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Comparative and Evaluation of Explicit Rate Flow Control in ATM Networks

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Abstract
Current and feature application make use of different technologies as voice, data and video. Consequently network technologies needed to support them. This paper gives the technical overflow of different networking technologies such as the internet. ATM and different approaches to run input on top of an ATM network and access their potential to be used as an integrated services network. Novel high throughput reservation based switch architecture for ATM/WDM network [4] is presented. This scheme is connection free a highly flexible yielding a powerful solution for high speed broadband packet switching networks.
Keywords: Fault Tolerance, Admission Control, ATM switches

1. Introduction

To dominate of input based network in the WAN/LAN has also help to proposals for ATM deployment that considerably differ from the traditional view of public telecom operators such as using ATM only as a high speed transmission system. The discussion about whether IP or ATM is the better technology for an integrated services network are ongoing and reached almost the state of a war between advocates of the two technologies. There is a broad consensus that ATM will first the implemented within WAN primarily as a switching technology. To support existing services primarily as a backbone technology because it is in this consent that most of the benefits of cell relay are realized.

Input traffic becomes the killer application for ATM network. One challenge in current network research is how to efficiently transport input traffic over ATM networks. On the basis of a connectionless model while ATM was originally designed for connection oriented services. Input traffic is usually switched using packet software forwarding technology. Which is expensive and has substantially limited forwarding capacity. ATM switches are designed with high transmission bandwidth but having limited connection setup processing capacity due to its complex signaling structure is developed for connection oriented services.

2. Related works

In the ATM switch a credit sending algorithm is necessary in order to confirm the request in the bus. The credit generated by the all active stations on the bus of the DQDB sub network. Thus a fair credit distribution protocol is necessary for the DQDB sub network. To avoid the system to the multiple request outstanding strategy should be used to increase the throughput. The distributed queuing mechanism is net fair without the bandwidth balancing mechanism [3]. With the BBM the credit may be lost. This may cause a station to keep a waiting for a credit from the ATM switch but the switch has sent the credit out and keeps waiting for a new arrival cell.

Allow MPOA devices to establish direct ATM connections. No significant changes to installed bridges , Routers and Hubs. Integrate with LAN emulation to support network layer multicasting and broad casting. Support auto configuration at host to separate switching from the routing. If the connection is established with signaling the call setup request should be blocked. If the allocated bandwidth for a connection could be accurate and cells get discarded by traffic policing. After their establishment connections can be cell on congested links in the network.

The number of configured connections is not necessarily equal to the number of active connections. If the connections between active they transport their cells with at least the agreed mean rate. As soon as the connection is established the ATM starts the usage parameter control function to monitor the actual traffic generated from the source against the source parameter declared for the connection request. This function enforces the service construct so that network resources are protected from the malicious or international misbehavior of the source.

For unambiguous specification of the conformance definition the generic cell rate algorithm is desired. The average capacity level of the queue must follow the desired set point. The bandwidth must be fairly assigned. The delays of bandwidth notification must be treated with deadline compensation techniques to prevent oscillations. The MCR should be considered in the cases where this ATM forum specification parameter is required. The effect of transient in ABR capacity must be studied to view the limitations of the proposed controller.

3. Simulation results

The average occupancy level is expected it follows the set point of the system. It can be observed that there is no relation between the steady state average level of the queue and the ABR level. The standard deviation of the queue level i.e. the magnitude of the oscillations. It is related to the fact variation of the ABR introduced and the oscillations caused by delays by adding 20% of the while noise to a stepwise ABR signal gives the result. There is no dependence between the oscillations of the queue and neither the average ABR value or the set point used. This is an important point for the controller where remain constant in a wide rate.

The portion of time queue is empty i.e. the channel not being fully used. This can be made near 0 in a steady state when assigning the set point twice the expand standard deviation. For a specific controller of the maximum setup point in a burst ABR signal is limited. An instant ABR change higher than this maximum will produce a queue overflow. The new oscillations that can appear near the saturation points. To obtain the maximum step wise in a stepwise ABR signal that the controller can handle without exceeding the queue size.

If the traffic arriving at packet switching node exceeds the capacity of the node the input buffer will fill up with unprocessed packets. When the buffer overflow further incoming packets will be discarded. This can have a severe impact on video quality. To avoid this is the rate of the video encoder must be controlled according to congestion information from the network.Another way of avoiding congestion the amount of traffic accepted for transmission over the network. In an ATM network this is carried out by the CAC function. By placing the limit on the traffic consists that are accepted at any point we can limit the occurrence of congestion.

Quantization size = (Buffer content / Division factor) + offset value

Algorithm 1:

Argument =Argument +1

CS = CS -1 and q = q+1

If argument > 0 and Cs +q < b

Cs = Cs +1

Argument = argument -1

Call Blocking Algorithm : 2

If received ABR cell

If queue length – length < output queue length

Add cell to output queue

Cost = cost +1

If (cost % n) = 0

If output queue size > (old output queue size + t)

Congested = true

Table 1: Queue label Table

Set Pointer	Cells	10 megabit	20 Megabit
2	4946	0.05	0.68
1.5	3710	0.05	0.03
1	2473	0.05	0.06
0.05	1237	0.05	0.03

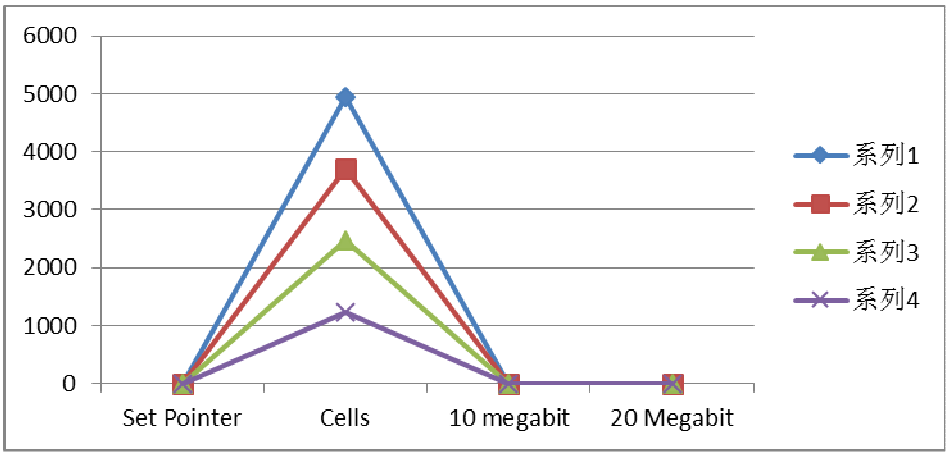
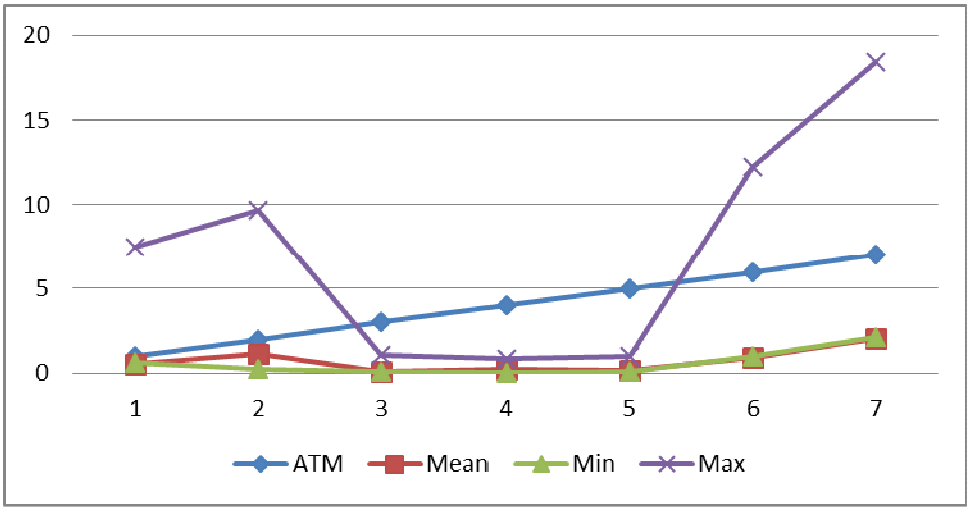


Table 2: Cell Distribution Rate

ATM	Mean	Min	Max
1	0.551	0.639	7.452
2	1.17	0.27	9.67
3	0.08	0.10	1.10
4	0.21	0.05	0.83
5	0.17	0.06	1.00
6	0.90	1.0	12.21
7	2.04	2.10	18.41



4. Performance Evaluation

Computing the number of CBR/VBR cells to transmit using the aggregated MPEG frame size and displaying rate. Computing the number of ABR cells to transmitting using the error in buffer level and change in error. Updating the max number of CBR/VBR cells on the output link and the output buffer level. The control table is obtained using a different simulation technique from the level 1 used for CAC. Thus result in information of a complete control i.e. one without any missing entries. We also need to further investigate how to message several control table 2 into a single one averaging the entries may not always be satisfactory. Specification of how many ATM cells from each active connection will be service in the current frame. Determination of the exact time slot each serviced ATM cell will be transmitted diagram 1 and 2.

Diagram 1: Avoid Call Blocking

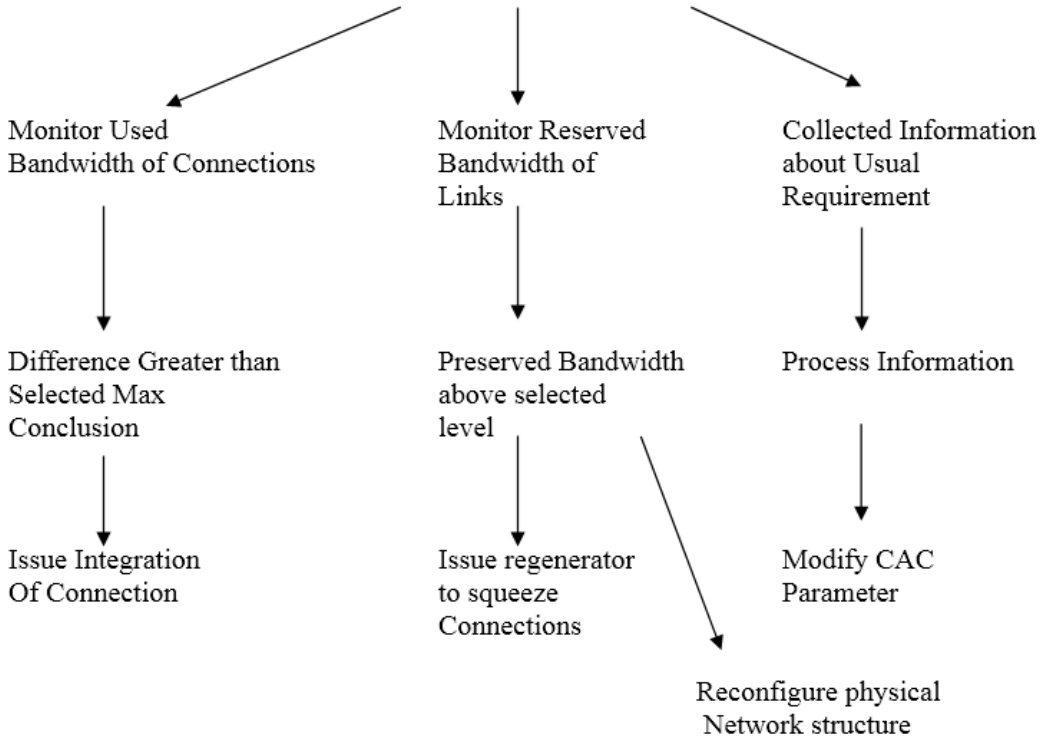
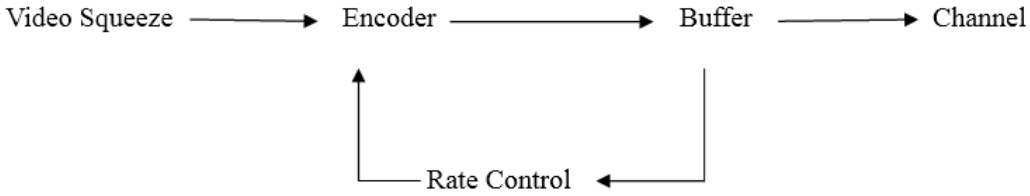


Diagram 2: Video Encoder



Conclusion

In this paper we gave a technical overview on the competing integrated services network solutions. Such as IP, ATM and the different available and emerging technologies and how to non IP over ATM network. It is identified their potential and shortcomings of being a solution for an ISDN. It remains the solution which role these network technology will play in the future. We try to give solution for the short term and the medium in long term. By applying an ultra high speed scheduling discipline extremely high capacity and low latency switching is achieved. The design is simple scalable and flexible to support diffuse traffic characteristics. The methods can be adapted to IP traffic and to various multiplexing technology. The method can be adopted to IP traffic and to various multiplexing technology.

Acronyms

ERICA – EXPLICIT RATE INDICATOR AND CONGESTION AVOIDANCE

MACR – MEAN ALLOWED CELL RATE

ADSL – ASYMMETRICAL DIGITAL SWITCH LINE

CPCS – COMMON PART OF THE CONVERGENCE SUB LAYER

GLRA – GENERIC CELL RATE ALGORITHM

SONE – SYNCHRONOUS OPTICAL NETWORK

BLLI – BROADBAND LOW LAYER INFORMATION

CIDR – CLASSLESS INTER DOMAIN ROUTING

DFFG – DEFAULT FORWARDER FUNCTIONAL GROUP

ICMP – INTERNET CONTROL MESSAGE PROTOCOL

SNAP – SUB NETWORK ACCESS POINT

SITA – SWITCHING IP THROUGH ATM

RVSP – RESOURCE RESERVATION PROTOCOL

POTS – PLAIN OLD TELEPHONE SYSTEM

OSPF – OPEN SHORTEST PATH FIRST

IGMP – INTERNET GROUP MANAGEMENT PROTOCOL

NHRP – NEXT HOP RESOLUTION PROTOCOL

NBMA – NON BROADCAST MULTIPLE ACCESS

MARS – MULTICAST ADDRESS RESOLUTION SERVER

MPLS – MULTI PROTOCOL LABEL SWITCHING

PNNI – PRIME NETWORK TO NETWORK INTERFACE

HDLC – HIGH LEVEL DATA LINK CONTROL

VPLS – VIRTUAL PRIME LAN SERVICE

SPVC – SOFT PERMENANT VIRTUAL CONNECTION

VCCV – VIRTUAL CIRCUIT CONNECTION VERIFICATION

VPLS – VIRTUAL PRIVATE LAN SERVICE

BECN – BACKWARD EXPLICIT CONGESTION NOTIFICATION

CIR – COMMITED INFORMATION RATE

DLCI – DATA LINK CONNECTION IDENTIFIER

EFCI – EXPLICIT FORWARD CONGESTION INDICATOR

FECN – FORWARD EXPLICIT CONGESTION NOTIFICATION

GCRA – GENERIC CELL RATE ALGORITHM

LAPB – LINK ACCESS PROCEDURE BALANCED

SSCS – SERVICE SPECIFIC CONVERGENCE SUBLAYER

References

1. Andrew G Mallis , 2004, An ATM Switch Control Interface for QOS and Reliability, INFOCOMM<3(4),

PP 117-127.
2. Ching Fong Su, IEEE 2000, Explicit Rate Flow Control for ABR Services in ATM Networks, ACM Trans, Vol 8, , Issue 3.
3. F R Rubio, 1999, Deadline Comparison for ABR Traffic Control Over ATM Networks.
4. Marg , 2010, Innovations in TDM/ATM to IP Architecture, IEEE GlobeCOMM, Vol 2, Issue 12, PP. 516-523.
5. John A Cope Land IEEE 2000, Buffer Management for Shared Memory ATM Switches
6. Suri S, IEEE 1994, A Comparative Evaluation of Space Priority Strategy in ATM Networks,IEEE INFOCOMM, Vol 2, Issue 12, PP 359-361.