XSTACK®

Affordable Data Center Class Storage

- High Availability (HA) Capable

- Handles Over 80,000 I/Os per Second

- Battery Protected Cache Memory:
  DSN-5110-10: 1GB per controller
  DSN-5210-10: 2GB per controller
  DSN-5410-10: 2GB per controller

- System Memory: 512MB

- 12 Hot-Swap SAS/SATA[1] Hard Drive Bays

- Supports 36TB[2] Capacity with 3TB[2] Hard Drives

- Supports up to 1024 volumes and host connections

- RAID Support: 0, 1, 1+0, and 5

- Mix and Match disk drives within a single array
  - Different Capacities, Manufacturers, Technologies and Speeds

- Volume Virtualization technology
  - Supports multiple RAID types and volumes segments on single drive
  - Optimizes capacity utilization and maximizes performance
  - Supports Online Capacity Expansion, Volume Reconfiguration and Migration on the fly

- Drive Roaming supported in Power Off

- Additional DSN-5000-10 Expansion Arrays Provide:
  DSN-5110-10: 144TB[2] Total Capacity
  DSN-5210-10: 252TB[2] Total Capacity
  DSN-5410-10: 252TB[2] Total Capacity

- 430 Watt Dual Redundant Hot-Swappable Power Supplies

- Industry Standard 2U 19-inch Chassis

High Performance iSCSI Interface

- DSN-5110-10: Four 1GbE Ports per controller

- DSN-5210-10: Eight 1GbE Ports per controller

- DSN-5410-10: One 10GbE Port per controller

b u s i n e s s

xStack Storage® HA capable 4x1GbE, 8x1GbE or 1x10GbE iSCSI SAN Array with 12 SAS/SATA[1] Bays (expandable to 84 bays)

Overview
D-Link's DSN-5000 series (DSN-5110-10, DSN-5210-10 and DSN-5410-10) iSCSI SAN array is a highly available, data center-class network storage solution in a 2U rackmount form factor, ideal for small to medium enterprises. The heart of the DSN-5000 series is a powerful 10Gbit iSCSI System-on-a-Chip (SoC) capable of handling over 80,000 I/Os per second. The DSN-5000 series supports 36TB[2] of raw capacity using 3TB[2] drives and overall scalability to 252TB[2] (DSN-5210-10 and DSN-5410-10). The DSN-5000 series can be easily implemented as a supplemental backup platform for quick restores, as secondary online storage, or as bandwidth-demanding primary storage for security surveillance and A/V applications.

A Choice of Host Interfaces – 1GbE or 10GbE
The DSN-5110-10 and DSN-5210-10 both support Multi-path I/O (MPIO), Multiple Connections per Session (MCS), and Link Aggregation Groups (LAG) for unmatched network flexibility, performance and resiliency, allowing their 1GbE data ports to be grouped together for up to 425MB/s or 850MB/s bandwidth, respectively.

The DSN-5410-10 utilizes a built-in, fully integrated 10GbE interface as a high performance alternative to 8Gbps Fibre Channel, for up to 1160MB/s bandwidth.

High Availability (HA)
The DSN-5110-10, DSN-5210-10 and DSN-5410-10 primary arrays, based on a single controller, each provide an ideal platform for nearline storage requirements such as disk-to-disk backup, data archiving and video surveillance.

With the addition of a secondary controller (DSN-510 for the DSN-5110-10, DSN-520 for the DSN-5210-10 and DSN-540 for the DSN-5410-10) the DSN-5000 series can provide the failover and redundancy

capabilities required for mission critical scenarios such as Virtual Machine (VM) shares, database applications, Online Transactional Processing (OLTP), email applications, storage consolidation and your other primary storage needs.

Expansion Options
The DSN-5110-10, DSN-5210-10 and DSN-5410-10 primary arrays each support 12 internal SAS/SATA[1] hard drives and with the addition of up to three DSN-5000-10 expansion arrays for the DSN-5110-10, and up to six DSN-5000-10 expansion arrays for the DSN-5210-10 and DSN-5410-10, can scale to a total of 96TB and 168TB raw storage capacity respectively. For high availability operation, a secondary I/O board, DSN-500, is installed in the DSN-5000-10 expansion array.

iSCSI for IP Networks
Storage Area Networks (SANs) have traditionally been reserved for complex Fibre Channel networks. The recent introduction of iSCSI has extended the powerful centralized storage capabilities of SAN technology to IP networks. By utilizing existing Ethernet technology, the costs associated with Fibre Channel switching, separate host bus adapters, expensive storage subsystems and administration is significantly reduced. iSCSI SANs leverage the Ethernet infrastructure and standards that are already familiar to most IT personnel.

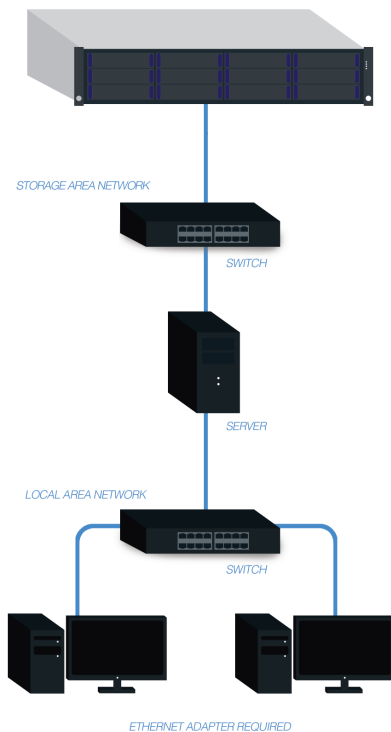### System-on-a-Chip (SoC) Implementation
By utilizing a SoC design, the DSN-5000 series combines both networking and storage functions into a single specialized Application Specific Integrated Circuit (ASIC). This SoC combines 10Gbps iSCSI, TCP & IP offload, 12 embedded processors and storage virtualization firmware onto a single chip. The tight integration of these functions eliminates interoperability, timing and support issues found in competitive products

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High Availability (HA)

- DSN-510 - Four 1GbE Ports (Secondary controller for DSN-5110-10)

- DSN-520 - Eight 1GbE Ports (Secondary controller for DSN-5210-10)

- DSN-540 - One 10GbE Port (Secondary controller for DSN-5410-10)

Drive Expansion

- DSN-5000-10 Expansion Array

  - For use with DSN-5110-10, DSN-5210-10 and DSN-5410-10 Primary SAN Arrays

  - Provides 12 Hot-Swap Drive Bays

  - Up to six expansion arrays supported for 84 drives total (DSN-5210-10 and DSN-541)

STORAGE AREA NETWORK

SWITCH

SERVER

LOCAL AREA NETWORK

SWITCH

ETHERNET ADAPTER REQUIRED

b u s i n e s s

xStack Storage® HA capable 4x1GbE, 8x1GbE or 1x10GbE iSCSI SAN Array with 12 SAS/SATA[1] Bays (expandable to 84 bays)

that offer a "discrete implementation" where in various components are selected separately, then assembled.

RAID support
D-Link's xStack iSCSI SAN arrays support RAID levels 0, 1, 1+0 and 5 configurations (striped sets, mirrored sets, striped mirrored sets and parity sets) for data protection and performance.

D-Link supports S.M.A.R.T., disk scan, and non-destructive data migration to prevent disk failure.

Embedded Centralized Storage Management
All of the D-Link xStack Storage products share a common easy-to-use configuration and management GUI console that allows you to manage multiple units from a single screen. The intuitive wizards ensure you will have your SAN out of the box and ready to go in a few minutes.

The embedded, user-friendly IP-SAN Device Manager (IDM) provides a comprehensive console for system management. Boasting a rich set of management features, this suite of utilities allows monitoring and control of the SAN array via the Storage Management Initiative-Specification (SMI-S) command set. With a secure server, users can remotely configure and monitor their SAN arrays over the Internet.

Advanced Management Features
The DSN-5000 series also provides an advanced set of features for efficient management and optimal storage performance.

For the fastest RAID performance offered in the industry, D-Link's adaptive cache management provides write coalescing and multi-stream read-ahead on a volume basis, optimizing cache utilization and performance

in an application-dependent manner. Volatile cache data protection is afforded via an on-board battery supporting 2GB of cache memory for a minimum of 72 hours. A write-back or write-through cache memory policy can be selected manually or automatically, depending on the status of the battery's charge.

The DSN-5000 series supports jumbo frames and VLAN tagging to segregate traffic into isolated zones for secure access, improving network throughput and reducing CPU overhead.

D-Link's volume virtualization technology utilizes the concept of storage extents, which are the fundamental building blocks used to enable features such as RAID, online capacity expansion, volume reconfiguration and migration. Each disk drive can contain multiple and divergent RAID configurations instead of requiring dedication to a single RAID set. This technology allows for the support of mixed disk drive capacities for volume creation. Volume capacity expansion and RAID level migration are performed online with minimal impact to users. Additionally, volume growth can occur without volume migration or reconstruction. Users can quickly deploy a SAN and simply add more drives as needed.

An iSCSI SAN array can prove to be a valuable tool to supplement a network storage foundation. Whether providing a low-cost block-based solution for replacement of Direct Attached Storage (DAS), providing primary online storage, or providing up to 1160 MB/s bandwidth for security surveillance, video editing, video post-production applications, the DSN-5000 series will provide the performance and functionality needed.

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Technical Specifications

DSN-5110-10	• Four 1GbE Copper per controller
DSN-5210-10	• Eight 1GbE Copper per controller
DSN-5410-10	• One 10GbE per controller (XFP adapter sold separately)

Features

Drive Bays	• 12, Expandable with DSN-5000-10 Expansion Arrays to - 48 for the DSN-5110-10 - 84 for the DSN-5210-10 and DSN-5410-10
Drive Interface Support	SAS/SATA[1]
System Memory	512MB
Cache Memory	• DSN-5110-10: 1GB per controller • DSN-5210-10: 2GB per controller • DSN-5410-10: 2GB per controller
Battery Backup for Cache	• Standard (Approximately 72 hours on full charge)
Bandwidth	• DSN-5110-10: Up to 425MB/s • DSN-5210-10: Up to 850MB/s • DSN-5410-10: Up to 1,160MB/s
Storage Capacity	• 36TB[2] Capacity with 3TB[2] Hard Drives • Additional DSN-5000-10 Expansion Arrays Provide - DSN-5110-10: 144TB[2] Total Capacity - DSN-5210-10: 252TB[2] Total Capacity - DSN-5410-10: 252TB[2] Total Capacity
Operating Systems Supported Please see support.dlink.com for latest support information	• Windows Vista® 32-bit & x64 (Ultimate & Enterprise) w/Built-in iSCSI initiator • Windows Server® 2003 R2	SP1 32 & 64-bit (Standard & Enterprise) with v2.07 iSCSI initiator or later • Windows Server 2008 Enterprise 32 & 64-bit with Built-in iSCSI initiator • Windows XP Pro® 32 & 64-bit with v2.07 iSCSI initiator or later • Windows 2000 Advanced Server – No MS iSCSI Initiator support, Qlogic HBA only • Red Hat® 7.3 • Red Hat Enterprise AS update 5 (64-bit) • Red Hat Enterprise 5 update 2 (64-bit) • SuSE® Professional 9.3 32-bit • SuSE Enterprise Server 10.2 32-bit • Sun Solaris® 10 build 6/06 • IBM AIX 5L • Microsoft Hyper-V • VMWare ESX Server® 3.02 & 3.5 • VMWare ESX Server 4.0 • Virtual Iron v4.2 • Citrix XenServer® v4 • Mac OS X® (10.4 & 10.5)
Supported NICs, iSCSI Accelerators and iSCSI HBAs Please see support.dlink.com for latest support information	• Intel® Pro 1000MT & XT [1GbE] • Intel Pro 10000 CX4 [10GbE] • Myricom® 10G-PCIE-8A-C+E [10GbE] • Chelsio S310X-SR-XFP [10GbE] • Neterion® Xframe® II & Xframe E [10GbE] • Alacritech® SES2104ET (Drivers: SNP 9.1.0.1092 & 7.3.1.0) • Alacritech SES2102ET (Drivers: SNP 9.1.0.1092 & 7.3.1.0) • QLogic® 4010C, 4052C, & 4062C

iSCSI Network Interface

Host Interface	• iSCSI Draft 20 Compliant Initiator
Connections	• 1,024 Hosts
CHAP Authentication	• Yes

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Access Control of Management	• Yes
iSCSI/TCP/IP Full HW Offload	• Yes
Jumbo Frames Support	• Yes
LAG Support (Link Aggregation)	• DSN-5110-10: Up to Four LAGs (Static LAG) • DSN-5210-10: Up to Eight LAGs (Static LAG) • DSN-5410-10: Not Applicable
VLAN Support	• DSN-5110-10 and DSN-5210-10: Up to Eight 1-to-1 Mapping between IP Subnet and VLAN. Multiple VLANs per physical port with VLAN Tag. • All physical ports in LAG belong to same VLAN (IEEE 802.1Q Tag)
Flow Control	• Enabled by default

Volume & RAID Support

RAID Controller	• Intergrated in ASIC Chip (one per controller)
RAID Support	• RAID Levels 0, 1, 1+0 and 5 (Striped sets, mirrored sets, striped mirrored sets and parity sets) The maximum number of drive members on a volume is the following: RAID-1 and RAID-10: 32 HDDs RAID-5: 17 HDDs RAID-O: 16 HDDs
Volumes	• 1,024 Virtual Volumes (256 accessible per initiator)
Target Nodes	• 1,024
Online Capacity Expansion	• Yes
Hot Swappable Drives	• Yes
Instant Volume Access	• Yes
Free Space Defragmentation	• Yes
Auto-Detection Failed Drive	• Yes
Auto-Rebuild Spare Drive	• Yes
RAID Level Migration	• Yes
Drive Roaming in Power Off (configured drives are not bay-specific)	• Yes
Micro Rebuilds	• Yes

Storage Management

Embedded IP-Based Management GUI	• Create, manage, expand and monitor storage pool, volumes and RAID
	• Event manager to view and persist events
Firmware Field Upgradeable	• Yes
SMI-S Version 1.1	• Yes
Event Log	• Yes

Power

Supply Type	• Dual Redundant Hot Swappable 2U 430 Watt
Input Voltage	• 85-264 VAC (auto-switching)
Input Frequency	• 50-63 Hz
Input Current	• 2A Maximum at 115VAC
Power Factor Correction	• Per EN61000-3-2

Environmental

Operating Temperature	• 41° to 104°F (5° to 40°C)
Storage Temperature	• -4° to 158°F (-20° to 70°C)
Operating Humidity	• 10% ~ 80% (Non-condensing)
Storage Humidity	• 5% ~ 95% (Non-condensing)

b u s i n e s s

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Physical (approximate)

Form Factor	• 2U Industry-standard 19-inch Rack
Dimensions (W x D x H)	• 17.6in x 19.5in x 3.5in (44.7cm x 49.5cm x 8.9cm)
Weight	• 50 lbs (22 kg)

International Approvals

Emissions	• CE Mark, FCC Class A, EN55022 Class A, EN55024
Safety	• UL/CUL, CSA International
RoHS	• Compliant

Warranty and Support

Warranty	• 3-Year Limited (Manufacturer's warranty on Hard Drives)
Extended Warranty	• Available (see Ordering Information below)
Support	• 1-Year (9 hours per day / 5 days per week Technical Support)

Ordering Information

Part Number	Description
DSN-5110-10	xStack Storage® 4x1GbE iSCSI SAN Array, 12 Bays, 2U, w/ Primary Controller, w/o Drives, with Trays
DSN-5210-10	xStack Storage® 8x1GbE iSCSI SAN Array, 12 Bays, 2U, w/ Primary Controller, w/o Drives, with Trays
DSN-5410-10	xStack Storage® 1x10GbE iSCSI SAN Array, 12 Bays, 2U, w/ Primary Controller, w/o Drives, with Trays
DSN-5000-10	xStack Storage® iSCSI SAN Expansion Array, 12 Bays, 2U, w/ Primary I/O Board, w/o Drives, with Trays
DSN-510	xStack Storage® 4x1GbE Secondary iSCSI SAN Controller for DSN-5110-10
DSN-520	xStack Storage® 8x1GbE Secondary iSCSI SAN Controller for DSN-5210-10
DSN-540	xStack Storage® 1x10GbE Secondary iSCSI SAN Controller for DSN-5410-10
DSN-500-LW	Extended Warranty for DSN-500
DSN-500	xStack Storage® Secondary I/O Board for DSN-5000-10
DEM-421XT	10Gigabit XFP Adapter (DSN-5410-10 and DSN-540)
DSN-210-SW	SureSync Replication & Synchronization Software
DSN-5110-10-LW	Extended Warranty for DSN-5110-10
DSN-5210-10-LW	Extended Warranty for DSN-5210-10
DSN-5410-10-LW	Extended Warranty for DSN-5410-10
DSN-5000-10-LW	Extended Warranty for DSN-5000-10
DSN-510-LW	Extended Warranty for DSN-510
DSN-520-LW	Extended Warranty for DSN-520
DSN-540-LW	Extended Warranty for DSN-540

[1] SATA Drive support for single controller configuration only.
[2] The DSN-5000 Series supports up to 3TB SAS drives, and up to 2TB SATA drives.

All references to speed are for comparison purposes only. Product specifications, size and shape are subject to change without notice, and actual product appearance may differ from that depicted. See inside package for warranty details.

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For more information
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