CS5302 DISTRIBUTED COMPUTING

ASSIGNMENT - 3 - Mutual Exclusion Algorithms

CS16BTECH11017

HARSHIT PATEL

SUZUKI KASAMI'S Broadcast Algorithm

In this algorithm, if a process wishes that wishes to enter the CS, does not posses the token, it broadcasts a REQUEST message for the token to all other sites. A sites that posses the token , sends the token to the requesting sites upon receipt of REQUEST message.If it was in CS, it sends the token after it has executed the CS.

Performance - In this algorithm a process gives priority to other sites with outstanding request for CS over its pending requests for CS.

If a process that does not possess the token, requests for CS , the algorithm requires N messages to obtain the token.

Synchronization Delay is 0 or T.

Raymond Algorithm

The algorithm considers nodes to be in a unrooted tree structure. It uses the concept of privilege to signify which node possess the privilege to enter the CS. Only a single node can posses the privilege at a time(except in transit state) . If no nodes requests for privilege, it is possessed by the node that lastly used it. Every node points in a particular direction(to either of its immediate neighbour) which specify the direction of the privileged node.

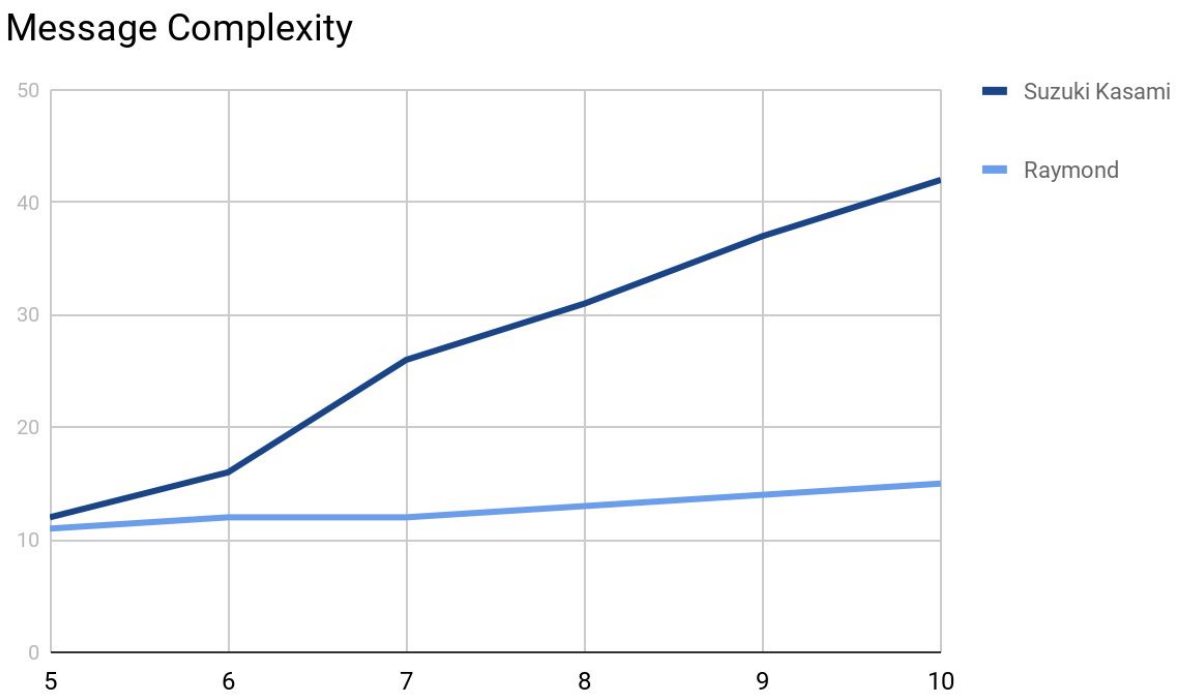
Performance -

Worst Case - **2*longest path of the tree** messages per CS entry

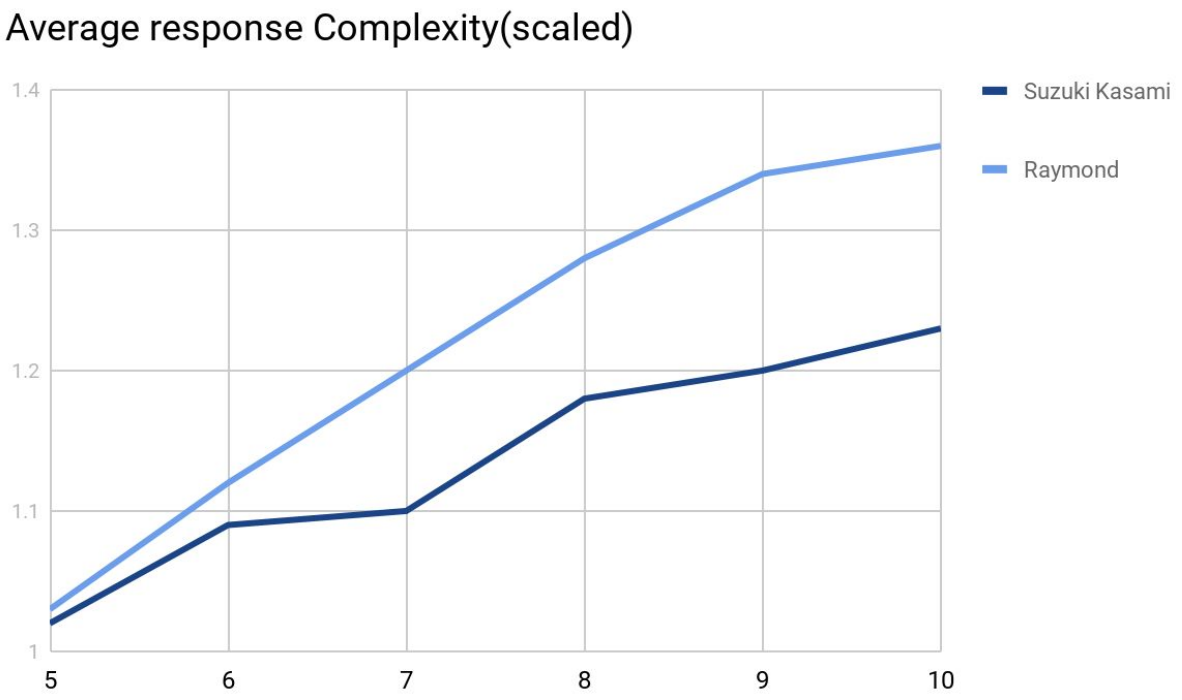
GRAPH TOPOLOGY-

In the Suzuki Kasami algorithm, we have a fully connected graph topology, but in Raymond's algorithm I have assumed a topology similiar to doubly linked list whose size is n.

Graph



Here k = 5 and n varies from 5 to 10



Result and Observation -

We can the message complexity of Raymond's algorithm is smaller than the Suzuki Kasami algorithm. This is due to the reason that in Raymond's algorithm a process sends a request message only to its nearest neighbour, but in Suzuki Kasami algorithm a process sends the request to all the other nodes. This difference becomes largely significant for bigger values of n.

Generally the response time complexity for Raymond's Algorithm is higher than the Suzuki Kasami algorithm. This is due to the reason that in Raymond's algorithm, a process asks its neighbour for the privilege, which in turn asks its neighbour. This sequence of requests can cause larger response time for fulfilling of CS request, as the neighbour on receiving the privilege can pass the to privilege to some other node according to its request queue. In Suzuki Kasami algorithm as the request is send to all other nodes, it can be quickly satisfied.