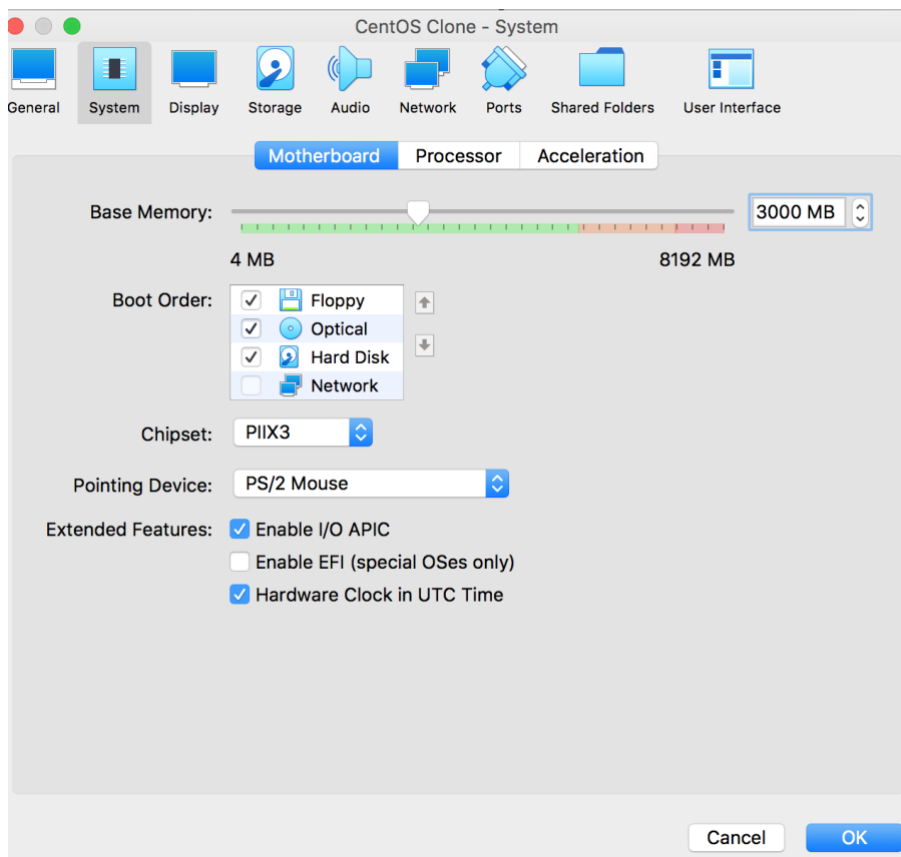
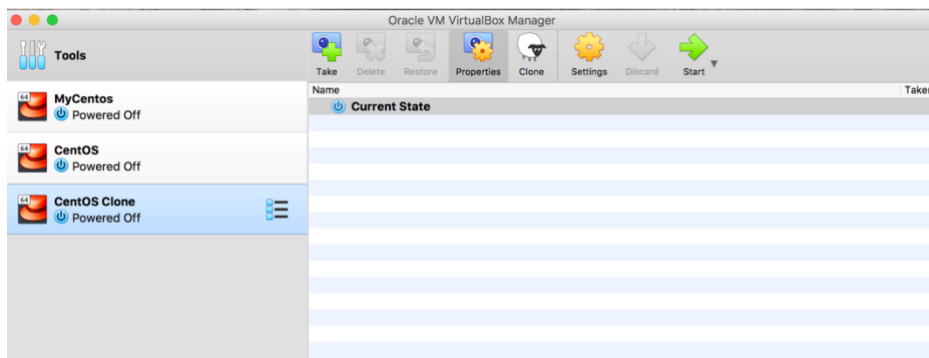
Create a snapshot of the VM in Virtual Box through selecting the VM and using the right mouse click and selecting “Snapshots”. A snapshot saves the current state of the VM.



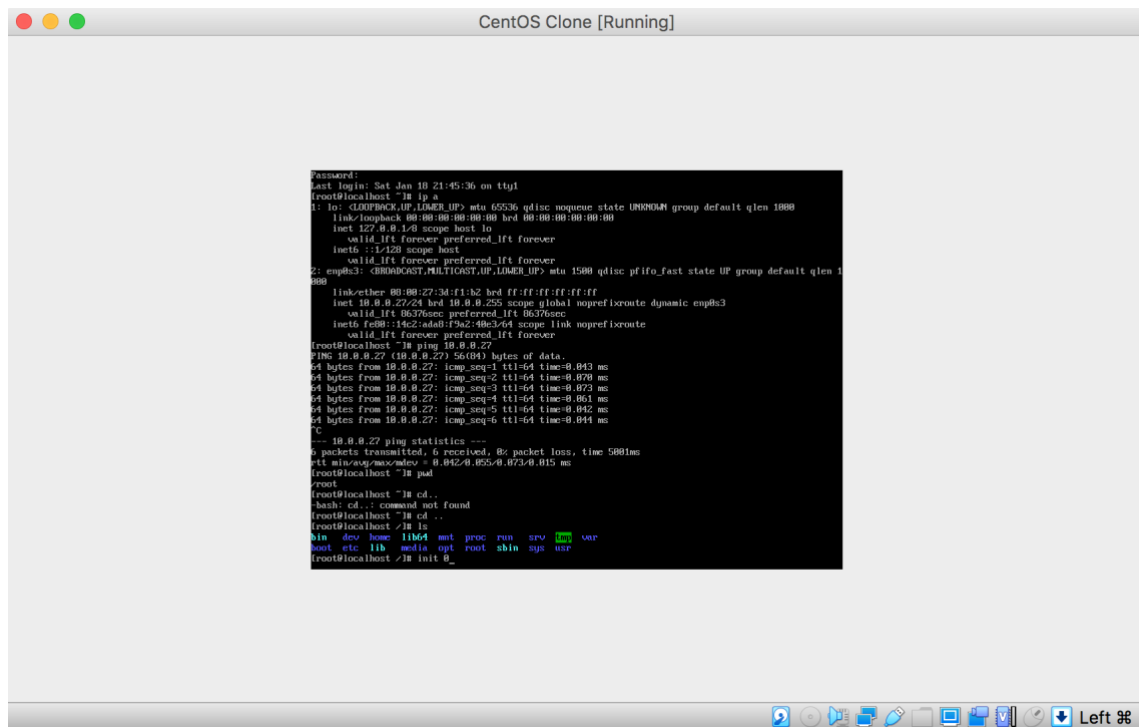
Make a clone of the VM CentOS through selecting the CentOS VM and displaying the menu using the right mouse click. Select “Clone...” from the drop-down menu, specify the name for the clone: “CentOS Clone” and select to create a “Full clone”.



Allocate 3 GB of RAM to the CentOS Clone:



Test the cloned VM CentOS Clone through logging in using the root and PW. Get IP address and ping IP address. Try a few Linux commands.



The screenshot shows a window titled "CentOS Clone [Running]". Inside is a terminal window with the following text:

```

Password:
Last login: Sat Jan 10 21:45:36 on ttty1
root@localhost ~# ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: emph3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 1000
    link/ether 00:00:27:34:f1:b2 brd ff:ff:ff:ff:ff:ff
    inet 10.0.0.22/24 brd 10.0.0.255 scope global noprefroute dynamic emph3
        valid_lft 86376sec preferred_lft 86376sec
    inet6 fe80::1a2:adad:f9a2:48c3:64 scope link noprefroute
        valid_lft forever preferred_lft forever
root@localhost ~# ping 10.0.0.22
PING 10.0.0.22 (10.0.0.22) 56(84) bytes of data:
64 bytes from 10.0.0.22: icmp_seq=1 ttl=64 time=0.043 ms
64 bytes from 10.0.0.22: icmp_seq=2 ttl=64 time=0.070 ms
64 bytes from 10.0.0.22: icmp_seq=3 ttl=64 time=0.073 ms
64 bytes from 10.0.0.22: icmp_seq=4 ttl=64 time=0.061 ms
64 bytes from 10.0.0.22: icmp_seq=5 ttl=64 time=0.042 ms
64 bytes from 10.0.0.22: icmp_seq=6 ttl=64 time=0.044 ms
^C
--- 10.0.0.22 ping statistics ---
6 packets transmitted, 6 received, 0% packet loss, time 580ms
rtt min/avg/max/mdev = 0.042/0.055/0.073/0.015 ms
root@localhost ~# pwd
root
root@localhost ~# cd ..
-bash: cd: command not found
root@localhost ~# cd ..
root@localhost ~# ls
bin  dev  home  lib64  mt  proc  run  srv  tmp  var
boot  etc  lib  media  opt  root /sbin  sys  usr
root@localhost ~# init 0

```

To power off the VM use `init 0` or `shutdown now`.

To sum up this assignment, I successfully created a Virtual Machine using Oracle's Virtual Box on which I can run CentOS, a Linux OS. Both, the initial CentOS virtual machine and its clone are fully functional Linux operating systems.

I didn't experience any problems in downloading the software packages or installing the VM on my Mac Book Pro.