Abstract

In computer networks, a message passes through several nodes to reach its destination. A message is delayed by different sources such as link bandwidth and buffer limitations.

In this research, a mathematical model is implemented to compute the optimal number of buffers that should be available for each node so that none of the messages is lost. This model is based on a priority assignment strategy where processing of a message is preempted by the arrival of messages from higher priority nodes. The load generated by each node is measured by a load factor which is defined as the ratio between the maximum time needed to process the arriving message and the minimum interarrival time between messages.

A case study is made on a star network in which a central node receives messages from n other nodes. The relation between the amount of buffer space needed and the load factor are made through computer simulation program.
The analysis presented in this paper may help in designing reliable networks by making sure, early in the design stages, that a sufficient amount of buffer space is provided to avoid message loss and unnecessary delays thereby increasing the network throughput.

References


Index Terms

Computer Science Networks

Keywords
Computer networks, buffer space, delay, priority, load factor, interarrival time, response time.