CMPT 371: Data Communications and Networking

Assignment (1)

Due: Oct 1, 2012

(P1 – 10 points) Suppose users share a 3 Mpbs link. Also suppose each user requires 150kbps when transmitting, but each user transmits only 10% of the time.

(a) When circuit switching is used, how many users can be supported?

If packet switching is used:
(b) What is the probability that a given user is transmitting?
(c) If we have 120 users, what is the probability that at any given time exactly n users are transmitting simultaneously?
(d) Why in the given system packet switching with 120 users may serve 120 users almost as good as circuit switching for 20 users?

(P2 – 10 points) Consider a packet of length L which begins at end system A and travels over three links to a destination end system. These three links are connected by two packet switches. Let d_i, s_i and R_i denote the length, propagation speed, and the transmission rate of link *i*, for *i=1, 2, 3*. The packet switch delays each packet by d_{proc}. Assuming no queuing delays, what is the total end-to-end delay for the packet?

(P3 – 30 points) Develop a Web Proxy!

As we discussed in the class, a web cache – or a web proxy – is a network entity that having its own storage, keeps the copies of recently requested objects and satisfies the requests to those objects on behalf on the origin servers.

When your proxy server receives an HTTP request for an object from a browser, it generates a new HTTP request for the same object and sends it to the origin server. When the proxy receives the corresponding HTTP response with the object from the origin server, it creates a new HTTP response, including the object and sends it to the client.

Your proxy should be multi-threaded, so that it will be able to handle multiple requests at the same time.