

Result analysis of assignment 2

Part A:

The task 1 method in my code is used to estimated the number of flows initialized from the sender.

We can identify each flow by their different source port but same source IP. Thus, I traversed all the packet messages and recorded different source port numbers but which have a source IP address different to the IP address 128.208.2.198.

In this method, I got two return value. The first one is a list of source port number of three initialized TCP flows from the sender. The another one is the destination port number.

For each TCP flow:

The task 2 method is used to print the information of three flows, and first two transactions of each flow.

a) In task_1 method, I already had source port number and destination port number for each port. I also have source IP address and destination IP address in the assignment specification.

b) For each flow, check each packet message's source port to find the first two transactions, and use get_info method in class Packet to get the information of each transaction.

The throughput method is used to calculate the throughput of the each flow.

c) To get the throughput of each flow, I try to find the minimum and maximum timestamp of each flow. During traversal all packets, sum the length of the buffer. The ratio of the buffer length sum and the difference of timestamp is the throughput.

Part B:

(1) Congestion window size:

congestion window size is the method used to calculate congestion window size for each flow

The first loop iterate different flows. For each flow, after the connection set up steps, I count the number of packets send from sender and the congestion window size is the counter stopped when sender receive the acknowledgement. Before the next loop counting next congestion window size, the counter should minus 1.

(2) Retransmission:

retransmission method is using to count for the retransmission times occurred by timeout or triple duplicate acknowledgement or other reason.

There is a loop iterates different flow. For a certain flow, count and record the occurrence of all messages send from sender and receive by sender in different dictionary, which key is the message's sequence number or acknowledge number and the value is the number of the message occur. Every value in the dictionary of sequence number greater than one means the retransmission occurred. At this time, we use this sequence number and use this as a key to find the value in acknowledge number dictionary. If the value greater than two means the same acknowledge message have been sent at least three time which is fast retransmission occurred by triple duplicate acknowledgement. If the value less or equal to 2, it might be timeout or other

reason. In this way, we need to calculate the RTO to determine if the retransmission time greater than RTO. If retransmission time greater than RTO, it is a timeout, otherwise, it is occurred by other reason.