CSCI 558L – Laboratory Assignment #10: Content based Router

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Due date: November 16, 2011 at 11:55pm

1) Sending and receiving raw data on to the Network

For this task, you are to write a server and a client application that use raw sockets to send and receive raw data in one or more files. Each file may contain one or more data segments of 50 bytes each with a designated delimiters (i.e., space, carriage return, and etc.) The job of the server is to read from the file and send each segment at a time. Each packet should only contain the data without any traditional header information such as the Ethernet header like the MAC addresses (the packet may contain some form of data in front of the packet to indicate the length and/or the start of the packet and the delimiter to indicate the end of the packet). The client application should simply listen to the port, parse the data and write the raw data into a file.

Submit the following:

(a) Source code of client and server applications
(b) DETER experiment NS file source that has 2 nodes connected by 1GB link
(c) Transcript of the execution of the client and server code
(d) Use iperf to measure and compute the effective throughput for UDP packets with 50 byte payload – turn in the description and the transcripts of your experiments to measure the throughput of only the data portion of the packet
(e) Measure the performance of your server and client – turn in the description and the transcripts of your experiments to measure the throughput of only the data portion of the packet (justify the increased throughput with your system)

2) Content based router

You are to build a content-based router for this part of the project. The router will simply look at the raw packet and route according to the content of the packet. The router can be built either by modifying the custom IP router that you built in previous lab assignment or by using the OpenFlow switch.

You will need to build an experiment with 4 nodes connected by a single content-based router in the middle. Each machine should have a client and a server application from previous section running. The server should send raw data packets that contain one of four words, RED, BLUE, GREEN, or YELLOW in a random fashion. The router should be configured to route the raw packets according to the word. If the router functions correctly, each client will generate a file with repeated segments of the same word.

Submit the following:

(a) Description of the router implementation
(b) DETER experiment NS file source
(c) Measure the performance of your router – turn in the description and the transcripts of your experiments to measure the throughput of only the data portion of the packet (justify the increased throughput with your system)