Electrical, Computer, and Systems Engineering
ECSE-6600: Internet Protocols
Spring 2000

Problem Set 3- Due Monday, April 12rd 2000

Your Name	

Notes:

1. Be brief.
2. Please write your answers on separate sheets and staple it along with the questions to facilitate easy grading.

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1	2	3	4	Total
35	20	20	25	100

TA Signature :_____

1. [Reading] Deployment is a key consideration in the development of new technologies. The following two papers discuss deployment issues with IP multicast and Ipv6 respectively (hypertext links available on course webpage). Read them and summarize issues NOT covered in class.

a) C. Diot et al, "Deployment issues with IP multicast":
ftp://ftp.sprintlabs.com/diot/xcast-deployment.zip

b) R. Gilligan et al, "Transition mechanisms for Ipv6 Hosts and Routers,":
http://www.ietf.org/drafts/draft-ietf-ngtrans-mech-04.txt

2. Find out how many hosts and domains are there in the rpi.edu domain. Hint: use the file /etc/hosts on ecse.rpi.edu or any key machine in the rpi.edu domain.

3. Describe why the Ipv4-protocol suite (with BOOTP or DHCP) falls short of providing autodonfiguration capabilities for Internet hosts. What features does Ipv6 provide to ensure autoconfiguration of hosts ? Why is a 128-bit address important for these capabilities ?

4. Describe why multicast support is required at the **network** (IP) layer (and not at the application-layer or at the transport-layer) to efficiently facilitate and manage one-to-many communications on the Internet. Why does reliable multicast threaten to annul these advantages of the IP multicast model (i.e. make it almost as inefficient as replicated unicast) ? What compromises and techniques can be used to enable reliable multicast while reducing the inefficiencies introduced ?

[The next problem is <u>not required</u> for this homework. It is an informal exercise if you have access to a linux machine with "tcpdump" installed]

Use the command 'tcpdump -n -vv -s 512 &' to look into the DNS packets on a linux machine with tcpdump enabled. Now try the following commands:
   a) nslookup 192.48.96.9
   b) nslookup shiv.ecse.rpi.edu
   c) host way.cis.ohio-state.edu

Capture and annotate the output in each case. Refer to pg 196-199 in your text for guidance in interpreting these values. You will see many kinds of DNS queries and responses including pointer, A, CNAME, MX, DNS error etc. Explain why multiple DNS queries are generated for each case. Hint: look at /etc/resolv.conf