

Overview

Nimble Storage All Flash Arrays

Nimble Storage All Flash Arrays from Nimble Storage, a Hewlett Packard Enterprise company, are the industry's only predictive all-flash arrays¹—designed to deliver radical simplicity and flash performance within a scalable, cloud-ready platform. The Nimble Storage AF1000 All Flash Array is the entry point to the Nimble Storage all-flash product line. Small but mighty, it delivers the functionality and scalability of a higher-end array at an affordable price. Combining a flash-optimized architecture with InfoSight Predictive Analytics, it gives you fast, reliable access to data with proven, measured availability of greater than 99.9999%².

The Nimble Storage AF1000 All Flash Array allows you to start small and scale to up to 78 TB effective capacity, assuming 5:1 data reduction. Backed by the Timeless Storage guarantee³ that comes with all Nimble Storage arrays, there is no need to pay for optional software, and forklift upgrades can become a thing of the past.

Designed to radically simplify operations, Nimble Storage All Flash Arrays feature InfoSight Predictive Analytics to predict and prevent issues across the infrastructure stack. Even the most complex issues are rapidly resolved because InfoSight has already collected the necessary information to solve the problem, removing the need for complex troubleshooting. As a result, traditional level 1 and 2 support staff is completely automated by InfoSight. The Nimble Storage support organization is entirely comprised of level 3 experts who answer calls in less than a minute on average.

NOTE: For more information about the entire Nimble Storage product portfolio, go to <http://www.nimblestorage.com>. Nimble Storage products are not available in some markets.



Nimble Storage AF1000 All Flash Array
(Base array, 4U; all 24 bays hold Dual Flash Carriers with Small Form Factor SSDs)

NOTE:

¹Based on publicly available information as of May 2017.

²Based on actual customer data collected by the Nimble Storage Support organization as of March 2017.

Refer to the whitepaper [redefining the Standard for System Availability](#) for additional details (registration required).

³Refer to <https://www.nimblestorage.com/satisfaction-guarantee/> for details.

Subject to Nimble Storage General Terms and Conditions available at <http://www.nimblestorage.com/docs>

Overview

Radical Simplicity and Non-disruptive Scale

- Radical simplicity, from deployment to configuration and management.
- Scale-to fit. Scale-up seamlessly to grow the performance and capacity of an array. Scale across multiple arrays non-disruptively in a cluster still managed as one.
- Quality of service (QoS) controls. Auto QoS prevents “noisy neighbor” issues. QoS limits allow you to set explicit IOPS and/or bandwidth limits.

InfoSight Predictive Analytics

- Proactive resolution. InfoSight automatically predicts and resolves 86% of problems¹ before you even know there is an issue.
- Solves storage and non-storage problems. By collecting and correlating sensors across the infrastructure stack, InfoSight uncovers problems spanning from storage to VMs. In fact, 54% of the problems InfoSight resolves are outside of storage².
- Prevents known issues with infrastructure that learns. If a problem is detected in one system, InfoSight begins to predict the issue and inoculate other systems. Every system gets smarter and more reliable through collective installed base insights.
- The support you’ve always wanted. Automation and proactive resolution put the focus on prevention, streamlining the process, and connecting you directly to support expertise. No more answering routine support questions, sending log files, or attempting to recreate issues.

Flash Efficiency

- Always-on reduction. Achieve up to 5X or better data reduction³ through flash efficiency and inline variable block deduplication and compression.
- Backup and disaster recovery at one-third the cost⁴. Nimble Storage arrays have built-in native replication that's easy to configure and deploy, allowing you to replicate from All Flash to Adaptive Flash or Secondary Flash arrays.
- Cloud-ready: Flexibility to create a multicloud environment with Nimble Cloud Volumes.

Absolute Resiliency

- Over 99.9999% measured availability^{Error! Bookmark not defined.}. Predictive analytics and fault-tolerant design achieve over six-nines of proven availability, validated across the installed base.
- Triple+ Parity RAID. Tolerates three simultaneous drive failures plus additional protection from intra-drive parity.
- SmartSecure encryption. Application-granular, FIPS-certified encryption and data shredding provide end-to-end security for data at rest and on-the-wire when replicated offsite.
- Comprehensive data protection. Application-consistent snapshots and replication as well as integration with leading backup software solutions provide an ideal foundation for comprehensive data protection.

NOTE:

¹ Based on actual customer data collected by the Nimble Storage support organization as of March 2017. Refer to the whitepaper [Redefining the Standard for System Availability](#) for additional details (registration required).

² Based on actual customer data collected by the Nimble Storage support organization as of March 2017. Refer to the Nimble Labs Research Report [Can Machine Learning Prevent Application Downtime?](#)

³ Based on internal Nimble Storage testing and validation performed March, 2017. Refer to <https://www.nimblestorage.com/its-all-about-data-reduction/> for details.

⁴ Nimble Storage offers built-in replication at no additional cost, allowing customers to use the array to also back up data and perform replication instead of purchasing additional hardware and/or software for this purpose. Additionally, customers are not forced to buy yet another all flash array to use as a backup target system since they can use a cost-effective Nimble Storage hybrid array, resulting in potential cost savings

Overview

Nimble Storage All Flash Array models

	Nimble Storage AF1000	
Number of controllers	2	
Number of drives	(24) SFF Solid State Drives ⁴	
Raw capacity in base array ¹	6 TB	11 TB
Usable capacity in base array ¹	4 TB	8 TB
Effective capacity in base array ^{1,2}	20 TB	39 TB
RAID level	Triple+ Parity RAID	
On-board connectivity	(4) 1 GbE/10 GbE ports, (2) per controller	
Additional host connectivity	(4) 1/10GbE iSCSI (10GBASE-T), or (4) 1/10GbE iSCSI (Optical), or (4) 8/16Gb Fibre Channel; depending on configuration	

NOTE: Specifications are subject to change without notice.

¹ For storage capacity, 1 GiB = 230 bytes and 1 TiB = 1,024 GiB.

² Assuming 5:1 data reduction with compression and deduplication.

³ Flash Capacity is provided by Solid State Drives, upgradable with Flash Upgrade Kits.

⁴ Included in base array, upgradable to (48) drives.

Host OS Support

Microsoft® Windows® Server, including Microsoft® Hyper-V™ | VMware vSphere™ | Ubuntu
SUSE® Linux Enterprise | SUSE® Linux Virtualization | Red Hat® Enterprise Linux® | Red Hat® Enterprise Virtualization
CentOS | Oracle® Linux® (UEK and RHEL compatible kernels) | Oracle® Solaris Citrix® | IBM® AIX®

For the latest information on supported operating systems refer to Single Point of Connectivity Knowledge (SPOCK) for HPE Storage products, including Nimble Storage: <http://www.hpe.com/storage/spock>

Service and Support and Warranty Information

Warranty

Nimble Storage arrays come with the following warranties:

- 1 year, parts-only warranty for hardware components
- 90 day, software updates for defects

Additionally, Nimble Storage will provide phone support for replacing a defective part. Additional support coverage is required for Nimble Storage arrays.

NOTE: Warranty is provided Nimble Storage, an HPE company.

Service and Support

Support is required for all Nimble Storage arrays. Support SKUs provide three years of 24x7 telephone and email support for the arrays with a choice of Next Business Day (NBD) or 4-hour parts delivery¹, access to Nimble Storage's InfoSight Predictive Analytics platform and software updates.

NOTE: Support contract is mandatory for all Nimble Storage products.

Installation Service

New Array Installation (USA/Canada only)

On-site installation of a new Nimble Storage array in a data center.

New Remote Installation

Remote installation of a new Nimble Storage array in a data center.

Upgrade Kit or Expansion Shelf Installation (USA/Canada only)

On-site installation of upgrades kits or expansion shelves for an existing Nimble Storage array.

NOTE: Installation services are optional for all Nimble Storage products.

NOTE: ¹Available in select markets; for areas not currently covered, Nimble Storage offers on-site spare parts/kits for purchase.

Configuration Information

Nimble Storage All Flash Arrays

The Nimble Storage AF1000 All Flash Array comes in a 4U form-factor chassis with

- (2) controllers with fans and NVDIMM,
- (4) 1GbE/10GbE network ports, i.e. (2) per controller, for iSCSI or management traffic and
- (2) power supplies and (2) C13/C14 power cords.

Nimble Storage AF1000 All Flash Arrays come with (24) Small Form Factor Solid State Drives included as standard. All 24 bays hold Dual Flash Carriers so that additional drives can be installed into the base array as field upgrade; bringing the total drive count to (48) Solid State Drives.

Additional host connectivity per controller is indicated in the product description below.

Base Array	<p>Nimble Storage AF1000 2x10GBASE-T 24x240GB Flash Array</p> <p>Includes base with the following</p> <ul style="list-style-type: none"> • Flash configuration: (24) 240 GB SDDs for 6TB raw capacity • Additional connectivity: (2) 10GbE iSCSI (10GBASE-T) ports per controller <p>Requires Nimble Storage AF1000 6TB Flash 3yr NBD Support or Nimble Storage AF1000 6TB Flash 3yr 4hr Support</p>	Q2Q34A
	<p>Nimble Storage AF1000 2x10GbE 24x240GB Flash Array</p> <p>Includes base with the following</p> <ul style="list-style-type: none"> • Flash configuration: (24) 240 GB SDDs for 6TB raw capacity • Additional connectivity: (2) 10GbE Optical iSCSI ports per controller <p>Requires Nimble Storage AF1000 6TB Flash 3yr NBD Support or Nimble Storage AF1000 6TB Flash 3yr 4hr Support</p>	Q2Q35A
	<p>Nimble Storage AF1000 2x16Gb FC 24x240GB Flash Array</p> <p>Includes base with the following</p> <ul style="list-style-type: none"> • Flash configuration: (24) 240 GB SDDs for 6TB raw capacity • Additional connectivity: (2) 8/16Gb FC ports per controller <p>Requires Nimble Storage AF1000 6TB Flash 3yr NBD Support or Nimble Storage AF1000 6TB Flash 3yr 4hr Support</p>	Q2Q36A
	<p>Nimble Storage AF1000 2x10GBASE-T 24x480GB Flash Array</p> <p>Includes base with the following</p> <ul style="list-style-type: none"> • Flash configuration: (24) 480 GB SDDs for 11TB raw capacity • Additional connectivity: (2) 10GbE iSCSI (10GBASE-T) ports per controller <p>Requires Nimble Storage AF1000 11TB Flash 3yr NBD Support or Nimble Storage AF1000 11TB Flash 3yr 4hr Support</p>	Q2Q37A
	<p>Nimble Storage AF1000 2x10GbE 24x480GB Flash Array</p> <p>Includes base with the following</p> <ul style="list-style-type: none"> • Flash configuration: (24) 480 GB SDDs for 11TB raw capacity • Additional connectivity: (2) 10GbE Optical iSCSI ports per controller <p>Requires Nimble Storage AF1000 11TB Flash 3yr NBD Support or Nimble Storage AF1000 11TB Flash 3yr 4hr Support</p>	Q2Q38A
	<p>Nimble Storage AF1000 2x16Gb FC 24x480GB Flash Array</p> <p>Includes base with the following</p> <ul style="list-style-type: none"> • Flash configuration: (24) 480 GB SDDs for 11TB raw capacity • Additional connectivity: (2) 8/16Gb FC ports per controller <p>Requires Nimble Storage AF1000 11TB Flash 3yr NBD Support or Nimble Storage AF1000 11TB Flash 3yr 4hr Support</p>	Q2Q39A

Configuration Information

Upgrades (optional)	Nimble Storage AF1000 24x240GB Flash Upgrade Kit	Q2Q40A
	Adds (24) 240 GB SSDs to an existing AF1000 base array for additional 6TB raw capacity Requires Nimble Storage AF1000 6TB Flash Upgrade Kit 3yr NBD Support or Nimble Storage AF1000 6TB Flash Upgrade Kit 3yr 4hr Support	
	Nimble Storage AF1000 24x480GB Flash Upgrade Kit	Q2Q41A
	Adds (24) 480 GB SSDs to an existing AF1000 base array for additional 11TB raw capacity Requires Nimble Storage AF1000 11TB Flash Upgrade Kit 3yr NBD Support or Nimble Storage AF1000 11TB Flash Upgrade Kit 3yr 4hr Support	
Support options (mandatory)	Nimble Storage AF1000 6TB Flash 3yr NBD Support	Q2Q82A
	Nimble Storage AF1000 11TB Flash 3yr NBD Support	Q2Q84A
	Nimble Storage AF1000 6TB Flash Upgrade Kit 3yr NBD Support	Q2Q86A
	Nimble Storage AF1000 11TB Flash Upgrade Kit 3yr NBD Support	Q2Q87A
	Nimble Storage AF1000 6TB Flash 3yr 4hr Support	Q2Q83A
	Nimble Storage AF1000 11TB Flash 3yr 4hr Support	Q2Q85A
	Nimble Storage AF1000 6TB Flash Upgrade Kit 3yr 4hr Support	Q2Q88A
	Nimble Storage AF1000 11TB Flash Upgrade Kit 3yr 4hr Support	Q2Q89A

Configuration Information

Installation Services

Installation services accelerate the installation and startup: Nimble Storage Pro Installation Services provide rapid planning, installation, and validation of Nimble Storage arrays into your environment

NOTE: On-site installation services are only available in the USA and Canada; installation services are optional.

Nimble Storage Upgrade Kit/Expansion Shelf Installation Service	Q2R14A
Nimble Storage New Array Installation Service	Q2R15A
Nimble Storage New Array Remote Installation Service	Q2R16A
Nimble Storage Additional Array Installation Service	Q2R17A

Racks

Nimble Storage arrays and expansion shelves are compatible with industry standard 4-post EIA 19 inch racks with square mounting holes, including HPE 36U, 42U and 47U Enterprise Shock Racks.

For more information on the HPE rack offerings, please see the following URL:

<http://h18004.www1.hpe.com/products/servers/platforms/rackandpower.html>

For more information on rack options, see:

<http://www.hpe.com/products/rackoptions>

For more information on PDUs, see:

<http://h18004.www1.hpe.com/products/servers/proliantstorage/power-protection/pdu.html>

Additional power cords

Nimble Storage arrays and expansion shelves come with (2) C13/C14 power cords included as standard. A pair of additional power cords (country/region specific) are required when connecting base arrays or expansion shelves to office power outlets.

Country/Region	Description	
Australia/New Zealand	HPE PWR CRD, 2.5m, 10A, C13—AU/NZ	AF569A
Europe (France, Germany, Spain)	HPE PWR CRD, 1.83m, 10A, C13—European	AF568A
Japan	HPE PWR CRD, 2m, 12A, C13—Japan	AF572A
Israel	HPE PWR CRD, 1.83m, 10A, C13—Israel	AF564A
India	HPE PWR CRD, 2m, 6A, C13—India	AF562A
Italy	HPE PWR CRD, 1.83m, 10A, C13—IT/CL	AF571A
South Korea	HPE PWR CRD, 1.83m, 10A, C13—Korea	AF560A
South Africa	HPE PWR CRD, 2.5m, 10A, C13—South Africa	AF567A
Taiwan	HPE PWR CRD, 1.83m, 13A, C13—Taiwan	AF561A
U.S./Canada	HPE PWR CRD, 1.83m, 10A, C13—U.S.	AF556A
United Kingdom/Hong Kong/Singapore	HPE PWR CRD, 1.83m, 10A, C13—UK	AF570A

Technical Specifications

Physical Dimensions	Width in/mm	Depth in/mm	Height in/mm/U	Weight lb/kg
Nimble Storage AF1000	17.5/445	26.5/673	7/175/4	80/36
Nimble Storage AF1000 Flash Upgrade Kits	15/381	17/432	6/153	24/11

Power Requirements

Input Voltage
AC PCM option

Nimble Storage AF1000

100 to 240 VAC (50 to 60 Hz)

Max power requirements (Watts/kVA)
Thermal (BTU)

550 W / 0.61 kVA
1802 BTU

Environmental Specifications⁴

Operating Temperature	10 - 35° C (50 - 95° F) Reduce rating by 1° F for each 1000 ft altitude (1.8° C/1,000 m)
Shipping Temperature	0° C - 40° C (32° F - 104° F) Maximum rate of change is 20°C/hr (36°F/hr)
Operating Altitude (ft/m) max.	10,000 ft / 3,048 m
Shipping Altitude (ft/m) max.	40,000ft/ 12,192 m
Humidity	8 - 90%, non-condensing
Shipping Humidity	5 - 95%, non-condensing
Operating Vibration	0.25 G, Sine 5 - 200 Hz (approx. 15 min/axis); 0.4 GRMS, Random 5 - 200 Hz (approx. 60 min/axis)
Non-operating Vibration	0.5 G, Sine 5 - 200 Hz (approx. 15 min/axis); 0.98 GRMS, Random 5 - 500Hz (approximate 30 min/axis)
Operating Shock	20 G, 2.5ms, half-sine, one shock on each side
Non-operating Shock	20 G, 10ms, square wave, one shock on each side

Technical Specifications

Electromagnetic Compatibility

Subpart B of Part 15 of FCC Rules for Class A digital devices
ICES-003, Issue 6, dated January 2016 (Class A)
VCCI V-3: April 2014 (Class A)
EN 55022:2010
CISPR 22:2008
AS/NZS CISPR 22:2009 +A1:2010
EN55032:2012
CISPR 32:2012
EN 55024:2010
CISPR 24:2010 +A1:2015
TCVN 7189:2009
NBTC TS 3001-2555
TP TC 020/2011

Acoustics Sound pressure level measured per ISO 7779 specs during normal operating fan

Fan Speed (RPM)

Standard Speed (3540 RPM)

Full Speed (13000 RPM)

Front	65.5	72.0
Back	71.2	75.8
Left	65.6	69.0
Right	65.6	70.7

Safety

EN60950-1:2005 (Second Edition); Am1:2009 + Am2:2013
IEC 60950-1:2005 (Second Edition); Am1:2009 + Am2:2013
EN60950-1:2006/A11:2009/A1:2010/A12:2011/A2:2013
UL/IEC 60960-1 2nd Ed. Am1 + Am2
CNS14336-1 ('99)
CNS13438 ('95)
NOM-019-SCFI-1998
NBTC TS 4001-2550
TP TC 004/2011
IS 13252 (PART 1):2010 +A1:2013 + A2:2-15
SANS IEC 60950-1

NOTE: Specifications are subject to change without notice.

Certifications / Markings

UL	NOM
cUL	MoEc
CE	NBTC SDoC
FCC Class A	CITC/CoC*
IC Class A	EAC
VCCI Class A	BIS
RCM	LOA (S. Africa)
BSMI Class A	RoHS 2011/65/EU, EN50581:2012
KC	WEEE
CCC Exemption	

Summary of Changes

Date	Version History	Action	Description of Change
12-Jun-2017	From Version 1 to 2	Changed	Detail on included power cords and SAS cables
5-Jun-2017	Version 1	Created	Created first version, including AF1000.



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