Innovative Systems Design and Engineering
ISSN 2222-1727 (Paper) ISSN 2222-2871 (Online)
Vol.7, No.2, 2016

Evaluation of MPLS Framework Congestion Control for Planning and Optimization in ATM Networks

P. Rajan
Research Scholar, Bharathiyar University, Coimbatore-641046

Dr. Arul Lawrence Selvakumar
Prof. and Head, Dept. of CSE, Rajiv Gandhi Institute of Technology, RT Nagar, Bangalore-32

Abstract
Recent Advances in MPLS have led to development of real-time applications. Many routing protocols have been specifically designed for these applications where real-time guarantee is an essential design issue. Real-time MPLS is an existing area of research. The common objective is trying to provide timeless guarantee for resource constrained MPLS. MPLS is emerging as a flexible technology that can transport voice,. IPV4 , IPV6 layer 2 services and even PDH and SDH/SONET circuit over a single packet infrastructure in a new attempt to solve the old problem of new network convergence. MPLS traffic emerging QOS support and fast restoration capabilities can be used to provide each service with strict service level arguments in a cost efficient way several standardization and industry organization are contributing to this goal.
Keywords: Congestion Control, MPLS

1. Introduction

MPLS switches using cell or frame traffic with MPLS control protocols. Internetworking gateways for adapting and internetworking a variety of services for transport over an MPLS network. A method for mapping TDM traffic on to MPLS. Definition of protocols data units and procedure for carrying over payload between internetworking nodes. Exchanging alarm indicates between internetworking nodes and MPLS is packet loss monitoring. MPLS core network containing of routers and to provide edge devices providing network internetworking functions between TDM and MPLS. TDM devices connected via framed or unframed TDM interfaces.

For security purposes the sequence number shall be set to a pseudo random value for the first packet transmitted on the PW associated with the MPLS service. For each MPLS frame sent over a given PW the corresponding CB's sequence number shall be incremented by 1 modulo 2 when RTP is used its sequence number shall be set to a value i.e. identical to the sequential number in the control world. APT value can be allowed and allocated from the range of dynamic values for each direction of PW. The ingress PW shall set the PT field in the RTP header to its allocated value. There values are generated accordance with the rules established. The clock frequency used for generating time stamp should be an integer multiple of 8 kHz.

It processes the length and sequence number of fields. It processes the AAL1 header field of each PDU and generates the TDM traffic towards the TDM interface. The expected sequence number is considered to be unknown until the first PDU has been received from the MPLS network. The first PDU received from the MPLS network is always considered in order to expected sequence number is set to the value of contained in that first packet. If the received sequence number is equal to or greater than the expected sequence number in a cyclic sense then the frame content is placed into a payout buffer and the expected sequence number is incremented by 1 modulo 2. Otherwise the received frame is dropped the expected sequence number is left unchanged.

2. Related works

The method used to assign and distribute labels in the network label values may be configured may be network administration or may be assigned automatically in different ways. Coupled with normal routing procedures in the network. Alternatively label may be assigned by exchange signaling messages from node to node along a particular route. Similarly to a connection establishment in an ATM network. The chosen route may have been selected by a constraint based on routing algorithm taking into account the capacity required to serve a particular Traffic flow.

Integrated QOS based transport capabilities suitable for the range of connection oriented and connectionless voice data and multimedia services associated with 3G scenario. Generic mobility management capabilities including location management and handoff with performance appropriate for voice data multimedia services. Flexible architecture capable of supporting a mix of radio access technologies without requiring separate overlay networks in each case. Scalability in both the case of address space and cost performance necessary to support the fast growth in mobile services. Architectural alignment with future broadband networks so as to provide seamless services to user with a mix of fixed and wireless service requirements.

The poor match between the virtual and physical topologies. The complexity and difficulty in optimization routing and path establishment. Balancing traffic on the basis of long time span as per the experience of the traffic. On the basis of time taken by the solution to resolve the congestion. Preventive policy tries to prevent

congestion by future estimation on the traffic. On the other hand reactive policies on sensing the congestion entry to reduce it. Supply side policies alter the supply of the resources to minimize the congestion.

3. Simulation results

A non linear length function is a pre requisite for exactness. When the link weight is positively correlated a linear approach may give a high success rate in flinging feasible path but under different circumstances the returned path may violate the constant by 100%. Routing with multiple constraints may require that multiple path be stored at a node necessitating a shortest path functioning. Reducing the search space is always derivable as it reduces the execution time of an algorithm. The non dominance principle is a strong search space reducing technique especially when the number of constraints themselves if strict also provides a search space reduction since many sub paths will violate those constraints. First calculating a path in polynomial time between the source and destination and then using this information to find a feasible path between the same source and destination is especially useful when graph becomes hard to solve. Our algorithm is more accurate than the algorithm by Li. This is clearly shown in the graph and diagrams. According to the related works which is discussed about the traditional queuing technique and active queue technique we have faced some bugs which are not tolerable so we have no proposed an explicit congestion notification mechanism with the existing system to overcome other obstacles.

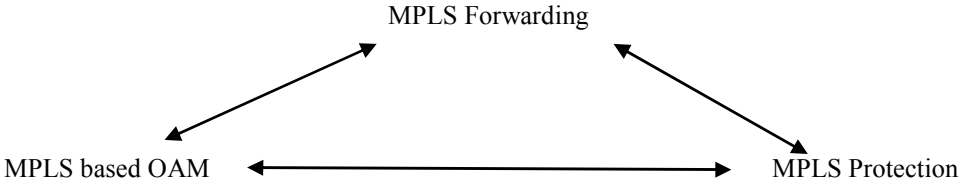
The expectation is that for scenario one where low congestion and low failure is present shortest route will perform well. If the analysis supports these expectations it will contribute to overall contributions and validation of confidence in the modules. As we move to the scenarios the present algorithm with its adaptive capabilities should show superiority and to validate effectiveness of the CLR estimation algorithm for a variety of traffic resources. Evaluate the accuracy of the CLR estimation algorithm compared to other algorithm in the literature. Our algorithm requires much less monitoring period. In our algorithm only are valid CLR observations of the virtual buffer is sufficient in order to generate a CLR estimate. In the algorithm by Li a number of CLR observation of the virtual buffer have to be made in order to generate a CLR estimate of the real buffer.

Algorithm 1:
For k = (k to l)then step 1
L(f) = n(f,l(f), kl(f))
N (f,j,k) = l(f0
End

Algorithm 2:
While ()
Algorithm (f, j, k)
If (l (f) > desired l (f)
Exit
Else k = k+1
End

Algorithm 3:
If buffer of destination then
Go to stop
Else
{
If destination = threshold
Then destination events
Goto check
Else
Destination feedback
Goto start
}
Stop

Figure 1: MPLS process



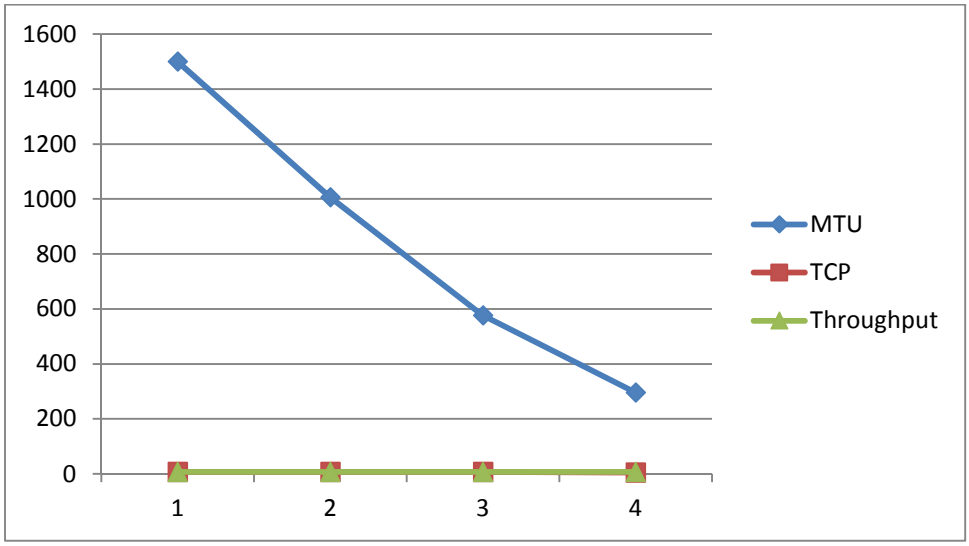
4. Performance results

Efficient use of resources and bandwidth for backup VC is only put to use only when necessary after the resolution of the congestion situation backup VC can be detected which means the corresponding resources will not be wasted. Complementary to another congestion control techniques the proposed technique should not replace existing congestion control techniques it should be looked out as a network operations and management technique to be used in specific situation where it is possible to use alternate path and when it is important to assure certain QOS levels. Simplicity mechanism is simple and does not require special protocols and / or complex control mechanisms explained in the figure 1.

This paper has proposed a method for service providers to provide PWE3 services over MPLS PSN with minimum additions and modifications to their existing infrastructure. This scheme provides a cost effective way to improve the transport efficiency of the PWE3 service at the same time reduces the load on the core and edge routers of the MPLS PSN. The signaling delays on an entity are roughly the processing delay for setup and connect messages. GSMP delay is the delay of adding a connection path on the switch through GSMP protocol running on the switch controller. If the ATM signaling waits for the acknowledgement of each GSMP request call its asynchronous GSMP operation. In this case the GSMP delay is negotiable. The route delay is the processing time on the COS for the re routing the old path to the new path mentioned in the tables 1-4.. It is roughly same as the sum of the processing time for setup and cannot. The accept delay is the processing time for a cell acceptance procedure in the server on the CT since the procedure goes to the kernel and then to the user space on the CT the delay is expected to the relatively large.

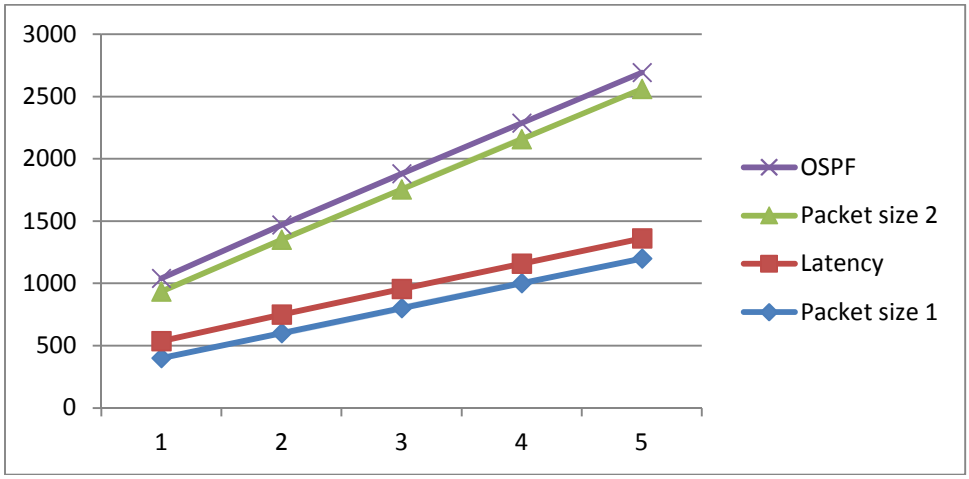
Throughput table - 1

MTU	TCP	Throughput
1500	7.4	7.4
1006	7.1	7.4
576	6.5	7.08
296	5	6.7



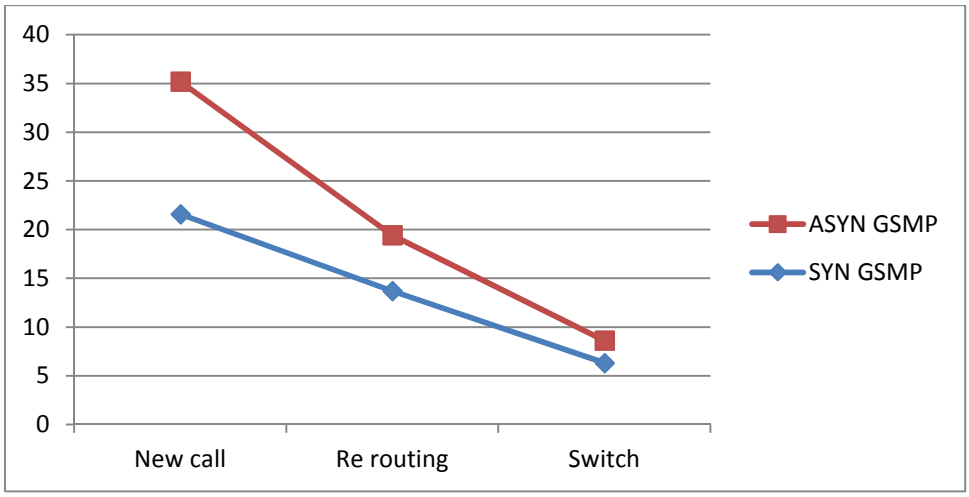
MPLS table-2

Packet size 1	400	600	800	1000	1200
Latency	135	150	155	158	160
Packet size 2	400	600	800	1000	1200
OSPF	105	120	125	129	132



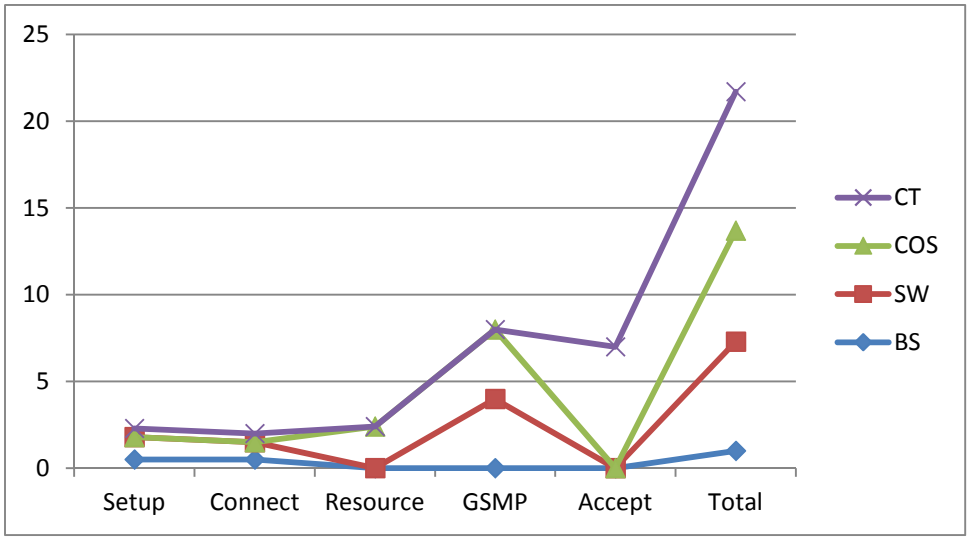
Path rerouting table - 3

Delay	SYN GSMP	ASYN GSMP
New call	21.6	13.6
Re routing	13.7	5.7
Switch	6.3	2.3



Signaling Table- 4

Device	Setup	Connect	Resource	GSMP	Accept	Total
BS	0.5	0.5	0	0	0	1
SW	1.3	1	0	4	0	6.3
COS	0	0	2.4	4	0	6.4
CT	0.5	0.5	0	0	7	8



Conclusion

Device an adaptive multipath protocols for packet switching networks such as IP based ATM networks. Incorporate ATM routing [3] with multipath routing [5] and external frame work to consider reliability and fault tolerant issues. We survey the state of the art in real time routing protocols and algorithm for WATM highlight the advantages and performances issue of each routing protocols al algorithm then classify the protocols. Finally we pinpoint future research directions in this regard. In addition the paper control with classification of each recent realtime routing protocols and discusses open research issue. Efficiency is necessary to remove a small number of signals for the VP congestion to go down and to satisfy values. Rapid response time the backup VC are established before congestion is installed the response time to congestion situation can be very short and low overhead of this techniques to impose a minimal overhead in terms of bandwidth and in terms of additional control messages.

Acronyms

CBID – CCIRCUIT BUNDLE IDENTIFIER
CPCS – COMMON PART CONVERGENCE SUB LAYER
EFCI – EXPLICIT FORWARD CONGESTION INDICATION
ELSP – EXPRESSION INFERRED LABEL SWITCH PATH
ILMI – INTEGRATED LINK MANAGEMENT INTERFACE
LLSP – LABEL INFERRED LABEL SWITCH PATH
BRAS – BROADBAND REMOTE ACCESS SERVER
NAVT – NET ACT UNIFIED TRANSPORT
OPEX – OPERATIONAL EXPENDITURE
PWE3 – PSEUDO WIRE EDGE TO EDGE EMULATION
VRRP – VIRTUAL ROUTER REDUNDANCY PROTOCOL
ESMC – ETHERNET SYNCHRONIZATION MESSAGE CHANNEL
VCCV – VIRTUAL CIRCUIT CONNECTIVITY VERIFICATION

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