

CECS 474 - Homework 2

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1. Problem Set (Chapter 2)

Problem 1: Consider a short, 10-meter link, over which a sender can transmit at a rate of 150 bits/sec in both directions. Suppose that packets containing data are 100,000 bits long, and packets containing only control (e.g., ACK or handshaking) are 200 bits long. Assume that N parallel connections each get $1/N$ of the link bandwidth. Now consider the HTTP protocol, and suppose that each downloaded object is 100 Kbits long, and that the initial downloaded object contains 10 referenced objects from the same sender. Would parallel downloads via parallel instances of non-persistent HTTP make sense in this case? Now consider persistent HTTP. Do you expect significant gains over the non-persistent case? Justify and explain your answer.

Problem 2: Consider distributing a file of $F=15$ Gbits to N peers. The server has an upload rate of $u_s=30$ Mbps, and each peer has a download rate of $d_i=2$ Mbps and an upload rate of u . For $N=10, 100$, and $1,000$ and $u=300$ Kbps, 700 Kbps, and 2 Mbps, prepare a chart giving the minimum distribution time for each of the combinations of N and u for both client-server distribution and P2P distribution.

2. Solution Submission and Deadline

You only need to submit the solutions to **problems 1 and 2** (which are marked through red text color) to BeachBoard.

Submission Deadline: March 7, 2022, 11:00 pm