HPE MSA 1040 Storage

Data Sheet

Content

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Overview

The HPE MSA 1040 Storage is designed for entry-level market needs, features 8Gb Fibre Channel, 12 Gb SAS, and 1GbE and 10GbE iSCSI at previously unattainable entry price points. The array allows users to take advantage of the latest storage technologies in simple and efficient ways by providing a good balance between performance and budget resulting in a highly favorable $/GB return on their investment.

Entry consolidation and virtualization initiatives are now well in your budgetary reach. The MSA 1040 offers many of MSA 2040 features but at more affordable entry price point. ProLiant and BladeSystems administrators as well as IT generalists will find storage management tasks simple and intuitive with MSA.

The MSA 1040 arrays leverage a new 4th-generation MSA architecture with a new processor, 2-host ports and 4GB data cache and 2GB of system memory per controller. Take advantage of the latest hard drive advances by choosing the form factor and technology which best meets your application and budget requirements. Unlike many competing arrays, the MSA 1040 ships standard with intuitive management tools and powerful data services such as Snapshots and Volume Copy for increased data protection. The MSA1040 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
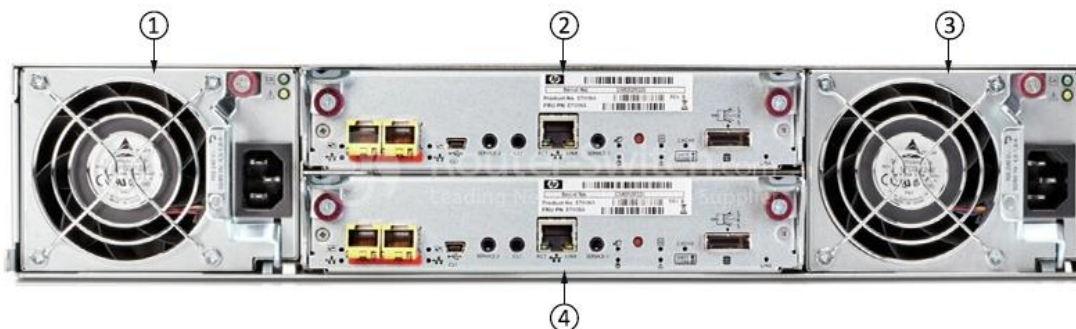
- HPE MSA Remote Snap Software LTU

Figure 1 shows the MSA 1040 Array LFF or supported 12-drive expansion enclosure.

Note:

①	Left ear	⑤	Disk drive Fault/UID LED
②	Disk drive Slots	⑥	Disk drive Online/Activity LED
③	Right ear	⑦	Enclosure ID LED
④	Unit Identification (UID) LED Heartbeat LED Fault ID LED		

Figure 2 shows the rear panel layout of the MSA 1040 controller enclosure.

Note:

①	AC Power supply
②	Controller module A
③	AC Power supply
④	Controller module B

Models

MSA 1040 Pre-Configured Models:

Description	Model
HP MSA 1040 2-port Fibre Channel Dual Controller LFF Storage[1]	E7V99A
HP MSA 1040 2-port Fibre Channel Dual Controller SFF Storage[2]	E7W00A
HP MSA 1040 2-port SAS Dual Controller LFF Storage[3]	K2Q90A
HP MSA 1040 2-port SAS Dual Controller SFF Storage[4]	K2Q89A
HP MSA 1040 2-port 1G iSCSI Dual Controller LFF Storage[5]	E7W01A
HP MSA 1040 2-port 1G iSCSI Dual Controller SFF Storage[6]	E7W02A
HP MSA 1040 2-port 10G iSCSI Dual Controller LFF Storage[7]	E7W03A
HP MSA 1040 2-port 10G iSCSI Dual Controller SFF Storage[8]	E7W04A

NOTE:

1. Includes LFF Array Chassis + two MSA 1040 FC 2-port controllers, SFPs installed, drives not included

2. Includes SFF Array Chassis + two MSA 1040 FC 2-port controllers, SFPs installed, drives not included

3. Includes LFF Array Chassis + two MSA 1040 SAS 2-port controllers, drives not included

4. Includes SFF Array Chassis + two MSA 1040 SAS 2-port controllers, drives not included

5. Includes LFF Array Chassis + two MSA 1040 1GbE 2-port controllers, SFPs installed, drives not included

6. Includes SFF Array Chassis + two MSA 1040 1GbE 2-port controllers, SFPs installed, drives not included

7. Includes LFF Array Chassis + two MSA 1040 10GbE 2-port controllers, SFPs installed, drives not included, direct attached copper cables are supported in 10GbE Controller systems

8. Includes SFF Array Chassis + two MSA 1040 10GbE 2-port controllers, SFPs installed, drives not included, direct attached copper

Smart Buys:

Smart Buys are pre-discounted SKU's available in participating North and South American countries. Please contact us for availability.

Smart Buy Drive Kits	
HP MSA 300GB 12G SAS 10K SFF(2.5in) Dual Port Enterprise 3yr Warranty Hard Drive	J9F44SB
HP MSA 600GB 12G SAS 10K SFF(2.5in) Dual Port Enterprise 3yr Warranty Hard Drive	J9F46SB
HP MSA 1.2TB 12G SAS 10K SFF(2.5in) Dual Port Enterprise 3yr Warranty Hard Drive	J9F48SB
HP MSA 1.8TB 12G SAS 10K SFF (2.5in) 512e Enterprise 3yr Warranty Hard Drive	J9F49SB
HP MSA 200GB 12G ME SAS SFF (2.5in) Enterprise Mainstream 3yr Warranty Solid State Drive	K2Q45SB
Smart Buy MSA 1040 Storage System	
HP MSA 1040 2-port Fibre Channel Dual Controller LFF Storage/S-Buy	E7V99SB
HP MSA 1040 2-port Fibre Channel Dual Controller SFF Storage/S-Buy	E7W00SB
HP MSA 1040 2-port 1G iSCSI Dual Controller LFF Storage/S-Buy	E7W01SB
HP MSA 1040 2-port 1G iSCSI Dual Controller SFF Storage/S-Buy	E7W02SB
HP MSA 1040 2-port 10G iSCSI Dual Controller LFF Storage/S-Buy	E7W03SB
HP MSA 1040 2-port 10G iSCSI Dual Controller SFF Storage/S-Buy	E7W04SB
HP MSA 1040 1Gb iSCSI w/12 300GB SAS 10K SFF (2.5in) Hard Drive Bundle/S-Buy	K2Q05SB
HP MSA 1040 1Gb iSCSI w/12 900GB SAS 10K SFF (2.5in) Hard Drive Bundle/S-Buy	K2Q06SB
HP MSA 1040 10Gb iSCSI w/12 300GB SAS 10K SFF (2.5in) Hard Drive Bundle/S-Buy	K2Q07SB
HP MSA 1040 10Gb iSCSI w/12 900GB SAS 10K SFF (2.5in) Hard Drive Bundle/S-Buy	K2Q08SB
Smart Buy Disk Enclosures	
HP D2700 Disk Enclosure/S-Buy	AJ941SB

Features

All MSA 1040 models offer a common set of valuable features:

• Ease of management featuring browser-based out-of-band access. This allows a department or small company to effectively handle growing storage requirements, with the aid of an intuitive GUI to administer the unit with a minimum of complexity. Ideal for local or remote installations.

• Storage Management Utility V3 (SMU). This new MSA management GUI brings a new modern look and feel to array management. SMU V3 is 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.

• Thin Provisioning allows storage allocation of physical storage resources only when 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.

• MSA 1040 comes standard with 64 controller-based snapshots and clone capability (volume copy is only available

on linear storage with pre-GL220 firmware; volume copy for both linear and virtual storage is available with GL220 firmware or newer). There is also an optional license for 512 snapshots.

- Dual controller array models with automated failover for high availability.
- All models support a wide variety of drives: High-performance enterprise-class SAS, and high-capacity SAS Midline drives.
- The MSA 1040 will support a maximum of 3 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 48 LFF or 99 SFF drives.
- Disk Groups support 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 and the purchases virtualization license 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 and the advanced Virtualization license needs to be purchased separately.
- Snapshot enhancements for virtual storage, including performance improvements, hierarchical snapshots, and simplified resource management. These enhancements are offered with GL200 or newer firmware and with the purchase of advanced Virtualization license.
- 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.
- Scheduler to schedule virtual storage snapshots for replication with GL220 firmware or later.
- SSD support is available with GL220 firmware or newer. With SSD support customers can enable advanced virtualization features such as read cache and automated tiering (requires Advanced Virtualization Upgrade License). SSD performance tier requires additional Performance Auto Tiering License.
- Virtual tier affinity allows customers to prioritize data by assigning appropriate affinity level (Performance, No Affinity & Archive) with GL220 firmware or later.

Non-disruptive on-line controller code upgrade (requires dual controllers w/ multi-pathing software) Upgradable by design.

Owners of a P2000 G3 array are able to do data-in-place upgrades to the new MSA 1040 array.

This unique ability protects the earlier investments in drives, and JBODs.

Application Solutions

The HPE MSA 1040 Storage is the ideal solution for customers running Oracle, Microsoft, SAP environments and those customers who are deploying virtual server technologies like VMware, Hyper-V. The MSA 1040 delivers enterprise functionality that enhances virtual environments, simplifies management, and reduces costs. Easy to deploy, scale and maintain, HPE MSA 1040 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 1040, Hewlett

Packard Enterprise 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 1040	
Capacity **Single Enclosure and** **Maximum Additional Drive** **Enclosures**	**LFF:** 120 TB (single LFF array-head -using 12 x 10TB LFF SAS MDL drives) 480 TB (by adding 3 LFF Disk Enclosures behind LFF Array & using 10 TB LFF SAS MDL drives) **SFF:** 43.2 TB (single SFF array-head - using 24 x 1.8TB SFF SAS drives) 178.2 TB (by adding 3 SFF Disk Enclosures behind SFF Array & using 1.8TB SFF SAS 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. Therefore each MSA storage system can have double the usable capacity listed above
Cache	6 GB per controller NOTE: 6GB cache includes Data (Read/Write) cache = 4GB and Metadata and System OS cache = 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	2 x 8Gb Fibre Channel ports per controller 2 x 1GbE RJ-45 ports per controller 2 x 10GbE ports per controller 2x 12Gb SAS ports per controller
Maximum Drives w/ 3 expansion	48 LFF/99 SFF
Maximum Host Supported	64 in v2 UI 512 in v3 UI
Standard Software	Snapshots (64)
Optional Software	Remote Snap (linear storage only) Max Snapshot (512)
MSA 1040 Models	MSA 1040 Storage offers 4 factory configured models: MSA 1040 8Gb FC with 2-ports per controller MSA 1040 12Gb SAS with 2-ports per controller MSA 1040 1GbE iSCSI with 2-ports per controller MSA 1040 10GbE iSCSI with 2-ports per controller
Modular Chassis	2U rack height. 12 Large Form Factor or 24 Small Form Factor drive bays, accommodating SAS and SAS MDL Drives
Scalability	The MSA 1040 Arrays are designed to allow an installation to begin with smaller capacity and be able to grow gradually as needed. The flexibility of SAS or SAS MDL drives technology, form factors, sizes, speeds, and costs per GB allows a system to easily fit in almost any budget.
Server Compatibility	• HPE ProLiant DL, ML • HPE c-Class Blade Servers
Power Requirements	
Input Power Requirements (typical-running I/O) SFF/LFF arrays	110VAC 3.20A, 343W; 220VAC 1.67A,337W
Max Input Power	100-240 VAC, 50/60 Hz., 4.20-1.77A
Heat Dissipation	1174 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	Per NEBS GR-63-CORE UNPACKAGED EQUIPMENT SHOCK CRITERIA (4.3.2)
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 1040 SFF 24-bay array: 19.5 in / 49.5 cm MSA 1040 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 1040 LFF chassis: 31 lbs. (DC-pwr model: 32.6 lbs) MSA 1040 SFF chassis: 29.1 lbs (DC-pwr model: 30.7lbs)

Performance

MSA 1040 Array Performance (with SSDs)[1]	HPE MSA 1040 8Gb FC Controller	HPE MSA 1040 10GbE Controller	HPE MSA 1040 1GbE Controller	HPE MSA 1040 SAS
Protocol (host connect)	8Gb Fibre Channel	10GbE iSCSI	1GbE iSCSI	6Gb SAS
MSA 1040 RAID 1 Performance Results				
Random Reads IOPS	72,900	69,100	53,400	71,200
Random Writes IOPS	29,100	28,000	27,900	29,000
Random Mix 60/40 IOPS	42,700	41,200	40,700	42,300
MSA 1040 RAID 5 Performance Results				
Random Reads IOPS	69,700	66,000	53,300	68,700
Random Writes IOPS	16,200	15,900	15,900	16,000
Random Mix 60/40 IOPS	28,500	27,900	25,100	28,100
MSA 1040 RAID 6 Performance Results				
Random Reads IOPS	69,500	66,700	53,500	68,600
Random Writes IOPS	13,000	12,700	12,600	13,000
Random Mix 60/40 IOPS	24,800	24,300	24,000	24,600

NOTE: 1) SSD's were used in a dual controller configuration of 4 vdisks consisting of two disks per vdisk and 1 volume per host. 4 hosts directly attached to the HPE MSA 1040 array were used in this test configuration (results cannot be expected with a single host).

MSA 1040 Array Performance (with HDDs)[2]	HPE MSA 1040 8Gb FC Controller	HPE MSA 1040 10GbE Controller	HPE MSA 1040 1GbE Controller	HPE MSA 1040 SAS
Protocol (host connect)	8Gb Fibre Channel	10GbE iSCSI	1GbE iSCSI	6Gb SAS

MSA 1040 RAID 10 Performance Results				
Random Reads IOPS	29,400	29,200	28,900	29,500
Random Writes IOPS	23,000	22,500	22,500	22,000
Random Mix 60/40 IOPS	25,500	25,000	25,000	25,000
Sequential Reads MB/s	3,100	3,050	440	3,100
Sequential Writes MB/s	1,650	1,650	420	1,650
MSA 1040 RAID 5 Performance Results				
Random Reads IOPS	29,000	28,800	28,600	29,500
Random Writes IOPS	13,000	12,800	12,500	12,500
Random Mix 60/40 IOPS	16,500	16,500	16,500	16,500
Sequential Reads MB/s	3,100	3,050	440	3,100
Sequential Writes MB/s	2,900	2,700	430	2,800
MSA 1040 RAID 6 Performance Results				
Random Reads IOPS	29,000	28,800	28,500	29,500
Random Writes IOPS	9,500	9,500	9,500	8,700
Random Mix 60/40 IOPS	12,500	12,700	12,500	12,500
Sequential Reads MB/s	3,100	3,050	440	3,100
Sequential Writes MB/s	2,700	2,650	420	2,750

NOTE: 2) 300 GB 15K SAS drives were used in a dual controller configuration of 8 vdisks consisting of twelve disks per vdisk, 3.3 TB volumes, and 2 volumes per host. 4 hosts directly attached to the HPE MSA 1040 arrays were used in this test configuration (results cannot be expected with a single host).

NOTE: MSA 1040 tests with 1GbE iSCSI used 4 hosts directly attached to the HPE MSA 1040 array. - Sequential tests results were achieved with 256K block sizes and random tests were based on 8K block sizes.

NOTE: For sequential workloads with a queue depth greater than 1, each sequential stream is targeted to operate on a separate LBA range. Other types of sequential workloads that target specific LBA ranges may achieve higher results. - All Fibre Channel results were measured using 16Gb FC Host Bus Adapters running at 8Gb. All 10GbE iSCSI results were measured using 10Gb iSCSI Host Bus Adapters. All 1GbE iSCSI results were measured using 1Gb network interface controllers (NICs). All 6Gb SAS results were measured using 6Gb SAS Host Bus Adapter.

NOTE: Number and type of applications, drive type and number of drives, operating system used, and the number of hosts will affect overall performance. This table is provided strictly as a test-lab comparison.

NOTE: These numbers reflect a full array configuration with the maximum number of front-end ports, disks, and controllers. The test results shown for the HPE MSA 1040 are designed to give a conservative reference point for comparisons.

MSA 1040 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	6 Gb SAS - Serial Attached SCSI

Protocol Support	
Host Ports	2 x 8Gb Fibre Channel per controller
	2 x 1GbE iSCSI per controller
	2 x 10GbE iSCSI per controller
Expansion Port	SAS (SFF8088) 4x lane 6 Gb SAS

Configuration and Order Information

Step 1 - MSA 1040 - Base Configuration

Select one model:

Model Name	SKUs
HP MSA 1040 2-port Fibre Channel Dual Controller LFF Storage[1]	E7V99A
HP MSA 1040 2-port Fibre Channel Dual Controller SFF Storage2	E7W00A
HP MSA 1040 2-port SAS Dual Controller LFF Storage[3]	K2Q90A
HP MSA 1040 2-port SAS Dual Controller SFF Storage[4]	K2Q89A
HP MSA 1040 2-port 1G iSCSI Dual Controller LFF Storage[5]	E7W01A
HP MSA 1040 2-port 1G iSCSI Dual Controller SFF Storage[6]	E7W02A
HP MSA 1040 2-port 10G iSCSI Dual Controller LFF Storage[7]	E7W03A
HP MSA 1040 2-port 10G iSCSI Dual Controller SFF Storage[8]	E7W04A
NOTE:	
1. Includes LFF Array Chassis + two MSA 1040 FC 2-port controllers, SFPs installed, drives not included	
2. Includes SFF Array Chassis + two MSA 1040 FC 2-port controllers, SFPs installed, drives not included	
3. Includes LFF Array Chassis + two MSA 1040 SAS 2-port controllers, drives not included	
4. Includes SFF Array Chassis + two MSA 1040 SAS 2-port controllers, drives not included	
5. Includes LFF Array Chassis + two MSA 1040 1GbE 2-port controllers, SFPs installed, drives not included	
6. Includes SFF Array Chassis + two MSA 1040 1GbE 2-port controllers, SFPs installed, drives not included	
7. Includes LFF Array Chassis + two MSA 1040 10GbE 2-port controllers, SFPs installed, drives not included, direct attached copper cables are supported in 10GbE Controller systems	
8. Includes SFF Array Chassis + two MSA 1040 10GbE 2-port controllers, SFPs installed, drives not included, direct attached copper cables are supported in 10GbE Controller systems	

Step 2 - Options

Select each option with quantities specified.

Step 2a - SAS or SAS MDL Drive Options

HPE MSA 1040 Arrays support both the HPE ProLiant Server SFF Hard Disk Drives and HPE MSA SFF

Hard Disk Drives

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 SAS drives. MSA 3.5-inch or 2.5-inch drives are for use only with MSA arrays and supported Disk Enclosures.

MSA 1040 Drives: 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 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	
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
MSA Large Form Factor (LFF) SAS MDL DP drives for MSA 1040 Array and MSA 2040 3.5-inch Disk Enclosure	
12G LFF 7.2K SAS Midline (MDL) HDDs	
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) Midline 1yr Warranty Hard Drive	J9F43A
HP MSA 4TB 12G SAS 7.2K LFF (3.5in) Midline 1yr Warranty Hard Drive	K2Q82A
HPE MSA 2TB 12G SAS 7.2K LFF (3.5in) Midline 512n 1yr Warranty Hard Drive	N9X93A
NOTE: 512e drives require MSA 1040/2040 firmware version GL200P002 or newer	
MSA Large Form Factor (LFF) SAS DP drives for MSA 1040 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

Step 2b - Drive Enclosure Options

Use either disk enclosure with Large or Small Form Factor, single or dual controller array heads. Each ships with two .5m mini-SAS to mini-SAS cables.

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

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

Step 2c - SAS Cable Options

miniSAS to miniSAS Cables:

Connecting MSA 1040 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 1040 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

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
OM3 FC LC-LC cables	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
	HP LC to LC Multi-mode OM3 2-Fiber 2.0m 1-Pack Fiber Optic Cable	AJ835A
	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

Supported options

Mini-SAS HD to Mini-SAS Fanout Cables	
HP Mini SAS High Density to Dual 2-lane Mini SAS External Fanout 1 Meter Cable	K2R02A
HP Mini SAS High Density to Dual 2-lane Mini SAS External Fanout 2 Meter Cable	K2R03A
HP Mini SAS High Density to Dual 2-lane Mini SAS External Fanout 4 Meter Cable	K2R04A
NOTE: Recommended to utilize Fanout cables when connecting to SAS HBAs for maximum future flexibility without downtime. The Fanout cables are not supported on the MSA 2040.	
Mini-SAS HD to Mini-SAS HD Fanout Cables	
HP Mini SAS High Density to Dual 2-lane Mini SAS High Density External Fanout 1 Meter Cable	K2Q99A
HP Mini SAS High Density to Dual 2-lane Mini SAS High Density External Fanout 2 Meter Cable	K2R00A
HP Mini SAS High Density to Dual 2-lane Mini SAS High Density External Fanout 4 Meter Cable	K2R01A
NOTE: Recommended to utilize Fanout cables when connecting to SAS HBAs for maximum future flexibility without downtime. The Fanout cables are not supported on the MSA 2040	
Mini-SAS HD to Mini-SAS Cables	
HP 1.0m External Mini SAS High Density to Mini SAS Cable	716189-B21
NOTE: This cable is used to connect 6Gb SAS initiator to MSA 2040 SAS controller. This is not used for connecting to a disk enclosure.	
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: Recommended to utilize standard cable when connecting to Blade enclosure switches.	
Mini-SAS HD to Mini-SAS HD Cables	
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
SAS Controllers	
HPE Smart Array P408e-m SR Gen10 12G SAS Mezzanine Controller	804381-B21
HP Smart Array P441/4GB FBWC 12Gb 2-ports Ext SAS Controller	726825-B21
HPE Smart Array P408e-p SR Gen10 12G SAS PCIe Plug-in Controller	804405-B21
HP Smart Array P441/4GB FBWC 12Gb 2-ports Ext SAS Controller	726782-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 1040 owners. A firmware upgrade may be required.	
NOTE: The Advanced Data Services Suite includes a Performance Tiering LTU, 512 Snapshot Software LTU, and the Remote Snap Software LTU.	
HPE MSA Advanced Data Services Suite LTU	Q0H99A
HPE MSA Advanced Data Services Suite E-LTU	Q0H99AAE
HPE MSA 1040 Adv Virtualized Upg LTU	D4T78A
HPE MSA 1040 Adv Virtualized Upg E-LTU	D4T78AAE

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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