



Innodisk® FlexiArray™ Storage Appliance

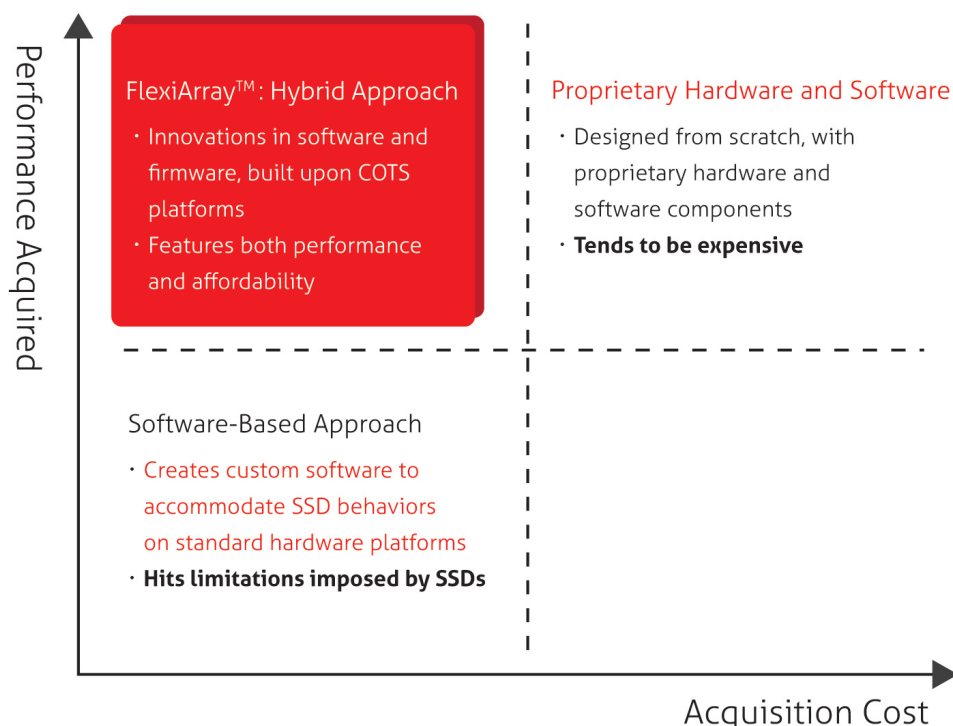
Accelerates Your I/O-Intensive Applications with High IOPS

Introduction

The FlexiArray™ storage appliance, powered by the FlexiRemap™ technology, is an all-flash array that delivers sustained high IOPS for data access operations, including the mostly concerned random writes. The FlexiArray™ may either serve as a primary storage or an intermediary accelerator to complement traditional hard disk drive (HDD) arrays. By improving storage efficiency, FlexiArray™ enables I/O-intensive applications to run faster with lower total cost of ownership (TCO).

FlexiArray™ protects against data loss and reduces service downtime through virtual drive groups, featuring fault tolerance, and automatic data reconstruction upon front-accessible drive replacement. The command-line interface (CLI) and web-based graphical user interface (GUI) are available for task management, configuration and status monitoring. In addition to 10GbE and InfiniBand connectivity, FlexiArray™ also offers popular remote data-sharing protocols, such as iSCSI, CIFS, and NFS.

FlexiArray™ is designed with cutting-edge innovations in solid-state drive (SSD) firmware and system-level software, under distinguished flash-collaborating architecture built upon commodity off-the-shelf (COTS) platforms. FlexiArray™ successfully eliminates inherent limitations from conventional SSD-powered systems architecture by making kernel-level drivers and SSD firmware seamlessly work together. In this way, FlexiArray™ simultaneously features performance and affordability to save significant investment in proprietary hardware.



Advantages of FlexiRemap™ Technology

FlexiRemap™ technology features :

- An adaptive flash translation layer (FTL) implemented at OS **kernel** level
- Flexible aggregation of multiple SSDs into a **super drive**
- Smart rescheduling of random writes into **sequential** ones
- Redundancy and global wear leveling with **inter-drive** knowledge
- **Scalable** performance

All SSDs in FlexiArray™ are effectively aggregated into a super drive; the super drive is further divided into two virtual groups. In an event of a drive failure, the virtual group to which the failed drive belongs degrades into read-only mode, while the other virtual group remains to operate normally. After the failed drive is replaced, FlexiArray™ reconstructs data automatically. When the reconstruction is complete, both virtual groups function normally. This well-thought-out fault-tolerant design and failover behavior avoids service downtime and keeps business-critical applications running at all times.

Fault Tolerance

Excels RAID 1 In Capacity

RAID 1 refers to duplicate sets of all data on separate drives. It provides high data availability because two complete copies of all information is simultaneously maintained. The disadvantage is paying the cost of half capacity for fault-tolerance. FlexiRemap™ technology complements data duplication with fewer capacities, but same efficiency in availability and performance.

RAID 5 uses data striping in a technique designed to provide fault-tolerant data storage without requiring full data duplication. Data is striped across all of the drives in the array with space reserved for parity data. The parity needs to be recalculated on every write which can reduce the efficiency of write performance. FlexiRemap™ technology deploys a hybrid architecture to sustain the write performance with scalability. FlexiRemap™ technology outdoes RAID 5 in every added drive of performance degradation.

Outperforms RAID 5 In Scalability

Applications

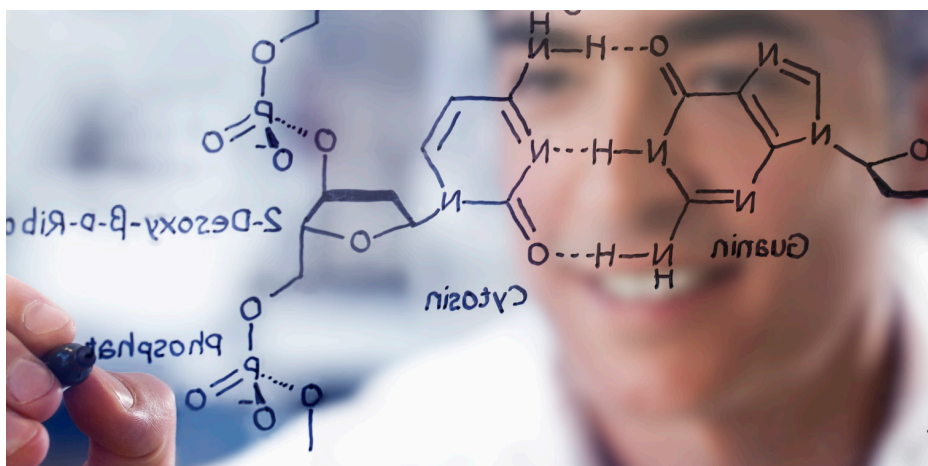
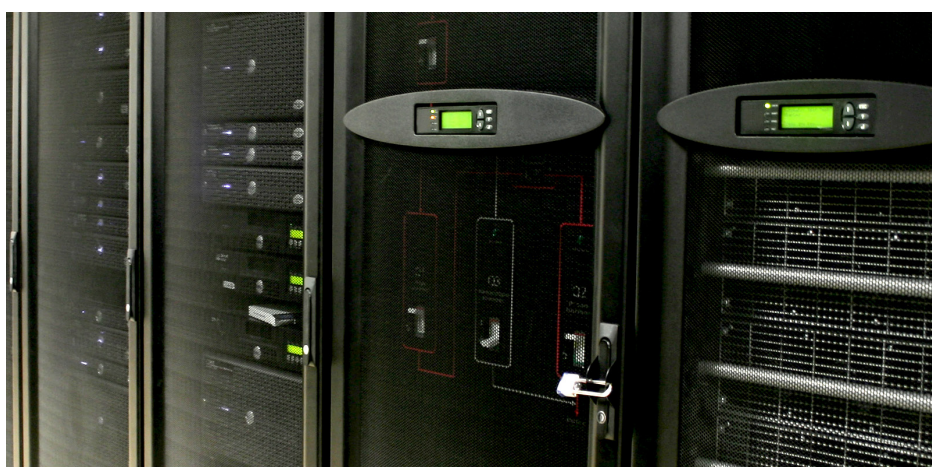


Virtual Desktop Infrastructure (VDI)

Traditional HDDs with high-capacity and modest performance are suitable for sequential workloads. However, HDDs are comparably too slow for VDI, which generates a heavy workload of random reads and writes. FlexiArray™ may either serve as a primary storage or an intermediary accelerator to highly reduce the latency and response time.

Database

Queries are often submitted to databases to analyze consolidated data from various points of view for better business decisions. Timely analytics based on real-time data are indispensable for today's business decision-makers and are also challenges to IT environments. FlexiArray™ complements HDD arrays for data tier to provide prompt operational data.



High Performance Computing (HPC)

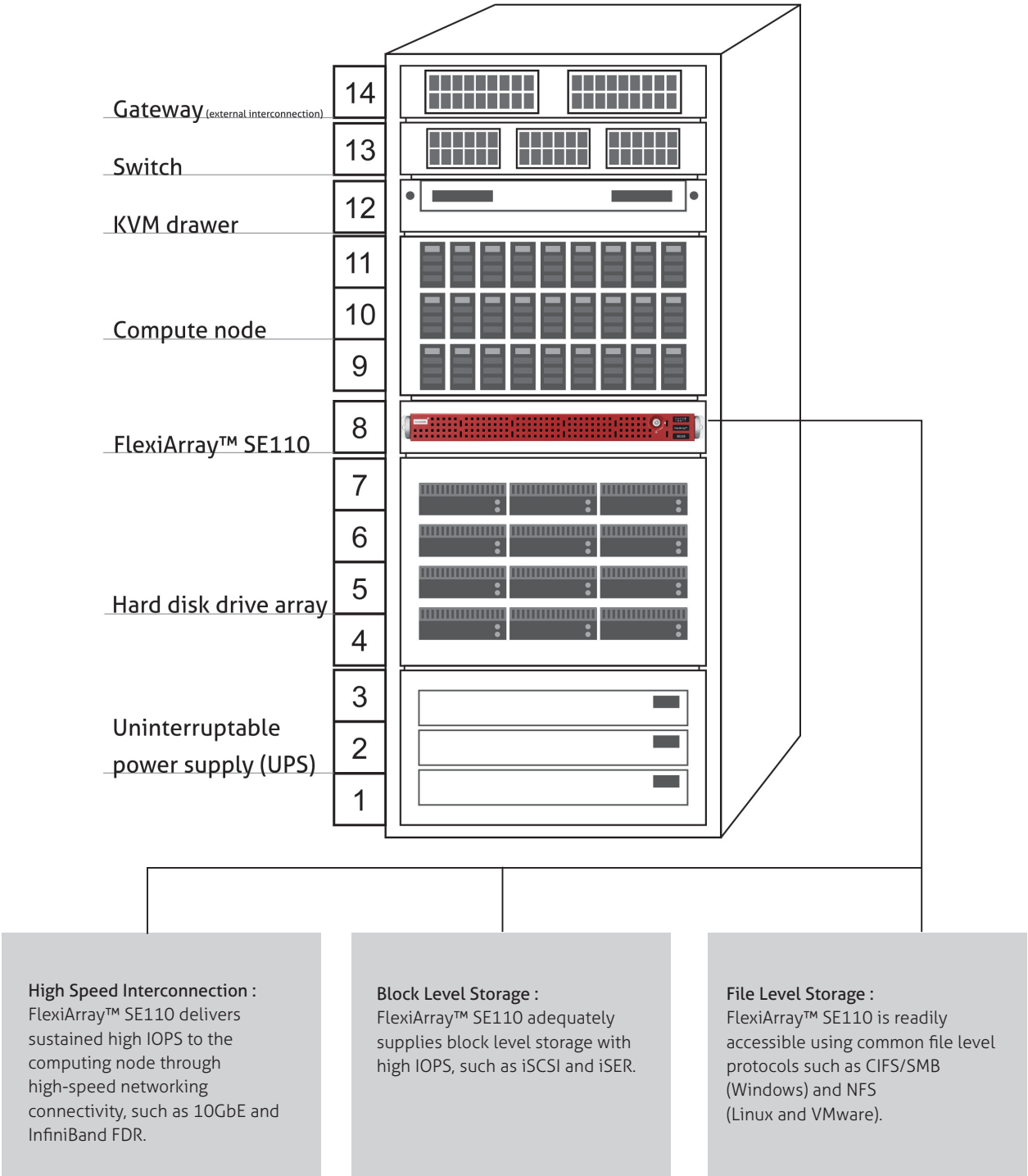
The metadata is composed with a high frequency of small transactions. A considerable amount of metadata is generated by compute node during the complicated calculation process of a tremendous amount of data. FlexiArray™ efficiently stores the metadata to increase the performance of calculations and to enable more accurate computational methods.

Online Collaboration

Increasing product sophistication coupled with global collaboration across countries drive the need for concurrent design processes within teams from partners, vendors, and customers. Immediate access to data and instant writes is the stepping-stone. FlexiArray™ cuts the loading time and shortens the design cycle.



Solution Composition



Deployment example in one 14U rack cabinet

Products



Model Name		FlexiArray™ SE108	FlexiArray™ SE110
Features		- Automatic data reconstruction upon SSD replacement - Global wear leveling with cross-drive knowledge - Sustained high IOPS for random write - Proactive SSD health monitoring and fault tolerance	
Configuration		1 TB	3 TB
Capacity		1,152 GB	3,072 GB
Form Factor		1U rack mount	1U rack mount
Number of Solid-State Drives		8	10
Flash Type		MLC	MLC
Performance (4 KB Random Write)		285,000+ IOPS	320,000+ IOPS
Data Protection		Through virtual groups	Through virtual groups
Connectivity Options		4 x 10GbE SFP+ or 1 x InfiniBand FDR QSFP	4 x 10GbE SFP+ or 1 x InfiniBand FDR QSFP
Protocols Supported		iSCSI CIFS/SMB (2.0/3.0) NFS (v3/v4)	iSCSI CIFS/SMB (2.0/3.0) NFS (v3/v4)
Power Supply		Two redundant hot-swap power supplies AC voltage: 100-240 V, 50-60 Hz (750 Watt each)	Two redundant hot-swap power supplies AC voltage: 100-240 V, 50-60 Hz (750 Watt each)
Hot-Swap Capability		Solid-state drives Power supplies	Solid-state drives Power supplies
Management Interfaces		Web-based GUI (via HTTP/HTTPS) CLI (via serial port)	Web-based GUI (via HTTP/HTTPS) CLI (via serial port)
Dimensions (W x D x H)		437 mm x 597 mm x 43 mm	437 mm x 597 mm x 43 mm
Weight		12.9 kg (28.4 lb)	12.7 kg (28.0 lb)
Environmental	Temperature	Operating: 10°C to 35°C Storage (non-operating): -40°C to 60°C	Operating: 10°C to 35°C Storage (non-operating): -40°C to 60°C
	Humidity	Operating: 10% to 90% non-condensing Storage (non-operating): 5% to 95% non-condensing	Operating: 10% to 90% non-condensing Storage (non-operating): 5% to 95% non-condensing

About Innodisk

Innodisk is a service driven provider of flash and DRAM products for the industrial and enterprise applications. With satisfied customers across the embedded, military, enterprise computing markets and more, we have set ourselves apart with a commitment to dependable products and unparalleled service. This has resulted in products including embedded peripherals designed to supplement existing industrial solutions and the high IOPS flash arrays for industrial and enterprise applications. The new business lines are leading our next step in being a comprehensive industrial system service provider and flash storage solution provider.

Absolute Service

Service is not just what we do. It's who we are.

Absolute Service is our pledge and our guide. It infuses everything we do at Innodisk.

Absolute Service is our promise to deliver the most comprehensive service in every situation. It's the philosophy that guides us in all interactions with our customers and business partners. It's the spirit of friendliness and enthusiasm that fills each member of the Innodisk team.

Absolute Service is our absolute commitment to our customers.

For more information, visit our website at <http://flexiarray.innodisk.com/>.

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