HyperIP®

DATA REPLICATION OPTIMIZATION (DRO)

Introduction

HyperIP is a Data Replication Optimizer (DRO) that is used to boost performance and delivery of replication traffic over standards-based IP networks. HyperIP specifically mitigates TCP performance issues that are common when moving storage application data over wide-area network (WAN) connections.
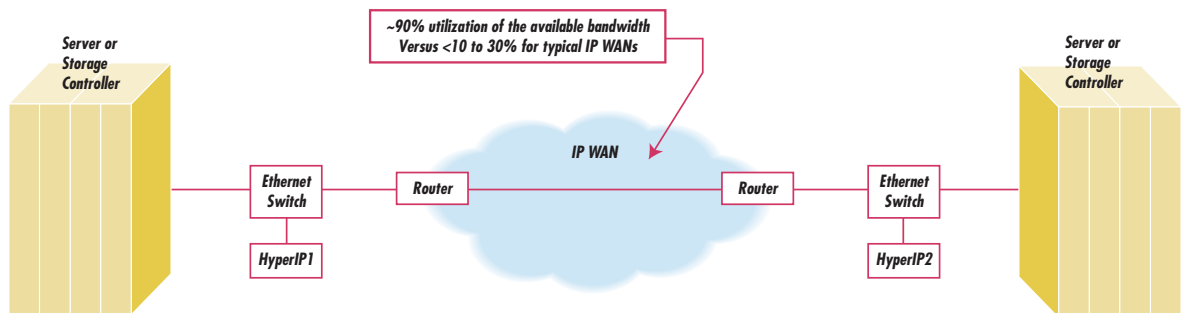
Besides DRO, HyperIP is also very effective for accelerating traffic for the following applications:

• Mirroring, Snapshot, Vaulting, Backup/Restore Applications
• Bulk Data Transfer Between Mission-Critical Applications such as FTP
• Data Migrations Between Data Centers
• Email Database Replication
• Content Distribution for Data Warehousing and Mining
• Check Images, Medical Images, Digital Video Files
• Two-Way Satellite Communications

The HyperIP Solution

HyperIP operates as an out-of-band network device that provides transparent application "acceleration" of TCP traffic across WAN networks. The HyperIP software runs on a standard off-the-shelf PCI-based "Intel" platform. HyperIP appliances are simply connected to the local and remote LAN segment via a standard GigE connection to an Ethernet switch typically closest to the application. HyperIP appliances are easily configured via a standard browser interface.

HyperIP is Simple and Nonintrusive to Storage Replication Applications

HyperIP's main purpose is to accelerate selected TCP data replication traffic over WANs. HyperIP appliances are configured on each side of a WAN (in pairs) and operate as a gateway or proxy for destination IP addresses. HyperIP intercepts TCP packets from selected applications based upon a set of address-filtering rules. The intercepted packets are then aggregated and sent over the network in a more efficient manner for achieving greater WAN throughput. A TCP connection is maintained between each endpoint application server and the local HyperIP appliance.

Most replication applications that use TCP/IP for their transport can benefit from the strengths of HyperIP. An up-to-date support matrix can be found on the NetEx website at www.netex.com.

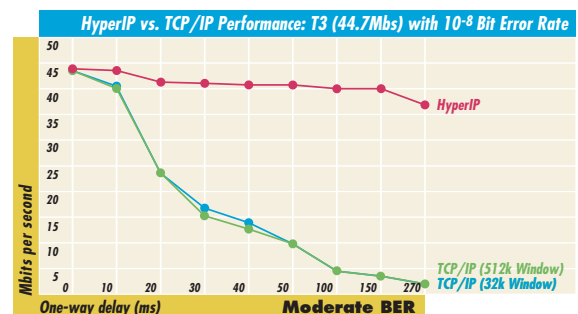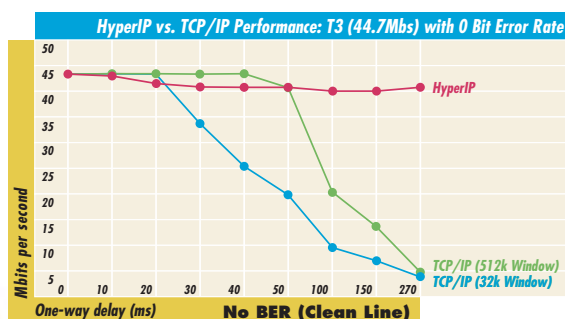**HyperIP provides the following value-added features:**

- Data Replication Optimization—Overcomes the negative effects of latency (over any distance) on TCP traffic to yield a 2x–10x performance improvement.
- Data Compression—Block-level compression and sequence-reduction algorithms improve bandwidth utilization and decreases bandwidth requirements from 60%–90%, at speeds of 2 Mbps–155 Mbps (OC-3).
- Production Hardened Shield—Protects data replication applications from often-disruptive variations in circuit conditions. This includes network latency, jitter, congestion, packet loss and bandwidth changes.
- Application Aggregation—Accelerates data replication applications from the same or multiple vendors.
- Rate Limit Controls—Allocates bandwidth for optimized performance of time-sensitive applications.
- Simplicity—HyperIP is built upon the foundation of simplicity. With HyperIP, there are no changes required to the network (IP) infrastructure, no network equipment refreshes or changes to the replication application.

Benefits achieved by providing enhancements to TCP/IP-based applications:

- Window Size—HyperIP's enhanced protocol keeps the available network bandwidth pipe full, resulting in extremely high and efficient link utilization. Typically achieving effective data throughput of 90%.
- Acknowledgement Scheme—HyperIP retransmits only nAKed blocks for error recovery. HyperIP does not resend data that has already been transmitted successfully.
- Fast Start—HyperIP starts transfers at rates close to the available session bandwidth.
- Dynamic Adjustments—HyperIP send rates are optimized for the current link conditions.
- Session Pipeline—Multiple TCP sessions can be aggregated over a smaller set of connections between the HyperIP appliances. This enables a very efficient use of the bandwidth, resulting in less protocol overhead versus acknowledging many small messages for individual connections.

Features for Unmatched DRO Performance

HyperIP provides very high performance, supporting speeds from 2 Mbps to 480 Mbps. HyperIP delivers dramatic performance improvements at distances of hundreds to tens of thousands of miles.

HyperIP Provides Consistent and Predictable Performance Regardless of Changing Network Conditions

Intelligent/Adaptive Block Compression

By using HyperIP's adaptive compression and sequence reduction features, performance for most applications is further enhanced. Compression ratios range from 2:1 to 15:1 depending on data's compressibility.
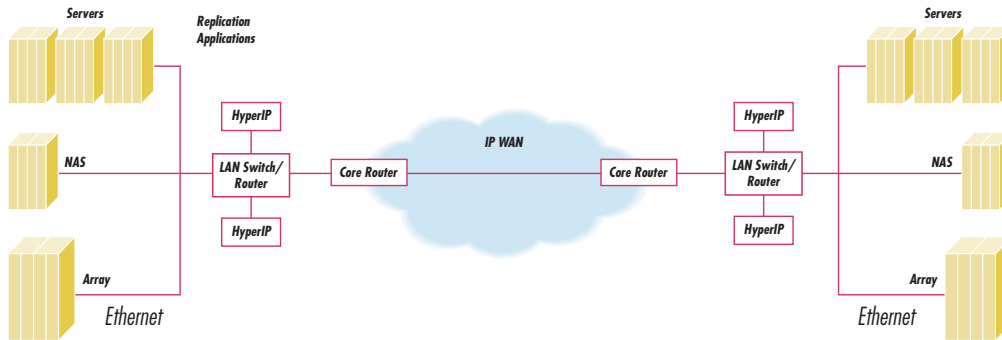
Transparency

HyperIP is completely transparent to the replication application. The behavior of the application remains unchanged except for much higher performance achieved across the IP WAN infrastructure. Whether the application was designed to operate on a peer-to-peer or client/server model, it will continue to function in the same manner with HyperIP. The application will not be aware of the fact that the packets are being optimized by HyperIP.

Guaranteed Data Delivery / Data Integrity

HyperIP provides an extremely efficient recovery mechanism for lost packets. As an end-to-end protocol, HyperIP guarantees data delivery and provides data integrity between the local and remote HyperIP units. This is accomplished by using a block-numbering acknowledgement and retransmission mechanism, along with UDP checksums to ensure the data has not been lost or corrupted over the WAN. With HyperIP, the application retains end-to-end control of the data and delivers consistent and predictable performance.

High Availability / Redundancy

In the event of a network failure, HyperIP finds an alternate path or notifies the application if one is not available. HyperIP also provides Automated Hot Standby (AHS) which is a high-availability feature based upon the Virtual Router Redundancy Protocol (VRRP).

HyperIP Supports Redundant Configurations for Mission-Critical Application Aggregation

Bandwidth Rate Limiting

HyperIP can be used to rate limit the application performance, which ensures fairness among other applications sharing the bandwidth. Rate limiting may also be set based upon time-of-day requirements.
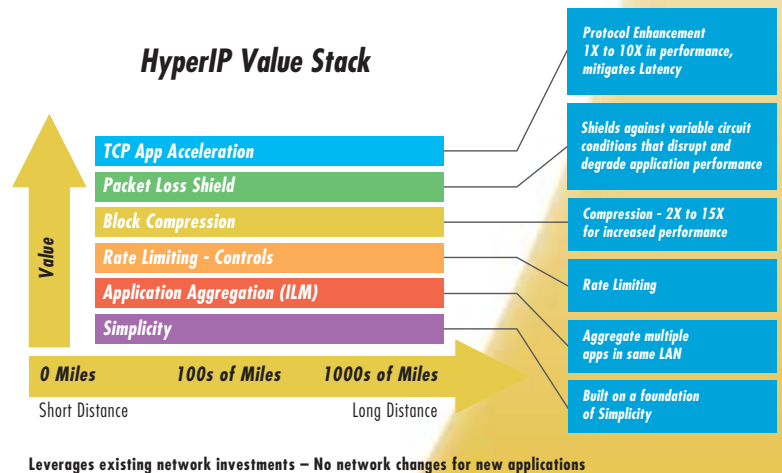
Reduced Equipment Costs, Simplified Solution

As compared with Fibre Channel (FC) over IP WAN technologies, HyperIP offers a solution that is much simpler to install and manage and is dramatically less expensive. This is extremely important for remote replication applications because, with HyperIP, less hardware is required to support the configuration. With HyperIP, you don't have to purchase and maintain dedicated FC switches, provision-dedicated FC over IP WAN circuits, install special WAN management, modify your TCP-based applications or tune any operating systems to move your data over the WAN. HyperIP is transparent to the replication application and is simple to implement for proof-of-concept testing and production environments.

Boost the Performance of Your Application and Save on Network Costs

HyperIP is a robust, standards-based solution that enables organizations to make efficient use of their existing IP WAN infrastructure. The performance gains delivered by HyperIP can provide direct financial savings as well as improvements in operational efficiencies.

Many of the world's largest financial, telecom, transportation and government organizations use HyperIP's core technology to move massive amounts of mission-critical data among their distributed data centers. NetEx is currently providing solutions for high-speed data transport to companies like the Royal Bank of Scotland Group, Verizon, BellSouth, Bank of America, NTT, Telstra, Sabre Reservations, EDS and many others.

HyperIP Value Stack

Value

TCP App Acceleration
Packet Loss Shield
Block Compression
Rate Limiting - Controls
Application Aggregation (ILM)
Simplicity

0 Miles   100s of Miles   1000s of Miles
Short Distance   Long Distance

Protocol Enhancement 1X to 10X in performance, mitigates Latency

Shields against variable circuit conditions that disrupt and degrade application performance

Compression - 2X to 15X for increased performance

Rate Limiting

Aggregate multiple apps in same LAN

Built on a foundation of Simplicity

Leverages existing network investments – No network changes for new applications

Want to know more? Please contact NetEx today!

www.netex.com

NetEx Sales Coverage

North America
U.S., Canada

Europe
Austria, Belgium, Denmark, Finland, France,
Germany, Italy, Luxembourg, Netherlands, Norway,
Sweden, Switzerland, United Kingdom

Africa
South Africa

Middle East
Bahrain, Cyprus, Egypt, Jordan, Lebanon, Oman,
Pakistan, Qatar, Saudi Arabia, United Arab Emirates

Asia Pac
Australia, Fiji, Japan, New Guinea,
New Zealand, Solomon Islands

www.netex.com
mailto:hyperip@netex.com

HYPER**IP**® by
NET E X®