一种具有路径多样性的自适应 3DNoC 路由算法

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摘　要：针对当前三维片上网络（3DNoC）路由算法中路径单一且不能适应性调节负载而引起的网络性能受限的问题，本文提出一种具有路径多样性特征的自适应路由算法.首先，对现有的路由算法进行分析，总结出最优路由路径范围并对路由策略进行建模，使得数据包能够以最短路径路由到目的 IP.随后，对三维片上网络路由器的负载进行分析，得到不同位置路由器负载的规律.最后根据路由器负载态势对路由策略模型进行优化，使网络在路径多样化条件下降低网络拥塞.实验结果表明，在各种网络负载情况下时，该算法大幅提高吐量，并能降低数据包延时.随着网络负载的提高，该算法依然具有优势.

关键词：三维片上网络；路径多样性；自适应；路由算法

A Path-Diversity Routing Algorithm with Adaptive Strategy for 3D Network-on-Chip

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Abstract： The previous routing algorithm in three-dimensional network-on-chip(3D NoC) without load adjust adaptability and path diversity will degrades performance. Aiming at this problem, this paper propose a path-diversity routing algorithm with load adjust strategy. Firstly, analysing existed routing algorithm, summarize the range of optimal path and build the model of routing strategy, for data packets can be routed to the destination IP with the shortest path; Then, analysis the load of three-dimensional network-on-chip and find the law of router load in different positions. Finally, according to the router load situation, the routing strategy model is optimized to reduce the network congestion under diversified path conditions. Experimental results show that the proposed algorithm has higher throughput rate and lower latency in average than other algorithm when the network load is low. with the increasesment of load, the present algorithm still has advantages.

Key words：three-dimensional network-on-chip; path diversity; adaptability; routing algotithm

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