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A PACKET DISCARD STRATEGY
FOR CONGESTION CONTROL OF
ASYNCHRONOUS TRANSFER
MODE DATA NETWORKS



*Australian Telecommunications Research Institute
Network Research Laboratory*

**“A PACKET DISCARD STRATEGY
FOR
CONGESTION CONTROL
OF
ATM DATA NETWORKS”**

(Telecommunications Engineer)

1996

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ABSTRACT

This thesis reports on the performance of a Packet Discard Strategy used as basis for congestion management of data traffic associated with Unspecified Bit Rate transfer service in ATM data networks. With this Packet Discard Strategy, when the cell occupancy of the ATM switch buffers is such that overflow is threatened, congestion is relieved by accepting into the congested buffers only cells from data frames already in transit through the switch and by rejecting all cells from new data frames. This regime continues until the congestion is relieved. In this thesis, we provide a conservative queueing system, where group arrivals is assumed, for modelling the behaviour of an ATM switch operating with and without the Packet Discard Strategy. Using a simulation model we compare the numerical results with those from the queueing model and investigate the factors affecting the relationship existed between the two results. For comparison, we also use a variant of the queueing system to model a Cell Discard Strategy where cells are discarded whenever the buffer is full. With the results from the queueing models, we also investigate the parameters affecting the performance of the discard strategies in terms of goodput and packet loss probability.

Simulations show that our simplification of using Group arrivals in the queueing analysis is reasonable and the results from the queueing model represents a conservative estimation of the performance of the system. We also observe that the switch operating with the Packet Discard Strategy remains 100% goodput even under sustained overload while the goodput of the switch operating with the Cell Discard Strategy degrades once the switch is overloaded.

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