Name _____

CS 513 S08, Introduction to LAN/WAN
Final Exam, April 1, 2008

Trivia Question (1 extra credit point)

Who is the governor of the commonwealth of Massachusetts?

1. (12 points) A Yahoo HTML webpage contains an interesting news story with a link to an accompanying video. If Yahoo already has a contract with a **Content Delivery Network (CDN)**, how will the CDN help if a user in Europe clicks on Yahoo's page? Explain the main steps in fetching the HTML page and the video. You can assume that Yahoo's main web server is in San Francisco, USA.

2. (10 points) Before **wireless networks** became popular, most timeouts on the Internet were caused by congestion and hence **TCP** reacted to timeouts by doubling its sender window (backed off). Over wireless network, timeouts may be due to garbled or lost packets that need to be retransmitted. If TCP backed off when timeouts occurred over wireless networks, would **TCP performance** be affected? Explain! How would you modify TCP to improve its performance over wireless networks?

3. (6 points) Why does the **Remote Procedure Call (RPC)** use **UDP** and not **TCP** as its transport protocol? How does an RPC client deal with an unreliable medium?

4. (6 points) What are **flash crowds** on the web? Give a solution to it.

5. (6 points) What protocol is used by a **diskless workstation** to find out its IP address? How does the protocol work?

6. (6 points) What are **choke packets** used for at the network layer? How is the **leaky bucket** congestion control scheme different?

7. (6 points) Explain what **BGP** is used for and why it may sometimes choose paths that are not the shortest paths.

8. (6 pts) Consider the following statement: **A Distance Vector routing algorithm Implementation which has the count-to-infinity problem can route packets to the wrong destinations.** Is this statement true or false? Briefly explain why.

9. (6 points) A friend of yours says that as memory gets cheaper, soon all routers will have very large buffer spaces and **congestion** on the Internet will no longer occur. Is she right? Explain.

10. (8 points) Explain the **3-way handshake** used for connection establishment in **TCP.** You may use a diagram.

11. (4 points) Name two features of **TCP** that **UDP** does not have

12. (6 points) In **DNS**, after the WPI Computer Science Department is assigned the URL www.cs.wpi.edu, who manages the assignment of the wireless.cs.wpi.edu URL to the Wireless research group in the WPI computer science department?

13. (6 pts) **HTTP** uses a simple **client-server** model with **stateless servers**. Why? Describe a web application in which it is necessary to recognize multiple requests from one **user session**. Name <u>and</u> describe briefly a popular mechanism for managing user sessions on the web today.

14. (6 points) Mary has two different email accounts with the ISPs AOL and Earthlink. She would like to use a single mail reader to manage emails from both these accounts. Does the email reader she chooses have to support **Pop3** or **IMAP**?

15. (6 points) Give two features of **WAP 1.0** that contributed to its failure and describe how **Imode** fixed them