

EMC Celerra NS-480 Unified Storage



EMC[®] Celerra[®] NS-480 systems can be integral elements of a comprehensive information lifecycle management strategy—a strategy that helps your enterprise attain the maximum value from its information, at the lowest TCO. Gain advanced failover for multi-protocol environments with the EMC Celerra NS-480 enterprise-class, unified storage system.

Technical Specifications

Architecture

The NS-480 unified storage platform supports both dual and four X-Blade configurations. X-Blade configurations can be deployed in N+1 or N+M Primary/Standby mode with N active blades and M pooled failover blades for flexible hardware availability protection (i.e., X-Blade failover). The Celerra family of unified storage platforms delivers the utmost flexibility with full concurrent support for NAS (NFS and CIFS) and iSCSI, and can be configured with native Fibre Channel host connections.

Each X-Blade consists of the following:

- Dual 2.8 GHz LV Intel[®] Xeon[®] processors
- 4 GB Double Data Rate RAM (266 MHz) on an 800 MHz FSB
- Two 4 Gb/s Fibre Channel ports for storage connectivity
- Up to two 4 Gb/s Fibre Channel ports for tape array connectivity
- Four 10/100/1000 BaseT ports, or two 1 Gigabit Ethernet Optical ports and two 10/100/1000 BaseT ports, or two 10 Gigabit Ethernet Optical ports and two 10/100/1000 BaseT ports
- One 10/100/1000 management port
- Instance of DART File Server software

Dual X-Blade configurations can be upgraded non-disruptively to four X-Blade configurations.

Storage Array I/O Connectivity

EMC UltraFlex[™] I/O modules offer additional flexibility for host and disk connectivity. The I/O modules, per storage processor, provide up to a maximum of up to four 4 Gb Fibre Channel ports for X-Blade connectivity, up to four 4 Gb or 8 Gb Fibre Channel ports for host (FC, MPFS, or EMC MirrorView[™] host) connectivity, or up to four 1 Gb or 10 Gb Ethernet Optical ports for host (iSCSI, MPFS, or MirrorView) connectivity subject to slot limits and certain other restrictions.

Note: FC supports FCP SCSI-3 protocol, FC-AL, and FC-SW with command tag queuing up to 256 tags.

SP System Memory and CPU

- Two identical storage processors per NS-480 platform
- 8 GB of memory per storage processor

Maximum Cable Lengths

Shortwave optical OM2: 50 meters (8 Gb), 100 meters (4 Gb), 300 meters (2 Gb), and 500 meters (1 Gb)

Shortwave optical OM3: 150 meters (8 Gb), 380 meters (4 Gb), 500 meters (2 Gb), and 860 meters (1 Gb)

Disk Connectivity

Each storage processor connects to one side of each of four redundant pairs of 4 Gb/s Fibre Channel buses, providing continuous drive access to hosts in the event of a storage processor or bus fault

NS-480 requires a minimum of five drives (Fibre Channel) and supports a maximum of 480 disk drives in 32 disk expansion chassis



Platform managed by a control station:

- Connection to each X-Blade via 10/100 interface
- Manages X-Blade failover
- Manages all file systems via GUI
- SNMP MIB II manageability
- Secure Shell for remote access
- HTTP server management interface
- Dual USB, 250 GB drive, DVD drive
- Single control station contains a 3.4 GHz single core Xeon CPU with 800 MHz FSB, 2 MB cache, and 2 GB memory

NS-480 comes with integrated storage with the following drive attributes:

- Six (includes a hot spare) to 480 disks in up to 32 drive trays
 - Each tray can be configured with:
 - All FC drives
 - Mixed FC, SATA*, and Flash* drives (FC, SATA, and Flash drives must be in separate trays)
- *SATA and Flash drives are not configured in the first drive tray

DART File Server Facilities**Protocols Supported**

- NFSv2, v3, and v4, CIFS (SMB 1 and SMB 2), FTP, FTP Secure, iSCSI, Fibre Channel
- Network Lock Manager (NLM) v1, v3, v4
- Routing Information Protocol (RIP) v1–v2
- Simple Network Management Protocol (SNMP)
- Network Data Management Protocol (NDMP) v1–v4
- Address Resolution Protocol (ARP)
- Internet Control Message Protocol (ICMP)
- Network Time Protocol (NTP) client
- Simple Network Time Protocol (SNTP)
- Kerberos Authentication
- Lightweight Directory Access Protocol (LDAP)

Optional DART Software Facilities

- Celerra Event Enabler (CEE): Integration facilities with third-party vendors
 - Celerra Anti-virus: Celerra integration with industry-leading, anti-virus vendors
 - Celerra Event Publishing Agent: Celerra integration with industry-leading, quota-management vendors
 - EMC Celerra Replicator™: Replicate over IP for disaster recovery, backup, and/or testing
 - Celerra Manager Advanced Edition: Extended management and monitoring of multiple Celerra systems
 - Celerra File-Level Retention (FLR): Create WORM (write once/read many) file systems with specified retention periods
 - Celerra File-Level Retention—Enterprise
 - Celerra File-Level Retention—Compliance
 - Celerra Multi-Path File System (MPFS): Delivers improved performance and scalability over traditional NAS
- Note: Celerra Manager-Basic, Virtual Provisioning, Deduplication, and EMC SnapSure™ are bundled.

Client Connectivity Facilities

- File access by FTP, NFS, CIFS, and MPFS
- Block access by Fibre Channel and iSCSI
- Virtual Data Movers for Microsoft® Windows clients
- Ethernet Trunking
- Link Aggregation (IEEE 802.3ad)
- Virtual LAN (IEEE 802.1q)
- UNIX archive utilities (tar/cpio)
- Network Status Monitor (NSM) v1
- Portmapper v2
- Network Information Service (NIS) Client
- Supports Microsoft DFS as Leaf node or Root Server
- NT LAN Manager (NTLM)
- LDAP signing for Windows
- Native Windows 2000/2003/2008 support
- Microsoft Windows Server 2003 Access-based Enumeration (ABE)

Optional Software Facilities

- EMC Navisphere® Manager: Comprehensive configuration, management, and event notification for single or multiple EMC systems
- Navisphere Analyzer: Comprehensive performance, management, and event notification
- Navisphere Quality of Service Manager (NQM): Manage system to meet performance service levels
- EMC SnapView™: Point-in-time view of information for non-disruptive backup and recovery
- EMC MirrorView/A and MirrorView/S: Remote asynchronous or synchronous replication for disaster recovery
- EMC PowerPath®: Path management
- EMC SAN Copy™: Enables local or long-distance data movement among various arrays (e.g., EMC CLARiON®, EMC Symmetrix®, non-EMC)

High-Availability Features

NS-480 X-Blade Enclosure

- Redundant power supplies for X-Blades and Control Stations
- Hot-swappable power and cooling
- Internal environmental status monitoring

DART Software Capabilities

- Celerra Manager: Web-based configuration and management
- Automated Volume Management (AVM): File system provisioning
- Virtual Provisioning: Allows for logical sizing and physical provisioning
- EMC SnapSure: Creates read-only or read-write, point-in-time logical snaps
- Monitoring: At-a-glance system status and performance statistics
- Data Deduplication: File-based deduplication and compression
- FileMover API: Open API for automated, transparent data movement between tiers of storage
- Ethernet Trunking
- Link Aggregation
- Failsafe Networking
- Network interface port failover
- X-Blade failover

Optional VMware Facilities

- Celerra Plug-in for VMware®: For provisioning, management, cloning, and deduplication
- PowerPath/VE: Path management for iSCSI and Fibre Channel
- Site Recovery Manager (SRM): Managing failover and failback making disaster recovery rapid and reliable
- Replication Manager: Host based management of array-based copies of data

Additional Facilities

- Celerra Fully Automated Storage Tiering (FAST): Automated, policy-based file tiering within cabinet, between cabinets, or to purpose-built storage
- PowerPath: Path management
- Replication Manager: Host-based management of array-based copies of data
- EMC Rainfinity® File Management Appliance (FMA and FMA/VE): File virtualization for transparent data mobility

Control Station

- Administration and management
- X-Blade installation and configuration
- X-Blade failover
- Monitor diagnostics
- Configuring network interfaces
- Creating and exporting file systems
- File-system consistency checks
- Extending file systems
- Auto-call event alerting
- Call-in remote maintenance

Storage

- Disk scrubbing
- Mirrored write cache with de-stage AC power loss
- Redundant hot-swap power, bus structures, and I/O subsystems
- Online global hot-spare disks
- PowerPath failover for Windows and UNIX hosts

RAID Levels

RAID 1/0: Data mirrored, then striped across four to 16 drives

RAID 5: Independent data access on three to 16 drives (with striped parity)

RAID 6: Dual parity distributed across four to 16 drives

Any combination of these RAID levels can exist on a single NS-480

RAID stripe depth configurable to 4, 16, 64, 128, or 256 sectors per disk

MetaLUNs: Storage virtualization via online LUN expansion through either striping or concatenation

Configurable global hot spares

Rebuild priority tuning: Adjustment of minimum I/O reserved for server use during rebuild

Supported Disk Drives

	73 GB 4 Gb/s Enterprise Flash Drive	200 GB 4 Gb/s Enterprise Flash Drive	400 GB 4 Gb/s Enterprise Flash Drive	146 GB 4 Gb/s	300 GB 4 Gb/s	450 GB 4 Gb/s
Nominal Capacity						
Formatted Capacity* (520 bytes/sector, 1 MB = 1,048,576 bytes)	72.67 GB	186.31 GB	372.5 GB	135 GB	272 GB	408 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"
Rotational Speed	N/A—Solid State	N/A—Solid State	N/A—Solid State	15,000 rpm	15,000 rpm	10,000 rpm
Interface	Fibre Channel	Fibre Channel	Fibre Channel	Fibre Channel	Fibre Channel	Fibre Channel
Access Time						
Average Seek	0.020 ms Read	0.020 ms Read	0.020 ms Read	3.7 ms Read	3.5 ms Read	3.8 ms Read
	0.020 ms Write	0.020 ms Write	0.020 ms Write	4.2 ms Write	4.0 ms Write	4.4 ms Write
Rotational Latency	N/A—Solid State	N/A—Solid State	N/A—Solid State	2.0 ms	2.0 ms	3.0 ms
Nominal Power Consumption						
Operating Mode	8.4 W	8.4 W	8.4 W	16.5 W	18.8 W	9.54 W
Idle Mode	5.4 W	5.4 W	5.4 W	10.7 W	13.7 W	5.96 W
Number of Drives per Disk Expansion Chassis	2-15	2-15	2-15	2-15	2-15	2-15

	450 GB 4 Gb/s	600 GB 4 Gb/s	600 GB 4 Gb/s	1 TB 4 Gb/s	2 TB 4 Gb/s	2 TB 4 Gb/s Low Power
Nominal Capacity						
Formatted Capacity* (520 bytes/sector, 1 MB = 1,048,576 bytes)	408.896 GB	545 GB	545.195 GB	931.5 GB	1,852.09 GB	1,852.09 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"
Rotational Speed	15,000 rpm	10,000 rpm	15,000 rpm	7,200 rpm	7,200 rpm	5,400 rpm
Interface	Fibre Channel	Fibre Channel	Fibre Channel	SATA	SATA	SATA
Access Time						
Average Seek	3.4 ms Read	3.8 ms Read	3.4 ms Read	8.5 ms Read	8.2 ms Read	N/A Read
	3.9 ms Write	4.4 ms Write	3.9 ms Write	9.5 ms Write	9.2 ms Write	N/A Write
Rotational Latency	2.0 ms	3.0 ms	2.0 ms	4.16 ms	4.17 ms	4.2 ms
Nominal Power Consumption						
Operating Mode	15.01 W	10.07 W	15.01 W	11.6 W	11.1 W	8.4 W
Idle Mode	10.38 W	6.49 W	11.82 W	8.0 W	7.5 W	4.0 W
Number of Drives per Disk Expansion Chassis	2-15	2-15	2-15	2-15	2-15	2-15

*Note: The EMC FLARE® storage operating environment requires 62 GB of disk space on each of the first five drives.

Dimensions (approximate)

	NS-480 with four data movers and one 15-disk tray	Expansion Disk Tray (can add 31)	40 U Rack Enclosure
Height	15.75 in. (40.0 cm), 9 NEMA units (U), including mounting rails	5.25 in. (13.34 cm) 3 NEMA units (U)	75.0 in. (190.8 cm) 24.0 in. (61.1 cm)
Width	18.92 in. (48.06 cm); mounting bars fit standard 19-in. NEMA cabinets	17.72 in. (45.0 cm)	39.0 in. (99.2 cm)
Depth	Chassis to rear: 31.58 in. (80.21 cm)	14.00 in. (35.56 cm)	
Weight	274.5 lbs (124.5 kg)	68 lbs (30.8 kg)	Empty: 380 lbs (173 kg)

Operating Environment

Temperature: 50–104 degrees F (10–40 degrees C)
Temperature Gradient: 18 degrees F/hr (10 degrees C/hr)
Relative Humidity: 20% to 80% (non-condensing)

Altitude

7,500 ft. (2,286.4 m) @ 104 degrees F (40 degrees C) max.
10,000 ft (3,048 m) @ 98.6 degrees F (37 degrees C) max.

Electromagnetic Emissions and Immunity

FCC Class A EN55022 Class A

CE Mark VCCI Class A (for Japan)

ICES-003 Class A (for Canada) AS/NZS 3548 Class A (for Australia/New Zealand)

EN55024 Immunity, ITE BSMI Class A (for Taiwan)

Quality and Safety Standards

UL 60950; CSAC 22.2-60950, FN 60950

Manufactured under an ISO 9000-registered quality system

ETSI EN 300 386

AC Power and Dissipation

Requirement	NS-480 with One 15-Disk Tray	Expansion Disk Tray*
AC Line Voltage	100 to 240 V AC, 50–60 Hz, single-phase	100 to 240 V AC, 50–60 Hz, single-phase
AC Line Voltage Tolerance	Voltage \pm 10%, frequency \pm 3 Hz	Voltage \pm 10%, frequency \pm 3 Hz
AC Line Current (Operating Maximum)	11.2 A max. at 100 V AC, 5.6 A max. at 200 V AC	3.8 A max. at 100 V AC, 1.9 A max. at 200 V AC
Power Consumption (Operating Maximum)	1,115 VA (970 W) max.	380 VA (365 W) max. (fully configured)*
Power Factor	0.98 min. at full load, low voltage	0.98 min. at full load, low voltage
Heat Dissipation (Operating Maximum)	3.49×10^6 J/hr, (3,400 Btu/hr) max.	1.31×10^6 J/hr, (1,250 Btu/hr) max.
In-rush Current	138 A max. for ½ line cycle, per line cord at 240 V AC 69 A max for ½ line cycle, per line cord at 120 V AC	50 A max. for ½ line cycle, per line cord at 240 V AC 25 A max. for ½ line cycle, per line cord at 120 V AC
Startup Surge Current	59 A rms max. for 50 ms, at any line voltage	15 A pk (10.6 A rms) max. for 100 ms, at any line voltage
AC Protection	10 A fuse on each power supply, both phases	10 A fuse on each power supply, both phases
AC Receptacle	IEC320-C14 appliance coupler, per power supply	IEC320-C14 appliance coupler, per power supply
Ride-through Time	30 ms min.	30 ms min.
Current Sharing	\pm 15% of full load, between power supplies	\pm 10% of full load, between power supplies

*Ratings assume fully loaded disk array enclosure that includes two power supplies, two LLCs, and 15 disk drives

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 onsite support, four-hour response time commitment, critical problem escalation management, and EMC installation of replacement parts.



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