

Express DX 1800 Series



The Highest Performance Data Reduction and Security Solution for Storage and Networking Applications

The massive amount of digital content and its global distribution is straining the compute, storage and networking infrastructure of large Enterprises and SMBs.

Fortune 500 companies and SMBs are struggling to manage the exponential growth in data, its mobility, and supporting a dynamic virtualized IT infrastructure required to address an increasingly demanding business environment. However, the vast majority of IT budgets are spent maintaining the existing storage and network infrastructure. Power, cooling, real estate, and the ever-increasing demand for compute, storage, network and application resources all continue to push costs higher.

Furthermore the growth in global online transactions and content distribution across heterogeneous networks as well as storing information on mobile or removable media is raising security concerns. Customers across the board want to ensure that their data is secure whether it is in transit across the network or at rest on their storage devices.

DX 1800 Series

The DX 1800 series offloads the computationally intensive tasks necessary to compress, deduplicate, and secure data in both block form for storage applications and packet form for networking applications. This product series is aimed at enabling a more unified and efficient compute, storage and network infrastructure for enterprise class customers.

This series offers power efficient hardware acceleration capabilities for data compression, deduplication, and network and storage security.

Hardware Offload

Hardware offload frees up valuable and expensive CPU resources to be utilized for improving application performance and enabling virtualized environments. Offloaded algorithms include:

- Data Reduction: eLZS, LZS and GZIP
- Security / Encryption: AES-CBC, -CTR, -GCM, -ECB; 3DES, ARC4
- Security / Authentication: AES-GCM, -GMAC, -XCBC-MAC; HMAC-SHA-1, -256, -384; HMAC-MD5; SSL3.0-MAC
- Hash for Deduplication: SHA-1, -256, -384; MD5
- Public Key: RSA, DH, DSA, ECDH and ECDSA
- OpenSSL and OpenSwan (using NETKEY) support
- Suite B Support

Performance and Scalability

- Throughput of up to 3.2 GB/sec (25.6 Gb/sec)
- Up to 56,800 Operations / sec for RSA 1K keys
- Multiple cards can be integrated into a system to attain aggregate performance
- Load balancing across multiple cards

High Availability

- End-to-end data protection assures data integrity by detecting, isolating and preventing the propagation of corrupt data caused by silent disk errors, application interaction and memory errors
- New software architecture provides failover protection in case of a card failure

Security

The series also offers a broad set of encryption algorithms enabling customers to select the desired security level for information sent over the LAN/WAN or at rest in a storage array. The flexibility to select the appropriate security level also simplifies implementation of policy based access and strengthens overall network security.

Power Efficiency

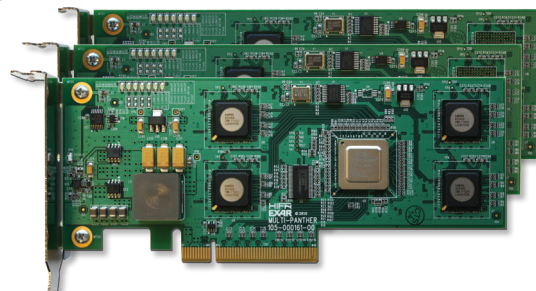
The DX 1800 series is designed to minimize power consumption and cooling costs. Typical power consumption ranges from 9.5W to 13.5W.

STORAGE SYSTEM APPLICATIONS

- Enterprise Network-Attached Storage (NAS)
- Direct-Attached Storage (DAS)
- Storage Area Network (SAN)
- Disk backup and archival servers, offering:
 - Remote Replication
 - Data deduplication
 - Continuous Data Protection (CDP)
 - Snapshot and Replication
 - Disk-to-Disk (D2D)
 - Virtual Tape Library (VTL)
 - Content-Addressable Storage (CAS)
- Tape backup servers

NETWORK APPLICATIONS

- Unified Threat Management Appliances
- Enterprise Secure Router / VPN Gateway/Wireless Backhaul
- Enterprise VPN Firewall
- Data Center Load Balancers
- Multi Service Switches
- Layer 4-7 Switches
- Carrier Network Security
- WAN Optimization Appliances



DX 1800 Series
Data Reduction and Security
Acceleration Cards

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	DX 1800 SERIES
KEY FEATURES	
Data Reduction Algorithms	eLZS, LZS, GZIP
Encryption / Decryption	- AES (128, 192, 256) CBC, GCM, CTR, ECB, XTS-256, XTS-512 3DES, DES, ARC4
Authentication	- AES-GMAC, -XCBC-MAC - HMAC-SHA-1, -256, -384; HMAC-MD5 - SSL3.0-MAC
Hashing for Deduplication	- SHA-1, SHA-256, SHA-384 - MD5
Public Key	- RSA and DH up to 8k-bits, DSA - ECDH and ECDSA (256-bit, 384-bit, 521-bit)
Random Numbers	- Hardware random number generator - ANSI X9.31 PRNG
Suite B Support	Broadest set of cryptographic algorithms for government applications - Top Secret: AES-GCM-256/AES-GMAC-256, SHA-384, ECDSA-384, ECDH-384 - Secret (and below): AES-GCM-128/AES-GMAC-128, SHA-256, ECDSA-256, ECDH-256
Open Source Network Security	- OpenSSL - OpenSwan
Performance / Throughput	See table below
Performance Features	- Compress, hash and encrypt in a single pass - Automatic load balancing - Hardware-assisted command chaining and scatter gather (unlimited buffers)
Ease of Use	- New SDK simplifies integration and reduces time to market - Intel QuickAssist API Support
Power and Space Efficiency	Fine grain power management ensures lowest real-time power consumption per command
Reliability and Service Features	- Software failover protection (All HW functionality) in case of card failure - End-to-end data integrity (On chip and off chip error detection) - Complete verification of compressed, encrypted and hash data in real time with no performance impact

	DX 1800 SERIES
CARD SPECIFICATIONS	
Bus Interface	- PCIe x8 - PCIe Spec. Rev. 2.0 compliant, Gen 2 speed (5 Gbps)
Card Dimensions	- Length: 16.77 cm (6.60 in) - Height: 6.89 cm (2.71 in)
Bracket Dimensions	Low profile: 1.84 x 7.92 cm (0.73 x 3.12 in) Optional full height: 1.84 x 12.00 cm (0.73 x 4.73 in)
ENVIRONMENTAL SPECIFICATIONS	
Temperature and Humidity	Operating: 0°C/32°F to 55°C/131°F; 10% to 90% RH non-condensing Storage: -10°C/14°F to 70°C/158°F; 5% to 95% RH non-condensing
Required Airflow	Yes. (2m/s)
Material Safety	RoHS-6
AGENCY APPROVALS	
Safety	USA: UL60950-1, 2nd Edition European Community: EN 60950-1, Low voltage directive 2006/95/EC and EMC directive 2004/108/EC Canada: cUL CSA C22.2 No. 60950-1-03
EMI and EMC	USA: FCC Part 15, Class B Canada: ICES-003[B], NMB-003[B] European Community: EN55022:2006, EN55024:1998 Japan: VCCI V-3/2008.04, Class B Taiwan: BSMI CNS13438:95(2006) Class B New Zealand/Australia: AS/NZS CISPR22 Korea: KCC KN22/KN24
SDK AND OS SUPPORT	
SDK Features	- Raw Acceleration API for Networking Applications - Data Offload API for Storage Applications - QuickAssist API (Intel standard) - Functional example applications show API usage - Demo application for testing performance - OS Abstraction Layer allows easy porting to custom OS
Operating Systems Supported	- Windows Server 2003 R2 (32/64 bit) - Windows Server 2008 (32/64 bit) - Red Hat Enterprise Linux 4 Update 6 (32/64 bit) - Red Hat Enterprise Linux 5 Update 1 (32/64 bit) - Novell SuSE LES 9 SP 4 (32/64 bit) - Novell SuSE LES 10 (32/64 bit)

Product Selector Guide

PRODUCT	PERFORMANCE (Refer to Note 2)			COMPRESSION			ENCRYPTION			HASH			PACKET PROCESSING ACCELERATION	POWER		PCIe CARD (HALF HEIGHT/ HALF LENGTH)
Model no.	Gbps	GB/s	1k RSA, Ops/s	LZS	eLZS	GZIP	AES	DES, 3DES	ARC4	SHA-1, MD5	SHA-256, SHA-384 (Note 3)	True Rng	IPsec, IPComp SSL/TLS	Typ (W)	Max (W)	Interface
DX 1845	25.6	3.2	56,800	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓ (Note 1)	13.5	22.5	PCIe x8
DX 1835	19.2	2.4	42,000	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓ (Note 1)	11.5	18.5	PCIe x8
DX 1825	12.8	1.6	28,000	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓ (Note 1)	9.5	14.5	PCIe x8

Note 1: Raw crypto/compression performed on-chip; packet header/trailer manipulation performed in software at application level

Note 2: Refer to performance application note for specific performance results for each algorithm.

Note 3: SHA-384, HMAC-SHA-384 supported in software.