Network Operations

Lab 1: Network Trouble-shooting

Trouble-shooting network problems is something that you will often encounter if you haven't already. Let's practice using some of the many tools described in this chapter that could help you isolate and trouble-shoot problems in your network.

Let's say that you sit down prepared to do some web surfing. You bring up a web browser prepared to do a google search, but for some reason after you type in "google.com" in the address bar, you are told that the host is unknown.

Let's start by making certain that your network is configured. Type:

```
ifconfig
```

Do you see some kind of network interface, perhaps `eth0`?

Next, let's see if you have a valid hostname assigned to your machine. Type:

```
hostname
```

Is the result what you expected?

Next, let's see if you have a valid IP address assigned to your host. Type:

```
ip addr show
```

Does the IP address look valid? Depending on where you are using this from, it is most likely a Class C IP address.

When you type in a name of a host like google.com, that name needs to be turned into an IP address. This is usually done with the Domain Name Server. To verify it is not a problem with your browser or with the web site a good tool to start with is `ping`. Try:

```
ping google.com
```

Since your network is likely working, you will need to press a **CTRL-C** to interrupt it, but let's say instead of it working, you got:

```
ping: unknown host google.com
```

It is likely that something is wrong with your DNS set-up. Now try:

```
host google.com
```

or

```
host google.com your-name-server
```

The first invocation above will use the nameserver configured in your **/etc/resolv.conf** file. You can add the hostname or IP address of a specific nameserver as in the second invocation example above.

You could also use the `dig` command if you prefer; it also queries your nameserver to resolve the hostname, like google.com to an IP address.

Again, these work, but it gives you some good practice using them. Instead, let's say they don't work. If querying your nameserver does not work, this is a problem with your name service.

There could be many reasons for this.

It could be that your name server machine is down (if not running on your own machine). Let's say that you know that name service is from another machine and you know that machine is up and running.

It could be that just the name service on that machine is down (not running). Again, let's assume that you also know that name service is up and running on the name server machine.

Another possibility is that your route to the name server machine is not correct. Let's test this. Consider that google.com is your name server. An IP address for google.com is
173.194.33.0. Let's see if you have a route to your name server. Try:

```
traceroute 173.194.33.0
```

Again, this should likely work for you, but what if you only got the first line in the `traceroute` output?

If this happened, most likely your default route is wrong. Try:

```
ip route show
```

Most likely this is set to your network interface and the IP address of your router, DSL, or Cable Modem. Let's say that it is blank or simply points to your own machine. Here's your problem! At this point, you would need to add a proper default route and run some of the same tests we just did.

Lab 2: Non-graphical browsers

In the chapter, we talked about three non-graphical browsers:

lynx

links and

w3m

There are times when you won't have a graphical window interface running on your **Linux** machine and you need to look something up on the web or download a driver (like a graphics driver in order to bring up a graphical window interface). So, it is a good idea to practice using a non-graphical web browser to do some work.

With **links**, you can use your mouse to click on the top line of the screen to get a menu. In this case, we want to go to google.com (or your favorite search engine), so you can just type **g** to go to a typed-in URL.

Pressing the **TAB** key will move your cursor to the **OK** button. You can then press the **ENTER** key.

You should now be at google.com (or your favorite search engine). Use the down-arrow key to move through the choices until you reach the blank line used to enter your search query. Now type **Intel Linux graphics drivers** in the search box. Use the down-arrow key to move you to the **Google Search** button. With that highlighted, press the **ENTER** key.

Use your down-arrow key to move to the entry: **Intel(R) Graphics Drivers for Linux - Download Center**. It may take several presses of the down-arrow key. You can press the **space-bar** to move down the page or the **'b'** key to move back up the page if needed. Once this line is highlighted, press the **ENTER** key.

You will now go to the **Intel Graphics Driver for Linux** page. If you want, you can read the page. Remember, the **space-bar** will page you down the page while the **'b'** key will move you back up the page. The **Page Down** and **Page Up** keys will do the same thing if you prefer. Find the URL under the line

URL Location:

Position your cursor at this line using the up-arrow or down-arrow key. Press the **ENTER** key to go to this location.

Page down this page until you see the line:

Latest Releases

If you move your cursor with the arrow keys, find the latest version (with the most recent release date) under this section. If using your arrow-keys, you should highlight **Release Notes**. Press the **ENTER** key.

This has installers for versions of **Ubuntu** and **Fedora**, along with the source code. You will need to page down a page or two depending on the size of your screen.

Select one of the installers, perhaps for the version of **Linux** that you are running, or just a random one, and press the **ENTER** key.

You should see a text dialog box with choices of what to do. Save the package wherever you want to.

You can now quit your non-graphical browser. If you used links, then click on the top line of the screen, select the **File** drop-down menu item, and click on **Exit**. Confirm that you really want to exit **Links**. You should now see your shell prompt.
