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Protocol Implementation on the Nectar Communication Processor

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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 μ sec. 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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