عنوان مقاله:

Network-level Exploration of an Intelligent Port Controller for Network-on-Chip

محل انتشار:

نویسنده:

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خلاصه مقاله:

Network-on-Chip (NoC) is the communication backbone in the domain of multi-core systems. Wormhole switching is the most commonly used flow control algorithm in NoC. However, as the workload is increased in the NoC, wormhole flow control causes head-of-line blocking which results in contention for the physical channel. This issue can be resolved by using virtual channels (VCs). Since VCs consume most of energy of NoC-based architectures, employing power consumption management techniques for VCs is essential. In this paper, we propose an intelligent port controller which monitors the activity of virtual channels in order to manage power consumption of the router; consequently, the power consumption of the whole NoC is considerably decreased. The proposed architecture dynamically allocates free VCs to input ports according to the traffic conditions, hence, it causes efficient utilization of NoC resources, considerable reduction of power consumption and increment of throughput, with a moderate low area overhead, compared with the traditional NoC port controller

کلمات کلیدی:

Dynamic network-on-chip, Intelligent port controller, Low-power design, Virtual channels

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https://civilica.com/doc/883869