Admission Control for Hard Real-Time Connections in ATM LANs

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Abstract

The CAC algorithm must efficiently determine if a new connection can be admitted by verifying that its QoS requirements can be met without violating those of previously admitted connections. In hard real-time systems, the QoS requirements are specified in terms of end-to-end cell deadlines and no cell loss due to buffer overflow. A CAC algorithm must account for interdependencies among connections caused by statistical multiplexing of cells in ATM networks. Furthermore, arbitrary topology of the network may lead to cyclic dependencies among various connections. We present an efficient CAC algorithm that addresses the above issues. The algorithm uses a traffic descriptor called the maximum traffic rate function to effectively compute bounds on end-to-end delays of connections and buffer requirements within the network. Our work differs from most previous work in that it does not require traffic restoration inside the network.

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