

An Efficient Scheme for Traffic Management in ATM Networks

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Abstract— As ATM network is designed for broad band transmission that is high data rate (25 Mbps to 2.5 Gbps) and supports the transmission of every kind of data, congestion control and delay have been important issues for ATM networks. Data transmission is done in the form of cell (53 bytes) relay. Hence, cell sequence and the error control have to be carried out properly. ATM networks presents difficulties in effectively controlling congestion not found in other types of networks, including frame relay networks. In this paper, we present an efficient methodology for traffic management. The simulation results suggest that the proposed solution is effective for both slow and high data rate transmission.

Keywords— ATM network, broad band transmission, congestion control, transmission delay

I. INTRODUCTION

International Telecommunication Union (ITU) has defined a restricted initial set of traffic and congestion control capacities aiming at simple mechanisms and network efficiency as follow. That sets the upper bound to the traffic, variability in the pattern of cell arrival and average rate of ATM connection.

1. Connection Admission Control.
2. Usage Parameter Control.
3. Priority Control.
4. Fast Resource Management.
5. Selective Cell Discarding.

Apart from that, ATM switch is important network device in ATM network for congestion and traffic control. That switches virtual circuit identifier (VCI) from left to right. It contains buffers and switching circuits to guide the connections.

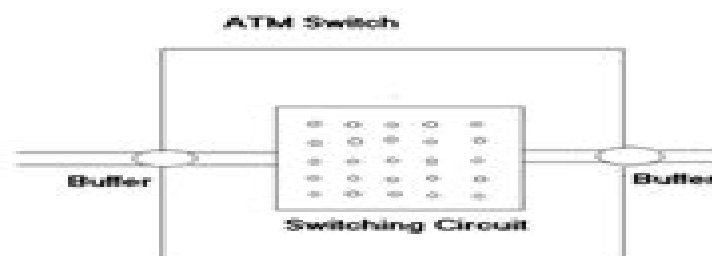


Fig. 1. Switching Architecture

A. Problem Statement

Traffic from user nodes can exceed the capacity of the network, which causes memory buffer of ATM switches to overflow and data loses. As per high data rate of transmission, cell storage and traffic management is required in ATM switches.

The restrictions of ITU-T can be managed by upgrading the performance of ATM switches. ATM switches takes a time to process each cell's VCI through switching circuit and referring to the routing table instead of no time. That affects the continuity of the cell transmission.

ATM switches do outgoing buffering if more than one cells have same VCI, which leads to defer in transmission and affect the CBR (Constant bit rate). That results in retransmission or poor performance at receiver side especially in case of video-audio data.

II. PROPOSED SOLUTION FOR AN EFFICIENT TRAFFIC MANAGEMENT IN ATM NETWORKS

Small buffers of ATM switches can be replaced with large memory blocks.

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Signaling and Switching for Packet Telephony Matthew Stafford, 2004 This must have reference on packet switching and signaling offers you an in depth understanding of the core packet switching architectures signaling flows and packet formats as well as service delivery It describes in detail the design principles for packet telephone switches and emphasizes the benefits of a distributed architecture and separating bearer and control Successful carrier grade deployments of packet telephony entail much more than simply stuffing voice samples into IP packets or ATM cells They involve deploying multiple protocols and this book gives you a solid understanding of all protocols used and a clear sense of where individual protocols fit in a packet based system *QoS & Traffic Management in IP & ATM Networks* David E. McDysan, 2000 Traffic management and quality of service are techniques which when applied to LAN WAN and the Internet facilitate the smooth flow of information This text explains how to make convergence work getting voice and data to flow without bottling up the network Internet II is also covered Network Management and Security International Engineering Consortium, 2006 A thorough detailed look into the world of the telecommunications the internet and information industries and their relation to networks and security global specialists have come together in this volume to reveal their ideas on related topics This reference includes notable discussions on the design of telecommunications networks information management network inventory security policy and quality and internet tomography and statistics Quality of Service Control in High-Speed Networks H. Jonathan Chao, Xiaolei Guo, 2001-11-29 The explosion of traffic over data communications networks has resulted in a growing demand for Quality of Service QoS techniques to ensure network reliability particularly in regard to e commerce

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Encyclopedia of Information Science and Technology, First Edition Khosrow-Pour, D.B.A., Mehdi,2005-01-31

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Computer Society. Technical Committee on the Internet,1999 Annotation Proceedings of the workshop held July 1999 Sixteen contributions discuss various Internet related topics including high performance common gateway interface invocation end to end management of mixed applications across networks a shopping assistant agent for web shops an intelligent interface agent for Web based information retrieval a case study in building Internet travel brokering services lifetime behavior and its impact on web caching coordinated placement and replacement for large scale distributed caches specification of order and reliability in SMIL documents smart multimedia file objects stochastic voting protocol to protect voters privacy an automated fault diagnosis system using hierarchical reasoning and alarm correlation and others Contains an author index only

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