

HPE MSA 2040 Storage Data Sheet



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Overview

ENERGY STAR certified HPE MSA 2040 is a high-performance storage array designed for entry-level Hewlett Packard Enterprise customers desiring 8Gb/16Gb Fibre Channel, 1GbE/10GbE iSCSI, or 12Gb SAS connectivity with 4 host ports per controller. The MSA 2040 Storage array provides an excellent value for customers needing performance balanced with price to support initiatives such as consolidation and virtualization.

The MSA 2040 delivers this performance by offering:

- High performance controller architecture
- 6GB cache per controller, 12GB per storage array
- Support for SSDs, Enterprise SAS HDDs, Midline SAS HDDs, and Self Encrypting Drives
- SAN and SAS interfaces
- Up to four (4) host ports per controller, 8 host ports per storage array
- Two new MSA 2040 Controllers:
 - MSA 2040 SAN Controller | 8Gb/16Gb FC connectivity and/or | 1GbE/10GbE iSCSI connectivity
 - MSA 2040 SAS Controller | 6Gb/12Gb SAS connectivity

The HPE MSA 2040 Storage ships standard with a license for 64 snapshots for increased data protection. The MSA2040 now offers a simplified licensing strategy with one optional software suite.

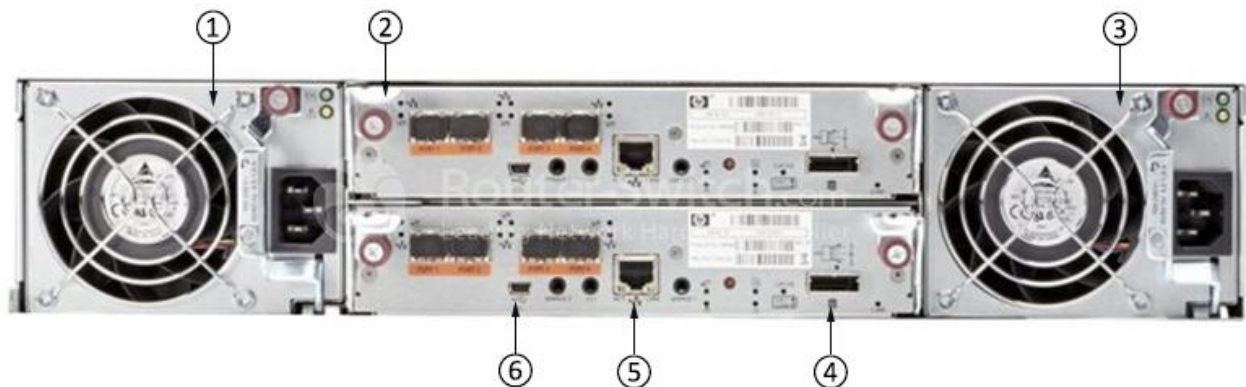
The Advanced Data Services Suite include the following software licenses:

- HPE MSA 2042 Performance Automated Tiering LTU
- HPE MSA 512-Snapshot Software LTU
- HPE MSA Remote Snap Software LTU

Figure 1 shows the MSA 2040 LFF enclosure.



Figure 2 shows the MSA 2040 rear panel with 2 controllers installed. SAS and SAN controllers have similar appearance, this figure is for reference.



Note:

①	Power supply
②	SAN: 8 and/or 16Gb Fibre Channel, 1 and/or 10GbE iSCSI SAS: 6Gb/12Gb mini-SAS HD ports
③	Power supply
④	Expansion port
⑤	Management Ethernet port
⑥	CLI port (mini-USB)

Models

MSA 2040 Controller:	
HP MSA 2040 SAN Controller	C8R09A
HP MSA 2040 SAS Controller	C8S53A
MSA 2040 Pre-Configured Models:	
HP MSA 2040 Energy Star SAN Dual Controller LFF Storage	K2R79A
HP MSA 2040 Energy Star SAN Dual Controller SFF Storage	K2R80A
HP MSA 2040 Energy Star SAS Dual Controller LFF Storage	K2R83A
HP MSA 2040 Energy Star SAS Dual Controller SFF Storage	K2R84A
MSA 2040 Array Bundles:	
HP MSA 2040 Energy Star SAN Dual Controller with 24 1.2TB 12G SAS 10K SFF HDD 28.8TB Bundle	M0T00A
HP MSA 2040 Energy Star SAS Dual Controller with 24 1.2TB 12G SAS 10K SFF HDD 28.8TB Bundle	M0T01A

Note:

1. Includes LFF Array Chassis + two MSA 2040 SAN controllers, no drives or SFPs are included

2. Includes SFF Array Chassis + two MSA 2040 SAN controllers, no drives or SFPs are included
3. Includes LFF Array Chassis + two MSA 2040 SAS controllers, no drives or host connect cables are included (SFP's not required for SAS controllers)
4. Includes SFF Array Chassis + two MSA 2040 SAS controllers, no drives or host connect cables are included (SFP's not required for SAS controllers)
5. Includes SFF Array Chassis + two MSA 2040 SAN controllers + 24 x 900 GB SFF SAS drives, no SFPs are included
6. Includes SFF Array Chassis + two MSA 2040 SAN controllers + 24 x 1.2TB SFF SAS drives, no SFPs are included
7. Includes SFF Array Chassis + two MSA 2040 SAS controllers + 24 x 1.2TB SFF SAS drives (SFP's not required for SAS controllers)
8. Includes SFF Array Chassis + two MSA 2040 SAS controllers + 24 x 900GB SFF SAS drives, no host connect cables are included (SFP's not required for SAS controllers)
9. Includes SFF Array Chassis + two MSA 2040 SAN controllers + 4x200GB SSD + 6x900GB 10K SFF HDD + 1 Performance Auto Tier LTU, no SFPs are included
10. Includes SFF Array Chassis + two MSA 2040 SAS controllers + 4x200GB SSD + 6x900GB 10K SFF HDD + 1 Performance Auto Tier LTU (SFP's not required for SAS controllers)

Features

All MSA 2040 models offer a common set of valuable features:

NOTE:

Customers must upgrade their MSA 2040 controller firmware to GL101 or later for iSCSI functionality

Customers must upgrade their MSA 2040 controller firmware to GL105 or later for Self-Encrypting Drive functionality

Customers must upgrade their MSA 2040 controller firmware to GL200 or later for MSA virtualizations features

Customers must upgrade their MSA 2040 controller firmware to GL210 or later for enhanced performance

Customers must upgrade their MSA 2040 controller firmware to GL220 or later for additional MSA virtualization features (such as remote snap replication for iSCSI, virtual tier affinity, large pool support, snapshot space management, scheduler and volume copy on virtual storage)

- MSA 2040 supports SSD drives which allow IT managers to boost IOPS performance.
- Automated Sub-Lun Tiering. The MSA 2040 can manage up to three tiers of storage: Performance tier, Standard tier and Archive tier. This feature is available with GL200 firmware or newer.
- SSD Performance Tier to improve random read and write performance. Creation of an SSD Performance Tier for both read and write capabilities requires a Performance Auto Tiering License (D4T79A/ D4T79AE). The Performance Auto Tiering License is not required in Linear Storage configurations not utilizing Virtual Storage Disk-Groups and Pools.
- SSD Read Cache to improve random read performance. A maximum of 2 SSD's are supported per pool utilizing a maximum of 4TB of read cache per controller.
- Thin Provisioning allows storage allocation of physical storage resources only once they are consumed by an application. Thin Provisioning also allows over-provisioning of physical storage pool resources allowing ease of growth for volumes without predicting storage capacity upfront. Thin Provisioning is available with GL200 firmware or newer.

- Snapshot enhancements for virtual storage, including performance improvements, hierarchical snapshots, and simplified resource management. Administrators can monitor and optionally control snapshot space usage with GL220 firmware or later.
- Prioritize data by assigning appropriate affinity level (Performance, No Affinity & Archive) with GL220 firmware or later.
- Large Pool Support is available with GL220 firmware or later. Customers can now enjoy 512 TiB capacity per virtual pool by enabling large pool support.
- MSA 2040 supports Self-Encrypting Drives (SED) to allow customers to secure their critical data and comply with all required regulatory mandates.

Simple storage management including an intuitive browser-based user interface.

- Storage Management Utility V3 (SMU). This new MSA management GUI brings a new modern look and feel to array management. SMU V3 available with GL200 firmware or newer. Existing MSA customers can choose to use the new SMU V3 or to continue to use the previous generation SMU V2 if new virtualization features are not required.
- MSA 2040 comes standard with 64 controller-based snapshots and clone capability (volume copy is available for both linear and virtual storage with GL220 firmware or later; pre-GL220 firmware, volume copy is only available on linear storage). Arrays also support an optional 512 snaps. Choose either a low-cost single controller array or start with a configured dual controller array model to fit the budget, high availability, and performance needs.
- All models feature a wide variety of drives: High-performance SSD drives, enterprise-class SAS, SED and SAS Midline drives.
- The MSA 2040 will support a maximum of 7 disk enclosures (either LFF and/or SFF). Add-on enclosures can either be D2700 Small Form Factor (SFF) drive enclosures or MSA 2040 Large Form Factor (LFF) disk enclosures. The array can grow incrementally from a few drives to 96 LFF or 199 SFF drives.
- Disks Groups can be spanned across multiple enclosures RAID levels 1, 5, 6, 10. Linear Vdisks support RAID levels 0, 1, 3, 5, 6, 10, 50.
- Maximum hard drive counts vary by RAID levels: 2 drive max for RAID level 1; max of 16 drives for RAID levels 0, 3, 5, 6, and 10; max of 32 drives for RAID level 50. With GL200 or newer firmware multiple Disk Groups can be aggregated into a Storage Pool.

The maximum LUN size is 140TB (128TiB)

- Storage Pools allow data on a given LUN to span across all drives in a pool. When capacity is added to a system, the user is also getting a performance benefit of the additional spindles –hence the term Wide Striping. Storage Pools are available with GL200 firmware or newer.
- Non-disruptive on-line controller code upgrade (requires dual controllers w/ multi-pathing software)
- Upgradable by design. Owners of an MSA P2000 G3 and an MSA 1040 array are able to do data-in-place controller upgrades to the new MSA 2040 array. This unique ability protects the earlier investments in drives, and JBODs.

Application Solutions

The HPE MSA 2040 Storage is the ideal solution for customers running Oracle, Microsoft, SAP environments and those customers who are deploying virtual server technologies like VMware and Hyper-V. The MSA 2040 delivers enterprise functionality that enhances virtual environments, simplifies management, and reduces costs. Easy to deploy, scale and maintain, HPE MSA 2040 Arrays ensure that crucial business data remains available.

Hewlett Packard Enterprise has developed best-in-class expertise in Oracle, Microsoft, SAP, and Virtualization Hypervisor technology through extensive testing with the HPE MSA 2040, HPE servers, and management software;

high availability and disaster recovery solutions; and backup and recovery on the Oracle, Microsoft, and SAP application platforms. As a result, our customers can expect a wide range of operational and business benefits where they can:

- Deploy IT assets across multiple locations.
- Incrementally grow storage without interruption.
- Enable high availability and disaster recovery capabilities for critical applications.
- Deploy a remote disaster recovery site.

Platform Information

General

MSA 2040	
Capacity Single Enclosure and Maximum Additional Drive Enclosures	LFF: 120 TB (single LFF array-head -using 12 x 10TB LFF SAS MDL drives) 960 TB (7 LFF Disk Enclosures behind LFF Array & using 10TB LFF SAS MDL drives) SFF: 76.8 TB (single SFF array-head - using 24 x 3.2TB SFF SSD drives) 637 TB (7 SFF Disk Enclosures behind SFF Array & using 3.2TB SFF SSD drives) NOTE: 1) maximum available storage capacity depends on the RAID level being implemented
Pool Capacity	GL200: 169 TB (154 TiB) GL210: 219 TB (200 TiB) GL220: 329 TB (300 TiB) GL220 with Large Pool Support: 562 TB (512 TiB) NOTE: 1) The above pool capacities by firmware release apply to virtual storage only 2) The above capacities are usable capacity/pool. Each MSA system can support two pools.
Cache	6 GB per controller NOTE: 6GB cache includes Data (Read/Write) cache = 4GB and Metadata and System OS memory= 2GB
Total LUNs (LUN size are dependent of the storage architecture: Linear vs. Virtualized)	512 maximum LUN size: 140TB (128TiB) Thin Provisioning allows you to create the LUNs independent of the physical storage
Host Interconnect	MSA 2040 SAN controller will support up to four connections with options of 16Gb, 8Gb FC and 10GbE, 1GbE iSCSI per controller. See table above for valid configuration table. MSA 2040 SAS controller will support up to four 6Gb/12Gb SAS connections per controller using miniSAS HD cables
Maximum Drives w/ expansion	96 LFF/199 SFF
Maximum host supported	64 in v2 UI 512 in v3 UI

Standard Software:	Snapshot, 64 (snaps)
Optional Software	Remote Snap (linear storage only) Max Snapshot (512) Performance Tiering
Product Technology	
MSA 2040 SAN controller	MSA 2040 SAN controller supports 8Gb FC, 16Gb FC, 1GbE iSCSI or 10GbE iSCSI SFPs.
MSA 2040 SAS controller	MSA 2040 SAS controller supports 6Gb and 12Gb SAS host connectivity using mini-SAS HD cables.
Modular Chassis	2U rack height. 12 Large Form Factor or 24 Small Form Factor drive bays, accommodating SSD (available only for Small Form Factor), SAS, SEDs and SAS Midline drives. Comes with space for one or two controllers
Drives available	<p>The MSA 2040 controllers support both the MSA 3.5-inch Large Form Factor (LFF) drives, and the MSA 2.5-inch Small Form Factor (SFF) drives.</p> <ul style="list-style-type: none"> • Solid State Drives (SSDs) deliver exceptional performance for applications requiring high random read IOPs performance (available only for Small Form Factor). • Serial Attached SCSI (SAS) enterprise-class drives are designed for high demand, 24x7 usage. • SAS Midline drives are usually reserved for archival of data as they are relatively inexpensive and are available in very large capacities. • Self-Encrypting Drives (SEDs) are designed to safeguard critical personal and business information and to comply with Regulatory Mandates
Optional Disk Enclosures	<p>MSA 2040 3.5-inch Disk Enclosure.</p> <p>This 2U unit has twelve LFF (3.5-inch) drive bays and accepts for MSA dual-ported SAS, SEDs and SAS MDL drives. The pre-configured HPE MSA 2040 LFF Drive Enclosure (M0S96A) has two I/O modules and supports both single and dual controller arrays.</p> <ul style="list-style-type: none"> • This 3.5-inch MSA disk enclosure can be attached to MSA 2040 LFF or SFF array head. • Each configured model ships standard with two .5m mini-SAS to mini-SAS cables for connection to the MSA 2040 array expansion port or existing disk enclosure cascade port. • LFF and/or SFF Disk Enclosures can be mixed up to the maximum of 7 total Disk Enclosures • The MSA 2040 does not support LFF SATA HDDs. <p>HP D2700 Disk Enclosure (AJ941A) is designed to support twenty five HPE Storage or ProLiant 2.5-inch Universal form factor (SFF) 12Gb, SSD, SAS, SEDs or SAS MDL hard drives. It ships standard with dual I/O modules installed.</p> <ul style="list-style-type: none"> • This 2.5-inch D2700 disk enclosure can be attached to MSA 2040 LFF or SFF

	<p>array head</p> <ul style="list-style-type: none"> The D2700 enclosure ships with a two .5m mini-SAS to mini-SAS cables for connection to the MSA 2040 array expansion port or existing disk enclosure cascade port. LFF and/or SFF Disk Enclosures can be mixed up to the maximum of 7 total Disk Enclosures. The MSA 2040 does not support SFF SATA HDDs.
DC-power chassis	<p>Hewlett Packard Enterprise is making the two models of controller-less chassis available with direct current (DC) power supplies. They each have the two empty bays where users can insert one or two MSA 2040 controller(s). The 500 watt power supply is designed to operate over the input range of -40VDC to -75VDC.</p> <p>MSA 2040 Controller-less Chassis (DC-powered) HP MSA 2040 SFF DC-power Chassis (C8R11A) (Will accept one or two MSA 2040 SAN or MSA 2040 SAS controllers and can accommodate up to twenty four 2.5-in (SFF) drives) HP MSA 2040 LFF DC-power Chassis (C8R13A) (Will accept one or two MSA 2040 SAN or MSA 2040 SAS controllers and can accommodate up to twelve 3.5-in (LFF) drives)</p>
Power Requirements	
Input Power Requirements (typical-running I/O) SFF/LFF arrays	<ul style="list-style-type: none"> 110VAC 3.32A, 344-390 W; 220VAC 1.61A,374-432W
Max Input Power	100-240 VAC, 50/60 Hz., 4.5-1.9A; 48-60 VDC 10.4A/8.3A
Heat Dissipation	1622 BTU/hr
Temperature and Humidity Ranges	
Operating Temperature	41°F to 104°F (5°C to 40°C)
Shipping Temperature	-40°F to 158°F (-40°C to 70°C)
Operating Humidity	10% to 90% RH @ 104°F (40°C) non-condensing
Non-Operating Humidity	Up to 93% RH @ 104°F (40°C)
Declared acoustic noise levels	
Sound Power	A weighted sound power LWAd=6,75 B
Sound Pressure	A weighted sound pressure LpAm - 55dB
Shock and Vibration	
Shock, Operational	3G's for 11 milliseconds
Shock, Non-Operational	15G 11ms half sine
Vibration, Operational	5-500Hz, 0.14 Grms shaped
Vibration, Non-Operational	3-365-3Hz, 1.22 Grms,z-axis,0.85 Grms, X&Y axis shaped spectrum
Physical	

Height	3.5 in/ 8.9 cm
Depth (excluding cables) (back of ear to back of controller handle)	MSA 2040 SFF 24-bay array: 19.5 in / 49.5 cm MSA 2040 LFF 12-bay array: 22.5in. / 57.2 cm
Width (body only)	17.6 in / 44.7 cm (w/ ears 19 in / 48.26 cm)
Chassis Weight (no controllers)	MSA 2040 LFF chassis: 31 lbs. (DC-pwr model: 32.6 lbs) MSA 2040 SFF chassis: 29.1 lbs (DC-pwr model: 30.7lbs)

MSA 2040 Controllers:

User Interface	Status and activity provided via management interfaces. Status Indicators on front of Controller
RAID Support	0, 1, 3, 5, 6, 10, 50
Cache Memory	4GB Read/Write. ECC protection with backup to Flash memory (indefinite backup)
Cache Backup	ECC protection with back up to flash memory (indefinite backup)
Upgradeable Firmware	yes
Disk Drive and Enclosure Protocol Support	6 Gb SAS - Serial Attached SCSI
Host Ports	FC: 4 x 8Gb Fibre Channel (per controller)
	FC: 4 x 16Gb Fibre Channel (per controller)
	iSCSI: 4 x 10GbE iSCSI (per controller)
	iSCSI: 4 x 1GbE iSCSI (per controller)
	SAS: 4 x 12 Gb mini-SAS HD using SAS 3.0 SFF-8644 connect interface (per controller)
Expansion Port	SAS (SFF8088) 4x lane 6 Gb SAS
Weight, controller	MSA 2040 SAN Controllers 4.8 lbs.

Configuration and Order Information

Hewlett Packard Enterprise has a very successful Configure to Order program for the MSA 2040 family. The MSA 2040 models and options may or may not be factory installed in a rack with add-on controllers, switches, MSA 2040 disk enclosures and hard drives. The MSA 2040 arrays may be integrated with ProLiant servers or as standalone storage. Orders to be shipped through the CTO process must have a minimum of two drives of the same type (SSD, SAS or SAS MDL) ordered per controller.

Step 1 - MSA 1040 - Base Configuration

Select one model:

Model Name	SKUs
MSA 2040 Controller-less Chassis (AC-powered)	
HP MSA 2040 Energy Star SFF Chassis	K2R81A
HP MSA 2040 Energy Star LFF Chassis	K2R82A
MSA 2040 Controller-less Chassis (DC-powered)	
HP MSA 2040 SFF DC-power Chassis	C8R11A

HP MSA 2040 LFF DC-power Chassis	C8R13A
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Step 2 - Options

Select each option with quantities specified.

Step 2a - MSA 2040 Controllers

Quantity	Description with Parts Shipped:	SKU
1 or 2	HP MSA 2040 SAN Controller	C8R09A
	NOTE: for either the LFF or SFF MSA 2040 chassis or the two DC-powered chassis	
1 or 2	HP MSA 2040 SAS Controller	C8S53A
	NOTE: each controller has four mini-SAS HD ports for host connection. Cables must be purchased separately.	
	NOTE: for either the LFF or SFF MSA 2040 chassis or the two DC-powered chassis.	

Step 2b - SFPs

NOTE: MSA 2040 SAN Controller does not ship with any SFPs. MSA SAS controllers do not require SFP modules.

Customer must select one of the following SFP options. Each MSA 2040 SAN controller can be configured with 2 or 4 SFPs. MSA SFPs are for use only with MSA 2040 SAN Controllers. For MSA 2040 10Gb iSCSI configuration user can use DAC cables instead of SFPs.

MSA Small Form Factor Pluggable (SFPs) Transceivers:	SKU
HPE MSA 2040 8Gb Short Wave Fibre Channel SFP+ 4-Pack Transceiver (Includes four x 8Gb SW FC SFPs)	C8R23A
HPE MSA 2040 16Gb Short Wave Fibre Channel SFP+ 4-Pack Transceiver (Includes four x 16Gb SW FC SFPs)	C8R24A
HPE MSA 2040 10Gb Short Range iSCSI Channel SFP+ 4-Pack Transceiver (Includes four x 10Gb SW iSCSI SFPs)	C8R25A
HPE MSA 2040 1Gb RJ-45 iSCSI Channel SFP+ 4-Pack Transceiver	C8S75A

Step 2c - SSD, SAS, SED or SAS MDL Drive Options

NOTE: SAS MDL drives are designed for archival or reference data. They should not be used in a heavy or intense I/O environment. Those situations require the use of enterprise-class SSD or SAS drives. MSA 3.5-inch or 2.5-inch drives are for use only with MSA arrays. Customers can mix SSD, SAS, and SAS MDL drives in the same array head and disk enclosure.

MSA 2040 Drives:

Solid State Drives (SSDs) (SFF 2.5-inch)	
12G SFF SAS SSDs (Mixed Use)	
HPE MSA 400GB 12G SAS Mixed Use SFF (2.5in) 3yr Warranty Solid State Drive	N9X95A
HPE MSA 800GB 12G SAS Mixed Use SFF (2.5in) 3yr Warranty Solid State Drive	N9X96A
HPE MSA 1.6TB 12G SAS Mixed Use SFF (2.5in) 3yr Warranty Solid State Drive	N9X91A
HPE MSA 3.2TB 12G SAS Mixed Use SFF (2.5in) 3yr Warranty Solid State Drive	N9X92A
SAS Drives (SFF 2.5-inch)	
12G SFF 15K SAS HDDs	
HP MSA 300GB 12G SAS 15K SFF (2.5in) Enterprise 3yr Warranty Hard Drive	J9F40A
HP MSA 450GB 12G SAS 15K SFF (2.5in) Enterprise 3yr Warranty Hard Drive	J9F41A
HP MSA 600GB 12G SAS 15K SFF (2.5in) Enterprise 3yr Warranty Hard Drive	J9F42A

HPE MSA 900GB 12G SAS 15K SFF (2.5in) Enterprise 3yr Warranty Hard Drive	Q1H47A
12G SFF 10K SAS HDDs	
HP MSA 300GB 12G SAS 10K SFF(2.5in) Dual Port Enterprise 3yr Warranty Hard Drive	J9F44A
HP MSA 600GB 12G SAS 10K SFF(2.5in) Dual Port Enterprise 3yr Warranty Hard Drive	J9F46A
HP MSA 1.2TB 12G SAS 10K SFF(2.5in) Dual Port Enterprise 3yr Warranty Hard Drive	J9F48A
HP MSA 1.8TB 12G SAS 10K SFF (2.5in) 512e Enterprise 3yr Warranty Hard Drive	J9F49A
NOTE: 512e drives require MSA 1040/2040 firmware version GL200P002 or newer	
12G SFF 7.2K SAS MDL HDDs	
HP MSA 1TB 12G SAS 7.2K SFF (2.5in) 512e Midline 1yr Warranty Hard Drive	J9F50A
HP MSA 2TB 12G SAS 7.2K SFF (2.5in) 512e Midline 1yr Warranty Hard Drive	J9F51A
NOTE: 512e drives require MSA 1040/2040 firmware version GL200P002 or newer	
MSA Large Form Factor (LFF) SAS MDL DP drives for MSA 2040 Array and MSA 2040 3.5-inch Disk Enclosure	
12G LFF 7.2K SAS Midline Drives	
HPE MSA 10TB 12G SAS 7.2K LFF (3.5in) Midline 512e 1yr Wty Hard Drive	P9M82A
HP MSA 8TB 12G SAS 7.2K LFF (3.5in) 512e Midline 1yr Warranty Hard Drive	M0S90A
HP MSA 6TB 12G SAS 7.2K LFF (3.5in) 512e Midline 1yr Warranty Hard Drive	J9F43A
HP MSA 4TB 12G SAS 7.2K LFF (3.5in) 512e Midline 1yr Warranty Hard Drive	K2Q82A
NOTE: 512e drives require MSA 1040/2040 firmware version GL200P002 or newer	
MSA Large Form Factor (LFF) SAS DP drives for MSA 2040 Array and MSA 2040 3.5-inch Disk Enclosure	
12G LFF SAS SSDs (SFF Solid State Drives in LFF Converters)	
HPE MSA 400GB 12G SAS Mixed Use LFF (3.5in) Converter Carrier 3yr Wty Solid State Drive	P9M79A
HPE MSA 800GB 12G SAS Mixed Use LFF (3.5in) Converter Carrier 3yr Wty Solid State Drive	P9M80A
MSA Large Form Factor (LFF) SAS DP Self-Encrypted Drives for MSA 2040 Array and MSA 2040 3.5-inch Disk Enclosure	
HPE MSA 4TB 12G SAS 7.2K LFF (3.5in) Midline Self Encrypted 1yr Warranty Hard Drive	Q1H48A
MSA Small Form Factor (SFF) SAS DP Self-Encrypted Drives for MSA 2040 Array and D2700 2.5-inch Disk Enclosure	
HPE MSA 1.2TB 12G SAS 10K SFF (2.5in) Enterprise Self Encrypted 3yr Wty Hard Drive	P9M81A

NOTE:

- All drives within the MSA 240 array must be self-encrypted drives to enable the encryption feature. There cannot be a mixture of encrypted and non-encrypted drives within the same array.

- SEDs can be used in a non-SED environment, but will not be encrypted unless all drives in the array are

SED

- Self-encrypted drives are only supported on the MSA 2040 Storage array and requires Firmware version GL105. Customers must upgrade their MSA 2040 controller firmware to GL105 or later for Self-Encrypting Drive functionality

- All MSA SEDs are FIPS 140-2 compliant FIPS 140-2 Validated Self-Encrypting Drives (SEDs) 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 as defined in the Federal Information Processing Standards (FIPS) 140-2 Publication

Step 2d - Drive Enclosure Options

HP MSA 2040 Energy Star LFF Disk Enclosure	M0S96A
HP D2700 Disk Enclosure	AJ941A
NOTE: Supported MSA Drives for the D2700 SFF Enclosure	
Solid State Drives (SSDs) (SFF 2.5-inch)	
12G SFF SAS SSDs (Mixed Use)	
HPE MSA 400GB 12G SAS Mixed Use SFF (2.5in) 3yr Warranty Solid State Drive	N9X95A
HPE MSA 800GB 12G SAS Mixed Use SFF (2.5in) 3yr Warranty Solid State Drive	N9X96A
HPE MSA 1.6TB 12G SAS Mixed Use SFF (2.5in) 3yr Warranty Solid State Drive	N9X91A
HPE MSA 3.2TB 12G SAS Mixed Use SFF (2.5in) 3yr Warranty Solid State Drive	N9X92A
Solid State Drives (SSDs) (SFF 2.5-inch)	
SAS Drives (SFF 2.5-inch)	
12G SFF 15K SAS HDDs	
HP MSA 300GB 12G SAS 15K SFF (2.5in) Enterprise 3yr Warranty Hard Drive	J9F40A
HP MSA 450GB 12G SAS 15K SFF (2.5in) Enterprise 3yr Warranty Hard Drive	J9F41A
HP MSA 600GB 12G SAS 15K SFF (2.5in) Enterprise 3yr Warranty Hard Drive	J9F42A
HP MSA 900GB 12G SAS 15K SFF (2.5in) Enterprise 3yr Warranty Hard Drive	Q1H47A
12G SFF 10K SAS HDDs	
HP MSA 300GB 12G SAS 10K 2.5in Dual Port Enterprise 3yr Warranty Hard Drive	J9F44A
HP MSA 600GB 12G SAS 10K 2.5in Dual Port Enterprise 3yr Warranty Hard Drive	J9F46A
HP MSA 1.2TB 12G SAS 10K 2.5in Dual Port Enterprise 3yr Warranty Hard Drive	J9F48A
HP MSA 1.8TB 12G SAS 10K SFF (2.5in) 512e Enterprise 3yr Warranty Hard Drive	J9F49A
NOTE: 512e drives require MSA 1040/2040 firmware version GL200P002 or newer	
12G SFF 7.2K SAS MDL HDDs	
HP MSA 1TB 12G SAS 7.2K SFF (2.5in) 512e Midline 1yr Warranty Hard Drive	J9F50A
HP MSA 2TB 12G SAS 7.2K SFF (2.5in) 512e Midline 1yr Warranty Hard Drive	J9F51A
NOTE: 512e drives require MSA 1040/2040 firmware version GL200P002 or newer	
12G SFF 10K SAS SED	
HPE MSA 1.2TB 12G SAS 10K SFF (2.5in) Enterprise Self Encrypted 3yr Wty Hard Drive	P9M81A

Step 2e - SAS Cable Options

miniSAS to miniSAS Cables:	
Connecting MSA 2040 Controller to a disk enclosure where a longer cable is desired.	
HP External Mini SAS 1m Cable ALL	407337-B21
HP External Mini SAS 2m Cable	407339-B21

Step 3 - Other MSA 2040 Options

Choose optional AC Power Cords (2 required)

NOTE: Two PDU cables: one 142263-008 (Black) and one 1422633-013 (Grey), ship standard with all AC-powered enclosures.

HP ProLiant 12 ft Power Cord	227099-001
Power Cord, (Australia/China/New Zealand)	227098-001

Power Cord, (Central Europe)	157215-001
Power Cord, (United Kingdom/Hong Kong)	157216-001
Power Cord, (Switzerland)	157219-001
Power Cord, (Italy)	157217-001
Power Cord, (Denmark)	157218-001
Power Cord, (Japan)	139867-001
Power Cord, (South East Asia/India)	157220-001

Step 4 - Choose Supported Options for Fibre Channel Infrastructure

CFibre Channel Host Bus Adapters - X86 servers	HP StoreFabric SN1000Q 16GB 1-port PCIe Fibre Channel Host Bus Adapter	QW971A
	HP StoreFabric SN1000Q 16GB 2-port PCIe Fibre Channel Host Bus Adapter	QW972A
	HP StoreFabric SN1100E 16Gb Single Port Fibre Channel Host Bus Adapter	C8R38A
	HP StoreFabric SN1100E 16Gb Dual Port Fibre Channel Host Bus Adapter	C8R39A
	BladeSystem c-Class Fibre Channel Mezzanine HBAs	
	QLogic QMH2562 8Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem	451871-B21
	Emulex LPe1205 8Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem	456972-B21
	C-class HBA	
	HP QMH2572 8Gb Fibre Channel Host Bus Adapter for BladeSystem c-Class	651281-B21
	HP LPe1205A 8Gb Fibre Channel Host Bus Adapter for BladeSystem c-Class	659818-B21
HP 82Q 8Gb 2-port PCIe Fibre Channel Host Bus Adapter	AJ764A	
Fibre Channel Host Bus Adapters - Integrity servers	Integrity	
	HP 4Gb 1-port PCI-X 2.0 Fibre Channel Host Bus Adapter	AB378B
	HP 4Gb 2-port PCIe Fibre Channel Host Bus Adapter	AD300A
	HP 4Gb 1-port PCIe Fibre Channel Host Bus Adapter	AD299A
	HP 4Gb 2-port PCIe Fibre Channel Host Bus Adapter	AD355A
	HP PCIe 1-port 4Gb and 1-port 1000BT Adapter	AD221A
	HP PCIe 2-port 4Gb and 2-port 1000BT Adapter	AD222A
	HP PCIe 2-port 4Gb and 2-port 1000BSX Adapter	AD393A
	HP PCI-X 1-port 4Gb FC and 1-port 1000BT Adapter	AD193A
	HP PCI-X 2-port 4Gb FC and 2-port 1000BT Adapter	AD194A
	HP PCI Express 1-port 8Gb Fibre Channel SR (QLogic) Adapter	AH400A
HP PCI Express 2-port 8Gb Fibre Channel SR (QLogic) Adapter	AH401A	

	HP 8Gb 1-port PCIe Fibre Channel Host Bus Adapter	AH402A
	HP 8Gb 2-port PCIe Fibre Channel Host Bus Adapter	AH403A
	Brocade Fibre Channel HBAs	
	HP 81B 8Gb 1-port PCIe Fibre Channel Host Bus Adapter	AP769B
	HP 82B 8Gb 2-port PCIe Fibre Channel Host Bus Adapter	AP770B
	Emulex Fibre Channel HBAs	
	HP 81E 8Gb 1-port PCIe Fibre Channel Host Bus Adapter	AJ762B
	HP 82E 8Gb 2-port PCIe Fibre Channel Host Bus Adapter	AJ763B
	QLogic Fibre Channel HBAs	
	HP 81Q 8Gb 1-port PCIe Fibre Channel Host Bus Adapter	AK344A
	HP 82Q 8Gb 2-port PCIe Fibre Channel Host Bus Adapter	AJ764A
	Integrity server blades	
	QLogic QMH2562 8Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem	451871-B21
	Emulex LPe1205 8Gb Fibre Channel Host Bus Adapter for c-Class BladeSystem	456972-B21
PremierFlexOM4 type cables	HP Premier Flex LC/LC Multi-mode OM4 2 fiber 1m Cable	QK732A
	HP Premier Flex LC/LC Multi-mode OM4 2 fiber 2m Cable	QK733A
	HP Premier Flex LC/LC Multi-mode OM4 2 fiber 5m Cable	QK734A
	HP Premier Flex LC/LC Multi-mode OM4 2 fiber 15m Cable	QK735A
	HP Premier Flex LC/LC Multi-mode OM4 2 fiber 30m Cable	QK736A
	HP Premier Flex LC/LC Multi-mode OM4 2 fiber 50m Cable	QK737A
	HP LC to LC Multi-mode OM3 2-Fiber 0.5m 1-Pack Fiber Optic Cable	AJ833A
	HP 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
OM3 FC LC-LC cables	HP LC to LC Multi-mode OM3 2-Fiber 5.0m 1-Pack Fiber Optic Cable	AJ836A
	HP LC to LC Multi-mode OM3 2-Fiber 15.0m 1-Pack Fiber Optic Cable	AJ837A
	HP LC to LC Multi-mode OM3 2-Fiber 30.0m 1-Pack Fiber Optic Cable	AJ838A
	HP LC to LC Multi-mode OM3 2-Fiber 50.0m 1-Pack Fiber Optic Cable	AJ839A

Step 4a - Choose Supported Options For SAS Infrastructure

Mini-SAS Cables	
HP 1.0m External Mini SAS High Density to Mini SAS Cable	716189-B21
HP 2.0m External Mini SAS High Density to Mini SAS Cable	716191-B21
HP 4.0m External Mini SAS High Density to Mini SAS Cable	716193-B21
NOTE: These cables are used to connect 6Gb SAS initiator to MSA 2040 SAS controller. These are not used for connecting to a disk enclosure.	
HP External 1.0m (3ft) Mini-SAS HD 4x to Mini-SAS HD 4x Cable	716195-B21
HP External 2.0m (6ft) Mini-SAS HD 4x to Mini-SAS HD 4x Cable	716197-B21
HP External 4.0m (13ft) Mini-SAS HD 4x to Mini-SAS HD 4x Cable	716199-B21

NOTE: These cables are used to connect 12Gb SAS initiator to MSA 2040 SAS controller. These are not used for connecting to a disk enclosure.

SAS Host Bus Adapters (HBAs)

HP H241 12Gb 2-ports Ext Smart Host Bus Adapter	726911-B21
HP H221 PCIe 3.0 SAS Host Bus Adapter	729552-B21

SAS Controllers

HP Smart Array P741m/4GB FBWC 12Gb 4-ports Ext Mezzanine SAS Controller	726782-B21
HP Smart Array P721m/2GB FBWC 6Gb 4-ports Ext Mezzanine SAS Controller	650072-B21
HP Smart Array P721m/512 FBWC 6Gb 4-ports Ext Mezzanine SAS Controller	655636-B21
HP Smart Array P712m/256 6Gb 2-ports Int/2-ports Ext Mezzanine SAS Controller	488348-B21
HP Smart Array P711m/1G 6Gb FBWC 4-ports Ext Mezzanine SAS Controller	513778-B21
HP Smart Array P441/4GB FBWC 12Gb 2-ports Ext SAS Controller	726825-B21
HP Smart Array P431/2GB FBWC 12Gb 2-ports Ext SAS Controller	698531-B21

Switches

HP 6Gb SAS Switch Single Pack for HP BladeSystem c-Class	BK763A
HP 6Gb SAS Switch Dual Pack for HP BladeSystem c-Class	BK764A

Step 4b - Choose Supported Options For 10GbE Infrastructure

- Verify that the cable/transceiver is supported with the connecting device (i.e. switch or NIC/iSCSI HBA)

NOTE: Direct attached copper cables are supported in 10GbE Controller systems.

Copper Cable	HP BladeSystem c-Class 10GbE SFP+ to SFP+ 0.5m Direct Attach Copper Cable	487649-B21
	HP BladeSystem c-Class 10GbE SFP+ to SFP+ 1m Direct Attach Copper Cable	487652-B21
	HP BladeSystem c-Class 10GbE SFP+ to SFP+ 3m Direct Attach Copper Cable	487655-B21
	HP BladeSystem c-Class 10GbE SFP+ to SFP+ 5m Direct Attach Copper Cable	537963-B21
	HP BladeSystem c-Class 10GbE SFP+ to SFP+ 7m Direct Attach Copper Cable	487658-B21
DAC Cable	HPE X242 10G SFP+ to SFP+ 1m Direct Attach Copper Cable	J9281B
	HPE X242 10G SFP+ to SFP+ 3m Direct Attach Copper Cable	J9283B
	HPE X242 10G SFP+ to SFP+ 7m Direct Attach Copper Cable	J9285B
	HPE FlexNetwork X240 10G SFP+ to SFP+ 0.65m Direct Attach Copper Cable	JD095C
	HPE FlexNetwork X240 10G SFP+ to SFP+ 1.2m Direct Attach Copper Cable	JD096C
	HPE FlexNetwork X240 10G SFP+ to SFP+ 3m Direct Attach Copper Cable	JD097C
	HPE FlexNetwork X240 10G SFP+ to SFP+ 5m Direct Attach Copper Cable	JG081C
	HPE FlexNetwork X240 10G SFP+ SFP+ 7m Direct Attach Copper Cable	JC784C

Step 5 - Software

The MSA advanced virtualization functionalities are available as salable options for new and existing MSA 2040. A firmware upgrade may be required.

Where to Buy

Want to buy this series of products? please contact:

- Tel: +1-626-239-8066 (USA)/ +852-3050-1066 / +852-3174-6166
- Fax: +852-3050-1066 (Hong Kong)
- Email: sales@router-switch.com (Sales Inquiries)

Or visit: [HPE MSA Storage Controllers](#)

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