SE 4C03 Winter 2005

Lab Exercise 2

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Revised: 16th January 2005

Assigned: 17-JAN-2005
Lab report due: 4-FEB-2005

Do this lab with your assigned team members.

1. Configure your host’s routing table using route so that the specification below is satisfied. Add a direct route to each of the three network interfaces on your host (this part should already be done if you configured the D-Link, 3Com, and loopback interfaces in Lab 1; it is worthwhile to check that you have done so!). Add enough indirect routes, including possibly a default route, to the routing table so that there is a route to each IP address on the little internet. Once you are done, examine the routing table on your host using the netstat -rn command. Please record and briefly clarify your findings. Also, put a copy of the route commands in the etc/rc.local file, so that they are executed when your host reboots.

Little internet specification

If your host number is \( x \), and a packet is destined for host \( y \), then:

(a) If \( x = y \) then the packet is immediately delivered.
(b) If \( x < y \) then the packet should be forwarded to a host with number \( z \) such that \( x < z \leq y \).
(c) If \( x > y \) then the packet is forwarded to a host with number \( z \) such that \( y \leq z < x \).
2. After configuring your host’s routing tables, use `ping` to determine which IP addresses are accessible from your host. Record your findings in a table on a separate sheet. Each entry of the table should include the date and time, the IP address of the host that was pinged, and a summary of the observations.

3. Use `ping -R` to determine the route taken to a particular IP address, that was accessible from your host, using ping in Part 2. Record your findings including the date and time, the IP address of the host for which the route was recorded, and a summary of the observations. Do the routes taken comply with the *little-internet specification*?

4. The *six degrees of separation* myth says that everyone in the world is connected to everyone else by no more than six degrees of separation, i.e., six people in a chain. This was made into a movie, and there is also a nice article by Jon Kleinberg (see links on the course webpage) that discusses this myth with regard to the internet. Based on your findings in Step 3, how many host on average did you cross while communicating with the destination of your choice?. Record your findings.

For your team’s lab report, hand in this sheet, a copy of your routing table, and your results for Parts 2, 3, and 4.