Network Laboratory #2 **Student Worksheet**

IP Configuration and Testing for Windows 2000 Workstations

Objectives:

1. Configure a Windows 2000 host for TCP/IP connections, including:
   a) Set the correct IP address
   b) Set the correct subnet mask
   c) Enter default routing information
2. Use the *ipconfig* and *ping* programs to test configuration and connections:
   The *ipconfig* program shows the current IP configuration of a workstation. The *ping* program can test the connectivity between one host and another host or network device.

Note:

The Windows 2000 workstation IP address format is: `10.0.<segment_number>0.10`
where the segment number is posted on the wall above the hosts

Procedure for testing connectivity:

1. Log on the Windows workstation as user "student" with no password.
2. Read the Windows help pages for *ping* and *ipconfig*.
3. Open a *command window* using the MS-DOS icon on the desktop or by clicking on *Start* > *Run* and typing "command".
4. In the command window, execute the *ipconfig* command to view the current configuration of your workstation. No IP address should be assigned yet.
5. In the command window, execute the *ping* command to test the TCP/IP connection.
   Try to contact the other host in your segment
   (i.e., `ping 10.0.<your_segment_number>0.20`)

What messages were displayed in response to this *ping* command? (answer briefly)

Configuring a Windows 2000 workstation for TCP/IP.

Note: some steps in this process may take a while for Windows to complete. Be patient.

Use the Windows Local Area Network Connection Wizard:

Start > Settings > Control Panel > Network and Dial-up Connections > Local Area Connection
or
Start > Settings > Network and Dial-up Connections > Local Area Connection

Then click on the *Properties* button and look for *Internet Protocol (TCP/IP)* in the list. It should be missing. If you see it, contact your lab instructor.

Otherwise, select *Install > Protocol* and click on the *Add* button.

When the list of protocols comes up, select *Internet Protocol (TCP/IP)* and then click *OK*.

Once the *Internet Protocol (TCP/IP)* item is added to the list, click on it and then click on the *Properties* button. Click on: "*Use the following IP Address:*" and then enter:

```
IP address :          10.0.<your_segment_number>0.10
Subnet address:       255.255.255.0
Default gateway:      10.0.<your_segment_number>0.1
```

When this information is entered, click on *OK* and click on *Close* in each dialog box.

When this is done, you should reboot your system.

Testing the TCP\IP configuration:

1. Open a *command window* using the MS-DOS icon on the desktop or by clicking on *Start>Run* and typing "command".
2. In the command window, execute the *ipconfig* command to view the current configuration of your workstation. Does the information reported by *ipconfig* match the information you entered in the above steps?

   Yes: _____ No: _____

3. In the command window, execute the *ping* command to test the TCP/IP connection:
   a. try this host (i.e., `ping 10.0.<your_segment_number>0.10`)
   b. try the other host in your segment (i.e., `ping 10.0.<your_segment_number>0.20`)
   c. try a host in another segment (i.e., `ping 10.0.<another_segment_number>0.10`)

What messages were displayed in response to these *ping* commands? (answer briefly)

a.

b.

c.

IP Configuration and Testing for Sun Solaris (UNIX) Workstations

Objectives:

2. Configure a Sun Solaris host for TCP/IP connections, including:
   d) Set the correct IP address and the correct subnet mask
   e) Enter default routing information
   f) Enter a "name" for the workstation
3. Use the *netstat* and *ping* programs to test configuration and connections:

Note:

The Sun Solaris workstation IP address format is: **`10.0.`**`<segment_number>`**`0.20`**
where the segment number is printed on the wall above the hosts

Procedure for testing connectivity:

6. Log on the Sun workstation as user "root" with password "netlab".
7. If a *terminal window* isn't already open, right-click on the desktop and select "Tools" and then "Terminal"
8. UNIX workstations can have more than one Ethernet interface. The interface we will be configuring is called `eri0`. The loopback interface is called `lo0`.
9. Read the UNIX "man" pages for *ping* and *netstat*. (type `man ping` or `man netstat`) and answer the following questions;
   Which *netstat* option shows the state of the interfaces used for TCP/IP? _____
   Which *netstat* option shows network addresses as numbers? _____
   Which *netstat* option shows the routing table? _____
10. In the terminal window, execute the command `netstat -in` to view the current configuration of your workstation. No IP address should be assigned yet. Another UNIX program that can be used to test the configuration is *ifconfig* (note: that's an ***f*** not a ***p***). It reports different information about the designated interface or protocol. Read the "man" pages on *ifconfig* and try it using `ifconfig eri0`. Compare the results with *netstat*.
11. In the terminal window, execute the *ping* command to test the TCP/IP connection:
    a. try the other host in your segment (i.e., `ping` **`10.0.`**`<your_segment_number>`**`0.10`**)
    b. try a host in another segment (i.e., `ping` **`10.0.`**`<another_segment_number>`**`0.10`**)
    c. try the *loopback* address (i.e., `ping` **`127.0.0.1`**)

What messages were displayed in response to these *ping* commands? (answer briefly)

a.

b.

c.

Configuring a Sun Solaris (UNIX) workstation for TCP/IP.

Instead of using a wizard to configure this workstation, you will edit or create several text files to set the required parameters. You can use one of two text editor programs: `vi` or `pico`. If you have used the `pine` email program on Pegasus, you will already be familiar with `pico`. Unless you are already familiar with `vi`, or want to learn how to use it (if so, type `man vi`), `pico` is recommended because it has built-in help and `vi` doesn't. In either case, don't get carried away, all you really need to do is open the file, enter some data and save the results.

Edit the following files carefully. Make sure nothing is added to the file but what is shown here.

1. Each UNIX host has a name. Your workstation will be called *sun<segment_number>*. For example, the Sun machine in segment `9` would be called `sun9`. Open the file `/etc/hostname.eri0`, type in the name for your workstation and save the file.
2. Next, you must associate that name with the IP address for the machine. Open the file `/etc/inet/hosts`. It should already contain the line: `127.0.0.1 localhost` which is the loopback address. Below that, add a new line with the IP address and name for this host. Save the file.
3. The netmask (or subnet address) is the same as you entered for the Windows machine, `255.255.255.0`, and should be entered into the file `/etc/inet/netmasks`. Open the file and add a new line at the bottom with the network address and netmask for this host. The network address for this lab is `10.0.0.0`.
4. Although we haven't set up the routers for this network, we should go ahead and assign the default router for this workstation so it will be ready for later. The default router for each segment has the address: **`10.0.`**<segment_number>**`0.1`** . Open the file `/etc/defaultrouter`, enter the default router's address and save the file.
5. Confirm that the four files contain the correct information and then reboot the machine by typing `reboot` in a terminal window.

Testing the TCP\IP configuration:

1. Log on the Sun workstation as user "root" with password "netlab".
2. If a *terminal window* isn't already open, right-click on the desktop and select "Tools" and then "Terminal"
3. In the command window, execute the correct *netstat* command to view the current configuration of your workstation. Does the information reported by *netstat* match the information you entered in the above steps?

   Yes: _____ No: _____

4. Execute `ifconfig eri0` and confirm that the results are correct.
   a. What is the number following `mtu`? _____
   b. What does that mean? _____
   c. What is the netmask number that is displayed? _____
   d. What is the broadcast address that is displayed? _____

5. In the command window, execute the *ping* command to test the TCP/IP connection:
   a. try this host (i.e., `ping 10.0.<your_segment_number>0.20`)
   b. try the other host in your segment (i.e., `ping 10.0.<your_segment_number>0.10`)
   c. try a host in another segment (i.e., `ping 10.0.<another_segment_number>0.10`)

   What messages were displayed in response to these *ping* commands? (answer briefly)

   a.

   b.

   c.

Sun Solaris workstations are configured with both *telnet* and *ftp* servers to allow remote access to files and programs. If you are not familiar with *telnet* or *ftp*, read the "man" pages for these programs. While these Windows 2000 workstations are not configured as *telnet* or *ftp* servers, they do include client programs that can be used to connect to the UNIX *telnet* and *ftp* servers.

a. On the Windows machine, open a command window and execute the *telnet* command to log into the Sun workstation: type `telnet 10.0.<your_segment_number>0.20`
b. Login in as `student` with password `student`
c. List the files in the "student" directory by typing: `ls`
d. How many files were listed? _____
e. Type `pwd` to display the directory's name and enter it here: _____
f. Confirm that you logged into the correct machine by typing: `netstat -in`
g. Close the telnet connection by typing: `exit`

In the next lab you will learn how to configure the routers but, at this point we can look at the present router configuration by making a telnet connection to the router.

a. Connect to your router using telnet: `telnet 10.0.<your_segment_number>0.1`
b. There is no login ID for these routers, but the password is: `netlab`
c. You should see a prompt from the router that says: **`router`**`<your_segment_number>`. For example, if you are in segment 9, it should say: `router9`
d. Next, you must enter the supervisor mode (like administrator or root) by typing: `enable` and entering the password: `netlab`
e. Type: `show config` to see the current router tables (use the spacebar to scroll down)
f. Type: `exit` to close the telnet connection

If you are done, turn this Lab handout in to your lab instructor.