Storage. Networking. Accelerated.™

LSI® MegaRAID® CacheVault™ Technology

Providing access to write-back cache is one of the many benefits of a hardware RAID controller card. Write-back cache improves application performance by storing write data to high performance cache memory during periods of heavy use. When there is a break in user requests the data is then written from the cache memory to the array.

During normal write-back operation, data is written to cache (DRAM), the IO is acknowledged as "complete" to the application that issued the write, and later the write is flushed to disk. If power is lost while write-back cache is enabled, the writes in DRAM may be lost. And since the controller has already acknowledged the IOs as complete, the application is unaware of the data loss.

To minimize this risk, Enterprise RAID controllers equipped with cache typically offer a battery back-up (BBU) option. The purpose of the battery is to provide power to the controller in the event that the power from the server is interrupted. This protects the data in the cache until power to the server can be restored and cache data written to disk.

While generally effective, BBUs may require maintenance, special handling and protect cache data for a limited time. CacheVault technology, providing flash-based cache protection for MegaRAID 6Gb/s SATA+SAS RAID controllers, offers a greener, lower total cost cache protection solution without the drawbacks of a BBU.

CacheVault Technology

CacheVault technology provides RAID controller cache protection using NAND flash memory and a supercapacitor. In the event of a power or server failure, CacheVault technology automatically transfers cached data from the DRAM cache to flash. Once power is restored, the data in the NAND flash is copied back into cache until it can be flushed to the disk drives. This technology eliminates the need for Lithium-ION battery backups that are traditionally used to protect cache memory on PCI RAID controllers.
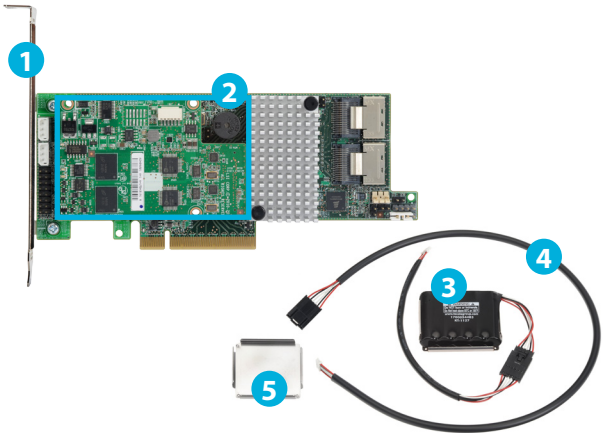
Go Green and Save

Using NAND flash eliminates the need to dispose of the Lithium-ION batteries typically found in today's BBUs. These batteries are a potential risk to the environment and many communities require that they be disposed of properly. This is something that will have to be done every time the battery is replaced during the course of the controller's life. By eliminating the need for these batteries, the risk to the environment and the cost of disposal can be avoided.

LSI 6Gb/s MegaRAID SATA+SAS controllers, together with CacheVault flash technology, virtually eliminate hardware maintenance associated with Lithium-ION batteries, lower total cost of ownership over the life of the controller card, and provide more environmentally friendly cache protection, all while maintaining optimal RAID performance.

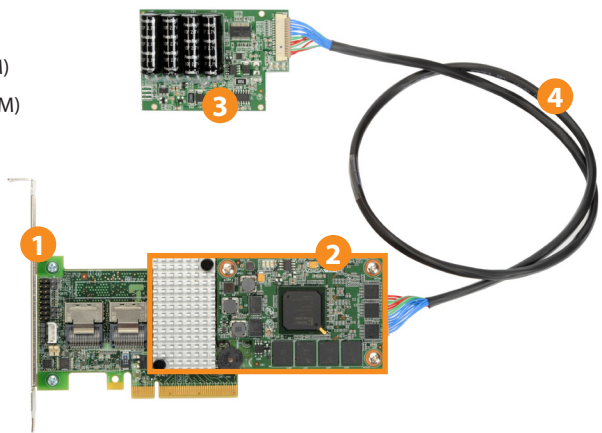|	CacheVault Technology	Standard Battery Backup
Maintenance schedule	None needed over the life of the controller	Battery should be replaced every 1-2 years; Battery monitoring required
Maintenance impact	None	Server must be opened (removed from rack) and should be taken offline while the battery is being replaced
Data recoverable for:	3+ years	Up to 72 hours, less if battery is degraded
Charge time	Capacitor charges in seconds while the system boots	4.5 to 9 hours
Time to cache protection	Immediate	24 to 48 hours for initial capacity test
Inventory requirements	None	Need to maintain at least a small inventory of emergency replacements
Disposal issues	None	Need to safely dispose of hazardous battery material

	9266-4i	9266-8i	9285CV-8e	9260CV-4i	9260CV-8i
Order Part Number	LSI00305 (single-pack) LSI00306 (Kit)	LSI00295 (single-pack) LSI00296 (Kit)	LSI00298 (single-pack)	LSI00280 (single-pack) LSI00281 (Kit)	LSi00282 (single-pack) LSI00283 (Kit)
Cache Protection	CacheVault and BBU Option LSICVM01 - LSI00297 LSIiBBU09 – LSI00279	CacheVault and BBU Option LSICVM01 - LSI00297 LSIiBBU09 – LSI00279	CacheVault INCLUDED with MegaRAID controller	CacheVault INCLUDED with MegaRAID controller	CacheVault INCLUDED with MegaRAID controller
Physical Dimensions	MD2 - Low Profile (6.6" X 2.713")	MD2 - Low Profile (6.6" X 2.713")	MD2 - Low Profile (6.6" X 2.713")	MD2 - Low Profile (6.6" X 2.536")	MD2 - Low Profile (6.6" X 2.536")
Ports	4 internal (side mount)	8 internal (side mount)	8 external	4 internal (top mount)	8 internal (top mount)
Connectors	1 SFF-8087 (int.)	2 SFF-8087 (int.)	2 SFF-8088 (ext)	1 SFF-8087 (int.)	2 SFF-8087 (int)
Bus Interface	x8 PCIe 2.0	x8 PCIe 2.0	x8 PCIe 2.0	x8 PCIe 2.0	x8 PCIe 2.0
Processor	Dual-core LSISAS2208 ROC	Dual-core LSISAS2208 ROC	Dual-core LSISAS2208 ROC	800MHz LSISAS2108 ROC	800MHz LSISAS2108 ROC
Cache	1GB 1333MHz DDRIII	1GB 1333MHz DDRIII	1GB 1333MHz DDRIII	512MB DDRII	512MB DDRII

1. MegaRAID Controller
2. CacheVault Flash Module (CVFM)
3. CacheVault Power Module (CVPM)
4. Remote Cable Extender
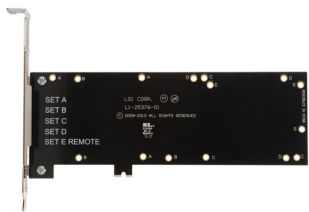5. CVPM Remote Mounting Steel Clip

LSICVM01 Accessory for 9266-4i/8i – In the Box: CacheVault Flash Module (CVFM02), CacheVault Power Module (CVPM02) with 3" cable, 24" remote cable extender, CVPM clip

MegaRAID SAS 9285CV-8e – In the Box: MegaRAID controller, CacheVault Flash Module (CVFM03), CacheVault Power Module (CVPM02) with 3" cable, 24" remote cable, CVPM clip

1. MegaRAID Controller
2. CacheVault Flash Module (CVFM)
3. CacheVault Power Module (CVPM)
4. Remote Cable

MegaRAID SAS 9260CV – In the box: MegaRAID controller, CacheVault Flash Module (CVFM01), CacheVault Power Module (CVPM01), 27" remote cable to connect CVFM and CVPM

BBU-BRACKET-05 (LSI00291) – Sold separately
Remote mounting board that allows customers to remotely mount their battery backup or CacheVault Power Module (CVPM) in an adjacent server PCI slot. Compatible with LSIiBBU06, LSIiBBU07 ,LSIiBBU08, LSIiBBU09

For more information and sales office locations, please visit the LSI web sites at:
lsi.com   lsi.com/channel

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