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Performance Management Tool and Intelligent Classical IP and ARP over Efficient Support in ATM Networks

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Abstract
This article describes mathematical programming model that have been developed to evaluate configuration strategies for metropolitan ATM telecommunications networks. The model determines the optimal placement of ATM switch hardware and fiber optic transport. The objective is to specify point to point traffic demand at minimum cost while ensuring specified performance under a core failure contingency. Model result suggests that a simple architecture based on 2 core switch location provides a robust near optimal solution.
Keywords: Network Design, Performance Management, Tabu Search, Passive Optical Network

Introduction

A powerful interactive GUI through which the user can enter complete network information and view the performance result end to end connection or individual network elements. The system database in which complete information about network configuration connectivity traffic and QOS structure is maintained. Performance evaluation software that includes analytical mode for the next traffic and frame relay ATM switches used in the ATM network. The rate are also algorithm for routing optimization and for an expert system decision support sub module which can assist in new planning and fault analysis. The algorithm uses the performance result of the modeling.

The homogenous set of sources set of sources approximate the traffic at each input line of a state with a separate buffer using the statistical matching method. The additional peak line rate constraint is applied if necessary. If the input of a stage with a shared buffer for all lines the first step is used for each input line for which the peak line rate constraint applies. Then the homogenous mix of sources on all of the input lines is approximated by an overall set of homogenous sources.

A low bandwidth and low power Omni directional network for location determination switch coordination and management. A cellular like system for multiple end user access to the switch using directional antennas. A high capacity highly directional multiple beam network for switch to switch communication. Mobile terminals the end user equipment which are basically ATM terminals with a radio adapter card for the air interface. Access points the base station of the cellular environments which the MT access to connect to the reset of the network. An ATM switches to support interconnection with the rest of the ATM network. A control system attached to the ATM switch containing ability and specific software to support mobility related operations such as handover which are not supported by the ATM switch. A low bandwidth low power Omni directional network for location dissemination switches coordination management which is the order wise network. A cellular system for multiple end to end user access to the switch using directional antennas for spatial reuse and a high capacity and highly directional multiple beam network for switch to switch communication.

Related Works

Interactive services, Conventional services like Video Conferencing, Video Telephony, Telemedicine and Distance Learning > Message services i.e. compound document and video mail. Retrieval services like document retrieval, Video text, and Electronic magazine. Distributive services, Broad cast TV and Video on demand. Successive capacity relocation redistributes capacity on a fixed VPC topology. Successive topology reallocation establishes AND/OR tears down VPC within an existing VPC topology. Global reconfiguration consists of both global topology reconfigurations. This activity potentially affects all VPC in the network. Long term planning derives a static set of VPC and initial or minimum capacity assignments for them.

Low VC setup complexity is important as it substantially reduces various OH of connection management. The setup complexity is proportional to the number of nodes in the VC in which the VCI is examined since these nodes are the intervention of software is needed. For this reason the number of VPS used for a routing VC should be small. The chosen route for a VC must also be short in terms of the number of physical link it uses or better in terms of propagation delay to efficiency utilize the communication network. The number of occupied entries in the VP routing tables implemented by the layout should be low enough at any location in the network.

The rerouting layout must overcome link disconnection with a low recovery OH. This is achieved by reducing the number of VP that share any link so that if a link is disconnected the number of VPS that need to be

rerouted in order to bypass the faulty link will be small. Capacity relocation redistributes capacity on a fixed VP topology. Topology reconfiguration establishes and tears down VP within an existing VP topology. Global reconfiguration consists of both global capacity reallocation and global topology reconfiguration. The activity penalty affects all VPS in the network. Long term planning derives and static or general set of VPS and initial or minimum capacity assignments for them.

Simulation results

The level of understanding the problem, the problem should be well defined and manageable. A clear understanding of problem is essential before a simulation model can be developed. It is a permanent that the model correctly simulates the problem. A software model may be often be systematically correct but might not actually simulate the problem area being addressed.. It is essential that the model being designed and simulated in such a way that allow various experiments to be carried out and an appropriate simulation results to be generated. The simulation model simply produces output data. This data must be manipulated and interpreted by the developer. The correct interpretation of this data is independent on the usefulness of the output data and also the user understanding of statistical methods. OPNET is object oriented where each object has a defined set of attributes. These configurable attributes result in a highly flexible development environment.

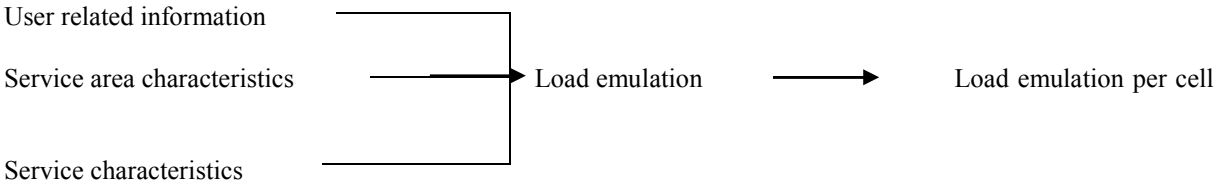


Figure 1: Load Evaluation Process

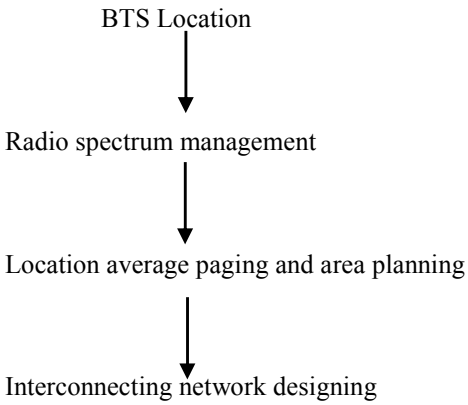


Figure 2 : Over all access segment design

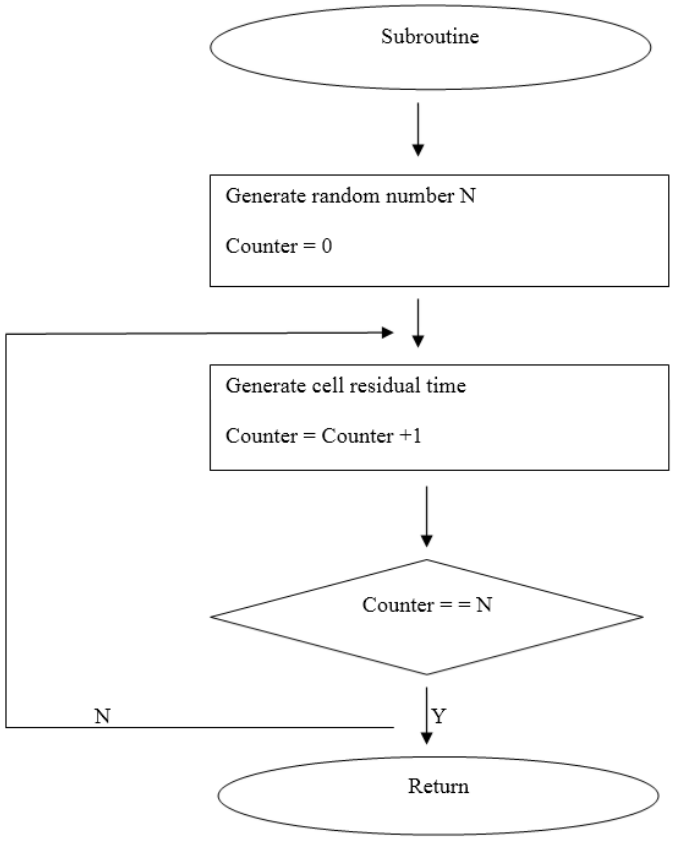


Fig 3: Generation of Total Time

Hierarchical modeling performed in a hierarchical approach to describe any communication network. Each level of the hierarchy to describe different aspect of the model being simulated. Models at the higher level to use model developed at one level to use model developed at one level lower of the hierarchy. This leads to a highly flexible simulation environment where generic models can be developed and it help to increase the responsibility and expandability. As a planning tool a new planner can run the simulator with various network configurations and traffic load to obtain statistics such as utilization of network link and throughput rate of virtual circuits. As a protocol analysis tool a researcher or protocol designer could study the total system effect of a particular protocol.

All sources are assigned to be identical with respect to their equipment. In other words feature such as interface cards link delays and bandwidth is unique for the type of environment unless specified. The sources are file server based on an on/off model with a null off period. This type of sources is more realistic than the infinite sources model with respect to common applications using TCP/IP. The queue flat model the switches buffer has a unique size which is fixed at 16000 cells. The reason for this choice is easier comparisons can be made between the three discard methods regardless of buffer resources. The choice of 16000 reflects fairly well what is implemented in most of today's ATM switches.

TCP timer granularities values have been chosen in order to fit with modern TCP implementations i.e. 200MB for the slow time out granularity and 50MS for the first time out granularity. The maximum distance from OLT and ONU is 10KM. The optical splitting ratio is 1:16 downstream speed and Upstream speed are 155.52 MBPS. Signal path subsystem is consist of the like interface equipment. The ATM switch fabric and the optical cell constructor Con troll processing subsystem this provides alarm status maintaining testing devices maintenance interfaces and OS interfaces. Guarantee of QOS in the backbone ATM switch. Reduction of buffer space in the VS/VD switch. An ER-calculation specified in which CCR can be used. Improving link utilization improvements in terminal throughput and a VP is a logical direct link between 2 nodes and accommodates a number of VC simultaneously.

A predefined route is defined for each VP in the physical facilities network. Each VP has a bandwidth in other words capacity which defines the upper limit for the total VC bandwidth carried by it. VP are switched on physical transmission links in a cell multiplexing manner. If a rate is available with sufficient capacity to accept to new VC setup cost is relatively low since designs are made exclusively by the CAC and routing algorithm. If a VP route exists but does not have adequate capacity to accommodate the new VC then the only way to avoid cell blocking is to allocate additional capacity to the set of VP along the route. Finally if no VP route is found from source to destination then the only way to avoid call blocking is by setting up a new VP or set of VPS.

Data engine the original data set drop input/output files. Parse engine extract information from the body of data and generate data structure used by visualization engine. Visualization engine provides a visualization functions in user interface and graphical views. Simply to add custom and C++ functions to a TCL inverter system. Allows TCL conditions to directly manipulate invertor's objects and short development life cycle. The mobile host which includes and keep the handoff process. It also incorporates a procedure to discard cells and playbacks image and a handoff performance control of the handoff. The handoff process receives from the server through the ATM network and synchronization mechanism with the server. The server sends the data through the network act jointly with the base station to synchronize the transmission.

Table 1 : Definition of communities

Number of Nodes	Number of Groups	Number of Members
8	2	4
16	2	8
32	2	16
64	2	32

Graph 1 : Definition of communities

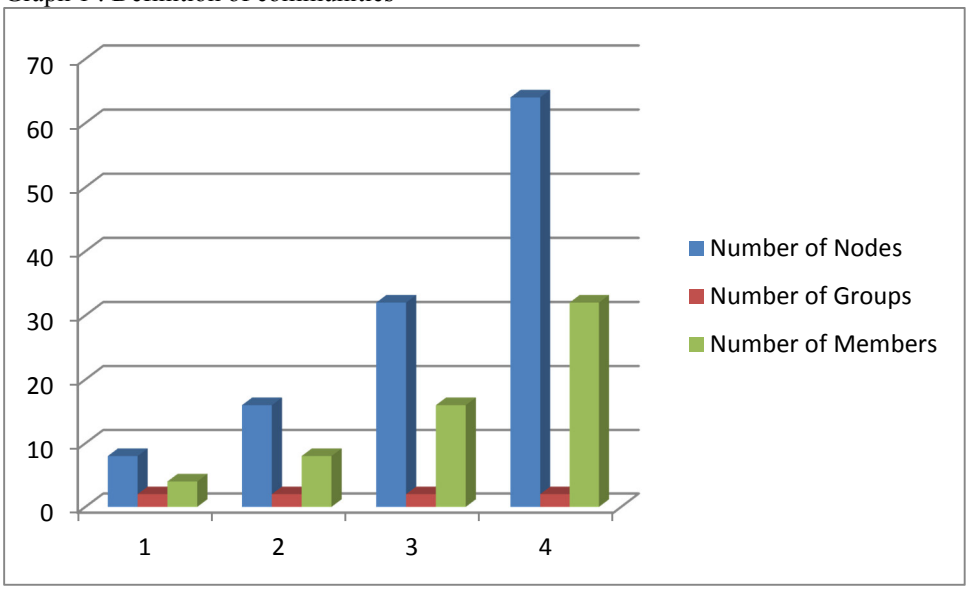


Table 2: Centralized Traffic

Feasible Solutions	Number of Nodes	Number of Centre
0.968	8	1
1.991	16	2
4.192	32	4
6.128	64	8

Graph 2: Centralized Traffic

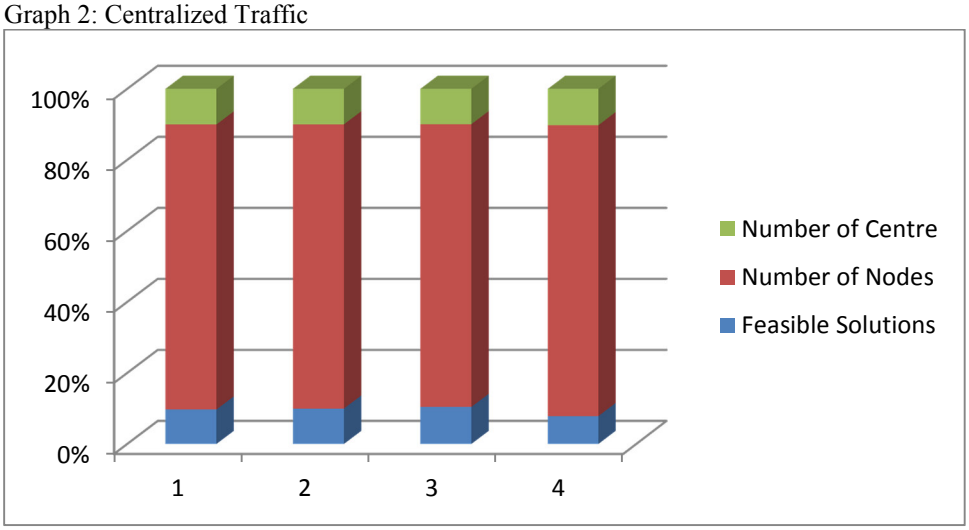


Table 3: Number of Links

Alg Results	Heuristic Alg.	Idle Routing Alg.	Random Soln.
Best Result	0.493	0.553	0.644
Avg. Result	0.493	0.751	0.913
Worst Result	0.491	0.99	0.97

Graph 3: Number of Links

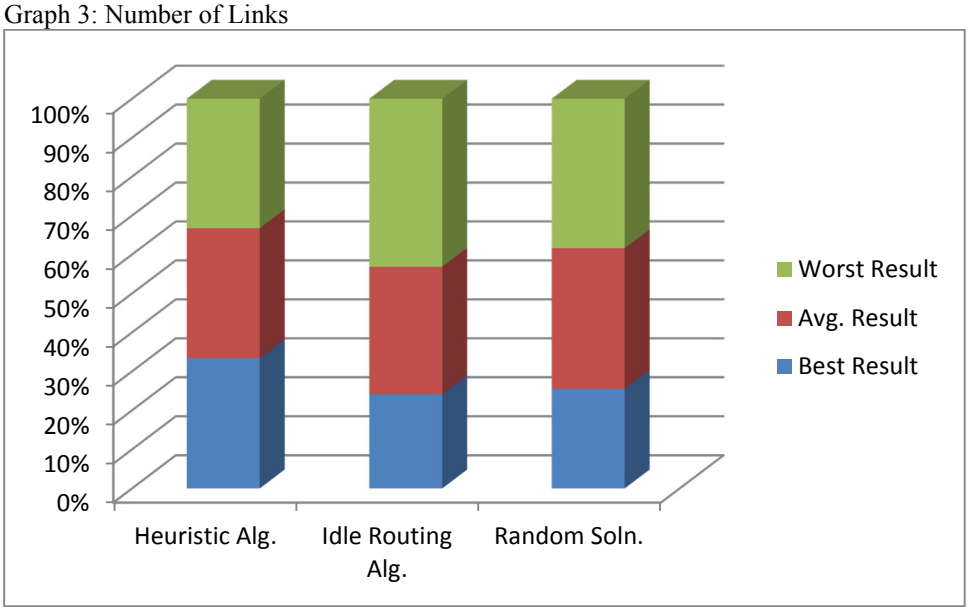


Table 4: Comparison of solutions

Network size	Sparse Network	Connected network
8	27	56
16	117	211
32	487	991
64	1991	4029

Graph 4: Comparison of solutions

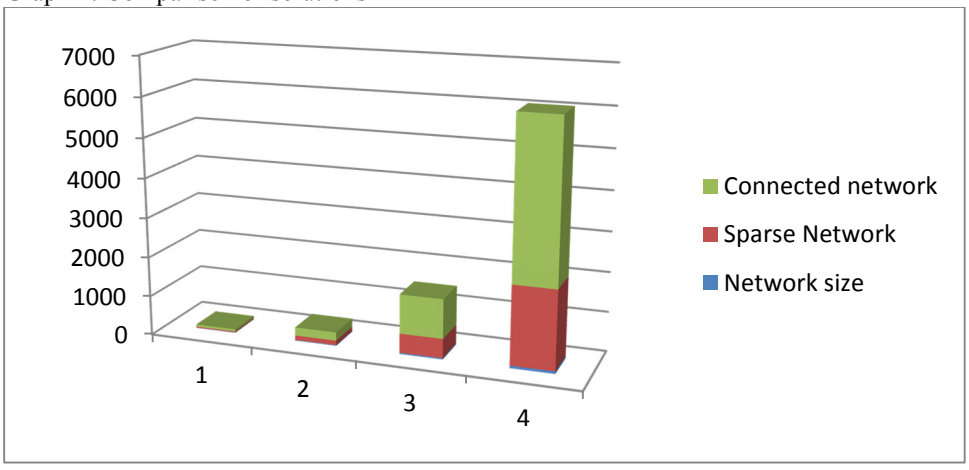


Table 5: ATM Switch Operation

I/P port	I/P VP/VCI	O/P Port	O/P VPI/VCI
1	29	2	45
2	44	1	28
1	63	3	29
3	29	1	65

Graph 5: ATM Switch Operation

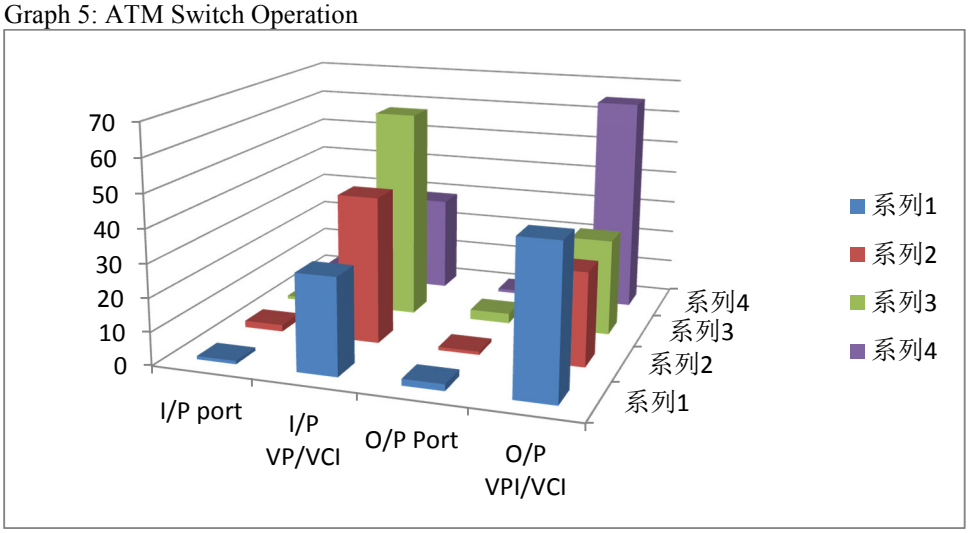


Table 6: Type of distributions

Path	A	B	C	D	E
1	100	100	100	100	100
2	100	79	51	9	8
3	100	59	26	2	9
4	100	39	13	0	9
5	100	20	5	0	9

Graph 6: Type of distributions

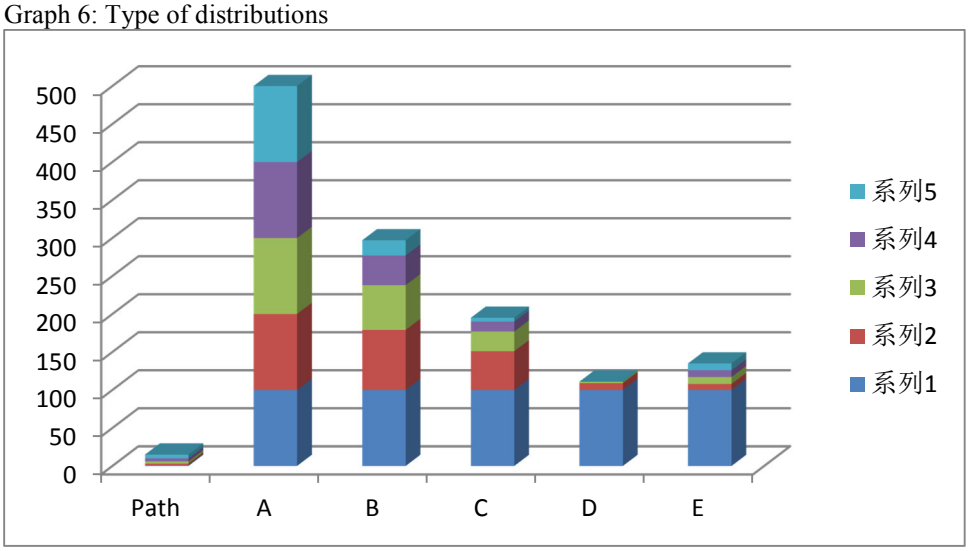


Table 7 : Routing Comparison

R	Free capacity	Indicator vector	Route wt.
R1	36	0,1	1
R2	38	0,0	2
R3	40	0,0	1
R4	39	1,1	2

Graph 7 : Routing Comparison

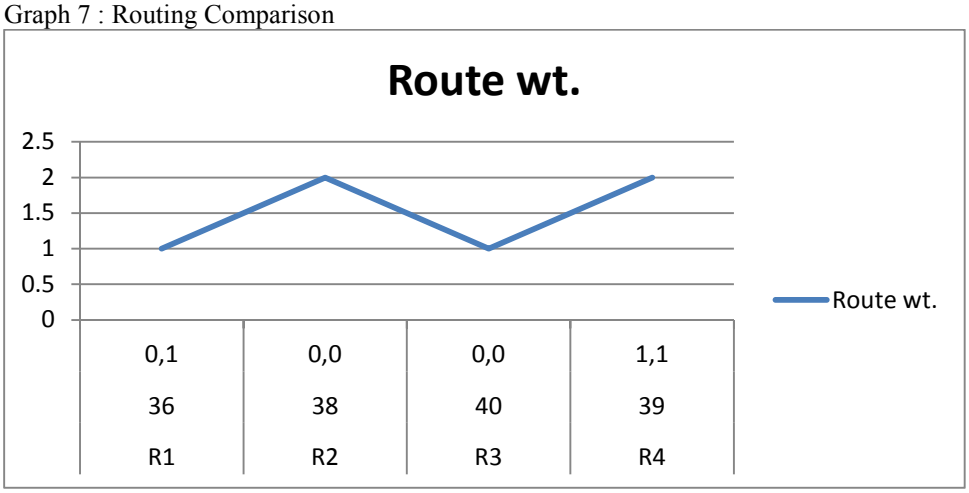
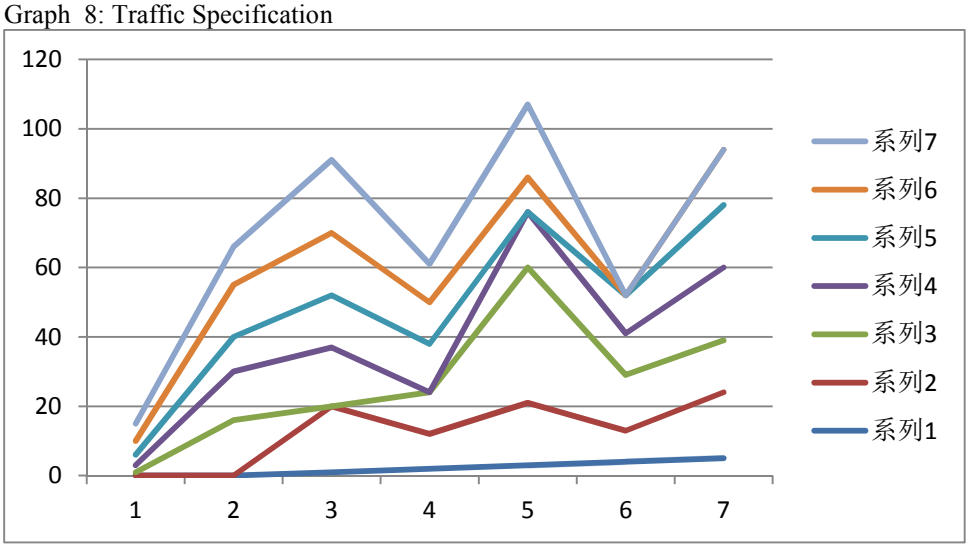


Table 8: Traffic Specification

ATM Nodes	0	1	2	3	4	5
0	0	19	10	18	9	19
1	16	0	12	39	16	15
2	14	17	0	16	12	21
3	10	15	14	0	11	18
4	15	18	12	10	0	16
5	11	21	11	21	0	0

Graph 8: Traffic Specification



Probability = Call received – (Total Message Received- Total cost) / Total Calls Received

Conclusion

The trade off for the hello internal effect at the amount of data sent to maintain like information and responsiveness to discover fairness. An increase in the hello internal decreases the amount of data but increases in the time to discover failure. Processing time utilization the nodes for packet and links delays effect network stability times but do not affect the amount of data needed to reach stability. Using a hierarchical network configuration reduces the amount of data and time required to reach network stability and maintainability.

Abbreviation

REGCAN-REGISTRATION CANCEL
REGNOT-REGISTRATION NOTIFICATION
CDVT-CELL DELAY VARIATION TOLERENCE
GCRA-GENERIC CELL RATE ALGORITHM
SECBR-SEVERELY ERRORED CELL BLOCK RATIO
CCITT-INTERNATIONAL TELEGRAPH AND TELEPHONE CONSULTATIVE COMMITTEE

CPCS-COMMON PORT CONVERGENCE SUBLAYER
LATM-LOCAL AREA NETWORK ATM
PARC-PALO ALTO RESEARCH CENTER
ROLC-ROUTING OVER LARGE CLOUDS
WATM-WIDE AREA NETWORK ATM

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