Semi-User-Level Communication Architecture

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Abstract

This paper introduces semi-user-level communication architecture, a new high-performance light-weighted communication architecture for inter-node communication of clusters. Different from traditional kernel-level networking architecture and user-level communication architecture, semi-user-level communication architecture removes OS kernel from its message-receiving path while reserves an OS trapping on its message-sending path. No interrupt handling is needed. This new communication architecture doesn't support user-level access to network interface. It provides good portability, security, and support for heterogeneous networking environment and usage of large memory. Semi-user-level communication architecture has been implemented on a SMP workstation cluster system called DAWNING-3000, which is interconnected through Myrinet. Communication performance results are given and overhead distribution is analyzed.