

## Dell PowerScale Hybrid

The PowerScale hybrid nodes handle a wide variety of large-scale data workloads while lowering your costs.

The PowerScale family comprises of PowerScale and Isilon scale-out file storage platforms configured with the PowerScale OneFS operating system. PowerScale OneFS provides the intelligence behind the highly scalable, high-performance modular storage solution that can grow with your business. A OneFS powered cluster can be built with a flexible choice of storage platforms including all-flash, hybrid and archive nodes. These solutions provide the performance, choice, efficiency, flexibility, scalability, security, and protection for you to store massive amounts of unstructured data within a cluster.

PowerScale Hybrid NAS platforms are highly flexible and strike a balance between large capacity and high-performance storage to provide support for a broad range of enterprise file workloads. The PowerScale hybrid platforms co-exist seamlessly in the same cluster with your existing PowerScale or Isilon nodes to drive your traditional and modern applications.

The PowerScale and Isilon Hybrid nodes include:

### PowerScale H700 and H7000

**PowerScale H700** provides maximum performance and value to support a demanding file workload. The H700 provides capacity up to 1.2 PB per chassis. The H700 includes inline compression and deduplication capabilities

**PowerScale H7000** is a versatile, high performance, high-capacity hybrid platform which supports up to 1.6 PB per chassis. The deep chassis based H7000 is an ideal to consolidate a range of file workloads on a single platform. The H7000 includes inline compression and deduplication capabilities



### Isilon H400, H500, H5600 and H600

**Isilon H400** delivers a balance of performance, capacity and value to support a wide range of file workloads. The H400 supports up to three GB/s bandwidth per chassis and provides capacity options ranging from 120 TB to 960 TB per chassis.

**Isilon H500** supports up to five GB/s bandwidth per chassis with a capacity ranging from 120 TB to 960 TB per chassis. The H500 is an ideal choice for organizations looking to consolidate and support a broad range of file workloads on a single platform.

**Isilon H5600** combines massive scalability – up to 1.28 PB per chassis – and up to eight GB/s bandwidth – in an efficient, highly dense, deep 4U chassis. The H5600 also includes inline compression and deduplication capabilities. The H5600 is designed to support to a wide range of demanding, large-scale file applications and workloads.

**Isilon H600** was designed to provide high performance at value. It delivers up to 120,000 IOPS and up to 12 GB/s bandwidth per chassis. The H600 is ideal for HPC workloads that don't require the extreme performance of all-flash.



Embedded, integrated, or attached OEM versions are available for PowerScale hybrid nodes as either de-branded or re-branded solutions.

## PowerScale H700 Hybrid Specifications

H700 ATTRIBUTES & OPTIONS	2 TB HDD	4 TB HDD	8 TB HDD	12 TB HDD	16 TB HDD	20 TB HDD
Chassis capacity	120 TB	240 TB	480 TB	720 TB	960 TB	1.2 PB
HDD drives (3.5") per chassis	60					
Self-encrypting drive (SED HDD) FIPS140-2 compliant option	Yes, except 20 TB drives					
Operating system	OneFS 9.2.1 or later					
Number of nodes per chassis	4					
ECC memory (per node)	192 GB					
Cache (per Node) solid state drives (SSD) (800 GB, 1.6 TB, 3.2 TB or 7.68 TB)	1 or 2 Capacity and number of SSDs determined by HDD size and count					
Front-end networking (per node)	2 x 100GbE (QSFP28) or 2 x 25GbE (SFP28)					
Infrastructure (back-end) networking (per node)	2 InfiniBand connections with QDR links or 2 x 100 GbE (QSFP28) or 2 X 25 GbE (SFP28)					
Max Power Consumption @ 200~240v (per chassis) <sup>1</sup>	1528 Watts (@25°C)					
Typical thermal rating	5213 BTU/hr					

<sup>1</sup>Values at <25° C are reflective of more steady state maximum values during normal operation

## PowerScale H7000 Hybrid Specifications

H7000 ATTRIBUTES & OPTIONS	12 TB HDD	16 TB HDD	20 TB HDD
Chassis capacity	960 TB	1.28 PB	1.6 PB
HDD drives (3.5") per chassis	80		
Self-encrypting drive (SED HDD) FIPS140-2 compliant option	Yes, except 20 TB drives		
Operating system	OneFS 9.2.1 or later		
Number of nodes per chassis	4		
ECC memory (per node)	384 GB		
Cache (per Node) solid state drives (SSD) (3.2TB or 7.68TB)	1 or 2 Capacity and number of SSDs determined by HDD size and count <sup>2</sup>		
Front-end networking (per node)	2 x 100GbE (QSFP28) or 2 X 25 GbE (SFP28)		
Infrastructure (back-end) networking (per node)	2 InfiniBand connections with QDR links or 2 x 100 GbE (QSFP28) or 2 X 25 GbE (SFP28)		

Max Power Consumption @ 200~240v (per chassis) <sup>1</sup>	1688 Watts (@25°C)
Typical thermal rating	5759 BTU/hr

<sup>1</sup>Values at <25° C are reflective of more steady state maximum values during normal operation

<sup>2</sup>20TB drive version of H7000 default with one 7.68TB cache drive while 12 and 16TB drive versions default with two 3.2TB cache drives

## Isilon H400 Hybrid Specifications

H400 ATTRIBUTES & OPTIONS	2 TB HDD	4 TB HDD	8 TB HDD	12 TB HDD	16 TB HDD
Chassis capacity	120 TB	240 TB	480 TB	720 TB	960 TB
HDD drives (3.5") per chassis	60				
Self-encrypting drive (SED HDD) FIPS140-2 compliant option	Yes				
Operating system	OneFS 8.1 or later except for self-encrypting drive options which require OneFS 8.1.0.1 or later.				
Number of nodes per chassis	4				
ECC memory (per node)	64 GB				
Cache (per Node) solid state drives (SSD) (800 GB, 1.6 TB, or 3.2 TB)	1 or 2				
Front-end networking (per node)	2 x 10GbE (SFP+) or 2 x 25GbE (SFP28)				
Infrastructure (back-end) networking (per node)	2 InfiniBand connections with QDR links or 2 x 10 GbE (SFP+)				
Max Power Consumption @ 200~240v (per chassis) <sup>1</sup>	1120 Watts (@25°C)				
Typical thermal rating	3800 BTU/hr				

<sup>1</sup>Values at <25° C are reflective of more steady state maximum values during normal operation

## Isilon H500 Hybrid Specifications

H500 ATTRIBUTES & OPTIONS	2 TB HDD	4 TB HDD	8 TB HDD	12 TB HDD	16 TB HDD
Chassis capacity	120 TB	240 TB	480 TB	720 TB	960 TB
HDD drives (3.5") per chassis	60				
Self-encrypting drive (SED HDD) FIPS 140-2 compliant option	Yes				
Operating system	OneFS 8.1 or later except for self-encrypting drive options which require OneFS 8.1.0.1 or later.				
Number of nodes per chassis	4				

ECC memory (per node)	128 GB
Cache (per node) Solid state drives (SSD) (1.6 TB or 3.2 TB)	1 or 2
Front-end networking (per node)	2 x 10GbE (SFP+) or 2 x 25GbE (SFP28) or 2 x 40GbE (QSFP+)
Infrastructure (back-end) networking (per node)	2 InfiniBand connections with QDR links or 2 x 40GbE (QSFP+)
Max Power Consumption @ 200~240v (per chassis) <sup>1</sup>	1330 Watts (@25°C)
Typical thermal rating	4,540 BTU/hr

<sup>1</sup>Values at <25° C are reflective of more steady state maximum values during normal operation

## Isilon H5600 Hybrid Specifications

H5600 ATTRIBUTES & OPTIONS	10 TB HDD	12 TB HDD	16 TB HDD
Raw chassis capacity	800 TB	960 TB	1.28 PB
HDD drives (3.5") per chassis		80	
Self-encrypting drive (SED HDD) FIPS 140-2 compliant option		Yes	
Operating system	OneFS 8.2.2 or later.		
Number of nodes per chassis	4		
ECC memory (per node)	256 GB		
Cache (per node) solid state drives (SSD) (3.2 TB only)	1 or 2	2	
Front-end networking (per node)	2 x 10GbE (SFP+) or 2 x 25GbE (SFP28) or 2 x 40GbE (QSFP+)		
Infrastructure (Back-End) networking (per node)	2 InfiniBand connections with QDR links or 2 x 40GbE (QSFP+)		
Max Power Consumption @ 200~240v (per chassis) <sup>1</sup>	1668 Watts (@25°C)		
Typical thermal rating	5628 BTU/hr		

<sup>1</sup>Values at <25° C are reflective of more steady state maximum values during normal operation

## Isilon H600 Hybrid Specifications

H600 ATTRIBUTES & OPTIONS	600 GB SAS	1.2 TB SAS
Chassis capacity	72 TB	144 TB
SAS drives (2.5") per chassis	120	

H600 ATTRIBUTES & OPTIONS		600 GB SAS	1.2 TB SAS
Self-encrypting drive (SED (SAS) FIPS 140-2 compliant option		Yes	
Operating system		OneFS 8.1 or later except for self-encrypting drive options which require OneFS 8.1.0.1 or later	
Number of nodes per chassis		4	
ECC memory (per node)		256 GB	
Cache (per node) solid state drives (SSD) (1.6 TB or 3.2 TB)		1 or 2	
Front-end networking (per node)		2 x 10GbE (SFP+) or 2 x 25GbE (SFP28) or 2 x 40GbE (QSFP+)	
Infrastructure (back-end) networking (per node)		2 InfiniBand connections with QDR links or 2 x 40GbE (QSFP+)	
Max Power Consumption @ 200~240v (per chassis) <sup>1</sup>		1700 Watts (@25°C)	
Typical thermal rating		5840 BTU/hr	

<sup>1</sup>Values at <25° C are reflective of more steady state maximum values during normal operation

CLUSTER ATTRIBUTES	H400	H500	H5600	H600	H700	H7000
Number of chassis	1 to 63					
Number of nodes	4 to 252					
Raw cluster capacity	120 TB to 60.4 PB	120 TB to 60.4 PB	800 TB to 80.6 PB	72 TB to 9 PB	120 TB to 75.6 PB	960 TB to 100.8 PB
Rack units	4 to 252					

## PowerScale Attributes

PRODUCT ATTRIBUTES	
Scale-out architecture	Distributed fully symmetric clustered architecture that combines modular storage with OneFS operating system in a single volume, single namespace, and single filesystem
Modular design	Four self-contained Isilon or PowerScale nodes include server, software, HDDs and SSDs in a 4U rack-mountable chassis. All nodes can be integrated into existing PowerScale and Isilon clusters with backend Ethernet or InfiniBand connectivity

## PRODUCT ATTRIBUTES

Scalability	A cluster can scale up to 252 nodes. A minimum number of hybrid nodes per cluster is four for PowerScale and four for Isilon. Add nodes to scale performance and capacity. A single cluster can deliver up to 186PB raw capacity.
High availability	No-single-point-of-failure. Self-healing design protects against disk or node failure; includes back-end intra-cluster failover
Operating system	PowerScale OneFS distributed file system creates a cluster with a single file system and single global namespace. It is fully journaled, fully distributed, and has a globally coherent write/read cache
Data protection	FlexProtect file-level striping with support for N+1 through N+4 and mirroring data protection schemes
2-way NDMP	Supports two ports of Fibre Channel (8G) that allows for two-way NDMP connections and two ports of standard 10GbE connectivity
Data retention	SmartLock policy-based retention and protection against accidental deletion
Security	File system audit capability and STIG hardening to improve security and control of your storage infrastructure and address regulatory compliance requirements. PowerScale Cyber Protection powered by Superna Ransomware Defender can be included
Efficiency	SmartDedupe data deduplication option, which can reduce storage requirements. Inline data reduction and compression available on F200, F600, F900, F810, H5600, H700, H7000, A300 and A3000 nodes
Automated storage tiering	Policy-based automated tiering options including SmartPools and CloudPools software to optimize storage resources and lower costs
Network protocol support	NFSv3, NFSv4, NFS Kerberized sessions (UDP or TCP), SMB1 (CIFS), SMB2, SMB3, SMB3-CA, Multichannel, HTTP, FTP, NDMP, SNMP, LDAP, HDFS, S3, ADS, NIS reads/writes
Data replication	SyncIQ fast and flexible one-to-many file-based asynchronous replication between clusters. SmartSync provides flexible file to file and file to object data movement

## ENVIRONMENTAL SPECIFICATIONS – POWER

**Isilon H400, H500:** Dual-redundant, hot-swappable 1050W (low line) 1100W (high line) power supplies with power factor correction (PFC); rated for input voltages 90 - 130 VAC (low line) and 180-264 VAC (high line)

Power factor and efficiency rate for **H400, H500**

System Load	Efficiency	PF
10%	86.00%	0.918
20%	92.95%	0.967
30%	93.93%	0.970
40%	94.41%	0.972
50%	94.49%	0.981
60%	94.11%	0.986
70%	94.04%	0.990
80%	93.86%	0.992
90%	93.63%	0.995
100%	93.25	0.996

**H5600, H600 and H7000:** Dual-redundant, hot-swappable 1450W power supplies with power factor correction (PFC); rated for input voltage 180 – 265 VAC (optional rack mount step-up transformer for 90-130 VAC input regions)

Power factor and efficiency rate for **H5600, H600 and H7000**

System Load	Efficiency	PF
10%	89.74%	0.933
20%	94.28%	0.982
30%	95.02%	0.990
40%	95.19%	0.994
50%	95.11%	0.996
60%	94.77%	0.997
70%	94.50%	0.998
80%	94.13%	0.998
90%	93.66%	0.998
100%	92.93%	0.998

CFM – Volume of airflow; cubic feet/minute

H5600, H7000: each Node 60CFM, total chassis 240CFM (max.)

H400, H500, H600, H700: each Node 70CFM, total chassis 280CFM (max)

## OPERATING ENVIRONMENT

Compliant with ASHRAE A3 data center environment guidelines

### DIMENSIONS / WEIGHT:

H400, H500, H600 and H700:

- Height: 7" (17.8 cm); Width: 17.6" (44.8 cm);
- Depth (front NEMA rail to rear 2.5" SSD cover ejector): 35.8" (91.0 cm);
- Depth (front of bezel to rear 2.5" SSD cover ejector): 37.6" (95.5 cm)

H5600 and H7000:

- Height: 7" (17.8 cm); Width: 17.6" (44.8 cm);
- Depth: (front NEMA rail to rear 2.5" SSD cover ejector): 40.4" (102.6 cm);
- Depth: (front of bezel to rear 2.5" SSD cover ejector): 42.2" (107.1 cm);

The following max weights per Chassis/node:

- H400: 245 lbs. (111.1 kg)
- H500: 250 lbs. (113.4 kg)
- H5600: 285 lbs. (129.3 kg)
- H600: 215 lbs. (97.5 kg)
- H700: 261 lbs. (118.4 kg)
- H7000: 311.7 lbs. (141.4 kg)

## MINIMUM SERVICE CLEARANCES

Front: 40" (88.9 cm), rear: 42" (106.7 cm)

## Safety and EMI Compliance

### Statement of Compliance

This Information Technology Equipment is compliant with the electromagnetic compatibility and product safety regulations/standards required by the countries in which the product is sold. Compliance is based on FCC part 15, CISPR22/CISPR24 and EN55022/EN55024 standards, including applicable international variations. Compliant Class A products are marketed for use in business, industrial, and commercial environments. Product Safety compliance is based on IEC 60950-1 and EN 60951-1 standards, including applicable national deviations.

This Information Technology Equipment is in compliance with EU RoHS Directive 2011/65/EU.

The individual devices used in this product are approved under a unique regulatory model identifier that is affixed to each individual device rating label, which may differ from any marketing or product family name in this datasheet.



PowerScale H700 and H7000 nodes are Energy Star compliant.

For additional information see <http://support.dell.com> under the Safety & EMI Compliance Information tab.

### Take the next step

Contact your Dell sales representative or authorized reseller to learn more about how PowerScale scale-out NAS storage can benefit your organization.



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