TCP/IP Versus NetEx/IP™ Performance

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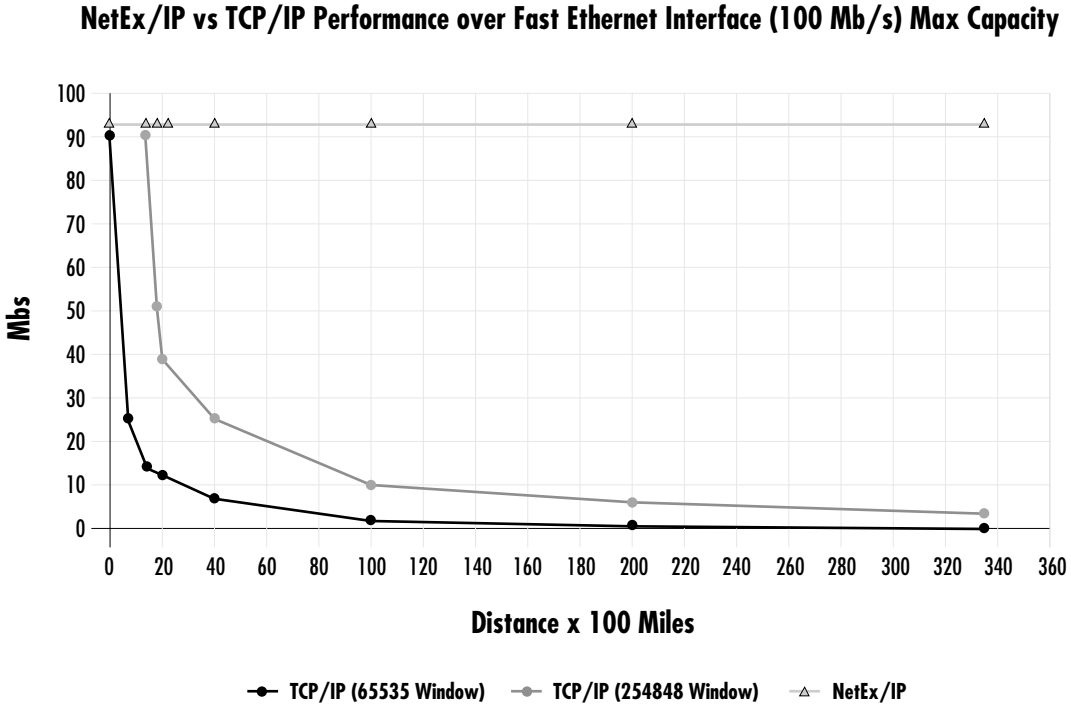
NetEx® has completed several internal benchmarks comparing NetEx/IP against TCP/IP performance. The following describes the test environment:

- IBM Netfinity to IBM Netfinity (Model 5000)
- LINUX NetEx in each Netfinity
- Memory-to-memory tests using the Eat/Gen applications
- Distance simulated from 0–33,000 miles, one way traffic
- Physical media was 100Base-T (Fast Ethernet)
- A third IBM Netfinity was used for delay simulation
- 1 millisecond equates to 100 miles for test purposes

Note: This test was completed in a controlled environment with NetEx/IP tuned to optimize the specific configuration. Performance will vary, depending upon configurations, but should always outperform TCP/IP over distance.

The chart below shows the results. As you can see, NetEx/IP is capable of sustaining greater performance over distance than TCP/IP. Moreover, NetEx/IP performance does not degrade over distance. Even with extended window sizes beyond 64K, TCP/IP performance fell sharply when distance/delay was introduced. The NetEx/IP protocol is capable of sustaining 93 Mb/s over a 100 Mb/s Fast Ethernet interface.



Advantages of NetEx/IP over TCP/IP

Big blocks NetEx/IP can block data into very large block sizes (4K, 8K, 16K, 32K, etc.) over channels as compared to TCP. TCP/IP often passes very small segments across the channel. Therefore, fewer processing cycles are required to transmit the same amount of data using NetEx/IP than would be required on a pure TCP/IP network. Subsequently, there are also fewer IO operations across the channel.

Larger window size Window size is a TCP terminology referring to the number of bytes the receiving side is willing to accept. NetEx deals with "proceed counts" that indicate the number of blocks the receiving side is willing to accept. With high proceed counts, NetEx/IP can transmit more blocks of data, which can fill the pipe more efficiently than TCP. Acknowledgments are required for each segment that guarantees data delivery, however, ACKs can be "bundled" so that a single message can represent an ACK for up to 16 blocks.

Data-streaming protocol Both NetEx and TCP are streaming protocols. TCP is really a byte-streaming protocol, whereas NetEx is a block-streaming protocol. With block streaming protocols, more data is transferred per message, which is more efficient over local and remote networks. This also allows NetEx/IP to fill the LAN or WAN pipes to a greater percentage of utilization, keeping more data "in the air" at any point in time. This is especially true for long-distance "high latency" networks like T1, T3, ATM and satellite transmissions. The more data that can fill a pipe, the more overall efficiency can be achieved.

Exploding data Most corporate data centers are experiencing a two to five times annual increase in their amount of data. To keep up with this increased demand on storage, compute power and network bandwidths, very high speed and efficient protocols and applications must be utilized. NetEx/IP and Netfinity® provide a combination of high speed and efficient protocols to keep pace with the increased demand. Especially with the distance factor, you should seriously consider if TCP/IP can meet your needs in this critical area.

Protocol stack efficiency As with any protocol stack, performance is limited to the available bandwidth. A fast processor will not make a 10Base-T run any faster. Furthermore, when using a pure TCP/IP solution, the speed you can transmit data between systems will be as fast as the slowest TCP stack in the configuration. When using a NetEx/IP solution, the speed you can transmit data between systems will be as fast as the slowest processor, subject to the available bandwidth. The NetEx/IP protocol itself will not be the limiting factor for performance.