

Electrical, Computer, and Systems Engineering
ECSE-6600: Internet Protocols
Spring 2001

Problem Set 3- Due Monday, April 9th 2001

Your Name	
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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	5	Total
30	10	20	15	25	100

TA Signature : _____

1. [Reading] Deployment is a key consideration in the development of new technologies. The following papers discuss deployment issues with IP multicast and Ipv6 respectively (hypertext links available on course webpage). Summarize them in the same fashion as you did for earlier papers, but include final paragraphs articulating what you learnt about how to design and deploy new technologies in today's Internet.
 - a) C. Diot et al, "Deployment issues with IP multicast": <ftp://ftp.sprintlabs.com/diot/xcast-deployment.zip>
 - b) Hugh W. Holbrook and David R. Cheriton, IP Multicast Channels: EXPRESS Support for Large-scale Single-source Applications, SIGCOMM'1999. <http://www.acm.org/sigcomm/sigcomm99/papers/session2-3.html>
 - c) R. Gilligan et al, "Transition Mechanisms for IPv6 Hosts and Routers", RFC 2893 <http://www.ietf.org/rfc/rfc2893.txt>
 - d) Carpenter et al, "Connection of IPv6 Domains via IPv4 Clouds," RFC 3056, <http://www.ietf.org/rfc/rfc3056.txt>
2. Describe why the Ipv4-protocol suite (with BOOTP or DHCP) falls short of providing auto-configuration capabilities for Internet hosts. What features does Ipv6 provide to ensure autoconfiguration of hosts ? Why is a 128-bit address important for these capabilities ?
3. Ipv6 was designed for supporting larger address spaces. But its deployment has been hindered in part due to the availability of viable substitutes: subnetting, super-netting (CIDR), DHCP, NAT and (recently) RSIP. Explain how each of these technologies play a part in the big picture of conserving and making efficient use of the Ipv4 address space.
4. Describe why multicast support is required at the **network** (IP) 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 ? What compromises and techniques can be used to enable reliable multicast while reducing the inefficiencies introduced ?
5. Explain how schedulers, buffer management and traffic shaper building blocks can be put together in order to achieve QoS capabilities (eg: guaranteed end-to-end delay and bandwidth). State briefly what is the purpose and place of the plethora of techniques in providing QoS on the Internet: RTP, int-serv, RSVP, diff-serv and MPLS. If you were an ISP, how (and in what order) would you plan to deploy (a subset of) these technologies ?