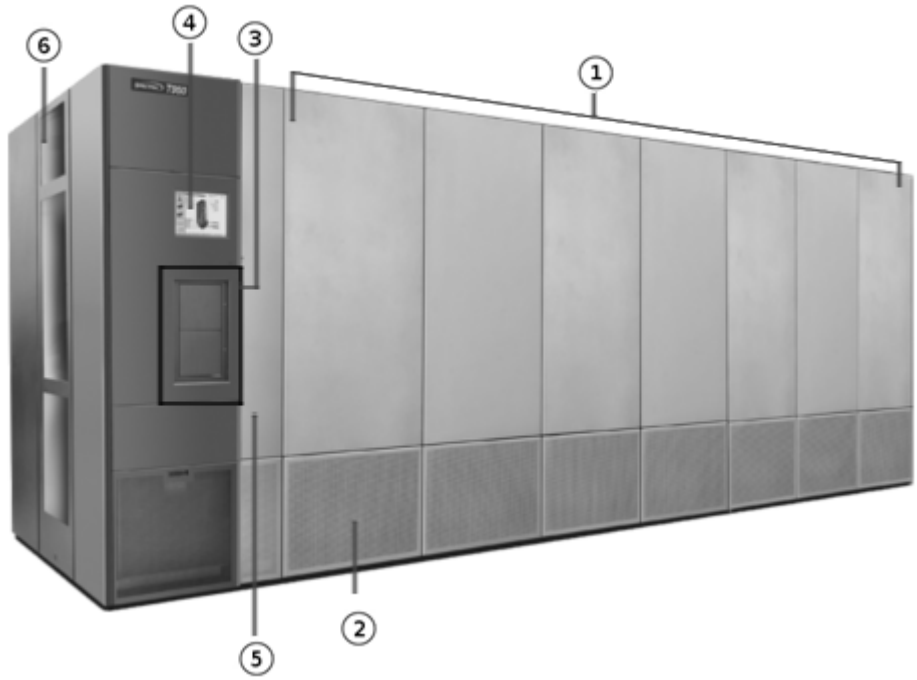
Overview

HPE T950 Tape Libraries

Meeting enterprise data growth challenges head-on, HPE T950 Tape Libraries deliver enormous scalability to keep pace with unpredictable data growth. Choose from a range of base configurations and scale up to 10,020 tape cartridges in increments of 10 slots for capacity on demand. Incorporating between 1 and 120 tape drives you can consolidate and store up to 150 PB (compressed 2.5:1) of enterprise data.



1. Drive and Media Expansion Frames
2. Air Filters and Fans (Behind cover panel)
3. Center TAP (Import/Export)
4. Operator Panel Touch Screen
5. Base Frame
6. Window Panel

Standard Features

1. **Scalability**
   a. Capacity on Demand from 50 to 10,020 LTO Tape Cartridges (7,614 Enterprise Tape Cartridges) and 1 to 120 tape drives
   b. Scale capacity in 10 LTO or 9 Enterprise tape slot increments
   c. Library frames/expansion modules add 8.71 ft^2 per frame
   d. The T950 can be configured either for LTO-6 and LTO-7 or TS11x0 Technology Drives, however mixed media support is not available within the library.
2. **High Availability**
   a. Redundant power supplies
   b. Global Spare Drive option
   c. Optional Assisted Self Maintenance Kit (ASM) for on-site parts replacement

Overview

3. **Manageability - BlueScale®**
    a. Management access on front panel of library or remotely via web-browser
    b. Easy to use web GUI
    c. BlueScale management software provides proactive hardware health monitoring
    d. BlueScale Library management provides advanced logs and reporting on media, drives, power consumption and performance
    e. Auto Support Logs (ASL) provide automatic e-mail alerts on monitored thresholds
4. **Security**
    a. Built-in BlueScale Standard Encryption
    b. Hardware Based Encryption through HPE ESKM (LTO Only)
5. **Longevity**
    a. Ideal for archiving cold or active data with a media shelf-life of up to 30 years
    b. Lowest cost per Gigabyte for longer term storage, no on-going power or energy requirement
    c. Portable, high density storage, small footprint with up to 15TB of compressed data on a single LTO-7 data cartridge
    d. LTFS for ease of use and assured interchange

Customer Benefits

1. **Capacity on demand**
    - Only buy what you need today and add storage capacity as you need it
    - Upgrade capacity in intervals of 10 LTO or 9 Enterprise tape slots at a time
    - More storage capacity in less floor space
    - Tape consolidation through capacity, performance, partitioning and reporting results in a lower total cost of ownership.
    - The T950 can be configured either for LTO-6 and LTO-7 or TS11x0 Technology Drives, however mixed media support is not available within the library.
2. **Continuous data protection**
    - Data Integrity Verification examines media health before and after data writes, when enabled
    - Integrated BlueScale Encryption provides automatic data protection
3. **Reduced cost of ownership**
    - Most energy efficient tape library for its class
    - Enhanced manageability from any location.
    - Proactive and predictive library maintenance supported by BlueScale management software
4. **Enhanced data security**
    - Provides a high level of encryption security, with compression, for strong backup data privacy to secure confidential information and address compliance quickly.
    - Supports WORM media (using LTO-7 Ultrium, LTO-6 Ultrium)
    - Providing a fail-safe method for permanently storing data records.

Family Comparison

	T950
Scalability	Scales horizontally with linear robot from 1 to 8 frames, 1-120 drives, and 50 to 10,020 slots.
Drive Technology*	LTO-7 or LTO-6 Ultrium Tape Drives, TS1150 Technology Drives
Capacity range	50 slots minimum in a single frame 10,020 slots in a max configuration of 8 frames
Maximum Drive Count	1-24 in a base frame 1-24 in each Drive expansion frame 120 in maximum configuration
Maximum Capacity (LTO-7, compressed 2.5:1)	150.3 PB using LTO-7 media (max 10,020 slots,8 frames)

Overview

Maximum Throughput (LTO-7 Native)	300 MB/s native per LTO-7 drive (36,000 MB/s maximum).
Standard Form-factor	Free standing
Dual robotics	Not Supported
Data & library security	Encryption: BlueScale Standard Encryption HPE ESKM supported (LTO Only)

*The T950 can be configured either for LTO-6 and LTO-7 or TS11x0 Technology Drives, however mixed media support is not available within the library.

Compatibility

Scalability to meet uncertain data growth

Buy only what you need today for backup and archive, and then expand the library for higher capacity and performance as your data grows.

The HPE T950 is capable of scaling capacity in as little as 10 LTO slots or 9 Enterprise slots at a time. When frame capacity reaches a maximum slot count or more throughput is required, additional expansion frames may be installed to expand the libraries capacity and total drive count.

The HPE T950 Tape Library provides a modular architecture allowing for capacity increases up to 5.52 PB / 8.71 ft^2.

The library configuration can accommodate:

- Up to 6 robotic interface modules
- 0 to 7 expansion Frames (Media Expansion, Drive Expansion)
- 50 to 10,020 possible cartridges slots maximum
- 1 to 120 LTO-7 or LTO-6 Ultrium Tape Drives, TS1150 Technology Drives.

NOTE: The HPE T950 can be configured either for LTO or TS11X0 Technology Drives – mixed media support in a T950 library is not available at this time.

HPE T950 Tape Libraries offer different expansion frames to best suit your data protection and/or archiving needs.

Frame Types	Slots (Max)	Drives (Max)	Max Throughput (Compressed)	Max Capacity (Compressed)
Base Frame for Single Frame Library	**LTO**		**LTO-7**	**LTO-7**
	1000 Slots	4 Drives	10.8 TB/hr	15 PB
	920 Slots	12 Drives	32.4 TB/hr	14.72 PB
	800 Slots	24 Drives	64.8 TB/hr	12.8 PB
	TS11X0 Technology		**TS1150 Technology**	**TS1150 Technology**
	738 Slots	4 Drives	10.1 TB/hr	18.45 PB
	684 Slots	12 Drives	30.24 TB/hr	17.4 PB
	594 Slots	24 Drives	60.48 TB/hr	14.85 PB
Base Frame for Multi Frame Library	LTO		LTO-7	LTO-7
	1000 Slots	4 Drives	10.8 TB/hr	15 PB
	920 Slots	12 Drives	32.4 TB/hr	14.72 PB
	800 Slots	24 Drives	64.8 TB/hr	12.8 PB
	TS11X0 Technology		**TS1150 Technology**	**TS1150 Technology**
	738 Slots	4 Drives	10.1 TB/hr	18.45 PB
	684 Slots	12 Drives	30.24 TB/hr	17.4 PB
	594 Slots	24 Drives	60.48 TB/hr	14.85 PB
Media Expansion	**LTO** 1,300 Slots	N/A		

Compatibility

	TS11X0 Technology 990 Slots	
Drive Expansion	LTO	
	1,070 Slots	12 Drives
	890 Slots	24 Drives
	TS11X0 Technology	
	810 Slots	12 Drives
	675 Slots	24 Drives

Data Path Failover

With the addition of two Robotic Interface Modules (RIMs), the secondary RIM may be configured to serve as a data path failover.

Media Handling

TeraPack® cases, are unique in how they are used in the library. TeraPacks increase library density beyond all competition. Multiple tape cartridges are grouped in a single container that is used throughout the library and beyond. Library robotics can transport a TeraPack within the library and select a requested tape from the TeraPack case. In this unique architecture, each TeraPack case equals 9 x Enterprise media or 10 x LTO media tape slots. A robot can move a bar-coded TeraPack case that contains 9 or 10 pieces of media in a single robotic move, while other tape libraries require 9 or 10 separate robotic moves to accomplish this task.

Traditional libraries organize tapes one-tape-deep along the library chassis wall. The T950 library uses TeraPack cases to store tapes, with each TeraPack case extending into the library's interior. This provides HPE Tape Libraries with very high density, allowing more tapes in a given area than competitors' libraries.

The library's two TeraPack Access Ports (TAPs) provide a practical and efficient method for inserting and removing media. To simplify use and reduce time spent on data protection, HPE Tape Libraries provides a configurable entry/exit pool, so all cases to be exported are identified before the operator unloads media. The TeraPack cases can be swiftly unloaded through the two TAPs, 18 Enterprise tapes or 20 LTO tapes at a time. Because tapes are loaded in multiple quantities, bulk loads and unloads save significant time.

BlueScale Management

The T950 Tape library provides a graphical interface that is extremely easy to use. You can monitor and manage the library from the tape library's front panel or remotely. Reporting is also straightforward - t the library, drive and media status can be viewed in a glance with complete reporting available if needed at the touch of a button. BlueScale is included with the T950 as a standard feature.

Library Lifecycle Management

BlueScale Library Lifecycle Management (LLM) tracks the library and its components across the library's lifecycle. Through Hardware Health Monitoring (HHM), BlueScale tracks maintenance thresholds for key library components and notifies you when maintenance tasks are required to keep your library in optimum operating condition. When a component reaches its maintenance threshold, the status bar displays a Maintenance Notification icon.

Library Lifecycle Management (LLM) collects or maintains the following information:

Compatibility

- Library serial number and name (if configured)
- Information about key library components monitored by HHM including maintenance thresholds
- Transporter moves including Drive-to-drive moves, drive-to-slot moves, slot-to-slot moves, slot-to-drive moves, and importing/exporting media

Drive Lifecycle Management (DLM)

DLM gathers data each time a tape is unloaded from a drive. The data stored by the library includes the following information about the last 50 tapes unloaded:

- Read/write errors, including soft and hard errors
- Tape alerts
- Flags generated while the tape was loaded in the drive
- Recent errors or recent information posted through the drive's single-character display

The library uses this data to generate a report on overall drive health as well as health reports for individual drives. These reports, along with BlueScale drive clean, test, and resets, help you determine whether a problem exists with a drive, a tape, or another library component.

Drive Performance Monitoring

The Drive Performance Monitor lets you get the most out of your library by ensuring that drives are performing at the highest possible throughput rate. Performance monitoring graphically displays the read/write performance of the drives in the library. Metrics can be tracked per individual drive or by tracking overall library throughput.

EnergyAudit Power Monitoring

EnergyAudit, the BlueScale power monitoring feature, tracks power use over time and by component. Customers can use this information to adjust and optimize power use. Tracking this data becomes increasingly important as energy prices continue to climb.

Auto Drive Clean

Maintenance TeraPack

Auto Drive Clean provides library-based cleaning of drives without user intervention. The Auto Drive Clean feature uses a dedicated cleaning partition with specially labeled Maintenance TeraPacks. The cleaning partition can be shared by multiple storage partitions and is used by the library to automatically clean drives whenever necessary.

Automated drive cleaning results in fewer failed tape read/write operations and is the recommended method for cleaning drives.

Advanced Reporting

Syslog

A Syslog server is used to easily monitor all system messages. Once configured, the library automatically sends all system messages to a designated Linux server that has been configured to support Syslog. Syslog is a standard for forwarding log messages over an Internet Protocol (IP) computer network. It provides separation of the software that generates log messages from the system

Compatibility

that stores the messages.

AutoSupport Logs (ASL)

The HPE T950 Tape libraries have a Phone Home feature, AutoSupport, which can be configured to automatically create and send e-mail messages about issues or problems to designated e-mail users, including technical support. The data included in these e-mail messages includes trace information, log data, a system description, and information about any message or issue. You can also elect to copy this same data to a USB device, if security concerns prevent the use of automatic outbound e-mail. You can set whether some or all messages are sent, per severity level of the message. This easy-to-use and easy-to-administer feature helps identify issues before they turn into problems, and speeds the resolution of problems. If the site is set up to use SSL, the Phone Home service uses the secure connection; otherwise, the service uses the network

Best in class reliability

As data becomes more and more mission critical, and downtime becomes more costly to the enterprise, customers are requiring high availability consolidated storage solutions which offer hot-plug components and redundancies of key operating subsystems (tape drives, power supplies, control modules and filters).

Data Encryption for added security

ESKM: The Hewlett Packard Enterprise Secure Key Manager, using the industry-standard KMIP protocol, reduces your risk of a costly data breach and reputation damage while improving regulatory compliance with a secure centralized encryption key management solution for LTO-7 and LTO-6 within the HPE T950 tape library. In addition, the ESKM provides strong auditable security and reliable lifetime key archival. The ESKM with KMIP and LTO-7/LTO-6 drive encryption in the T950 Tape Library provides a complete and secure privacy solution to protect customer's confidential data.

Bulk media import/export for significant time savings

The Center TAP (TeraPack Access Point) allows for up to 20 LTO or 18 Enterprise tape cartridges to be imported/exported into the library at one time.

LTO Ultrium Technology

LTO (Linear Tape Open) Ultrium Tape Drives use best of breed technology. By taking the best features from other tape technologies and combining them into a single new technology, Ultrium tape drives are in a league of their own. LTO technology is an open industry standard format.

Data Rate Matching

Data Rate Matching combines sophisticated buffer management with variable tape drive motor speeds to match the tape drive transfer rate to the host output. This feature ensures that the tape drive continues to stream data regardless of the environment, and brings three big advantages:

- It optimizes performance and maximizes overall efficiency, allowing the drive to respond immediately to any data speed changes from the host.
- It minimizes rewinding and repositioning of the tape, significantly reducing physical wear and increasing reliability.
- It minimizes the power requirements for the drive by reducing the number of repositions needed.

LTO Ultrium & TS Technology Tape Drives	**data transfer rate range** (native)
LTO-7 Ultrium Drives	101 to 300 MB/s

Compatibility

LTO-6 Ultrium Drives	40 to 160 MB/s
TS1150 Technology Drives	112 to 360 MB/s

WORM (Write-Once, Read-Many) Drive and Media Support

Critical to the success of data retention policies in highly regulated environments is the ability to store and manage data in an unalterable state. Following stringent guidelines set forth by regulatory agencies such as the SEC and HIPPA, IT organizations must now integrate new solutions and policies that can verify the integrity of stored data for periods that can extend well beyond seven years. Every generation of LTO Ultrium since LTO-3 tape drives feature the ability to archive and store data in a read-only, non-rewriteable format that meets the most stringent regulatory guidelines. Using a combination of integrated fail-safe features in the drive firmware, cartridge memory, and tape formatting, LTO Ultrium provides the ability to archive large amounts of data for periods of up to 30 years in a secure, untampered state. Ultrium tape drives include support for both rewritable and WORM media providing for a secure, long-term archiving solution into any data protection strategy. LTO Ultrium WORM provides the following advantages:

- A single drive to support all backup and archiving needs
- Two distinctive tape cartridges to easily distinguish and manage both rewriteable and WORM data cartridges
- A specially designed WORM data cartridge with multiple integrated fail-safe features to prevent accidental or intentional overwriting of data
- Support from many backup and archiving software vendors, providing the most comprehensive and mainstream support in the industry

HPE Certified TeraPack Media

HPE Certified TeraPack Media is designed to ensure that customers have the most reliable and automated tape storage available. No other supplier places as much emphasis on continual enhancements and features that simplify all aspects of the media management process. From manufacturer selection to testing and customer shipment, every step of the certified media process is designed to ensure you have the most reliable and automated tape storage available.

1. **Quality** - All manufactured tape is not the same, leaving your data to chance with suspect media. Only the highest quality media available on the market becomes HPE Certified TeraPack Media. This ensures you have the most reliable and worry-free data protection possible

2. **Clean** - The CarbideClean® process is a unique enhancement that extends the life of your tape drives and enhances the performance and capacity of your tapes. HPE Certified TeraPack Media with CarbideClean ensures your media is debris-free, allowing your system to run at peak performance.

3. **Intelligence** - Media Lifecycle Management (MLM) reduces the most common media-related failures. MLM allows you to proactively manage your tape inventory through simple monitoring of over 40 health statistics and automatically identifies at-risk tapes ready for retirement.

4. **Verification** - Certified Media assures data integrity using an integrated, intelligent and comprehensive set of Data Integrity Verification (DIV) tools when integrated with your tape library. PreScan verifies your tapes are safe prior to usage and QuickScan and FullScan verify your data has been properly written to tape

5. **Protect** - When combining HPE Certified TeraPack Media and our tape library family's integrated BlueScale Encryption Key Management, your data is protected with a

Compatibility

straightforward, easily installed solution.

6. **Management** – Media arrives on customers doorsteps, individual tapes unwrapped with pre-applied barcode labels bundled in TeraPack containers and ready for bulk-loading into your tape library

7. **Warranty** - Lifetime Guarantee warrants our tapes to be free from defects in materials and workmanship for the life of the media. We'll exchange any defective tape free of charge

Data Integrity Verification

HPE T950 Tape Libraries' data integrity verification features a set of background processes that provide multiple levels of integrity verification for LTO data cartridges. These features help ensure that data stored over any length of time, including archived data stored for years, can be retrieved as needed. These processes include PreScan and PostScan (QuickScan or Fullscan). PreScan checks newly imported tapes to make sure they are ready to use (for example, in good health and not write-protected.) FullScan verifies readability of all the data written on the tape. Quickscan verifies the readability of the data on a single pass of the tape.

PreScan: Once configured, the library automatically inserts each newly imported LTO cartridge into an LTO tape drive in the partition and checks the drive to determine the following about the cartridge:

- Non-MLM-enabled tape
- Broken or dislodged leader pin
- Poor media health
- Write protected
- Encrypted tape with a moniker not currently stored in the library

PostScan: After data is written to tape, a PostScan can be conducted to verify that the data written to the tape has no errors. Using either **QuickScan** or **FullScan**, the drive will scan each LTO cartridge and confirm that there are no media errors on the tape by reading either a single length of one wrap of tape (16 tracks on LTO) or the entire length of the tape, up to the end of the recorded data (EOD).

The PostScan process is performed by the library independently of the backup application normally used to read and write data to the tape. The results of the scan are stored in the library's media-health database. The user can set triggers to check the health of tapes over an interval of time, to ensure that the data is valid. You can also verify a specific tape's data integrity manually/by request.

QuickScan Using Global Spare— A Global Spare drive can be used to verify the integrity of all the data on a tape in a single wrap, from the beginning of the tape up to the end of first wrap or the end of recorded data (EOD), whichever comes first. Using a Global Spare drive avoids potential delays in normal operation while a QuickScan is being performed.

Software Support

The HPE T950 Tape Libraries are supported on the following ISV's for LTO drives:

- HPE Data Protector
- ARCserve Backup
- EMC Legato Networker
- IBM Spectrum Protect
- VERITAS Backup Exec
- VERITAS NetBackup
- CommVault Simpana
- Oracle Diva Archive
- Quantum StorNext
- SGI DMF
- MassTech MassStore
- SGL Flashnet

Compatibility

- Dell/Quest Software
- IBM HPSS

Please contact sales for further details including current TS11X0 Technology Compatibility.

Encryption Support

BlueScale Standard Encryption: Included with Tape Library

The HPE T950 Tape Libraries are supported on the following Encryption Key Servers:
HPE ESKM 5.0 (LTO Only)

Service and Support, and Warranty Information

Warranty Included with the Product

The HPE T950 has a standard warranty that extends one year from the date of shipment from the factory. This warranty includes a Next Business Day service contract. Additional years of warranty service can be purchased.

Service and Support

A wide range of support operations and professional services are offered. Support options include ongoing telephone and web support, an Assisted Self-Maintenance (ASM) option that stores customer-replaceable spare parts on-site, a global spare drive option, and built-in "phone home" support through the library's AutoSupport feature. Professional Services further extends options through site visits and preventive maintenance options. Customers automatically receive complete installation and integration services.

Recommended Support Services

Four-Hour On-Site Service

Four-Hour On-Site Service includes:

- Telephone access to a Technical Support representative, 24 hours a day, 7 days a week, 365 days a year (including evenings, weekends, and holidays).
- Upon verification that the unit has malfunctioned and a part replacement is required, a service visit from a field service representative will be dispatched to arrive on-site within four hours, including evenings, weekends, and holidays. The customer may specify an arrival time after the four-hour window. The customer may be requested to replace the part if appropriate.
- Remote troubleshooting 24 hours a day, 7 days a week, 365 days a year.
- 24 x 7 x 365 access to the Support Web Portal, knowledge base and online documentation.

Next Business Day On-Site Service

Next Business Day On-Site Service includes:

- Access to a Technical Support representative on any business day (not including evenings, weekends, or holidays) from 8:00 a.m. to 5:00 p.m. (customer local time).
- A service visit from a field service representative, upon verification that the unit has malfunctioned and a part replacement is required. If Technical Support is notified by 5:00 p.m. (customer local time), a field service representative will be dispatched for arrival on the following business day between 8:00 a.m. and 5:00 p.m.
- Remote troubleshooting between 8:00 a.m. and 5:00 p.m. (customer local time) during the standard business week, excluding nationally recognized holidays in the customer's location.
- 24 x 7 x 365 access to the Support Web Portal, knowledge base and online documentation.

Service and Support, Warranty Information

Next Business Day Service

Next Business Day service includes:

- Telephone support between 8:00 a.m. and 5:00 p.m. (customer local time) during the standard business week of the country where the equipment is registered with the Library Service Provider, excluding any nationally recognized holidays in that location.
- Next business day delivery of parts. Upon verification that the product has malfunctioned and a part replacement is required, the part will be shipped for delivery and customer installation the next business day. Parts must be shipped by 14:30 p.m. to arrive the next business day.
- Remote troubleshooting between 8:00 a.m. and 5:00 p.m. (customer local time) during the standard business week, excluding nationally recognized holidays in the customer's location.
- 24 x 7 x 365 access to the Support Web Portal, knowledge base and online documentation**.**

Assisted Self Maintenance (ASM)

Recognizing that some users prefer to have hands-on control over library uptime, we design our products so that major components are customer-replaceable. With our Assisted Self-Maintenance (ASM) support options, spare components are placed at your facility, ready to be installed by your IT staff in your data storage environment. Most of the swappable components can be replaced, with only a screwdriver, in less than three minutes. HPE Tape Libraries are the only libraries in the industry that ship with on-site, user-replaceable components that include:

- Drive
- Power supply
- Air filters
- Connectivity controller (RIM – Robotics Interface Module)The ASM Gold program adds the following components to the on-site kit:
- Transporter (robotics) – ASM Gold
- Library Control Module/Robotics Control Module – ASM Gold

The library robotics replacement procedure requires only a screwdriver, which is included in the ASM kit. With ASM, data center staff can replace components as directed by the tape library technical support team to resolve library issues as they arise. Instead of having to wait for an average of eight hours for an engineer to arrive at the site, the T950 library can be running again in less than five percent of the usual wait time.

More Information **https://support.spectralogic.com/**

Technical Specifications

LTO T950 Frames

Select one:

LTO Base Frame Single Frame Configuration – No Expansion Frames are being added	Part Number
HPE T950 Base Frame 1 Drive Bay assembly Maximum 4 LTO Drives 1000 Slots	Q1G58A
HPE T950 Base Frame 3 Drive Bay assembly Maximum 12 LTO Drives 920 Slots	Q1G59A
HPE T950 Base Frame 6 Drive Bay assembly Maximum 24 LTO Drives 800 Slots	Q1G61A

- Includes 20 Entry/Exit Slots, zero drives, and 50 slots enabled

NOTE: As drives and slots are added, additional Expansion Frames may be required. Please contact your local sales representative to ensure desired capacity is achieved.

NOTE: This product is TAA (Trade Agreements Act) compliant.

LTO Base Frame Multi-Frame Configuration – Expansion Frames being added to Base Frame	Part Number
HPE T950 Base Frame 1 Drive Bay assembly for Multi Frame Configurations Maximum 4 LTO Drives 1000 Slots	Q1G64A
HPE T950 Base Frame 3 Drive Bay assembly for Multi Frame Configurations Maximum 12 LTO Drives 920 Slots	Q1G65A
HPE T950 Base Frame 6 Drive Bay assembly for Multi Frame Configurations Maximum 24 LTO Drives 800 Slots	Q1G66A

- Includes 20 Entry/Exit Slots, zero drives, and 50 slots enabled

NOTE: As drives and slots are added, additional Expansion Frames may be required. T950 Expansion Frame kits are required. Please contact your local sales representative to ensure desired capacity is achieved.

NOTE: This product is TAA (Trade Agreements Act) compliant.

LTO T950 Expansion Frames	Part Number
HPE T950 3 Drive Bay Assembly Expansion Frame Maximum 12 LTO Drives 1,010 Slots	Q1G60A
HPE T950 6 Drive Bay Assembly Expansion Frame Maximum 24 LTO Drives 890 Slots	Q1G62A
HPE T950 LTO Media Expansion Frame 1,300 Slots	Q1G63A
HPE LTO Entry/Exit TeraPack 10-slot No Media	Q0H10A

- Qty 5 Entry/Exit TeraPacks will be added to a new T950 single and T950 multi-frame configurations

TS11X0 Technology T950 Frames

Select one Base Frame:

Technical Specifications

TS11X0 Technology Base Frame Single Frame Configuration – No Expansion Frames are being added	Part Number
HPE T950 Base Frame 1 Drive Bay Assembly Maximum 4 TS Technology Drives 738 Slots	Q1G67A
HPE T950 Base Frame 3 Drive Bay Assembly Maximum 12 TS Technology Drives 684 Slots	Q1G68A
HPE T950 Base Frame 6 Drive Bay Assembly Maximum 24 TS Technology Drives 594 Slots	Q1G70A

- Includes 18 slot Entry/Exit Slots, zero drives, and 45 slots enabled

  NOTE: As drives and slots are added, additional Expansion Frames may be required. Please contact your local sales representative to ensure desired capacity is achieved.

  NOTE: This product is TAA (Trade Agreements Act) compliant.

TS11X0 Technology Base Frame Multi-Frame Configuration – Expansion Frames being added to Base Frame	Part Number
HPE T950 Base Frame 1 Drive Bay Assembly for Multi Frame Configurations Maximum 4 TS Technology Drives 738 Slots	Q1G74A
HPE T950 Base Frame 3 Drive Bay Assembly for Multi Frame Configurations Maximum 12 TS Technology Drives 684 Slots	Q1G75A
HPE T950 Base Frame 6 Drive Bay Assembly for Multi Frame Configurations Maximum 24 TS Technology Drives 594 Slots	Q1G76A

- Includes 18-slot Entry Exit slots, zero drives, and 45 slots enabled

  NOTE: As drives and slots are added, additional Expansion Frames may be required. T950 Expansion Frame kits are required. Please contact your local sales representative to ensure desired capacity is achieved.

  NOTE: This product is TAA (Trade Agreements Act) compliant.

TS11X0 Technology T950 Expansion Frames	Part Number
HPE T950 3 Drive Bay Assembly Expansion Frame Maximum 12 TS Technology Drives 810 Slots	Q1G69A
HPE T950 6 Drive Bay Assembly Expansion Frame Maximum 24 TS Technology Drives 675 Slots	Q1G71A
HPE T950 TS Technology Media Expansion Frame 990 Slots	Q1G72A
HPE TS11X0 Technology Entry/Exit TeraPack 9-slot No Media	Q0H14A

Qty 5 Entry/Exit TeraPacks will be added to a new T950 single and T950 multi-frame configurations

Technical Specifications

T950 Expansion Frames Kits – required for Multi-Frame T950 configurations

HPE T950 Multiple (2 Frames) Assembly Kit	Q1G52A
HPE T950 Multiple (3 Frames) Assembly Kit	Q1G53A
HPE T950 Multiple (4 Frames) Assembly Kit	Q1G54A
HPE T950 Multiple (5 Frames) Assembly Kit	Q1G55A
HPE T950 Multiple (6 Frames) Assembly Kit	Q1G56A
HPE T950 Multiple (8 Frames) Assembly Kit	Q1G57A

NOTE:

- Customers may also be required to also purchase the necessary number of drives, Fibre Channel cables, tape media, power cords and software licenses in order to complete the library solution.
- Installation and Support services will be quoted as a part of each library order.

Tape Drives, Slot/Capacity Licenses, and Certified TeraPack Media

LTO-7 Drive Options	**Part Number**
HPE T950 LTO-7 Ultrium Fibre Channel Full Height Drive EDBA Sled (New Or Upgrade Option)	Q0H09A
HPE T950 LTO-7 Ultrium Fibre Channel Full Height Drive Sled (Upgrade Option)	Q0H08A
Quantity: 1 to 24 drives per drive frame; up to 120 drives maximum	

LTO-6 Drive Options	
HPE T950 LTO-6 Ultrium Fibre Channel Full Height Drive EDBA Sled (New or Upgrade Option)	Q0H02A
HPE T950 LTO-6 Ultrium Fibre Channel Full Height Drive Sled (Upgrade Option)	Q0H01A
Quantity: 1 to 24 drives per drive frame; up to 120 drives maximum	

TS1150 Technology Drive Options	**Part Number**
HPE T950 TS1150 Technology Fibre Channel Drive EDBA Sled (New Or Upgrade Option)	Q0H17A
Quantity: 1 to 24 drives per drive frame; up to 120 drives maximum	

LTO Slots/Capacity Licenses	**Part Number**
HPE T950 LTO BlueScale Storage Chamber 10-slot LTU	Q0G86A
LTO slots are purchased in 10 slot increments.	

TS11X0 Technology Slots/Capacity Licenses	**Part Number**
HPE T950 TS11X0 Technology BlueScale Storage Chamber 9-slot LTU	Q0H11A
TS11X0 Technology slots are purchased in 9 slot increments.	

Technical Specifications

HPE Certified LTO TeraPack Media

Non-Custom Labeled Certified LTO TeraPacks Data Cartridges

HPE LTO-6 BaFe Non-custom Labeled TeraPack 10 Certified CarbideClean Data Tapes	Q1G95A
HPE LTO-6 MP Non-custom Labeled TeraPack 10 Certified CarbideClean Data Tapes	Q1G97A
HPE LTO-7 Non-custom Labeled TeraPack 10 Certified CarbideClean Data Tapes	Q1H01A

Custom Labeled Certified LTO TeraPacks Data Cartridges

NOTE: Custom labeled products allow customers to customize a specific sequence printed on each label. A custom barcode label order form must be completed.

HPE LTO-6 BaFe Custom Labeled TeraPack 10 Certified CarbideClean Data Tapes	Q1G96A
HPE LTO-6 MP Custom Labeled TeraPack 10 Certified CarbideClean Data Tapes	Q1G98A
HPE LTO-7 Custom Labeled TeraPack 10 Certified CarbideClean Data Tapes	Q1H02A

Non-Custom Labeled Cleaning LTO TeraPacks

HPE LTO TeraPack 10 Certified Cleaning Tapes	Q1H03A

TeraPack Dust Cover (LTO)

HPE LTO TeraPack 10-slot Dust Cover	Q1H05A

Part Name	HPE LTO-6 BaFe Cert TeraPack Tapes	HPE LTO-6 BaFe Cust Cert TeraPack Tapes	HPE LTO-6 MP Cert TeraPack Tapes	HPE LTO-6 MP Cust Cert TeraPack Tapes	HPE LTO-7 Cert TeraPack Tapes	HPE LTO-7 Cust Cert TeraPack Tapes	HPE LTO Cleaning TeraPack Tapes
Part Number	Q1G95A	Q1G96A	Q1G97A	Q1G98A	Q1H01A	Q1H02A	Q1H03A
Format	LTO-6 BaFe	LTO-6 BaFe Cust	LTO-6 MP	LTO-6 MP	LTO-7	LTO-7	LTO Cleaning Tapes
Media Format	Re-Writable	Re-Writable	Re-Writable	Re-Writable	Re-Writable	Re-Writable	
Quantity per Package	10	10	10	10	10	10	10
Capacity	2.5 TB Uncompressed	2.5 TB Uncompressed	2.5 TB Uncompressed	2.5 TB Uncompressed	6.0 TB Uncompressed	6.0 TB Uncompressed	
	6.25 TB Compressed	6.25 TB Compressed	6.25 TB Compressed	6.25 TB Compressed	15 TB Compressed	15 TB Compressed	
Tape Length	846 m	846 m	846 m	846 m	960 m	960 m	319 m
Tape Width (Metric)	12.65 mm	12.65 mm	12.65 mm	12.65 mm	12.65 mm	12.65 mm	12.65 mm
Tape Thickness	6.1 um	6.1 um	6.4 um	6.4 um	5.6 um	5.6 um	8.9 um
Particle Type	BaFe	BaFe	MP	MP	BaFe	BaFe	MP
Bit Density	343 kbits/inch	343 kbits/inch	343 kbits/inch	343 kbits/inch	485 kbits/inch	485 kbits/inch	
Number of Data Tracks	2176	2176	2176	2176	3584	3584	
Magnetic Layer Coercivity	2280 Oe	2280 Oe	2850 Oe	2850 Oe	2850 Oe	2850 Oe	
Archival Storage Life	30 years	30 years	30 years	30 years	30 years	30 years	
Warranty	Limited Lifetime Warranty	Limited Lifetime Warranty	Limited Lifetime Warranty	Limited Lifetime Warranty	Limited Lifetime Warranty	Limited Lifetime Warranty	Limited Lifetime Warranty

Technical Specifications

Environmental Operating							
Temperature	10 to 45°C	10 to 45°C	10 to 45°C	10 to 45°C	10 to 45°C	10 to 45°C	10 to 45°C
	(50 to 113°F)	(50 to 113°F)	(50 to 113°F)	(50 to 113°F)	(50 to 113°F)	(50 to 113°F)	(50 to 113°F)
Relative Humidity	10-80%	10-80%	10-80%	10-80%	10-80%	10-80%	10-80%
Maximum wet bulb temperature	26°C (79°F)	26°C (79°F)	26°C (79°F)	26°C (79°F)	26°C	26°C	26°C
Environmental Storage Conditions							
Temperature	16 to 32°C	16 to 32°C	16 to 32°C	16 to 32°C	16 to 32°C	16 to 32°C	16 to 32°C
	(61 to 90°F)	(61 to 90°F)	(61 to 90°F)	(61 to 90°F)	(61 to 90°F)	(61 to 90°F)	(60 to 89°F)
Relative Humidity	20-80%	20-80%	20-80%	20-80%	20-80%	20-80%	20-60%
Maximum wet bulb temperature	26°C (79°F)	26°C (79°F)	26°C (79°F)	26°C (79°F)	26°C (79°F)	26°C (79°F)	26°C (79°F)

HPE Certified TS11X0 Technology TeraPack Media

Non-Custom Labeled Certified TS11X0 Technology TeraPacks Data Cartridges

HPE TS1150 JD Non-custom Labeled TeraPack 9 Certified CarbideClean Data Tapes Q1G99A

Custom Labeled Certified TS11X0 Technology TeraPacks Data Cartridges

NOTE: Custom labeled products allow customers to customize a specific sequence printed on each label. A custom barcode label order form must be completed.

HPE TS1150 JD Custom Labeled TeraPack 9 Certified CarbideClean Data Tapes Q1H00A

Non-Custom Labeled Cleaning TS11X0 Technology TeraPacks

HPE TS11X0 Technology TeraPack 9 Certified Cleaning Tapes Q1H04A

Part Name	HPE TS1150 Cert TeraPack Tapes	HPE TS1150 Cust Cert TeraPack Tapes	HPE TS Series Cleaning TeraPack Tapes
Part Number	Q1G99A	Q1H00A	Q1H04A
Format	TS1150	TS1150 Cust	
Media Format	Re-Writable	Re-Writable	
Quantity per Package	9	9	9
Capacity	10 TB Uncompressed	10 TB Uncompressed	
	25 TB Compressed	25 TB Compressed	
Tape Length	1,072 m	1,072 m	318 m
Warranty	Limited Lifetime Warranty	Limited Lifetime Warranty	Limited Lifetime Warranty
Environmental Operating			
Temperature	16 to 32°C	16 to 32°C	16 to 32°C
	(61 to 90°F)	(61 to 90°F)	(60 to 90°F)

Technical Specifications

Relative Humidity	20-80%	20-80%	8-10%
Maximum wet bulb temperature	26°C (79°F)	26°C (79°F)	23°C (79°F)
Environmental Storage Conditions			
Temperature	16 to 25°C	16 to 25°C	
	(61 to 77°F)	(61 to 77°F)	
Relative Humidity	20-50%	20-50%	
Maximum wet bulb temperature	26°C (79°F)	26°C (79°F)	

HPE T950 Tape Library Licenses

HPE T950 KMIP Encryption Key - enables 24 Drives Q0G92A

NOTE: Quantity 1 license needed per Drive Frame

HPE T950 Shared Library Services Direct Connect Software – enables tape library partitioning Q0G94A

HPE T950 Shared Library Services QIP RIM Connect Software – enables tape library partitioning Q0H03A

Additional Options

Model Name	Part Number
HPE RIM2 Robotic Interface Module	Q0H07A
HPE BlueScale SD Card	Q0H06A
HPE T950 to T950B Exp Frame Connect Kit (Upgrades)	Q0G98A
NOTE :Needed to connect T950 frame to a T950B Expansion Frame	
HPE LS Gen3 2x Upgrade	Q0G99A
HPE LS Gen3 1x Upgrade	Q0G97A
HPE N+1 Failover Power Pack Kit	Q0G89A
HPE 5-12V 8Amp Power Pack	Q0G90A
Shipping Crate Ramp	Q0G85A
HPE Drive Bay Assembly	Q0G88A
HPE Ethernet Drive Bay Assembly	Q0H00A
NOTE : Each Drive Bay Assembly can hold up to 4 LTO or TS11X0 Technology Drives and 1 Robotic Interface Module	
HPE T950 VAX Bumper (Upgrades)	Q0G91A

Technical Specifications

Fibre Channel Cables

HPE 10m Duplex Multi-mode 50u LC/LC Optical Cable	Q0G67A
HPE 20m Duplex Multi-mode 50u LC/LC Optical Cable	Q0G68A
HPE 50m Duplex Multi-mode 50u LC/LC Optical Cable	Q0G69A

Power Cord

HPE 2.5m 220-240V AU Power Cord	Q0G56A
HPE 2.5m 220-240V ZA/IN Power Cord	Q0G57A
HPE 2.5m 220-240V UK Power Cord	Q0G58A
HPE 2.5m 220-240V IL Power Cord	Q0G59A
HPE 2.5m 220-240V JP Power Cord	Q0G60A
HPE 2.5m 220-240V EU Power Cord	Q0G61A
HPE NEMA L6-30P 220-240V 4.5m US Power Cord	Q0G62A
HPE C19 IEC ZA Power Cord	Q0G63A
HPE C19 IEC to NEMA 5-15P 110-120V 2.5m Power Cord	Q0G64A
HPE C13 to NEMA 5-15P 110-240V 50-60Hz 14AWG 2m Power Cord	Q0G65A
HPE C19 IEC309 220-240V 12AWG 4.6m Power Cord	Q0G66A
HPE C19 L6-20P 220-240V 20Amp 4.5m US Locking Power Cord	Q0G70A

T950 Support Options

HPE T950 1yr Gold Assisted Self Maintenance	Q0H21A
HPE T950 1yr Gold Assisted Self Zone 2 Maintenance	Q0H22A
HPE T950 2yr Gold Assisted Self Maintenance	Q0H23A
HPE T950 2yr Gold Assisted Self Zone 2 Maintenance	Q0H24A
HPE T950 1yr 7x24 with 4hr Onsite Support	Q0H25A
HPE T950 1yr 7x24 with 4hr Onsite Zone 2 Support	Q0H26A
HPE T950 1yr Next Business Day Onsite Support	Q0H27A
HPE T950 1yr Next Business Day Onsite Zone 2 Support	Q0H28A
HPE T950 2yr 7x24 with 4hr Onsite Support	Q0H29A
HPE T950 2yr 7x24 with 4hr Onsite Zone 2 Support	Q0H30A
HPE T950 2yr Next Business Day Onsite Support	Q0H31A
HPE T950 2yr Next Business Day Onsite Zone 2 Support	Q0H32A
HPE T950 BlueScale Software 1yr 7x24 with 4hr Onsite Support	Q0H33A
HPE T950 BlueScale Software 1yr 7x24 with 4hr Onsite Zone 2 Support	Q0H34A
HPE T950 BlueScale Software 2yr 7x24 with 4hr Onsite Support	Q0H35A
HPE T950 BlueScale Software 2yr 7x24 with 4hr Onsite Zone 2 Support	Q0H36A
HPE T950 BlueScale Software 2yr Next Business Day Onsite Support	Q0H37A
HPE T950 BlueScale Software 2yr Next Business Day Onsite Zone 2 Support	Q0H38A
HPE T950 Drives 1yr 7x24 with 4hr Onsite Support	Q0H40A
HPE T950 Drive 1yr 7x24 with 4hr Onsite Zone 2 Support	Q0H41A

Technical Specifications

	HPE T950 Drive 2yr 7x24 with 4hr Onsite Support	Q0H42A
	HPE T950 Drive 2yr 7x24 with 4hr Onsite Zone 2 Support	Q1F80A
	HPE T950 Drive 2yr Next Business Day Onsite Support	Q1F81A
	HPE T950 Drive 2yr Next Business Day Onsite Zone 2 Support	Q1F82A
	HPE T950 Drive Expansion Frame 1yr 7x24 with 4hr Onsite Support	Q1F83A
	HPE T950 Drive Expansion Frame 1yr 7x24 with 4hr Onsite Zone 2 Support	Q1F84A
	HPE T950 Drive Expansion Frame 2yr 7x24 with 4hr Onsite Support	Q1F85A
	HPE T950 Drive Expansion Frame 2yr 7x24 with 4hr Onsite Zone 2 Support	Q1F86A
	HPE T950 Drive Expansion Frame 2yr Next Business Day Onsite Support	Q1F87A
	HPE T950 Drive Expansion Frame 2yr Next Business Day Onsite Zone 2 Support	Q1F88A
	HPE T950J 1yr Gold Assisted Self Maintenance	Q1F89A
	HPE T950J 1yr Gold Assisted Self Zone 2 Maintenance	Q1F90A
	HPE T950J 2yr Gold Assisted Self Maintenance	Q1F91A
	HPE T950J Zone 2 2yr Gold Assisted Self Maintenance	Q1F92A
	HPE T950J TS11X0 Technology Drive 1yr 7x24 with 4hr Onsite Support	Q1F93A
	HPE T950J TS11X0 Technology Drive 1yr 7x24 with 4hr Onsite Zone 2 Support	Q1F94A
	HPE T950J TS11X0 Technology Drive 2yr 7x24 with 4hr Onsite Support	Q1F95A
	HPE T950J TS11X0 Technology Drive 2yr 7x24 with 4hr Onsite Zone 2 Support	Q1F96A
	HPE T950J TS11X0 Technology Drive 2yr Next Business Day Onsite Support	Q1F97A
	HPE T950J TS11X0 Technology Drive 2yr Next Business Day Onsite Zone 2 Support	Q1F98A
	HPE T950 RIM QIP 1yr 7x24 with 4hr Onsite Support	Q1F99A
	HPE T950 RIM QIP 1yr 7x24 with 4hr Onsite Zone 2 Support	Q1G00A
	HPE T950 RIM QIP 2yr 7x24 with 4hr Onsite Support	Q1G01A
	HPE T950 RIM QIP 2yr 7x24 with 4hr Onsite Zone 2 Support	Q1G02A
	HPE T950 RIM QIP 2yr Next Business Day Onsite Support	Q1G03A
	HPE T950 RIM QIP 2yr Next Business Day Onsite Zone 2 Support	Q1G04A
	HPE T950 1 Unit Co-term Support	Q0H39A
T950 Professional Services Offerings	HPE Professional Services T950 Onsite Installation Base	Q0G71A
	HPE PS T950 Expn Frame Install	Q0G72A
	HPE Professional Services T950 Expansion Frame Installation Upgrade	Q0G73A
	HPE Professional Services T950 Onsite (per Day) Consulting and Training	Q0G74A
	HPE Professional Services T950 Onsite (per Week) Consulting and Training	Q0G75A
	HPE Professional Services T950 Annual Preventive Maintenance	Q0G76A
	HPE Professional Services T950 Individual Preventive Maintenance	Q0G83A

Technical Specifications

Dimensions	**Form Factor**	**Free standing**
	Frames (Base, Drive Expansion, Media Expansion)- Physical (HxWxD)	79.125-82 x 29.0 x 43.25 inches (201.0-208.3 x 73.7 x 109.9 cm)
	Frames (Base, Drive Expansion, Media Expansion)- Shipping (HxWxD)	86.4 x 42.0 x 55.2 inches (220.0 x 110.0 x 140.0 cm)
Weight		
Base Frame	**Out of box**	876-895 lbs (397-406 kg)
	Shipping	1,200-1,300 lbs (544-590 kg)
Drive Expansion Frame	**Out of box**	720-750 lbs (327-340 kg)
	Shipping	1,045-1,155 lbs (474-524 kg)
Media Expansion Frame	**Out of box**	538 lbs (244 kg)
	Shipping	862 lbs (391 kg)

Robotic and Host Interface	Fibre Channel, 8Gb/2Gb/1Gb Multi-mode optical, LC connector and optional Robotic Interface Module
Library Management Interface	One RJ-45 Ethernet port, 10/100Base-T.

Drive Performance (1Kb = 1,000 bytes)		**LTO-7 Ultrium**	**LTO-6 Ultrium**	**TS1150 Technology**
	Native Data transfer rate	300 MB/s with LTO-7 media	160 MB/s with LTO-6 media	360 MB/s with TS1150 Technology
	Average load, thread, & initialize time	12 seconds	12 seconds	12 seconds
	Average unload time	17 seconds	17 seconds	17 seconds
	Average First File Access Time	60 seconds	60 seconds	55 seconds

Input Requirements	Auto-range to domestic and international AC voltages	
	Nominal / Range Line Frequency	
Input Requirements Power Consumption	Range Line Voltage	50 Hz / 60Hz
	Typical Input Current	**200 VAC to 240 VAC**
	VA max 183W (N+1)	**13A max**
Connectors	FC	
Drives Supported	Native Fibre Drives: LTO-7 Ultrium, LTO-6 Ultrium, and TS1150 Technology Drive	**LC Connector**
Maximum Number of Drives	**24 drives per Base Frame and 24 per Drive Expansion Frame up to maximum of 120 drives per library with multiple expansion frames**	

Technical Specifications

Reliability (Library Only)	**MTBF**	250,000 power-on hours 100% duty cycle
	MSBF	100,000
Reliability (Library Only)	**MTTR**	3 minutes for hot-swap components. 30 minutes for non-hot-swap-components
Relative Humidity (non-condensing)	**Operating**	Operating: 20% to 80% non-condensing
	Shipping	Shipping & Storage: 10% to 95% non-condensing
Temperature Range	**Operating**	Dry Bulb: 10° to 40° C/50° to 104° F Wet Bulb: 25° C (77° F) maximum
	Shipping	Dry Bulb: -40° to 65° C/-40° to 149° F Wet Bulb: 46° C (115° F) maximum
Regulatory Compliance	**Safety**	
	EMC	UL 60950-1, 2nd ed. Including am1, am2 IEC 60950-1(ed.2); am1;am2
Regulatory Compliance	**Country Regulatory Compliance**	CISPR 22/class A, CISPR 24, FCC/Class A
	Regulatory Model Number	For country specific compliance contact your local sales representative. TFinity®

Summary of Changes

Date	Version History	Action	Description of Change
09-Dec-2016	From Version 1 to 2	Changed	Changes made to the Overview section
28-Nov-2016	Version 1	Created	Document created

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For tape drives and media, 1 GB = 1 billion bytes. Actual formatted capacity is less.

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