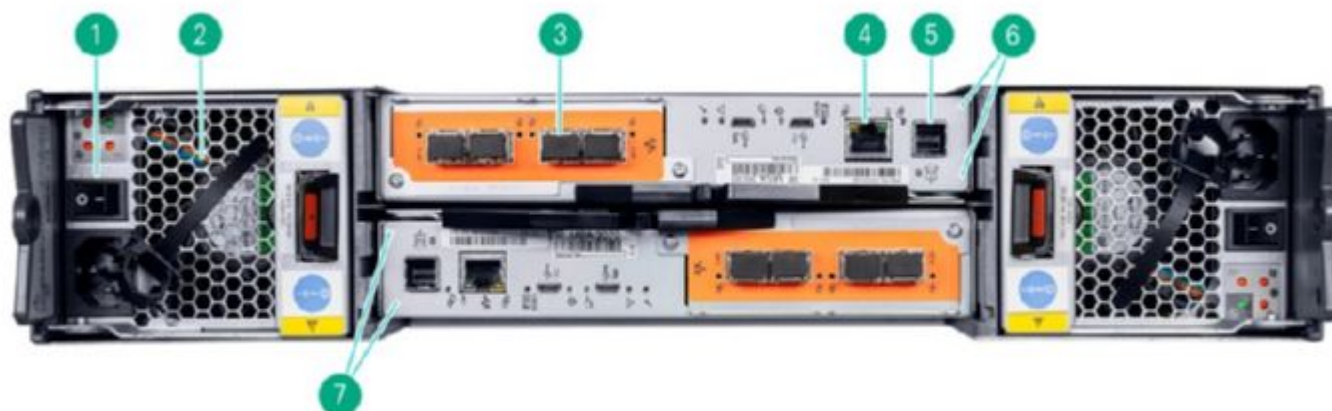Overview

HPE MSA Gen7 Storage QuickSpecs

Looking for simple, high-performance, and low-cost shared storage that delivers application acceleration across all of your server workloads?

HPE MSA Storage has been the leading shared storage solution for HPE ProLiant Servers for almost three decades. With over 600,000 storage arrays sold, MSA continues to deliver on its promise of simple, fast, and affordable storage for SMB customers. The MSA Gen7 storage array sets a new standard for entry-level shared storage by providing an affordable path to high-performance storage without compromising on the simplicity and reliability that its customers depend on. The MSA Gen7 array portfolio delivers up to 2X more system performance while supporting user scalability beyond 7 PB per array with new high-capacity media options. New Gen7 innovations supporting online system and media firmware updates, as well as simpler and faster access to the HPE MSA Health Check tool, reduce the complexity, and time required for routine system maintenance.

HPE MSA Gen7 Storage - Front View

HPE MSA Gen7 Storage- Rear View

Overview

Item	Description	Item	Description
1.	Power Switch	5.	12 Gb SAS expansion port
2.	Redundant Power and Cooling Module (AC or DC)	6.	Controller A (Inverted)
3.	Host connection ports (16 Gb and 32 Gb FC, 10/25 GbE iSCSI, 10GBase-T iSCSI, or 12 Gb SAS depending on model)	7.	Controller B
4.	Ethernet management port		

What's New

- HPE Smart Choice MSA Gen7 all-flash storage array bundles with up to 92TB of raw storage capacity included, supporting 16Gb and 32Gb Fibre Channel, 10GbE and 25GbE iSCSI, and 12Gb SAS host connectivity.
- HPE MSA Gen7 array models supporting 32Gb Fibre Channel host connectivity available on MSA 2070, 2070 Flash Bundles, 2072 Hybrid-Flash Bundles, and TAA-compliant MSA 2070 storage arrays
- HPE MSA 32Gb SFP+ Fibre Channel 4-pack Transceiver option
- Next generation, HPE MSA Gen7 shared storage portfolio including the MSA 2070, 2070 Flash Bundles, 2072 Hybrid-Flash Bundles, and TAA-compliant MSA 2070 storage arrays. Up to 2x more IOPS (random) and 30% more bandwidth (sequential) performance as compared to the previous generation MSA Gen6
- Scale beyond 7 PB per array by adding up to nine (9) MSA 2U LFF 12-drive and/or SFF 24-drive expansion drive enclosures with new high-capacity HDD and SSD MSA media options
- Updated HPE MSA Storage Management Utility (SMU v.4) that supports simple, fast access to the MSA Health Check Tool for routine system maintenance
- Support for non-disruptive, online firmware updates for both MSA controllers and drive media

MSA 2070 Storage Array Models

Description	SKU
HPE MSA 2070 16Gb Fibre Channel LFF Storage	S1H41A
HPE MSA 2070 32Gb Fibre Channel LFF Storage	S3T79A
HPE MSA 2070 16Gb Fibre Channel SFF Storage	S1H42A
HPE MSA 2070 32Gb Fibre Channel SFF Storage	S3T80A
HPE MSA 2070 10/25GbE iSCSI LFF Storage	S1H43A
HPE MSA 2070 10/25GbE iSCSI SFF Storage	S1H44A
HPE MSA 2070 10GBASE-T iSCSI LFF Storage	S1H45A
HPE MSA 2070 10GBASE-T iSCSI SFF Storage	S1H46A
HPE MSA 2070 12Gb SAS LFF Storage	S1H47A
HPE MSA 2070 12Gb SAS SFF Storage	S1H48A

TAA-compliant MSA 2070 Storage Array Models

Description	SKU
HPE MSA 2070 16Gb Fibre Channel SFF TAA-compliant Storage	S1H49A
HPE MSA 2070 32Gb Fibre Channel SFF TAA-compliant Storage	S3T85A
HPE MSA 2070 16Gb Fibre Channel LFF TAA-compliant Storage	S1H50A
HPE MSA 2070 32Gb Fibre Channel LFF TAA-compliant Storage	S3T86A
HPE MSA 2070 10/25GbE iSCSI SFF TAA-compliant Storage	S1H51A
HPE MSA 2070 10GBASE-T iSCSI SFF TAA-compliant Storage	S1H52A
HPE MSA 2070 12Gb SAS SFF TAA-compliant Storage	S1H53A

Overview

MSA 2070 Flash Bundle Array Models

Description	SKU
HPE MSA 2070 16Gb Fibre Channel SFF 23TB Flash Bundle	S3L64A
HPE MSA 2070 32Gb Fibre Channel SFF 23TB Flash Bundle	S3T83A
HPE MSA 2070 10/25GbE iSCSI SFF 23TB Flash Bundle	S3L65A
HPE MSA 2070 16Gb Fibre Channel SFF 46TB Flash Bundle	S3L66A
HPE MSA 2070 32Gb Fibre Channel SFF 46TB Flash Bundle	S3T84A
HPE MSA 2070 10/25GbE iSCSI SFF 46TB Flash Bundle	S3L67A

MSA 2072 Hybrid-Flash Array Models

Description	SKU
HPE MSA 2072 16Gb Fibre Channel SFF Storage	S2C83A
HPE MSA 2072 32Gb Fibre Channel SFF Storage	S3T81A
HPE MSA 2072 10/25GbE iSCSI SFF Storage	S2C84A
HPE MSA 2072 10GBASE-T iSCSI SFF Storage	S2C85A
HPE MSA 2072 12Gb SAS SFF Storage	S2C86A

MSA Gen7 Smart Choice Array Models

Description	SKU
HPE MSA 2070 SFF 2x16Gb FC 4-port Controller 12x1.92TB SSD 4x16Gb SFP FC XCVR 23TB Storage Array	P76572-B25
HPE MSA 2070 SFF 2x16Gb FC 4-port Controller 12x3.84TB SSD 4x16Gb SFP FC XCVR 46TB Storage Array	P76570-B25
HPE MSA 2070 SFF 2x16Gb FC 4-port Cntrl 12x7.68TB SSD 4x16Gb SFP FC XCVR 92TB Storage Array	P84181-B25
HPE MSA 2070 SFF 2x32Gb FC 4-port Controller 12x1.92TB SSD 4x32Gb SFP FC XCVR 23TB Storage Array	P79245-B25
HPE MSA 2070 SFF 2x32Gb FC 4-port Controller 12x3.84TB SSD 4x32Gb SFP FC XCVR 46TB Storage Array	P79246-B25
HPE MSA 2070 SFF 2x32Gb FC 4-port Cntrl 12x7.68TB SSD 4x32Gb SFP FC XCVR 92TB Storage Array	P84182-B25
HPE MSA 2070 SFF 2x10/25GbE iSCSI 4-port Cntrl 12x1.92TB SSD 4x10Gb iSCSI XCVR 23TB Storage Array	P76571-B25
HPE MSA 2070 SFF 2x10/25GbE iSCSI 4-port Cntrl 12x3.84TB SSD 4x10Gb iSCSI XCVR 46TB Storage Array	P76569-B25

Description	SKU
HPE MSA 2070 SFF 2x10/25GbE iSCSI 4-port Cntrl 12x7.68TB SSD 4x10Gb iSCSI XCVR 92TB Storage Array	P84183-B25
HPE MSA 2070 SFF 2x10/25GbE iSCSI 4-port Cntrl 12x1.92TB SSD 4x25Gb iSCSI XCVR 23TB Storage Array	P84177-B25
HPE MSA 2070 SFF 2x10/25GbE iSCSI 4-port Cntrl 12x3.84TB SSD 4x25Gb iSCSI XCVR 46TB Storage Array	P84179-B25
HPE MSA 2070 SFF 2x10/25GbE iSCSI 4-port Cntrl 12x7.68TB SSD 4x25Gb iSCSI XCVR 92TB Storage Array	P84184-B25
HPE MSA 2070 SFF 2x12Gb SAS 4-port Cntrl 12x1.92TB SSD 23TB Storage Array	P84178-B25
HPE MSA 2070 SFF 2x12Gb SAS 4-port Cntrl 12x3.84TB SSD 46TB Storage Array	P84180-B25

Standard Features

HPE MSA Gen7 Storage	
Array	
Access Type	Block
Form Factor	2U, SFF or LFF
Number of controllers per array	2
Number of host ports per array	8
FC host connectivity	16 Gb and 32 Gb
iSCSI host connectivity (IPv4 and IPv6)	10/25 GbE, 10GBase-T
SAS host connectivity	12 Gb
Cache, per array	
Max Read cache per array	8.34 TB (7.6 TiB)
Data (read/write) cache + system memory per array	48 GB
Pool Capacity	Two (2) Pools 4 PiB addressable capacity per pool 1,954 TiB* Useable capacity per system Notes: *Using 24 TB HDDs in RAID MSA-DP+ and recommended sparing
RAID Levels supported:	NRAID/RAID 0*,1, 5, 6, 10, MSA-DP+ Notes: *Read Cache Only
Enclosures	
Expansion Drive Enclosures	0-9 enclosures
LFF/SFF array/enclosure mixing	Supported
Maximum number of drives per 2U array enclosure	24 SFF or 12 LFF
Maximum number of drives per 2U drive enclosure	24 SFF or 12 LFF
Drive enclosure interface type	12 Gb SAS
Drives	
Maximum total HDDs per array	240 SFF / 120 LFF (array + 9x drive enclosures)
Maximum total SSDs per array	240 SFF / 120 LFF (array + 9x drive enclosures)
Max raw capacity per 2U array enclosure	737.28 TB SFF / 288 TB LFF
Max raw capacity per drive enclosure	737.28 TB SFF / 288 TB LFF
Max raw capacity per array	7.37 PB (All SFF) / 2.88 PB (All LFF)
Drive Capacities	
SFF SSDs	1.92 TB, 3.84 TB, 7.68 TB
LFF SSD	1.92 TB
SFF HDDs	10K: 1.2 TB, 1.8 TB, 2.4 TB
LFF HDDs	7.2K: 8 TB, 12 TB, 16 TB, 20 TB, 24 TB
Self-Encrypting SSDs	SFF: 1.92 TB, 3.84 TB, 15.36 TB, 30.72 TB LFF: 1.92 TB
Self-Encrypting HDDs Notes: Sold in 6-pack bundles only	SFF: 2.4 TB LFF: 12 TB
Software Features	
Thin Technologies	Thin Provisioning, Space Reclamation, Thin Rebuild
Automated Tiering	Performance Tier, Standard Tier, Archive Tier
Replication	Snapshots (512), Volume Copy, Remote Snaps
Quality of Service	Virtual Tier Affinity
Additional Features	
Maximum number of volumes	512
Maximum number of snapshots	512
Maximum number of hosts	512
Maximum number of initiators	1024
Customer self-installable	Yes
Customer self-repairable	Yes
Customer self-upgradeable	Yes
HPE MSA Health Check analytics	Yes
Energy Star Certified	Yes
USGv6 Certified	Yes

Standard Features

Check with your HPE Sales Representative or authorized HPE Partner for availability of MSA Gen7 32Gb Fibre Channel Array models.

All MSA Gen7 models offer a common set of valuable features

Chassis

- − 12 drive bay LFF or 24 drive bay SFF 2U base arrays, depending on model

- − 12 drive bay LFF or 24 drive bay SFF 2U expansion drive enclosures, depending on model

- − 12 Gb SAS disk expansion protocol

- − MSA Gen6/Gen7 drive carriers
- − HPE Bezel Lock Kit (optional)

Storage Controllers

- − Dual controller active/active (dual pool) design - can be configured as active/passive (single pool) as well
  Notes: The MSA Gen7 arrays do not support single controller configurations. Single-controller support is provided only when a controller fails over to its partner controller.

- − 4 host ports per controller, 8 host ports per array

- − 16 Gb and 32 Gb Fibre Channel, 10/25 GbE iSCSI, 10GBase-T and 12 Gb SAS protocol support (depending on array model) (Array models supporting 32 Gb FC to be added in 2025)

- − RAID offload ASIC and Processor

- − 48 GB system cache

- − 12 Gb SAS expansion ports

- − Battery-free cache backup with super capacitors and MMC

Available Drives

- − MSA Gen7 Storage Systems support a wide variety of 3.5-inch LFF and 2.5-inch SFF drives

- − Solid-State Drives (SSDs) deliver the highest levels of performance and reliability

- − Enterprise-class SAS hard disk drives (10K RPM) offer a balance of performance, capacity, and cost while delivering enterprise grade reliability

- − Midline SAS hard disk drives (7.2K RPM) are optimized to provide the best ratio of capacity to cost

Expansion Capacity

- − Maximum expansion of 9 drive enclosures (using any combination of LFF and/or SFF drive enclosures)

- − Maximum of 240 SFF or 120 LFF drives (depending on expansion form factor and drive mix)

- − Maximum of 7.37PB SFF / 2.88PB LFF raw capacity

Storage Services

- − Virtual Storage

- Up to two (2) pools, 4PiB addressable capacity per pool
- Automated tiering v2.0

Standard Features

- SSD read cache extension
- Thin Provisioning
- Volume Copy
- Snapshot capability (64 snaps standard, upgrade to 512 snaps per array with MSA Advanced Data Services License)

  – Virtual Storage Disk Groups can be spanned across multiple enclosures

  – Virtual Storage RAID levels supported: 0, 1, 5, 6, 10, MSA-DP+ (RAID 0 supported for Read Cache only)

  – Advanced MSA-DP+ RAID data protection supports:

- Integrated sparing
- Faster rebuilds
- Incremental disk group expansion

Management

  – Redundant web-based interface (MSA Storage Management Utility v4)

  – HPE MSA Health Check - accessible through the MSA Storage Management Utility and via HPE.com

  – RESTful interface (Redfish and Swordfish)

  – Command Line Interface (CLI)

  – Firmware Update Server - automated notification of new firmware availability

  – Non-disruptive online controller and media firmware upgrades via MSA Smart Components. Requires multi-pathing software through the host operating system

  – Arxscan Arxview remote monitoring via HPE Complete (optional)

Data Protection

  – Support for self-encrypting (SED) SSD and HDD options - MSA 2070 and MSA 2070 TAA-compliant models only

  – Remote Snapshot (array-based asynchronous replication) - available with the MSA Advanced Data Services License

  – VMware Site Recovery Manager (optional)

  – HPE Zerto Virtual Replication (optional)

  – HPE Bezel Lock Kit (optional)

Optional Drive Enclosures

HPE MSA 2U 12-drive LFF Drive Enclosure
This HPE MSA 2U 12-drive LFF Drive Enclosure is designed to support up to twelve HPE Storage LFF drives and accepts MSA dual-ported 12 Gb SAS SSDs and SAS Midline HDDs. The MSA 2U 12-drive LFF Drive Enclosure includes two I/O modules and is supported on all MSA Gen7 Storage Array models.

  – The MSA 2U 12-drive LFF Drive Enclosure can be attached to any MSA Gen7 Storage Array model

  – Each MSA 2U 12-drive LFF Drive Enclosure ships standard with two 0.5m mini-SAS HD to mini-SAS HD cables for connection to the MSA Gen7 controller array expansion port or existing drive enclosure cascade port

  – LFF and/or SFF drive enclosures can be mixed up to the maximum of nine drive enclosures

Standard Features

HPE MSA 2U 24-drive SFF Drive Enclosure
This HPE MSA 2U 24-drive SFF Drive Enclosure is designed to support up to twenty-four HPE Storage SFF drives and accepts MSA dual ported 12 Gb SAS SSD and Enterprise SAS HDDs. The MSA 2U 24-drive SFF Drive Enclosure includes two I/O modules and is supported on all MSA Gen7 Storage Array models.

− The MSA 2U 24-drive SFF Drive Enclosure can be attached to any MSA Gen7 Storage Array model

− Each MSA 2U 24-drive SFF Drive Enclosure ships standard with two 0.5m mini-SAS HD to mini-SAS HD cables for connection to the MSA Gen7 controller array expansion port or existing drive enclosure cascade port

− LFF and/or SFF drive enclosures can be mixed up to a maximum of nine drive enclosures

Scalability

− LFF configurations can scale up to 288 TB per drive enclosure, expandable to 2.88 PB with the addition of a maximum of nine MSA 2U 12-drive LFF Drive Enclosures

− SFF configurations can scale up to 737 TB per drive enclosure, expandable to 7.37 PB with the addition of a maximum of nine MSA 2U 24-drive SFF Drive Enclosures

Disk Group

A Disk Group is a collection of disks in a given redundancy mode (RAID 1, 5, 6, 10 or MSA-DP+). Disk Group RAID level and size can be created based on performance and/or capacity requirements. Multiple Disk Groups can be allocated into a Storage Pool for use with the Virtual Storage features.

Storage Pools

Storage Pools are comprised of one or more Disk Groups. A volume's data on a given LUN can span all disk drives in a pool. When capacity is added to a system, users will benefit from the performance of all spindles in that pool.

MSA Gen7 Storage Arrays support large, flexible Volumes with sizes up to 128TiB, facilitating seamless capacity expansion. As pools are expanded, data automatically reflows to balance capacity utilization on all drives.

RAID 0, 1, 5, 6, 10 and MSA-DP+

MSA Gen7 Storage features support for multiple levels of RAID-based data protection. RAID 0 (Striping) is supported for read cache only. RAID 5 combines block striping and parity. Because data and parity are striped across all the disks, no single disk is a bottleneck. RAID 6 allocates two sets of parity data across drives and allows simultaneous write operations. It can withstand two simultaneous drive failures without downtime or data loss. RAID 10 is mirroring and striping without parity and allows large disk groups to be created with high performance and mirroring for fault tolerance. MSA-DP+ offers improved performance, availability, and very fast rebuild times compared to traditional parity RAID by utilizing erasure coding technology. MSA-DP+ includes distributed spare capacity (default is equal to 2x the largest drive) and does not use traditional spare drives.

MSA-DP+

MSA-DP+ is a RAID-based data protection level introduced with the 6th Generation MSA Storage Systems that:

− Maximizes flexibility

− Provides built-in spare capacity

− Optimizes performance due to the elimination of idle spares

Standard Features

  − Allows for very fast rebuilds, large storage pools, and simplified expansion

If a disk fails in an MSA-DP+ disk group, and the failed disk is replaced with a new disk in the same slot, the replacement disk will be added to the disk group automatically. All disks in an MSA-DP+ disk group must be the same type (enterprise SAS, for example), but can have different capacities, provided the range of difference does not exceed a factor of two. For example, mixing a 1.2 TB disk and a 2.4 TB disk is acceptable; but mixing an 8 TB disk and a 24 TB disk is not recommended. It is conceivable that a sizeable difference between mixed disk capacities (ratio greater than two) could prevent consuming space on disks due to insufficient distributed space required to support striping.

All disks in an MSA-DP+ disk group are used to hold user data, but not all disks will be used by each page of data. To increase fault tolerance, any available capacity on disks can be allocated as spare for reconstruction purposes. When new data is added, new disks are added, or the system recognizes that data is not distributed across disks in a balanced way, the system moves the data to maintain balance across the disk group. Spare drives are not used by MSA-DP+ disk groups since the RAID design provides built-in spare capacity that is spread across all disks in the disk group. In the case of a disk failure, data will be redistributed to many disks in the disk group, allowing for quick rebuilds and minimal disruption to I/O. The system will automatically default to a target spare capacity that is the sum of the largest two disks in the MSA-DP+ disk group, which is large enough to fully recover fault tolerance after loss of any two disks in the disk group. The actual spare capacity value can change depending on the current available spare capacity in the disk group. Spare capacity is determined by the system as disks are added to a disk group, or when disk groups are created, expanded or rebalanced.

  Notes:
− HPE recommends not mixing disks if the ratio of the largest disk to the smallest disk is greater than two.
− For more information on MSA-DP+, refer to the HPE MSA Gen7 Virtual Storage Technical Reference Guide.

Configuration and Management Tools

  − Management access: out-of-band, Storage Management Utility (SMU) V4, CLI

  − Interface Types: USB, 100/1000 Ethernet

  − Protocols Supported: SNMP, SSH, SMTP, FTP, SFTP, HTTP, HTTPS, Telnet

Web Browser Support

MSA Gen7 Storage Arrays include web-based management (MSA Storage Management Utility v4) and CLI-based software for storage and RAID management, setup, configuration, and troubleshooting. MSA Gen7 Storage management supports Microsoft Edge, Mozilla Firefox, and Google Chrome.

Hot Plug Expansion and Replacement Support

All MSA Gen7 Storage Array models support hot plug replacement of controllers, drives, fans, power supplies, and I/O modules for simple, fast installation and maintenance. Hot add expansion of drives and drive enclosures is also supported.

HPE Server Compatibility

HPE MSA has been the leading shared storage (SAN) solution for HPE ProLiant Servers for 25+ years. In addition to supporting HPE's full range of ProLiant DL and ML servers, MSA Gen7 Storage also supports interoperability with many other HPE Server solutions. Interoperability for all HPE Servers is based on the selection of operating systems (OS) and host-bus adapters (HBA) that are qualified with HPE MSA Gen7 Storage Array models. Please refer to the HPE SPOCK website for all compatible OS and HBA options at: http://www.hpe.com/storage/spock.

Standard Features

3rd Party Server Support

HPE Storage Division supports "HPE Storage Blocks" connected to purchasable, Industry Standard third-party (non-HPE) servers. An "HPE Storage Block" is defined as the combination of supported HPE Storage components made up of HPE-branded HBA(s) + HPE-branded switch(es) + HPE-supplied firmware/drivers + HPE-supplied multipathing software (where applicable) + HPE Storage". For "HPE Storage Block" details on MSA Gen7 Storage solutions, refer to the "MSA array interoperability" table posted on the HPE SPOCK website.

OS Support

Refer to the Hewlett Packard Enterprise support statements for complete current OS version support at:
http://www.hpe.com/storage/spock

- Microsoft Windows Server

- VMware vSphere

- Red Hat Enterprise Linux

- SuSE SLES Linux

- Red Hat Enterprise Linux

- Oracle Linux

- Citrix Hypervisor/XenServer

Advanced Data Services Suite

The HPE MSA Advanced Data Services Suite is included with each MSA 2072 model and can be purchased as an option on all MSA 2070 models. The MSA Advanced Data Services Suite includes the following functionality:

- Performance Tiering

- 512 Snapshots and Volume Copy

- Remote Snap functionality

Performance Tiering and Archive Tiering

Disk tiers are comprised of aggregating one or more Disk Groups of similar physical disks. All MSA Gen7 Storage Array models can support three distinct tiers:

- A Performance tier with SSDs

- A Standard SAS tier with Enterprise SAS HDDs

- An Archive tier utilizing Midline SAS HDDs

MSA Gen7 supports sub-LUN tiering and automated data movement between tiers. The MSA automated tiering engine moves data between available tiers based on the access characteristics of that data. Frequently accessed "pages" will migrate to the highest available tier delivering maximum I/O's to the application.

An Advanced Data Services Suite License is required when mixing HDDs and SSDs within the same system, except when using SSDs exclusively as SSD Read Cache. See the following table for examples:

Standard Features

Pool A	Pool B	License required?
HDDs	−HDDs −None	No
SSDs (Flash pool)	−SSDs (Flash pool) −None	
HDDs & SSDs (Read Cache)	−HDDs & SSDs (Read Cache) −HDDs −None	
SSD (Flash pool)	−HDDs	Yes
HDD & SSD (Auto-tiering)	−Any configuration −None	

Snapshot and Volume Copy

−All MSA Gen7 Storage Arrays come standard with 64 snaps

−A 512 Snapshot license is included with all 2072 models and is available as an option on all other Gen7 models vis the MSA Advanced Data Services Suite

−Snapshots create up to 512 point-in-time copies of data

−Volume Copies create up to 128 point-in-time copies of data

−Volume copies become standard volumes when they are complete

−Recovery is instant - revert data from any previous Snapshot or Volume Copy

−Backup 'snapped' data to disk, virtual tape, or physical tape without a backup window

−If telephone support and software updates are desired for bundled software functionalities like 64 snapshots and volume copy software, a combination HW + SW support care pack must be purchased

−Hewlett Packard Enterprise does not provide warranty assistance for software products included with our base hardware products. Support is available through HPE Tech Care Service options. The hardware warranty component of these services is accounted for in the pricing of Tech Care Service options

Remote Snap

HPE MSA Remote Snap software is an array-based feature that provides remote replication between HPE MSA arrays. MSA Remote Snap is a form of asynchronous replication which consists of replication of block-level data from a volume on a local system to a volume on a second independent system. This second system may be co-located with the first system or may be located at a remote site.

−Remote snapshots are used to determine the data to be replicated using the differences in snapshots on the primary volume, minimizing the amount of data to be transferred

−MSA Remote Snap replication technology delivers key data management and protection capabilities

- Using snapshots as the underlying technology, Remote Snap creates multiple local recovery points which can be used to complement daily backups

Standard Features

- Remote Snap's replication technology provides the ability to access data in remote sites providing support across dispersed operations
- Remote Snap replication allows for business continuance in the event of a failure on the primary site

  – To perform a replication:

- A snapshot of the volume to be replicated is taken, creating a point-in-time image of the data
- This point-in-time image is compared to the point-in-time image taken during the previous replication and the changes are then replicated to the destination volume by copying the data represented by the snapshot via a transport medium such as TCP/IP (iSCSI) or Fibre Channel
- The amount of data transferred is minimized though the use of snapshots whenever possible and only changed data will be replicated to target sites
- Support for both Ethernet and Fibre Channel protocols provides flexibility across multiple application environments

  – Support for "Many-to-1" replication (up to 4 nodes) - primary use case is to replicate from "many" branch offices to the home office for the purpose of backing up data from the branches

  – Flexible architecture supports remote replication between all MSA Gen7 array models using virtual storage architecture

  – Snapshot-based replication enables both local and remote recovery depending on requirements:

- Isolate problems to a specific point in time which can be selected by the administrator
- Supports long-distance replication
- Supports fast application recovery with minimal or no transaction loss
- Creates disaster tolerant copies of your critical business data
- No "single-point-of-failure" solution to increase the availability of your data

  – With improved HPE MSA disaster recovery features, you can:

- Failover to the secondary/remote volume or volume group
- Map the secondary volume or volume group for access
- When the primary array has recovered, failback to the primary volume or volume group with the option to incorporate changes made to the secondary volume or volume group

  – Advanced MSA Remote Snap technology also supports the ability to reverse the direction of the replication set

Notes: One Advanced Data Services Suite License per array is required for replication. For example, if you have two MSA arrays performing replication (from Primary system to Remote System), you will need a total of 2 licenses.

Standard Features

HPE Storage Integration Pack for VMware vCenter (SIP4VC)

The HPE Storage Integration Pack for VMware vCenter (formerly known as OneView for vCenter) enables vSphere administrators to quickly obtain context-aware information and manage supported HPE Storage devices in their VMware vSphere environment directly from within vCenter. This plug-in operates independently of the core HPE OneView product and does not require a license to use. By providing a clear relationship between VM's, datastores and storage, the VMware administrator's productivity increases, as does the ability to ensure quality of service. Roles
for administrators can be defined on an individual basis, providing the ability to apply specific permissions for both view and control functions.

HPE Storage Integration Pack for VMware vCenter supports mixed array environments including HPE MSA Storage and other HPE Storage systems including Primera, 3PAR, Nimble, Alletra, and HPE GreenLake for Block Storage.

When deployed with MSA Storage, HPE Storage Integration Pack for VMware vCenter provides the following:

- Active Management functionality for the MSA Storage:

- Create/Expand/Delete a Datastore
- Create a Virtual Machine from a template

- Monitors the health and status of the MSA Storage

- Displays LUN / volume connections from VMs and ESX servers to the arrays and provides the location and attributes of the MSA array within the SAN

- Identifies what storage features are available to allow administrators to match the features available on the MSA array to their requirements

- Provide a cluster-level view of the storage

- HPE Storage Integration Pack for VMware vCenter is downloadable from **MSC** (My Software Center)

vStorage API for Array Integration (VAAI)

The vSphere Storage APIs are a set of technologies and interfaces that enable vSphere to leverage storage resources to deliver improved efficiency, control, and ease of use. The vSphere Storage APIs for Array Integration (VAAI) is one of these technologies. The VAAI initiative introduces APIs to improve performance, resource usage, and scalability by leveraging more efficient storage array-based operations. Primitives are specific functions used with VAAI that that serve as integration points to storage arrays. When supported by the array, primitives in VAAI allow the hypervisor to communicate directly with storage arrays to offload storage functionality traditionally handled by the hypervisor. Storage arrays can handle these functions more intelligently and efficiently because they are purpose built to perform storage tasks and can complete the request much faster than the host could complete it.

HPE MSA Storage supports the following VAAI primitives:

- Hardware-Assisted Locking: Also known as Atomic Test & Set (ATS), this primitive protects metadata for VMFS cluster file systems at the block level rather than at the volume level, reducing SCSI reservation contention between vSphere hosts by allowing simultaneous access to different parts of the vSphere datastore

Standard Features

– Copy Offload: Also known as XCOPY, this primitive copies VMDK, enabling full copies of data to be made within the storage array, reducing data reads/writes required by both the vSphere host and network infrastructure

– Block Zeroing: This primitive allows the array to handle the process of zeroing disk blocks. Instead of having the host wait for the operation to be complete, the array can signal that the operation has been completed right away, handling the process on its own without involving the vSphere host

HPE Morpheus VM Essentials Software

HPE Morpheus VM Essentials Software is a virtualization software solution that allows customers to provision and manage KVM and VMware-based VMs from a single intuitive interface. The solution comes with the KVM-based HVM hypervisor that is enhanced to include enterprise-grade cluster management with capabilities such as high availability, live compute and storage migration, distributed workload placement, integrated data protection, secure hardening, and external storage support. To enable flexibility for those continuing to host VMware-based applications, VM Essentials can also be used to connect to and manage existing VMware clusters. This means unified management and simple VM provisioning across both the HVM hypervisor and VMware ESXi™ so you can provision workloads on demand to the right environment, on your terms, with zero lock-in. When you're ready, you can use the included toolset to convert existing VMware images to VM Essentials.
Please review the HPE Morpheus VM Essentials Software QuickSpecs for further details.
HPE MSA Gen7 Storage is now fully qualified for use with HPE Morpheus VM Essential Software.
Please visit the HPE Morpheus VM Essentials Software Compatibility Matrix for further details on supported server, storage, and software platforms.

LDAP Support

LDAP (Lightweight Directory Access Protocol) is an industry standard application protocol for accessing and maintaining distributed directory information services over an IP network. LDAP provides the ability to authenticate MSA users with a central directory.

– Domain or Directory Credentials are not stored on the MSA for authentication - avoids a security issue

– Once user groups are configured on all MSAs in your organization, users can be authenticated on any MSA through the Active Directory

– Uses an LDAP implementation to authenticate users with a Windows Active Directory

– The MSA CLI and SMU will allow the configuration of new LDAP users groups into the MSA security scheme (manage vs monitor users, interface restrictions Web/CLI/FTP)

– Ability to authenticate Local or LDAP users

Standard Features

I/O Workload Functionality

A beneficial user interface element called "I/O Workload" is included in the MSA Storage Management Utility. MSA array controllers maintain a substantial amount of data pertaining to I/O dynamics at a logical page level (4MB chunks). From this data, it is possible to gain insights into the percentage of I/Os that are being processed by what percentage of the overall array's capacity across a 7-day timeline. While some workloads have "transient" data access patterns, many workloads have steady access patterns on small portions of the array's capacity. This produces "hot" pages in the array which remain hot a large amount of the array's uptime. Users would see substantial benefits if these pages could be served from the fastest media in the array (ideally SSDs). As has been described in the "Performance Tiering and Archive Tiering" section of this document, the MSA array's tiering engine will work to position the hottest pages on the fastest media at any given time. The new I/O Workload graph will show a line labeled Capacity and a line plot for each selected workload percentage (100%, 80%, or Other% value).

Interpreting the I/O Workload graphs allows users to strike a balance between the cost of SSD capacity versus its performance benefits. For example, some customers may be willing to have a couple of days where peak usage is far above the SSD capacity line as it may be acceptable to have slower performance as the system uses HDDs for a larger percentage of the workload I/O. This may be perfectly acceptable for systems sized to optimize cost per TB due to budget constraints. Other users may want to optimize the system such that a sizeable percentage of daily I/O can reside on SSD media (sized to 80% or 90%). When combined with other performance monitoring tools, the new I/O Workload function provides users with a representation as to how the workloads and the MSA are working together in a user's real-world environment.

Protect your data with HPE MSA Storage and Veeam Backup & Replication

Together, HPE and Veeam help you safeguard your data to ensure it's always on, always protected and that your enterprise can rapidly and easily recover should a situation arise. With HPE MSA Storage certified as a Backup Repository to provide seamless protection and Instant VM Recovery, Veeam Backup & Replication can provide a single management console to orchestrate the protection of virtual servers, physical machines and cloud-based workloads. Due to the extraordinary ratio of cost to capacity and performance offered by HPE MSA Storage, Veeam Back & Replication with HPE MSA Storage makes the perfect solution to modernize your backup strategy and protect your data from disaster.
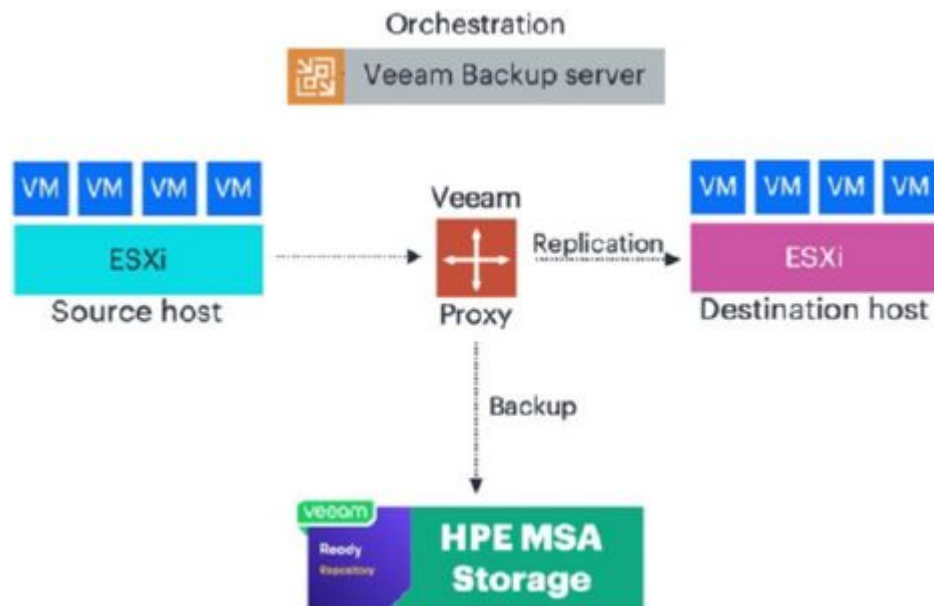
Key features of Veeam Backup and Replication:

– Image-level VM backups: Create application-consistent backups with advanced application-aware processing.

– Higher data availability with efficient movement of backup copies offsite for disaster recovery

– Unify management of protection of physical and cloud environments

Standard Features

- Scale-out Backup Repository: Create a single virtual pool of backup storage to which backups can be assigned, offering the freedom to easily extend backup storage capacity.

- SureBackup: Automatically tests and verifies every backup and every VM for recoverability.

- Image-based VM replication with WAN acceleration: Get backups off site up to 50x faster than non-accelerated traffic and save bandwidth for offsite for disaster recovery (DR).

- Direct Storage Access: Perform vSphere backups faster and with reduced impact by backing up via Direct SAN Access and Direct NFS Access.

- Instant VM Recovery: Restore access to a failed VM in less than two minutes while the full restore is executed in parallel.

- Native tape support: Store entire VM backups or individual files on HPE StoreEver with direct restore from tape.

- SureReplica: Automatically test and verify every VM replica for recoverability.

For more details on Veeam Backup & Replication see the Veeam Backup & Replication web pages.

HPE Zerto

HPE MSA Storage users can leverage HPE Zerto Virtual Replication to replicate applications and data from one MSA array to another MSA array. Popular use cases include departmental MSA storage replicated to enterprise storage, enterprise storage replicated into an MSA array, or to protect MSA workloads in the cloud. Zerto operates on the hypervisor level and includes orchestration and automation built-in to enable faster recovery of workloads (RTO in minutes) at much lower Recovery Point Objective (RPO of seconds) available through other data protection tools like backup. Zerto is also a workload mobility tool and allows IT to confidently move workloads and data across heterogeneous storage or cloud.

Ordering, configuring and installing Zerto is simple. Zerto is licensed by the number of Virtual Machines that are being protected or moved. For mobility use cases, order the appropriate number of migration licenses needed. For replication use cases, order the appropriate quantity of Zerto Virtual Replication licenses using a combination of the tiered licenses plus the corresponding maintenance part numbers. The license is independent of source and target array size, type or capacity being replicated. See the HPE Zerto QuickSpecs for a complete list of part numbers. A corresponding MSA Advanced Data Services LTU is not required for data replication when using Zerto Virtual Replication. An MSA Advanced Data Services LTU would only be required if deploying MSA array-based replication. Zerto installs as a virtual machine under VMware or Hyper-V or in the Cloud as a VM in AWS and Azure in minutes. Zerto does not install any components in the guest operating system and does not depend on any specific configuration of the storage or use MSA array or VMware snapshots to replicate and recover applications.
Review the HPE Zerto QuickSpecs for more information.

HPE MSA Health Check Tool

MSA Health Check is a cloud-based tool that provides users insight into the general health of their MSA array. The tool uses a powerful rules-based analytics engine which can predict failures before they happen. The MSA Health Check tool performs a full sweep of analytics, checking thousands of data points from sensors inside the MSA array. The analytics engine will pick up common failure signatures and check against MSA best practices producing a simple, easy to digest PDF report with status and suggested courses of action to correct anything found in the scan. The tool is free of charge to HPE MSA customers. The MSA Health Check tool is supported across all current MSA Gen7 storage arrays as well as the prior four generations of arrays (MSA P2000 G3, MSA 1040/2040/2042, MSA 1050/2050/2052, and MSA 1060/2060/2062).

Fast and simple access to the MSA Health Check Tool is now available through the MSA Storage Management Utility (v4). Access is also available online through the HPE website at: http://www.hpe.com/storage/MSAHealthCheck.
For more information on how to use HPE MSA Health Check, please review the HPE MSA Health Check User Guide.

Standard Features

TAA Compliance

HPE MSA Storage offers multiple TAA-compliant storage array models across its entire portfolio. MSA Gen7 Storage allows users to build TAA-compliant storage solutions using any combination of media, HDD and/or SSD, available. Simply start by selecting a TAA-compliant Gen7 base array model (see "Step 1: Select Your MSA Gen7 Array Model" in the "Configuration Information") and add six (6) or more HPE MSA drives via HPE's Factory Integration Services. To add storage capacity beyond the base array, MSA Gen7 users can add up to nine (9) MSA 2U 12-drive LFF Drive Enclosures and/or MSA 2U 24-drive SFF Drive Enclosures to each storage array while maintaining TAA-compliance.

Notes: TAA-compliant MSA Gen7 Storage solutions require all customers to add a minimum of six (6) MSA drives to each array configuration via HPE Factory Integration Services at the time of ordering. Customers may choose any combination of HPE MSA drives currently available including HDD and/or SSD, as well as self-encrypting drive (SED) options.

ENERGY STAR Certification

All MSA Gen7 Storage Arrays are ENERGY STAR certified. ENERGY STAR certified products are energy efficient, which results in cost savings via reduced energy consumption and regulatory rebates. Please refer to the US EPA website for details on ENERGY STAR certification criteria and process. MSA Gen7 ENERGY STAR Certification is listed on the EPA website.

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Service and Support

Warranty

- − MSA Storage Systems carry a 3-year limited warranty, parts-only exchange, normal business hours, with next business day response

- − MSA Enterprise SAS (10K RPM) SFF HDDs carry a 3-year limited warranty, parts-only exchange, normal business hours, with next business day response

- − MSA Midline SAS (7.2K RPM) LFF HDDs carry a 1-year limited warranty, parts-only exchange, normal business hours, with next business day response

- − MSA SSDs carry a 3-year limited warranty, parts-only exchange, normal business hours, with next business day response. The MSA SSD warranty includes unconditional replacement in case of drive failure, media wear-out, or both

The MSA Gen7 Storage Array has been designed with customer self-repairable parts to minimize repair time and provide greater flexibility in performing defective parts replacement. Please refer to Hewlett Packard Enterprise limited warranty Statement and parts replacement instructions for further details.

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

Service and Support

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/completecare

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, considering 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, considering 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

Service and Support

–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 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

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/hpesc/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 - at the edge, in colocations, or in 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

Pre-Configured MSA Models - HPE Smart Choice purchase program

The HPE Smart Choice purchase program features popular fully configured products that can be quoted in minutes and shipped quickly through HPE Authorized Partners. Products are configured and tested in an HPE factory and stocked at HPE Authorized Distributors and Partners. The products arrive in a single box, making onsite integration easier and more efficient for partners and customers. Additionally, there are aggressively priced HPE Services available only through the HPE Smart Choice program when you purchase an HPE Smart Choice product.

For additional information on the HPE Smart Choice purchase program, please visit:

https://www.hpe.com/psnow/doc/a50009219enw

HPE MSA Gen7 Storage models currently available through the HPE Smart Choice program include:

Description	SKU
HPE MSA 2070 SFF 2x16Gb FC 4-port Controller 12x1.92TB SSD 4x16Gb SFP FC XCVR 23TB Storage Array	P76572-B25
HPE MSA 2070 SFF 2x16Gb FC 4-port Controller 12x3.84TB SSD 4x16Gb SFP FC XCVR 46TB Storage Array	P76570-B25
HPE MSA 2070 SFF 2x16Gb FC 4-port Cntrl 12x7.68TB SSD 4x16Gb SFP FC XCVR 92TB Storage Array	P84181-B25
HPE MSA 2070 SFF 2x32Gb FC 4-port Controller 12x1.92TB SSD 4x32Gb SFP FC XCVR 23TB Storage Array	P79245-B25
HPE MSA 2070 SFF 2x32Gb FC 4-port Controller 12x3.84TB SSD 4x32Gb SFP FC XCVR 46TB Storage Array	P79246-B25
HPE MSA 2070 SFF 2x32Gb FC 4-port Cntrl 12x7.68TB SSD 4x32Gb SFP FC XCVR 92TB Storage Array	P84182-B25
HPE MSA 2070 SFF 2x10/25GbE iSCSI 4-port Cntrl 12x1.92TB SSD 4x10Gb iSCSI XCVR 23TB Storage Array	P76571-B25
HPE MSA 2070 SFF 2x10/25GbE iSCSI 4-port Cntrl 12x3.84TB SSD 4x10Gb iSCSI XCVR 46TB Storage Array	P76569-B25
HPE MSA 2070 SFF 2x10/25GbE iSCSI 4-port Cntrl 12x7.68TB SSD 4x10Gb iSCSI XCVR 92TB Storage Array	P84183-B25
HPE MSA 2070 SFF 2x10/25GbE iSCSI 4-port Cntrl 12x1.92TB SSD 4x25Gb iSCSI XCVR 23TB Storage Array	P84177-B25
HPE MSA 2070 SFF 2x10/25GbE iSCSI 4-port Cntrl 12x3.84TB SSD 4x25Gb iSCSI XCVR 46TB Storage Array	P84179-B25

Description	SKU
HPE MSA 2070 SFF 2x10/25GbE iSCSI 4-port Cntrl 12x7.68TB SSD 4x25Gb iSCSI XCVR 92TB Storage Array	P84184-B25
HPE MSA 2070 SFF 2x12Gb SAS 4-port Cntrl 12x1.92TB SSD 23TB Storage Array	P84178-B25
HPE MSA 2070 SFF 2x12Gb SAS 4-port Cntrl 12x3.84TB SSD 46TB Storage Array	P84180-B25

Notes:

– Each of the Smart Choice models listed above includes:

- Two 4-port controllers with either 16Gb FC, 32Gb FC, 10GbE iSCSI, 25GbE iSCSI, or 12Gb SAS host connectivity (depending on the selected model)
- Twelve factory-integrated MSA SFF Read Intensive (RI) SSDs - either 1.92TB, 3.84TB, or 7.68TB
- One 4-pack of SFP Transceivers, host connectivity appropriate (excluding 12Gb SAS models)
- Included drives factory configured into a single pool

Configuration Information

Step 1: Select Your MSA Gen7 Array Model
– Each array model includes a SFF or LFF array chassis (depending on the selected model), two MSA 2070 controllers, two redundant 580W AC power supplies, two 1.5m PDU cords (IEC C14), and one rack-mount kit
– Transceivers are not included with the array and must be purchased separately. All MSA 2070 16 Gb Fibre Channel, 32 Gb Fibre Channel and 10/25 GbE iSCSI array models must use qualified MSA SFP transceiver options - review "Step 2: Select Your SFP+ Module" section for further details

Description	SKU
HPE MSA 2070 16Gb Fibre Channel LFF Storage	S1H41A
HPE MSA 2070 32Gb Fibre Channel LFF Storage	S3T79A
HPE MSA 2070 16Gb Fibre Channel SFF Storage	S1H42A
HPE MSA 2070 32Gb Fibre Channel SFF Storage	S3T80A
HPE MSA 2070 10/25GbE iSCSI LFF Storage	S1H43A
HPE MSA 2070 10/25GbE iSCSI SFF Storage	S1H44A
HPE MSA 2070 10GBASE-T iSCSI LFF Storage	S1H45A
HPE MSA 2070 10GBASE-T iSCSI SFF Storage	S1H46A
HPE MSA 2070 12Gb SAS LFF Storage	S1H47A
HPE MSA 2070 12Gb SAS SFF Storage	S1H48A

Notes: MSA 2070 Storage Systems support all HDD and SSD drive options including self-encrypting drive (SED) options.

TAA-compliant MSA 2070 Storage Systems

Description	SKU
HPE MSA 2070 16Gb Fibre Channel SFF TAA-compliant Storage	S1H49A
HPE MSA 2070 32Gb Fibre Channel SFF TAA-compliant Storage	S3T85A
HPE MSA 2070 16Gb Fibre Channel LFF TAA-compliant Storage	S1H50A
HPE MSA 2070 32Gb Fibre Channel LFF TAA-compliant Storage	S3T86A
HPE MSA 2070 10/25GbE iSCSI SFF TAA-compliant Storage	S1H51A
HPE MSA 2070 10GBASE-T iSCSI SFF TAA-compliant Storage	S1H52A
HPE MSA 2070 12Gb SAS SFF TAA-compliant Storage	S1H53A

Notes:
– All TAA-compliant array models require that a minimum of six factory-integrated (CTO) MSA drives be added at the time of ordering. Choose from either HDD and/or SSD drive options
– TAA-compliant MSA 2070 array models support all HDD and SSD drive options including self-encrypting drive (SED) options

MSA 2070 Flash Bundle Storage Systems

Description	SKU
HPE MSA 2070 16Gb Fibre Channel SFF 23TB Flash Bundle	S3L64A
HPE MSA 2070 32Gb Fibre Channel SFF 23TB Flash Bundle	S3T83A
HPE MSA 2070 10/25GbE iSCSI SFF 23TB Flash Bundle	S3L65A
HPE MSA 2070 16Gb Fibre Channel SFF 46TB Flash Bundle	S3L66A
HPE MSA 2070 32Gb Fibre Channel SFF 46TB Flash Bundle	S3T84A
HPE MSA 2070 10/25GbE iSCSI SFF 46TB Flash Bundle	S3L67A

Configuration Information

Notes:
– Each MSA 2070 Flash Bundle Storage System includes twelve (12) factory-integrated SFF Read Intensive SSDs (capacity will depend on selected array model)

– MSA 2070 Flash Bundle Storage Systems support all HDD and SSD drive options excluding self-encrypting drive (SED) options

MSA 2072 Hybrid-Flash Storage Systems

Description	SKU
HPE MSA 2072 16Gb Fibre Channel SFF Storage	S2C83A
HPE MSA 2072 32Gb Fibre Channel SFF Storage	S3T81A
HPE MSA 2072 10/25GbE iSCSI SFF Storage	S2C84A

Description	SKU
HPE MSA 2072 10GBASE-T iSCSI SFF Storage	S2C85A
HPE MSA 2072 12Gb SAS SFF Storage	S2C86A

Notes:
– Each MSA 2072 Hybrid-Flash Storage System includes two (2) factory-integrated SFF 1.92 TB Read Intensive SSDs and one (1) MSA Advanced Data Services license

– MSA 2072 Hybrid-Flash Storage Systems support all HDD and SSD drive options excluding self-encrypting drive (SED) options

Step 2: Select Your SFP+ Module

Description	SKU
HPE MSA 16Gb Short Wave Fibre Channel SFP+ 4-pack Transceiver	C8R24B
HPE MSA 32Gb SFP+ Short Wave Fibre Channel 4-pack Transceiver	S3Y23A
HPE MSA 10Gb Short Range iSCSI SFP+ 4-pack Transceiver	C8R25B
HPE MSA 25Gb SFP28 Short Range 4-pack iSCSI Transceiver	S0K91A

Notes:
– MSA Gen7 Storage Systems do not ship with SFPs (does not apply to MSA Smart Choice models)
– Each MSA Gen7 16 Gb Fibre Channel, 32 Gb Fibre Channel, and/or 10/25 GbE iSCSI storage array can be configured with either four or eight SFPs
– MSA SFPs are for use with MSA Gen7 16 Gb FC, 32 Gb FC, or 10/25 GbE iSCSI Storage Systems only
– MSA Gen7 10GBase-T iSCSI and 12 Gb SAS Storage Systems do not require SFP modules
– Minimum of one SFP transceiver 4 pack is required for 16 Gb and 32 Gb Fibre Channel models
– MSA Gen7 10/25 GbE iSCSI configurations can use Direct Attach Copper (DAC) cables instead of SFPs
– All MSA Gen7 10/25 GbE iSCSI array models (LFF and SFF) can support either 10 Gb or 25 Gb transceivers in the same array
– All MSA Gen7 10/25 GbE iSCSI models require either an SFP 4 pack of transceivers (C8R25B or S0K91A) or a DAC cable option
– Controller host ports are recommended to be configured identically

Step 3: Select Your Drives

– The following HDD and SSD media options are compatible with MSA Gen 6 and Gen7 Storage Systems only

– The following HDD and SSD media options are not compatible with MSA Storage Systems prior to Gen6

– HDD and SSD media options available prior to MSA Gen6 are not compatible with MSA Gen 6 or Gen7 Storage

Configuration Information

Systems

− Customers can mix SSD, Enterprise SAS, and SAS Midline (MDL) drives in the same array configuration

− An Advanced Data Services Suite License is required when mixing HDDs and SSDs within the same configuration, except when using SSDs exclusively as SSD Read Cache. See the Performance Tiering and Archive Tiering section for more information

− SFF SSD 6-Pack Bundles are only offered as options for MSA 2070 Flash Bundle arrays models

− TAA compliance for MSA Gen7 is available for select array models - see "Step 1: MSA Gen7 Array Base Configurations" to select the appropriate base array model. A minimum of six MSA Gen7 drives - either HDD, SSD or any combination - must be added to the array at the time of ordering to maintain TAA compliance

SFF HDD 6-Pack Bundles
MSA SFF HDD options are available to purchase in bundles that include 6 drives. Purchasing MSA drives in bundles typically provides a lower purchase price than purchasing them individually. Check with your HPE sales representative or channel partner for further details.

Description	SKU
HPE MSA 7.2TB SAS 12G Enterprise 10K SFF (2.5in) M2 3yr Wty 6-pack HDD Bundle	R0Q65A
Notes: Contains 6 x MSA 1.2 TB 12G SAS 10K SFF Enterprise HDDs (R0Q55A).	
HPE MSA 10.8TB SAS 12G Enterprise 10K SFF (2.5in) M2 3yr Wty 6-pack HDD Bundle	R0Q66A
Notes: Contains 6 x MSA 1.8 TB 12G SAS 10K SFF Enterprise HDDs (R0Q56A).	
HPE MSA 14.4TB SAS 12G Enterprise 10K SFF (2.5in) M2 3yr Wty 6-pack HDD Bundle	R0Q67A
Notes: Contains 6 x MSA 2.4 TB 12G SAS 10K SFF Enterprise HDDs (R0Q57A).	

LFF HDD 6-Pack Bundles
MSA LFF HDD options are available to purchase in bundles that include 6 drives. Purchasing MSA drives in bundles typically provides a lower purchase price than purchasing them individually. Check with your HPE sales representative or channel partner for further details.

Description	SKU
HPE MSA 48TB SAS 12G Midline 7.2K LFF (3.5in) M2 1yr Wty 6-pack HDD Bundle	R0Q69A
Notes: Contains 6 x MSA 8 TB 12G SAS 7.2K LFF Midline HDDs (R0Q59A)	
HPE MSA 72TB SAS 12G Midline 7.2K LFF (3.5in) M2 1yr Wty 6-pack HDD Bundle	R0Q71A
Notes: Contains 6 x MSA 12 TB 12G SAS 7.2K LFF Midline HDDs (R0Q61A)	
HPE MSA 96TB SAS 12G Midline 7.2K LFF (3.5in) M2 1yr Wty 6-pack HDD Bundle	R3U73A
Notes: Contains 6 x MSA 16 TB 12G SAS 7.2K LFF Midline HDDs (R3U72A)	
HPE MSA 120TB SAS 12G Midline 7.2K LFF M2 1-year Warranty 6-pack HDD Bundle	S0F33A
Notes: Contains 6 x MSA 20 TB 12G SAS 7.2K LFF Midline HDDs (S0F32A)	
HPE MSA 144TB SAS 12G Midline 7.2K LFF M2 1-year Warranty 6-pack HDD Bundle	S3P39A
Notes: Contains 6 x MSA 24 TB 12G SAS 7.2K LFF Midline HDDs (S3P38A)	

Configuration Information

Self-Encrypting HDD 6-Pack Bundles
MSA Self-Encrypting (SED) HDD options are available to purchase in bundles that include 6 drives. Purchasing MSA drives in bundles typically provides a lower purchase price than purchasing them individually. Contact your HPE sales representative or channel partner for further details.

Description	SKU
HPE MSA 14.4TB SAS 12G Enterprise 10K SFF (2.5in) M2 3-year Warranty FE 6-pack HDD Bundle	S4M84A

Notes: Contains 6 x MSA 2.4 TB 12G SAS 10K SFF FIPS-Encrypted HDDs

HPE MSA 72TB SAS 12G Midline 7.2K LFF (3.5in) M2 1-year Warranty FIPS Encrypted 6-pack HDD Bundle	S4R85A

Notes: Contains 6 x MSA 12 TB 12G SAS 7.2K LFF FIPS-Encrypted HDDs

Notes:
− All drives within an MSA array must be self-encrypted drives to enable the encryption feature
− Mixing SED and non-encrypting drives within the same system is supported but not recommended. Encryption is unavailable while both drive types are installed in the same system, even if allocated to different drive pools. Additionally, non-encrypting drives installed to expand a system with encryption enabled will not be usable
− All MSA SED options have been certified by the U.S. National Institute of Standards and Technology (NIST) and Canadian Communications Security Establishment (CSE) as meeting the Level 2 security requirements for cryptographic modules

SFF SSD 6-Pack Bundles
MSA SSD options are available to purchase in bundles that include 6 drives and can be added to any MSA 2070 Flash Bundle array for capacity expansion. Purchasing MSA drives in bundles typically provides a lower purchase price than purchasing them individually. Contact your HPE sales representative or channel partner for further details.

Description	SKU
HPE MSA 11.5TB SAS 12G Read Intensive SFF (2.5in) M2 3-year Warranty 6-pack SSD Bundle	S2E44A

Notes: Contains 6 x MSA 1.92 TB SAS 12G Read Intensive SFF SSDs (R0Q47A)

HPE MSA 23TB SAS 12G Read Intensive SFF (2.5in) M2 3-year Warranty 6-pack SSD Bundle	S2E45A

Notes:
− Contains 6 x MSA 3.84 TB SAS 12G Read Intensive SFF SSDs (R3R30A)
− SSD 6-Pack Bundles are available as capacity expansion options for MSA 2070 Flash Bundles only. If needed for any other MSA Gen7 array model, you may request approval at: **msa.pm@hpe.com**.

SFF HDD Single Drive Options

Description	SKU
HPE MSA 1.2TB SAS 12G Enterprise 10K SFF (2.5in) M2 3yr Wty HDD	R0Q55A
HPE MSA 1.8TB SAS 12G Enterprise 10K SFF (2.5in) M2 3yr Wty HDD	R0Q56A
HPE MSA 2.4TB SAS 12G Enterprise 10K SFF (2.5in) M2 3yr Wty HDD	R0Q57A

Configuration Information

LFF HDD Single Drive Options

Description	SKU
HPE MSA 8TB SAS 12G Midline 7.2K LFF (3.5in) M2 1yr Wty HDD	R0Q59A
HPE MSA 12TB SAS 12G Midline 7.2K LFF (3.5in) M2 1yr Wty HDD	R0Q61A
HPE MSA 16TB SAS 12G Midline 7.2K LFF (3.5in) M2 1yr Wty HDD	R3U72A
HPE MSA 20TB SAS 12G Midline 7.2K LFF M2 1-year Warranty HDD	S0F32A
HPE MSA 24TB SAS 12G Midline 7.2K LFF M2 1-year Warranty HDD	S3P38A

SFF SSD Single Drive Options

Description	SKU
HPE MSA 1.92TB SAS 12G Read Intensive SFF (2.5in) M2 3yr Wty SSD	R0Q47A
HPE MSA 3.84TB SAS 12G Read Intensive SFF (2.5in) M2 3yr Wty SSD	R3R30A
HPE MSA 7.68TB SAS 12G Read Intensive SFF (2.5in) M2 3-year Warranty SSD	S0F31A

LFF SSD Single Drive Options

Description	SKU
HPE MSA 1.92TB SAS 12G Read Intensive LFF (3.5in) M2 3yr Wty SSD	R0Q49A

Self-Encrypting (SED) SSD Single Drive Options

Description	SKU
HPE MSA 1.92TB SAS 12G Read Intensive SFF (2.5in) M2 3-year Warranty FIPS Encrypted SSD	S4M81A
HPE MSA 1.92TB SAS 12G Read Intensive LFF (3.5in) M2 3-year Warranty FIPS Encrypted SSD	S4M82A
HPE MSA 3.84TB SAS 12G Read Intensive SFF (2.5in) M2 3-year Warranty FIPS Encrypted SSD	S4M83A
HPE MSA 15.36TB SAS 12G Read Intensive SFF (2.5in) M2 3-year Warranty FIPS Encrypted SSD	S4R83A
HPE MSA 30.72TB SAS 12G Read Intensive SFF (2.5in) M2 3-year Warranty FIPS Encrypted SSD	S4R84A

Notes:
− All drives within an MSA array must be self-encrypted drives to enable the encryption feature
− Mixing SED and non-encrypting drives within the same system is supported but not recommended. Encryption is unavailable while both drive types are installed in the same system, even if allocated to different drive pools. Additionally, non-encrypting drives installed to expand a system with encryption enabled will not be usable
− All MSA SED options have been certified by the U.S. National Institute of Standards and Technology (NIST) and Canadian Communications Security Establishment (CSE) as meeting the Level 2 security requirements for cryptographic modules

Configuration Information

Step 4: Expand the Storage Capacity of Your MSA Array

- Add up to 9 additional drive enclosures to any MSA Gen7 array model

- Attaching both LFF and SFF drive enclosures is supported on any MSA Gen7 array model

- Adding LFF drive enclosures to a SFF base array model or adding SFF drive enclosures to a LFF base array model is supported

- Add any combination of LFF or SFF drive enclosures and drive media to a TAA-compliant base array model

Drive Enclosures

Description	SKU
HPE MSA 2U 12-drive LFF Drive Enclosure	S1H54A
HPE MSA 2U 24-drive SFF Drive Enclosure	S1H55A

Notes:
- Each drive enclosure includes a single rack-mount kit and two 0.5m MiniSAS HD to MiniSAS HD cables
- Additional options for providing longer drive enclosure cables are available in the section below

Drive Enclosure Cables

Description	SKU
HPE External 1.0m (3ft) Mini-SAS HD 4x to Mini-SAS HD 4x Cable	716195-B21
HPE External 2.0m (6ft) Mini-SAS HD 4x to Mini-SAS HD 4x Cable	716197-B21

Notes: For use when adding a drive enclosure and a longer cable is required.

Step 5: Add Security and Power Options to Your MSA Array

Security Option

Description	SKU
HPE Bezel Lock Kit	875519-B21

DC Power Option

Description	SKU
HPE MSA 764W -48VDC Hot Plug Power Supply Kit	R0Q90A

Notes:
- All MSA Gen7 array enclosures and drive enclosures ship standard with two redundant 580W AC power supplies
- Each R0Q90A option kit includes one 764W -48VDC hot plug power supply unit and one 48VDC 2.3M power cord
- If DC power is desired, then two DC power supply options must be purchased for each array and drive enclosure
- DC Power Supplies can be ordered with factory integration or with field integration. With factory integrated orders, the AC power supplies will not be shipped with the array

Configuration Information

Power Cords

Description	SKU
HPE C13 - C14 WW 250V 10Amp 2.0m Jumper Cord	A0K02A
HPE C13-NEMA 6-15P 10A/250V 3.6m Black Power Cord	A0N33A
HPE C13 - Nema 5-15P US/CA 110V 10Amp 1.83m Power Cord	AF556A
HPE C13 - GB-1002 CN 250V 10Amp 1.83m Power Cord	AF557A
HPE C13 - IRAM -2073 AR 250V 10A 2.5m Power Cord	AF558A
HPE C13 - KSC- 8305 KR 250V 10Amp 1.83m Power Cord	AF560A
HPE C13 - CNS-690 TW 110V 13Amp 1.83m Power Cord	AF561A
HPE C13 - IS-1293 IN 240V 6Amp LV 2.0m Power Cord	AF562A
HPE C13 - SI-32 IL 250V 10Amp 1.83m Power Cord	AF564A
HPE C13 - SEV 1011 CH 250V 10Amp 1.83m Power Cord	AF565A
HPE C13 - DK-2.5A DK 250V 10Amp 1.83m Power Cord	AF566A
HPE C13 - SABS-164 ZA 250V 10Amp 2.5m Power Cord	AF567A
HPE C13 - CEE-VII EU 250V 10Amp 1.83m Power Cord	AF568A
HPE C13 - AS3112-3 AU 250V 10Amp 2.5m Power Cord	AF569A
HPE C13 - BS-1363A UK/HK/SG 250V 10Amp 1.83m Power Cord	AF570A
HPE C13 - JIS C8303 JP 100V 12Amp 2.0m Power Cord	AF572A
HPE C13 - C14 WW 250V 10Amp Flint Gray 2.0m Jumper Cord	AF573A
HPE C13 - NBR-14136 BR 250V 10Amp 1.83m Power Cord	AF591A
HPE C13-C14 IN 250V 10Amp 2m Black Jumper Cord	R1C65A

Notes:
– Two PDU cables ship standard with all AC-powered enclosures
– These power cords may be used by customers that desire to plug their base array and/or drive enclosures into a localized wall outlet or PDU

Step 6: Select Host Connection Cables for your MSA Array

Fibre Channel Infrastructure

PremierFLexOM4 type 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

Configuration Information

Description	SKU
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

OM3 Fibre FC to LC cables

Description	SKU
HPE LC to LC Multi-mode OM3 2-Fiber 0.5m 1-Pack Fiber Optic Cable	AJ833A
HPE LC to LC Multi-mode OM3 2-Fiber 1.0m 1-Pack Fiber Optic Cable	AJ834A
HPE LC to LC Multi-mode OM3 2-Fiber 2.0m 1-Pack Fiber Optic Cable	AJ835A
HPE LC to LC Multi-mode OM3 2-Fiber 5.0m 1-Pack Fiber Optic Cable	AJ836A
HPE LC to LC Multi-mode OM3 2-Fiber 15.0m 1-Pack Fiber Optic Cable	AJ837A
HPE LC to LC Multi-mode OM3 2-Fiber 30.0m 1-Pack Fiber Optic Cable	AJ838A
HPE LC to LC Multi-mode OM3 2-Fiber 50.0m 1-Pack Fiber Optic Cable	AJ839A

10 GbE Infrastructure

Direct Attach Copper Cables

Description	SKU
HPE Aruba Networking 10G SFP+ to SFP+ 1m Direct Attach Copper Cable	J9281D
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
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
HPE Networking X240 10G SFP+ SFP+ 0.65m DAC Cable	JD095C
HPE Networking X240 10G SFP+ SFP+ 1.2m DAC Cable	JD096C
HPE Networking X240 10G SFP+ SFP+ 3m DAC Cable	JD097C
HPE Networking X240 10G SFP+ SFP+ 5m DAC Cable	JG081C
HPE Networking X240 10G SFP+ 7m DAC Cable	JC784C
HPE Networking Comware X240 40G QSFP+ to 4x10G SFP+ 1m Direct Attach Copper Splitter Cable	JG329A
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

Configuration Information

25 GbE Infrastructure

Direct Attach Copper Cables

Description	SKU
HPE Aruba Networking 25G SFP28 to SFP28 3m Direct Attach Copper Cable	JL488A
HPE Aruba Networking 25G SFP28 to SFP28 5m Direct Attach Copper Cable	JL489A
HPE 100Gb QSFP28 to 4x25Gb SFP28 3m Direct Attach Copper Cable	845416-B21
HPE Networking X240 QSFP28 4xSFP28 3m Direct Attach Copper Cable	JL283A

Active Optical Cables

Description	SKU
HPE Aruba Networking 25G SFP28 to SFP28 3m Active Optical Cable	R0M44A
HPE Aruba Networking 25G SFP28 to SFP28 7m Active Optical Cable	R0M45A
HPE Aruba Networking 25G SFP28 to SFP28 15m Active Optical Cable	R0Z21A
HPE QSFP28 to 4x25Gb SFP28 7m Active Optical Cable	845420-B21
HPE QSFP28 to 4x25Gb SFP28 15m Active Optical Cable	845424-B21

SAS Infrastructure

Mini SAS HD to Mini SAS Cables

Description	SKU
HPE 1.0m External Mini SAS High Density to Mini SAS Cable	716189-B21
HPE 2.0m External Mini SAS High Density to Mini SAS Cable	716191-B21
HPE 4.0m External Mini SAS High Density to Mini SAS Cable	716193-B21

Notes: These cables are used to connect the c-Class 6 Gb BladeSystem SAS switch to MSA Gen7 SAS Storage system.

Mini SAS HD to Mini SAS HD Cables

Description	SKU
HPE External 1.0m (3ft) Mini-SAS HD 4x to Mini-SAS HD 4x Cable	716195-B21
HPE External 2.0m (6ft) Mini-SAS HD 4x to Mini-SAS HD 4x Cable	716197-B21
HPE External 4.0m (13ft) Mini-SAS HD 4x to Mini-SAS HD 4x Cable	716199-B21

Notes:
− These cables are used to connect the DL and ML ProLiant 12 Gb SAS Servers to MSA Gen7 SAS Storage system
− The 1.0m and 2.0m Mini-SAS HD to Mini-SAS HD cables can also be used for connecting a MSA Gen7 SAS controller to a SFF or LFF drive enclosure

Step 7: Add the HPE Advanced Data Services License to Your MSA Array

Description	SKU
HPE MSA Advanced Data Services LTU	R2C33A
HPE MSA Advanced Data Services E-LTU	R2C33AAE

Notes:
− The Advanced Data Services Suite includes a Performance Tiering LTU, 512 Snapshot Software LTU, and the Remote Snap Software LTU
− Configurations which have a mixture of both SSDs and HDDs within the same system that are being configured for performance tiering (excluding SSD Read Cache), will require the Advanced Data Services LTU
− MSA Gen7 array configurations with all SSDs or with an SSD Read Cache extension do not require an Advanced Data Services LTU

Technical Specifications

MSA Gen7 Storage Technical Specifications	
Power requirements	
Input Power Requirements (typical-running I/O) SFF/LFF arrays	120VAC 3.07A, 293-361 W; 220VAC 1.58A,289-352W
Max Input Power	100-240 VAC, 50/60 Hz., 4.38-2.17A; 48-60 VDC 10.4A/8.3A
Heat Dissipation	1766 BTU/hr
Temperature and Humidity Ranges	
Operating Temperature	ASHRAE A3 5°C to 40°C, -12°C DP & 8 to 24°C DP (Derate maximum allowable dry-bulb temperature 1°C/175m above 900m)
Shipping Temperature	-40°F to 158°F (-40°C to 70°C)
Operating Humidity	Up to 85% RH
Non-Operating Humidity	Up to 90% RH @ 30°C
Physical	
Height	3.5 in (8.9 cm)
Depth (Back of chassis ear to controller latch)	20.0 in (50.8 cm)
Depth (Front of chassis ear to back of cable bend)	26.4 in (66.9 cm)
Width (Chassis only)	17.5 in (44.5 cm)
Width (Chassis with bezel ear caps)	19.0 in (48.3 cm)
Weight LFF Enclosure	
Chassis empty	11 lbs (5 kg)
Controller enclosure (fully populated with FRUs and disks)	71 lbs (32 kg)
Expansion enclosure (fully populated with FRUs and disks)	62 lbs (28 kg)
Weight SFF Enclosure	
Chassis empty	11 lbs (5 kg)
Controller enclosure (fully populated with FRUs and disks)	66 lbs (30 kg)
Expansion enclosure (fully populated with FRUs and disks)	55 lbs (25 kg)
Acoustic Ratings	
Sound Power	A weighted sound power LWAd - 8.3 B
Sound Pressure	A weighted sound pressure LpAm - 74dBA

Shock and Vibration	
Shock, Operational	5G, 11 ms
Shock, Non-Operational	15G, 10ms
Vibration, Operational	5-500Hz, 0.18 Grms
Vibration, Non-Operational	x-axis (5-300Hz) 0.8 Grms z-axis (5-300Hz) 1.2 Grms
Altitude	
Altitude, operating	3000m (10,000 feet)
Altitude, non-operating	12,192m (40,000 feet)

Technical Specifications

MSA Gen7 Power Supply Details

2U Flex 580W PSU 80+ Platinum

Input Voltage Range (V rms)	100-240		
Frequency Range (Hz)	50-60		
Nominal Input Voltage	115	208	230
Maximum Output Wattage Rating (W)	584	584	584
Nominal Input Current (Arms)	5.56	3.06	2.77
Maximum Input Wattage Rating (W)	639.4	635.5	630
Maximum Rated VA (VA)	640.3	636.1	625.2
Efficiency (%/100)	0.913	0.919	0.935
Power Factor	0.999	0.999	0.999
Leakage Current (mA)	<0.8		
Maximum Inrush Current (A peak)	45		
Maximum Inrush Current Duration (ms)	40		
Maximum British Thermal Unit Rating (BTU-hr)	2180.4	2167.0	2148.3

MSA Gen7 Storage Regulatory Information

Safety	UL/CSA 62368-1 (USA/Canada)
	EN 62368-1 (International)
Power	EU Regulation 2019/424 (Lot 9)
Electromagnetic Compatibility	VCCI Class A (Japan)
	FCC Class A (USA)
	ICES-003 Class A (Canada)
	EN55032: (European Union Class A); CISPR 32 (International Class A)
	EN61000-3-2: (Harmonics) (European Union)
	EN61000-3-3: (Flicker) (European Union)
	EN 55035 (European Union, Immunity, Class A); CISPR 24 (International Immunity, Class A)
	AS/NZS CISPR 32, Class A (Australia, New Zealand)
	CNS 13438 Taiwan, Class A (Taiwan)
	KN32 Class A (Emissions Class A); KN35 (Immunity) (S Korea)
RoHS and WEEE	RoHS-6/6
	China RoHS
	WEEE
Country Approvals	United States, Australia/New Zealand, Canada, European Union, Japan, South Korea, Taiwan
TAA Compliance	MSA 2070 TAA-compliant array models: COO Mexico

MSA Gen7 Benchmark Performance Results

The performance figures provided here are for reference as many variables exist between array configurations, workloads, drive types, disk group setup parameters and host system setup. For additional help in sizing your capacity and/or performance requirements, HPE recommends consulting with your HPE sales representative or authorized HPE partner to determine the MSA configuration that best fits your needs. These numbers are subject to change without notice.

HPE MSA Gen7 Benchmark Performance Results	
Benchmark Performance Results	HPE MSA Gen7
IOPS	
Random Reads	783,000
Random Writes	227,000
Sequential	
Segmented Sequential Reads	14.1 GB/s
Segmented Sequential Writes	9.6 GB/s

Notes: Performance results were generated using internal HPE test tools. Number and type of applications, drive type and number of drives, operating system used, and the number of hosts will affect overall performance.

Environment-friendly Products and Approach End-of-life Management and Recycling

Hewlett Packard Enterprise offers end-of-life product return, trade-in, and recycling programs in many geographic areas for our products. Products returned to Hewlett Packard Enterprise will be recycled, recovered or disposed of in a responsible manner.

The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard Enterprise web site. These instructions may be used by recyclers and other WEEE treatment facilities as well as Hewlett Packard Enterprise OEM customers who integrate and re-sell Hewlett Packard Enterprise equipment.

Summary of Changes

Date	Version History	Action	Description of Change
06-Oct-2025	Version 4	Changed	HPE Rebranding FY25
02-Sep-2025	Version 3	Changed	Overview and Standard Features sections were updated - HPE Smart Choice MSA models and HPE Morpheus VM Essentials Software details added. Configuration Information section was updated - New SKUs were added.
		Added	P76572-B25, P76570-B25, P84181-B25, P79245-B25, P79246-B25, P84182-B25, P76571-B25, P76569-B25, P84183-B25, P84177-B25, P84179-B25, P84184-B25, P84178-B25, P84180-B25
03-Mar-2025	Version 2	Changed	Overview, Standard Features, Configuration Information and Technical Specification sections were updated. Added MSA Gen7 32Gb FC models and updated Standard Features section.
02-Dec-2024	Version 1	New	New QuickSpecs.

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