

Congestion Control System for Computer Systems

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- Computer Technology

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- Computer Technology
- Data Centers
- Protocols

Data centers share information dictated by network protocols, and in order to operate efficiently, these protocols must access information quickly on a large scale. However, the two leading protocols, Transmission Control Protocol (TCP) and Remote Direct Memory Access (RDMA) both fail in one of those categories: TCP has a high latency due to heavy operating system (OS) involvement in packet processing and RDMA is not plausible on a large scale because of its hop-by-hop flow control.

Researchers at Purdue University have developed a congestion control system with no OS involvement that is applicable to RDMA's hop-by-hop flow control networks. This new design, called receiver-directed rate metering (RDRM), requires change only at the edge nodes and not at the network switches. This allows for the use of commodity network switches, which reduces cost. In addition, all congestion control is achieved by piggy backing a single integer value with existing acknowledgments (ACKs). RDRM allows for the direct communication of the maximum rate at which each sender may communicate, so it may be adopted in either hop-by-hop or end-to-end flow systems.

Advantages:

- No OS involvement
- Only requires change at end nodes
- Use of commodity switches reduces cost

Potential Applications:

- Integration into existing RDMA protocols
- Large data centers
- New network protocols

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