A Comparative Study of Interconnection Network

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Abstract

The topology of interconnection networks stage a key role in the performance of all general purpose networking applications. Cube-based architectures are one of the most important interconnection networks that focuses upon the evaluation and applications of cube-based networks. Cube-based architectures have received greatly focus over the past decade since they propose a wealthy interconnected structure with a number of attractive properties such as low diameter, high bisection width, smaller complexity and Cost. However, the major drawback of cube-based architectures is the difficulty of its VLSI layout. In Parallel computer, the hypercube network has been broadly used as the interconnection network. However, the number of communication links for each node is a logarithmic function of the total number of nodes in hypercubes. Therefore, the hypercube is not a superior applicant for an interconnection network for a extremely large parallel computer that might contain hundreds of thousands of nodes due to IC technology and port number restrictions. In this paper a variety of interconnection network based on the cube-based networks is brief discussed along with their properties. X-torus topology has better properties in terms of diameter, average latency,
throughput, and path diversity. Although some more links are added in xtorus, the number of links is of the same order of magnitude with that of mesh, xmesh, and torus. It also takes advantage of increasing higher levels of VLSI process. The comparative study suggests the methods to overcome the above restrictions besides having attractive properties.

References

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**Index Terms**

Computer Science  
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**Keywords**

Performance evaluation, Diameter, Average node distance, Message Traffic density