Performance Summary

› Using Blue Coat MACH5 technology together with IBM Tivoli Storage Manager enables organizations to complete backups within the assigned window and dramatically improve recovery time in a disaster

› Progressive Incremental updates use less than half the original bandwidth.

› Full Backup Set copies and restores are accelerated by over 30 times

› Protocol optimization improves TSM speed, byte caching and compression reduce bandwidth usage, and bandwidth management ensures sufficient resources to complete the backup on time

Test Scenario

IBM Tivoli Storage Manager testing was conducted using a WAN connection of 2Mbit/sec with 100ms round trip time and a dataset of 2GB. This represents typical network performance for geographically distributed branch offices. Tests included initial data replication between the two sites, incremental backup after additions and changes were made to the initial dataset, and full restoration from backup. A "miss" is a test where none of the data has traversed the WAN through a Blue Coat SG before. A "hit" is a test where some (an incremental backup) or all (a full restoration) of the data has been seen by the ProxySG before.

Blue Coat SG Appliances Optimize and Accelerate IBM Tivoli Storage Manager

Today, organizations face an expanding set of data protection and retention challenges. IBM Tivoli Storage Manager is a popular solution for centralized, automated data protection that reduces complexity, manages costs and aides compliance. To accomplish these goals, IBM Tivoli Storage Manager must replicate large amounts of data across the wide area network.

WAN links, however, have higher latency and much less bandwidth than either a LAN or Fibre Channel network. Latency severely impacts the performance of protocols that TSM relies on for WAN communication, and the amount of data often dwarfs the bandwidth most organizations can afford. Even using TSM's intelligent data move-and-store techniques, the amount of data can still be significant, and much larger than can be moved across the WAN during the backup window. If differential backups take hours, and a full restoration takes days or longer, how can organizations effectively maintain backups? Or worse, how can they expect to restore them quickly in a real disaster?

Blue Coat Optimized TSM

The Blue Coat MACH5 technologies including byte caching, compression, protocol optimization and bandwidth management, significantly improve IBM Tivoli Storage Manager data transfers. Backup Set initialization triggers a massive amount of network traffic which is highly repetitive and very compressible. Progressive and Incremental updates also contain much repetition; although the data is new in each individual file (or sub-file backup), the byte patterns between files are very redundant and respond well to compression and caching. This allows Blue Coat MACH5 to improve initialization, recovery, and update times by up to 90% in real customer deployments.

The Blue Coat solution goes beyond just compression and protocol optimization, however, by providing bandwidth management to control access to network resources. Although not shown directly in this testing, Blue Coat SG appliances can prioritize traffic based on user, application, time of day and content, ensuring that IBM Tivoli Storage Manager gets the bandwidth it needs both during the backup window, and in the event of an emergency restore.

Measuring the Improvement

Tests conducted in labs and within customers' live environments show that Blue Coat appliances running MACH5 significantly improve the performance of IBM Tivoli Storage Manager in real world scenarios. Using Blue Coat MACH5 optimization technology, the time needed to complete a backup operation was reduced by over 508% on the first (cold) pass, and subsequent backups by almost 90%. Bandwidth used to complete the backup or restore was also reduced by over 60%. Such a dramatic improvement makes it possible for our customers to complete their backups within the nightly window again. For a new full Backup Set initializationrestoration, Blue Coat MACH5 reduced the overall time to clone by over 3041 times; convenient for IT when creating sets, but that performance increase would be critical in the event of an actual restore due to data loss or disaster.
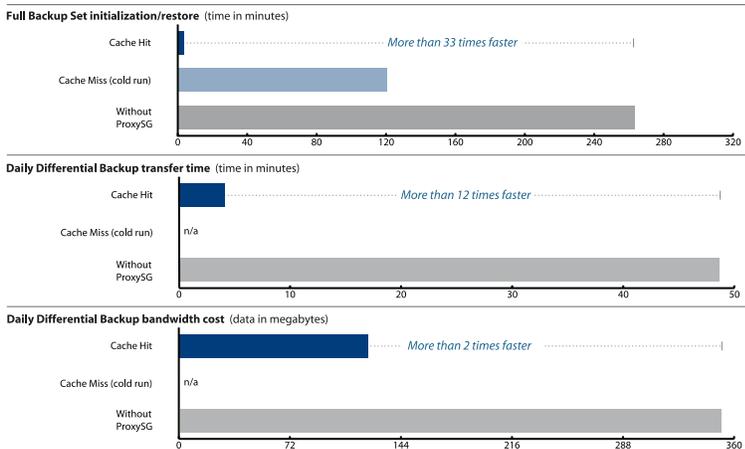
Full Backup Set initialization/restore (time in minutes)

Cache Hit	More than 33 times faster
Cache Miss (cold run)	
Without ProxySG	

0　40　80　120　160　200　240　280　320

Daily Differential Backup transfer time (time in minutes)

Cache Hit	More than 12 times faster
Cache Miss (cold run)	n/a
Without ProxySG	

0　10　20　30　40　50

Daily Differential Backup bandwidth cost (data in megabytes)

Cache Hit	More than 2 times faster
Cache Miss (cold run)	n/a
Without ProxySG	

0　72　144　216　288　360

About Blue Coat MACH5 Acceleration Technology

Blue Coat MACH5 technology is a patent-pending combination of five separate application management and tuning technologies that provide unrivaled improvements in application performance and bandwidth utilization. Whether at the edge of your network, or right in the heart of it, MACH5 technology provides a powerful toolkit for meeting any application delivery challenge. These technologies include:

Bandwidth Management

Assign priority and network resources based not only on port or device, but on users, applications and content to more accurately reflect your corporate policies on the network. Works by itself, or integrates with your infrastructure QoS to provide application intelligence to the packet switching network.

Protocol Optimization

Improves the performance of protocols that are inefficient over the WAN through specific enhancements that make them more tolerant to the higher latencies typically found there. Blue Coat has been optimizing network protocols for over a decade, and offers multiple improvements for TCP, CIFS, HTTP, HTTPS, MAPI and most streaming video and IM protocols.

Byte Caching

Cache repetitive traffic found in the byte stream and serve it locally to reduce the amount of traffic that actually uses the WAN at all. Works like a customized compression algorithm for your network traffic, and leads to dramatic bandwidth savings.

Object Caching

Store files, videos and web content locally, providing LAN-like performance for WAN users, without the overhead and risk of traditional wide area file services. For content delivery, no technology does more to reduce latency and bandwidth to improve the end user experience.

Compression

Inline compression can reduce predictable patterns even on the first pass, making it an ideal complement to byte caching technology.

About the Blue Coat ProxyClient

ProxyClient builds on Blue Coat's secure web gateway and acceleration technologies to extend application delivery to the desktop. Using MACH5 technology, including caching, compression and protocol optimization, ProxyClient accelerates web and office applications for roaming and small branch users. ProxyClient delivers LAN-like user experience and Blue Coat web filtering with a simple and easy footprint for installation, configuration, deployment and ongoing maintenance.