

THE DESIGN AND IMPLEMENTATION OF NETWORK SERVICES
CS 302 Instructor: George Porter Spring 2005
Exit Exam

The purpose of this exam is to test your knowledge of what you learned this semester. It won't be graded, but rather might be used as a prereq test in a future course. Each numbered question is worth 1/3 the total points.

- 1) Concurrency and I/O
 - a. One approach to handling multiple clients is the use of Threads. What are the advantages of such an approach? The disadvantages?
 - b. Describe how one can use non-blocking I/O to support multiple clients in a single-threaded application. What are the advantages of this approach? The disadvantages?

- 2) Layering
 - a. What is Integrated Layer Processing (ILP)? What problem is it solving, and why was it proposed? In fact, ILP is controversial. Discuss in the context of the end-to-end argument.
 - b. What is a content distribution network? How does a CDN like Akamai make use of the DNS system to facilitate content distribution? What would a CDN based on a P2P system such as I3 look like?

- 3) Middleware
 - a. Middleboxes such as the Alteon Layer 2-7 switch are used for content switching. Draw a 3-tier network service and demonstrate how an HTTP content switch can be used to mask server failure
 - b. Replication and Partitioning data across servers can increase the scalability of a network service. Discuss the advantages and disadvantages of each approach in regards to 1) flash traffic, 2) server failure, and 3) network failure