

Guaranteeing Real-Time Traffic Through an ATM Network

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Abstract

We review state-of-the art and present a method to analyze the end-to-end delay of messages sent through an Asynchronous Transfer Mode (ATM) network. We consider a network with a number of source and destination nodes, each transmitting/receiving multiple data streams carrying real-time messages. We also describe a method to predict the maximum buffer-need. By calculating the maximum end-to-end delay and buffer-need it is possible to determine if real-time messages are delivered in a timely manner, i.e., if specified deadlines are met. Our modelling and calculations are based on the response-time analysis used in e.g. analysis of fixed priority CPU-scheduling.

To guarantee short delays for urgent messages we propose the use of priority queues in the source nodes and in the ATM switch. Our proposed switch mechanism is simple and inexpensive to implement, and the priority queues enable messages of different urgency to efficiently share the network resource.