SOLUTION BRIEF

ATLANTIS™

Hyper-Converged with Lenovo

lenovo FOR THOSE WHO DO.

All-Flash Hyper-Converged Storage

Lenovo and Atlantis have tested the world's first All-Flash Hyper-Converged solution that integrates the proven Lenovo System x® server platform, the innovative Atlantis USX™ software-defined storage platform and unique Lenovo eXFlash® memory-channel storage. This result shows how enterprises can achieve all-flash performance at half the cost of SAN storage by integrating storage into the compute layer.

With an entry-level, three-server configuration, enterprises can process more than two million OLTP database transactions per minute, deliver up to 3 million real-world IOPS and support four hundred persistent power-user virtual desktops with disk performance that is five times faster than a MacBook Air.

Lenovo System x Server Platform

The solution offers either Lenovo Flex System® compute servers or Lenovo System x rack servers that provide outstanding performance for mission-critical applications. Its energy-efficient design supports more cores, memory, and data capacity in a scalable and easy to manage platform. With more computing power per watt and the latest Intel Xeon processors, enterprises can reduce costs while maintaining speed and availability.

Lenovo eXFlash DDR3 Flash Memory DIMMs

The solution features Lenovo eXFlash memory-channel storage, a high-performance solid-state storage device that plugs into existing memory DIMM slots and is directly connected to the DDR3 system memory bus. This new technology has better performance and lower latency than solid-state devices (SSDs) or PCIe SSD adapters.

Atlantis USX

The solution is built on Atlantis USX, a software-defined platform that pools the Lenovo eXFlash DIMMs to create file or block shared storage, increases the effective storage capacity by up to ten times and provides Atlantis HyperDup™ content-aware data services to turn the Lenovo server direct-attached storage into an enterprise-class storage system. Atlantis USX includes real-time deduplication technology that provides data reduction, IO acceleration, faster provisioning, data mobility, security and business continuity. Atlantis USX integrates the capability to create an optional high-capacity expansion tier that is accelerated using Lenovo eXFlash DIMMs with up 300TB of effective storage capacity in a 3 server configuration.

KEY BENEFITS

Cost Reduction

- 80% lower cost per GB than all-flash arrays
- 90% lower cost per IOPS than SAN
- No OPEX for datacenter storage

Storage Performance

- **IOPS:** up to 3.3 million IOPS
- **Latency:** 1.15 ms
- **OLTP Database:** 2 million tpm
- **VDI:** 5x Disk Performance of MacBook Air

Scalability

- Scale out linearly to an unlimited number of servers and petabytes of integrated storage
- Scales using high density blades or using rack servers
- Add storage capacity or performance dynamically through software

ATLANTIS USX COST REDUCTION

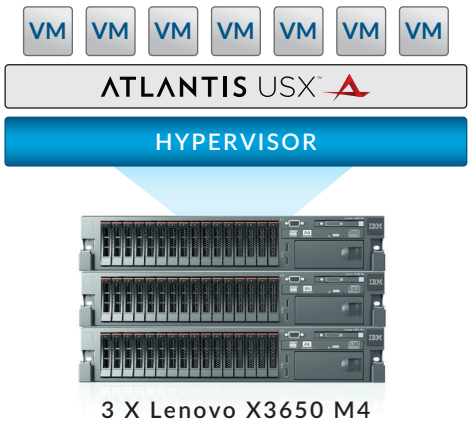
	SAN/NAS	All-Flash Array	Atlantis USX
Cost per IOPS	$3	$1.60	$0.05
Cost per GB	$4	$12	$2

"By 2016, server-based storage solutions will lower storage hardware costs by 50% or more."

— Gartner: G00255093

As the use cases for Flash DIMMs evolve, it will be attractive to IT teams running virtualized environments as a generalized use case, because of the combination of reduced storage cost and scalability.

— Gartner: G00255093



3 X Lenovo X3650 M4

SYSTEM SPECIFICATIONS

Lenovo x3560 M4 Servers	3	6	12
Rack Units	6	12	24
Lenovo eXFlash DIMMs	24	48	96
6TB 7200RPM SATA HDD Optional Capacity Expansion	18	36	72
STORAGE CAPACITY			
All-Flash Raw Capacity (TB)	9.6	19.2	38.4
All-Flash Effective Capacity (TB)	64	128	256
Max Raw Capacity w/ HDDs (TB)	108	216	432
Max Effective Capacity w/ HDDs (TB)	300	600	1200
STORAGE PERFORMANCE (MAXIMUM IOPS TESTED WITH IOMETER)			
Mixed IOPS (50% read, 50% write, 80% random, 4K)	3.3 million	6.6 million	13.2 million
Write Heavy IOPS (20% read, 80% write, 80% random, 4K)	2.6 million	5.2 million	10.4 million
Average latency (ms) (50% read, 50% read, 80% random)		1.15ms	

ATLANTIS™
The New Order of Storage Freedom

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