Fusing unprecedented IOPS and bandwidth performance with highly efficient capacity management, this is the storage foundation for the next generation of data intensive applications sets.

Big Data is here and it's unruly. Capacity and performance requirements are exploding and increasingly more difficult to predict. Data patterns have changed, requiring new, massive multi-threaded storage processing capabilities designed for today's multi-core, multi-application sets.

Innovative, award winning and proven in the world's largest and most demanding production environments, DDN's Storage Fusion Architecture (SFA) utilizes the most advanced processor technology, busses and memory with an optimized RAID engine and sophisticated data management algorithms. The SFA12KX product family is designed to derive peak performance out of your compute investments with a massive I/O infrastructure and multi-media disk drives that maximize system performance and lower storage investment costs. The SFA12KX product family is purpose-built to simplify and tame big data growth, enabling you to architect and scale your environment more intelligently, efficiently and cost effectively than ever before.

**BUSINESS ADVANTAGES**

**Industry Leading Performance & Capacity** - Significantly reduces capital and operational expenses with fewer systems to purchase and manage

**SFX™** - Get flash performance at close to SATA prices with intelligent flash caching

**Industry Leading Density** - Reclaim valuable floor space, reduce power and cooling costs Up to 84 drives per 4U enclosure - 5.04PB per rack

**Lower Overall TCO by 50%** - Reduced floor space, power and cooling requirements

**Supports the Most Drives** - Up to 1,680 disk drives in a single a storage system for simple, cost-effective scalability & the freedom to mix SAS, SATA and SSD media

**In-Storage Processing™** - Enables latency-sensitive applications to live right inside of the storage controller, removing the need to purchase and manage external servers, network adapters and switches

**Reduces Energy** - Consumption By 50% eliminating unnecessary storage enclosures, switches, fans and power supplies

**Transparency Protect Your Data** - Data-At-Rest Encryption ensures that the potential exposure of sensitive data is eliminated in the event of stolen, misplaced or discarded drives.

**TECHNICAL ADVANTAGES**

**Balanced Storage Performance** - For highly transactional and high-bandwidth applications and best in class throughput

**Hybrid Controller** - Combine flash with rotating media to accelerate application performance and lower TCO up to 70%

**ReACT™ Intelligent Cache Management** - Optimizes writes in real-time: sequential data goes directly to disk media while small, random IO utilizes extremely fast cache

**Read I/O Quality of Service** - Read IO doesn't suffer due to a single, unresponsive disk

**DirectProtect™ Real-Time Error Detection & Correction** - Increases data resiliency and reliability with little performance impact

**Unparalleled Back-end SSD Support** - Fully utilizes SSDs for unprecedented levels of sustained random IOPS

**Journaled Drive Rebuilds** - Reduces rebuild times by only requiring new/changed blocks to be written to recoverable drives

**Data-At-Rest Encryption** - Transparent hardware based encryption without performance degradation
As the leader in Big Data, we provide a number of innovations that increase performance, efficiency and data protection. Designed for multiple classes of data and storage performance requirements, this unique multi-RAID architecture combines up to 1,680 SATA, SAS and SSD drives into a simply managed, multi-petabyte platform. Data resides on the optimal disk technology according to priority and access pattern, while selecting the appropriate RAID level to maximize performance and cost-effectiveness. In the background, the system performs multiple levels of parity generation and real-time data integrity verification and error correction without impacting application performance.

**STORAGE FUSION ARCHITECTURE**

**40% DENSER**

**RECLAIM YOUR DATACENTER**

Resolve space and power limitations with the industry's densest storage platform. Each enclosure houses 84 drives in just 4U to deliver up to 5.04PB per rack.

**800% FASTER**

**CONSOLIDATE, SIMPLIFY, SAVE**

Leverage industry leading storage performance to satisfy growing IOPS requirements with the fewest number of systems. Single systems provide up to 48GB/s and reaching 1TB/s can be achieved in just 21 systems.

**STORAGE FUSION FABRIC™**

**ENORMOUS INTERNAL BANDWIDTH**

Redundant & non-blocking internal SAS fabric provides the internal bandwidth needed to support data protection & access concurrency. This high-speed conduit to HDDs and SSDs aggregate performance and allow for easy consolidation. SFA12KX protects performance during drive rebuilds, while competing systems lose as much as 40%.

**FILE STORAGE SIMPLIFIED**

**TURN-KEY SERVER-LESS APPLIANCES**

Deploying, managing and scaling file storage has never been easier. The SFA12KXE arrives pre-configured with the file system embedded right inside the storage controller’s virtual machines, eliminating the need for external servers, network adapters and switches.

**EASE ADMINISTRATION**

**SIMPRESS MANAGEMENT**

Flexible management options enable you manage with ease: GUI • CLI • SNMP • New API

**50% LOWER TCO**

**SMARTER BIG DATA STORAGE**

Choosing SFA12KX's industry leading performance, capacity and density as your storage building block, means deploying the fewest number of systems to manage, power and maintain.

**IN-INTERNAL PROCESSING™**

**ELIMINATE SERVERS & SWITCHES**

DDN’s breakthrough innovation enables latency-sensitive applications to live right inside of the storage controller. Enjoy the fastest application performance available with up to 16 embedded virtual machines while removing the need to purchase and manage external servers, network adapters and switches.
READ QUALITY OF SERVICE
RETAIN FULL PERFORMANCE FOR SLAS

Traditional Storage systems lose performance during drive rebuilds, data integrity checks and error events degrading performance.

With SFA, your system will operate at full-speed to ensure consistently predictable performance, data availability and maintain SLAs.

STORAGE FUSION ARCHITECTURE

ENABLES APPLICATIONS TO THRIVE

The design concepts of SFA are delivered across a comprehensive storage portfolio featuring DAS, SAN, NAS and VTL storage access.

Storage Fusion Architecture supports multiple, high-speed RAID levels within a single system. Designed for multiple classes of data and storage performance requirements, SFA multi-RAID architecture combines up to 1,680 SATA, SAS and SSD disks into a simply managed architecture where the optimum media serves, stores & archives prioritized data.

With up to 120GB/s of Storage Fusion Fabric bandwidth, the SFA12KXi family can perform multiple levels of parity generation, drive correction and data integrity verification without detracting from an application's performance.

SFA12KX CONFIGURATIONS

START SMALL AND SCALE FLEXIBLY

These standard configurations provide maximum performance and capacity density. Powerfully consolidate multiple traditional systems and utilize the most efficient storage building block as you scale performance and/or capacity to meet ever growing data and application requirements.

![IO Paths Traditional](image)

![World Leading Enterprise Storage Data Center Efficiency](image)
**SYSTEM FEATURES**
Active/Active Storage Controllers

RAID 6 8+2, 4+2, RAID 5 8+1, 4+1, RAID 1 1+1

Sequential Read and Write Performance up to 40GB/s, Random read 4K IOPS of 4 Million from SSD

Max Drives 1680, Max Capacity 10.08PB SSD

Cache Up to 64GB - Battery backed and mirrored

Client Support Windows, Linux and Mac OSX

**ACTIVE/ACTIVE CONTROLLER STORAGE HOST PORTS**
16 x56 Gb/s (FDR) Infiniband Ports, 32 x 16Gb/s (FC16) Fibre Channel

**STANDARD SOFTWARE FEATURES**
SFX, LUN Mapping and Masking, Intelligent Write Striping, Read QoS Port Zoning Detection, Data-At-Rest Encryption, DirectProtect Data Integrity Check/Correction SFA Scriptable API, Web XML API, CLUI and Web GUI, Pager and E-Mail Fault Console with SNMP Notification

**OPTIONAL DDN STORAGE GATEWAYS**
GRIDScaler Parallel File Storage System, EXAScaler Parallel File Storage System

**DRIVE ENCLOSURE MODELS**

<table>
<thead>
<tr>
<th>Description</th>
<th>Supported Drive Types</th>
<th>Supported Drive Sizes</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS8460</td>
<td>SSD, SAS and SATA</td>
<td>3.5&quot;</td>
</tr>
<tr>
<td>SS7000</td>
<td>SSD, SAS and SATA</td>
<td>3.5&quot;, 2.5&quot;</td>
</tr>
<tr>
<td>SS2460</td>
<td>SSD, SAS and SATA</td>
<td>2.5&quot;</td>
</tr>
</tbody>
</table>

For additional details on the SS8460, SS7000 or SS2460 drive enclosures, please see their respective data sheets at ddn.com.

**ENVIRONMENTAL ATTRIBUTES – ACTIVE/ACTIVE DUAL CONTROLLERS (COUPLE) **

<table>
<thead>
<tr>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height: BRU, 14.0&quot; (35.6 cm) (includes 2 x External Cache BBUs and dual cording support) Width: 17.25&quot; (43.8 cm) Depth: Storage Manager Only - 28.75&quot; (73.0cm) Combined BBU/ATS – 38.9&quot; (98.8cm) Depth 25.5&quot; (64.8 cm)</td>
</tr>
<tr>
<td>SFA Power</td>
</tr>
<tr>
<td>Average Cooling</td>
</tr>
<tr>
<td>Airflow (CFM)</td>
</tr>
<tr>
<td>Voltage range:</td>
</tr>
<tr>
<td>Operating environment:</td>
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<tr>
<td>Weight:</td>
</tr>
</tbody>
</table>

**AGENCY CERTIFICATIONS**
UL, CE, cUL, C-Tick, FCC

**PART NUMBER**

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRU-12K20ES-CX3</td>
<td>SFA12K-20E Singlet Controller; 8 Port InfiniBand QSFPS Host, 16Gb/128Gb</td>
</tr>
<tr>
<td>FRU-12KX40-56IB</td>
<td>SFA12KX Intelligent Module w/ 8 FDR InfiniBand Ports. Power cables; Rail Kit</td>
</tr>
<tr>
<td>FRU-SFA12K20IB</td>
<td>SFA12K-20 Singlet Controller; 8 Port InfiniBand QSFPS Host, 32Gb</td>
</tr>
<tr>
<td>FRU-SFA12K40FC</td>
<td>SFA12K-40 Spare Intelligent Module w/ 8x FC-16 ports; No SFA License</td>
</tr>
<tr>
<td>FRU-SFA12K40IB</td>
<td>SFA12K-40 Singlet Controller; 8 Port InfiniBand QSFPS Host, 32Gb</td>
</tr>
<tr>
<td>FRU-12K40S-16FC</td>
<td>SFA12K-40 Spare Singlet Controller; 8 Port, Fibre Channel 16Gb; No SFA OS license</td>
</tr>
<tr>
<td>FRU-12K-BBUB</td>
<td>SFA12K Eaton Evolution 1550 External UPS Replacement Batteries</td>
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<tr>
<td>FRU-12K-BBUU</td>
<td>SFA12K Eaton SP 1550G R External Uninterruptible Power Supply (UPS)</td>
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<tr>
<td>FRU-12K-ATS</td>
<td>SFA12K Dual AC Automatic Transfer Switch</td>
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<tr>
<td>FRU-SS7K-ENC</td>
<td>SS7000 Empty Chassis</td>
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<tr>
<td>FRU-SS8K-ENC</td>
<td>SS8460 Empty Chassis</td>
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<tr>
<td>FRU-12K40S-16FC</td>
<td>SFA12K-40 Spare Singlet Controller; 8 Port, Fibre Channel 16Gb; No SFA OS license</td>
</tr>
</tbody>
</table>

**FIELD REPLACEABLE UNITS**

For more information visit:
http://www.ddn.com/products/storage-platform-sfa12kx/

**ABOUT DDN®**
DataDirect Networks (DDN) is the world’s leading big data storage supplier to data-intensive, global organizations. For more than 15 years, DDN has designed, developed, deployed and optimized systems, software and solutions that enable enterprises, service providers, universities and government agencies to generate more value and to accelerate time to insight from their data and information, on premise and in the cloud. Organizations leverage the power of DDN technology and the deep technical expertise of its team to capture, store, process, analyze, collaborate and distribute data, information and content at largest scale in the most efficient, reliable and cost effective manner. DDN customers include many of the world’s leading financial services firms and banks, healthcare and life science organizations, manufacturing and energy companies, government and research facilities, and web and cloud service providers. For more information, visit our website www.ddn.com or call 1-800-837-2298.