

Introduction to Networking

Exercise 1: Viewing Network Interfaces

Objective: Learn how to view network interfaces using nmcli.

1. Open your terminal.

What is the contents of the file `/etc/hosts`

Open the file with vi or nano and add the ip addresses of your colleagues.

example:

```
192.168.4.185 rocky-5
```

save the file and ping some of the other machines using the hostname.

```
ping -c1 rocky-5
```

2. List all available network interfaces:

```
nmcli device status
```

3. Identify the network interface you want to configure (e.g., eth0, ens33, enp7s0, etc.).

Please take the second interface that is NOT your ip address....

Exercise 2: Configuring a Static IP Address

Objective: Configure a static IP address using nmcli.

1. Identify your network interface (this example has enp1s0 as the interface).

2. Set the DNS server (replace with your preferred DNS server):

```
sudo nmcli con mod enp7s0 ipv4.dns "8.8.8.8"
```

```
sudo nmcli con show enp7s0 | grep ipv4.dns
```

3. Activate the connection:

```
sudo nmcli con up enp7s0
```

Exercise 3: Configuring DHCP

Objective: Configure a network interface to use DHCP for IP addressing.

1. If you want to switch to DHCP, modify your second interface connection:

```
sudo nmcli con modify enp7s0 ipv4.method auto
```

2. Bring the connection down and then back up to apply the changes:

```
sudo nmcli con down enp7s0
```

```
sudo nmcli con up enp7s0
```

3. Verify that the interface has received an IP address:

```
nmcli device show enp7s0
```

If you like, inspect the graphical tool for NetworkManager.

nmtui

Exercise 4: Viewing Current Network Configuration

Objective: Use various commands to view the current network configuration.

1. View the current IP address and routing information:

```
ip addr show  
ip route show
```

2. Check the DNS servers being used:

```
cat /etc/resolv.conf
```

Exercise 5: Testing Connectivity

Objective: Test network connectivity to other devices in the network.

1. Ping the default gateway to check connectivity:

```
ping -c 4 192.168.4.1
```

2. Ping another device in the subnet (replace with an actual device IP):

```
ping -c 4 192.168.4.1
```

Exercise 6: Managing Network Connections

Objective: Learn how to manage network connections using nmcli.

1. List all configured network connections:

```
nmcli con show
```

2. Delete the connection you created earlier:

```
sudo nmcli con delete enp1s0
```

3. List the remaining connections to confirm deletion:

```
nmcli con show
```

Check out the following directory:

/etc/NetworkManager/system-connections

What do you see in there. Inspect the content of the file..

Can you restore the enp7s0 connection again?

Take this command as an example:

nmcli con add connection.interface-name <name> type ethernet

Exercise 7: Getting Network Statistics

Objective: Use commands to view network statistics and interface information.

1. Use the ip command to display interface statistics:

```
ip -s link show
```

2. Use the ss command to view active connections:

```
ss -tuln
```

Exercise 8: Checking Network Manager State

Objective: Learn how to check the status of NetworkManager.

1. Check the status of the NetworkManager service:

```
systemctl status NetworkManager
```

2. Restart the NetworkManager service (if necessary):

```
sudo systemctl restart NetworkManager
```

Exercise 9: Using traceroute

Objective: Trace the route packets take to a remote host.

1. Install traceroute if it's not already installed:

```
sudo apt install traceroute
```

Or if using yum:

```
sudo apt install traceroute
```

2. Use traceroute to trace the path to the default gateway:

```
traceroute 192.168.4.1
```

Exercise 10: Cleaning Up

Objective: Remove any unnecessary configurations and ensure a clean state.

