

Overview

HPE GreenLake for Block Storage MP

HPE GreenLake for Block Storage brings mission-critical storage to the mid-range – delivering enterprise-class resiliency, performance, and scalability at an affordable price. Powered by the new HPE Alletra Storage MP hardware platform, HPE GreenLake for Block Storage is the industry's first disaggregated, scale-out block storage with 100% availability guaranteed. Get an intuitive, AI-driven cloud experience on-prem that simplifies management and shifts operations from infrastructure-centric to app-centric. Empower line of business with intelligent, self-service provisioning while managing and protecting workloads across your hybrid cloud from a single cloud console. Scale performance and capacity independently — and without disruption — with disaggregated storage. Meet every SLA with mission-critical storage that delivers an unrivalled 100% data availability guarantee. Accelerate your most demanding apps with consistently fast performance and ultra-low latency — even at scale.



HPE GreenLake for Block Storage
(2-Node all NVMe Storage Base)

What is new

- **Easily and cost-effectively scale to meet evolving workload demands with disaggregated storage:** New, multi-node switched models enable you to scale capacity and performance independently for greater efficiency and lower cost.
- **Accelerate mission-critical apps with up to 2X performance boost¹.** New 2, 3, and 4 controller node switched models (with a choice of 16-core or 32-core configurations) – adding to the existing option of 2 core controller node switchless models – enables a leap in performance of up to 2X.
- **Scale without limitation with 2X more capacity².** Support for up to 16 JBOF expansion shelves enables you to start small and scale big– from 15.36TB to around 5.8 PB³ - without disruption.
- **Maximize efficiency and cost savings with granular capacity upgrades:** Support for 8 to 24 SSDs per enclosure — with the ability to upgrade drives in 2-drive increments and JBOFs in increments of 1 — gives you the flexibility to fine-tune, adapt, and elastically scale storage environments in line with specific workload capacity requirements and evolving business needs.

Overview

- **Unlock the full power of NVMe for Ethernet networks with NVMe/TCP:** With new NVMe over TCP host protocol support, you get all the benefits of a low latency, high performance NVMe fabric without committing to a dedicated storage network like Fibre Channel. You now have the flexibility to choose the front-end storage protocol that best fits your workloads and existing network infrastructure thanks to support for Fibre Channel, NVMe-oF/FC, NVMe-oF/TCP and iSCSi.
- **Simplify management with enhanced and extended AI-driven performance reporting:** HPE GreenLake for Block Storage built on HPE Alletra Storage MP is powered by industry leading AIOps for infrastructure, delivered via the Data Services Cloud Console (DSCC) on the HPE GreenLake cloud platform. The latest release of the Data Ops Manager app on DSCC continues to eliminate the guesswork for customers when it comes to storage optimization through enhanced and extended AI-based performance reporting and analytics for improved troubleshooting and insights. Key reporting enhancements include headroom utilization trend analysis by volume set, top volume set hotspots by latency, improved workload drift detection, and resource contention detection. With the latest release of the Data Ops Manager, customers also get improved capacity reporting, capacity savings and efficiency metrics, and new sustainability metrics (including carbon utilization emissions and energy consumption).
- **Take the risk and complexity out of data migration:** Remove the risk and complexity of switching to a new storage platform with multiple options for quick, non-disruptive data migration.
 - With **HPE Peer Motion**, you can move data from HPE 3PAR, HPE Primera, and HPE Alletra 9000 storage arrays to HPE GreenLake for Block Storage built on HPE Alletra Storage MP — online, non-disruptively, and without complex planning or dependency on extra tools.
 - With **HPE Zerto**, you get a simple (4-click), scalable, and risk-free migration experience for large, complex virtualized environments — regardless of hardware or storage platform.
 - If you don't have the required in-house IT staff availability, expertise, and tools to ensure a successful migration, **HPE Data Migration Services** will get you up and running fast. This simplifies the data migration process and provides a flexible way to migrate an organization's critical data safely with minimal impact to operations. You have a choice of several online and offline options for migrating their data to align with their organization's requirements, budgets, and timelines.

Notes:

- ¹Compared to existing 2 node (16-core/32-core) switchless configurations
 - ²Compared to release 3 of HPE GreenLake for Block Storage built on HPE Alletra Storage MP.
 - ³Fully loaded configuration with 16x JBOFs totalling 384 x 15.36TB NVMe SSDs.
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Standard Features

Hardware

- HPE GreenLake for Block Storage is powered by the new HPE Alletra Storage MP with 2-Node and 4-Node storage controllers and up to 5.8 PB of all NVMe capacity in a single system.

Simplify management with an intuitive cloud experience on prem

- **Simplify operations and move faster with a cloud operational experience:** Reduce on-premises storage complexity across the lifecycle— from install to upgrade — with an AI-driven cloud operational experience powered by the HPE GreenLake Edge to Cloud Platform.
- **Simplified deployment:** Get started in minutes with streamlined device deployment. Simply rack the infrastructure, plug in the power cords, and connect the network cables. With a few clicks, the new system is configured and available in your fleet, ready to serve data for application workloads.
- **Deploy apps faster:** Automate app deployment with intent-based provisioning. Select the storage tier, workload type, capacity, and protection policy, and let AI-driven intelligence automatically optimize your SLAs by recommending the best-suited system across your fleet for your new workload.
- **Unified storage management:** 100% cloud-managed infrastructure means you can manage, monitor, and protect your global storage environment from a single cloud console that's accessible from any location, on any device - so managing hundreds of systems across geographies is as simple as managing one.
- **Invisible upgrades:** Thanks to SaaS-based delivery, new data services instantly become available to you. Data plane software upgrades are non-disruptive and intelligently matched to a given system.

Run any app – without compromise with a 100% data availability guarantee

- **Get peace of mind with 100% data availability guaranteed:** Built on an AI-driven, disaggregated, no single point of failure platform to guarantee resilient 100% data availability for your mission-critical apps.
- **Advanced DR and HA:** Meet any recovery-point objective (RPO) and recovery-time objective (RTO) strategy with transparent business continuity and automatic fail-over across multiple sites, as well as getting simple and efficient hybrid cloud data protection for on-prem and cloud native workloads.
- **Accelerate your most demanding applications:** Built on a unique, massively parallel, multi-node, and all-active platform, HPE GreenLake for Block Storage MP consolidates traditional and next-generation mission-critical applications at scale with predictable performance and ultra-low latency.
- **Industry's most advanced AI-Ops:** Predict and prevent disruptions before they occur across the stack and pinpoint issues between storage and VMs and under-utilized resources. Take the guesswork out of managing data infrastructure with AI-driven recommendations that improves performance, drives higher availability, and optimizes resource utilization and planning.
- **Transformed support experience:** Eliminate time-consuming, frustrating escalations via predictive support automation and direct access to the experts and resources you need.



Standard Features

HPE Alletra Storage MP				
	8-core	16-core	32-core	Expansion Shelf
Base Chassis	2U	2U	2U	2U
Number of Nodes	2	2 or 4	2 or 4	2
CPUs per Node	1	1	1	1
Memory per Node	256 GB	256 GB	512 GB	64 GB
Maximum Number of slots per Node ¹	4	4	4	2
Maximum Host Ports per Node	8-ports	8-ports	8-ports	N/A
Fibre Channel Host Ports per Node	0 - 8 ports	0 - 8 ports	0 - 8 ports	N/A
iSCSI Host Ports per Node	0-4 ports	0-4 ports	0-4 ports	N/A
	8-core	16-core	32-core	Expansion Shelf
Max Number of NVMe SSDs per expansion shelf	24	24	24	24
Max number of expansion shelves per system ³	N/A	2 +1 (NS) 16 (S)	2 +1 (NS) 16 (S)	N/A
Max Raw Capacity per expansion shelf	368 TB / 328.5TiB	368TB/328.5TiB	368TB/328.5TiB	368TB/328.5 TiB
Max Effective Capacity ² per expansion shelf	1099TB / 1000TiB	1099TB/1000TiB	1099TB/1000TiB	1099TB/1000TiB
Max Raw Capacity per System ³	368TB /328.5TiB (NS)	1110TB/1005TiB (NS) 5900TB/5366TiB (S)	1110TB/1005TiB (NS) 5900TB/5366TiB (S)	N/A
Max Effective Capacity ² per System ³	1099TB /1000TiB	2683TB/2440TiB (NS) 17902TB/16282TiB (S)	2683TB/2440TiB (NS) 17902TB/16282TiB (S)	N/A

Notes:

- ¹Slot 3 and Slot 4 can be used for host connectivity (at least one is required), and RCIP is optional; Slot 1 and Slot 2 are used for expansion
- ²Effective capacity assumes 4:1 data compaction ratio (thin provisioning, deduplication, compression, and copy technologies) in a RAID 6 (10+2) configuration. Note TB vs TiB. Actual ratios will vary based on workload. See HPE Store More Guarantee for more information.
- ³NS = switchless configurations; S = switched configurations

Host OS Support

Microsoft® Windows® Server and Microsoft® Hyper-V™ | VMware ESX and ESXi | Red Hat® Enterprise Linux® | SUSE® Linux Enterprise Server (SLES)

Host OS support varies by connectivity protocol to host. For the latest information on supported operating systems refer to Single Point of Connectivity Knowledge for HPE Storage Products (SPOCK): <http://www.hpe.com/storage/spock>



Service and Support

Warranty

HPE GreenLake for Block Storage has 1 year, parts only warranty. The warranty on all HPE GreenLake for Block Storage Solid State Drives (SSD) is 1 year, parts only, and offers unconditional replacement in case of drive failure, media wear-out, or both. Hewlett Packard Enterprise warrants only that the software media will be free of physical defects for a period of ninety (90) days from delivery. For more information about Hewlett Packard Enterprise's Global Limited Warranty and Technical Support, visit:

<http://www.hpe.com/storage/warranty>

HPE Services

No matter where you are in your digital transformation journey, you can count on HPE Services to deliver the expertise you need when, where and how you need it. From planning to deployment, ongoing operations and beyond, our experts can help you realize your digital ambitions.

<https://www.hpe.com/services>

Consulting Services

No matter where you are in your journey to hybrid cloud, experts can help you map out your next steps. From determining what workloads should live where, to handling governance and compliance, to managing costs, our experts can help you optimize your operations.

<https://www.hpe.com/services/consulting>

HPE Managed Services

HPE runs your IT operations, providing services that monitor, operate, and optimize your infrastructure and applications, delivered consistently and globally to give you unified control and let you focus on innovation.

[HPE Managed Services | HPE](#)

Operational services

Optimize your entire IT environment and drive innovation. Manage day-to-day IT operational tasks while freeing up valuable time and resources. Meet service-level targets and business objectives with features designed to drive better business outcomes.

<https://www.hpe.com/services/operational>

HPE Complete Care Service

HPE Complete Care Service is a modular, edge-to-cloud IT environment service designed to help optimize your entire IT environment and achieve agreed upon IT outcomes and business goals through a personalized experience. All delivered by an assigned team of HPE Services experts. HPE Complete Care Service provides:

- A complete coverage approach -- edge to cloud
- An assigned HPE team
- Modular and fully personalized engagement
- Enhanced Incident Management experience with priority access
- Digitally enabled and AI driven customer experience

<https://www.hpe.com/services/complecare>



Service and Support

HPE Tech Care Service

HPE Tech Care Service is the operational support service experience for HPE products. The service goes beyond traditional support by providing access to product specific experts, an AI driven digital experience, and general technical guidance to not only reduce risk but constantly search for ways to do things better. HPE Tech Care Service delivers a customer-centric, AI driven, and digitally enabled customer experience to move your business forward. HPE Tech Care Service is available in three response levels. Basic, which provides 9x5 business hour availability and a 2-hour response time. Essential which provides a 15-minute response time 24x7 for most enterprise level customers, and Critical which includes a 6-hour repair commitment where available and outage management response for severity 1 incidents.

<https://www.hpe.com/services/techcare>

HPE Lifecycle Services

HPE Lifecycle Services provide a variety of options to help maintain your HPE systems and solutions at all stages of the product lifecycle. A few popular examples include:

- Lifecycle Install and Startup Services: Various levels for physical installation and power on, remote access setup, installation and startup, and enhanced installation services with the operating system.
- HPE Firmware Update Analysis Service: Recommendations for firmware revision levels for selected HPE products, taking into account the relevant revision dependencies within your IT environment.
- HPE Firmware Update Implementation Service: Implementation of firmware updates for selected HPE server, storage, and solution products, taking into account the relevant revision dependencies within your IT environment.
- Implementation assistance services: Highly trained technical service specialists to assist you with a variety of activities, ranging from design, implementation, and platform deployment to consolidation, migration, project management, and onsite technical forums.
- HPE Service Credits: Access to prepaid services for flexibility to choose from a variety of specialized service activities, including assessments, performance maintenance reviews, firmware management, professional services, and operational best practices.

Notes: To review the list of Lifecycle Services available for your product go to:

<https://www.hpe.com/services/lifecycle>

For a list of the most frequently purchased services using service credits, see the [HPE Service Credits Menu](#)

Other Related Services from HPE Services:

HPE Installation and Startup Service

Provides for the installation of your HPE hardware according to product specifications including options. The HPE service delivery technician will connect the product to a LAN as appropriate and enable remote support to allow for automatic case creation for hardware failures.

HPE Software Installation and Startup Service

Provides deployment of individual software features, helping to ensure proper installation in your storage environment as well as helping you increase the benefit from your storage investment.

HPE Education Services

Training and certification designed for IT and business professionals across all industries. Broad catalogue of course offerings to expand skills and proficiencies in topics ranging from cloud and cybersecurity to AI and DevOps. Create learning paths to expand proficiency in a specific subject. Schedule training in a way that works best for your business with flexible continuous learning options.

<https://www.hpe.com/services/training>



Service and Support

Defective Media Retention

An option available with HPE Complete Care Service and HPE Tech Care Service and applies only to Disk or eligible SSD/Flash Drives replaced by HPE due to malfunction.

Consult your HPE Sales Representative or Authorized Channel Partner of choice for any additional questions and services options.

Parts and Materials

HPE will provide HPE-supported replacement parts and materials necessary to maintain the covered hardware product in operating condition, including parts and materials for available and recommended engineering improvements.

Parts and components that have reached their maximum supported lifetime and/or the maximum usage limitations as set forth in the manufacturer's operating manual, product QuickSpecs, or the technical product data sheet will not be provided, repaired, or replaced as part of these services.

How to Purchase Services

Services are sold by Hewlett Packard Enterprise and Hewlett Packard Enterprise Authorized Service Partners:

- Services for customers purchasing from HPE or an enterprise reseller are quoted using HPE order configuration tools.
- Customers purchasing from a commercial reseller can find services at <https://ssc.hpe.com/portal/site/ssc/>

AI Powered and Digitally Enabled Support Experience

Achieve faster time to resolution with access to product-specific resources and expertise through a digital and data driven customer experience

Sign into the HPE Support Center experience, featuring streamlined self-serve case creation and management capabilities with inline knowledge recommendations. You will also find personalized task alerts and powerful troubleshooting support through an intelligent virtual agent with seamless transition when needed to a live support agent.

<https://support.hpe.com/hpsc/public/home/signin>

Consume IT On Your Terms

HPE GreenLake edge-to-cloud platform brings the cloud experience directly to your apps and data wherever they are—the edge, colocations, or your data center. It delivers cloud services for on-premises IT infrastructure specifically tailored to your most demanding workloads. With a pay-per-use, scalable, point-and-click self-service experience that is managed for you, HPE GreenLake edge-to-cloud platform accelerates digital transformation in a distributed, edge-to-cloud world.

- Get faster time to market
- Save on TCO, align costs to business
- Scale quickly, meet unpredictable demand
- Simplify IT operations across your data centers and clouds

To learn more about HPE Services, please contact your Hewlett Packard Enterprise sales representative or Hewlett Packard Enterprise Authorized Channel Partner. Contact information for a representative in your area can be found at "Contact HPE"

<https://www.hpe.com/us/en/contact-hpe.html>

For more information

<http://www.hpe.com/services>



Configuration Information

Step 1: Choose the Storage Chassis and Controller Nodes

HPE GreenLake for Block Storage configuration starts with the selection of the HPE Alletra Storage MP Chassis and Controller Nodes. The Alletra Storage MP Chassis is a 2U 2-node chassis that includes 24 bays for small form factor NVMe SSD drives for switchless configuration. Switched configurations do not allow for SSD drives in the same chassis as the controller nodes—NVMe SSDs are added via expansion shelves (JBOFs). The Alletra Storage MP Chassis does not include any controller nodes or power supplies—these must be added.

HPE Alletra Storage MP Chassis

Description

	SKU
HPE GreenLake for Block Storage MP Base Configuration	S0B84A
<ul style="list-style-type: none"> One (1) S0B84A SKU must be ordered for each configuration 	
HPE Alletra Storage MP 2U Chassis	R7C75A
HPE Alletra Storage MP 2U TAA-compliant Chassis	S0U32A
<ul style="list-style-type: none"> One (1) Alletra Storage MP Chassis SKU must be ordered for each switchless array. One (1) or two (2) Alletra Storage MP Chassis SKUs must be ordered for each switched array For switchless configurations, the Alletra Storage MP Chassis can host two controller nodes and up to 24 small form factor NVMe drives in a 2U chassis. For switched configurations, the Alletra Storage MP Chassis can host two controller nodes in a 2U chassis. The Alletra Storage MP Chassis does not include any controller nodes or Power Supplies. 	

HPE GreenLake for Block Storage Controller Nodes

Switchless controller nodes

HPE Alletra Storage MP 256GB 8-core Block Controller Node	S0S38A
HPE Alletra Storage MP 256GB 8-core TAA-compliant Block Controller Node	S0S40A
HPE Alletra Storage MP 256GB 16-core Block Controller Node	S0R21A
HPE Alletra Storage MP 256GB 16-core TAA-compliant Block Controller Node	S0S41A
HPE Alletra Storage MP 512GB 32-core Block Controller Node	S0S39A
HPE Alletra Storage MP 512GB 32-core TAA-compliant Block Controller Node	S0S43A

Switched controller nodes

HPE Alletra Storage MP 256GB 16-core Cluster Block Controller Node	R7D02A
HPE Alletra Storage MP 256GB 16-core TAA-compliant Cluster Block Controller Node	S0S42A
HPE Alletra Storage MP 512GB 32-core Cluster Block Controller Node	R7D03A
HPE Alletra Storage MP 512GB 32-core TAA-compliant Cluster Block Controller Node	S0R20A

- Each Controller Node SKU includes one controller node
- Two (2) Controller Node SKUs must be ordered per chassis. For switched configurations, the optional second chassis must have one (1) or two (2) controller nodes. Switched configurations support 2, 3, or 4 controller nodes.
- Controller nodes need to be of the same type. Different controller node types cannot be mixed in the same chassis.
- Each Controller Node contains two (2) OCP slots for host adapters (Slot 3 and Slot 4), and Slot 1 and Slot 2 are used for expansion.
- For a switchless system, each 32-core Block Controller Node (S0S39A or S0S43A) requires (1) 100GbE 2-port OCP HBA (S2A68A) in Slot 1 (see Adapters section)
- When Expansion Shelves are configured on a switchless system, each Block Controller Node (S0S39A or S0S43A) requires (1) 100GbE 2-port OCP HBA (S2A68A) in Slot 2 (see Adapters section)
- For a switched system, each Block Controller Node requires (1) 100GbE 2-port OCP HBA (S2A68A) in Slot 1 and (1) 100GbE 2-port OCP HBA (S2A68A) in Slot 2 (see Adapters section)



Configuration Information

HPE Alletra Storage MP Switches

Description	SKU
HPE Alletra Storage MP 32-port 100GbE Switch Bundle	S1R08A
HPE Alletra Storage MP 32-port 100GbE -48VDC Switch Bundle	S1S69A
HPE Switch Pair with 4U Cable Tray Installation Kit	S0A95A
HPE Switch Pair without Tray Installation Kit	S3V78A

- When switched systems are configured, min two (2)/max two (2) of the switch bundles are added to the configuration
- The Alletra Storage MP switch bundles can only be used for interconnectivity of the Alletra Storage MP controller nodes and the Alletra Storage MP expansion shelf nodes
- The Alletra Storage MP switch bundles **cannot** be used for connectivity to host servers or any other systems
- The Alletra Storage MP -48VDC switch bundles (S1S69A) are used when DC power is selected for the system
- Switched configurations require an Installation Kit—the 4U Cable Tray Installation Kit (S0A95A) is the default; the Installation Kit without a tray (S3V78A) can be selected for switched configurations that will not grow beyond a total four (4) chassis (controller chassis plus JBOF chassis)

Step 2: Choose Power Supplies

Description	SKU
HPE Alletra Storage MP C14 1600W AC Power Supply	R7C76A
HPE Alletra Storage MP C14 2200W AC Power Supply	R9Z97A
HPE Alletra Storage MP 1600W -48VDC Power Supply	R7C78A

- The Alletra Storage MP Chassis requires two (2) Power Supplies per chassis
- Power Supplies are factory integrated in the Storage chassis for shipment
- The C14 1600W AC Power Supply (R7C76A) is 80 PLUS Platinum certified
- The C14 1600W AC Power Supply (R7C76A) supports high-line; no low-line support
- The C14 2200W AC Power Supply (R9Z97A) is 80 PLUS Titanium certified and needed for EU Lot9 requirements
- The C14 2200W AC Power Supply (R9Z97A) supports high-line; no low-line support
- The DC Power Supply (R7C78A) not available for China, Taiwan, and India

HPE GreenLake for Block Storage Power Cord

HPE C13 - C14 250V 10Amp Black 1.4m WW Power Cord	R9R52A
HPE C13 - C14 250V 10Amp Gray 1.4m WW Power Cord	R9S00A
HPE C13 - C14 250V 10Amp Black 1.37m IN Power Cord	R9R53A
HPE C13 - C14 250V 10Amp Gray 1.37m IN Power Cord	R9S01A
HPE C13 - C14 250V 10Amp Black 2m WW Power Cord	S3L68A
HPE C13 - C14 250V 10Amp Gray 2m WW Power Cord	S3L69A
HPE C13 - C14 250V 10Amp Black 2m IN Power Cord	S3L70A
HPE C13 - C14 250V 10Amp Gray 2m IN Power Cord	S3L71A
HPE 1600W -48VDC 600V 3.5m Power Cable Kit	P22173-B21
HPE 1600W -48VDC Power Cable Lug Kit	P36877-B21

- R9R52A and R9S00A are for worldwide use except for India
- R9R53A and R9S01A are for India use only
- The 2m power cords are required for the switches



Configuration Information

Step 3: Choose Adapters

Host adapters are used for connection to hosts. They can be ordered standalone to be installed in the field or they can be factory integrated into controller nodes. HPE GreenLake for Block Storage does not have any built-in host ports therefore any configuration needs to have at least one (1) host adapter per controller node. For RCIP remote copy, the Replication HBAs can be ordered as an option.

HPE GreenLake for Block Storage Host Adapters

Description

	SKU
HPE Alletra Storage MP 32Gb 4-port Fibre Channel OCP LPm37004 Host Bus Adapter	S2S64A
HPE Alletra Storage MP 32/64Gb 4-port Fibre Channel Host Bus Adapter	R7C90A
HPE Alletra Storage MP 10/25GbE 4-port Host Bus Adapter	R7C82A

HPE GreenLake for Block Storage Replication

HPE Alletra Storage MP 10/25GbE 4-port Host Bus Adapter	R7C82A
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HPE GreenLake for Block Storage Backend Connectivity

HPE Alletra Storage MP 100GbE 2-port OCP Host Bus Adapter	S2A68A
HPE 100Gb QSFP28 to QSFP28 0.5m Direct Attach Copper Cable	R8M59A
HPE Aruba Networking 100G QSFP28 to QSFP28 1m Direct Attach Copper Cable	R9F77A
HPE Aruba Networking 100G QSFP28 to QSFP28 2m Active Optical Cable	R9F76A

Requirements for 100GbE backend connectivity

The table below shows the adapter and cable requirements for backend connectivity for both switched and switchless configurations. The recommended cables are shown, alternate cable lengths in Step 5 may be used.

Alletra Storage MP Nodes (switchless)	100GbE HBA per node	Cables per node
Alletra Storage MP 8-core nodes (switchless)	N/A	N/A
Alletra Storage MP 16-core nodes (switchless)	(1) S2A68A if JBOF used	(2) R9F77A if JBOF used
Alletra Storage MP 32-core nodes (switchless)	(1) S2A68A and (1) S2A68A if JBOF used	(1) R8M59A and (2) R9F77A if JBOF used
Alletra Storage MP expansion shelf nodes (JBOF)	(1) S2A68A	N/A
Alletra Storage MP Nodes (switched)	100GbE HBA per node	Cables per node
Alletra Storage MP 16-core nodes (switched)	(2) S2A68A	(4) R9F77A
Alletra Storage MP 32-core nodes (switched)	(2) S2A68A	(4) R9F77A
Alletra Storage MP expansion shelf nodes (JBOF)	(1) S2A68A	(2) R9F77A (Perf Optimized) (1) R9F77A (Cap Optimized)

Host Bus Adapter Transceiver Kit

HPE 10Gb SFP+ Short Wave 1-pack Pull Tab Optical Transceiver	Q2P65A
HPE 25Gb SFP28 Short Wave Extended Temperature 1-pack Pull Tab Optical Transceiver	Q2P64B
HPE 32Gb SFP28 Short Wave 1-pack LP Pull Tab Optical Transceiver	S3N85A
HPE 32Gb SFP28 Short Wave 1-pack Pull Tab Optical Transceiver	Q2P62A

- Each Controller Node (S0S38A, S0R21A) must have at least one Fibre Channel HBA (S2S64A or R7C90A), or one 10/25GbE HBA (R7C82A) for host connectivity. A Controller Node without any host adapters is not a supported configuration.
- Maximum of two (2) Fibre Channel HBA (S2S64A or R7C90A) can be ordered per Controller Node.
- Mixing of different Fibre Channel HBA SKUs on the same system is not supported
- Maximum of two (2) 10/25GbE HBA (R7C82A) can be ordered per Controller Node.



Configuration Information

- Refer to SPOCK and the *Alletra Storage MP iSCSI Best Practices* document on Seismic for iSCSI configuration details.
- The S2S64A 32Gb Fibre Channel Adapter includes two (2) 32Gb transceivers. Additional S3N85A 32Gb transceivers are optional and must be ordered in pairs.
- The R7C90A 32/64Gb Fibre Channel Adapter does not include any transceivers. The Q2P62A 32Gb transceivers must be ordered in pairs separately—min 2, max 4 per HBA
- The 10/25GbE Adapter does not include any transceivers, the transceivers must be ordered in pairs separately.
- For each 10/25GbE Adapter, the 10Gb SFPs or 25Gb SFPs can be ordered with a minimum two (2), and maximum four (4).
- A pair of 10Gb SFPs and a pair of 25Gb SFPs can be mixed in the same 10/25GbE Adapter.
- 10/25Gb SFPs are not required if DAC cables are selected
- The 25Gb SFP supports only the 25Gb speed—it does not support 10Gb
- The 10Gb SFP supports on the 10Gb speed—it does not support 25Gb

Step 4: Choose Drives

Drives are orderable at the time the array is purchased and can be added in the future when additional capacity is required. HPE GreenLake for Block Storage supports SSDs with NVMe interface and TLC NAND technology.

HPE GreenLake for Block Storage Encrypted Drives

Description	SKU
HPE Alletra Storage MP 1.92TB NVMe SFF Self-encrypting SSD	R9H66A
HPE Alletra Storage MP 3.84TB NVMe SFF Self-encrypting SSD	R9H67A
HPE Alletra Storage MP 7.68TB NVMe SFF Self-encrypting SSD	R9H68A
HPE Alletra Storage MP 15.36TB NVMe SFF Self-encrypting SSD	R9H69A
HPE Alletra Storage MP 1.92TB NVMe SFF FIPS Encrypted SSD	R9H70A
HPE Alletra Storage MP 3.84TB NVMe SFF FIPS Encrypted SSD	R9H71A
HPE Alletra Storage MP 7.68TB NVMe SFF FIPS Encrypted SSD	R9H72A
HPE Alletra Storage MP 15.36TB NVMe SFF FIPS Encrypted SSD	R9H73A
HPE Alletra Storage MP 1.92TB NVMe SFF FIPS Encrypted TAA-compliant SSD	SOQ01A
HPE Alletra Storage MP 3.84TB NVMe SFF FIPS Encrypted TAA-compliant SSD	SOQ02A
HPE Alletra Storage MP 7.68TB NVMe SFF FIPS Encrypted TAA-compliant SSD	SOQ03A
HPE Alletra Storage MP 15.36TB NVMe SFF FIPS Encrypted TAA-compliant SSD	SOQ04A

Step 5: NVMe Expansion Shelf (JBOF)

The HPE Alletra Storage MP NVMe all-flash expansion shelf (JBOF) is a 2U chassis to add additional system capacity. The expansion shelf supports 8-24 NVMe SSDs, in two-drive increments with up to two (2) Expansion Shelves per system (switchless) and up to sixteen (16) Expansion Shelves per system (switched). Each expansion shelf requires:

Notes:

- [Min 2/Max 2 of Expansion Shelf Nodes](#)
- [Min 2/Max 2 Power Supplies and power cords](#)
- [Min 8/Max 24 SSDs \(see SSDs listed above\)](#)
- [Min 1/Max 1 100GbE 2-port OCP HBA \(S2A68A\) per Expansion Shelf Node](#)
- [Switchless: Min 2/Max 2 100G cables \(1 per Expansion Shelf Node\), 100G 1m DAC Cable \(R9F77A\) recommended—Active Optical Cables listed also supported](#)



Configuration Information

- Switched: Min 2/Max 2 of 100G Active Optical Cable (AOC) for Performance Optimized configurations (1-8 JBOFs); the R9F76A 100G QSFP28 to QSFP28 2m Active Optical Cable is the default; other AOC lengths listed also supported.
- Switched: Min 1/Max 1 of 100G Active Optical Cable (AOC) for Capacity Optimized configurations (9-16 JBOFs); the R9F76A 100G QSFP28 to QSFP28 2m Active Optical Cable is the default; other AOC lengths listed also supported.

Description

	SKU
HPE Alletra Storage MP NVMe Configure-to-order Block Expansion Shelf	S1J10A
HPE Alletra Storage MP Block Expansion Shelf Node	S1R28A
HPE Alletra Storage MP NVMe Configure-to-order TAA-compliant Block Expansion Shelf	S0S46A
HPE Alletra Storage MP Block Expansion Shelf TAA-compliant Node	S1R29A
HPE Alletra Storage MP 100GbE 2-port OCP Host Bus Adapter	S2A68A
HPE Aruba Networking 100G QSFP28 to QSFP28 1m Direct Attach Copper Cable	R9F77A
HPE Aruba Networking 100G QSFP28 to QSFP28 2m Active Optical Cable	R9F76A
HPE Aruba Networking 100G QSFP28 to QSFP28 7m Active Optical Cable	R9F79A

- The minimum supported quantity is eight (8) drives per chassis
- Drives can be ordered in increments of two drives from 8 to 24 drives per chassis
- HPE GreenLake for Block Storage supports only RAID 6
- For initial configurations, and within a system (base array plus any expansion shelves), all drives must be of the same capacity and type. Mixing drives of different capacities in the same system is not allowed.
- Drives must be loaded starting from the leftmost slot (slot 1) to the right and leaving no empty slots between drives.
- The switchless 16-core and 32-core systems support up to two (2) expansion shelves
- The switched systems support up to eight (8) expansion shelves (Performance Optimized), or 9-16 expansion shelves (Capacity Optimized).
 - When a switched system is ordered with 9-16 JBOFs, it is configured as Capacity Optimized
 - When a switched system is ordered with 1-8 JBOFs, it is configured as Performance Optimized
- The 8-core systems do not support expansion shelves
- When expansion shelves are used, drive quantities should be balanced across all shelves—base array shelf and expansion shelves

HPE Encryption License

Description

	SKU
HPE Storage FIPS Data Encryption LTU	SOA99A
HPE Storage FIPS Data Encryption E-LTU	SOA99AEE
HPE Storage Data Encryption LTU	SOA98A
HPE Storage Data Encryption E-LTU	SOA98AEE

- A data encryption license (LTU) is required to enable encryption on HPE GreenLake for Block Storage. One encryption license is required for each encrypted storage solution. Once encryption is enabled on the storage solution, it cannot be disabled.
- Encryption can be turned on, non-disruptively, at any time, even after data has been written to the system.
- Supports Utimaco® Enterprise Secure Key Manager (ESKM) 4.0, 5.0 and Gemalto® SafeNet KeySecure k460 centralized key management
- The local key manager is included in the HPE GreenLake for Block Storage OS. There is not a separately orderable part number for the local key manager

Step 6: Choose Cables for Host Connectivity

HPE GreenLake for Block Storage requires cables for host connectivity, and replication. The OM4 fiber cables are used for host connectivity and Peer Motion.



Configuration Information

OM4 Cables

Description

	SKU
HPE Premier Flex LC/LC Multi-mode OM4 2 Fiber 1m Cable	QK732A
HPE Premier Flex LC/LC Multi-mode OM4 2 Fiber 2m Cable	QK733A
HPE Premier Flex LC/LC Multi-mode OM4 2 Fiber 5m Cable	QK734A
HPE Premier Flex LC/LC Multi-mode OM4 2 Fiber 15m Cable	QK735A
HPE Premier Flex LC/LC Multi-mode OM4 2 Fiber 30m Cable	QK736A
HPE Premier Flex LC/LC Multi-mode OM4 2 Fiber 50m Cable	QK737A

Direct Attach Copper Cables (10GbE) - HPE Networking Comware

HPE Networking X240 10G SFP+ SFP+ 3m DAC Cable	JD097C
HPE Networking X240 10G SFP+ SFP+ 5m DAC Cable	JG081C
HPE Networking Comware X240 40G QSFP+ to 4x10G SFP+ 3m Direct Attach Copper Splitter Cable	JG330A
HPE Networking Comware X240 40G QSFP+ to 4x10G SFP+ 5m Direct Attach Copper Splitter Cable	JG331A

Direct Attach Copper Cables (10GbE) – HPE Aruba Networking

HPE Aruba Networking 10G SFP+ to SFP+ 3m Direct Attach Copper Cable	J9283D
HPE Aruba Networking 10G SFP+ to SFP+ 7m Direct Attach Copper Cable	J9285D

Direct Attach Copper Cables (10GbE) – Cisco

HPE C-series 3M Passive Copper SFP+ Cable	K2Q21A
HPE C-series 5M Passive Copper SFP+ Cable	K2Q22A
HPE C-series SFP+ to SFP+ Active Copper 7.0m Direct Attach Cable	QK701A

Direct Attach Copper Cables (10GbE) - HPE BladeSystem

HPE BladeSystem c-Class 10GbE SFP+ to SFP+ 3m Direct Attach Copper Cable	487655-B21
HPE BladeSystem c-Class 10GbE SFP+ to SFP+ 5m Direct Attach Copper Cable	537963-B21

Smart Active Optical Cables (25GbE) - HPE

HPE 25GbE SFP28 to SFP28 3m Smart Active Optical Cable	Q9S67A
HPE 25GbE SFP28 to SFP28 5m Smart Active Optical Cable	Q9S68A

AOC/DAC Cables– HPE

HPE 25Gb SFP28 to SFP28 3m Direct Attach Copper Cable	844477-B21
HPE 25Gb SFP28 to SFP28 7m Active Optical Cable	844483-B21
HPE 100Gb QSFP28 to 4x25Gb SFP28 3m Direct Attach Copper Cable	845416-B21

Ethernet Cables (Management)

HPE RJ45 to RJ45 Cat5e Black M/M 7.6ft 1-pack Data Cable	C7535A
HPE 4.3m/14ft CAT5 RJ45 M/M Ethernet Cable	C7536A
HPE 7.6m/25ft CAT5 RJ45 M/M Ethernet Cable	C7537A
HPE 15.2m/50ft CAT5 RJ45 M/M Ethernet Cable	C7542A

Notes: For the latest information refer to Single Point of Connectivity Knowledge for HPE Storage Products (SPOCK): <http://www.hpe.com/storage/spock>.



Configuration Information

Step 7: Choose Bluetooth Connectivity Kit Option

HPE Alletra Storage MP supports a Chassis Discovery Module (CDM) which enables the chassis connecting to Data Services Cloud Console (DSCC) without a controller node present. There is an optional Bluetooth setup and configuration of the chassis.

Description

HPE Alletra Storage MP CDM Bluetooth Connect Kit

SKU

S0U79A

Step 8: Choose Racking Options

HPE GreenLake for Block Storage is compatible with most industry standard 4-post EIA 19-inch racks with square mounting holes. HPE GreenLake for Block Storage can be factory configured and shipped in a rack or shipped without a rack for field integration into an existing rack. The racks used for factory integration are the HPE G2 Advanced Series Racks or the HPE G2 Enterprise Series Racks.

Factory Integration

A factory integrated HPE GreenLake for Block Storage is configured into the HPE Intelligent Series Rack with the appropriate power distribution units (PDUs). Other products such as servers or back-up products can be factory integrated in the rack and different PDUs can be added or selected (if needed) only via HPE Factory Express Services. Multiple HPE GreenLake for Block Storage arrays can be factory integrated in the same rack.

HPE Intelligent Series Racks

Description

HPE 42U 600mmx1200mm G2 Enterprise Shock Rack

P9K40A

HPE G2 Rack 42U 1200mm Side Panel Kit

P9L16A

HPE 42U 600mmx1200mm G2 Kitted Advanced Shock Rack with Side Panels and Baying

P9K10A

HPE 42U 600mmx1075mm G2 Enterprise Shock Rack

P9K38A

HPE G2 Rack 42U 1075mm Side Panel Kit

P9L15A

HPE 42U 600mmx1075mm G2 Kitted Advanced Shock Rack with Side Panels and Baying

P9K08A

- HPE recommends using HPE GreenLake for Block Storage in 1200mm deep racks with 3-phase power because this combination provides the best rack density.

Notes:

- For more information on rack options: <http://www.hpe.com/products/rackoptions>.
- For more information on PDUs: <https://www.hpe.com/us/en/product-catalog/servers/power-distribution-units.html>

Step 9: Choose Software

Hewlett Packard Enterprise provides an extensive selection of features in the HPE GreenLake for Block Storage OS software, including Virtual Copy, Remote Copy, Priority Optimization, Peer Motion, and Peer Persistence, etc. Data Encryption is offered separately with a LTU (see the Drive section for more information).

HPE Alletra Software and Support SaaS

HPE GreenLake for Block Storage include a subscription to HPE GreenLake for Block Storage Software and Support SaaS that includes all-inclusive software features for the specified raw capacity and term, and it enables cloud-based management of the array from the HPE Data Services Cloud Console and access to data services, and related support.

- HPE GreenLake for Block Storage Software and Support SaaS SKU must be selected for each Storage solution.
- The quantity of SaaS is determined by the raw capacity, in TB, configured. For example, if 100TB is configured, then the SaaS quantity will equal 100 for the term ordered.
- The standard terms are shown below; other terms may be available by exception



Configuration Information

HPE Alletra Software and Support SaaS

Description	SKU
HPE GreenLake for Block Storage MP OS per TB 3-year Software and Support SaaS	S3Q00AAE
HPE GreenLake for Block Storage MP OS per TB 4-year Software and Support SaaS	S3Q01AAE
HPE GreenLake for Block Storage MP OS per TB 5-year Software and Support SaaS	S3Q02AAE

In addition to the HPE Alletra Software and Support SaaS SKU, each system will have an HPE GreenLake for Block Storage MP OS LTU SKU. The quantity for the LTU SKU will always equal one (1) and will match the term of the SaaS SKU and Support

HPE GreenLake for Block Storage MP OS 3-year LTU	S3Q00A
HPE GreenLake for Block Storage MP OS 4-year LTU	S3Q01A
HPE GreenLake for Block Storage MP OS 5-year LTU	S3Q02A

Step 10: Choose Support

Choose HPE Services Tech Care to experience the new operational service for HPE products. For HPE GreenLake for Block Storage, HPE Services Tech Care is available in three response levels: Basic which provides next-business-day parts exchange where available, Essential which provides 4-hour parts exchange where available, and Critical which includes a 6-hour Hardware-Call-to-Repair for severity 1 and severity 2 incidents where available and outage management response for severity 1 incidents.

All levels of Tech Care enjoy 7x24 access to experienced technical engineers upon calling HPE for support.

<https://www.hpe.com/psnow/doc/a50003571enw>

Step 11 – Choose Installation options

Storage Installation and Startup Service

HPE GreenLake for Block Storage Installation and Startup Service provides deployment of your HPE GreenLake for Block Storage, helping to ensure proper installation in your storage environment as well as helping you increase the benefit from your storage investment. The service provides activities required to help you deploy your HPE GreenLake for Block Storage into operation.

Self-Installation

Customers and partners also have the option to self-install HPE GreenLake for Block Storage. The self-installation option can be selected in the configurator tool (OCA) and will remove the Storage Installation and Startup Service from the quote. All HPE GreenLake for Block Storage models and configurations are eligible for self-installation.

To successfully install the HPE GreenLake for Block Storage, the installer should:

- Have a good understanding and knowledge of Storage Area Networks, Fibre Channel fundamentals and a basic understanding of TCP/IP and other networking protocols (DNS/NTP).
- Have experience creating Storage LUNs, presenting/exporting LUNs to a server and formatting the LUNs to make them usable for applications.
- Be able to troubleshoot hardware and software issues using logs and documentation.

If the installer does not meet the profile or is not comfortable with the self-installation process, Hewlett Packard Enterprise recommends engaging the Hewlett Packard Enterprise sales representative or Hewlett Packard Enterprise Channel Partner to purchase HPE Deployment Services.



Configuration Information

Customer responsibilities

- Ensure that the host and SAN environment is supported and compliant with HPE recommendations and best practices. Host and SAN Implementation Guides are available at <https://support.hpe.com/hpesc/public/home>. Support Matrix are available on SPOCK (HPE Storage Single Point of Connectivity Knowledge) <http://www.hpe.com/storage/spock>.
- Resolve any problems with their SAN and host environment prior to installing the HPE GreenLake for Block Storage.

Notes: Customers performing a self-install (according to rules identified above) will not void their warranties and will be fully supported.



Technical Specifications

HPE Alletra Storage MP Specifications

Physical Dimensions	Width in/mm	Depth in/mm	Height in/mm/U	Weight lb/kg
HPE 42U 1075mm G2 Advanced Series Rack	23.50 / 597	43.78 / 1111	78.99 / 2006	281 / 127
HPE 42U 1075mm G2 Enterprise Series Rack	23.54 / 598	44.30 / 1125	78.98 / 2007	230 / 105
HPE 42U 1200mm G2 Advanced Series Rack	23.50 / 597	50.65 / 1286	78.99 / 2006	311 / 141
HPE 42U 1200mm G2 Enterprise Series Rack	23.54 / 598	51.19 / 1300	78.98 / 2007	251 / 114
HPE Alletra Storage MP Base Enclosure (Enclosure, two Controller IOMs, two PS, one CDM, no drives, no HBAs)	19.00 / 483	33.11 / 841	3.44 / 87.5 / 2	74.0 / 33.6
HPE Alletra Storage MP Base Enclosure Packaging Pallet	23.00/584 24.00/610	38.75/984 40.00/1016	11.50/292	
HPE Alletra Storage MP NVMe SSD with carrier	3.11 / 79	6.57 / 167	0.59 / 15.0	0.63 / 0.28
HPE 32Gb 4-port FC Host Bus Adapter	3.33 / 84.6	5.20 / 132	0.59 / 15.0	0.50 / 0.23
HPE 10/25Gb 4-port Ethernet Host Bus Adapter	3.33 / 84.6	5.20 / 132	0.59 / 15.0	0.50 / 0.23

Power Requirements

Input Voltage - AC PCM option

- HPE Alletra Storage MP Base: 200 to 240 VAC (50 to 60 Hz)

Notes: Refer to the [HPE Power Advisor online tool](#) for power consumption, heat loading, and circuit sizing information:

HPE Power Advisor utility

Environmental Specifications

Operating Temperature	41° to 95° F (5° to 35° C) - Reduce rating by 1° F for each 1000 ft altitude (1.8° C/1,000 m)	
Shipping Temperature	-30° to 60°C (-22 to 140°F). Maximum rate of change is 20°C/hr (36°F/hr)	
Operating Altitude (ft/m) max.	10,000 ft / 3,048 m	
Shipping Altitude (ft/m) max.	40,000ft / 12,192 m	
Humidity	10% to 90% non-condensing	
Shipping Humidity	10% to 90% non-condensing	
Operating Vibration	0.25 G, Sine, 5-500 Hz; 0.25 GRMS, Random 5-500 Hz	
Non-operating Vibration	0.75 G, Sine, 5-500 Hz	
Operating Shock	5G, 11ms, half-sine	
Non-operating Shock	10 G, 11ms, half-sine	
Maximum Exhaust Air Flow	HPE Alletra Storage MP Base: 267 CFM	
Acoustic Sound Pressure Level*	Typical 60% Duty Cycle Fans	100% Duty Cycle Fans
HPE Alletra Storage MP Base	65.7 dB	74.5 dB

*Acoustics Sound pressure level measured per ISO 7779 specifications

Technical Specifications

Electromagnetic Compatibility

- CISPR 32:2015/ EN 55032: 2015 +A11:2020 Class A
 - BS EN 55032:2015 +A11:2020
 - CISPR 35:2016/ EN 55035:2017 +A11:2020
 - BS EN 55035:2017 +A11:2020
 - IEN 61000-3-2: 2019 +A1:2021
 - EN 61000-3-3: 2013 +A2:2021
 - AS/NZS CISPR 32:2015 +A1:2020 Class A
 - CNS 13438:2006 Class A
 - 47 CFR Part 15 Subpart b Class A
 - ICES-003 Issue 7 Class A
 - VCCI-CISPR 32: 2016 Class A
 - RRA Notice No. 2021-3 (2021.02.08) Class A
 - RRA Notice No. 2021-10 (2021.02.08)
-

Safety

- IEC 60950-1:2005 (2nd Edition); +A1:2009 +A2:2013
 - EN 62479:2010
 - IEC 62368-1: 2014/ IEC 62368-1:2018
 - EN 62368-1:2014+A11:2017/ EN 62368-1:2020 +A11:2020
 - CNS 14336-1
 - ANSI/UL 62368-1:2021
 - CAN/CSA-C22.2 No. 62368-1:19 Update No. 1-2021
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Certifications/Markings

- BIS
 - BSMI
 - cCSAus
 - CE
 - FCC Class A
 - IC Class A
 - KCC
 - Morocco
 - RCM
 - VCCI
 - WEEE
 - China RoHS
 - EU RoHS
 - UKCA
-



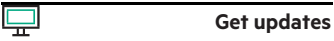
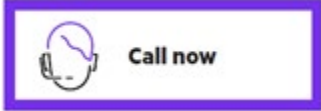
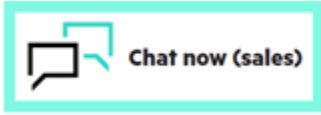
Summary of Changes

Date	Version History	Action	Description of Change
19-Aug-2024	Version 12	Changed	Standard Features and Configuration Information sections were updated
05-Aug-2024	Version 11	Changed	Overview, Standard Features, and Configuration Information sections were updated.
03-Jun-2024	Version 10	Changed	Configuration Information section was updated
26-Feb-2024	Version 9	Changed	Networking product names were updated.
05-Feb-2024	Version 8	Changed	Overview, Standard Features, and Configuration Information sections were updated.
08-Jan-2024	Version 7	Changed	Configuration Information section was updated
13-Nov-2023	Version 6	Changed	Overview, Standard Features, Service and Support and Configuration Information sections were updated. HPE Services Rebranding
02-Oct-2023	Version 5	Changed	Standard Features and Configuration Information sections were updated
07-Aug-2023	Version 4	Changed	Configuration Information and Technical Specifications sections were updated
10-Jul-2023	Version 3	Changed	Configuration Information and Technical Specifications sections were updated
15-May-2023	Version 2	Changed	Configuration Information section was updated
03-April-2023	Version 1	New	New QuickSpecs.



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