HyperIP™ for Remote IP Storage Solutions

Remote IP storage speed bumps

Many enterprises realize that remote storage provides one of the most effective insurance policies against the loss of mission-critical information. These enterprises also wish to leverage their IP infrastructures to enable the remote Business Continuity/Disaster Recovery solutions they implement.

Remote storage, such as replication, mirroring, snapshot and backup/restore should be just another application that shares the common infrastructure. Instead, organizations are discovering some annoying speed bumps on the road between data centers. Speed bumps such as:

- **High bandwidth costs and low performance of IP-based storage networks.** Despite perceptions, using TCP/IP to move large amounts of data over long distances leaves a lot to be desired. In some cases, the fact that TCP/IP is not operating efficiently for very-high-speed data transport is holding back the wider adoption of remote IP storage solutions.

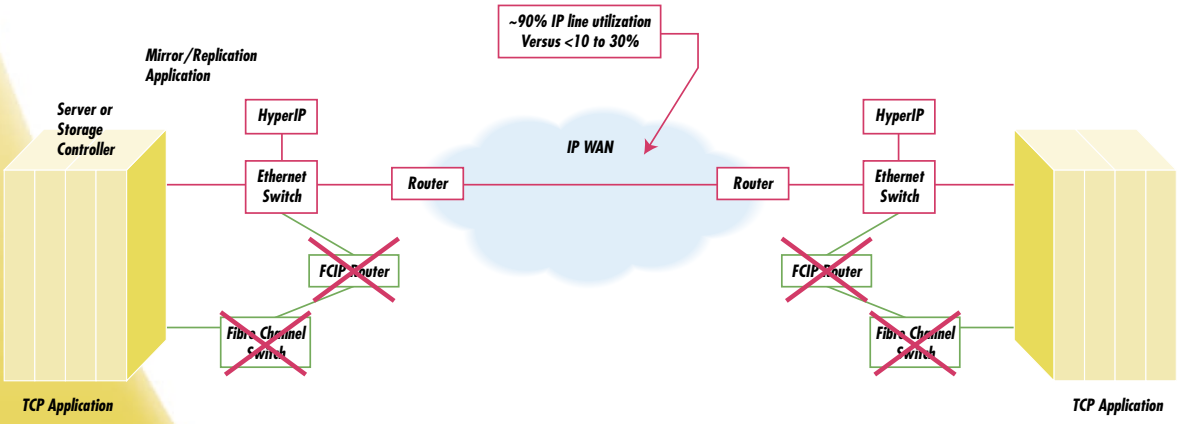
- **The expense of using Fibre Channel (FC) networks for remote storage.** Remote storage over IP applications based upon FC not only requires fabric switches, but also expensive extension equipment to connect FC SANs to IP. Fibre Channel over IP solutions are often priced out of reach for all but the biggest enterprises.

Why it pays to get HyperIP

HyperIP is a software-based solution that accelerates TCP applications over WANs for long-distance IP transmissions. It's based on the fastest and most successful IP transport technology available today. HyperIP offers unmatched IP price/performance over time and distance.

HyperIP boosts performance of remote IP storage applications by 3 to 10 times. When compression is used, the performance gain and effective throughput is even greater. More data can be sent over the same or even smaller pipes, lowering the cost of bandwidth, equipment and operations. For many organizations, the bandwidth efficiency provided by HyperIP makes remote storage possible by substantially lowering the cost of ownership.

And because HyperIP is transparent to applications and implemented through simply attaching to 100MB or Gigabit Ethernet network segments, HyperIP allows customers to easily leverage existing IP infrastructures for remote storage applications. That means remote storage applications can be used without fabric switches and other expensive extension equipment, lowering their TCO even more and making them easier to use and maintain.



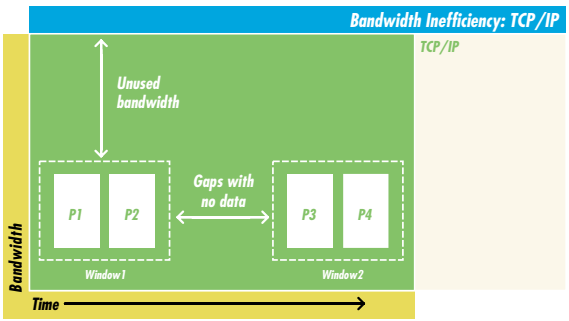
HyperIP in action

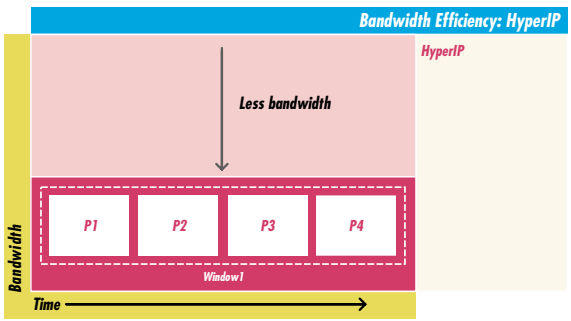
HyperIP is based on Internet Engineering Task Force RFC3135 and is easy to use in standards-based environments. In fact, many of the world's largest financial, telecommunications, transportation and government organizations use HyperIP core technology to move massive amounts of mission-critical data over vast distances everyday.

As the fastest transport technology over long distances, HyperIP offers four major advantages over TCP/IP:

HyperIP reduces communications costs by eliminating bandwidth waste

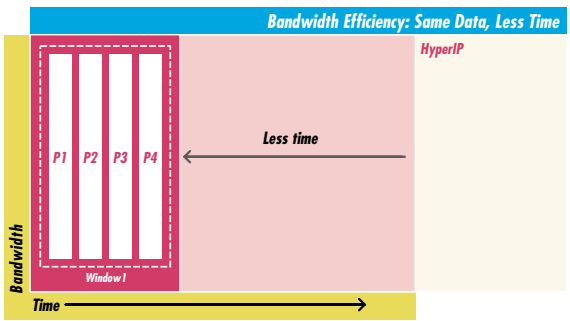
TCP/IP's limited window size restricts the number of data packets transferred per window, which causes gaps between windows. These gaps prevent the usage of all available bandwidth, resulting in high communications costs and minimal performance. HyperIP's expanded window size eliminates gaps and ensures the use of all available bandwidth. Eliminating wasted bandwidth enables the network to move data most efficiently.





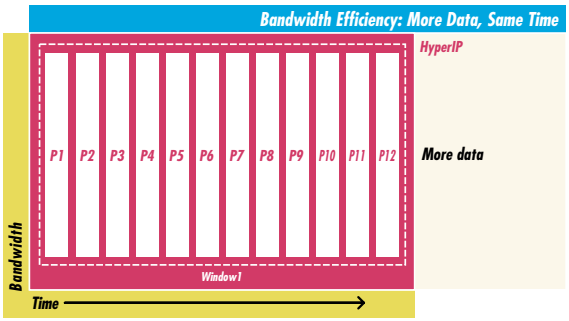
HyperIP shrinks production windows with sustained high performance

HyperIP's fast-start and data-blocking capabilities take advantage of all available bandwidth to deliver the highest performance and throughput. Plus, HyperIP has the ability to dynamically aggregate data from multiple streams into larger blocks of data for transmission.



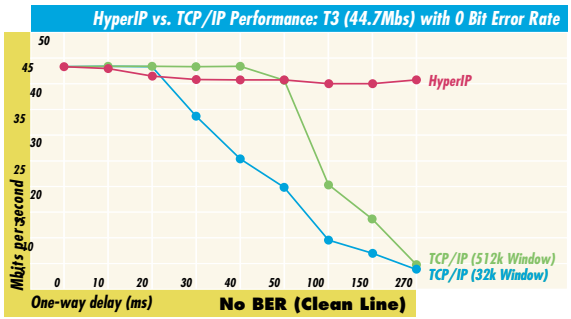
HyperIP optimizes network productivity by maximizing data throughput

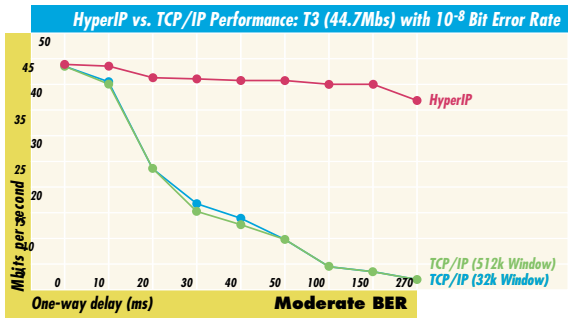
With HyperIP, maximum amounts of data are sent over the network because the window size scales with the network. Therefore, as the enterprise network grows in distance, HyperIP performance increasingly outpaces TCP/IP. In fact, comparative tests document HyperIP performance up to 10 times faster than TCP/IP, depending on the distance involved. Today, HyperIP can fill connections at speeds from DS3 to 500Mb/sec. By using intelligent compression features as part of HyperIP, performance is enhanced even more. Typical compression ratios range from 2:1 to 4:1, depending upon the compressibility of the data.



*HyperIP optimizes performance with faster error recovery**

In conjunction with a large storage company, HyperIP and TCP/IP were compared under various bit-error conditions that simulated real-world network operations. For this test, the network bandwidth was a T3 with various distances and Bit Error Rates (BER). Test results demonstrated that as bit errors increase, HyperIP's performance is increasingly superior to TCP/IP. HyperIP recovers from bit errors more quickly than TCP/IP because it retransmits only the blocks of data received in error. Most versions of TCP/IP do not support selective retransmits, which means TCP/IP must resend all of the data sent at the point of error, as well as any data that follows.





HyperIP is a software solution that runs on off-the-shelf PCI hardware and is transparent to the application server platform and operating system. HyperIP achieves its performance gains without specialized tuning that is required by some TCP extensions and without the propagation of these extensions throughout the network configuration. HyperIP maintains a very high level of performance regardless of vendor equipment used in the configuration.

How much can HyperIP save storage customers and reduce TCO?

In most cases, the answer is plenty. Savings come from dramatically lower bandwidth costs and, in many cases, from the elimination of expensive and complex equipment. But bandwidth cost is only part of the story. Many organizations are experiencing problems moving data over IP. Increasingly, replications, snapshots, backups — whatever organizations need — can't be completed in time. HyperIP can make storage applications live up to their promise — getting mission-critical data moved when it needs to be moved.

Standards based, application transparency

Native Ethernet is now powerful enough to serve as the backbone for remote storage over IP. With HyperIP, you can leverage native Ethernet LANs, reduce equipment costs and networking complexity, and make better utilization of IP bandwidth.

Want to know more? Please contact NetEx.

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*Results may vary depending upon the distances involved.

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