

# **A Separate-Queue Multicast Architecture For High-Speed Routers**

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The progressive integration of traditional communication services (telephony, radio and TV broadcasting, etc.) into the Internet has resulted in a number of challenges, one of them being the need for efficient multicast support by the routers (IP router, ATM switch, Ethernet switch, etc.). The frequently-adopted virtual output queued (VOQ) architecture for unicast traffic doesn't apply directly to multicast traffic, since one multicast packet has more than one destination port. As a result, there are two multicast queue architectures that have been proposed in the literature: FIFO queue and multicast VOQ. The FIFO queue architecture is not efficient because of the HoL problem, and the multicast VOQ architecture is not practical because there are too many states to maintain and no arbitration algorithm has ever been proposed. Our contribution in this paper is to propose a new multicast queue architecture called separate queue (SQ) along with its arbitration algorithm, round robin serving (RRS). A relatively small number of FIFO queues are maintained in each input and each HoL packet can be made ready for transmission. It is shown that our algorithm performs better than the arbitration algorithms for a FIFO queue architecture in terms of delay and throughput. We also propose a way to keep packets from the same flow in sequence and a corresponding hardware implementation method.