Name_____ _____/20 pts.

Name_____

SE 4C03 Winter 2007

Lab Exercise 2

Instructor: William M. Farmer
Revised: 8 February 2007

Assigned: 9 February 2007
Lab report due: 9 February 2007

Do this lab exercise with your assigned team member.

1. Make sure your host is booted.

2. Enable IP forwarding on your host by changing or adding the line

   ```
   FORWARD_IPV4 = YES
   ```

   in the file `/etc/sysconfig/network`. _____/2 pts.

3. Using the `route add` and `route del` commands, configure your host's routing table so that the specification below is satisfied. You may not use a default route nor any host-specific routes. Your routing table should include no more than 18 routes, one for each of the 17 SPNs and the loopback network. Using supernetting you can reduce the number of routes to 10.

4. Create a shell script that contains the `route add` and `route del` commands needed to build your host's routing table. Name the file `route-script`, set the group to `team`, set the permissions to `rwxrwx---`, and put a copy of it in the directory named `/etc` on your host. _____/10 pts.

5. Put a call to `route-script` in the `/etc/rc` start-up script so that your `route` commands are executed whenever your host is rebooted. Reboot your host and make sure the routing table is correct.
   _____/2 pts.

6. Starting at 3:30 use `ping` and `traceroute` to determine which Little Internet IP addresses are accessible to your host and which hosts are not correctly forwarding datagrams. Record your findings in a table on a separate sheet. _____/6 pts.

7. If you identify a host that has a misconfigured routing table, please ask the group managing the host to fix it.

For your team's lab report, hand in this sheet, your interface access findings, and a paper copy of each team member's log book (if it is more convenient, you may hand this in at the beginning of the next lecture). If your log book is missing or incomplete, 4 points will be deducted from your mark. *You and your partner must hand the lab report in together before the end of the lab session. If you do not attend the lab session or leave the lab before handing in the lab report, you will receive a mark of 0 for the lab exercise.*

Little Internet Routing Specification

Let h_1 and h_2 be two Little Internet hosts. The *distance* between h_1 and h_2, written $d(h_1, h_2)$, is the minimum number of hops needed to get from h_1 to h_2 (or equivalently from h_2 to h_1). $d(h_1, h_2) = 0$ iff $h_1 = h_2$, and $d(h_1, h_2) = 1$ iff h_1 and h_2 both have interfaces to the same SPN.

Suppose your host is h and the destination address of an IP datagram that has arrived at your host is the address of an interface belonging to host h'. If $h = h'$, the datagram will be immediately delivered to your host. If $h \neq h'$, the routing table of your host must be configured so that the datagram is forwarded to a host h'' directly connect to h such that

$$d(h'', h') < d(h, h').$$

If every host's routing table satisfies this specification, there should be universal connectivity in the Little Internet.