

**CODING FOR IMPROVED THROUGHPUT
PERFORMANCE
IN NETWORK SWITCHES**

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ABSTRACT

- Network switches and routers need to serve packet writes and reads at rates that challenge the most advanced memory technologies. As a result, scaling the switching rates is commonly done by parallelizing the packet I/Os using multiple memory units.
- For improved read rates, packets can be coded upon write, thus giving more flexibility at read time to achieve higher utilization of the memory units. This paper presents a detailed study of coded network switches, and in particular, how to design them to maximize the throughput advantages over standard uncoded switches.

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- Toward that objective, the paper contributes a variety of algorithmic and analytical tools to improve and evaluate the throughput performance.
- The most interesting finding of this paper is that the placement of packets in the switch memory is the key to both high performance and algorithmic efficiency. One particular placement policy we call “design placement” is shown to enjoy the best combination of throughput performance and implementation feasibility.

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EXISTING SYSTEM

- Currently the most viable way to scale switching rates is by parallelizing the writing and reading of packets between multiple memory units (MUs) in the switch fabric.
- However, this introduces the problem of memory contention, whereby multiple requested packets need to access the same bandwidth-limited MUs. Our ability to avoid such contention in the write stage is limited, as the reading schedule of packets is not known upon arrival of the packets to the switch.

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PROPOSED SYSTEM

- Full-throughput instances are the most desired operation mode for a switch, because there is no need for queueing unfulfilled packet requests.
- We derive necessary and sufficient conditions for an instance to be full-throughput, and specify placement policies motivated by these conditions.

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HARDWARE REQUIREMENTS

- Processor - Pentium-IV
- Speed - 1.1 Ghz
- RAM - 256MB(min)
- Hard Disk - 20 GB
- Key Board - Standard Windows Keyboard
- Mouse - Two or Three Button Mouse
- Monitor - SVGA

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SOFTWARE REQUIREMENTS

- Tool - Network Simulator-2
- Operating system - LINUX
- Front end - OTCL (Object Oriented Tool Command Language)

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