Computer Networks Lab (CS 353): Lab 3

This assignment will be graded.

1. Simulate a star topology with 5 nodes. In a star topology, the nodes are connected to a central hub. A message received from one node is passively broadcast to all the other nodes.

You can reuse code from your client-server lab assignments, with the server acting as the central hub and each node acting as the client. Each client must have an address associated with it and the destination address of the recipient must be included in the message sent by the sender. When a message is received, each node must accept it if the message is meant for it and discard it if it is not meant for it**. Note that this is only a simulation of a star topology.**

You need to demonstrate sending a message from node to all the other nodes. The node that sends and the nodes that receive must print the messages received, including the messages that are discarded. The message can be a simple text string. For example, node 1 can send a message “Message <i>” to node i, where i is not equal to 1. Nodes 2 through 5 will print the messages they accept and discard. [7 marks]

Write a program that implements the message flow from the top layer to the bottom layer of the 7-layer protocol model. Your program should include a separate protocol function for each layer. Protocol headers are sequences up to 64 characters. Each protocol function has two parameters: a message passed from the higher layer protocol (a char buffer) and the size of the message. This function attaches its header in front of the message, prints the new message on the standard output, and then invokes the protocol function of the lower-layer protocol. The input to the program is an application message. [3 marks]