



Emulex Delivers High Performance for SSDs in Tiered Storage

Data centers implementing SSDs for storage tiering demand high performance, reliability and scalability

At a Glance

Some data is more important than other data and needs to be treated differently. A mission critical application often has slower performance due to I/O on less important data. Tiered storage offers a solution. This is the assignment of different categories of data to different types of storage media which greatly increases overall performance for the most critical applications. For solid-state drives (SSDs) attached to a Storage Area Network (SAN), Emulex delivers reliable and high performance connectivity to enable fast and reliable storage tiering with its LightPulse® Fibre Channel 8Gb/s Host Bus Adapter (HBA) while Emulex HBAnyware® provides centralized management of all Emulex adapters in the tiered storage environment.

Products

- Emulex LightPulse Fibre Channel 8Gb/s HBA
- Emulex HBAnyware

Solution Benefits

- Emulex LightPulse Fibre Channel 8Gb/s HBAs deliver superior performance for SSDs in tiered storage solutions
- Emulex boasts the highest reliability in the industry with field proven 10 million hours mean time between failure (MTBF)
- Emulex HBAnyware delivers enterprise scalability

Tiered Storage

Application bottlenecks that occur in data centers with large deployments of hard disk drives (HDD) have increasingly caused administrators to rethink their storage needs to better align them with the company's business needs. SSDs can help remove these bottlenecks and represent the latest in tiered storage technology, called "Tier 0."

Tiered storage focuses on different types of storage based on an application's performance, availability and recovery requirements where categories of data are assigned to different types of storage media. The Storage Networking Industry Association (SNIA) reports that the hardest part of implementing a tiered storage solution is categorizing the data which may be based on levels of protection needed, performance requirements, frequency of use and other considerations.

With advanced SSD technology, enhanced tiered storage is now a reality. This technology allows a company to better align its storage needs with its business needs and is often attached to a SAN. These solutions automate the movement and placement of data across storage resources as needs change over time, enabling continuous optimization of applications by eliminating trade-offs between capacity and performance, while lowering cost and delivering higher service levels at the same time.

Other SSD installations incorporate a combination of SSD and Tier 1/2 RAID, allowing companies to achieve their performance, capacity, scalability and reliability goals while saving money. Mixing SSD with slower but high density Tier 1/2 storage can result in a perfect blend of high IOPS and low cost per capacity. For example, if a company has an application that requires the purchase of a large number of HDD for performance, they can move the files that demand the highest performance off the inefficient and slow HDD to an SSD. A slower Tier 2 storage array could then be used for the data that is not frequently accessed.

	Type of Data	Solution
Tier 0	Applications that require significant disk I/O – more I/O than the disk subsystem can deliver	NAND Flash, SSD (Flash/RAM-based)
Tier 1	Mission critical, recently accessed, top secret	Double-parity RAID, SSD making an entry
Tier 2	Financial, seldom-used, or classified files	Less expensive media in SANs (e.g., SATA drives)
Tier 3	Event driven, rarely used, unclassified data or archived data	Even less expensive media (e.g., virtual tape library (VTL), tape, cloud archiving making an entry)

Figure 1 Tiered storage levels.

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Tier 0/SSD Options

Flash-based SSD—Data that would do well on flash-based systems is from read-intensive applications or at least those with a more normal level of writes. If the flash system has a large enough RAM cache, it can also support high bursts of writes, meaning it is suited to applications that require significant disk I/O but where individual hot files cannot be identified, such as data warehouses. Flash-based systems offer higher capacities than RAM-based systems, as well as lower power consumption. Because of the capacities available with flash-based SSD, it is now possible to move entire databases onto a SSD.

RAM-based SSD—The first step in establishing a Tier 0 is identifying the data that should go on the system. With RAM-based systems, these are applications with high write I/O transactions. In these applications, specific files can be identified as “hot,” meaning that the files are so active they need more I/O than the disk subsystem can deliver. The other driving factor in RAM SSD installations is low latency. For many applications, latency is more important than absolute peak IOPS numbers, though the best combinations offer both low latency and high IOPS.

The Emulex Solution

Tiered storage solutions address the need for high performance for critical applications. These same applications require reliable performance which is why the Emulex LightPulse Fibre Channel 8Gb/s HBA is often implemented in a SAN that supports storage tiering. The Emulex LightPulse Fibre Channel 8Gb/s HBA delivers the speed and reliability to most effectively apply a tiered storage solution with SSDs.

Enterprises implement storage tiering to achieve the following storage benefits:

- Shrinks backup window
- Faster restores
- Reduce cost of storage infrastructure
- Reduced power costs from utilizing tiered storage (i.e., no power costs for data archived on tape or cloud)

Emulex has long delivered superior performance and reliability with its LightPulse 4Gb/s Fibre Channel HBA. To meet the needs of data centers with shrinking to non-existent backup windows and extremely sensitive data that requires fast recovery, the Emulex LightPulse Fibre Channel 8Gb/s HBA is the proven HBA of choice.

As new SAN-attached tiered storage technologies are evaluated, data center administrators using the Emulex LightPulse Fibre Channel 4Gb/s HBA can easily upgrade to the Emulex LightPulse Fibre Channel 8Gb/s HBA to double their backup and recovery speed. Data center administrators considering the Emulex LightPulse Fibre Channel 8Gb/s HBA for the first time can check the Emulex Interoperability site (<http://www.emulex.com/support/interop.jsp>) for a list of the leading data center solution providers who have tested and approved Emulex Fibre Channel HBAs.

Emulex delivers:

Superior HBA performance for faster storage tiering

- 37% better transaction rates
- 33% more effective CPU utilization
- 127% greater second channel I/O transaction performance
- Better multi-port scalability

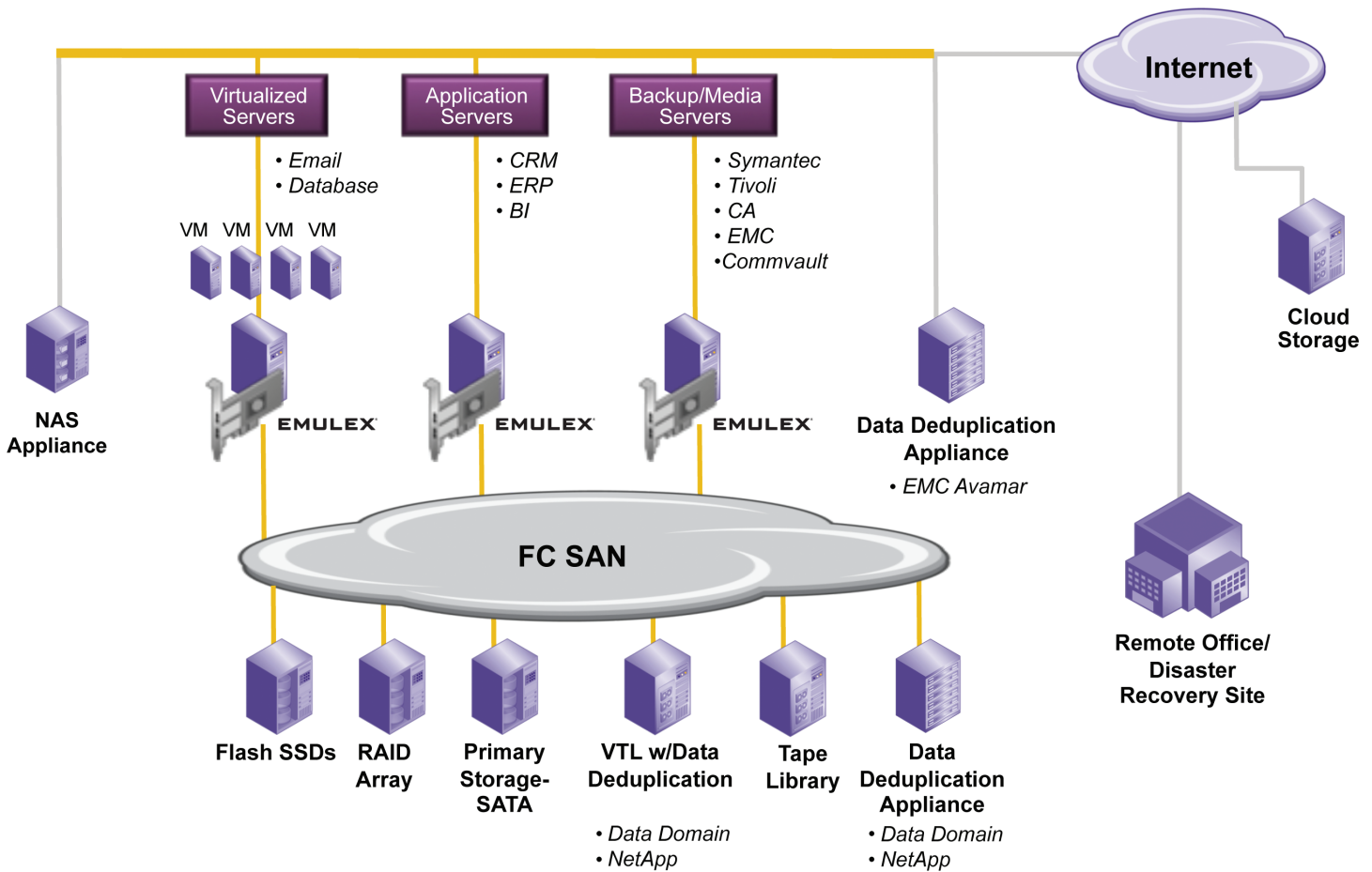
Higher availability for reliable storage tiering

- Industry's most reliable HBA based on actual field return data
- 30% higher reliability over nearest competitor
- More than 10 million hours MTBF

Streamline management for reduced costs and enterprise scalability

- Secure and centralized management of Emulex Fibre Channel HBAs
- Broad OS support ensures seamless integration into enterprise SAN environments
- Emulex standards-based software and management tools provide ease of deployment

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Summary

SSD technology delivers improved storage performance and capacity optimization. By offloading files that have robust IOPS requirements to an SSD, the hard drive storage array is freed up to solely meet the capacity requirement. By using the larger, slower drives, the storage array can handle a larger amount of data for the company at a much lower price. Data centers can implement automated storage tiering based on new technology or implement a combination of Tier 0 and Tier 1/2 technologies. For any SAN-attached tiered storage initiative, the Emulex LightPulse Fibre Channel 8Gb/s HBA delivers superior performance in both speed and reliability while Emulex HBAnyware delivers enterprise scalability. Data centers can trust Emulex for their SAN connectivity needs.



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