Mean Packet Waiting Time in Token Accessed LAN

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The local area network is a widely accepted form of computer communication networks extended over a limited geographical area. The network and associated technologies have evolved in a response to the needs of sharing data and expensive computing resources. To ensure the optimum use of computing resources throughout the system's life cycle the continued effort to evaluate the performance of the system is indispensable.

This is a study dealing with the packet waiting time in token accessed local area networks. The waiting time is one important performance measure for such a system. In addition to the packet transmission time the other important components of packet waiting time are the token passing time and the token processing time. The token processing time is a time required to seize the free token and do any ancilliary processing when the node has packets to be transmitted. Considering the rapid increase in the transmission rate over the media this time segment can no longer be overlooked in the performance evaluation studies of local area networks. There has been a number of studies dealing with problems in this area, however, most of the studies did not take account of the token processing time in their models.

The waiting time model developed in this study includes the token processing time. The model is developed for exhaustive, semi-gated and full-gated service discipline using a cyclic order service M/G/1 queueing model. Due to the complexities involved only an approximation algorithm was developed. As a means of validating the model a simulation study was conducted for a hypothetical system and was shown that the result agrees reasonably well with the results obtained from the proposed algorithm.