

Evaluation of Processor Power of Proposed MALN

Amardeep Gupta
Head, Department of Computer Sc and IT
DAV College, Amritsar

Introduction: In this paper Modified Alpha Network has been compared with the existing Four Tree Network on the basis of Processor Power Performance Parameter.

Keywords: MALN, ALN, FT, Performance Parameters, Probability of Request Generation, Processor Utilization, Processor Power, Throughput and cost

Processor Utilization

The parameters like Processor Utilization, Processor Power, Throughput and cost of Proposed MIN MALN have been calculated and compared with existing MINs like MALN and Four Tree.

Table 1 shows the compared values of Processor Utilization of MALN, ALN and FT

Table 1 Processor Utilization (PU) comparison of MALN, ALN and FT

$\begin{matrix} \text{PU} \\ \text{P}_{\text{req_gen}} \end{matrix}$	MALN	ALN	FT
0.1	0.2636	0.1749	0.2142
0.2	0.2442	0.1499	0.1898
0.3	0.2273	0.1316	0.1794
0.4	0.2123	0.1175	0.1697
0.5	0.1990	0.1065	0.1609
0.6	0.1871	0.0975	0.1528
0.7	0.1763	0.0902	0.1452
0.8	0.1665	0.0840	0.1383

0.9	0.1576	0.0786	0.1318
1.0	0.1494	0.0740	0.1145

Table 2 shows the compared values of Processing Power of MALN, ALN and FT

Table 2 : Processor Power (PP)comparison of MALN, ALN and FT

PP P_{req_gen}	MALN	ALN	FT
0.1	4.2171	2.7948	3.4272
0.2	3.9071	2.3984	3.0368
0.3	3.6362	2.1056	2.8704
0.4	3.3964	1.8800	2.7152
0.5	3.1834	1.7040	2.5744
0.6	2.9929	1.5600	2.4448
0.7	2.8208	1.4432	2.3232
0.8	2.6646	1.3440	2.2128
0.9	2.5219	1.2576	2.1088
1.0	2.3911	1.1840	1.832

Table 3 shows the compared values of Throughput of MALN, ALN and FT

Table 3: Throughput comparison of MALN, ALN and FT

Throughput		MALN	ALN	FT
Processor Utilization	P_{req_gen}			
	0.1	0.0264	0.0175	0.0214
	0.2	0.0488	0.0299	0.0379
	0.3	0.0682	0.0394	0.0538
	0.4	0.0849	0.0470	0.0678
	0.5	0.0995	0.0532	0.0804
	0.6	0.1122	0.0585	0.0916
	0.7	0.1234	0.0631	0.1016
	0.8	0.1332	0.0672	0.1106
	0.9	0.1419	0.0707	0.1186
	1.0	0.1494	0.0740	0.1145

Fig 1:

Comparison of Processor Utilization of MALN, ALN and FT

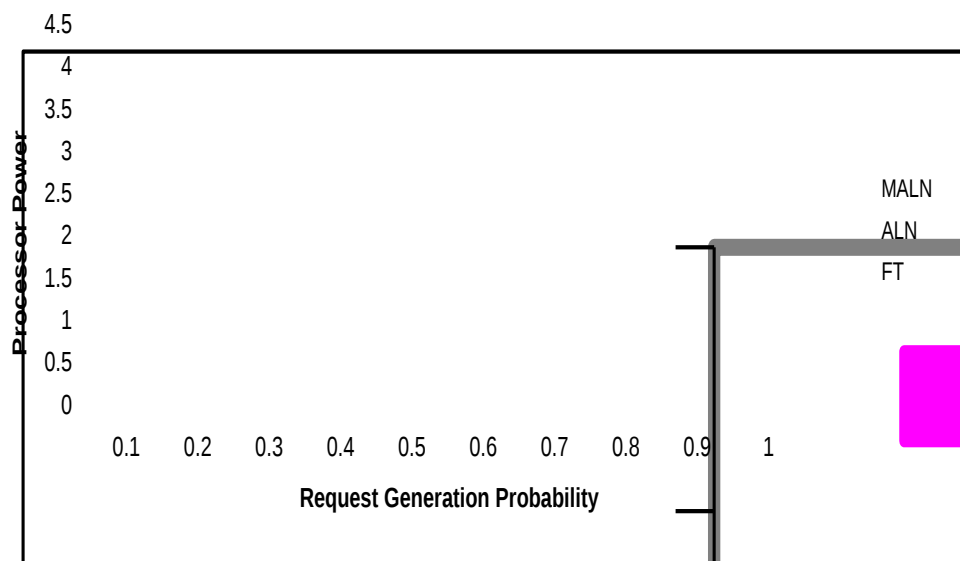


Fig 2: Comparison of Processor Power of MALN, ALNand FT

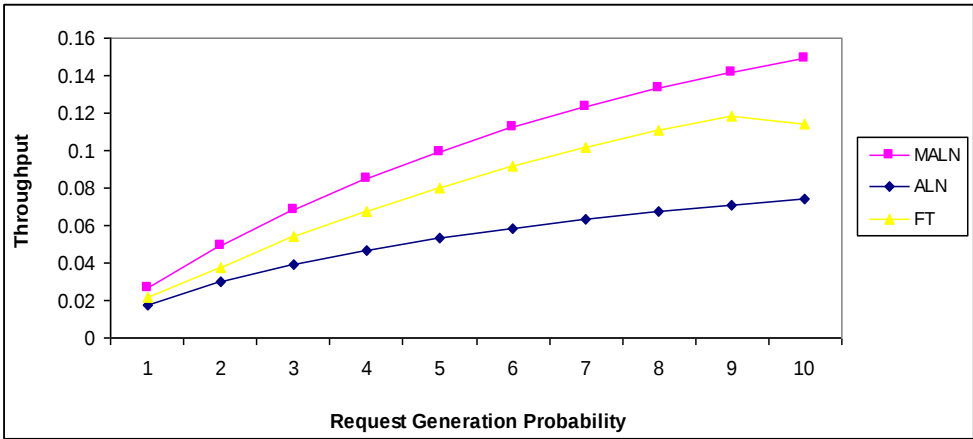


Fig 3: Comparison of Throughput of MALN, ALN and FT

Table 4: Comparison of the cost units of MALN, ALN and FT			
Size of Network In log ₂ N	MALN	ALN	FT
4	240	276	258
6	1176	1212	1194
8	4920	4956	4938
10	19896	19932	19914

Fig 4 shows the plotted values from Table 4.

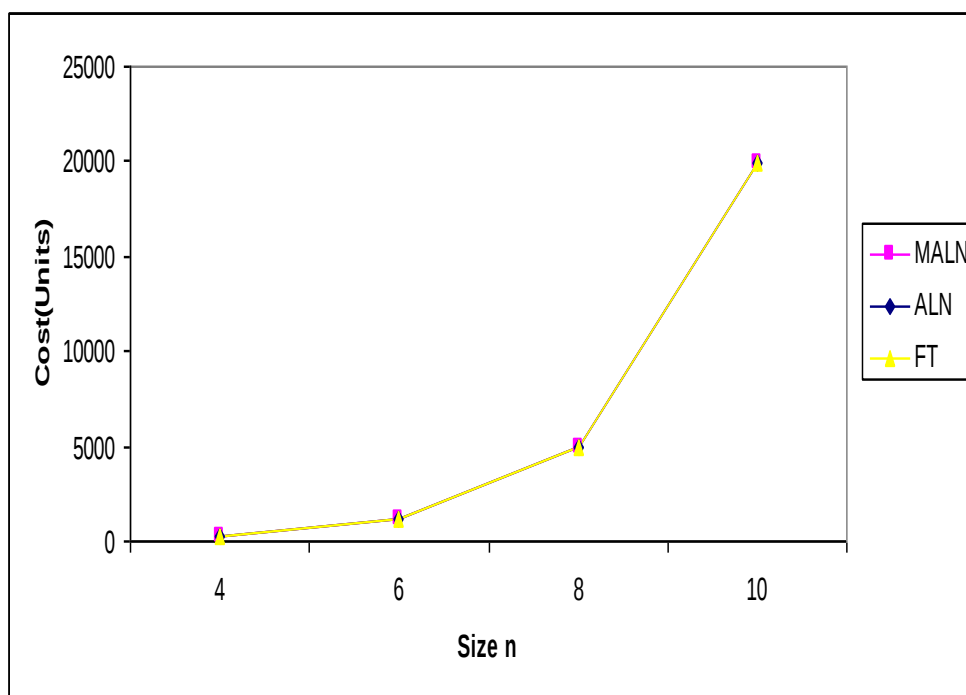


Fig 4: Cost comparison of MALN, ALN and FT

Conclusion

In the proposed Network more number of SEs are active for the transfer of packets. That is why, the proposed Network has improved PU and PP which has been depicted in Fig 1 and Fig 2. As in proposed Network, more number of packets are received at the destination in unit cycles as compared to existing ALN and FT MINs, Throughput is improved in the MALN. Fig 3 exhibits this comparison. Because of the lesser number of SEs are used in the proposed MIN, as compared to existing MINs i.e. ALN and FT, the cost of all sizes of proposed MIN is less as compared to the other two networks.

Fig 4 shows, that the proposed Network MALN, is cost effective than existing ALN and FT.

References

1. Bansal P. K., Singh Kuldeep, and Joshi R. C., 1991, "Reliability and Performance Analysis of a Modular Network", *Journal of Microelectronics and Reliability*, **33** (4), pp. 529-534.
2. Patel, J. H., October 1981, "Performance of Processor-Memory Interconnections for Multiprocessors", *IEEE Transactions on Computers*, **C-30** (10), pp. 771-780.
3. Reddy S. M. and Kumar V. P., August 1984, "Fault-Tolerant Multistage Interconnection Networks", *Proceedings 5th International Conference on Parallel Processing*, pp. 155-164.
4. Sengupta J., June 2001, "On Fault-Tolerant MINs for Multiprocessor Systems", A Ph.d Dissertation, Department of Computer Science and Engineering, TIET, Patiala.
5. Siegel H. J., 1985, "*Interconnection Networks for Large Scale Parallel Processing: Theory and Case Studies*", Lexington, M.A.: Lexington Books.