

# EMC SOLUTIONS FOR EPIC EHR ENVIRONMENTS

## Enabled by EMC XtremIO, VMware and LINUX

All-Flash storage technology has emerged as a powerful force in the delivery of healthcare today, providing a highly reliable storage option for the most demanding, mission-critical, and increasingly virtualized EHR applications such as Epic. EMC XtremIO, the market leading all-flash storage platform, is transforming the healthcare IT. Your Epic infrastructure can be best served by the combination of all-flash storage arrays like XtremIO, VMware's server virtualization technologies, and applications running on LINUX platforms.

### CREATE AN AGILE EPIC APPLICATION ENVIRONMENT WITH EMC XtremIO

Driven by the needs of enterprise-wide EHR environments and virtualization, XtremIO delivers very high I/O performance with sub-millisecond latencies, even with highly randomized workloads. XtremIO is a very good match for Epic Caché databases, Cogito analytics, virtual desktop infrastructure (VDI), and virtualized servers, all with sub-millisecond performance requirements. XtremIO's clean-sheet all-flash array design has created the opportunity to deliver massive I/O performance and also dramatically reduce the overall cost of an Epic deployment through consolidation and advanced data services such as data deduplication and compression, space-efficient snapshots, and thin provisioning.

The truly transformative potential for Epic workload agility and cost savings comes from on-demand, full-performance copy services to expedite business-critical processes, such as real-time reporting and analytics. However, all this potential can be realized only with an architecture that is based on a clean-sheet design specifically designed for flash. Only XtremIO delivers on this with the unique combination of always-on, inline data services and linear scale-out architecture for consistent, high performance, and predictable IOPS and latency.

### UNIMAGINABLE PERFORMANCE IS ONLY THE START

Welcome to the 100% All-Flash Enterprise Storage Array from XtremIO – where unimaginable performance is only the start. With XtremIO, data reduction does not equal performance reduction. The array delivers astoundingly high IOPS and low latency all the time, without compromise. XtremIO is managed through a powerful, yet simple graphical interface, with an available Command Line Interface (CLI) for automation.

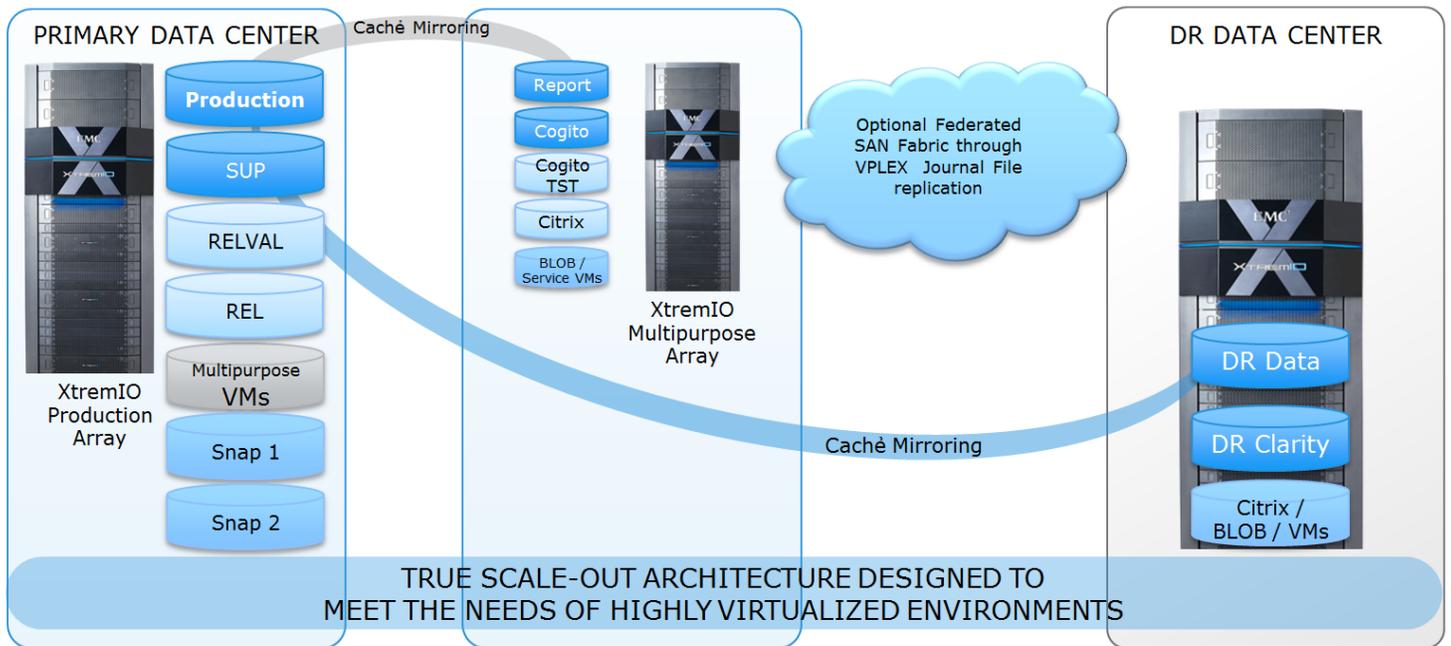


Figure 1. Example XtremIO all-flash architecture in Epic production environment.

### INLINE, ALWAYS-ON DATA REDUCTION

XtremIO does not store any duplicate data across the entire cluster. The data deduplication is inline, at the memory level, even before the data touches the SSDs. It also automatically compresses data for a diverse variety of data sets. It does so after all duplications have been removed, ensuring that the compression is performed only for unique data blocks. Data compression is performed in real-time and not as a post-processing operation, so the data is always written only once. This improves the endurance of the flash array by minimizing the Write Amplification (WA) of the SSDs, allowing up to 300% more data to be stored on the same physical flash drive for database and VDI environments.

**WRITEABLE AGILE SNAPS** — With the XtremIO unique metadata snapshot container architecture, you can create full-performance writeable snapshots, known as XtremIO Virtual Copies (XVC), instantly without the overhead and storage space required for “brute force” copies. This is highly valued in a typical Epic environment where an average of 12 full production-size copies could be in use. Lab testing has shown that up to a 50% reduction in storage footprint can be achieved due to the use of space-efficient snapshots, which leads to cost savings in power, floor space, and cooling.

You can also create and keep snapshots of your production and test/development volumes on the same XtremIO array with no impact on system performance. With XtremIO inline deduplication your copies are super space-efficient, using space only for new, globally unique data blocks and metadata. Go ahead – take snapshots of your snapshots to make as many copies as you need.

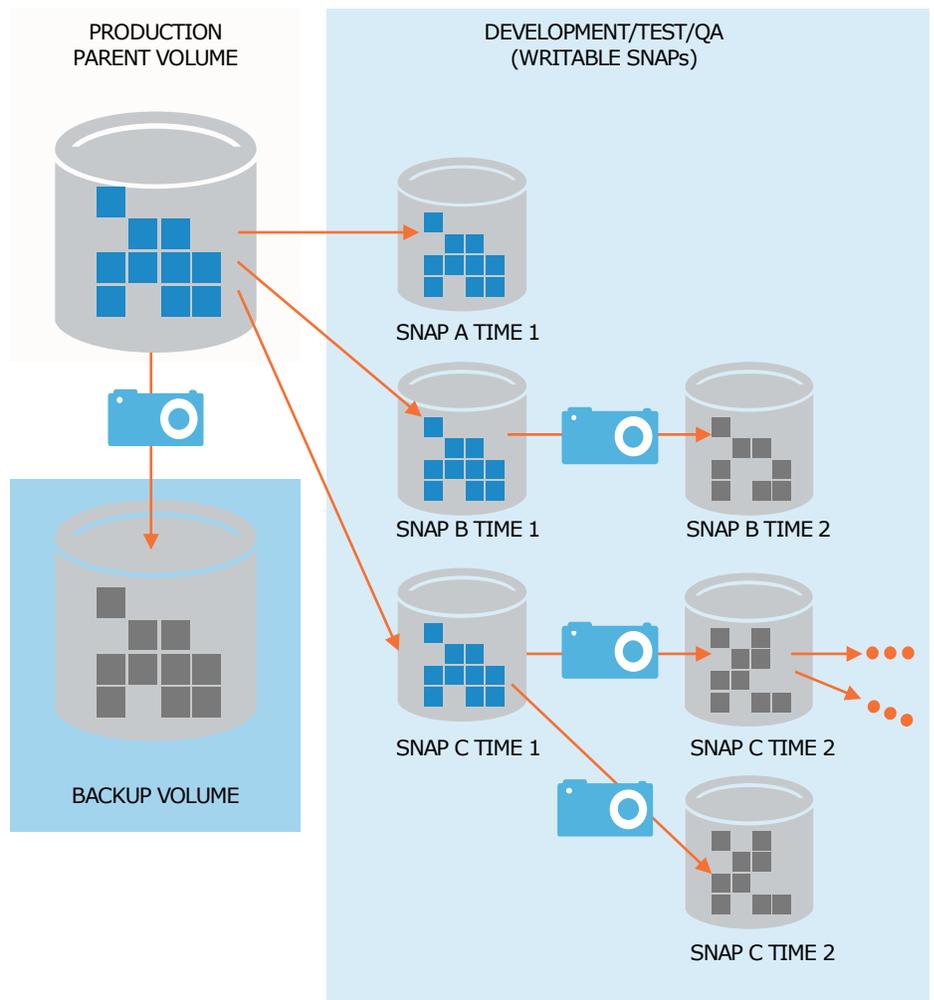


Figure 2. XtremIO redefines Snapshots

**POWERFUL SCALE-OUT** — With a scale-out design that grows according to your needs, additional performance and capacity are added in a building-block approach. XtremIO’s advanced architecture ensures that maximum performance is maintained as the system scales – without administrator intervention, configuration or tuning. All resources scale in balance – storage processors, memory, flash capacity, and host ports – and are pooled in a cluster so there are no performance bottlenecks, allowing to you always get the most out of the system and the best performance from your Epic environment. XtremIO arrays scale out to any desired performance or capacity level. Just add more ‘X-Brick’ scaling units to a cluster or add a new cluster.

**CONSISTENT, LOW-LATENCY I/O PERFORMANCE** — XtremIO delivers consistent performance under demanding conditions that leave other products gasping for IOPS and exhibiting inconsistent latency. You don’t have to worry about your Epic performance dropping as array capacity fills, as the system is put under sustained high load, or even as the flash is written over and over again.

**SURPRISINGLY AFFORDABLE** — XtremIO utilizes e-MLC flash combined with sophisticated wear leveling, always-on, inline data reduction and thin provisioning, and write abatement technology that deliver extended flash endurance. This results in superior performance with enterprise-class reliability at a very reasonable price. XtremIO arrays get the job done with less flash capacity than other all-flash arrays, making them surprisingly affordable and cost-effective.

**AMAZINGLY SIMPLE** — XtremIO's revolutionary internal architecture completely eliminates complex setup and tuning steps, while inherently delivering maximum performance. Create and size volumes in a few clicks, map them to hosts with a few more, and the array is configured. XtremIO can go from shipping box to production in well under an hour. With true N-way active/active operation, all volumes can be accessed through all ports on all storage processors in the cluster for ideal multipath I/O and the ultimate in performance aggregation.

**FLASH-SPECIFIC DATA PROTECTION** — When securing mission-critical Epic data, XtremIO flash-specific data protection algorithms ensure that the array is as resilient as it is fast. Every cluster-scaling X-Brick has its data protected in an N+2 scheme that tolerates multiple, simultaneous SSD failures across a cluster. Optimal data encoding and decoding processes recover from SSD failures rapidly with distributed rebuilds. As an additional layer of security, data encryption at rest is available with every array.

## REDEFINE TRUSTED IT AND AGILITY FOR YOUR EPIC EMR ENVIRONMENT

XtremIO plays a vital role in providing consistent low-latency and high I/O performance and application agility to meet the demands of your Epic environment. They can scale easily, are energy and space efficient, surprisingly affordable, and amazingly simple. Plus, with built-in capabilities for Epic workload consolidation, data reduction, and on-demand, writeable snaps -- XtremIO, in most cases, is the most cost-effective storage solution for your Epic environment.

EMC works with Epic, VMware, and other partners to develop new solutions that deliver industry-leading innovation for your Epic EHR. As a result, we have been extremely successful in delivering Epic IT infrastructure that satisfies the demands of both the Epic application and Epic users for instant and continuous access to patient data by authorized users. EMC is redefining trusted health IT at more than half of Epic sites in the U.S. today, including most of the largest Epic installs. Let us work with you to determine how XtremIO can help you redefine the optimal IT infrastructure for your Epic environment.

### CONTACT US

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