



Highlights

- Support next-generation cloud infrastructures on IBM® Z servers, backed by virtualised tape storage
 - Gain private cloud-like functionality that keeps IBM TS7700 data accessible to hosts in the grid
 - Reduce operational expenses by keeping business-critical data secure, available and easy to manage
 - Simplify tape management and improve batch window performance
 - Leverage disk and physical tape technologies in a single, cost-effective, secure solution.
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IBM TS7760

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

With cloud infrastructures on the rise and data volumes expanding exponentially, organisations 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, physical tape libraries can require long access times, making the use cost-prohibitive in transactional storage infrastructures. That's where virtualised tape storage comes in.

IBM TS7760 is a mainframe virtual tape solution that optimises data protection and business continuance for IBM Z platform data. Through the use of virtualisation 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 superb performance to support today's cloud environments. The TS7760 solution features encryption-capable high-capacity cache using 8 terabytes (TB) serial attached SCSI (SAS) self-encrypting, Federal Information Processing Standard (FIPS)-capable disk drives (DDs) with Distributed Redundant Array of Independent Disks (RAID) 6 Dynamic Disk Pools (DDPs), 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. It can store up to 1 petabyte (PB) per square foot of floor space (10.1 PB per square metre).

The TS7760 system has been designed to help enhance performance and provide the capacity needed for public, private and hybrid clouds. Deploying this innovative solution can help reduce batch processing time, total cost of ownership (TCO) and management overhead.

Gain data protection and retention for mainframe environments

The TS7760 solution supports 8 gigabits per second (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.

Boost availability through Dynamic Disk Pools

TS7760 DDPs improve data availability by minimising the rebuild duration time after a DD failure. In fact, this next-generation technology can rebuild a failed DD up to eight times faster than traditional RAID 6. By distributing the rebuild workload across a pool of drives, the impact of the process is greatly reduced.

The DDPs 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.



Protect your business with TS7760 grids

The grid communication feature allows interconnection of up to eight¹ 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 (DR), 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.

IBM TS7760 at a glance

Specifications	Single node configuration	8-cluster grid* max configuration
Usable Dynamic Disk Pool array cache	Up to 2.47 PB with expansions	Up to 19.87 PB with expansions
Virtual drives	496	3,968
TS1100 tape drives	0 to 16	0 to 128
Virtual volumes	4 million	4 million
8 Gbps FICON channels	8	64
Maximum logical paths	4,096	32,768
Warranty	One-year on-site repair	–

Physical specifications

Width	635.0 mm (25.0 in.)
Depth	1,409.7 mm (55.5 in.)
Height	1,930.4 mm (76.0 in.)
Weight	791.5 kg (1,745.0 lb.)
Supported environments [†]	IBM z/OS, IBM z/VM, IBM z/VSE, IBM z/TPF

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 (E2E) data encryption. It uses FIPS 140-2-capable DDs 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, TS7760 supports TS1150 tape drive encryption capabilities. TS1150, IBM TS1140 and some earlier TS1100 Series tape drives² 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 specialised 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 organisational 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 unauthorised 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.

Why IBM?

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

For more information

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

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* Grids of over 4 systems require RPQ

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

¹ Grids of more than 4 systems require RPQ

² IBM TS1130 and IBM TS1120 tape drives also support encryption.

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