

# EMC XtremCache

Server flash caching software for superior performance, intelligence, and protection of mission-critical data

## ESSENTIALS

- Reduces latency and increases throughput
- Extends EMC FAST technology into the server
- Leverages back-end data services provided by networked storage

IT organizations are faced with an application performance challenge caused by an imbalance between the processing power of servers and the access time of storage disks. Server processing power continues to advance, doubling every 18 months, yet disk drive throughput remains the same. This has caused a bottleneck in the input/output (I/O) stack whereby the server and the application have capacity to process more I/O than disk drives can deliver. This is referred to as the “I/O gap.” Flash drives in the array have helped to close this gap by providing an order-of-magnitude better performance. Now, server-based flash technology is accelerating I/O performance by even another order of magnitude over array-based flash.

EMC® XtremCache™ is intelligent caching software that leverages server-based flash technology to reduce latency and accelerate throughput for dramatic application performance improvement. XtremCache accelerates reads and protects data by using a write-through cache to the networked storage to deliver persistent high availability and disaster recovery. Coupled with array-based EMC Fully Automated Storage Tiering (FAST) software, XtremCache creates the most efficient and intelligent I/O path from the application to the data store. The result is a networked infrastructure that is dynamically optimized for performance, intelligence, and protection for both physical and virtual environments. XtremCache can be used with any flash media in the server—both solid-state drives (SSDs) and PCIe cards. The software is optimized for use with EMC XtremSF™—a PCIe flash card available in 550 GB eMLC, 700 GB eMLC, 1.4 TB eMLC, 2.2 TB eMLC, 350 GB SLC, and 700 GB SLC capacities.

## SUPERCHARGED APPLICATION PERFORMANCE

XtremCache accelerates block I/O reads for those applications that require the highest input/output operations per second (IOPS) and/or the lowest response time. The software caches the most frequently referenced data on the server flash, shrinking storage access time while offloading the I/O processing from the storage array. By sitting in the server, XtremCache bypasses the overhead of networked storage access, reducing response time from milliseconds to microseconds. XtremCache puts the data into the server I/O stack, closer to the application, to dramatically improve performance. With throughput improvements of over 300 percent and reductions in latency by as much as 50 percent, XtremCache takes application performance to an entirely new level, giving it the boost it needs.

XtremCache is optimized for web applications, online transaction processing (OLTP), customer relationship management (CRM) and enterprise resource planning (ERP) databases, email applications, and other read-intensive workloads. XtremCache offloads much of the read traffic from the storage array, allowing it to allocate greater processing power to other applications. While one application is accelerated with XtremCache, the array's performance for other applications is maintained or



DATA SHEET

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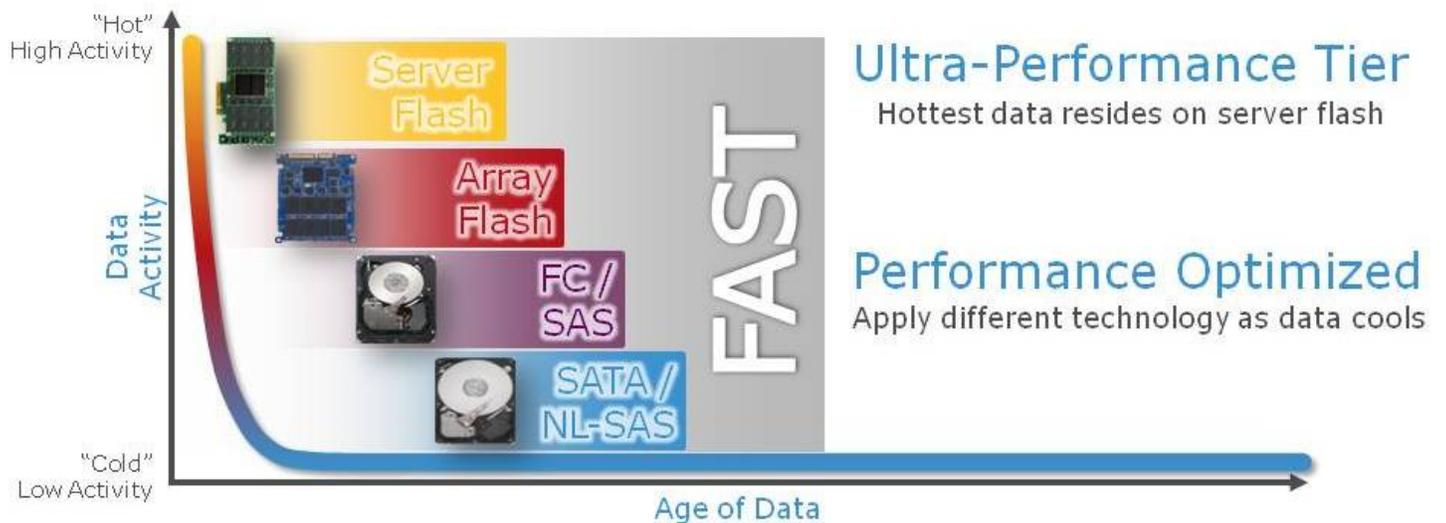
even slightly enhanced. As XtremCache is installed on more servers in the environment, the result is a highly scalable I/O processing model. The environment as a whole, including the servers and the storage system, is capable of processing increasingly more IOPS.

XtremCache provides complete and flexible control over the scope and granularity at which it can be enabled. In physical environments, users can enable or disable XtremCache at the source volume or LUN level. In virtual environments, the XtremCache capacity is provisioned to an individual virtual machine (VM).

## AUTOMATED CACHING INTELLIGENCE

XtremCache intelligently delivers read requests directly from cache memory. The caching optimization within XtremCache automatically adapts to changing workloads by determining which data is most frequently accessed and promoting it into the server flash cache. XtremCache is completely infrastructure agnostic. Sitting between the application and the storage array, it does not require any changes to either. It is transparent to the storage, application, and user. Once XtremCache has been installed, no user intervention is necessary to start seeing performance benefits.

EMC's architectural approach is to leverage the right technology to get the right data to the right place at the right time and cost. To accomplish this, EMC has developed its FAST array-based software, which automates the movement and placement of data across storage resources as needs change over time, optimizing applications while lowering costs. XtremCache extends FAST into the server, adding another tier of intelligence and performance to the I/O stack. When coupled with FAST, XtremCache creates the most efficient and intelligent I/O path from the application to the data store. With both technologies, EMC provides an end-to-end tiering solution to optimize application capacity and performance from the server to the storage. As a result of the XtremCache intelligence, a copy of the "hottest" data automatically resides in the server for maximum speed. As the data slowly ages and "cools," it is automatically moved to the appropriate tier of the storage array—from server flash to array flash to Fibre Channel/SAS drives to SATA/nearline SAS drives over time.



XtremCache uniquely offers cache deduplication—a data compression technique that eliminates redundant data in the cache by storing only a single copy of identical chunks of data. Deduplication provides great economic benefit. With deduplication enabled, server flash can hold more data since it does not hold duplicate copies of the same data. The effective cache size is therefore larger than the physical cache size, which allows for a larger working set size and ultimately reduces the cost per gigabyte. Furthermore, since duplicate data does not have to be written to the server flash, the number of writes is reduced, allowing for a lower wear-out rate and, consequently, a longer life.

## TOTAL PROTECTION

While accelerating performance, XtremCache simultaneously delivers enterprise-class protection of mission-critical application data. Data in the cache is simply a copy of data that is already stored on the array, while the master copy is maintained by the advanced data services that only EMC's trusted networked storage provide, including high availability, end-to-end integrity, reliability, and disaster recovery. XtremCache leverages a write-through algorithm which ensures that newly written data persists to the networked storage array, such as EMC Symmetrix® VMAX® and VNX® series. If the server fails, the data remains protected and accessible on the array.

XtremCache includes a unique software option that enables users to split the available server flash between caching and local storage. This provides flexibility for users to simultaneously use the card as a caching device for mission-critical data and as a read/write storage device for temporary data. Users can fully optimize their workloads by adjusting caching or storage without having to change their card deployment.

## 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—or visit us at [www.EMC.com](http://www.EMC.com).

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