Eyebrow

IBM Diamondback Tape Library

Ultra high-density tape for cyber resilient data archiving, deployable across any data center environmental conditions.

Highlights

Provides ultra high-density storage—up to 61.9 PB per rack

Stores up to 154.8 PB per library with 2.5:1 compression

Enables deployment in hotter data centers with no tape rooms

Improves cyber resilience with air-gapped isolation

Enterprises today confront the challenge of managing more data than ever before, a problem that's especially severe for organizations with hundreds of petabytes of data. Examples can be found in areas as diverse as machine learning, autonomous driving, pharmaceutical research, particle accelerators, and astrophysics.

In addition to storing all this information, organizations also need backup and recovery systems for everyday data protection tasks. But even those systems aren't sufficient to counter the risk posed by floods, wildfires or other natural disasters—in addition to the increasingly prevalent threat of cyberattacks.

Reduce tape costs by up to 30%

reduce co-location cost and/or eliminate tape rooms. [3]

The IBM® Diamondback Tape Library was designed to provide sustainable, cost-effective data storage to address the problems of increasing data volumes, rising energy costs, frequent cyberattacks, and shrinking IT staffs. IBM Climate-Controlled Diamondback offers the ease of deployment and service of a standard IBM Diamondback, deployable in a wide range of ASHRAE data center configurations.

IBM Diamondback is available with full IBM service through the IBM Storage Expert Care Basic and IBM Storage Expert Care Premium services. IBM Storage Expert Care is recommended to provide optimal system availability and reduce downtime of drives and libraries. Other IBM Diamondback features include:

- Support for standardized reporting via the server interface to help administrators integrate IBM Diamondback with existing software
- Support for library management via REST API commands over SCSI
- Customer serviceable, high-performance robot with dual grippers to increase mount performance and system reliability
- Optional 5U of rack space on top of the library for Fibre Channel switches, tape data movers, or IBM Storage® Archive nodes
- Support for Open Recommended Access Order (oRAO), which can deliver up to 73% faster data retrieval access[1] to your LTO Ultrium 9 / 10 tape cartridges. LTO-10 40TB provides even greater performance with xRAO[3] leveraging a higher resolution for data locates.
- A physical “air gap” to isolate tape libraries from an organization’s primary data storage systems and help improve cyber resilience

Ultra high-density storage
IBM Diamondback delivers ultra high-data density, with up to 61.9 PB[2] of native data in a single eight-square-foot library using 40TB LTO Ultrium 10 cartridges.

Massive capacity
Using standard 2.5:1 compression, each IBM Diamondback Tape Library can store up to 154.8 PB, which provides the high-capacity organizations need to retain their growing volume of data.

Hotter and Wetter data center support
IBM Climate-Controlled Diamondback features an insulated and sealed climate-controlled operation that allows tape to be deployed in up to ASHRAE A4 datacenters without special tape rooms or conditions.

Enhanced cyber resilience
Because it’s physically separated from an organization’s primary storage systems, IBM Diamondback Tape Library provides an “air gap” that helps isolate archived data and improves cyber resilience.

IBM Diamondback—Specifications

Tape drives	IBM LTO-9 and LTO-10 tape technology
Native data rate	400 MB/sec
Native capacity	LTO-9 18 TB / LTO-10 30TB or 40TB
Cartridge types	IBM Ultrium 8, 9, 10 & 10 40TB
Number of drives	Up to 14
Compression rate	2.5:1 compression
Number of tape cartridges	Up to 1584 (recommended up to 1548 data cartridges, and up to 1557 with swap cells, cleaner & diagnostic media
Maximum data transfer (native)	20.2 TB/hr
Maximum capacity (2.5:1 compression)	154.8 PB (1548 cartridges)
Drive interface	8 Gb/sec Fibre Channel (LTO-9) 32 Gb/sec Fibre Channel (LTO-10) 12 Gb/sec SAS
Service magazine	One magazine with 10 cartridge slots
Management	Remote graphical user interface (GUI) SCSI and REST API (compatible with existing TS4500 APIs)
Operating systems support	See the IBM System Storage Interoperation Center RHEL, Linux®, Unix, IBM AIX®, HPUX, Microsoft Windows

Physical characteristics	IBM Diamondback	IBM Climate-Controlled Diamondback
EIA space	42U	42U + 251.5mm depth
Height	2025 mm (79.7 in)	2025 mm (79.7 in)
Width with covers	600 mm (23.6 in)	600 mm (23.6 in)
Depth (including front and rear doors)	1225 mm (48.23 in)	1471 mm (57.9 in)
Weight of frame empty	413 kg (908 lb)	570 kg (1254 lb)
Max weight	785 kg (1727 lb)	1021 kg (2246 lb)

IBM Diamondback—Operational environmental characteristics*

	Allowable†	Recommended‡	Maximum rate of change
Dry-bulb temperature	16 to 32°C (60 to 90°F)	16 to 25°C (60 to 77°F)	5°C/Hour (9°F/Hour)
Humidity range, non-condensing	20% to 80% RH	20% to 50% RH	5% RH/Hour with no condensation
Maximum dew point temperature	22°C (72°F)		
Maximum elevation	3050 m (10,000 feet)		

IBM Climate-Controlled Diamondback—Operational environmental characteristics*

	Allowable†	Recommended‡	Maximum rate of change
Dry-bulb temperature	5 to 45°C (46 to 114°F)	16 to 32°C (60 to 77°F)	8°C/Hour (15°F/Hour)
Humidity range, non-condensing	20% to 90% RH	20% to 50% RH	10% RH/Hour
Maximum dew point temperature	24°C (75°F)		
Maximum elevation	3050 m (10,000 feet)		

* Product equipment is removed from the original shipping container and installed but not in use—for example, during repair, maintenance, or upgrade.
† Derate maximum dry-bulb temperature 1°C/300 m above 900 m (1.8°F/1,000 feet above 3,000 feet).
‡ Derate maximum recommended dry-bulb temperature 1°C/300 m above 1,800 m (1.8°F/1,000 feet above 6,000 feet).

IBM Diamondback – Power requirements

	Power consumption (watts)			Cooling requirements
	Off*	Idle	Max cont. (not peak)	Btu/Hour max continuous†
Library without drives or PDU	11	95	130	442
Each LTO-9 drive‡	0	18	37	126
Each LTO-10 drive‡	0	24.8	35.8	
Each FC 1852 PDU (in top rack)	9	9	9	31
Each FC 1853 PDU (in frame)	17	17	17	58

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* "Off" refers to power consumed when the library is connected to an AC power source and the library on/off switch is set to off.
† To calculate the total cooling required by the library in Btu/hr, multiply the total power in watts by 3.41. To convert Btu/hr to kBtu/hr, divide your result by 1000.
‡ Idle power is consumed when the drive has no tape cartridge loaded. Maximum continuous power is consumed when the drive is actively reading and writing to the tape. These power consumption values include the power that is required for the cooling fan at normal speed. In ambient environments that are hotter than the recommended range, the cooling fan might speed up and draw more power.

IBM Diamondback – Warranty and service options

Warranty term lengths	1-year, 3-year, 5-year
Warranty coverage	9 x 5 next business day, parts only, IBM on-site limited
Service Expert Care Term length	1 to 5 years
Service Expert Care Basic coverage	9 x 5 next business day, IOR (IBM on-site repair), support line
Service Expert Care Premium coverage	24 x 7 same day, IOR (IBM on-site repair), support line, predictive alerts, 30-minute response (sev1/2), remote code load, technical account manager (TAM

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Service Expert Care Advanced coverage	Available 1-5 years 24 x 7 same day IOR (IBM on-site repair) Installation usage and configuration support line.)

Top rack physical characteristics

EIA space	5U
Height	266.6 mm (10.5 in)
Width without covers†	542 mm (21.3 in)
Width with covers	600 mm (23.6 in)
Depth (including front and rear doors)	1225 mm (47.72 in)
Weight of top rack—empty‡	17.5 kg (38.5 lb)
Max loaded weight of top rack with 2 side-panels, front and rear doors	94 kg (206 lb)

Capacity depends on drives installed, number and type of cartridges used, and compression ratio achieved. Listed capacity is physical. Usable capacity may be less.
† Frame width only
‡ A top rack can optionally be installed on any Diamondback frame. Side panels and PDUs are also optional. Each side panel adds 6.8 kg (15 lbs). Each PDU adds 4.5 kg (10 lbs).

For more information
To learn more about the IBM Diamondback Tape Library, please contact your IBM representative or IBM Business Partner, or visit ibm.com/products/diamondback-tape-library

1. Based on IBM internal testing of like user data sets, not all users will see these levels of performance improvements as optimization varies according to the number of segments retrieved. Source: Tsuyoshi Miyamura and Osamu Matsumiya, IBM LTO 9 Tape Drive RAO Performance Position Paper, May 2021 –https://www.ibm.com/downloads/cas/K4M5GBZ
2. Capacity depends on drives installed, number and type of cartridges used, and compression ratio achieved. Listed capacity is physical. Usable capacity may be less.
3. When Comparing data center tape specific rooms of 2.5EB compared to IBM Climate- Controlled Diamondback in a standard data center.

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