



HPE MSA 2050 Storage Data Sheet



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Overview

The flash-ready HPE MSA 2050 Storage system is designed for affordable application acceleration that is ideal for small and remote office deployments. But do not let the low-cost fool you. The HPE MSA 2050 Storage system gives you the combination of simplicity, flexibility to grow now and into the future, and advanced features you may not expect to find in an entry-priced array. Start small and scale as needed with any combination of solid-state disks (SSD), high-performance enterprise, or lower-cost midline SAS-based drives.

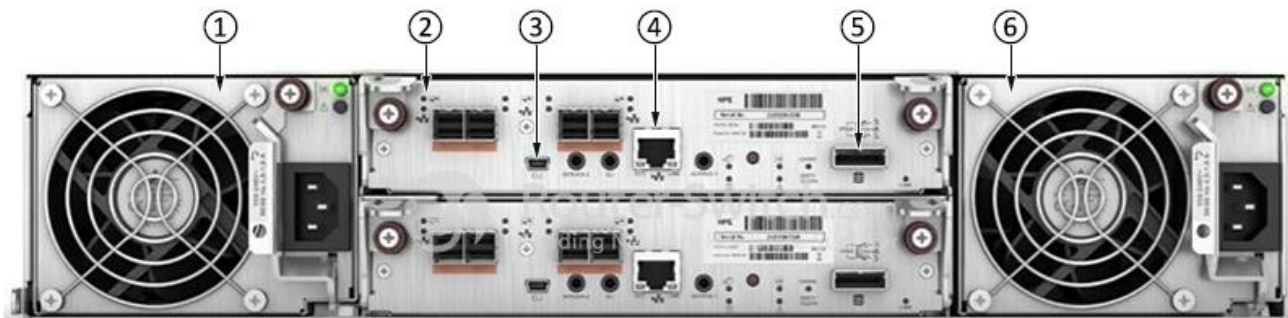
HPE MSA Storage has been the industry-leading entry storage SAN platform for the past eight years, with nearly 500,000 storage systems sold worldwide. Now the HPE MSA 2050 Storage system delivers 2x higher performance [1] than the previous generation at the same price, delivering in excess of 200,000 IOPS starting at under \$10,000 USD for affordable application acceleration. It's seriously simple and affordable flash-ready storage to help you get the most performance for the lowest cost.

- 200,000+ IOPS starting at under \$10K for affordable application acceleration
- Flexible base model delivers 2x IOPS performance than the previous generation MSA for the same price.
- Advanced data services with no experience required
- Easy to install, easy to use, easy to maintain—no storage expertise necessary
- Automated tiering dynamically responds to workload changes, so you don't have to
- Keep your business running with expanded data protection features
- New virtualized snapshot technology makes data protection and instant recovery a snap
- Remote replication with FC and iSCSI supports affordable disaster recovery
- Grow flexibly now and into the future
- Data-in-place upgrades protect drive investments and eliminate data migrations
- Start small and scale as needed with any combination of SSD, Enterprise or Midline SAS drives

Figure 1 shows the MSA 2050 enclosure.



Figure 2 shows the MSA 2050 rear panel with 2 controllers installed.



Note:

①	Power supply
②	Host connection ports FC or iSCSI
③	CLI port (mini-USB)
④	Management Ethernet port
⑤	Expansion port
⑥	Power supply

Standard Features

HPE MSA 2050 Storage	
Array	
Access Type	Block
Form Factor	2U, SFF or LFF
Number of controllers per array	2
Minimum/Maximum host ports	1/8
FC host connectivity	8/16Gb
iSCSI host connectivity	1Gb or 10Gb
Cache, per array	
Max Read cache per array	8TB
Data (read/write) cache + system memory per array	16GB
Pool Capacity (with Large Pool Support)	562 TB (512 TiB)
RAID Levels supported: Virtual mode	RAID 1, 5, 6, 10
Enclosures	

Expansion Drive Enclosures	0-7 enclosures
LFF/SFF array/enclosure mixing	Supported
Maximum number of drives per array enclosure	24 SFF/12 LFF
Maximum number of drives per drive enclosure	24 SFF/12 LFF
Drive enclosure interface type	6Gb SAS
Drives	
Maximum total HDDs per array	192 SFF / 96 LFF
Maximum total SSDs per array	192 SFF / 96 LFF
Max raw capacity per array enclosure	76.8 TB SFF / 120TB LFF
Max raw capacity per drive enclosure	76.8 TB SFF / 120TB LFF
Max raw capacity per array	614.4TB SFF / 960TB LFF
Drive Capacities	
SFF SSDs (Mixed Use)	400GB, 800GB, 1.6TB, 3.2TB
LFF SSDs (Mixed Use)	400GB, 800GB
SFF HDDs	15K: 300GB, 600GB, 900GB
	10K: 300GB, 600GB, 900GB, 1.2TB, 1.8TB
	7.2K: 1.0TB, 2.0TB
LFF HDDs	7.2K: 2TB, 4TB, 6TB, 8TB, 10TB
SEDs	10K SFF: 1.2TB
	7.2K LFF: 4TB
Software Features	
Thin Technologies	Thin Provisioning, Space Reclamation, Thin Rebuild
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
Models	
HPE MSA 2050 SAN Dual Controller LFF Storage ^{1,3}	Q1J00A
HPE MSA 2050 SAN Dual Controller SFF Storage ^{1,3}	Q1J01A
HPE MSA 2050 SAN NEBS Certified DC-Power SFF Storage ^{2,3}	Q1J04A

HPE MSA 2050 SAN DC-power LFF Storage ^{2,3}	Q1J79A
NOTES: 1. Includes an LFF or SFF Array Chassis depending on model, two MSA 2050 SAN controllers, two AC power supplies, no drives 2. Includes an LFF or SFF Array Chassis depending on model, two MSA 2050 SAN controllers, two DC power supplies, no drives 3. SFPs not included	
HPE MSA 2050 SAN DC-power LFF Storage ^{2,3}	Q1J79A

All MSA 2050 models offer a common set of valuable features:

- MSA 2050 SAN storage system architecture maximizes performance
 - Includes SFF or LFF array chassis, depending on model
 - Two MSA SAN controllers
 - Four host ports per controller
 - Each SAN controller supports 8 Gb FC, 16 Gb FC, 1GbE iSCSI or 10GbE iSCSI. Host connectivity
 - 8 GB read/write cache per controller.
 - Battery-free cache backup with super capacitors and compact flash
- MSA 2050 SAN Controller allows customers to create their own Combo Controller by mixing FC and iSCSI SFPs.

Below are the valid configurations for mixing SFPs:

Configuration Table for mixing SFPs

Configuration	Controller	Host Port 1 SFP ¹	Host Port 2 SFP ¹	Host Port 3 SFP ²	Host Port 4 SFP ²
Dual SAN Controller	Controller A	16Gb FC	16Gb FC	None	None
				16Gb FC	16Gb FC
				8Gb FC	8Gb FC
				10GbE iSCSI	10GbE iSCSI
				1GbE iSCSI	1GbE iSCSI
		8Gb FC	8Gb FC	None	None
				16Gb FC	16Gb FC
				8Gb FC	8Gb FC
				10GbE iSCSI	10GbE iSCSI
				1GbE iSCSI	1GbE iSCSI
		10GbE iSCSI	10GbE iSCSI	None	None
				10GbE iSCSI	10GbE iSCSI
	1GbE iSCSI			1GbE iSCSI	
	None			None	
1GbE iSCSI	1GbE iSCSI	None	None		
		10GbE iSCSI	10GbE iSCSI		
		1GbE iSCSI	1GbE iSCSI		
Controller B	Match Controller A	Match Controller A	Match Controller A	Match Controller A	

NOTES:

1. SFP in Host Port 1 must match SFP in Host Port 2
2. SFP in Host Port 3 must match SFP in Host Port 4

All MSA 2050 models offer a common set of valuable features (cont):

- Storage Management Utility V3 (SMU). The MSA management GUI brings a new modern look and feel to array management.
- 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.
- All models feature a wide variety of drives: High-performance SSD drives, enterprise-class SAS, and SAS Midline drives.
- The MSA 2050 will support a maximum of 7 disk enclosures (either LFF and/or SFF). Add-on enclosures can either be HPE MSA 2050 LFF Disk Enclosure or HPE MSA 2050 SFF Disk Enclosure.
- The MSA 2050 can grow incrementally to a maximum of 96 LFF, 192 SFF drives, or a combination of SFF and LFF enclosures up to the maximum of 8 total enclosures.

Virtual Storage Disks Groups can be spanned across multiple enclosures.

- Virtual Storage RAID levels supported: 1, 5, 6, 10.
- Maximum hard drive counts vary by RAID levels: 2 drive max for RAID level 1; max of 16 drives for RAID levels 5, 6, and 10.
- Multiple Disk Groups can be aggregated into a single Storage Pool.
- 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.

The maximum LUN size is 140TB (128TiB)

- Snapshot enhancements for virtual storage, including performance improvements, hierarchical snapshots, and simplified resource management. Administrators can monitor and optionally control snapshot space usage.
- Prioritize data by assigning appropriate affinity level (Performance, No Affinity or Archive)
- Customers can configure 512 TiB capacity per virtual pool by enabling large pool support.
- Non-disruptive on-line controller code upgrade. Requires Multi-pathing software.
- Upgradable by design. Owners of an MSA 2040, MSA 2042 and MSA 1040 array are able to do data-in-place upgrades to the new MSA 2050 array. This unique ability protects the earlier investments in drives, and JBODs.
- Certain limitations are applicable. Please review the Upgrading to the HPE MSA 2050/2052 Technical Whitepaper before upgrading your MSA 2040, MSA 2042 or MSA 1040 systems

Product Technology

SAN controller	MSA 2050 SAN controller supports 8Gb FC, 16Gb FC, 1GbE iSCSI or 10GbE iSCSI host connectivity.
Modular Chassis	2U rack height. 12 LFF or 24 SFF drive bays. All MSA 2050 SAN Storage Systems come standard with 2 SAN controllers
NOTE: The MSA 2050 does not support single controller configurations.	
Drives available	<p>The MSA 2050 SAN Storage systems support both the MSA 3.5-inch LFF drives, and the MSA 2.5-inch SFF drives.</p> <ul style="list-style-type: none"> • Solid State Drives (SSDs) deliver exceptional performance for applications requiring high random read IOPs performance. • 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.
Optional Disk Enclosures	Just as the user has a choice of chassis for the array enclosure (LFF or SFF drive bays), they also have a choice of expansion disk enclosures accommodating either drive size. Both the MSA 2050 LFF Disk Enclosure and MSA 2050 SFF Disk Enclosure can be hot-added to an operating array. SFF and LFF Array enclosures and Disk Enclosures can be mixed without limitations.

Performance

MSA 2050 End-to-End Performance Results:

MSA 2050 Array Performance ¹	HPE MSA 2050 Converged SAN Controller with HDDs	HPE MSA 2050 Converged SAN Controller with Mixed Use SSDs
Protocol (host connect)	16 Gb Fibre Channel	16 Gb Fibre Channel
MSA 2050 RAID 1 SSD Performance Results ²		
Random Reads (IOPs)		220,600
Random Writes (IOPs)		102,800
MSA 2050 RAID 5 Performance Results ^{3,4}		
Segmented Sequential Reads (MB/s)	5,280	
Segmented Sequential Writes (MB/s)	4,650	

End-to-End performance notes:

- 1) 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. This table is provided strictly as a test-lab comparison
- 2) Dual Controller configuration, (8) 400GB Mixed Use SSDs, RAID: 1, two drives per Disk Group; two Disk Groups per Pool, 2 volumes per Pool, block size: 8k, average latency under 5ms, Windows Server 2012 host, 16Gb FC direct connect to array

3) Dual Controller configuration, (72) 15k HDD, RAID: 5, nine drives per Disk Group, 4 Disk Groups per Pool, 32 volumes per Pool, block size: 256k, average latency under 30ms, Windows Server 2012 host, 16Gb FC direct connect to array

4) Sequential performance numbers were generated using segmented sequential workloads. For segmented 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.

Technical Specifications

MSA 2050	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)	SFF 24-bay array: 19.5 in / 49.5 cm 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)	

	Weight (Includes chassis and 2 controllers. No drives)	LFF chassis: 40.6 lbs. SFF chassis: 38.7 lbs
MSA 2050 Regulatory Info	Safety	UL 60950-1 (USA) CAN/CSA-C22.2 No.60950-1-03 (Canada) EN 60950-1 (European Union) GS mark (Germany) IEC 60950-1 (International) CCC Mark (power supply only, China PRC)
	Electromagnetic Compatibility	VCCI:2008-04 Class A (Japan) FCC 15:109(g) Class A (USA) ICES-003:2004 Class A (Canada) EN55022: (European Union Class A); CISPR 22 (International Class A) EN61000-3-2: (Harmonics) (European Union) EN61000-3-3: (Flicker) (European Union) EN 55024 (European Union, Immunity, Class A); CISPR 24 (International Immunity, Class A) AS/NZS CISPR 22, Class A (Australia, New Zealand) CNS 13438 Taiwan, Class A (Taiwan) KN22 Class A (Emissions Class A); KN24 (Immunity) (S Korea)
	RoHS and WEEE	RoHS-6/6 Compliance, China RoHS, WEEE
	Country Approvals	United States, Australia / New Zealand, Canada, China (PRC), European Union, Germany (GS Mark), Japan, South Korea, Taiwan

Configuration and Order Information

Step 1 - MSA 2050 - Base Configurations

Pre-Configured Systems

MSA 2050 Base System (AC Powered)	
HPE MSA 2050 SAN Dual Controller LFF Storage ^{1,3,4}	Q1J00A
HPE MSA 2050 SAN Dual Controller SFF Storage ^{1,3,4}	Q1J01A
MSA 2050 Base System (DC Powered)	
HPE MSA 2050 SAN NEBS Certified DC Power SFF Storage ^{2,3,4}	Q1J02A
HPE MSA 2050 SAN DC-Power LFF Storage ^{2,3,4}	Q1J03A

NOTE:

- 1) Includes an LFF or SFF Array Chassis depending on model, two MSA 2050 SAN controllers, two AC power supplies, no drives
- 2) Includes an LFF or SFF Array Chassis depending on model, two MSA 2050 SAN controllers, two DC power supplies, no drives
- 3) SFPs not included
- 4) Single controller options are not supported.

Step 2 – Choose Your SFP+ Module

SFP+ Modules	HPE MSA 8Gb Short Wave Fibre Channel SFP+ 4-pack Transceiver (Includes four x 8Gb SW FC SFPs)	C8R23B
	HPE MSA 16Gb Short Wave Fibre Channel SFP+ 4-pack Transceiver (Includes four x 16Gb SW FC SFPs)	C8R24B
	HPE MSA 10Gb Short Range iSCSI SFP+ 4-pack Transceiver (Includes four x 10Gb SW iSCSI SFPs)	C8R25B
	HPE MSA 1Gb RJ-45 iSCSI SFP+ 4-pack Transceiver (Includes four x 1Gb RJ-45 iSCSI SFPs)	C8S75B

Step 3 – Select Your Drives

MSA HDDs and SSDs drives are for use with MSA Storage Systems only.

Customers can mix SSD, SAS, and SAS MDL drives in the same array enclosure and disk enclosure

SFF SSDs	
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
SFF HDDs	
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	
LFF SSDs	

12G LFF SAS SSDs (Mixed Use)	
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
LFF HDDs	
12G LFF 7.2K SAS Midline Drives	
HPE MSA 2TB 12G SAS 7.2K LFF (3.5in) 512n Midline 1 yr Warranty Hard Drive	N9X93A
HPE MSA 4TB 12G SAS 7.2K LFF (3.5in) 512e Midline 1yr Warranty Hard Drive	K2Q82A
HPE MSA 6TB 12G SAS 7.2K LFF (3.5in) 512e Midline 1yr Warranty Hard Drive	J9F43A
HPE MSA 8TB 12G SAS 7.2K LFF (3.5in) 512e Midline 1yr Warranty Hard Drive	M0S90A
HPE MSA 10TB 12G SAS 7.2K LFF (3.5in) Midline 512e 1 yr Wty Hard Drive	P9M82A
SFF SEDs	
MSA Small Form Factor (SFF) SAS DP Self-Encrypted Drives	
HPE MSA 1.2TB 12G SAS 10K SFF (2.5in) Enterprise Self Encrypted 3yr Wty Hard Drive	P9M81A
LFF SED	
MSA Large Form Factor (LFF) SAS DP Self-Encrypted Drives	
HPE MSA 4TB 12G SAS 7.2K LFF (3.5in) Enterprise Self Encrypted 3 yr Wty Hard	Q1H48A

NOTE:

- All drives within the MSA 2050 array must be self-encrypted drives (SEDs) 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 SEDs
- 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 Establishmen (CSE) as meeting the Level 2 security requirements for cryptographic module as defined in the Federal Information Processing Standards (FIPS) 140-2 Publication

Step 4 – Options

Drive Enclosures	HPE MSA 2050 LFF Disk Enclosure	Q1J06A
	HPE MSA 2050 SFF Disk Enclosure Note: · Each drive enclosure includes two 0.5m MiniSAS to MiniSAS cables · Add up to 7 additional drive enclosures · MSA 2050 LFF Disk Enclosure can be connected to either the MSA 2050 SFF or LFF dual controller systems. · HPE MSA 2050 SFF Disk Enclosure can be connected to either the MSA 2050 SFF or LFF dual controller systems.	Q1J07A
SAS Cable	HP External Mini SAS 1m Cable ALL	407337-B21
	HP External Mini SAS 2m Cable	407339-B21
AC Power Cords	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 5a - Choose Supported Options for Fibre Channel Infrastructure

PremierFlexOM4 cables	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 5b - Choose Supported Options For 10GbE Infrastructure

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 6 – Software

The MSA Advanced Virtualization software is available as an option on the MSA 2050.

HPE MSA Advanced Data Services Suite LTU	Q0H99A
HPE MSA Advanced Data Services Suite E-LTU	Q0H99AAE

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)

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