CS 428: Second Midterm (Fall '03)

Answer all problems. You have 1.5 hours to complete this test. Your answers should be concise – short and to the point, but including the important technical issues. Be specific. Clearly state any assumptions. Good luck!

**Problem 1:** (16 points; 10 minutes) Briefly explain any 4 of the following terms:

1. Flooding
2. Connection Initiation in TCP
3. Sparse Mode Multicast
4. RPC
5. Flow Control

**Problem 2:** (24 points; 15 minutes) For the following alternatives, first identify 3 relevant metrics for comparing the alternatives and then compare them according to these metrics.

1. TCP vs. UDP
2. Link State vs. Distance Vector
3. Core Based Trees vs. Reverse Path Multicast

**Problem 3:** (24 points; 20 minutes)

You are the Chief Technology Officer for the startup company netwit.com, selling network enabled surfboards. You were allocated network addresses 99.99.0.0 to 99.99.3.255

(a) (8 points) Your company has two branch offices, one in Daytona Beach, and one 50 miles away in Cocoa Beach. Roughly 3/4 of your machines will be in Daytona. Subnet your network between the two sites according to that ratio showing your subnet masks, network prefix and host ranges in each network.

(b) (4 points) Show the routing table entries for your company: (1) at a router in England, and (2) at a router in Orlando, midway between your two sites.

(c) (4 points) Suppose that your company grows really quickly, but is unable to obtain additional IP addresses. Discuss a possible solution to this problem.

(d) (8 points) With the success of your company, you decide to obtain your own AS number. Explain what routing protocols would be necessary to connect your company to the Internet briefly explaining the basic features of these protocols.

**Problem 4:** (10 points; 10 minutes) What are three factors that contribute to the scalability of the Internet? Explain how they do so.

**Problem 5:** (12 points; 10 minutes)

(a) (8 points) Briefly explain how mobile IP supports mobility. Consider the case when the node moves twice and then moves back to its home network.

(b) (4 points) Identify any performance problems that arise.

**Problem 6:** (14 points; 15 minutes)

One approach to solve the count-to-infinity problem in distance vector is to include a sequence number from a destination with its updates. Whenever its neighbor link state changes (e.g., new link is added, or old link is removed) they increase the sequence number they send out with their update. Show with an example how you would use this information to eliminate or reduce count to infinity. Do you think this approach works?