CS 276 – Distributed Computing and Computer Networks
Final Exam
Open Books, Papers and Notes

Question 1: Multicast (25 pts)

(5 pts)(A) How is IGMP different than the intra-domain multicast protocols, i.e. DVMRP/MOSPF/PIM/CBT?

(5 pts)(B) How does a router know if an IP packet that it has received is unicast or multicast?

(5 pts)(C) What is the difference between Truncated Reverse Path Broadcast (TRPB) and Reverse Path Multicast (RPM)?

(5 pts)(D) What are the differences between DVMRP and PIM-DM?

(5 pts)(i) Explain which we implemented in Homework #3.

Question 2: Routing (15 pts)

(10 pts)(A) How would two intra-domain protocols like OSPF and RIP interoperate? How does such interoperability affect path efficiencies?

(5 pts)(B) Is there a (1) network topology (big/small, high/small degree node, etc) and/or (2) network characteristics (loaded/unloaded, robust/unreliable, stable/unstable, etc) in which a distance vector protocol runs better/worse than a link state protocol?

Question 3: DNS (5 pts)

(5 pts)(A) DNS uses a combination of interactive and recursive queries. Explain what this means and why this is done. Use a diagram of a sample DNS query that uses both types.

Question 4: HTTP Performance (30 pts)

(5 pts)(A) List the reasons why HTTP over TCP is considered to be inefficient.

(25 pts)(B) Propose some significant change to doing WWW transactions that improves performance. How would you evaluate your proposal with the goal of convincing someone that your technique is better than the existing mechanism? What factors, metrics, and parameters would you use if you actually designed a way to evaluate your proposal?

Question 5: ATM (10 pts)

(10 pts)(A) Describe how IP routing is performed on top of an ATM network. Use the vBNS as an example.

Question 6: Active Nets and Security (15 pts)

(15 pts)(A) Consider firewalls in the context of active networks. How are firewalls similar to active networks and how are they different.