TECHNOLOGY

Distributed Row-Column Decoding For A One-Sided Mesh Switch

OVERVIEW

Background:
One-sided crossbar fabric is well-suited to interconnecting active ports such as line cards in network routers and peripheral devices in computer systems where ports serve both as inputs and outputs. Its simple topology and straightforward routing makes it more attractive for network-on-chip and system-on-chip designs compared to other non-blocking fabrics such as one-sided crossbar switches. However, the direct realization of an n-port one-sided crossbar results in a fan-in and fan-out of n – 1 per port.

Innovation:
Researchers at the University of Maryland have designed distributed row-column decoding algorithm to realize unicast and multicast assignments on one-sided mesh switches. The fan-in and fan-out problem of one-sided crossbar fabric can be alleviated by distributing the direct links between the ports to the switches. While this does not increase the complexity of the switch, the transformation increases the path-length. A distributed row-decoding algorithm that can be run locally within the switches is introduced to maintain a high throughput over a mesh switch and produce a streaming routing process.

APPLICATIONS

Circuit and packet switching
On-chip network routers
Multicore computer chips

ADVANTAGES

Congestion-free packet unicast and multicast switching
Potential for faster networks and routers
Lower cost network servers and routers

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CATEGORIES

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- Power Electronics
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EXTERNAL RESOURCES

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