WINCHESTERSYSTEMS®
Purpose-Built Storage

FlashDisk® Database Accelerator DA-2000

Accelerate Database Speed by 2X to 25X
Delivers Over 200,000 Sustained 4KB IOPS

Database Performance
FlashDisk Database Accelerator (DBA) is a "plug-and-play" data storage unit featuring solid state disks (SSDs) and ultra-fast controllers that multiplies the speed of Oracle, SQLserver, SAP and MySQL and other random access applications on an enterprise SAN by 2X to 25X - with no software changes. Queries, reports, sorts and merges all run faster with reliable hardware acceleration whether native or virtual.

FlashDisk DBA clocks in at 73,000 sustained random and 213,000 sustained sequential IOPS with bursts to 500,000 IOPS using typical database-sized 4 KB blocks.

Purpose-Built
Designed as a "Purpose-Built" storage solution, the FlashDisk DBA utilizes uniquely fast disk controllers and the speed of special purpose, high speed SSDs. With no mechanical disk heads, SSDs run at electronic speeds with vastly lower read and write latencies. However, most RAID controllers were designed for mechanical disks and thus cannot keep up with the performance that SSDs provide, especially for small-block random access applications like database and transaction processing.

FlashDisk Database Accelerator

Performance
-213,000 sequential; 73,000 random IOPS
-3 GB/sec writes; 5 GB/sec reads
-Eight 8 Gb Fibre Channel ports

Capacity
-200/400/800 GB eMLC SSDs
-19.2 TB raw (24 SSDs at 800 GB each)
-9.6 TB usable (RAID 1, 10)
-Virtual storage pools maximize utilization

SSD Endurance
-8 full capacity writes per day for 5 years
-Wear leveling uses all SSD blocks evenly
-Automated block replacement

Reliability & Serviceability
-Hot-swappable drives, power supplies, fans, BBUs, AC inlets and controllers
-Hot spares with automatic drive rebuilds
-Supports drive path failover & load balancing
-No single point of failure configurations

Compatibility
-Supports any open O/S
-Supports VMware, Citrix, Hyper-V
-No host software or drivers needed

Centralized & Remote Management
-FlashDisk Global Manager manages multiple standard FlashDisk and FlashDisk DBA units over network with web browser GUI
-24x7 automated "call-home" service to US call center

Speed, Speed, Speed
Dual redundant, exceptionally high speed disk controllers make use of the SSDs to maximize performance. Typical 15K rpm hard disks deliver up to 250 disk IOPS (disk operations per second) thus twelve in a single unit delivers only 3,000 random IOPS. By contrast, FlashDisk DBA with 12 SSDs and an ultra fast controller delivers up to 73,000 random I/O's per second - nearly 25 times the data rate. For data transfer, FlashDisk DBA excels with 3 GB per second writes and 5 GB per second reads. Imagine what that would mean in your database applications and backup.

SAN Accessible
Fast data access requires fast host interface. FlashDisk DBA provides eight 8 Gb Fibre Channel ports to provide SAN access or up to eight direct attached server connections in a "SAN-In-A-Box" configuration - without Fibre Channel switches.

Reliability
In applications that are mission critical, each SSD is mirrored to another so that the application continues running even if one SSD from each mirror pair fails. FlashDisk DBA uses only the highest quality enterprise Multi-Level Cell (eMLC) SSDs, with a typical write endurance of at least 8 full-media writes per day for 5 years. All components are redundant, easily accessible and hot-swappable including controllers, drives, power supplies, fans and AC power.

Summary
FlashDisk DBA is "Purpose-Built" to deliver unprecedented performance and exceptional reliability and serviceability to mission database applications. Example benchmarks below highlight the obvious benefits.

Database Function	15K Disks	FlashDisk DBA	Speed Multiple	Time Reduction
Simple Query	*3 min 34 sec*	*16 sec*	**13.4**	92.5%
Short Report	*8 min 3 sec*	*1 min 35 sec*	**5.1**	80.3%
Long Report	*2 hr 53 min*	*23 min*	**7.5**	86.7%

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FlashDisk DBA Rear View

FlashDisk DBA supports eight Fibre Channel 8 Gb ports for SAN switch attach or "SAN-In-A-Box" connections to up to 8 servers.

FlashDisk DBA SSD Performance Data

Benchmarks	IOPS
12 Non-Raid SSDs	*4KB Blocks*
Sequential writes	*132,000*
Sequential reads	213,000
Random writes	55,000
Random reads	73,000

FlashDisk DBA delivers 25 times the random IOPS of disk based systems - making them perfect for database applications.

Compatibility

Operating systems	Supports 14 Operating Systems including Windows, Linux, and UNIX
Platforms supported	Intel, Oracle, HP, IBM system p, Apple, SGI
Cluster support	Supports 9 industry-standards including Windows, Linux, and Veritas
Remote monitoring ports	RJ45 10/100 Ethernet
Communication protocols	TCP/IP, SNMP, SSH
Connectivity	Host adapters available for PCI-X, PCI Express

Storage Management

FlashDisk Global Manager GUI	Manage storage services of multiple FlashDisks from any web browser
Event notification	Automatic event and problem alert notification
FlashAlert call home service	24-hour call center available for immediate action
Manage out of band	Ethernet

FlashDisk DBA 2U Enclosure

SSD controller	Single/Dual redundant 64-bit, 12th generation controller
RAID levels supported	0, 1, 10
Host interfaces	8 Gb F/C and 1 Gb Ethernet
Number of drives	12 x 3.5" or 24 x 2.5" SSDs
On-line capacity expansion	Automatically adds new drives to existing array - "on-the-fly"
Cache memory capacity	2 GB, expandable to 4 GB per controller
Non-volatile cache	Li-ION battery powered backup to flash memory
Maximum LUNs	1024 total, 64 per host ID
Maximum number of hosts	64
LUN mapping/filtering	Configurable per logical partition

Controls and Indicators

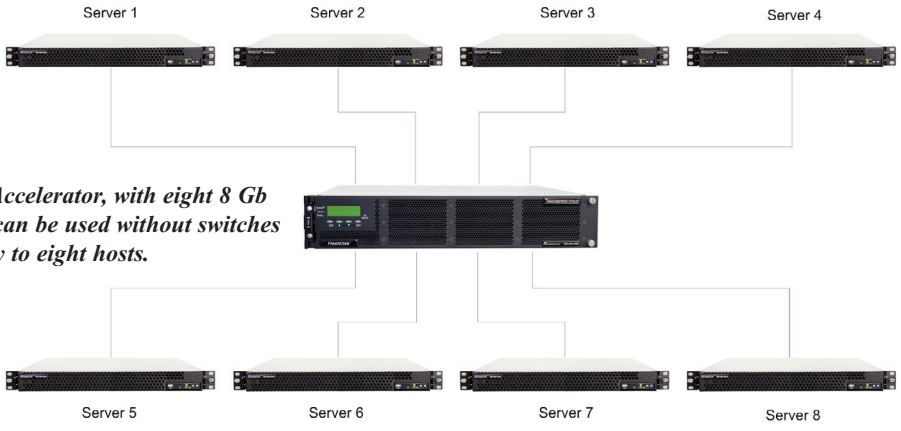
LCD front operation panel	2 x 16 character display, push button controls.
LED indicators	LED power, battery, controller, and system status
Alerting	Audible and visual alerts
Component failure	Failure indication through LCD and GUI
LCD front operating console	Access storage functions from front panel

General

Uninterruptible power supply	Required when using write-back cache
Redundant AC power	Dual 90-260 VAC Inlet, 47-63 Hz
Power consumption	100 VAC @ 8/10A; 240 VAC @ 4/5A; 460 W with PFC
Enclosure dimensions	3.5" h x 17.5" w x 19.2" d
Enclosure weight	Approximately 57 lbs. fully loaded with SSDs
Operating temperature	0° to 40° C
Cooling system	Two dual hot-swap, ball bearing blowers; <51 dB-A
Compliance	FCC, UL, CE, CSA

Warranty & Service

Standard warranty	One year, next day on-site and toll-free hotline; Options up to 24x7 on-site
Installation and service	On-site installation; 24x7 service available



FlashDisk Database Accelerator, with eight 8 Gb Fibre Channel Ports can be used without switches and connected directly to eight hosts.

www.winsys.com

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