

## Replication Performance Enhanced with Built-In WAN Optimization

### Introduction

The need for data protection is well understood. A wide range of internal and external pressures compel organizations to implement Business Continuity (BC) and Disaster Recovery (DR) strategies. At a minimum, compliance with a multitude of laws and regulations mandate this. Clearly, data protection is essential for the safeguarding and preservation of critical data - the very lifeblood of all businesses. Yet how does a company effectively protect emails stored in Microsoft® Exchange™, SQL databases, ERP/CRM data, company documents and other vital data? In its essence, data protection is simple: take the entire data store and copy it to a separate location, so data can be recovered in the event of a disaster at the primary site.

Certain specific motivations exist for protecting data across extended geographic distances, such as better protection against localized catastrophes or the availability of cheaper power at rural sites. For this type of distant data replication, Wide Area Networking (WAN) plays a key role. In the quest to improve RPO and RTO, which centers on the need to protect large amounts of data in a small window of time, comes the drive to use “fatter” and more expensive data pipes. Sadly, unless various WAN optimization techniques are in play, much of the WAN bandwidth will surely go unutilized, despite the cost of such a premium link.

TCP/IP is the ubiquitous data transfer protocol used in WAN transport with “assured delivery”. In order to guarantee delivery of packets, TCP is designed as a “chatty” protocol that depends on packet acknowledgements. Therefore, if packets are lost due to collisions, flow congestions or electrostatic disturbances, the TCP protocol enters a very stringent recovery process which introduces a tremendous amount of overhead, drastically reducing throughput. Another two factors that adversely impact WAN replication are out-of-order packet delivery and the innate high latency associated with long distance replication.

### WAN Acceleration and Transport Optimization

The key to a successful DR implementation is the optimization of data transfer. Yet inherent problems prevent most companies from implementing the proper DR plan. The first and most common problem is the network bandwidth between the sites. Most companies do not have the budget for the pipe size needed between the primary and DR site to keep them in sync. Thus, many organizations chose not to implement DR due simply to the cost of the network bandwidth required to meet the demand.

Most storage vendors typically recommend third party appliances to improve bandwidth utilization. These are essentially “edge-devices” installed at the replication end-points which implement various optimization algorithms to achieve this. While this meets the need, it comes at a high price, since third party edge appliances require the end user to allocate additional budget upfront to address the matter. Apart from the CAPEX involved with acquisition, increased power consumption and cost of management increases OPEX as well. Needless to say, rack space requirements and carbon footprint also go up. Moreover, the luxury of “single-pane” management is lost, as now separate management tools are required to incorporate these third party devices.

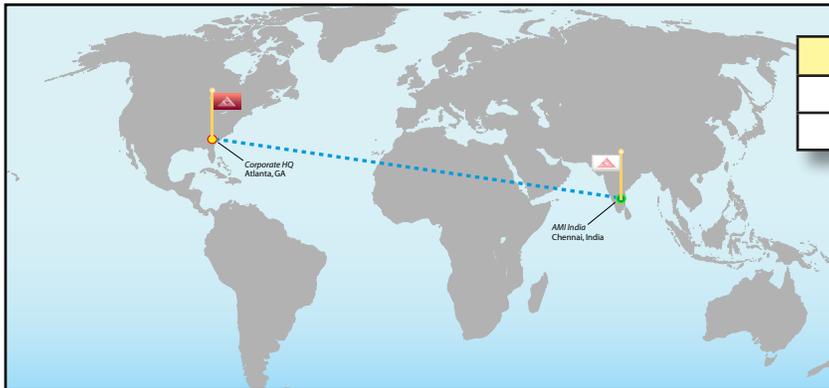
StorTrends solves these problems through innovative WAN acceleration and transport optimization, built into every StorTrends appliance at no additional cost. StorTrends utilizes patented technology that intelligently combines standards-based transport

*Though simple to understand, remote replication is one of the most difficult to implement. There are two main reasons for this:*

- **Growth in the amount of primary data that needs to be protected**
- **Complexity and dynamics of WAN transport**

methods to achieve outstanding WAN transport efficiency.

The innovations and technologies employed by StorTrends include data optimization technologies like data compression and de-duplication to reduce the footprint of data transferred. StorTrends also employs adaptive compression techniques to vary the depth of compression depending on CPU utilization. Additionally, WAN acceleration techniques ensure maximum utilization of available WAN bandwidth.



Atlanta – Chennai	85 MB File	500 MB File
Standard Transport	36m 49s	1h 53m 10s
StorTrends WDS	4m 29s	20m 31s

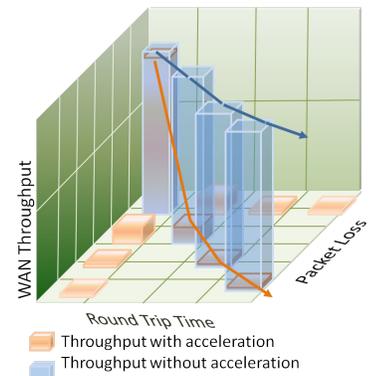
The story does not end here, since WAN is typically a shared resource between multiple departments. StorTrends provides Quality-Of-Service (QOS) mechanisms to enable the administrator to configure available bandwidth so other WAN clients can coexist with the service. Mechanisms are also in place to schedule WAN transfers during specific intervals, useful particularly for leased lines. Because data transported over WAN is exposed to security threats, StorTrends offers 128 Bit AES encryption to safeguard it.

Finally, to make replication even easier, the ManageTrends™ web-based management application used in all StorTrends storage appliances enables quick configuration of WAN replication along with extensive reporting tools. The beauty of the StorTrends WAN transfer implementation lies in its innovative architecture. Although many of these transactional details are under the hood, the extensive monitoring tools are available in ManageTrends provide the administrator with a clear understanding of StorTrends WAN utilization efficiency.

## Why StorTrends for WAN Optimization?

StorTrends advantages include:

- Built-in WAN Acceleration and Optimization
- Adaptive compression algorithms allows to intelligently vary the depth of compression
- Seamless single pane of glass management with ManageTrends
- Exhaustive WAN optimization monitoring tools
- Secure transport with 128 Bit AES encryption
- Elegant QOS tools to control shared bandwidth utilizations
- Fast replication of base image using transportable media



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