FLASH STORAGE
FAQ’s

FREQUENTLY ASKED QUESTIONS

WHAT IS FLASH STORAGE AND WHAT IS IT USED FOR?
Flash storage is any storage repository that uses flash memory. Flash memory comes in many form factors, and you probably use flash storage every day. From a single Flash chip on a simple circuit board attached to your computing device via USB to circuit boards in your phone or MP3 player, to a fully integrated “Enterprise Flash Disk” where lots of chips are attached to a circuit board in a form factor that can be used in place of a spinning disk. Flash storage is everywhere!

WHAT IS FLASH STORAGE SSD?
A "Solid State Disk" or EFD “Enterprise Flash Disk” is a fully integrated circuit board where many Flash chips are engineered to represent a single Flash disk. Primarily used to replace traditional spinning disk, SSDs are used in MP3 players, laptops, servers and enterprise storage systems.

WHAT IS THE DIFFERENCE BETWEEN FLASH STORAGE AND SSD?
Flash storage is a reference to any device that can function as a storage repository. Flash storage can be a simple USB device or a fully integrated All-Flash Storage Array. SSD, “Solid State Disk” is an integrated device designed to replace spinning media, commonly used in enterprise storage arrays.

WHAT IS THE DIFFERENCE BETWEEN FLASH STORAGE AND TRADITIONAL HARD DRIVES?
A traditional hard drive leveraged rotating platters and heads to read data from a magnetic device, comparable to a traditional record player; while flash storage leveraged electronic media, or flash memory, to vastly improve performance. Flash eliminates rotational delay and seek time, functions that add latency to traditional storage media.

WHAT IS THE DIFFERENCE BETWEEN AN ALL FLASH ARRAY AND A HYBRID ARRAY?
A Hybrid Storage Array uses a combination of spinning disk drives and Flash SSDs. Along with the right software, a Hybrid Array can be configured to improve overall performance while reducing cost. An All-Flash-Array is designed to support only SSD media.

SEE NEXT PAGE FOR XTREMIO FAQ’S
WHAT IS XTREMIO AND HOW IS IT UNIQUE?

XtremIO is a full-featured All-Flash-Array that has been designed from the ground-up to unlock the full potential of Flash and Solid-State Disk (SSD). Its powerful architecture was designed to deliver the performance, reliability, and IT flexibility needed in today’s enterprise data centers.

The XtremIO Solution is unique in many ways, but we view performance as a key differentiator. It is scalable, it is consistent, it is inherently load balanced, and it requires no tuning. XtremIO has inline, global, scalable, wire-speed data reduction.

WHEN SHOULD A CUSTOMER CONSIDER XTREMIO AS AN ALTERNATIVE TO OTHER EMC STORAGE SOLUTIONS WITH ISILON, AND VMAX?

EMCs product portfolio is designed to deliver choice, choice based on our customers’ application needs. XtremIO delivers in-line data services designed to reduce the amount of data written to the underlying storage media. These data services provide tremendous benefit for application workloads like Virtual Desktop, Virtual Server and OLTP database environments, while EMC Hybrid platforms provide a balance of cost and performance based on workload needs.

The EMC Product Positioning Guide will help navigate your workload needs with the right storage architecture.

HOW DOES XTREMIO LOWER TCO?

XtremIO delivers more performance and usable capacity, and less overhead, energy consumption, heat generation, and rack space than any other Flash storage array. XtremIO Storage delivers the ultimate efficiency – delivering more IOPS in fewer rack units, watts, and BTUs.

HOW DOES XTREMIO LOWER THE EFFECTIVE COST OF FLASH CAPACITY?

XtremIO delivers a highly efficient 82% usable raw storage capacity, and this is substantially higher than other Flash Arrays. As a result, flash storage is more expensive than hard disk based storage on a raw $/ GB basis, XtremIO systems deliver more raw and usable capacity with inline data reduction, superior data protection and thin provisioning at much higher performance than hard drives. XtremIO makes Flash Capacity cost competitive with traditional storage solutions.

SEE NEXT PAGE FOR FLASH STORAGE TERM DEFINITIONS
TERM DEFINITIONS

FLASH MEMORY
Flash is non-volatile read/write semiconductor memory which is used in Solid State Storage devices. Flash stores data bits in cells. Originally Flash was designed to hold one bit per cell, which is known as Single Level Cell (SLC) Flash.

Subsequent generations of Flash products were designed to hold two or more bits per cell. This is called Multi Level Cell (MLC) Flash. Of course MLC Flash is higher density memory than SLC Flash, and thus MLC Flash offers a lower cost per bit than MLC. However, MLC Flash has lower endurance than SLC Flash.

GARBAGE COLLECTION
Working in the background, Garbage Collection accumulates data blocks previously marked for deletion, performs a whole block erasure on each "garbage" block, and returns the reclaimed space for reuse by subsequent.

SSA (SOLID-STATE ARRAY)
The SSA category is a new subcategory of the broader ECB storage market. SSAs are scalable, dedicated solutions based solely on solid-state semiconductor technology for data storage that cannot be configured with HDD technology at any time. As distinct from SSD-only racks within ECB storage arrays, an SSA must be a stand-alone product denoted with a specific name and model number, which typically (but not always) includes an operating system and data management software optimized for solid-state technology.

SSD (SOLID STATE DRIVE)
Solid state storage that may utilize traditional HDD form factors such as 3.5-inch, 2.5-inch or 1.8-inch. Solid State Drives typically use storage interfaces such as SATA, SAS, or Fibre Channel.

SSS (SOLID STATE STORAGE)
Any storage capability that is provided by non-moving memory technology rather than moving magnetic or optical media. Solid State Storage typically possesses the property of non-volatility and may take various forms such as Solid State Drives, Solid State Cards, or Solid State Modules. Typical interfaces used include SATA, SAS, Fibre Channel, or PCIe.

THROUGHPUT
A measure of the amount of data that can be transferred from a device (reads) or transferred to a device (writes) within a specified time period, typically measured in MegaBytes per second (MB/s). Throughput is indicative of the performance of a device in an application generating sequential reads or writes.

WEAR LEVELING
A set of algorithms utilized by a Flash Controller to distribute writes and erases across Flash cells. The purpose of Wear Leveling is to delay individual cell wear-out and prolong the useful life of the Flash-based storage device.
WRITE AMPLIFICATION

Because a previously written NAND flash memory location must be erased before it can be re-written, the number of write operations within Flash Solid State Device typically exceeds the number of writes issued by the host. This “write amplification” can be represented in equation form: Write Amplification = (Data Written to Flash) / (Data Written by Host.)

EXPLORE HOW EMC FLASH SOLUTIONS CAN HELP MEET YOUR NEEDS.

CONTACT US

To learn more about how EMC products, services, and solutions can help solve your business and IT challenges, contact your local representative or authorized reseller, visit www.emc.com, or explore and compare products in the EMC Store.