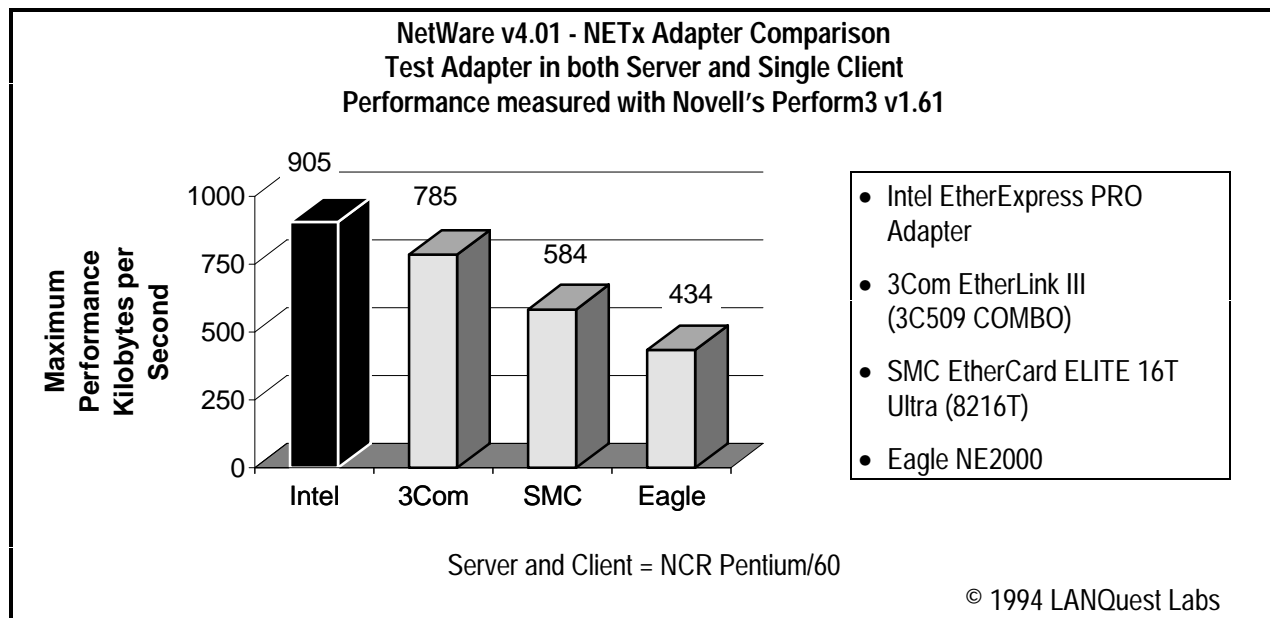


The new Intel EtherExpress™ PRO Adapter is among the fastest Ethernet client adapters LANQuest Labs has tested. While previous versions of the Intel adapter were reliable, performance was generally below that of top performing cards. In this most recent series of client adapter tests under NetWare v4.01, the new EtherExpress PRO outperformed 3Com's EtherLink III, and significantly outperformed SMC's EtherCard ELITE 16T Ultra and Eagle's NE2000 using Novell's NETx client drivers, and a pair of NCR Pentium/60 PCs. All tests were run using Novell's Perform3 v1.61 in a "matched-pair" configuration: a single client and a single server with identical adapters in both machines.

When these results were compared to performance under NetWare v3.11 and NETx (in both published and unpublished LANQuest tests), the Intel and SMC cards both demonstrated increased throughput, while 3Com performance decreased. In LANQuest's tests, this gave the EtherExpress PRO Adapter a 15% performance advantage over the EtherLink III for NetWare users who are running v3.11 drivers with v4.01 servers.

The SMC and Eagle adapters had a different issue, showing a substantial decrease in performance with the NCR Pentium, when compared to earlier 486 client/server combinations (in both published and unpublished LANQuest tests). The net effect is to give Intel a sizable performance advantage for certain configurations. In these LANQuest tests, Intel outperformed SMC and Eagle by 55% and 109%, respectively.



Adapter Architecture

Intel attributes the superior performance of its EtherExpress PRO Adapter to three synergistic design features. The first feature is Concurrent Processing, an early interrupt technology which allows the PRO adapter to send data over the wire or forward it to the host PC before an entire packet is received. This efficient data processing feature enhances overall throughput. For maximum system performance on LANs with high network traffic or multitasking operating systems, Concurrent Processing works in conjunction with a large 32 kilobyte buffer memory. Intel maintains that this large buffer resolves any performance degradation which might be associated with both retransmissions and CPU reprocessing of data. Finally, the EtherExpress PRO Adapter uses advanced 32-bit driver instructions and a 32-bit data port to leverage the wider data paths found on today's platforms. Intel credits this combination of features with ensuring its EtherExpress PRO Adapters deliver top data throughput, optimized for today's high performance Intel486™ and Pentium™ processor-based PCs.

Test Methodology and Philosophy

LANQuest Labs used the latest adapters and drivers in all tests. All adapters were installed and configured according to their installation guides' instructions for best performance.

Testing was carried out on a two-node test network consisting of an NCR Pentium/60 for both server and single client. Tests were conducted using Novell NetWare v4.01 with NETx drivers. All other factors that influence performance were held constant. LANQuest used the industry standard network adapter test, Novell's Perform3 v1.61, with transfer files sizes of 4 to 64 kilobytes. The numbers in our graphs represent the maximum throughput seen throughout that range, averaged across three test runs.

PERFORM3: Novell's Perform3 is a NOS independent test that measures the network throughput produced by memory-to-memory data transfers from a file server to participating workstations. With one client and an equivalent or faster server, the performance bottleneck will occur at the client's adapter/driver. If clients are added, the bottleneck will shift to the server's adapter/driver, or will reach the maximum capability of the network media.

Test Configurations: With one client and an equivalent or faster server, adapter performance with NetWare and NETx under Ethernet, Token Ring, and FDDI is limited primarily by the client's adapter/driver, with smaller but significant contributions from the server adapter/driver and other networking software. As clients are added to the test, the bottleneck first shifts to the server's adapter/driver, then to the maximum throughput capacity of the network under that network operating system. Adding additional clients will scarcely increase either the total network traffic or the percentage of network utilization. However, the bandwidth demands of each added client will result in diminishing throughput for individual stations. For this reason, all high-performance client adapters appear slower in multi-client Perform3 tests.

Combined Client/Server (or "Matched-Pair") Testing: Since many customers may want to purchase the same adapter for both servers and high-end workstations, conducting tests with the same adapter/driver in both machines provides a "vendor performance" rating that can be compared to price, reliability, and other factors. Since users perceive performance at their own workstations, LANQuest used the same testing methodology--1 client and 1 server to determine the best client throughput.

LANQuest Labs

LANQuest Labs is the nation's leading independent network product testing laboratory. Since 1987, LANQuest has tested thousands of combinations of network operating systems, servers, routers, bridges, adapters, workstations, protocol analyzers and network applications. LANQuest also designs network diagnostic and performance testing products, which are sold through manufacturers representatives and international distributors. LANQuest's testing services include compatibility, functionality, interoperability, performance, Q.A., stress, and certification testing. LANQuest Labs' tests are nationally known and have appeared in such publications as *Network World*, *LAN Technology*, *PC Week*, *MacWEEK* and *Personal Computing*. LANQuest Labs' clients include most leading network vendors, including 3Com, Cisco Systems, Hewlett-Packard, IBM, Intel, Madge, Microsoft, Novell, SMC, Ungermann-Bass, and a number of major end users.