1990

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September 1990
CMU-CS-90-153

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SIGCOMM '90 Symposium on Communications Architectures and Protocols
Philadelphia, Pennsylvania
September 24–27, 1990

This research was sponsored by the Defense Advanced Research Projects Agency, Information Science and Technology Office, under the title "Research on Parallel Computing," ARPA Order No. 7330, issued by DARPA/CMO under Contract MDA972-90-C-0035.
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Keywords: protocol implementation, high-speed networks

Abstract

We have built a high-speed local-area network called Nectar that uses programmable communication processors as host interfaces. In contrast to most protocol engines, our communication processors have a flexible runtime system that supports multiple transport protocols as well as application-specific activities. In particular, we have implemented the TCP/IP protocol suite and Nectar-specific communication protocols on the communication processor. The Nectar network currently has 25 hosts and has been in use for over a year. The flexibility of our communication processor design does not compromise its performance. The latency of a remote procedure call between application tasks executing on two Nectar hosts is less than 500 μsec. The same tasks can obtain a throughput of 28 Mbit/sec using either TCP/IP or Nectar-specific transport protocols. This throughput is limited by the VME bus that connects a host and its communication processor. Application tasks executing on two communication processors can obtain 90 Mbit/sec of the possible 100 Mbit/sec physical bandwidth using Nectar-specific transport protocols.

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