IBM TS7760 Virtual Tape Library

Massive scalability and continuous data availability of IBM Z environments for the cloud era

Highlights

- Gain innovative data protection and business continuance for IBM Z
- Keep data secure, continuously available and easy to manage
- Support cloud infrastructures on IBM Z, backed by virtualized tape storage
- Reduce operational expenses by keeping data secure and easy to manage
- Simplify IBM Z tape operations and improve batch window performance
- Leverage disk and physical tape technologies in one economical solution

With cloud infrastructures on the rise and data volumes expanding exponentially, organizations need a cost-effective way to manage both primary and backup data that is active, inactive or even archived. Long-term retention of data is a business priority—as is continuous availability from anywhere at any time—but the storage solution must also fit within today's budget constraints. Storing infrequently accessed data on costly disk storage simply doesn't make sense. At the same time, accessing data on tape can take longer, making it unappealing for transactional storage infrastructures. That's where virtualized tape storage comes in.

The TS7700 family has been designed to help enhance performance and provide the capacity needed for today's tape processing requirements. Deploying these innovative solutions can help reduce batch processing time, total cost of ownership and management overhead.

IBM TS7760 is the latest member of the TS7700 family. It is a mainframe virtual tape solution that optimizes data protection and business continuance for IBM Z platform data. Through the use of virtualization and disk cache, TS7760 operates at disk speeds while maintaining compatibility with existing tape operations. Its fully integrated tiered storage hierarchy takes advantage of both disk and tape technologies to deliver performance for active data and best economics for inactive and archive data. Also, IBM TS7760 now supports the IBM z14, part of the next generation of the IBM Z family.

The TS7760 virtual tape solution has the scalability, reliability and superior performance to support today's cloud

environments. The TS7760 solution features encryption-capable, high-capacity cache using 8 TB SAS self-encrypting, Federal Information Processing Standard (FIPS)-capable disk drives with Distributed RAID 6 Dynamic Disk Pools, providing the ability to scale to very large capacities with advanced data protection.

For long-term data retention, TS7760 can be directly attached to physical tape storage. It writes data to high-capacity, high-performance IBM TS1150 and earlier IBM TS1100 Series tape drives installed in IBM TS4500 and IBM TS3500 tape libraries.

IBM TS7760 delivers outstanding virtualization capabilities for continuous data protection of IBM Z data.

Increase business flexibility with cloud as a storage tier

Transparent Cloud Tiering (TCT) for IBM TS7760 is designed to help increase business agility with policy-driven data movement to multicloud environments for long-term retention and data protection.

The server-less direct data transfer from TS7700 to a cloud[1] may improve business efficiency while reducing capital and operating expense.

Transparent Cloud Tiering also integrates with IBM Cloud Object Storage and can provide direct transparent connectivity to IBM Cloud and Amazon S3.

With TCT, the challenge of keeping up with explosive data growth becomes much more manageable.

Gain data protection and retention for mainframe environments

The TS7760 solution supports 16 Gbps IBM FICON for attachment to IBM Z servers at distances of up to 250 km (155 miles) using dense wavelength division multiplexing in combination with switches, or greater distances using supported channel extension products.

Increase storage capacity with optimized data compression

In addition to the standard compression built into the FICON adapters used by TS7760, two enhanced compression options are available to balance performance requirements with storage requirements: LZ4 compression and ZSTD compression algorithms[2]. Now, the maximum TS7760 usable disk capacity of 2.45 PB can hold over 12 PB using 5:1 compression, in a single repository, depending on which compression method is used.

Boost availability through Dynamic Disk Pools

TS7760 Dynamic Disk Pools improve data availability by minimizing the rebuild duration time after a disk drive failure. By distributing the rebuild workload across a pool of drives, the impact of the process is greatly reduced.

The Dynamic Disk Pools feature distributes data, parity information and spare capacity across the drives in the TS7760 system. Its intelligent algorithm defines which drives are used for segment placement—making sure data is fully protected.

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Protect your business with TS7760 grids

The grid communication feature allows interconnection of up to eight[3] TS7700 systems in a grid configuration. This TS7760 function is comparable to IBM Metro Mirror and IBM Global Mirror. Since TS7760 systems typically reside in different locations to provide better availability and disaster recovery, grid communication is designed to help keep data available, even when a site experiences an outage. This helps maintain availability during planned maintenance, service or system upgrades, or unexpected outages, and helps avoid the physical transportation of tape

cartridges in the event of a disaster. The grid configuration also allows administrators to use TS7760 as an archival installation with full back-end physical tape functionality.

The TS7760 grid feature includes multiple modes of synchronous and asynchronous replication. This can be assigned to volumes through an IBM Data Facility Storage Management Subsystem (DFSMS) policy, providing flexibility in implementing business-continuity solutions.

Simplify management using a graphical user interface

A web-based graphical user interface (GUI), based on the interface used in several other IBM storage solutions, is provided to configure and monitor TS7760. The GUI can be used to access information such as the current system status and resource usage statistics. This interface has been designed to make more efficient use of a storage administrator's time in configuring and managing the TS7760 solution while also helping reduce the time needed to train new administrators.

Ensure data security and regulatory compliance

Designed to keep data more secure and to help meet regulatory guidelines, TS7760 provides end-to-end data encryption. It uses FIPS 140-2-capable disk drives to support AES-256 disk-based encryption for data at rest within the disk cache repositories.

To help keep information confidential if physical tapes are lost or compromised, all TS7700 models support TS1150 tape drive encryption capabilities. TS1150, IBM TS1140 and some earlier TS1100 Series tape drives[4] include data encryption capabilities to help prevent the need for host-based data encryption—and the concurrent drain on host performance and resources—or the additional expense of specialized encryption appliances.

IBM Security Key Lifecycle Manager can generate and manage encryption keys for both disk and tape drives across the enterprise. This offering delivers advanced, federated, cross-domain key management designed to help lock down organizational data more comprehensively and easily than ever before.

Replication in the grid cloud is handled through Secure Sockets Layer (SSL) transmission over Ethernet. SSL cryptography uses public and private keys to create the secure link between clusters, protecting data in flight from unauthorized access.

To help support the long-term retention of reference data and meet requirements of regulatory bodies worldwide, microcode capabilities enable the TS7760 to support a virtual equivalent of write-once-read-many (WORM) functionality.

[1]Cloud Storage Tier requires system to have a minimum 64GB RAM.

[2] All clusters in a grid must be running release 4.1.2 machine code, or higher, before either enhanced compression option may be selected

[3] Grids of more than 4 systems require RPQ.

[4] IBM TS1130 and IBM TS1120 tape drives also support encryption.

Tape - Mainframe Virtualization
Data Sheet

IBM TS7760 at a glance		
Specifications	Single node configuration	8-cluster grid Max configuration
Usable Disk cache*	Up to 2.45 PB	Up to 19.6 PB
Virtual drives	496	3,968
TS1100 or 3592 tape drives†	4 to 16	32 to 128
Virtual volumes	4,000,000	4,000,000
16 Gbps FICON channels	8	64
Maximum logical paths	4,096	32,768
Warranty	One-year on-site repair	One-year on-site repair
Physical specifications		
Width	616 mm (24.25 in.)	
Depth	1,425 mm (56.1 in.)	
Height	1,930.4 mm (76.0 in.)	
Weight	746 kg (1,645.0 lb.)	
Supported environments‡	IBM z/OS IBM z/VM IBM z/VSE IBM z/TPF	

* Not all array cache capacity is usable. Cache capacities vary with grid configurations, including a combination of TS7720, TS7740 and TS7760 models.

† Tape support is optional on TS7720 and TS7760

‡ Please refer to the technical documentation for minimum software-level requirements and specific function or feature support.

Why IBM?

The performance and availability of your storage environment can either enhance or hamper your cloud initiatives—and your business. As a storage market leader, IBM can help you handle the challenges your organization encounters.

For more information

To learn more about IBM TS7760, please contact your IBM representative or IBM Business Partner, or visit: **ibm.com**/us-en/marketplace/ts7760

Additionally, IBM Global Financing provides numerous payment options to help you acquire the technology you need to grow your business. We provide full lifecycle management of IT products and services, from acquisition to disposition. For more information, visit: https://www.ibm.com/financing

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