

# Nimble Storage CS-Series Arrays: Building Blocks of the Adaptive Flash Platform

Nimble Storage CS-Series arrays are the building blocks of Adaptive Flash, a storage platform that dynamically and intelligently allocates storage resources to satisfy the changing needs of business-critical applications.



Adaptive Flash is based on CASL™, Nimble’s patented Cache Accelerated Sequential Layout architecture, and InfoSight™, its data sciences-based approach to the storage lifecycle. CASL allows performance and capacity to be scaled seamlessly and independently. InfoSight leverages the power of deep-data analytics to deploy storage resources as needed by business-critical applications.

## Nimble Storage CS-Series Arrays

Any Nimble Storage array can be scaled to enterprise levels of performance and capacity.

**The CS210, CS215, and CS235** provide value and capacity for small to medium-sized IT organizations or remote offices, for workloads such as Microsoft Exchange and VDI.

**The CS300** is ideal for midsize IT organizations or distributed sites of larger organizations. It offers the best capacity per \$ for workloads like Microsoft applications, VDI, or virtual server consolidation. The CS300 delivers 1.6x more IOPS than the CS235.

**The CS500** offers advanced performance for larger-scale deployments or IO-intensive workloads, like larger-scale VDI, and Oracle or SQL Server databases, and provides the best performance and IOPS per \$. The CS500 achieves 5x the performance of the CS235.

**The CS700** is designed for consolidating multiple large-scale critical applications with aggressive performance demands. It delivers approximately 7x the IOPS of the CS235.

All Nimble Storage arrays support the iSCSI storage protocol. Fibre Channel protocol support is available with the CS235, CS300, CS500, and CS700.

## Scale-to-Fit with Scale-Out Architecture

CASL’s scale-to-fit capability allows performance and capacity to be scaled seamlessly and independently to meet the growing demands of today’s enterprise applications. Capacity can be scaled to hundreds of terabytes by simply adding disk shelves while performance can be enhanced by adding CPU cores for greater overall throughput or additional solid state drives (SSDs) for enhanced read performance. Performance and capacity can even be seamlessly scaled beyond a single array to a cluster of up to any four Nimble Storage arrays.

## Integrated Data Protection

Data protection is built into every Nimble Storage array, eliminating the inefficiency associated with managing primary and backup storage tiers. Nimble arrays use advanced data protection features including frequent point-in-time snapshots and WAN-efficient replication.

## InfoSight and Proactive Wellness

InfoSight is a key component of the Adaptive Flash platform, offering expert guidance on scaling. InfoSight monitors all Nimble arrays, collectively and individually, from the cloud, using the data it collects to pinpoint problems — and offer remedies — before they can bring systems down.

In addition to InfoSight, Nimble offers these key support benefits: access to 24x7 technical support; 4-hour, or next business day, parts delivery; always-on monitoring and response; and frequent software updates.

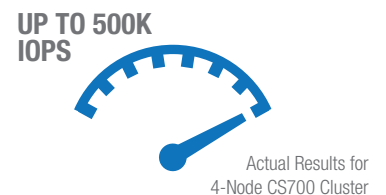
“Our customers see large data sets, small data sets and diverse workloads. Nimble’s CS700 and all-flash expansion shelf combine to offer customers a means of covering lots of ground in terms of both performance and capacity, within an attractively small datacenter footprint.”

Jeff Thomas  
Director of IT operations  
MarkLogic

## Our Customers Require Up To 10x Less Rackspace



## Our Customers Get Blazing Performance



## Our Customers Enjoy Virtually Zero Downtime



## Product Specifications

Product Family	Ultimate Performance Scale-Out Cluster <sup>1,7</sup>	Extreme Performance Family						High Performance Family						Base Performance Family						Value Array Family					
		CS700		CS500		CS300		CS700		CS500		CS300		CS210		CS215		CS235							
Raw Disk Capacity, Base (TB) <sup>2</sup>	2,448	12	24	36	48	72	12	24	36	48	72	12	24	36	48	72	8	12	24						
Min. Usable Capacity (TB) <sup>4</sup>	1,784	8	16	25	33	50	8	16	25	33	50	8	16	25	33	50	4	8	16						
Effective Capacity, Base (TB) <sup>2</sup>	1,784-3,568	8-16	16-32	25-50	33-66	50-100	8-16	16-32	25-50	33-66	50-100	8-16	16-32	25-50	33-66	50-100	4-8	8-16	16-32						
Effective Capacity, Maximum (TB) <sup>3,5,6</sup>	3,568	808	824	842	858	892	808	824	842	858	892	808	824	842	858	892	140	302	428						
Max Number of Disk Expansion Shelves	24	up to 6						up to 6						up to 6 <sup>9</sup>											
Base/Max Flash Capacity per Array (GB)	30,720	3,200 to 7,680						1,200 to 7,680						640 to 3,840											
Max Supported Flash with All-Flash Shelf (GB)	192,000	38,400						38,400						16,000											
Power Requirement (Watts)	13,000	650						600						500											

## Expansion Shelves

	HDD Expansion Shelves				SSD Expansion Shelf	
	ES1-H25	ES1-H45	ES1-H65	ES1-H85	ES1-H90T	ES1-AFS
Raw Disk Capacity (TB) <sup>2</sup>	15	30	45	60	90	NA
Min. Usable Capacity (TB) <sup>4</sup>	11	23	34	45	66	NA
Effective Capacity (TB) <sup>2,5</sup>	11-22	23-46	34-68	45-90	66-132	NA
Flash Capacity (GB) <sup>10</sup>	160 / 480	300 / 960	600 / 960	1,600	1,920	up to 30,720B
SAS Connectivity Per Controller	2x 6Gb SAS (2 modules/shelf)					2x 6Gb SAS (2 modules/shelf)
Power Requirement (Watts)	400					200

## Physical and Environmental Specifications

Dimensions	5.2"H x 17.2"W x 26.5"D 13.2 cm x 43.7 cm x 67.3 cm 3 Rack Units
Weight	76 lbs. / 34.5 kg
Weight (All-Flash Shelf)	55 lbs. / 25 kg
Operating Temperature	50° - 95° F (10° - 35° C)
Non-Operating Temperature	32° - 104° F (0° - 40° C)
Operating Humidity	8 - 90%
Non-Operating Humidity	5 - 95%

## Supported Protocols and Network Connectivity

Supported Protocols	CS700		CS500		CS300		CS235		CS215		CS210	
	SCSI	Fibre Channel	SCSI	Fibre Channel	SCSI	Fibre Channel	SCSI	Fibre Channel	SCSI	Fibre Channel	SCSI	Fibre Channel
Number of Available Interface Cards (per array controller)	3	3	3	3	3	3	3	3	3	3	3	3
Dual-port 1GbE (on board) <sup>6</sup>	1 (included)	1 (included)	2 only	2 only	2 only	2 only	1 (included)	1 (included)	1 (included)	1 (included)	1 (included)	1 (included)
Dual-port 1GbE (optional)	N/A	N/A	2 only	2 only	2 only	2 only	1 or 2	1 or 2	1 or 2	1 or 2	1 or 2	1 (included)
Dual-port 10Gbaset (optional)	1 or 2	1 or 2	1 or 2	1 or 2	1 or 2	1 or 2	1 or 2	1 or 2	1 or 2	1 or 2	1 or 2	N/A
Dual-port 10GbE SFP+ (optional)	1 or 2	1 or 2	1 or 2	1 or 2	1 or 2	1 or 2	1 or 2	1 or 2	1 or 2	1 or 2	1 or 2	N/A
Dual-port 16Gb FC (optional)	2 or 3	1 or 2	1 only	1 only	1 only	1 only	1 only	1 only	1 only	1 only	1 only	N/A
On-Board 6Gb SAS Connectivity Per Controller	2x 4-lane	2x 4-lane	2x 4-lane	2x 4-lane	2x 4-lane	2x 4-lane	2x 4-lane	2x 4-lane	2x 4-lane	2x 4-lane	2x 4-lane	1x 4-lane

### Notes

- Maximum performance configuration consists of 4x CS700 arrays, each with 1x ES1-AFS all-flash expansion shelf and 6x ES1-H85 capacity expansion shelves.
- Raw and effective capacities are calculated using Base 10 (i.e., 1 TB = 1,000,000,000,000 bytes) after excluding space for parity, spares, and system overhead; the range represents 0 to 2x compression.
- Maximum capacity is the capacity of the base array and maximum number of expansion shelves.
- Minimum usable capacity denotes the base capacity available to users once parity, spares and system overhead are deducted from overall raw capacity. Compression increases overall effective capacity.
- Compression rates vary across applications; 2x compression factor reflected in upper range of effective capacity (based on actual compression rates seen by customers).
- Each array controller has 2x 1GbE ports built in. Additional network interface options vary, per array family.
- Max flash capacity shown accounts for SSD capacity included with each ES1 expansion shelf.
- Maximum expanded capacity for a CS300 includes a maximum of three ES1-H90T expansion shelves and three ES1-H85 expansion shelves.
- Max capacity for CS215 includes two ES1-H90T expansion shelves and one ES1-H25 expansion shelf.
- Max capacity for CS235 includes three ES1-H90T expansion shelves (requires NimbleOS 2.3).
10. Larger flash capacity listed for ES1-HxB variants



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