

Computer Networks

Programming Assignment

To be Completed in groups of upto three students

Draft 1 (as there can be changes)

Announced on: 1st Nov 2010

To be Submitted on: 3rd & 5th Jan 2011,

**(Report: Monday at start of Class
Demo: Wednesday during lab)**

Objective: Design a traceroute type tool on application layer

Description:

Design an application that sends three UDP packets to each router from source to destination and calculate the RTT for each and provide average RTT as well with names etc. When the application comes up it starts all the routers, sources and destinations. Each has to know their role and the path to be taken if receive a packet. Only the directly related routers know about the hosts. They have to send messages to others to inform about that. System will take some time to stabilize so all routers know what is the path to take if they have to send the packets from any source to any destination in the network.

There are two types of messages to be sent, one routing updates and second actual traceroute packets. The traceroute packets have TTL incrementing from 1, routers only reply to the packet if it receives one with TTL of 1, otherwise it just decrements the value and forwards to packet. We need to see some message from the routers when they forward or reply the packet.

Sender sends multiple packets with increasing TTL until it receives reply from the destination.

Routers have to send reply as well as forward packet when they receive traceroute messages so database at each router needs to keep all forwarding as well as reverse addresses.

You have to design your own message format and give IDs in any way you want. At minimum the message must have source address, destination address, TTL and address of the sending node etc.

Network:

Design your network with atleast two sources and two destinations with atleast three routers on the path from source to destination. The network should stabilize and the route from each router should be displayed.

Bonus:

For doing more you get bonus marks, do write in the report clearly what is extra. Use your imagination.....

Assumptions:

The description of the assignment is purposefully kept very vague so you have to make assumptions for anything missing. Please make sure to provide complete information about your assumptions like, purpose, reason, impact etc.

Submission:

There are two parts:

- Report: A comprehensive report on the functionality of your program, its features, your assumptions etc needs to be submitted on 3rd Jan 2010 at the start of the class. Follow proper report format and keep it clear and concise. Don't put code in the report.
- Demo: A ten minutes demo of each group's application will be taken to see how your program works.

Important:

- You are free to use any programming language, no programming support is provided by us.
- Make sure that all group members work equally on the assignment.
- Make sure you know the latest version of the draft as there can be changes to specifications.