Nytro™ WarpDrive™ Flash Accelerator Card

Data Sheet

Key Features and Benefits

- High throughput up to 4GB/s on PCIe 3.0 products
- DuraWrite™ advanced wear leveling technology
- Dynamic over-provisioning
- Self-heals from block level and page level failures
- Batteryless power fail protection

Integration Features

- PCIe 3.0 support for FHHL
- Plug and play
- Bootable solution
- Industry hardened drivers
- Non-destructive single push firmware/driver update
- Offload architecture resulting in low host CPU and memory utilization
- Lower space, power, cooling and management costs than traditional HDD solutions
- Enterprise-level quality and reliability

The Seagate® Nytro WarpDrive Flash Accelerator card is designed to offer high performance with low latency and low CPU burden. Nytro cards accelerate applications such as data warehousing, data mining, data analytics, online transaction processing, high performance computing and big data.

Their PCIe host interface standard, enterprise drivers and small form factors make them more flexible and easier to integrate into today's low-profile, high-performance system chassis.

Improve Application Performance

Nytro cards are designed to improve application performance and maximize return on investment. They can greatly improve end-user level performance because less power, cooling and server requirements can significantly lower CAPEX and total cost of ownership.

Sophisticated Architecture

Nytro cards are built on the latest enterprise-level solid state technologies and include sophisticated advanced features to help deliver consistently high levels of performance, endurance and reliability under some of the most demanding conditions. Seagate DuraWrite™ technology optimizes the number of program cycles to the flash storage, effectively extending the rated write endurance of the flash storage by 8x or more when compared to standard controllers.

Other algorithms and dedicated onboard hardware resources handle complex flash management tasks like garbage collection and wear leveling. Leveraging these advanced features, Nytro cards deliver the performance and endurance needed for accelerating critical business applications.

Nytro cards contain no moving parts to maintain, require no user configuration at set-up and include a management infrastructure for extensive monitoring, including health, error rate and failure monitoring. And, with the Seagate Enterprise Storage Manager—a web based management tool—users can easily create and manage Seagate flash configurations from a single interface.

Nytro™ WarpDrive™ Flash Accelerator Card

Nytro™ WarpDrive Card™	3.2TB
Form Factor	FHHL
Workload Optimization	Balanced Read-Write Workload

Nytro™ WarpDrive™ Acceleration Card Specifications	
Usable Capacity	3.2TB
Interface	×8 PCIe 2.0 and 3.0 (electrical)
Read Bandwidth (256K)	Up To 4.0GB/s
Write Bandwidth (256K)	Up To 2.5GB/s
Read IOPs (8K)	Up To 280,000
Write IOPs (8K)	Up To 200,000
Average Latency	<50 microseconds
Auxiliary Power	Auxiliary power may be required for a FHHL card. Auxiliary power cable will be shipped with the card.
Product Health Monitoring	Self-Monitoring, Analysis and Reporting Technology (S.M.A.R.T.) commands, plus additional flash monitoring
Data Encryption	AES-128/256
Warranty	The lesser of 3 years or the end of the NAND flash life
Management Tools	CLI, Seagate Enterprise Storage Manager (GUI-based)
Environmentals	Operational at 0°C to 45°C Airflow requirement 300 LFM Humidity: 5% to 90% non-condensing Altitude: Operational max 10,000 feet
Operating System[2]	CentOS: 5.10, 6.0-6.4 Debian: 6.0.5, 6.0.7 Fedora: 17, 18 FreeBSD: 7.2, 7.4, 8.2, 8.3, 9 OEL: 5.4-6.4 RHEL: 5.0-5.10, 6.0-6.4 SLES: 10 SP0-SP4, 11 SP0-SP3 Solaris10U10, 11 (×86 & SPARC) Ubuntu: 10.04, 11.1, 12.04 VMware: ESX4.0U4, 4.1U2, 5.0U1, 5.1 Windows: XP SP2, Windows 7-SP1, 8, Windows Server: 2003 R2 SP2, 2008 R2-SP1, 2012
Regulatory Compliances	Safety: US/Canada UL, Europe CB Agency Certifications: CE mark, C-Tick mark, Canadian Compliance Statement, KCC, HF, Taiwan BSMI, Japan VCCI, FCC Class B and CISPR Class B
Environmental Compliance	RoHS, WEEE

Nytro™ WarpDrive Card™ Ordering Information				
Model Number	Capacity[1]	NAND Type	Form Factor	NAND PetaByte Writes (typical)
ST3200KN0002	3.2TB	eMLC	FHHL	>117

1 One gigabyte, or GB, equals one billion bytes and one terabyte, or TB, equals one trillion bytes when referring to product capacity.

2 See the complete list in the latest release notes.

Note: Sequential compressible data was used for these tests. Highly tuned configuration for maximum performance. Subject to change.