Name:

Red Hat Lab – Chapter 12

BC

Use **Red Hat Lab Environment** to complete the lab. Issue the following commands immediately before step 1:

```
history -c
history -w
```

These commands should be repeated for each user@machine prompt. See boxes below.

Paste a screenshot in the box below of the command output from the command below. Include the command itself in the screenshot:

`lab grade net-review`

```
[student@workstation ~]$ lab grade net-review

Grading lab.

 · Checking lab systems ..................................................... SUCCESS
 · Checking hosts file configuration ........................................ SUCCESS
 · Checking that lab network connection exists .............................. SUCCESS
 · Checking that lab network connection is marked as active ................. SUCCESS
 · Checking that lab autoconnect is marked yes .............................. SUCCESS
 · Checking lab IP address and netmask ...................................... SUCCESS
 · Checking lab second IP address and netmask ............................... SUCCESS
 · Checking lab IPv4 gateway ................................................ SUCCESS
 · Checking lab IPv4 DNS .................................................... SUCCESS

Overall lab grade: PASS
```

Issue the command `history` after the last step for root@serverb. Paste a screenshot of the history in the proper box below. Include the command itself and the full history of commands.

root@serverb

```
[root@serverb ~]# history
    1  vim /etc/NetworkManager/system-connections/"Wired connection 1.nmconnection"
    2  nmcli con reload
    3  nmcli con up "Wired connection 1"
    4  ip -br addr show eth0
    5  ping -c3 10.0.1.1
    6  exit
    7  ip link
    8  nmcli con show --active
    9  nmcli con add con-name lab ifname eth0 type ethernet ipv4.method manual ipv4.address 172.25.250.11/24
ipv4.gateway 172.25.250.254
   10  nmcli con mod "lab" ipv4.dns 172.25.250.254
   11  nmcli con mod "lab" connection.autoconnect yes
   12  nmcli con mod "Wired connection 1" connection.autoconnect no
   13  nmcli con mod "lab" +ipv4.address 10.0.1.1/24
   14  echo "10.0.1.1 private" >> /etc/hosts
   15  history
```

Lab Manual

Use the VirtualBox RHELv9 virtual machine for this lab. Do not use the Red Hat Lab Environment. Issue the following commands in the Terminal window before starting the lab on the next page:

```
history -c
history -w
```

Repeat these commands for root@RHELv8 if necessary.

Paste the results of the history command in the box at the end of the lab.

Lab 17: NetworkManager

Use the RHELv9 virtual machine for this lab. The RHELv9 virtual machine has a virtual network adapter set to NAT. This virtual adapter connects through your actual physical network card to connect to the rest of your live, physical network and beyond to the Internet. It gets its IP address settings by using Dynamic Host Configuration Protocol (DHCP) which is a dynamic way of obtaining IP information automatically. This is handled by the hypervisor (VirtualBox or VMware Workstation). Its network type is set to Network Address Translation (NAT) which translates IP addresses between your virtual network and your physical network. This is what allows your virtual machines to reach the Internet. It is your WAN interface.

If necessary, add another virtual network adapter to your virtual machine. The network type will be set to Host-only. Host-only allows your virtual machine to talk to your host machine and to other virtual machines running on your host machine. Network traffic is not allowed to leave your network adapter. This will give us an isolated virtual network to use in our lab exercises. This is your LAN interface. Follow these steps:

1. Shut down your virtual machine if it is running.
2. Right-click your VM and select Settings.
3. With the Hardware tab selected, click the Add button.
4. Choose ***Network Adapter*** and click Finish.
5. Ensure the new adapter is selected, and then select the Host-only radio button and click OK.
6. Power on your virtual machine.

Before continuing, we need to make sure we know which Network Adapter is set to NAT and which is set to Host-Only. Right-click your VM and select Settings again. With the Hardware tab selected, select the Network Adapter that is set to NAT. Then click the Advanced button. On the screen that appears, write down the MAC Address value (for example, 00:0C:29:CD:75:55). Click Cancel. Select the Host-only Network Adapter followed by the Advanced button. Write down the MAC Address for the Host-only adapter (for example, 00:0C:29:CD:73:5F). We will use these values to help us identify each adapter during our exercise.

Exercise:

1. Display the status of NetworkManager.
2. Display details about your network adapter devices. From the details, use the MAC addresses determined above to identify the device name of the NAT interface and the Host-only interface. Also, make a note of the connection name.
3. Use the NetworkManager Text User Interface to display the status of your LAN interface.

Use the NetworkManager Command Line Interface for the following steps:

4. Show all connections.
5. Show all devices and their state (one device per line in the output)
6. Show details about all devices.
7. Configure your WAN interface to use DHCP.
8. Configure the LAN interface with IPv4 address 10.0.0.10 and a prefix length of /24.
9. Configure the LAN interface with a default gateway of 10.0.0.10.
10. Configure the LAN interface with a DNS server at 10.0.0.10.

11. Bring the LAN interface down
12. Bring the LAN interface back up (that is, bounce the interface).
13. Display details about your new interface to confirm your settings.

```
student@RHELv8:~$ history
    1  history -w
    2  systemctl status nmcli
    3  nmcli general status
    4  nmcli device show
    5  nmtui
    6  nmcli con show
    7  nmcli dev status
    8  ip route
    9   nmcli con mod ens160 ipv4.method auto
   10  nmcli con mod "Wired connection 1" ipv4.address 10.0.0.10/24
   11  nmcli con mod "Wired connection 1" ipv4.gateway 10.0.0.10
   12  nmcli con mod "Wired connection 1" ipv4.dns "10.0.0.10"
   13  nmcli con down "Wired connection 1"
   14  nmcli con up "Wired connection 1"
   15  nmcli dev show
   16  ip -s link show
   17  cat /etc/resolv.conf
   18  ping -c3 10.0.0.20
   19  ping6 -c 2 ff02::1%ens192
   20  ip route
   21  history
```

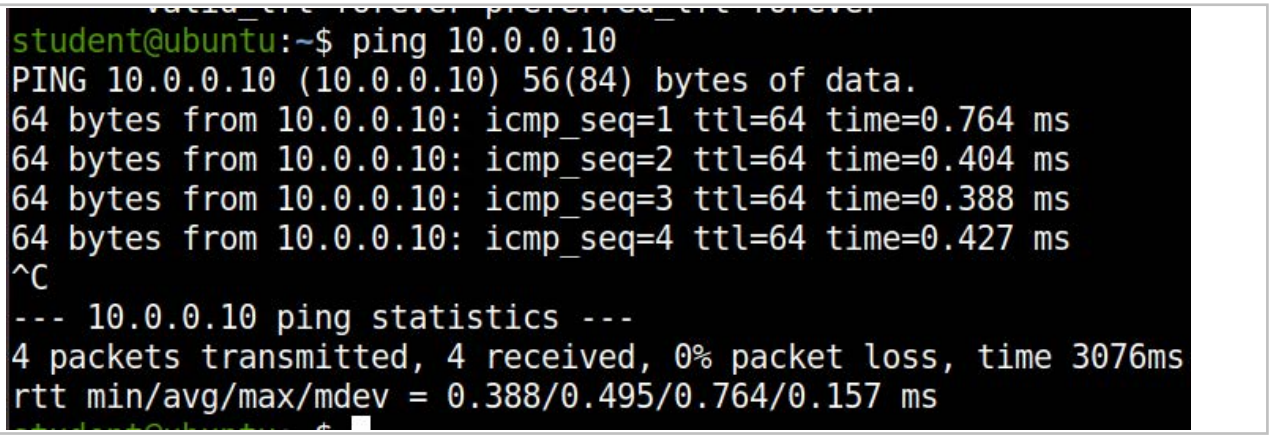
Lab 18: NetworkManager (Ubuntu)

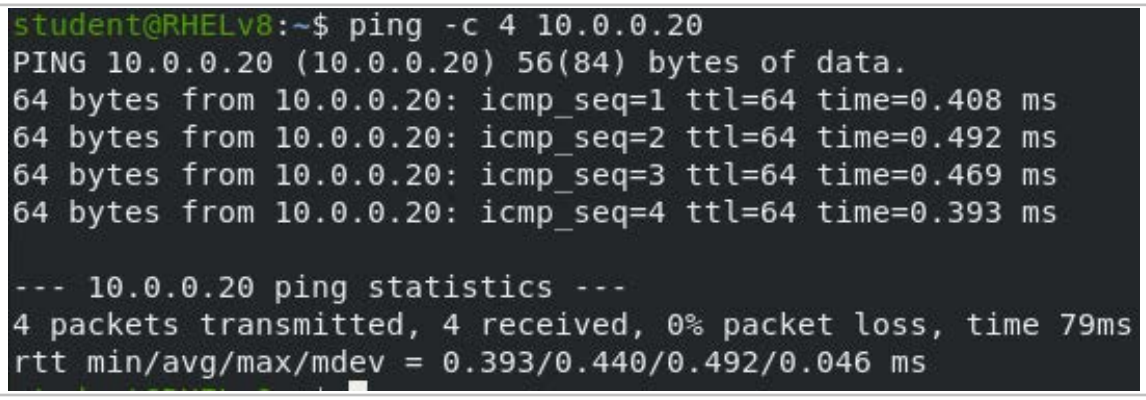
Repeat Lab 17 using your Ubuntu virtual machine. Use the following settings:

IPv4 address	10.0.0.20
Prefix length	24
Default Gateway	10.0.0.20
DNS server	10.0.0.20

After your configuration is complete, test connectivity both directions between the RHELv9 and Ubuntu machines. Paste your history of commands in the first box. Paste a screenshot showing your successful connection from Ubuntu to RHELv9 in the second box. Include a screenshot showing your successful connection from RHELv9 to Ubuntu in the third box.

```
student@ubuntu:~$ history
    1  history -w
    2  nmcli
    3  nmcli general status
    4  nmcli dev show
    5  nmcli dev status
    6  nmcli con mod "Wired connection 1" ipv4.method auto
    7  nmcli con mod "Wired connection 2" ipv4.address 10.0.0.20/24
    8  nmcli con mod "Wired connection 2" ipv4.gateway 10.0.0.20
    9  nmcli con mod "Wired connection 2" ipv4.dns "10.0.0.20"
   10  nmcli con down "Wired connection 2"
```





Lab 19: Network Troubleshooting

1. Test connectivity from the RHELv9 virtual machine to the Ubuntu virtual machine.
2. Trace the route to www.google.com.
3. Trace the route to www.google.com using a different command.
4. Display information about Google's DNS server at 8.8.8.8.
5. Display a list of the Network Manager configuration scripts on RHELv9.
6. Display the contents of the network configuration script for the LAN interface.
7. Display the routing table.
8. Display the hosts file used for name resolution.
9. Display the nameserver used during our runtime configuration.
10. Display the link status using the runtime utility.
11. Display IP addresses using the runtime utility.
12. Use a command that searches DNS records to discover the IP address of Red Hat's DNS server.
13. Display the active Internet connections and their current state.
14. Display a list of the Network Manager configuration scripts on Ubuntu.
15. Display the contents of the network configuration script for the LAN interface on Ubuntu.

Include history of commands for RHELv9 and for Ubuntu:

```
student@RHELv8:~$ history
    1  history -w
    2  ping 10.0.0.20
    3  tracepath www.google.com
    4  mtr --curses google.com
    5  tracepath google.com
    6  dig 8.8.8.8
    7  cat /etc/sysconfig/network-scripts/
    8  ls /etc/sysconfig/network-scripts/
    9  cat /etc/sysconfig/network-scripts/ifcfg-Wired_connection_1
   10  ip route
   11  cat /etc/host
   12  cat /etc/hosts
```

```
student@ubuntu:~$ history
    1  history -w
    2  ping 10.0.0.10
    3  tracepath www.google.com
    4  mtr --curses google.com
    5  dig 8.8.8.8
    6  nameserver 8.8.8.8
    7  dig www.google.com
    8  ls /etc/netplan/01-network-manager-all.yaml
    9  ls -a /etc/netplan/01-network-manager-all.yaml
   10  ls /run/NetworkManager/conf.d/
   11  sudo cat /etc/NetworkManager/system-connections/'Wired connection 2'/
   12  history
```