

Lab #4: Solaris Networking

Understanding UNIX networks starts with understanding UNIX network commands and the information they provide. We will use a number of UNIX commands to analyze our network and our UNIX network capabilities. View the online help (man, info, etc) for more information on each command.

ping

The **ping** command allows the user to test whether or not a network connection is active, the speed of that connection, and how a network behaves given specific data loads. We will use this command in its simplest form:

```
ping IP-address
```

When the ping command is finished (or you manually stop it with CTRL-C), a minimum, average, and maximum time taken to transmit and receive the request packets is calculated, as is a percentage of packets that may have been lost.

ifconfig

The **ifconfig** command is a tool used to display and configure network interfaces. We will use this command to display information about our network interface by entering the ifconfig command with no options. This command will display information about the network card (normally **hme0**, on Solaris), IP address, broadcast address, and network mask. It also shows how many packets were received and transmitted. There is also information about the *loopback* device (**lo**).

The loopback device is a path for your machine to network with itself. This feature is useful for testing a computer's networking capabilities without being physically connected to a network. By convention, the loopback device is given the address **127.0.0.1**.

arp

The **arp** command by itself is used to view the information currently in the ARP table (Address Resolution Protocol). This table maps the IP address of machines on your network segment with their MAC address.

hostname

The **hostname** command tells you what the hostname of your machine is set to. The hostname is determined from a number of sources, such as the **/etc/network** or **/etc/hosts** files.

netstat

The **netstat** command displays details about the network, including routing tables and other interface statistics. When used by itself, the netstat command displays a large amount of data. The information of interest to us is at the top of the list: *active Internet connections*. This list displays the Internet address your connected to, how you are connected to it, and how much data has been sent and received by this connection.

nslookup

This command queries the DNS database to determine information about network hosts. If you supply the IP address, the command gives the hostname. If you supply the hostname, the command gives you the IP address. It uses the **/etc/resolv.conf** file to determine the DNS server(s).

traceroute

This program prints the route along which an IP packet travels from the local host to reach the destination host. It also shows each hop along the connection route from a local to remote host and gives all the intermediate routers.

To Do:

1. Open a text editor and create a file called lab4answers.txt with your name on the first line.
2. Use the **hostname** command to determine your hostname. Copy and paste the output into your text file. Look at the **/etc/hosts** file, and find out your IP address. Copy this line to your text file.
3. Use the **ifconfig** program to determine your IP address. Record it in your text file. Does the IP address match the one from the previous step?
4. Run **ifconfig -a** to display all your network interfaces. Are there the same number of entries as displayed in the previous step, or more entries? Record any additional ones with their IP addresses (if applicable) here.
5. Use the **arp** command to determine if your IP address is listed. If not, **ping** your IP address and then run the **arp** command again. Does it show up now? Record your MAC address.
6. Use the **arp -a** command to determine if your neighbour's IP address is listed. If not, **ping** your neighbour's IP address and then run the **arp** command again. Does it show up now? Record your neighbour's IP and MAC addresses.

7. Connect to the web server with the command **ssh technology**

Accept the certificate (if offered), and login using your username and password. Do an **ls** command when you have successfully logged in, then run the **netstat** command. Look near the top of the list and record the line(s) displayed for your connection.

8. Use the **traceroute** command to find a route to various hosts on the Internet.
For example,

```
traceroute technology.niagarac.on.ca  
traceroute niagaracollege.ca  
traceroute microsoft.com  
traceroute sun.com
```

Submit via email to Mike upon completion.