DATA SHEET

EMC CLARiiON AX4 Storage System

Simplifying the move to networked storage

The EMC® CLARiiON® AX4 is a versatile and cost-effective solution for organizations looking for an alternative to server-based storage. The AX4 delivers performance, scalability and advanced data management features in one, easy-to-use storage solution.

The Big Picture

- Full-function network storage for Windows, Linux, NetWare, Solaris, AIX, HP-UX
- Most cost-effective iSCSI SAN solution for VMware environments
- Flexible connectivity—select from iSCSI and Fibre Channel models
- 3 Gb/s SAS and SATA disk drives for a variety of storage needs
- Scalable to 60 drives and up to 60 TB
- Intuitive management interface and customer-replaceable components simplify use and maximize availability
- Snapshot capabilities simplify backup for demanding application environments
- Includes path management functionality with PowerPath
- Unique combination of performance, ease of use, and available software support
- Built on the advanced CLARiiON software capabilities that have proven to deliver the industry's most highly available midrange storage systems

Affordable and scalable

Advanced capabilities start with the scalability to meet the needs of today and the requirements of tomorrow. Single-controller AX4 models are a low-cost approach to deploying external storage and provide an economical storage platform for applications such as backup-to-disk and a variety of data archiving tasks. Dual-controller models offer the superior availability, connectivity, and performance that business-critical data and applications require.

Need more capacity and performance than 12 disk drives can provide? The AX4 can scale up to 60 drives through four expansion enclosures and up to 60 TB of capacity for headroom that will keep users and applications in their comfort zone. The capabilities of the AX4 go beyond simply providing generous storage capacity. With the ability to provide consolidated storage for up to 64 hosts, the AX4 provides maximum flexibility for growing organizations that want to add servers and applications.

Well connected

With both iSCSI and Fibre Channel models, the AX4 enables organizations to choose a network interconnect that is right for their environments. AX4 iSCSI arrays provide the foundation for cost-effective shared storage using widely available IP networking components for either direct-attach or for a network using conventional Ethernet switches. AX4 arrays with 4 Gb/s Fibre Channel connections utilize low-cost host bus adapters to provide cost-effective direct-attach configurations with a wide range of SAN switch options to create SANs for up to 64 high-availability servers. Each controller supports two front-end ports—either 4Gb/s Fibre Channel or 1 Gb/s iSCSI.

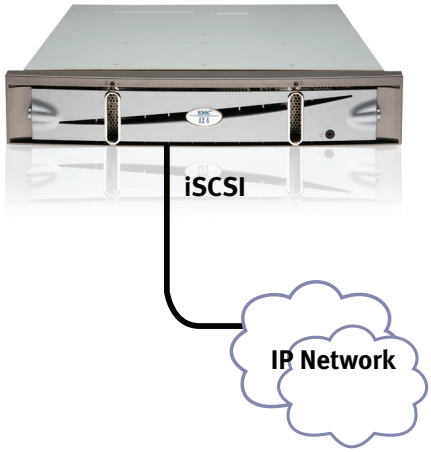
Tiered storage—mix it up

The concept of tiered storage is simple—having a range of storage types to match the storage needs of the data. What makes this simple concept powerful is having the option to easily mix drives geared for performance, as required by I/O-intensive applications, with those that deliver cost-effective capacity for backup and archiving, among other needs. The AX4 can be equipped with serial-attached SCSI (SAS) drives for performance-oriented applications and serial ATA (SATA) drives to deliver the lowest cost per gigabyte and highest capacity per drive. The ability to mix SAS and SATA drives within each enclosure provides the most flexible and economical system configurations for all needs.

The EMC CLARiiON AX4 series delivers functionality that unleashes the benefits of tiered storage. Users can easily deploy, expand, and re-deploy storage with the AX4 series.

It allows users to migrate data seamlessly between different classes of drives and RAID types to deliver the optimal combination of performance, availability, and economy. With CLARiiON's unique virtualLUN and metaLUN technologies, users are able to unlock the full capabilities of tiered storage,

easily migrating, expanding, and reconfiguring their storage capacity to meet changing application requirements. AX4 users can also easily expand existing disk pools and virtual disks as application storage needs change.



Leverage existing IP network and Ethernet expertise with iSCSI connectivity

Superior data availability and reliability

Leveraging Intel® Xeon® processors, the AX4 provides a flexible, reliable storage solution for your business. The AX4 has inherited many advanced software capabilities that have proven to deliver five-nines availability in CLARiiON midrange storage systems, including the CLARiiON CX3 series. The efficient mirrored cache design on dual-controller models supports high performance as well as availability. The AX4 provides continuous background disk consistency checking, enabling end-to-end data integrity. The simplified management and rebuild features of the AX4's global hot-spare technology enhance protection and maximize system dependability.

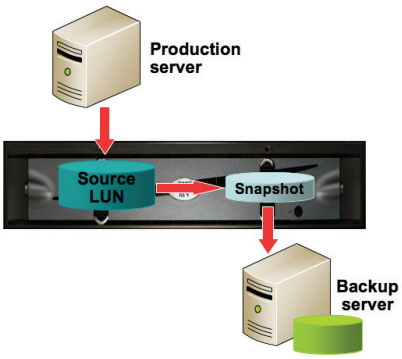
Advanced capability without the complexity

The AX4 delivers maximum capability in an entry-level system without adding unwanted complexity. The system combines exceptional ease of use and intuitive manageability with the performance and scalability that business-critical applications require. The AX4 also offers unmatched flexibility with a choice of management environments and software solutions, enabling customers to grow the capabilities of the system to match their changing environments.

Included software functionality provides ease of use

The EMC CLARiiON AX4 comes with Navisphere® Express, an intuitive user interface that simplifies installation, configuration, and operation. The graphical approach to creating and managing storage allows users to create and allocate new capacity in seconds.

And with built-in CLARiiON tools such as virtualLUN capability, users can easily and dynamically migrate data to optimize performance and efficiency, all without application downtime. The AX4 also comes with point-in-time snapshot capabilities and EMC PowerPath® path management software with load balancing and path failover for high availability.



Snapshots for simple, efficient backup and recovery

Optional advanced management and data replication

The optional Navisphere Management Suite extends the capabilities of the AX4 to meet the needs of growing and distributed organizations. Navisphere Manager provides the ability to manage multiple CLARiiON arrays, including AX and CX systems, from a single console. It also supports EMC SnapView™ software, which is included with Navisphere Manager, for multiple point-in-time snapshots as well as full-volume copies of critical data.

For Fibre Channel AX4 systems, the addition of EMC MirrorView™ software enables synchronous or asynchronous data replication between arrays, maximizing data availability and enabling comprehensive disaster recovery solutions. EMC SAN Copy™ software enables high-speed data replication between AX and CX series models, as well as multi-vendor arrays for data migration and edge-to-core environments such as remote or satellite offices.

To enhance these capabilities, the addition of EMC Replication Manager simplifies the management and automation of the entire information replication process from the application layer, including Microsoft Exchange, SQL, and Oracle, to the array for CLARiiON SnapView and SAN Copy software.

Most capable and affordable entry-level SAN for VMware

With iSCSI connectivity and integration with virtualized servers, the AX4 provides the most capable entry-level SAN for VMware. A storage area network (SAN) featuring the CLARiiON AX4 will further the benefits of VMware® deployments by supporting and enabling the powerful new features of VMware Infrastructure 3, such as VMotion™, DRS, and advanced high-availability features. A solution combining VMware with the affordable, simple, scalable, and reliable CLARiiON AX4 provides enterprise-class capabilities and efficiencies in an easy-to-use storage platform.

Comprehensive interoperability support for multi-vendor environments

The EMC CLARiiON AX4 is the answer to storage consolidation for heterogeneous environments. It supports Windows, Linux, AIX, HP-UX, Solaris, and VMware. The CLARiiON capabilities on the AX4 allow realtime volume expansion for new virtual machine creation. EMC E-Lab™ testing and support resources ensure interoperability with host operating systems, HBAs, SAN infrastructure, and clustering solutions.

Service and support

CLARiiON AX4 support options deliver choice and flexibility. Count on EMC's world-class support paired with maintainability and usability features to keep information available and operations running. The AX4 includes a standard three-year warranty with 5x9 coverage (Enhanced support) for next-business-day on-site response. Customers can also choose to upgrade to a premium level of maintenance (Premium support) which includes 7x24 coverage with four-hour on-site response.

Specifications

RAID Levels

RAID 1/0, RAID 3, RAID 5, RAID 6

Management

With Navisphere Express
MetaLUNs: Storage virtualization via online LUN expansion through concatenation
Virtual LUN dynamic volume migration
Configurable global hot spares

With Navisphere Manager
MetaLUNs: Storage virtualization via online LUN expansion through either striping or concatenation
VirtualLUN dynamic volume migration
Configurable global hot spares with rebuild priority tuning

Front-End (Host) Connectivity

One or two storage processors (SPs) per AX4
1 GB of memory per storage processor

	Fibre Channel	iSCSI
Each storage processor has	Two 4 Gb/s Fibre Channel optical ports	Two 1 Gb/s Ethernet ports with full iSCSI off-load
Protocol	FCP SCSI-3 FC-AL and FC-SW support	iSCSI
Maximum cable length	Shortwave Optical: 150 meters (4 Gb/s) 300 meters (2 Gb/s)	CAT5/5E and CAT6 Copper: 100 meters (1 Gb/s)

SAS SATA

Mix high-performance SAS and low-cost/ high-capacity SATA drives within the system

Back-End (Disk) Connectivity

Each storage processor has one 4x3 Gb/s SAS expansion port.

Disk Drives

Interface **Capacity (RPM)**	**3.0 Gb/s SAS** **146 GB (15,000)**	**3.0 Gb/s SAS** **300 GB (15,000)**	**3.0 Gb/s SAS** **450 GB (15,000)**	**3.0 Gb/s SAS** **400 GB (10,000)**	**3.0 Gb/s SATA** **750 GB (7,200)**	**3.0 Gb/s SATA** **1 TB (7,200)**
Formatted Capacity (520 bytes/sector), 1 MB = 1,000,000 bytes)	135.77 GB	272.59 GB	408.90 GB	372.52 GB	698.6 GB	931.5 GB
Form Factor	3.5”	3.5”	3.5”	3.5”	3.5”	3.5”
Height	1.0”	1.0”	1.0”	1.0”	1.0”	1.0”
Data Buffer	32 MB	16 MB	16 MB	16 MB	16 MB	32 MB
Transfer Rates						
Buffer to/from Media	58–96 MB/s	97 MB/s	131-294 MB/s	97 MB/s	72–78 MB/s	42-85 MB/s
SP to/from Buffer	300 MB/s (max.)	300 MB/s (max.)	300 MB/s (max.)	300 MB/s (max.)	300 MB/s (max.)	300 MB/s (max.)
Access Time						
Average Seek	3.5 ms Read 4.0 ms Write	3.5 ms Read 4.0 ms Write	3.6 ms Read 4.1 ms Write	3.9 ms Read 4.2 ms Write	8.5 ms Read 9.5 ms Write	8.2 ms Read 9.2 ms Write
Rotational Latency	2 ms	2.0 ms	2.0 ms	2.98 ms	4.16 ms	4.17 ms

System Expansion

	AX4	AX4 with Expansion Pack
Storage Processors	Single or Dual	Dual
Disk Drive Quantity	4 to 12	4 to 60
Disk Drive Type	SAS and SATA	SAS and SATA
Total LUNs	512	512
Total Snap LUNs	16	16
Total Hosts	Up to 10	Up to 64

Server Operating System Support

Windows Server 2008	IBM AIX
Windows Server 2003	Solaris
Windows 2000	NetWare (CLI and host utilities not included)
Linux	VMware
HP-UX	

Integrated Management Features

Navisphere Express Management Utility: Web-accessible configuration and management for an individual array
Shared Storage Control: data protection, shared storage access, and security for heterogeneous SAN environments
Path Management: PowerPath path failover for continuous data access and load balancing for optimal performance
Snapshot Management: create local point-in-time snapshots for flexible backups
Non-disruptive Upgrade (NDU): online upgrades of storage software and FLARE® operating system (dual SP only)

Available Software*

Navisphere Manager: comprehensive configuration, management, and event notification for single or multiple CLARiiON systems
Navisphere Analyzer: comprehensive performance, management, and event notification
SnapView: point-in-time view of information for non-disruptive backup and BCVs
MirrorView: remote synchronous or asynchronous replication for disaster recovery
SAN Copy: enables local or long-distance data movement between various arrays (e.g., CLARiiON, Symmetrix®, non-EMC)
Replication Manager family: manages the replication process (host and replication software) to integrate SnapView and MirrorView operations
CLARalert®: constant system monitoring, call-home notification, and remote diagnostics

*Consult your EMC or EMC partner account manager for availability, software configuration, and compatibility information.

Dimensions (approximate)

Rack-mount Single-Processor Chassis (standard NEMA 19-inch rack)

Height	Width	Depth	Weight
3.5 in. (8.89 cm), 2 EIA units	17.5 in. (44.45 cm)	20 in. (50.8 cm)	57 lb. (25.86 kg) max.

Rack-mount Dual-Processor Chassis with SPS (includes optional second SPS)

Height	Width	Depth	Weight
5.25 in. (13.36 cm), 3 EIA units	17.5 in. (44.45 cm)	24 in. (cm)	108 lb. (49.1 kg) max.

Rack-mount SAS Disk Expansion Chassis with Dual Power Supplies

Height	Width	Depth	Weight
3.5 in. (8.98 cm), 2 EIA units	17.5 in. (44.45cm)	20 in. (50.8 cm)	54 lb. (24.5 kg) max.

40U Rack Enclosure

Height	Width	Depth	Weight
75.0 in. (190.8 cm)	24.0 in. (61.1 cm)	36 in. (91.6 cm)	Empty: 300 lb. (136kg)

Power

	Processor Chassis	SAS Disk Expansion Chassis
Frequency	47–63 Hz	47–63 Hz
AC Voltage	100–240 Vrms, single phase	100–240 Vrms, single phase
Current	4.5-1.8A	3.6-1.5A
Power Factor	0.98 (min)	0.98 (min)
Power Consumption	490 VA (450 W) max.	390 VA (360 W) max.
Heat Dissipation (maximum)	1,535 BTU/hr	1,228 BTU/hr
Protection	Rack-mount: 12 amps, fused	Rack-mount: 12 amps, fused
AC Circuits	Redundant, external AC circuits	Redundant, external AC circuits
Inlet Type	Dual Inlet Rack-mount: IE320-C14 appliance coupler	Dual Inlet Rack-mount: IE320-C14 appliance coupler

40U Cabinet (optional) AC Power Capability

AC Voltage	200–240 VAC +/– 10%, Single Phase
AC Frequency	47–63 Hz
Power Configuration	Two power domains (base and extended), each redundant
Power Inlet Count	Either two (for redundant base configuration), or four (for redundant extended configuration)
Plug Types	NEMA L6-30P or IEC309-332 P6 or IP57 (Australia)
Input Power Capacity	4800 VA @ 200 V, 5760 VA @ 240 V (each domain) 9600 VA @ 200 V, 11,520 VA @ 240 V (total both domains)
AC Protection	30A, 2-pole circuit breaker

Operating Environment

Temperature: 50–104 degrees F (10–40 degrees C)
Temperature Gradient: 10 degrees C/hr
Relative Humidity: 20% to 80% (non-condensing)
Altitude
8,000 ft. (2438.4 m) @ 104 degrees F (40 degrees C) max.
10,000 ft. (3048 m) @ 98.6 degrees F (37 degrees C) max.

Electromagnetic Emissions and Immunity

FCC Class A
CE Mark
ICES-003 Class A (for Canada)
EN55024 Immunity, ITE
CISPR24 Immunity, ITE
MIC/RRL Class A (for S Korea)
EN55022 Class A
VCCI Class A (for Japan)
AS/NZS 3548 Class A (for Australia/New Zealand)
BSMI Class A (for Taiwan)
CISPR22, Class A

Quality and Safety Standards

UL 60950-1; CSA C22.2-60950-1(ULc); EN60950-1/IEC 60950-1; CNS
Manufactured under an ISO 9000-registered quality system

Warranty and Support Options

Standard three-year Enhanced Warranty: 5x9 NBD, 7x24 remote support, customer installation of replacement disk drives, power supplies, fans and small-form-factor pluggable optical transceivers.

Optional Premium Maintenance upgrade: 7x24 on-site support, four-hour response time commitment, Critical Problem Escalation management, and EMC installation of replacement parts.

EMC² where information lives®

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