

Site Requirements Guide

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Table of Contents

	Preface	v
Chapter 1	Site Preparation	1
	Required tools and equipment	2
	System connectivity requirements	3
	Circuit breaker, power outlet, and console pinout requirements	8
Chapter 2	Hardware Characteristics	13
	FAS systems, SA systems, and V-Series systems/gFiler gateways	14
	FAS250 systems	16
	FAS270 systems and GF270c gateways	18
	FAS900 series systems and GF900 series gateways	20
	FAS2000 series systems	22
	FAS30xx/V30xx series systems	30
	FAS31xx/V31xx series systems	37
	FAS6000/V6000 series systems	42
	SA systems	45
	SA200 system	46
	SA300 system	50
	SA600 system	52
	NearStore systems	54
	VTL appliances.	55
	Disk shelves.	58
	DS14 series disk shelves	59
	System cabinets.	66
	42-unit cabinets.	67
	Third-party switches	70
Chapter 3	System Setup Worksheets.	71
	System setup worksheet	72

Appendix A	Feature Update Record	75
	Index	77

Preface

About this guide

This guide describes hardware platform characteristics, electrical, cooling, and space requirements. It also contains system setup worksheets to aid you in setting up your new system.

Audience

This guide is for both end-users and Professional Service personnel.

Command conventions

You can enter system commands on the system console or from any client that can obtain access to the system using a Telnet session. In examples that illustrate commands executed on a UNIX® workstation, the command syntax and output might differ, depending on your version of UNIX.

Formatting conventions

The following table lists different character formats used in this guide to set off special information.

Formatting convention	Type of information
<i>Italic type</i>	◆ Words or characters that require special attention. ◆ Placeholders for information you must supply. For example, if the guide requires you to enter the <code>fcstest adaptername</code> command, you enter the characters “fcstest” followed by the actual name of the adapter. ◆ Book titles in cross-references.
Monospaced font	◆ Command and daemon names. ◆ Information displayed on the system console or other computer monitors. ◆ The contents of files.
Bold monospaced font	Words or characters you type. What you type is always shown in lowercase letters, unless your program is case-sensitive and uppercase letters are necessary for it to work properly.

Special messages

This guide contains special messages that are described as follows:

Attention

A note contains important information that helps you install or operate the system efficiently.

Caution

A caution contains instructions that you must follow to avoid damage to the equipment, a system crash, or loss of data.

WARNING

A warning contains instructions that you must follow to avoid personal injury.

About this chapter This chapter describes the tools you need and the system connection, circuit breaker, and outlet requirements for your site.

Topics in this chapter This chapter discusses the following topics:

- ◆ “Required tools and equipment” on page 2
- ◆ “System connectivity requirements” on page 3
- ◆ “Circuit breaker, power outlet, and console pinout requirements” on page 8

Required tools and equipment

Required tools and equipment

Prior to receiving your hardware, make sure that you have the appropriate tools and equipment assembled and ready to use:

- ◆ Pallet jack, forklift, or hand truck, depending on what you receive
- ◆ #1 and #2 Phillips head screwdrivers and a flathead screwdriver for cable adapters
- ◆ ASCII terminal (also referred to as an ANSI terminal) or Serial console
- ◆ Null modem cable (optional)

Attention

If the DB-9 to DB-9 straight-through serial cable for an ASCII terminal connection provided with your system is not compatible with your terminal connector, you need a null modem cable.

WARNING

Three people are required to install FAS2000 series systems, FAS900 series systems, GF900 series gateways, FAS6000 series systems, and NearStore/VTL storage engines when both power supplies are installed. Two people are required to install all other storage systems and disk shelves safely into a rack or System Cabinet.

Additional tools necessary for -48V DC power connections

If you ordered a -48V DC version of your appliance, you need the following -48V DC power supply cable tools and equipment to fabricate the three-way cables required for DC power connections:

- ◆ Wire-stripper
- ◆ Soldering tool
- ◆ Pliers
- ◆ 12 AWG (2 mm diameter) x 3C copper wire (Wire length is determined by your environment.)

Attention

Do not mix different AC with DC power supplies in your appliance.

System connectivity requirements

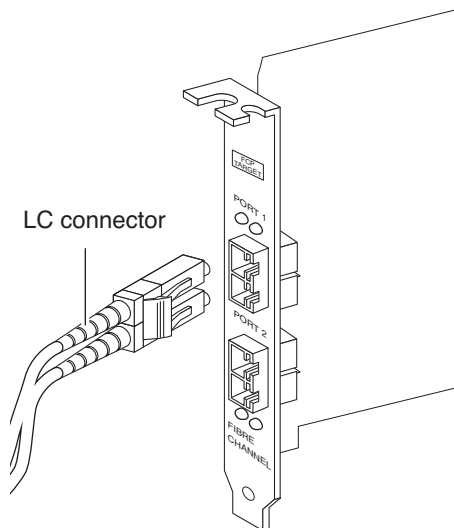
Types of connectivity

Your system requires the following types of connections:

- ◆ Fibre Channel—Connects your appliance to disk shelves, Fibre Channel switches, tape backup devices, and to other storage devices. They can connect through the following media:
 - ❖ Copper
 - ❖ Fiber
- ◆ Ethernet—Connects your appliance to an Ethernet network through the following media:
 - ❖ Copper
 - ❖ Fiber

Fibre Channel connectivity

Your appliance connects to disk shelves, Fibre Channel switches, tape backup devices, and other storage through onboard ports or adapter ports. The following illustration shows a typical LC connector used to connect Fibre Channel devices.



Fibre Channel connectivity

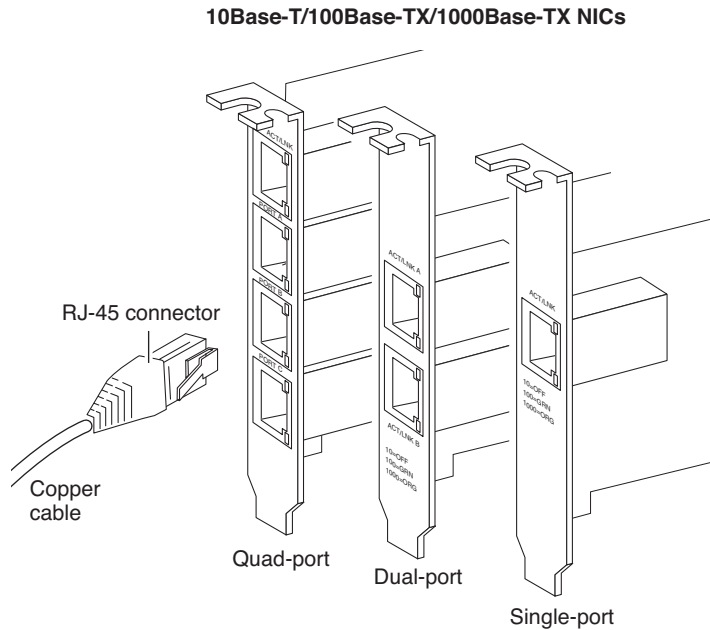
The following table lists maximum distances supported by 50 micron multimode fiber optic cables, with LC or SC connectors, connected to dual-port or quad-port Fibre Channel NICs.

Wavelength (Nanometers)	Core size (microns)	Modal Bandwidth (MHz/km)	Distance (Meters)	Card (speed)
850	50	500	500	1 Gb
			300	2 Gb
			150	4 Gb
		2000	860	1 Gb
			500	2 Gb
			270	4 Gb

Ethernet connectivity

Your appliance connects to a GbE network through either onboard ports or GbE network interface cards (NICs) which support either copper or fiber cabling.

Copper GbE cabling and NICs: The cabling and network requirements are for GbE and 10GbE networks using copper cabling.



Types: Single-port, dual-port, quad-port

Connector type: RJ-45 for all

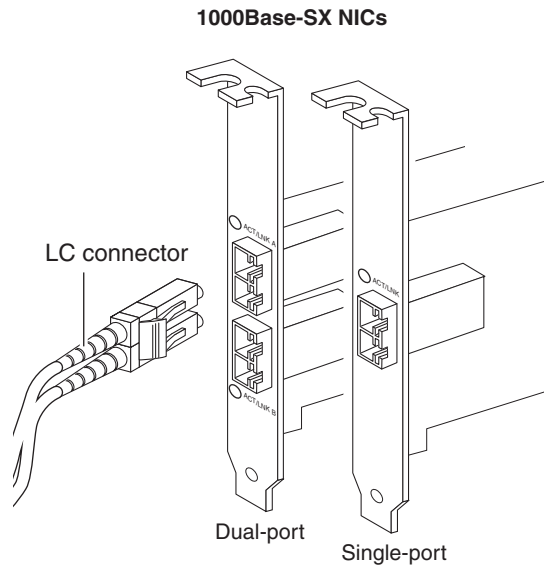
Cable type: Category 5, Category 5E or Catageory 6 unshielded four-pair cable for 10/100-T/100BASE-TX/1000BASE-TX

Note

Category 5 cables that do not have four-pair wires do not work properly with 10/100-T/100BASE-TX/1000BASE-TX speed networks. Use Category 6 cables for these networks.

Maximum distance: 100m

Fiber GbE cabling and NICs: The following cabling and network requirements are for GbE networks using optical cabling.



The following table lists maximum distances supported by 50 or 62.5 micron multimode fiber optic cables, with LC or LC duplex connectors for the 1000BASE-SX NICs, connected to single-port or dual-port Fibre Channel GbE NICs.

Wavelength (Nanometers) MM laser	Core size (microns)	Modal Bandwidth (MHz/km)	Distance (Meters)	Card type
850	50	500	550	1000BASE-SX
	62.5	160	220	
	62.5	200	275	
	62.5	200	33	
	50	2,000	300	

**Using older cables
with PCI-X and PCIe
10GBASE-SR cards**

Do not use less than the recommended 2,000 Mhz/km bandwidth for 10GBASE-SR cards. The following table lists maximum distances supported by some more common cable bandwidths.

Wavelength (Nanometers)	Core size (microns)	Modal Bandwidth (MHz/km)	Distance (Meters)
850	50	2,000	300

Circuit breaker, power outlet, and console pinout requirements

About the requirements

NEMA: If your equipment is mounted in a rack, the total number of circuit breakers required for your equipment is based on the current draw. You should not load a circuit beyond 80% of the rated limit for the circuit.

For example, if you have a 20A circuit, you should load it to no more than 16A of draw.

IEC: If your equipment is mounted in a rack, the total number of circuit breakers required for your equipment is based on the current draw.

For example, if you have a 16A circuit, you should load it to no more than 16A of draw.

Attention

Overloading circuit breakers can lead to tripped breakers or power brownouts that can cause system errors.

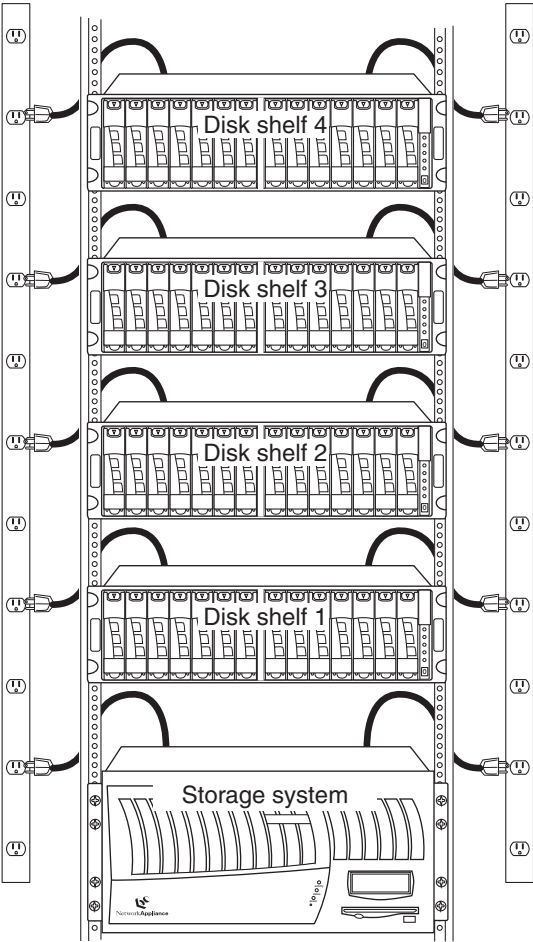
Typical AC power breaker requirements

The following illustration displays the redundant power configuration of four DS14 disk shelves and one controller. In this example, two circuits at 200 to 240V AC (four disk shelves and one controller per circuit) are required.

The conditions stated in the following illustration might not meet the requirements of your site. Use this guide to determine the requirements for your hardware.

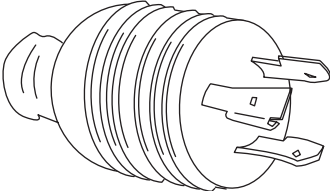
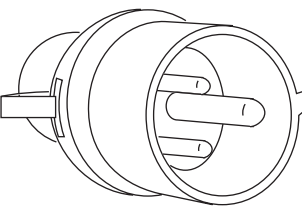
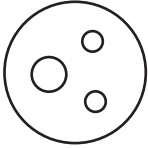
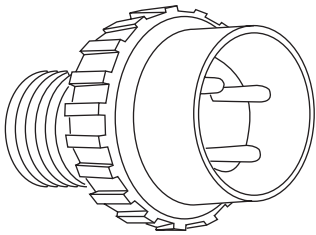
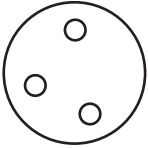
Power strip for
primary power

Power strip for
redundant power



**System cabinet
power cord plugs**

The following table lists system cabinet power cord plugs.

Region	Power cord	Plug	Socket view
U.S.A. Canada	NEMA L6-30 North America NEMA L6-20 North America	 Note _____ NEMA L6-20 is slightly smaller in dimension than the NEMA L6-30. _____	
Europe Asia Central America South America	IEC309-30/32 International IEC309-16 International	 Note _____ IEC 309-16 is slightly smaller in dimension than the IEC309-30/32. _____	
Australia New Zealand	AS/NZS3123-20 Australia		

**System cabinet
power cord length**

The length of a system cabinet power cord is 10 feet (3.05m) or 15 feet (4.57m).

Console port adapter pinout

The following table lists the pinout configuration for the RJ-45 to DB-9 adapter shipped with the systems.

RJ-45	Signal	DB-9 (Male connector)
1 [not connected]		
2 [not connected]		
3 (connected to pin 3 on DB-9)	TXD	3 (connected to pin 3 on RJ-45)
4 (connected to pin 5 on DB-9)	GND	5 (connected to pin 4 on RJ-45)
5 [not connected]		
6 (connected to pin 2 on DB-9)	RXD	2 (connected to pin 6 on RJ-45)
7 [not connected]		[not connected] 1
8 [not connected]		[not connected] 4
		[not connected] 6 through 9

ASCII terminal console wiring

The following table lists the RJ-45 connection pinout for the ASCII terminal console wiring.

Pin number	Signal
1	Connected to pin 8
2	Not connected
3	TXD (from system)
4	GND
5	GND
6	RXD (to system)
7	Not connected
8	Connected to Pin 1

About this chapter

This chapter tabulates hardware characteristics for the following types of hardware:

- ◆ “FAS systems, SA systems, and V-Series systems/gFiler gateways” on page 14
- ◆ “SA systems” on page 45
- ◆ “Disk shelves” on page 58
- ◆ “System cabinets” on page 66
- ◆ “Third-party switches” on page 70

FAS systems, SA systems, and V-Series systems/gFiler gateways

About this section

This section lists tabulated descriptions of the hardware characteristics, clearance, environmental, and electrical requirements for different systems.

How the measurements are made

These published system measurements are conservative. The following assumptions, conditions, and observations apply to these measurements:

- ◆ Line voltage is either 100V AC, 200V AC, or -48V DC.
- ◆ Current and power are steady state rms values.
- ◆ Heat dissipation in BTU/hour is based on Watts multiplied by 3.4129
- ◆ Measurements are taken at room ambient.
- ◆ Data is collected for each individual controller, controller module, or disk shelf, not for clustered systems or other combinations.
- ◆ Each disk shelf is fully populated with a particular drive type and speed and exercised with multiple threads of a disk stress test program.
- ◆ Controllers or controller modules with PCI slots are fully populated and are exercised with test program.
- ◆ To account for customer work loads that exceed these conditions, the total system workload is increased by 10% to obtain electrical current, power, and heat dissipation values.
- ◆ If the system configuration causes fan speed to increase or decrease, the data is collected in that mode.
- ◆ Because fan speed can vary for a given set of conditions, the worst case set of numbers is presented.
- ◆ Electrical requirements for systems containing performance accelerator modules are measured with the maximum number of these modules installed in the system.

Interpreting the electrical requirements tables

The headings for the electrical requirements tables are defined as follows:

- ◆ Worst-case—Power consumption with system running on one PSU, high fan speed, and power distributed over one power cord.
- ◆ Per PSU—Typical power needs, per PSU, for a system operating under normal conditions.
- ◆ System—Typical total power needs for two PSUs in a system operating under normal condition and power distributed over two power cords.

Converting watts to volt-amps (VA)

Use the following formula to calculate VA from watts:

$$VA = Watts/PF$$

$$PF = 0.95$$

$$Watts = \text{Watts listed in the individual tables}$$

For detailed information

For details about specific models of systems, see the following topics:

- ◆ “FAS250 systems” on page 16
- ◆ “FAS270 systems and GF270c gateways” on page 18
- ◆ “FAS900 series systems and GF900 series gateways” on page 20
- ◆ “FAS2000 series systems” on page 22
- ◆ “FAS30xx/V30xx series systems” on page 30
- ◆ “FAS31xx/V31xx series systems” on page 37
- ◆ “FAS6000/V6000 series systems” on page 42
- ◆ “SA200 system” on page 46
- ◆ “SA300 system” on page 50
- ◆ “SA600 system” on page 52

FAS250 systems

FAS250 characteristics

The following table lists the characteristics and requirements for your hardware.

Physical characteristics:

Weight	With disk drives	77 lbs (35 kg)
	Empty	50.6 lbs (23 kg)
Rack units		3
Height	Rack-mount	5.25 in. (13.3 cm)
	Tower	20.3 in. (51.6 cm)
Width	Rack-mount	17.6 in. (44.7 cm)
	Tower	10.4 in. (26.4 cm)
Depth	Rack-mount	20 in. (50.8 cm)
	Tower	20 in. (50.8 cm)

Clearance dimensions:

Front—cooling	All versions	6 in. (15.3 cm)
Rear—cooling	Tower	12 in. (30.5 cm)
	Two-post rack	19 in. (48.3 cm)
	Four-post rack	12 in. (30.5 cm)
Front—maintenance	Tower	25 in. (63.5 cm)
	Two-post rack	25 in. (63.5 cm)
	Four-post rack	25 in. (63.5 cm)

Rear—maintenance	Tower	12 in. (30.5 cm)
	Two-post rack	12 in. (30.5 cm)
	Four-post rack	12 in. (30.5 cm)

Environmental requirements:

Operating temperature range	41° F to 104° F (5° C to 40° C)
Nonoperating temperature range	-40° F to 140° F (-40° C to 60° C)
Relative humidity	20 to 80% noncondensing
Acoustic level	58 dBA @ 23° C

Electrical requirements:

Input voltage		100 to 120V			200 to 240V		
	Drives	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
			Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	10K	2.84	1.74	1.71	1.36	0.86	1.71
	15K	3.27	2.0	3.99	1.65	1.01	2.01
Input power measured, W	10K	283	172.5	345	270	165	330
	15K	326	198.5	397	326	196	392
Thermal dissipation, BTU/hr	10K	964	589	1,178	919	562.5	1,125
	15K	1,110	677	1,354	1,110	667.5	1,335
Input power frequency, Hz		50 to 60					

FAS systems and V-Series systems/gFiler gateways
FAS270 systems and GF270c gateways

**FAS270 and GF270c
characteristics**

The following table lists the characteristics and requirements for your hardware.

Physical characteristic:

Weight	With disk drives	77 lbs (35 kg)
	Empty	50.6 lbs (23 kg)
Rack units		3
Height		5.25 in. (13.3 cm)
Width		17.6 in. (44.8 cm)
Depth		20 in. (50.9 cm)

Clearance dimensions:

Front—cooling	All versions—two- post rack and four-post rack	6 in. (15.3 cm)
Rear—cooling		12 in. (30.5cm)
Front—maintenance		25 in. (63.5 cm)
Rear—maintenance		12 in. (30.5 cm)

Environmental requirements:

Operating temperature range	41° F to 104° F (5° C to 40° C)
Nonoperating temperature range	-40° F to 149° F (-40° C to 60° C)
Relative humidity	20 to 80% noncondensing
Acoustic level	58 dBA@ 23° C

FAS270 electrical requirements:

Input voltage		100 to 120V			200 to 240V		
	Drives	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
			Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	10K	3.12	1.88	3.76	1.52	0.92	1.83
	15K	3.83	2.15	4.30	1.83	1.04	2.07
Input power measured, W	10K	311	187.5	375	299	177.5	355
	15K	382	214.5	429	361	202.5	405
Thermal dissipation, BTU/hr	10K	1,062	639.5	1,279	1,020	606	1,212
	15K	1,302	731.5	1,463	1,230	690	1,380
Input power frequency, Hz		50 to 60					

GF270 electrical requirements:

Input voltage	100 to 120V			200 to 240V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input power measured, W	218	123	246	210	119	238
Thermal dissipation, BTU/hr	743	420	840	716	405	810
Input power frequency, Hz	50 to 60					

FAS systems and V-Series systems/gFiler gateways

FAS900 series systems and GF900 series gateways

**FAS900 series and
GF900 series
characteristics**

The following table lists the characteristics and requirements for your hardware.

Physical characteristics			
	Weight		105 lbs (47.7 kg)
	Rack units		6
	Height		10.3 in. (26.2 cm)
	Width		17 in. (43.2 cm)
	Depth		21.3 in. (54.1 cm)
Clearance dimensions			
	Front—cooling	All versions— two-post rack and four-post rack	6 in. (15.2 cm)
	Rear—cooling		12 in. (30.5 cm)
	Front—maintenance		25 in. (63.5 cm)
	Rear—maintenance		40 in. (101.6 cm)

Environmental requirements		
	Operating temperature range	50° F to 104° F (10° C to 40° C)
	Operating temperature recommended range	68° F to 77° F (20° C to 25° C)
	Nonoperating temperature range	-40° F to 158° F (-40° C to 70° C)
	Relative humidity	20 to 80% noncondensing
	Acoustic level	49.5 dBA @ 23° C 6.4 bels @ 23° C
Electrical requirements		
	Input voltage, V	100 to 240
	Input current actual, A	3.8 to 1.95
	Input power actual, W	330
	Thermal Dissipation, BTU/hr	1,126
	Input power frequency, Hz	50 to 60

FAS2000 series systems

FAS2020 system characteristics

The following table lists the characteristics and requirements for your hardware.

Physical characteristics:

Weight	60 lbs (27.215 kg) full 38 lbs (17.237 kg) empty
Rack units	2
Height	3.5 in (8.9 cm)
Width	17.6 in (44.7 cm)
Depth	22.5 in (57.2 cm)

Clearance dimensions:

Front—cooling	All versions— Two-post rack and four-post rack	6 in. (15.2 cm)
Rear—cooling		12 in. (30.5 cm)
Front of chassis— maintenance		30 in. (76.2 cm)
Rear of chassis— maintenance		36 in. (91.4 cm)

Environmental requirements:

Operating temperature range	50° F to 104° F (10° C to 40° C)
Nonoperating temperature range	-40° F to 140° F (-40° C to 60° C)
Relative humidity	20 to 80% noncondensing
Acoustic level	N/A

Electrical requirements—one controller module:

Input voltage		100 to 120V			200 to 240V		
	Drives (in GB)	Worst- case, single PSU	Typical		Worst- case, single PSU	Typical	
			Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	144 SAS	3.83	1.7	3.39	1.94	0.94	1.87
	300 SAS	4.44	1.95	3.89	2.23	1.08	2.16
	250 SATA	3.07	1.47	2.94	1.60	0.79	1.57
	500 SATA	3.22	1.55	3.09	1.68	0.81	1.61
	750 SATA	3.37	1.61	3.22	1.69	0.83	1.66
Input power measured, W	144 SAS	377	165	330	371	174	348
	300 SAS	439	191	381	431	204	407
	250 SATA	300	144	287	304	145	289
	500 SATA	319	151	301	322	147	294
	750 SATA	332	158	316	327	152.5	305
Thermal dissipation, BTU/hr	144 SAS	1,287	563	1,125	1,264	593	1,185
	300 SAS	1,497	649	1,298	1,470	669	1,338
	250 SATA	1,024	490	979	1,035	494	987
	500 SATA	1,088	514	1,028	1,099	501	1,002
	750 SATA	1,133	539	1,077	1,114	520	1,039
Input power frequency, Hz		50 to 60					

Electrical requirements—two controller modules:

Input voltage		100 to 120V			200 to 240V		
	Drives (in GB)	Worst- case, single PSU	Typical		Worst- case, single PSU	Typical	
			Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	144 SAS	4.69	2.05	4.09	2.34	1.11	2.22
	300 SAS	4.94	2.38	4.75	2.45	1.19	2.37
	250 SATA	3.82	1.86	3.72	1.91	0.93	1.86
	500 SATA	3.94	1.90	3.80	1.97	0.97	1.93
	750 SATA	4.13	1.95	3.89	2.09	0.99	1.98
Input power measured, W	144 SAS	464	200	400	452	210	419
	300 SAS	488	233	465	476	224	448
	250 SATA	377	183	365	367	173	345
	500 SATA	389	186	372	381	180	360
	750 SATA	409	191	382	404	186	372
Thermal dissipation, BTU/hr	144 SAS	1,583	683	1,365	1,542	714.5	1,429
	300 SAS	1,665	794	1,587	1,624	715	1,527
	250 SATA	1,287	623	1,245	1,253	589	1,178
	500 SATA	1,328	634	1,268	1,298	614	1,227
	750 SATA	1,395	651	1,302	1,377	634	1,268
Input power frequency, Hz		50 to 60					

Electrical requirements—one controller module, no disks:

Input voltage	100 to 120V			200 to 240V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	1.67	0.8	1.60	0.9	0.45	0.89
Input power measured, W	165	77	153	160	75	149
Thermal dissipation, BTU/hr	563	261	521	544	253	506
Input power frequency, Hz	50 to 60					

Electrical requirements—two controller modules, no disks:

Input voltage	100 to 120V			200 to 240V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	2.63	1.12	2.23	1.34	0.59	1.18
Input power measured, W	254	108	215	240	104	208
Thermal dissipation, BTU/hr	866	366	731	818	355	709
Input power frequency, Hz	50 to 60					

FAS2050 system characteristics

The following table lists the characteristics and requirements for your hardware.

Physical characteristics:

Weight	110 lbs (49.895 kg)
Rack units	4
Height	6.9 in. (17.5 cm)
Width	17.6 in. (44.7 cm)
Depth	22.5 in. (57.2 cm)

Clearance dimensions:

Front—cooling	All versions—Two-post rack and four-post rack	6 in. (15.2 cm)
Rear—cooling		12 in. (30.5 cm)
Front of chassis—maintenance		30 in. (76.2 cm)
Rear of chassis—maintenance		36 in. (91.4 cm)

Environmental requirements:

Operating temperature range	50° F to 104° F (10° C to 40° C)
Nonoperating temperature range	-40° F to 140° F (-40° C to 60° C)
Relative humidity	20 to 80% noncondensing
Acoustic level	66 dBA @ 23° C 6.6 bels @ 23° C

Electrical requirements—one controller module:

Input voltage		100 to 120V			200 to 240V		
	Drives (in GB)	Worst- case, single PSU	Typical		Worst- case, single PSU	Typical	
			Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	144 SAS	5.64	2.38	4.76	2.82	1.33	2.65
	300 SAS	6.62	2.96	5.92	3.27	1.38	2.76
	250 SATA	4.40	2.02	4.04	2.30	1.04	2.07
	500 SATA	4.64	2.18	4.36	2.33	1.09	2.17
	750 SATA	5.07	2.26	4.51	2.46	1.20	2.40
Input power measured, W	144 SAS	560	233	465	547	251	502
	300 SAS	658	292	583	636	266	523
	250 SATA	435	197	393	439	193	386
	500 SATA	459	213	425	447	204	408
	750 SATA	504	220	439	474	224	447
Thermal dissipation, BTU/hr	144 SAS	1,909	794	1,587	1,864	855	1,710
	300 SAS	2,243	994	1,988	2,165	891	1,782
	250 SATA	1,482	670	1,339	1,497	659	1,317
	500 SATA	1,564	724	1,448	1,523	696	1,392
	750 SATA	1,718	749	1,497	1,617	762	1,523
Input power frequency, Hz		50 to 60					

Electrical requirements—two controller modules:

Input voltage		100 to 120V			200 to 240V		
	Drives (in GB)	Worst- case, single PSU	Typical		Worst- case, single PSU	Typical	
			Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	144 SAS	6.31	2.84	5.68	3.09	1.45	2.89
	300 SAS	7.51	3.34	6.68	3.73	1.71	3.41
	250 SATA	5.54	2.49	4.98	2.7	1.26	2.52
	500 SATA	5.74	2.84	5.67	2.89	1.33	2.65
	750 SATA	5.91	2.74	5.47	2.97	1.39	2.77
Input power measured, W	144 SAS	628	279	558	600	275	550
	300 SAS	747	330	659	728	328	655
	250 SATA	549	244	487	518	237	474
	500 SATA	567	277	554	561	252	503
	750 SATA	585	268	536	575	262	524
Thermal dissipation, BTU/hr	144 SAS	2,142	951	1,902	2,044	938	1,876
	300 SAS	2,547	1,124	2,247	2,483	1,116	2,232
	250 SATA	1,872	831	1,662	1,767	809	1,617
	500 SATA	1,932	946	1,891	1,913	857	1,714
	750 SATA	1,996	914	1,827	1,962	893	1,785
Input power frequency, Hz		50 to 60					

Electrical requirements—one controller module, no disks:

Input voltage	100 to 120V			200 to 240V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	2.10	0.90	1.80	1.10	0.50	0.99
Input power measured, W	205	86.5	173	198	84	168
Thermal dissipation, BTU/hr	698	295	589	675	287	574
Input power frequency, Hz	50 to 60					

Electrical requirements—two controller modules, no disks:

Input voltage	100 to 120V			200 to 240V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	2.62	1.19	2.37	1.35	0.62	1.24
Input power measured, W	256	114	227	250	111	222
Thermal dissipation, BTU/hr	874	387	773	851	379	758
Input power frequency, Hz	50 to 60					

FAS systems and V-Series systems/gFiler gateways
FAS30xx/V30xx series systems

**FAS30xx/V30xx
series
characteristics**

The following table lists the characteristics and requirements for your hardware.

Physical characteristics:

Weight	68 lbs (30.84 kg)
Rack units	3
Height	5.13 in. (13 cm)
Width	17.73 in. (45.0 cm)
Depth	24 in. (60.7 cm)

Clearance dimensions:

Front—cooling	All versions— two-post rack and four-post rack	6 in. (15.2 cm)
Rear—cooling		12 in. (30.5 cm)
Front—maintenance		30 in. (76.2 cm)
Rear—maintenance		36 in. (91.4 cm)

Environmental requirements:

Operating temperature range	50° F to 104° F (10° C to 40° C)
Nonoperating temperature range	-40° F to 149° F (-40° C to 65° C)
Relative humidity	20 to 80% noncondensing
Acoustic level	53 dBA @ 23° C 6.6 bels @ 23° C

FAS3020/V3020 electrical requirements:

Input voltage	100 to 120V			200 to 240V			-40 to -60V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	3.39	1.2	2.4	1.77	0.71	1.40	8.2	2.85	5.7
Input power measured, W	336	118	236	329	115	229	328	113	226
Thermal dissipation, BTU/hr	1,144	403	805	1,122	392	783	1,118	286	771
Input power frequency, Hz	50 to 60						N/A		

FAS3040/V3040 electrical requirements:

Input voltage	100 to 120V			200 to 240V			-40 to -60V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	3.66	1.7	3.4	1.9	0.95	1.9	7.94	3.7	7.4
Input power measured, W	363	169	338	358	165	330	318	148	296
Thermal dissipation, BTU/hr	1,238	576	1,152	1,221	564	1,127	1,084	506	1,011
Input power frequency, Hz	50 to 60						N/A		

FAS3040/V3040 electrical requirements with one Performance Accelerator Module I card:

Input voltage	100 to 120V			200 to 240V			-40 to -60V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	4.21	1.82	3.63	2.21	1.04	2.07	9.74	4.12	8.21
Input power measured, W	418	178	355	417	175	350	389	164	328
Thermal dissipation, BTU/hr	1,425	606	1,212	1,422	597	1,193	1,328	560	1,119
Input power frequency, Hz	50 to 60						N/A		

FAS3050/V3050 electrical requirements:

Input voltage	100 to 120V			200 to 240V			-40 to -60V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	3.88	1.7	3.4	2.04	0.95	1.9	9.49	4.0	8.0
Input power measured, W	386	164	328	384	164	327	380	160	319
Thermal dissipation, BTU/hr	1,317	560	1,119	1,309	559	1,116	1,295	545	1,089
Input power frequency, Hz	50 to 60						N/A		

FAS3070/V3070 electrical requirements:

Input voltage	100 to 120V			200 to 240V			-40 to -60V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	4.03	1.85	3.7	2.06	1.05	2.1	10.57	4.7	9.4
Input power measured, W	400	181	362	387	178	355	423	188	376
Thermal dissipation, BTU/hr	1,365	617	1,233	1,320	606	1,212	1,442	642	1,283
Input power frequency, Hz	50 to 60						N/A		

FAS3070/V3070 electrical requirements with two Performance Accelerator Module I cards:

Input voltage	100 to 120V			200 to 240V			-40 to -60V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	4.51	2.04	4.08	2.29	1.22	2.43	10.67	4.63	9.26
Input power measured, W	449	201	402	438	208	415	427	185	370
Thermal dissipation, BTU/hr	1,530	685	1,369	1,493	707	1,414	1,455	632	1,263
Input power frequency, Hz	50 to 60						N/A		

FAS31xx/V31xx series systems

FAS31xx/V31xx series characteristics

The following table lists the characteristics and requirements for your hardware.

Physical characteristics:

Weight—one controller module	102 lbs (46.27 kg)
Weight—two controller modules	121 lbs (54.89 kg)
Rack units	6
Height	10.75 in. (27.3 cm)
Width	17.73 in. (45.0 cm)
Depth	24 in. (60.7 cm)

Clearance dimensions:

Front—cooling	All versions— two-post rack and four-post rack	6 in. (15.2 cm)
Rear—cooling		12 in. (30.5 cm)
Front—maintenance		30 in. (76.2 cm)
Rear—maintenance		36 in. (91.4 cm)

Environmental requirements:

Operating temperature range	50° F to 104° F (10° C to 40° C)
Nonoperating temperature range	-40° F to 149° F (-40° C to 65° C)
Relative humidity	20 to 80% noncondensing
Acoustic level	53 dBA @ 23° C 6.6 bels @ 23° C

FAS3140/V3140 electrical requirements—one controller module:

Input voltage	100 to 120V			200 to 240V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	3.98	1.89	3.77	1.97	0.97	1.93
Input power measured, W	396	187	373	385	183	366
Thermal dissipation, BTU/hr	1,350	636	1,272	1,313	625	1,249
Input power frequency, Hz	50 to 60					

FAS3140/V3140 electrical requirements—two controller modules:

Input voltage	100 to 120V			200 to 240V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	7.38	2.99	5.97	3.60	1.49	2.98
Input power measured, W	736	297	594	712	291	581
Thermal dissipation, BTU/hr	2,509	1,013	2,026	2,427	991	1,981
Input power frequency, Hz	50 to 60					

FAS3140/V3140 electrical requirements with two Performance Accelerator Module I cards—one controller module:

Input voltage	100 to 120V			200 to 240V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	4.14	1.98	3.96	2.05	1.02	2.03
Input power measured, W	412	197	393	400	192	384
Thermal dissipation, BTU/hr	1,405	670	1,340	1,364	655	1,309
Input power frequency, Hz	50 to 60					

FAS3140/V3140 electrical requirements with four Performance Accelerator Module I cards—two controller modules:

Input voltage	100 to 120V			200 to 240V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	7.99	3.29	6.58	3.89	1.65	3.29
Input power measured, W	796	328	655	770	321	641
Thermal dissipation, BTU/hr	2,714	1,117	2,234	2,626	1,093	2,186
Input power frequency, Hz	50 to 60					

FAS3170/V3170 electrical requirements—one controller module:

Input voltage	100 to 120V			200 to 240V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	5.07	2.37	4.74	2.52	1.19	2.38
Input power measured, W	505	235	470	493	230	459
Thermal dissipation, BTU/hr	1,722	801	1,602	1,680	782	1,564
Input power frequency, Hz	50 to 60					

FAS3170/V3170 electrical requirements—two controller modules:

Input voltage	100 to 120V			200 to 240V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	9.74	4.07	8.14	4.69	2.02	4.03
Input power measured, W	969	405	810	930	394	788
Thermal dissipation, BTU/hr	3,305	1,381	2,761	3,170	1,343	2,686
Input power frequency, Hz	50 to 60					

FAS3170/V3170 electrical requirements with four Performance Accelerator Module I cards—one controller module:

Input voltage	100 to 120V			200 to 240V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	5.27	2.49	4.98	2.62	1.25	2.5
Input power measured, W	525	247	494	513	241	482
Thermal dissipation, BTU/hr	1,790	843	1,685	1,749	822	1,644
Input power frequency, Hz	50 to 60					

FAS3170/V3170 electrical requirements with eight Performance Accelerator Module I cards—two controller modules:

Input voltage	100 to 120V			200 to 240V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	10.54	4.49	8.98	5.08	2.22	4.44
Input power measured, W	1,048	447	894	1,006	434	868
Thermal dissipation, BTU/hr	3,574	1,525	3,049	3,430	1,480	2,960
Input power frequency, Hz	50 to 60					

FAS systems and V-Series systems/gFiler gateways
FAS6000/V6000 series systems

**FAS6000/V6000
series
characteristics**

The following table lists the characteristics and requirements for your hardware.

Physical characteristics:

Weight	122 lbs (55.34 kg)
Rack units	6
Height	10.32 in. (26.21 cm)
Width	17.53 in. (44.52 cm)
Depth (including cable management tray)	29 in. (73.66 cm)

Clearance dimensions:

Front—cooling	All versions—two-post rack and four-post rack	6 in. (15.2 cm)
Rear—cooling		12 in. (30.5 cm)
Front of chassis—maintenance		25 in. (63.5 cm)
Rear of chassis—maintenance		40 in. (102 cm)

Environmental requirements:

Operating temperature range	50° F to 104° F (10° C to 40° C)
Nonoperating temperature range	-40° F to 158° F (-40° C to 70° C)
Relative humidity	20 to 80% noncondensing
Acoustic level	56.5 dBA @ 23° C 7.0 bels @ 23° C

FAS6030/FAS6040/V6030 electrical requirements:

Input voltage	100 to 120V			200 to 240V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	9.26	2.75	5.4	4.6	1.4	2.8
Input power measured, W	922	266	531	882	255	509
Thermal dissipation, BTU/hr	3,144	906	1,812	3,008	869	1,737
Input power frequency, Hz	50 to 60					

FAS6030/FAS6040/V6030 electrical requirements with four Performance Accelerator Module I cards:

Input voltage	100 to 120V			200 to 240V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	10.15	3.03	6.05	5.06	1.65	3.29
Input power measured, W	1009	293	585	969	289	578
Thermal dissipation, BTU/hr	3,440	998	1,996	3,305	985	1,969
Input power frequency, Hz	50 to 60					

FAS6070/FAS6080/V6070 electrical requirements:

Input voltage	100 to 120V			200 to 240V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	9.72	2.8	5.6	4.84	1.45	2.9
Input power measured, W	966	274	548	928	266	532
Thermal dissipation, BTU/hr	3,293	935	1,870	3,166	908	1,816
Input power frequency, Hz	50 to 60					

FAS6070/FAS6080/V6070 electrical requirements with five Performance Accelerator Module I cards:

Input voltage	100 to 120V			200 to 240V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	12.11	3.85	7.70	5.97	2.07	4.14
Input power measured, W	1,203	376	752	1,158	368	736
Thermal dissipation, BTU/hr	4,104	1,283	2,566	3,950	1,255	2,509
Input power frequency, Hz	50 to 60					

SA systems

About this section

This section lists tabulated descriptions of the hardware characteristics, clearance requirements, environmental requirements, and electrical requirements for SA systems.

For detailed information

For details about specific models of systems, see the following topics:

- ◆ “SA200 system” on page 46
- ◆ “SA300 system” on page 50
- ◆ “SA600 system” on page 52

SA systems

SA200 system

SA200 system characteristics

The following table lists the characteristics and requirements for your hardware.

Physical characteristics:

Weight	110 lbs (49.895 kg)
Rack units	4
Height	6.9 in. (17.5 cm)
Width	17.6 in. (44.7 cm)
Depth	22.5 in. (57.2 cm)

Clearance dimensions:

Front—cooling	All versions—Two-post rack and four-post rack	6 in. (15.2 cm)
Rear—cooling		12 in. (30.5 cm)
Front of chassis—maintenance		30 in. (76.2 cm)
Rear of chassis—maintenance		36 in. (91.4 cm)

Environmental Requirements:

Operating temperature range	50° F to 104° F (10° C to 40° C)
Nonoperating temperature range	-40° F to 140° F (-40° C to 60° C)
Relative humidity	20 to 80% noncondensing
Acoustic level	66 dBA @ 23° C 6.6 bels @ 23° C

Electrical requirements—one controller module:

Input voltage		100 to 120V			200 to 240V		
	Drives (in GB)	Worst- case, single PSU	Typical		Worst- case, single PSU	Typical	
			Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	144 SAS	5.64	2.38	4.76	2.82	1.33	2.65
	300 SAS	6.62	2.96	5.92	3.27	1.38	2.76
	250 SATA	4.40	2.02	4.04	2.30	1.04	2.07
	500 SATA	4.64	2.18	4.36	2.33	1.09	2.17
	750 SATA	5.07	2.26	4.51	2.46	1.20	2.40
Input power measured, W	144 SAS	560	233	465	547	251	502
	300 SAS	658	292	583	636	266	523
	250 SATA	435	197	393	439	193	386
	500 SATA	459	213	425	447	204	408
	750 SATA	504	220	439	474	224	447
Thermal dissipation, BTU/hr	144 SAS	1,909	794	1,587	1,864	855	1,710
	300 SAS	2,243	994	1,988	2,165	891	1,782
	250 SATA	1,482	670	1,339	1,497	659	1,317
	500 SATA	1,564	724	1,448	1,523	696	1,392
	750 SATA	1,718	749	1,497	1,617	762	1,523
Input power frequency, Hz		50 to 60					

Electrical requirements—two controller modules:

Input voltage		100 to 120V			200 to 240V		
	Drives (in GB)	Worst- case, single PSU	Typical		Worst- case, single PSU	Typical	
			Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	144 SAS	6.31	2.84	5.68	3.09	1.45	2.89
	300 SAS	7.51	3.34	6.68	3.73	1.71	3.41
	250 SATA	5.54	2.49	4.98	2.7	1.26	2.52
	500 SATA	5.74	2.84	5.67	2.89	1.33	2.65
	750 SATA	5.91	2.74	5.47	2.97	1.39	2.77
Input power measured, W	144 SAS	628	279	558	600	275	550
	300 SAS	747	330	659	728	328	655
	250 SATA	549	244	487	518	237	474
	500 SATA	567	277	554	561	252	503
	750 SATA	585	268	536	575	262	524
Thermal dissipation, BTU/hr	144 SAS	2,142	951	1,902	2,044	938	1,876
	300 SAS	2,547	1,124	2,247	2,483	1,116	2,232
	250 SATA	1,872	831	1,662	1,767	809	1,617
	500 SATA	1,932	946	1,891	1,913	857	1,714
	750 SATA	1,996	914	1,827	1,962	893	1,785
Input power frequency, Hz		50 to 60					

Electrical requirements—one controller module, no disks:

Input voltage	100 to 120V			200 to 240V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	2.10	0.90	1.80	1.10	0.50	0.99
Input power measured, W	205	86.5	173	198	84	168
Thermal dissipation, BTU/hr	698	295	589	675	287	574
Input power frequency, Hz	50 to 60					

Electrical requirements—two controller modules, no disks:

Input voltage	100 to 120V			200 to 240V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	2.62	1.19	2.37	1.35	0.62	1.24
Input power measured, W	256	114	227	250	111	222
Thermal dissipation, BTU/hr	874	387	773	851	379	758
Input power frequency, Hz	50 to 60					

SA systems
SA300 system

**SA300 system
characteristics**

The following table lists the characteristics and requirements for your hardware.

Physical characteristics:

Weight	68 lbs (30.84 kg)
Rack units	3
Height	5.13 in. (13 cm)
Width	17.73 in. (45.0 cm)
Depth	24 in. (60.7 cm)

Clearance dimensions:

Front—cooling	All versions— two-post rack and four-post rack	6 in. (15.2 cm)
Rear—cooling		12 in. (30.5 cm)
Front—maintenance		30 in. (76.2 cm)
Rear—maintenance		36 in. (91.4 cm)

Environmental requirements:

Operating temperature range	50° F to 104° F (10° C to 40° C)
Nonoperating temperature range	-40° F to 149° F (-40° C to 65° C)
Relative humidity	20 to 80% noncondensing
Acoustic level	53 dBA @ 23° C 6.6 bels @ 23° C

SA300 electrical requirements:

Input voltage	100 to 120V			200 to 240V			-40 to -60V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	4.03	1.85	3.7	2.06	1.05	2.1	10.57	4.7	9.4
Input power measured, W	400	181	362	387	178	355	423	188	376
Thermal dissipation, BTU/hr	1,365	617	1,233	1,320	606	1,212	1,442	642	1,283
Input power frequency, Hz	50 to 60						N/A		

SA300 electrical requirements with two Performance Accelerator Module I cards:

Input voltage	100 to 120V			200 to 240V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	4.51	2.04	4.08	2.29	1.22	2.43
Input power measured, W	449	201	402	438	208	415
Thermal dissipation, BTU/hr	1,530	685	1,369	1,493	707	1,414
Input power frequency, Hz	50 to 60					

SA systems

SA600 system

SA600 system characteristics

The following table lists the characteristics and requirements for your hardware.

Physical characteristics:

Weight	122 lbs (55.34 kg)
Rack units	6
Height	10.32 in. (26.21 cm)
Width	17.53 in. (44.52 cm)
Depth (including cable management tray)	29 in. (73.66 cm)

Clearance dimensions:

Front—cooling	All versions—two-post rack and four-post rack	6 in. (15.2 cm)
Rear—cooling		12 in. (30.5 cm)
Front of chassis—maintenance		25 in. (63.5 cm)
Rear of chassis—maintenance		40 in. (102 cm)

Environmental requirements:

Operating temperature range	50° F to 104° F (10° C to 40° C)
Nonoperating temperature range	-40° F to 158° F (-40° C to 70° C)
Relative humidity	20 to 80% noncondensing
Acoustic level	56.5 dBA @ 23° C 7.0 bels @ 23° C

SA600 electrical requirements:

Input voltage	100 to 120V			200 to 240V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	9.72	2.8	5.6	4.84	1.45	2.9
Input power measured, W	966	274	548	928	266	532
Thermal dissipation, BTU/hr	3,293	935	1,870	3,166	908	1,816
Input power frequency, Hz	50 to 60					

SA600 electrical requirements with five Performance Accelerator Module I cards:

Input voltage	100 to 120V			200 to 240V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	12.11	3.85	7.70	5.97	2.07	4.14
Input power measured, W	1,203	376	752	1,158	368	736
Thermal dissipation, BTU/hr	4,104	1,283	2,566	3,950	1,255	2,509
Input power frequency, Hz	50 to 60					

NearStore systems

About this section	This section lists tabulated descriptions of the hardware characteristics, clearance requirements, environmental requirements, and electrical requirements for NearStore systems.
For detailed information	For details about specific models of NearStore systems, see “VTL appliances” on page 55.

VTL appliances

VTL appliance characteristics

The following table lists the characteristics and requirements for your hardware.

Physical characteristics:

Weight	Storage engine	75 lbs (34.019 kg)
	DS14mk2 AT	77 lbs (35 kg)
	Fully loaded in system cabinet	999 lbs (453.14 kg)
Rack units	Storage engine	3
	DS14mk2 AT	3
Height	Storage engine	5.13 in. (13 cm)
	DS14mk2 AT	5.25 in. (13.3 cm)
Width	Storage engine	17.68 in. (44.9 cm)
	DS14mk2 AT	17.6 in. (44.8 cm)
Depth	Storage engine	24.33 in. (61.8 cm)
	DS14mk2 AT	21.75 in. (55.2 cm)

Clearance dimensions:

Front	Storage engine and DS14mk2 AT	25 in. (63.5 cm)
Rear—cooling		12 in. (30.5 cm)
Bezel		1.5 in. (3.8 cm)
Rear—maintenance		40 in. (101.6 cm)
Vertical rack space		10.5 in. (26.7 cm)
Vertical rack space between storage engine and disk shelf		1.5 in. (3.8 cm)

Environmental requirements:

Operating temperature maximum range	Storage engine	50° F to 104° F (10° C to 40° C)
	DS14mk2 AT	41° F to 104° F (5° C to 40° C)
Operating temperature recommended range	Storage engine and DS14mk2 AT	68° F to 77° F (20° C to 25° C)
Nonoperating temperature range	Storage engine and DS14mk2 AT	-40° F to 140° F (-40° C to 60° C)
Relative humidity	Storage engine	20 to 80% noncondensing
	DS14mk2 AT	
Acoustic level	Storage engine	54 dBA @ 23° C
	DS14mk2 AT	48.7 dBA at 25° C

VTL300/700/1400 electrical requirements:

Input voltage	100 to 120V			200 to 240V			-40 to -60V		
	Worst-case, single PSU	Typical		Worst-case, single PSU	Typical		Worst-case, single PSU	Typical	
		Per PSU	System, two PSUs		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	4.03	1.85	3.7	2.06	1.05	2.1	10.57	4.7	9.4
Input power measured, W	400	181	362	387	178	355	423	188	376
Thermal dissipation, BTU/hr	1,365	617	1,233	1,320	606	1,212	1,442	642	1,283
Input power frequency, Hz	50 to 60						N/A		

Disk shelves

About this section

This section lists tabulated descriptions of the hardware characteristics, clearance requirements, environmental requirements, and electrical requirements for disk shelves.

Note

NearStore VTL system disk shelf information is listed in the section “FAS systems, SA systems, and V-Series systems/gFiler gateways” on page 14.

For detailed information

For details about specific models of disk shelves, see “DS14 series disk shelves” on page 59.

Disk shelves

DS14 series disk shelves

**DS14 series
characteristics**

The following table lists the characteristics and requirements for your hardware.

Note_____

The DS14 series includes the DS14, DS14mk2 FC, DS14mk4 FC with an ESH, ESH2, or ESH4 (ESH refers to ESH 2 and ESH4), and DS14mk2 AT.

Physical characteristics:

Weight	With disk drives—DS14mk2 FC, DS14mk4	77 lbs (35 kg)
	With disk drives—DS14mk2 AT	68 lbs (30.8 kg)
	Empty	50.06 lbs (23 kg)
Rack units		3
Height		5.25 in. (13.3 cm)
Width		17.6 in. (44.7 cm)
Depth	DS14mk2 FC/DS14mk4 FC	20 in. (50.8 cm)
	DS14mk2 AT	22 in. (55.2 cm)

Clearance dimensions:

Front—cooling	All versions—two-post rack and four-post rack	6 in. (15.3 cm)
Rear—cooling and maintenance		12 in. (30.5 cm)
Front—maintenance		25 in. (55.9 cm)

Environmental requirements:

Operating temperature range	41° F to 104° F—(5° C to 40° C)
Nonoperating temperature range	-40° F to 140° F—(-40° C to 60° C)
Relative humidity	20 to 80% noncondensing
Acoustic level	58 dBA @ 23° C

DS14mk2 AT, 7.2K speed electrical requirements:

Input voltage		100 to 120V			200 to 240V			-40 to -60V		
	Size GB	Worst -case, single PSU	Typical		Worst -case, single PSU	Typical		Worst -case, single PSU	Typical	
			Per PSU	System, two PSUs		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	250	2.79	1.36	2.72	1.38	0.70	1.39	7.38	2.84	5.67
	320	2.85	1.56	3.12	1.43	0.78	1.56	7.4	2.82	5.64
	500	2.94	1.45	2.9	1.43	0.74	1.47	8.04	3.11	6.22
	750	3.42	1.61	3.22	1.63	0.53	1.60	8.42	6.63	7.25
	1 TB	3.15	1.55	3.10	1.55	0.78	1.56	8.33	3.24	6.48
Input power measured, W	250	279	136	271	271	132	264	295	114	227
	320	284	155	310	283	152	304	296	113	226
	500	293	144	288	286	142	283	322	125	249
	750	341	161	321	323	155	309	337	145	290
	1 TB	315	154	308	309	150	300	333	130	259
Thermal dissipation, BTU/hr	250	953	462	923	923	450	900	1,007	387	773
	320	968	529	1,058	964	518	1,035	1,009	385	769
	500	998	492	983	975	482	964	1,097	424	848
	750	1,163	548	1,095	1,103	527	1,054	1,148	495	989
	1 TB	1,073	525	1,050	1,054	512	1,024	1,136	442	884
Input power frequency, Hz		50 to 60						N/A		

DS14mk2 FC, 10K speed electrical requirements:

Input voltage		100 to 120V			200 to 240V			-40 to -60V		
	Size GB	Worst -case, single PSU	Typical		Worst -case, single PSU	Typical		Worst -case, single PSU	Typical	
			Per PSU	System, two PSUs		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	72	3.31	1.72	3.43	1.61	0.84	1.67	7.61	3.02	6.04
	144	3.56	1.72	3.43	1.75	0.87	1.73	9.23	3.63	7.26
	288	4.0	1.95	3.89	1.96	0.95	1.9	10.54	3.73	7.45
Input power measured, W	72	330	171	342	318	162	323	305	121	242
	144	356	171	342	348	167	334	369	145	290
	288	399	194	387	420	187	374	422	149	298
Thermal dissipation, BTU/hr	72	1,125	584	1,167	1,084	552	1,103	1,039	413	825
	144	1,215	584	1,167	1,185	570	1,140	1,259	495	990
	288	1,362	660	1,320	1,433	638	1,275	1,437	508	1,016
Input power frequency, Hz		50 to 60						N/A		

DS14mk2 FC, 15K speed electrical requirements:

Input voltage		100 to 120V			200 to 240V			-40 to -60V		
	Size GB	Worst -case, single PSU	Typical		Worst -case, single PSU	Typical		Worst -case, single PSU	Typical	
			Per PSU	System, two PSUs		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	72	3.41	1.82	3.63	1.67	0.89	1.78	10.04	3.98	7.95
	144	3.96	1.88	3.75	1.93	0.94	1.88	10.40	4.13	8.25
	288	4.43	2.16	4.32	2.23	1.07	2.13	11.98	4.36	8.72
Input power measured, W	72	340	181	362	331	173	345	402	159	318
	144	395	187	373	383	183	365	416	165	330
	288	443	216	431	443	208	415	479	175	349
Thermal dissipation, BTU/hr	72	1,159	617	1,234	1,129	589	1,178	1,370	543	1,085
	144	1,347	636	1,272	1,245	653	1,305	1,418	563	1,125
	288	1,512	735	1,470	1,512	707	1,414	1,634	595	1,190
Input power frequency, Hz		50 to 60						N/A		

DS14mk4 FC, 10K speed electrical requirements:

Input voltage		100 to 120V			200 to 240V			-40 to -60V		
	Size GB	Worst -case, single PSU	Typical		Worst -case, single PSU	Typical		Worst -case, single PSU	Typical	
			Per PSU	System, two PSUs		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	72	2.81	1.51	3.01	1.38	0.76	1.51	7.57	2.94	5.87
	144	3.44	1.68	3.36	1.68	0.83	1.66	9.11	3.62	7.23
	288	3.89	1.89	3.78	1.90	0.94	1.87	10.24	4.04	8.07
Input power measured, W	72	279	150	299	272	145	290	303	118	235
	144	344	167	334	333	161	321	364	145	289
	288	388	189	377	376	182	364	410	162	323
Thermal dissipation, BTU/hr	72	953	510	1,020	926	495	990	1,032	401	801
	144	1,174	570	1,140	1,137	548	1,095	1,242	493	986
	288	1,324	644	1,287	1,283	621	1,242	1,397	551	1,101
Input power frequency, Hz		50 to 60						N/A		

DS14mk4 FC, 15K speed electrical requirements:

Input voltage		100 to 120V			200 to 240V			-40 to -60V		
	Size GB	Worst -case, single PSU	Typical		Worst -case, single PSU	Typical		Worst -case, single PSU	Typical	
			Per PSU	System, two PSUs		Per PSU	System, two PSUs		Per PSU	System, two PSUs
Input current measured, A	72	3.42	1.83	3.65	1.66	0.91	1.82	10.22	4.1	8.2
	144	3.54	1.73	3.45	1.73	0.87	1.73	9.49	3.77	7.54
	288	4.52	2.14	4.27	2.23	1.06	2.12	11.73	4.81	9.61
Input power measured, W	72	342	182	363	329	177	353	409	164	328
	144	354	172	344	343	167	334	380	151	301
	288	451	213	426	443	207	414	469	193	385
Thermal dissipation, BTU/hr	72	1,167	619	1,238	1,122	602	1,204	1,394	559	1,118
	144	1,208	587	1,174	1,170	570	1,140	1,295	514	1,028
	288	1,538	726	1,452	1,512	705	1,410	1,599	656	1,311
Input power frequency, Hz		50 to 60						N/A		

System cabinets

About this section This section lists tabulated descriptions of the hardware characteristics, clearance requirements, environmental requirements, and electrical requirements for NetApp System Cabinets.

For detailed information For details about specific models of system cabinet, see “42-unit cabinets” on page 67.

System cabinets

42-unit cabinets

42U system cabinet characteristics

The following table lists the characteristics and requirements for your hardware.

Note

The system cabinet uses passive air flow for cooling.

Physical characteristics:

Weight	Loaded	Up to 1,500 lbs (Up to 680 kg)
	Empty	320 lbs (145.2 kg)
PDU weight	20A PDU x 4 PDU per cabinet	7.8 lbs (3.54 kg) per PDU
	30A PDU x 2 PDU per cabinet	13.4 lbs (6.08 kg) per PDU
	30A PDU x 4 PDU per cabinet	7.8 lbs (3.54 kg) per PDU
Height	Cabinet	78.7 in. (200 cm)
	Crate	85.8 in. (218 cm)
Width	Cabinet	23.6 in. (60 cm)
	Crate	29.8 in. (75.7 cm)
Depth	Cabinet	37.4 in. (95 cm)
	Crate	48 in. (121.9 cm)

Clearance dimensions:

Front	30 in. (76.3 cm)
Rear	30 in. (76.3 cm)
Top	12 in. (30 cm)

Environmental requirements:

Operating temperature maximum range	32° F to 104° F (0° C to 40° C)
Operating temperature recommended range	68° F to 77° F (20° C to 25° C)
Nonoperating temperature range	-40° F to 149° F (-40° C to 65° C)
Relative humidity	10 to 90% noncondensing
Acoustic level	0 dBA @ 23° C

Electrical requirements:

The system cabinet offers three PDU options:

- ◆ 20A PDU—four 0U (zero U) PDUs, with eight outlets per PDU. The PDUs are mounted two per side. Each outlet has a cable retaining wire.
- ◆ 30A PDU—two 0U PDUs, with 16 outlets per PDU. The PDUs are mounted as one unit per side. Each outlet has a cable retaining wire.
- ◆ 30A PDU—four 0U (zero U) PDUs, with eight outlets per PDU. The PDUs are mounted two per side. Each outlet has a cable retaining wire

Note

All PDUs have 200 to 240V input voltage and input frequency of 50/60 Hz.

20A PDU electrical requirements:

Description	Power cords per system cabinet	Plug type	Service type	Current capacity per system cabinet side
20A PDU single-phase	4	NEMA L6-20	20A	35.2A
		IEC309-16	16A	32A
		Australia AS/NZS3123-20	20A	40A
Input power actual—3,373 W maximum per PDU				
Thermal dissipation, BTU/hr— 23,020 BTU/hr				

30A PDU electrical requirements:

Description	Power cords per system cabinet	Plug type	Service type	Current capacity per system cabinet side
30A PDU single-phase	2	NEMA L6-30	30A	26.4A
	Input power actual, W—5,460 W maximum per PDU			
	Thermal dissipation, BTU/hr—18,629 BTU/hr			
	2	IEC309-30/32	30/32A	30A
	Input power actual, W—5,800 W maximum per PDU			
	Thermal dissipation, BTU/hr—20,062 BTU/hr			
	4	NEMA L6-30	30A	52.8A
		IEC309-30/32	30/32A	48A
	Input power actual, W—6,746 W maximum per PDU			
	Thermal dissipation, BTU/hr—23,020 BTU/hr			

Note

For complete power redundancy, each PDU must be connected to a dedicated circuit.

Third-party switches

Where to find information about your switches

See your switch documentation for height, dimensions, weight, clearance, environmental, and electrical requirements.

Topics in this chapter

This chapter contains a worksheet for you to use in initial system setup, where no additional software is licensed. See the *Software Setup Guide* for a worksheet for systems that have additional licensed software.

System setup worksheet

Worksheet instructions

This worksheet is a planning aid for setting up either a stand-alone system or an active/active configuration. The entries in this worksheet are based on the typical questions you encounter while running `setup`. You might encounter slightly different questions, depending on your answers to some questions and also which version of Data ONTAP your system is running.

To use this worksheet, complete the following steps:

1. Copy this form; make one copy for each node in your system.
2. Gather the appropriate information for your system and fill in the blanks with the data for the node. You may not need all rows or columns in this form.
3. Rack and cable your system, as described in the documentation accompanying your system.
4. Run the `setup` script. The script automatically loads and runs when you first apply power to your system. Use the data you collected in this worksheet to complete the initial setup process.

Host name:						
Network configuration information	e0a	e0b	e0c	e0d	e0e	e0f
Virtual interfaces: [Y/N]						
IP addresses: First 3 #s _____._____._____						
Netmask: First 3 #s _____._____._____						
Should interface e0a/e0b take over partner IP address during failover? [Y/N] (FAS2000 series systems)			N/A	N/A	N/A	N/A
Media type/speed (100tx-fd, 100tx, auto [100/1000]):						

Flow control (none, receive, send, full):						
Enable jumbo frames?						
Complete setup through the Web interface? [Y/N]						
Default Gateway IP address/name:						
IP address or name of administration host: (Leave blank for root access to /etc from any NFS client)						
Timezone (name of city or region in /etc/zoneinfo file) [EST5EDT]						
Where is the NetApp system located? (Text string)						
Enter the root directory for the HTTP files [/vol/vol0/home/http]						
Do you want to run DNS resolver? [Y/N]						
DNS domain name (you can enter up to 3 nameservers)						
IP address for DNS first nameserver						
Do you want another nameserver [Y/N]						
IP address for alternate nameserver						
Do you want another nameserver [Y/N]						
IP address for alternate nameserver						
Do you want to run NIS client? [Y/N]						

Remote system management (RLM, RM, or BMC):	
RLM:	
Would you like to configure the RLM LAN interface [y]:	
Would you like to enable DHCP on the RLM LAN interface [y]:	
Please enter the name or IP address of the mail host:	
BMC: (FAS2000) The Baseboard Management Controller (BMC) provides remote management capabilities including console redirection, logging and power control. It also extends autosupport by sending down filer event alerts	
Would you like to Configure the BMC [Y/N]	
Enable DHCP on the BMC LAN interface [Y/N]	
IP address for the BMC	
Netmask for the BMC	
IP address for the BMC Gateway	
Gratuitous ARP interval for the BMC [10 second (max 60)]	
The mail host is required by your system to enable BMC to sense ASUP messages when the filer is down	
IP address or name of the mail host	
IP address for the mail host	
Note _____ You may use autosupport options to configure alert destinations. _____	

Feature Update Record



Feature update history

The following table lists and describes the history of changes made to this manual. When a change is implemented, it applies to the release in which it was implemented and all subsequent releases, unless otherwise specified.

Feature updates	Feature first implemented in	Documentation revision for feature date
Added specifications for ESH4 and DS14mk4 FC disk shelves.	Data ONTAP 6.4.4 or higher and Data ONTAP 6.5.1 or higher	April 2007
Revised power figures for FAS250, FAS270, FAS300 series systems, and FAS6000 series systems. Removed legacy equipment. Implementation of Feature Update Record (this chapter).	Data ONTAP 7.2.1 or higher	
Added FAS2020 and FAS2050 information	Data ONTAP 7.2.2L1	June 2007
Added diskless FAS2050 information. Added RJ-45 to DB-9 console port adapter and ASCII terminal pinout tables.		September 2007
Added FAS6040 and FAS6080 information. Added information to DS14 disk shelf section for different drive capacities.	Data ONTAP 7.2.4	December 2007
Added diskless FAS2050 single controller module power requirements.	Data ONTAP 7.2.4 or higher	January 2008
Modified PDU information for 42U System Cabinet.		March 2008

Feature updates	Feature first implemented in	Documentation revision for feature date
Added SA systems information. Added power information for PDUs deployed in Europe.	Data ONTAP 7.2.5 or higher	May 2008
Added FAS31xx and V31xx series system information.		June 2008
Added Performance Accelerator Module I information Removed Inrush data from all platform and disk shelf tables		

Index

A

- AC power
 - breaker requirements 8
- audience, intended for this book v

C

- cable requirements
 - 1000BASE-T TOE NIC 5
 - 10G BASE-SR NIC 6
- calculating volt-amps 15
- circuit breaker and power outlet requirements 8
- clearance dimensions
 - 42-unit cabinet 67
 - DS14 series disk shelf 59
 - DS14mk2 AT disk shelf 55
 - FAS2020 series system 22
 - FAS2050 series system 26
 - FAS250 system 16
 - FAS270 system 18
 - FAS30xx series system 30
 - FAS31xx series system 37
 - FAS6000 series system 42
 - FAS900 series system 20
 - GF270c gateway 18
 - GF900 series gateway 20
 - N5000 series system 37
 - NearStore VTL appliance 55
 - SA200 system 46
 - SA300 system 50
 - SA600 system 52
 - V30xx series system 30
 - V31xx series system 37
 - V5000 series system 37
 - V6000 series system 42
- Console
 - ASCII terminal pinout 11
 - RJ-45 to DB-9 adapter pinout 11
- conventions
 - command v
 - formatting v

D

- disk shelves
 - DS14 series 59
 - DS14mk4 FC 59
- DS14 series disk shelf electrical requirements
 - DS14mk2 AT 7.2 K speed 61
 - DS14mk2 FC 10 K speed 62
 - DS14mk2 FC 15 K speed 63
 - DS14mk4 FC 10 K speed 64
 - DS14mk4 FC 15 K speed 65

E

- electrical requirements
 - 42-unit cabinet 68
 - calculating volt-amps (VA) 15
 - DS14mk2 AT 7.2 K speed 61
 - DS14mk2 AT disk shelf in a VTL appliance 57
 - DS14mk2 FC 10 K speed 62
 - DS14mk2 FC 15 K speed 63
 - DS14mk4 FC 10 K speed 64
 - DS14mk4 FC 15 K speed 65
 - FAS2020 series system 23, 24, 25
 - FAS2050 series system 27, 28, 29
 - FAS250 system 17
 - FAS270 system 19
 - FAS3020 system 31
 - FAS3040 system 32
 - FAS3050 system 34
 - FAS3070 system 35
 - FAS3070 system with one Performance Accelerator Module I card 36
 - FAS3140 system 38
 - FAS3140 system with performance accelerator modules 39
 - FAS3140 system with two or four Performance Accelerator Module I cards 39
 - FAS3170 system 40
 - FAS3170 system with four Performance Accelerator Module I cards 41

- FAS3170 system with one Performance Accelerator Module I card 40
- FAS3170 system with performance accelerator modules 41
- FAS6030/FAS6040 system 43
- FAS6030/FAS6040 system with four Performance Accelerator Module I cards 43
- FAS6070/FAS6080 system 44, 53
- FAS6070/FAS6080 system with five Performance Accelerator Module I cards 44
- FAS900 series system 21
- GF270c gateway 19
- GF900 series gateway 21
- N5000 series system 39, 40, 41
- NearStore VTL appliance 57
- SA200 system 47, 48, 49
- SA300 system 51
- SA600 system 53
- table heading definitions 15
- V3020 system 31
- V3040 system 32
- V3050 system 34
- V3070 system 35
- V3070 system with one Performance Accelerator Module I card 36
- V3140 system 38
- V3140 system with performance accelerator modules 39
- V3140 system with two or four Performance Accelerator Module I cards 39
- V3170 system 40
- V3170 system with four Performance Accelerator Module I cards 41
- V3170 system with one Performance Accelerator Module I card 40
- V3170 system with performance 41
- V5000 series system 39, 40, 41
- V6030 system 43
- V6030 system with four Performance Accelerator Module I cards 43
- V6070 system 44, 53
- V6070 system with five Performance Accelerator Module I cards 44

- environmental requirements
 - DS14 series disk shelf 60
 - DS14mk2 AT disk shelf 56
 - FAS2020 series system 22
 - FAS2050 series system 26
 - FAS250 system 17
 - FAS270 system 18
 - FAS30xx series system 30
 - FAS31xx series system 37
 - FAS6000 series system 42
 - FAS900 series system 21
 - GF270c gateway 18
 - GF900 series gateway 21
 - NearStore VTL appliance 56
 - SA200 system 46
 - SA300 system 50
 - SA600 system 52
 - V30xx series system 30
 - V31xx series system 37
 - V6000 series system 42

G

- gFiler gateways
 - GF270c 18
 - GF900 series 20

N

- NearStore systems, NearStore VTL appliance 55

O

- outlet requirements, AC power breaker 8

P

- physical characteristics
 - 42-unit cabinet 67
 - DS14 series disk shelf 59
 - DS14mk2 AT 55
 - FAS2020 system 22
 - FAS2050 series system 26
 - FAS250 system 16
 - FAS270 system 18
 - FAS30xx series system 30

- FAS31xx series system 37
- FAS6000 series system 42
- FAS900 series system 20
- GF270c gateway 18
- GF900 series gateway 20
- NearStore VTL appliance 55
- SA200 system 46
- SA300 system 50
- SA600 system 52
- V30xx series system 30
- V31xx series system 37
- V6000 series system 42

Pinout

- ASCII terminal pinout 11
- RJ-45 to DB-9 console port adapter pinout 11

S

- special messages vi
- storage system
 - FAS2020 22
 - FAS2050 26
 - FAS250 16

- FAS270 18
- FAS30xx series 30
- FAS31xx series 37
- FAS6000 series 42
- FAS900 series 20
- SA200 46
- SA300 50
- SA600 system 52

- system cabinets, 42-unit cabinet 67
- system setup worksheet 72

T

- tools and equipment required 2

V

- volt-amps, calculating 15
- V-Series systems
 - V30xx 30
 - V31xx 37
 - V5000 37
 - V6000 22, 26, 42

