

LSI® Nytro™ WarpDrive™ Family Application Acceleration Cards



Capacity Range

- Capacity options from 200 GB to 3.2 TB

Performance and Reliability Features

- High throughput up to 4 GB/s on PCIe 3.0 products
- DuraWrite™ advanced wear leveling technology
- Ultra-low write Amplification
- Built in data compression
- Dynamic Overprovisioning
- Advanced Read Disturb Management
- Recycler, Advanced Garbage Collection
- Error correction protection up to 55 bits per 512 bytes
- Self heals from block level and page level failures
- Battery less power fail protection
- Less than 5 second recovery from power failure
- High reliability with ASIC based controller instead of FPGA

Integration Features

- PCIe 2.0 for HHHL, PCIe 3.0 support for FHHL
- Installs with no user configuration required – just plug and play
- Bootable solutions with Unified Extensible Firmware Interface (UEFI) support
- Industry hardened drivers
- Integrated management with rich feature set
- SMART monitoring and TRIM support
- Secure Erase support
- Broad OS and Server support
- Non-destructive single push firmware/driver update

The new family of LSI Nytro WarpDrive application acceleration cards is designed to offer high performance with low latency and a low CPU burden. The Nytro WarpDrive cards accelerate applications such as data warehousing, data mining, data analytics, online transaction processing, high performance computing and Hadoop.

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

The Nytro WarpDrive cards are designed to improve application performance. The high performing Nytro WarpDrive cards can do the work of hundreds of traditional spinning hard disk drives (HDDs).

Using the Nytro WarpDrive cards in place of traditional HDDs greatly improves end user level performance and maximizes return on investment. Fewer hard drives means less power, cooling and servers required with the bottom line being significantly lower CAPEX and total cost of ownership.

Sophisticated Architecture

The Nytro WarpDrive 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. LSI's DuraWrite™ technology optimizes the number of program cycles to the flash storage, effectively extending the rated write endurance of the flash storage by 20x or more when compared to standard controllers.

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

The Nytro WarpDrive cards contain no moving parts to maintain and require no user configuration at set-up and they include a management infrastructure for extensive monitoring including health, error rate and failure monitoring.



Key End User Benefits

- Offload architecture resulting in low host CPU and memory utilization
- Lower space, power, cooling and management costs than traditional HDD solutions
- Requires no user configuration thereby reducing operational overhead
- Enterprise quality and reliability

Nytro WarpDrive Card	200 GB/400 GB	400 GB/800 GB/1.6 TB	3.2 TB
Form Factor	HHHL	HHHL	FHHL
Workload Optimization	Write intensive workload	Balanced Read-Write Workload	Balanced Read-Write Workload
Read IOPS (8K)	190,000	185,000	260,000
Write IOPS (8K)	138,000	120,000	200,000
Read Bandwidth (256K)	2.0 GB/s	2.0 GB/s	4.0 GB/s
Write Bandwidth (256K)	1.7 GB/s	1.0 GB/s	2.5 GB/s

Note: Sequential compressible data was used for these tests

LSI Nytro WarpDrive Acceleration Card Specifications

Usable Capacity	200 GB to 3.2 TB
Average Latency	<50 microseconds
End of Life Data Retention	>3 months
Interface	x8 PCI Express 2.0 and 3.0
Brackets	Full height spare bracket included for HHHL
Environmental Compliance	RoHS, WEEE Halogen and lead free
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 (SMART) commands, plus additional flash monitoring
Emission Compliances	Safety: US/Canada UL, Europe TUV Agency Cert: US/Canada, Europe, Japan, Taiwan, NZ/AUS, All Major
Environmentals	Operational at 0° to 45°C Airflow requirement 300 LFM; Humidity: 5 to 90% non-condensing Altitude: Operational max 10,000 feet
Operating System	Windows: XP-SP2, Server 2003 R2 SP2, Vista SP2, Server 2008 SP2, Win 8 Server, Win 2012 VMware: 4.OU4ESX, 4.OU4ESX i, 4.1U2ESX, 4.1U2ESX i, 5.0 U1, 5.0 U1 ESX i FreeBSD: 7.2 - 9.0 Solaris: x86, SPARC LINUX: SLES, RHEL, CentOS, OEL/UEK, Ubuntu, Debian, Fedora, XenServer, OVM Check the product page on lsi.com for the latest supported operating systems

LSI Nytro WarpDrive Card Ordering Information

Name	Capacity	NAND Type	PetaByte Writes (typical)	Ordering Part Number
NWD-WLP4-200	200 GB	SLC	>37	LSI00323
NWD-WLP4-400	400 GB	SLC	>74	LSI00324
NWD-BLP4-400	400 GB	eMLC	>11	LSI00318
NWD-BLP4-800	800 GB	eMLC	>22	LSI00319
NWD-BLP4-1600	1.6 TB	eMLC	>45	LSI00320
NWD-BFH8-3200	3.2 TB	eMLC	>90	LSI00393

For more information and sales office locations, please visit the LSI website at: www.lsi.com



North American Headquarters
San Jose, CA
T: +1.866.574.5741 (within U.S.)
T: +1.408.954.3108 (outside U.S.)

LSI Europe Ltd.
European Headquarters
United Kingdom
T: [+44] 1344.413200

LSI KK Headquarters
Tokyo, Japan
T: [+81] 3.5463.7165

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