



Technical FAQ

FAS2240 Technical FAQ

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1 FAS2240 Overview

The FAS2240 is the newest member of the industry-leading NetApp® entry-level storage controller product line. The FAS2240 introduces significant performance and high-bandwidth 10GbE or 8Gb FC I/O options while maintaining the low price point critical in this storage tier. The FAS2240 is based on the NetApp leading-edge SAS storage shelf technology and provides investment protection by allowing conversions into shelves that can then be connected to higher end storage controllers. In addition to these features, the FAS2240 also offers reliability, availability, serviceability, and manageability (RASM) with the integrated service processor (SP), the next generation of remote management in the NetApp storage family introduced previously on the FAS/V3200 and FAS/V6200 models.

What is the FAS2240 platform?

Answer: The FAS2240 is the newest member of the NetApp entry-level platform family and offers improved performance, high-bandwidth I/O options, RASM improvements using the integrated service processor, and in-place conversion from controller to shelf for easy upgrades to higher end controllers without migrating data from internal disks.

What are the key features provided by the FAS2240 entry-level refresh?

Answer:

- 2–3x performance increase versus the FAS2040 depending on workload
 - 64-bit architecture versus 32-bit in the FAS2040
 - Hyperthreading doubles cores available to Data ONTAP® versus the FAS2040
- Mezzanine slot for optional 10GbE or 8/4/2Gb FC connectivity or may be left empty
- Two models available: FAS2240-2 and FAS2240-4
 - FAS2240-2 is a 2U option for use with internal SAS
 - FAS2240-4 is a 4U option for use with internal solid-state disk (SSD) and/or SATA
 - Same processor controller module (PCM) for both 2U and 4U options
- Integrated into NetApp DS2246 and DS4243 SAS storage
 - Convert FAS2240 into shelf and attach to higher end controller without data migration

What are the FAS2240 model transitions?

Answer:

- FAS2240-2 replaces FAS2040s with SAS internal disks.
- FAS2240-4 replaces FAS2040s with SATA internal disks.

2 FAS2220 Technical Questions and Answers

2.1 FAS2240 Controller and Chassis

What components make up the FAS2240?

Answer: FAS2240 components are the processor controller module (PCM), the optional mezzanine card for 10GbE or 8/4/2Gb FC, and the chassis, which can be either a DS2246 or a DS4243 shelf, depending on the internal disks.

What is the rack unit for the FAS2240?

Answer: The FAS2240-2 with internal SAS is 2U, and the FAS2240-4 with internal SSD or SATA is 4U.

What is the difference between the FAS2240-2 and the FAS2240-4?

Answer: The FAS2240-2 is based on the DS2246 SAS shelf and only supports internal SAS disks.

The FAS2240-4 is based on the DS4243 SAS shelf and supports internal SSDs and/or SATA disks.

Both the FAS2240-2 and FAS2240-4 use the same PCM.

Are the FAS2240-2 and FAS2240-4 controllers the same for both models?

Answer: Yes, the same PCM is used in the FAS2240-2 and the FAS2240-4 and automatically picks up the model type based on the chassis in which it boots up. For sparing purposes, only one PCM is needed for a site with both FAS2240-2 and FAS2240-4 models.

Can a FAS2240 controller be moved between a FAS2240-2 and a FAS2240-4?

Answer: Yes, the PCM can be moved between FAS2240-2 and FAS2240-4 models and will automatically pick up the correct model type once booted in the new chassis. You might have to change the ha-config setting for controller and/or chassis from the maintenance menu in the new configuration, however. When changing between HA and standalone configurations, the controller and chassis each needs to have its ha-config setting changed. Details about changing this setting are covered in the “Data ONTAP High-Availability Configuration Guide” on the NetApp Support site.

Are the FAS2240 controllers hot-swappable?

Answer: The FAS2240 controller is hot-swappable and, it is important to note, does not require turning off either power supply unit (PSU).

Does the FAS2240 chassis protect the front-side LEDs better than the FAS2000?

Answer: Yes, the issue with FAS2000 LEDs getting broken is fixed in the FAS2240. The DS2246 and DS4243 chassis provide encased protection to the front-panel LEDs and complete protection from accidental breakage.

Will installing the bezel upside down break the front-side LEDs?

Answer: Unlike the FAS2000 front panel, LEDs are not damaged if the bezel is installed upside down.

What are the FAS2240 FRU part numbers for ordering spares?

Answer:

Table 1) FAS2240 FRU part numbers for sparing.

Part Number	Manufacturing 3x5	Description
X519A-R6	114-00065	R6,750W POWER SUPPLY,AC,DS2246
X6588-R6	332-00278R6	R6,CONN,OPTICALXCVR,8 Gb, SFP+,SHORTWAVE
X6589-R6	332-00279R6	R6,CONN,OPTICALXCVR, 10Gb,SFP+,SHORTWAVE
X5526A-R6	111-00593	R6,RKMT KIT,4-POST,UNIVERSAL
X5527A-R6	111-00864	R6,RKMT KIT,2-POST,DS2246
X1847-R6	271-01847	BTRY,3V,COIN,LTHM,CR2032
X3245A-R6	111-00846	R6,SUB ASSY,CONTROLLER MODULE,FRU,FAS2240
X3117A-R6	111-00908	R6,ASSY,BATT,LI-ON, 7.2V,2CELL,HOLDER,FAS2240
X3209A-R6	107-00099	R6,IC,DIMM,2GB,ECC,REG,240P,DDR3-800,NVMEM slot
X3208A-R6	107-00100	R6,IC,DIMM,4GB,ECC,REG,240P,DDR3-800
X1160A-R6	111-00810	R6,SUB ASSY,MEZZ CARD,10GbE,FAS2240
X1150A-R6	111-00811	R6,SUB ASSY,MEZZ CARD,8Gb FC,FAS2240
X1165A-R6	111-00813	R6,SUB ASSY,MEZZ CARD BLANK,FAS2240
X1425A-R6	501-01102	R6,DSK ASSY,USB MEDIA,2GB
X559A	111-00717	FAS2240-2 SHELF, EMPTY, 2PSU, AC, DS2246, R6
X5561A-R6 *	N/A	DSK SHLF,Empty,4PSU,Midplane II,DS4243
X5052-R6	N/A	BLANK, CHASSIS FILLER, REAR, DS4243, R6
X5055-R6	N/A	BLANK, CHASSIS FILLER, REAR, DS2246, R6

* Available in March 2012 Quote Tool.

What is the FAS2240 chassis ID set to in manufacturing?

Answer: FAS2240-2 and FAS2240-4 chassis will be set to ID 00 in manufacturing.

2.2 FAS2240 Active-Active and Standalone Configurations

Is the FAS2240 supported in standalone and HA configurations?

Answer: The FAS2240 can be used in standalone or HA configurations. In standalone configurations, the PCM blank should be installed in the empty bay to enable proper cooling.

Are PCM blanks interchangeable between FAS2240-2 and FAS2240-4?

Answer: No, the PCM blanks are not interchangeable and are keyed to prevent them from being used in the wrong chassis.

Which bay is populated on FAS2240 standalone configurations?

Answer: FAS2240-2 should be the controller in the left slot (slot A) when looking at the chassis rear. FAS2240-4 should have the PCM in the top bay (slot A).

What field upgrades are available with the FAS2240?

Answer: A FAS2240 standalone controller can have a second controller added to become HA.

FAS2240 controllers can have the optional mezzanine card added later.

The FAS2240 can have additional external SSD, SAS, or SATA storage added later.

The FAS2240 PCMs can be replaced with IOM3 or IOM6 on FAS2240-4 or IOM6 modules on FAS2240-2 and connected to higher end controllers.

External shelves purchased with FAS2240 can be migrated to higher end controllers as part of an upgrade.

Does hardware-assisted takeover work on the FAS2240?

Answer: Yes, hardware-assisted takeover on the FAS2240 uses the new SP. The hardware-assisted takeover functionality is similar to using the RLM in the FAS3000, FAS3100, and FAS6000 controller families.

There is more information about the SP in section 2.3.

What HA configurations are available with FAS2240?

Answer: FAS2240 HA configurations are only available in a single-chassis solution. Dual-chassis FAS2240 HA configurations are not possible.

What is the interconnect in FAS2240 HA configurations?

Answer: FAS2240 HA is supported within the same chassis and the HA interconnect uses Infiniband paths over the backplane.

Are there any single points of failure in the FAS2240?

Answer: While the chassis backplane is not fault tolerant, there are no active components on the backplane on which controllers rely to remain in a running state. This passive backplane is a highly reliable component that is very unlikely to cause an outage on a FAS2240. Reliable passive backplanes are used in almost all modular storage systems with two controllers in a single chassis as well as network switches. Also, NetApp has been shipping systems and subsystems with shared backplanes for quite some time (DS14-class disk shelves, the FAS200 series, FAS2000, and the FAS3100 series) and more recently with the FAS3200 and FAS6200 controllers and new SAS shelves. All have demonstrated very high reliability of the chassis backplane.

Is MetroCluster available on the FAS2240 series?

Answer: No, FAS2240 is not supported with MetroCluster™.

Is the FAS2240 series also available as V-Series?

Answer: No, FAS2240 is not supported in V-Series configurations.

Is a FlexCache version of the FAS2240 available?

Answer: No, FAS2240 does not have a FlexCache® personality option.

2.3 FAS2240 System Features

How much memory and NVMEM does the FAS2240 have?

Answer:

Table 2) System memory for active-active configurations.

Active-Active	Total Physical Memory	Total NVMEM
FAS2240 HA	12GB*	1.5GB

*FAS2240 NVMEM is taken out of the total physical memory present. The remaining memory is available for Data ONTAP.

What type of processors and how many processing cores does the FAS2240 have?

Answer:

Table 3) Processing cores for active-active configurations.

Active-Active	Processors	Processing Cores	Hyperthreaded Cores	Processor Speed
FAS2240 HA	2 x 64-bit Dual-core	4	8	1.7 GHz

What are the hyperthreaded cores on the FAS2240?

Answer: The FAS2240 processor has hyperthreading capabilities and provides part of the performance increase over the FAS2040. Data ONTAP will utilize eight cores in an HA FAS2240. Utilities such as sysstat -M or statit also report the number of hyperthreaded cores versus the physical.

Which Data ONTAP release is required for FAS2240?

Answer: The FAS2240 is only supported in Data ONTAP 8.1 RC1 and later releases.

Which Data ONTAP build does the FAS2240 use?

Answer: The FAS2240 uses the x86_64 build. This same build supports both AMD and the latest platforms based on Intel®.

How are NVMEM contents protected on the FAS2240 upon dirty shutdown?

Answer: As with the FAS2000 and FAS3200 series, the FAS2240 uses battery-backed-up system memory called NVMEM, and it provides similar functionality as NVRAM on other FAS platforms. Unlike NVRAM, which uses separate battery-backed-up memory, NVMEM uses space carved out of battery-backed-up main system memory to provide NVMEM functionality. On FAS2240 the DIMM slot closest to the NVMEM battery is backed up by the battery to maintain the contents in the event of a dirty shutdown.

How long will NVMEM battery backup last, and how long does it take to recharge a completely discharged NVMEM battery?

Answer: The NVMEM battery will last at least 72 hours, and it takes 15 hours to charge a completely discharged NVMEM battery.

Does the FAS2240 have an LCD display?

Answer: No, the FAS2240 does not have an LCD display. However, LEDs are provided on the chassis front to help determine the state of the controller. Remote management has proven to be the primary source for monitoring system information versus LCDs. Also, with the SP the state of LEDs can be determined remotely.

Does the FAS2240 series support remote management?

Answer: The FAS2240 uses the new SP, the next-generation RLM and BMC remote management module, for remote management functionality. The SP has all the features of RLM and BMC along with new ones that improve RASM capabilities. The new SP features are covered in section 2.3.

The SP was initially released on the FAS/V3200 and FAS/V6200 in November 2010.

What are some of the service processor (SP) management features?

Answer: The SP performs FRU reporting and tracking, monitors and reports on internal sensors, reports on LED states, and actively manages fan speed.

Besides the 10/100 Ethernet management interface (the external management port is shared by SP and e0M), the SP can also be accessed from the serial console by toggling with Ctrl-G. Use Ctrl-D to get back to the serial console.

Is the SP connected to both the Ethernet and the serial console?

Answer: The SP is always connected to the Ethernet and the serial console and can be accessed from either. If the SP is accessed over the Ethernet, you can toggle to the serial console with Ctrl-D. If logged into the serial console, you can toggle into the SP using Ctrl-G. To get back to the serial console, toggle with Ctrl-D.

Is the SP an FRU like the RLM?

Answer: No, the SP is integrated on the motherboard but runs its own kernel outside of Data ONTAP and is always available.

Is there a command to administer the SP?

Answer: Yes, Data ONTAP has added a new command to administer the SP. The new command is "sp." The setup command also prompts for TCP/IP information needed to use the SP using the Ethernet.

What are the SP firmware levels?

Answer: The SP requires v2.0 in Data ONTAP 8.1 for FAS2240.

What are the BIOS levels on the FAS2240?

Answer: The FAS2240 uses BIOS level 8.0.

There is no NMI button on the FAS2240. How do I generate a core?

Answer: The SP is required to generate a core file. Once logged into the SP, run the command `system core`.

What are the system diagnostics in FAS2240?

Answer: The FAS2240 uses system-level diagnostics, or SLDIAG, in place of the older SYSDIAG on most platforms. SLDIAG is accessed using maintenance mode during bootup. If `sysdiag` is entered at the loader prompt, the system will boot into maintenance mode.

The FAS/V3200 and FAS/V6200 controllers also use SLDIAG for system diagnostics.

What is the boot medium in FAS2240?

Answer: The FAS2240 uses a USB flash in place of the CompactFlash. The USB flash, which is an FRU item, offers the same reliability as CompactFlash.

The FAS/V3200 and FAS/V6200 also use a USB flash for boot media.

What amount of concurrent streams does the FAS2240 support in 7-Mode?

Answer:

Table 4) FAS2240 concurrent stream limits in 7-Mode.

Product	Without NearStore Source/Destination	With NearStore Source/Destination
Volume SnapMirror®	50/50	50/100
Synchronous SnapMirror	16/16	16/16
QSM	64/64	120/120
SnapVault®	64/64	120/120

The NearStore® license is enabled by default in Data ONTAP 8.1.

For more information about using SnapMirror in Cluster-Mode, refer to the Cluster-Mode SnapMirror Data ONTAP 8.1.1 presentation on the Field Portal. [TR-4015: SnapMirror Configuration and Best Practices Guide for Data ONTAP 8.1 Operating in Cluster-Mode](#) can also be helpful when planning data protection using SnapMirror in Cluster-Mode.

Is local SyncMirror supported on the FAS2240?

Answer: Local SyncMirror® can be used on the FAS2240 provided the mirror spans SAS and FC disks. As a result the FC mezzanine card is required to configure SyncMirror on the FAS2240.

2.4 FAS2240 I/O

What onboard I/O ports does the FAS2240 have?

Answer: Each FAS2240 controller has two 6/3Gb SAS and four GbE ports for host and storage connectivity.

Table 5) Onboard I/O ports.

Active-Active	GbE	6/3Gb SAS
FAS2240 HA	8	4

What management interfaces does the FAS2240 have?

Answer: The SAS ACP port shown in the following table is covered further in a later question.

Table 6) Onboard management interfaces.

Active-Active	Serial Console	Management SP/e0M (Wrench)	Private Management SAS ACP (Wrench with Lock)
FAS2240 HA	2	2	2

Which Ethernet port does the MAC address label specify, and what are the offsets to other Ethernet ports?

Answer: The controller MAC address label specifies the GbE e0a port, and other Ethernet ports are offsets from this address. The following table shows the offset for each Ethernet device based on the MAC address label on the rear of the controller.

Table 7) Ethernet MAC address offsets.

Offset from Label	Device Name
00	e0a
01	e0b
02	e0c
03	e0d
04	e0M
05	e0P
06	SP

Are the onboard GbE ports on a single ASIC or separate ASICs?

Answer: The four onboard GbE ports use a common quad-port GbE ASIC.

What is the SAS ACP port?

Answer: The private management provides out-of-band management to the SAS DS2246 and DS4243 shelves. For more information on the ACP port, review the [Storage Subsystem Technical FAQ](#).

What kind of expansion slots does the FAS2240 have?

Answer: Each FAS2240 controller has one PCIe mezzanine slot that takes a special 10GbE or 8/4/2 Gb FC card. Adapters used in other controllers cannot be used in the FAS2240 mezzanine slot.

Does the FAS2240 expansion slot support Flash Cache adapters?

Answer: No, a Flash Cache mezzanine card is not available for the FAS2240.

Can the FC ports on the mezzanine card be used in target or initiator mode?

Answer: Yes, the FC ports on the FAS2240 mezzanine card can be set to target or initiator mode.

What are the names of the mezzanine FC ports?

Answer: The FAS2240 FC ports on the mezzanine card are 1a and 1b.

Do the FAS2240 mezzanine FC ports ship with SFP+ installed?

Answer: Yes, two SFP+s are automatically included per FAS2240 FC mezzanine card and do not need to be ordered separately.

Do the mezzanine FC ports require special SFP+?

Answer: Yes, the SFP+ used on FAS2240 mezzanine FC ports is not interchangeable with other SFP/SFP+ modules. The required SFP+ is model X6588-R6. See the FAS2240 SE presentation for an image of the SFP+.

What are the names of the mezzanine 10GbE ports?

Answer: The FAS2240 10GbE ports on the mezzanine card are e1a and e1b.

Do the FAS2240 mezzanine 10GbE ports ship with SFP+ installed?

Answer: No. Because the 10GbE ports can be used with copper or optical cables, SFP+ isn't included by default on the FAS2240 10GbE mezzanine card. It needs to be added during ordering if required. Here's an example of how to add SFP+s when ordering a FAS2240 with a 10GbE mezzanine card.

Navigate to Add Product > Cables/SFPs > Misc. Cables/Misc. SFPs and sort by description by clicking the description header and add the required SFP. Or simply type in the part number within the Search field and click Go.

Figure 1) Ordering SFP+ for 10GbE FAS2240 ports.

The screenshot shows the 'Add Product' interface. At the top, there is a search bar with 'x6589' entered and a 'Go' button. Below the search bar, a yellow box highlights 'X6589-R6'. On the left, a navigation menu shows 'Cables / SFPs' selected, with a sub-menu open showing 'Misc. Cables / Misc. SFPs' highlighted by a red arrow. The main area displays a table of products with columns: Part#, Quantity, Action, and Quick Ship Message. The table lists various cables and SFPs. The row for 'SFP+ Optical 10Gb Shortwave' with part number 'X6589-R6' is highlighted with a red box. The 'Action' column for this row contains an 'Add' link.

Part#	Quantity	Action	Quick Ship Message
X6532-R6		Add	This cable only su...
X6533-R6		Add	
X6534A-R6		Add	
X6538-R6		Add	
X6539-R6		Add	
X6556-R6		Add	
X6563-R6		Add	
X6588-R6		Add	
X6589-R6		Add	
X881-R6		Add	

Do the mezzanine 10GbE ports require a special SFP+?

Answer: Yes, the SFP+ used on FAS2240 mezzanine 10GbE ports is not interchangeable with other SFP+ modules. The required SFP+ is model X6589-R6, and you can look in the FAS2240 SE presentation for an image of it.

Which cables are supported on the FAS2240 mezzanine FC card?

Answer:

Fibre optics module:

- 332-00278R6 CONN, OPTICALXCVR, 8 Gb, SFP+, SHORTWAVE (X6588-R6)
- Not interchangeable with other 8Gb SFP+ types

Supported optical cables:

- 112-00188 2m LC to LC cable X6553-R6
- 112-00090 5m LC to LC cable X6536-R6
- 112-00189 15m LC to LC cable X6554-R6
- 112-00091 30m LC to LC cable X6537-R6

Which cables are supported on the FAS2240 mezzanine 10GbE card?

Answer:

Copper cabling:

- NetApp resells both Cisco® and Brocade switches. Always purchase cables available from the switch vendor being used.
- Cisco:
 - o X-SFP-H10GB-CU1M-R6 Cisco Twinax Cable, 10GBE Cu SFP+, 1M, R6
 - o X-SFP-H10GB-CU3M-R6 Cisco Twinax Cable, 10GBE Cu SFP+, 3M, R6
 - o X-SFP-H10GB-CU5M-R6 Cisco Twinax Cable, 10GBE Cu SFP+, 5M, R6

Fibre optics:

- 332-00279R6 R6, CONN, OPTICALXCVR, 10Gb, SFP+, SHORTWAVE (X6589-R6)
- Not interchangeable with other 10GbE SFP+ types
- Supported optical cables:
 - o 112-00188 2m LC to LC cable X6553-R6
 - o 112-00090 5m LC to LC cable X6536-R6
 - o 112-00189 15m LC to LC cable X6554-R6
 - o 112-00091 30m LC to LC cable X6537-R6

Are there any special requirements with Cluster-Mode on the FAS2240?

Answer: Running Data ONTAP 8.1 operating in Cluster-Mode on the FAS2240 requires that all of the 10GbE mezzanine card ports be used for the cluster network. The data network can use two to four of the onboard GbE ports for NFS, CIFS, and iSCSI connectivity, and the management network uses the e0M port. See the FAS2240 SE presentation for a diagram of the supported Cluster-Mode configuration.

Is the external USB port supported?

Answer: No, the external USB port is not used at this time.

2.5 FAS2240 Storage

What maximum spindle counts and capacities are supported on the FAS2240?

Answer:

Table 8) Maximum spindle counts and capacities.

Standalone and Active-Active	Maximum Spindles	Maximum Capacity
FAS2240-2	144	374TB
FAS2240-4	144	432TB

Capacity for the FAS2240-2 is based on 24 internal 600GB SAS disks and 5 external DS4243 shelves with 120 3TB SATA disks. FAS2240-4 capacities are based on 144 3TB SATA disks.

What are the aggregate and volume size limits on the FAS2240 series?

Answer:

Table 9) Maximum aggregate sizes.

Storage Area	Maximum Aggregate Size
Maximum aggregate size	60TB raw 54TB usable*
Minimum root volume size	160GB**
Maximum volume size	53.7TB usable *
Maximum dedupe volume size	53.7TB usable *
Maximum compression volume size	53.7TB usable *

*With Snapshot™ reserve set to zero.

** In Data ONTAP 8.1.1 minimum root volume size increases to 162GB when creating new aggregates.

What internal disks are supported on the FAS2240-2 model?

Answer:

Table 10) Supported internal disks on the FAS2240-2.

Disk	Supported At
450GB SAS	Launch
600GB SAS	Launch
600GB SAS NSE	Data ONTAP 8.1 RC3

What internal disks are supported on the FAS2240-4 model?

Answer:

Table 11) Supported internal disks on the FAS2240-4.

Disk	Supported At
1TB SATA	Launch
2TB SATA	Launch
3TB SATA	Launch

What internal disk configurations can be ordered on the FAS2240?

Answer: At launch the FAS2240 can be ordered with either 12- or 24-internal-disk configurations.

Starting with the February 2012 Quote Tool FAS2240 configurations with zero internal disk drives can be ordered.

Starting with the June 2012 Quote Tool internal SSDs can be ordered for the FAS2240-4. Orderable internal SSD options on the FAS2240-4 are with 12 SSDs or 6 SSDs with 18 SATA disks.

Starting in August 2012 Quote Tool mixed 6 SSD and 18 SATA internal disks can be ordered in the FAS2240-4.

Can a FAS2240 be ordered diskless with no internal disk drives?

Answer: Yes, starting with the February 2012 Quote Tool you can order FAS2240 with no internal disk drives.

Does the FAS2240 support zero internal disks?

Answer: Yes. As of January 2012 FAS2240 is supported with no internal disks. Starting with the February 2012 Quote Tool FAS2240 configurations with zero internal disk drives can be ordered.

What external shelves and shelf modules are supported on the FAS2240 series at launch?

Answer:

Table 12) Supported shelves and shelf modules.

Shelf	Shelf Module
DS2246	IOM6
DS4243	IOM3
DS4246	IOM6
DS14mk4	ESH4
DS14mk2	ESH4
DS14mk2-AT	AT-FCX

Is the DS4486 supported on the FAS2240?

Answer: No, the DS4486 is not supported on the FAS2240.

Which external hard disk drives (HDDs) are supported in the FAS2240?

Answer: All SAS disks supported in the SAS shelves listed in Table 12 are supported on the FAS2240. SSD drives are supported externally in the DS4243 shelves on the FAS2240 and available starting in January 2012. 15K FC disks that are 144GB in size and larger, 10K FC disks that are 300GB in size and larger, and SATA disks that are 500GB and larger are supported on the FAS2240. FC disks 72GB and smaller are not supported on the FAS2240.

Are NSE disks supported in the FAS2240?

Answer: Yes, internal 600GB SAS AES-256 NSE disks can be used on the FAS2240-2 and externally in the DS2246 shelves. Support for internal NSE on FAS2240-4 is targeted toward the end of 2012.

Are SSDs supported on the FAS2240?

Answer: Yes, SSDs are supported with the FAS2240 in external shelves starting in January 2012.

Starting in the June 2012 Quote Tool and with Data ONTAP 8.1.1, internal SSDs are supported and orderable on the FAS2240-4.

Are internal SSDs supported on the FAS2240-4?

Answer: Yes, starting in the June 2012 Quote Tool and with Data ONTAP 8.1.1, internal SSDs are supported on the FAS2240-4.

Are mixed internal SSDs and HDDs supported on the FAS2240-4?

Answer: Yes, starting in the August 2012 Quote Tool and with Data ONTAP 8.1.1, a FAS2240-4 can be purchased with an internal mix of 6 SSDs and 18 HDDs.

Are Flash Pools supported on the FAS2240?

Answer: Yes, starting in the June 2012 Quote Tool and with Data ONTAP 8.1.1, Flash Pools are supported on the FAS2240.

What is the maximum amount of Flash Pool SSD cache on the FAS2240?

Answer: The FAS2240 supports up to 300GB of Flash Pool SSD cache for standalone or HA controllers. SSDs serving as data disks count against the 300GB limit, but parity or spare SSDs do not. As a result, three SSDs can be configured as data disks in Flash Pool aggregates for standalone or HA FAS2240 controllers.

In Data ONTAP 8.1.2 the maximum Flash Pool cache size increases to 400GB.

Does the FAS2240 support more than one Flash Pool aggregate?

Answer: Two Flash Pool aggregates can be created on the FAS2240, but due to parity and spare disks the SSD overhead results in a costly solution for an entry-level platform. Creating two Flash Pool aggregates on a FAS2240 requires nine SSDs with three used as data disks, four used as parity disks, and two used as spares.

What is the maximum number of external shelves if SSDs are present on a FAS2240?

Answer: If SSDs are present on a FAS2240, then the maximum number of external shelves reduces to three.

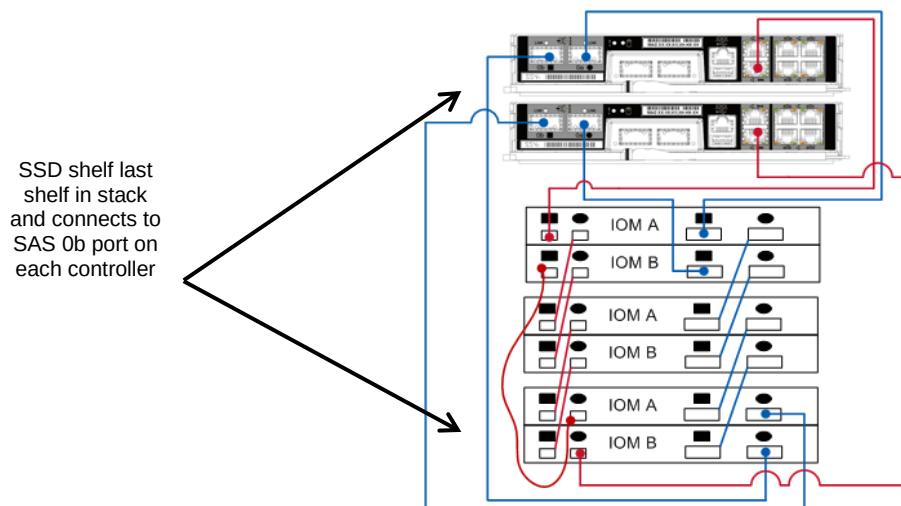
What is the maximum number of SSDs supported on the FAS2240?

Answer: The FAS2240 supports up to three fully populated DS4243 external shelves for 72 maximum SSDs on the FAS2240-2. In addition to three external SSD shelves the FAS2240-4 also supports up to 12 internal SSDs and has a maximum number of 96 SSDs.

Can SSDs be mixed with SAS or SATA disk drives on the FAS2240?

Answer: Yes, SSDs can be mixed with SAS or SATA disks on the FAS2240. Connect external shelves containing SSDs as shown in Figure 2 so their position in the SAS stack is closest to SAS port 0b on each controller. It should be noted that mixing SSD in the same stack with SAS and SATA is only supported on FAS2200 family and no other platforms.

Figure 2) Using external SSD and HDD on FAS2240.



Can external SAS disks be used on the FAS2240-4?

Answer: Yes, external SAS disks can be used on the FAS2240-4.

Can external SATA disks be used on the FAS2240-2?

Answer: Yes, external SATA disks can be used on the FAS2240-2.

Can external DS2246 and DS4243 external shelves be mixed on the FAS2240?

Answer: Yes, you can mix DS2246 and DS4243 on the single FAS2240 SAS stack, but you should minimize transitions between the two shelf types. It should be noted that mixing DS2246 and DS4243 is only supported on FAS2240 and no other platforms.

Can the FAS2240 be converted to a storage shelf?

Answer: Yes, the FAS2240 can be converted to a storage shelf by changing the PCM with the appropriate IOM shelf module. See section 2.2 for more details about supported FAS2240 field upgrades and conversions.

Can external shelves purchased with FAS2240 be used if the customer later upgrades to FAS3200 or FAS6200?

Answer: Yes, the external shelves purchased with FAS2240 can be migrated later as part of a controller upgrade.

Are cables for MP-HA on FAS2240 internal disks included by default?

Answer: Starting in the May 2012 Quote Tool the two SAS cables and single CAT 5 cable will be included by default on FAS2240 HA controllers. These cables connect the SAS and ACP ports together to establish MP-HA connectivity on FAS2240 HA systems with no external storage as described in the FAS2240 SE presentation on slide 45.

Are there conversion kits to convert a FAS2240 into a shelf?

Answer: Yes, the kits in Table 13 are available to convert a FAS2240 to a storage shelf.

Table 13) FAS2240 conversion kits.

Model	Part Number	Contents
FAS2240-2	X896A-R6 DS2246,Kit,FAS2240-2,R6	2 x X5713A-R6: IOM6 2 x X6557A-R6: 0.5m SAS cable 1 x X70074-R6 2pc end caps, DS2246
FAS2240-4	X897A-R6 DS4243,Kit,FAS2240-4,R6	2 x X5712A-R6: IOM3 2 x X6557A-R6: 0.5m SAS cable 1 x X70073-R6 2pc end caps, DS4243

2.6 FAS2240 Chassis Power Supplies, Weight, and Thermals

What are the FAS2240-2 chassis dimensions?

Answer:

Table 14) FAS2240-2 physical chassis dimensions.

Dimension	Metric	English
Height	2U	
Width	48 cm	19"
Depth	48.4 cm	19.1"
Depth with cable management	58.7 cm	23.1"

What are the FAS2240-4 chassis dimensions?

Answer:

Table 15) FAS2240-4 physical chassis dimensions.

Dimension	Metric	English
Height	4U	
Width	48 cm	19"
Depth	61 cm	24"
Depth with cable management	71.1 cm	28"

What is the FAS2240 acoustics noise?

Answer: The FAS2240-2's declared sound power (LwAd) per ISO9296 is 6.9 Bel, and the sound pressure (LpAm: bystander positions) is 51.0 dB.

The FAS2240-4's declared sound power (LwAd) per ISO9296 is 6.9 Bel, and the sound pressure (LpAm: bystander positions) is 49.6 dB.

What is the weight of supported FAS2240-2 configurations?

Answer:

Table 16) FAS2240-2 weight.

Configuration	Metric	English
Standalone: 12 disks	20.1 kg	44.4 lbs
Standalone: 24 disks	22.9 kg	50.4 lbs
HA: 12 disks	22.4 kg	49.4 lbs
HA: 24 disks	25.2 kg	55.4 lbs

What is the weight of supported FAS2240-4 configurations?

Answer:

Table 17) FAS2240-4 weight.

Configuration	Metric	English
Standalone: 12 disks	37.9 kg	83.5 lbs
Standalone: 24 disks	46.3 kg	102.0 lbs
HA: 12 disks	40.2 kg	88.6 lbs
HA: 24 disks	48.6 kg	107.1 lbs

What are the shipping dimensions and weights of the FAS2240?

Answer: The FAS2240-2 always has two power supplies, and the FAS2240-4 always has four power supplies, regardless of the configuration.

Table 18) FAS2240 shipping dimensions and weights.

Model	Packaging P/N	Dimensions (Without Pallet)	Weight (Without Pallet)
FAS2240-2	400-00500	29.8" x 25.6" x 14.4"	75 lbs
		75.69 cm x 65.02 cm x 36.58 cm	34.01 kg
FAS2240-4	400-00450	32.0" x 24.0" x 15.6"	130 lbs
		81.28 cm x 60.69 cm x 39.62 cm	68.04 kg

What are the FAS2240-2 wattage and BTU ratings?

Answer:

Table 19) FAS2240-2 wattage and BTU ratings with 24 600GB SAS disks.

24 600GB SAS Disks	100V Wattage Typical Wattage	100V Wattage Worst Case	200V Wattage Typical Wattage	200V Wattage Worst Case
FAS2240-2 single FC mezzanine	270 W 922 BTU	409 W 1,396 BTU	263 W 898 BTU	397 W 1,355 BTU
FAS2240-2 single	269 W 919 BTU	390 W 1,332 BTU	262 W 895 BTU	379 W 1,294 BTU
FAS2240-2 HA FC mezzanine	357 W 1,219 BTU	509 W 1,738 BTU	340 W 1,161 BTU	487 W 1,663 BTU
FAS2240-2 HA	356 W 1,215 BTU	474 W 1,618 BTU	339 W 1,157 BTU	456 W 1,557 BTU

What are the FAS2240-4 wattage and BTU ratings?

Answer:

Table 20) FAS2240-4 wattage and BTU ratings with 24 2TB SATA disks.

24 2TB SATA Disks	100V Wattage Typical Wattage	100V Wattage Worst Case	200V Wattage Typical Wattage	200V Wattage Worst Case
FAS2240-4 single FC mezzanine	489 W 1,669 BTU	537 W 1,833 BTU	477 W 1,628 BTU	524 W 1,789 BTU
FAS2240-4 single	482 W 1,646 BTU	533 W 1,820 BTU	468 W 1,598 BTU	517 W 1,765 BTU
FAS2240-4 HA FC mezzanine	562 W 1,919 BTU	597 W 2,038 BTU	560 W 1,912 BTU	584 W 1,994 BTU
FAS2240-4 HA	545 W 1,861 BTU	582 W 1,987 BTU	531 W 1,813 BTU	568 W 1,939 BTU

How many power supplies does the FAS2240 have?

Answer: The FAS2240-2 always has two power supplies, and the FAS2240-4 always has four power supplies, regardless of the configuration.

Are the FAS2240 power supplies assigned to a particular controller?

Answer: No, the power supplies are assigned to the FAS2240 chassis and not to a specific controller.

What type of fan and power supply failures can the FAS2240 withstand?

Answer: In Data ONTAP 8.1, both FAS2240 models can run indefinitely with a failed fan or power supply. See next question for additional information about FAS2240-4 power supply fault resiliency.

What happens if a second power supply fails on the FAS2240-4?

Answer: In Data ONTAP 8.1 RCx releases, the FAS2240-4 will shut down if a second power supply fails. Similarly, if the four PSUs on FAS2240-4 are connected across two PDUs in a cabinet and a PDU fails, the FAS2240-4 will shut down.

In Data ONTAP 8.1 GA release, the FAS2240-4 will continue to run with two working PSUs but requires three working PSUs to power up or reboot.

In Data ONTAP 8.1.1 RC1, the FAS2240-4 will continue to operate and also power up or reboot with two working PSUs.

How long will a FAS2240 run if a power supply is removed?

Answer: The FAS2240 will initiate a shutdown if a PSU is removed for more than two minutes.

In the event of a PSU failure, the blower inside is powered from the backplane and will continue to cool the FAS2240. To avoid the two-minute shutdown rule, do not remove a failed FAS2240 PSU until a replacement has arrived.

Which rail kit does the FAS2240-2 use for mounting in third-party cabinets?

Answer: The FAS2240-2 uses the following mounting kits depending on the rack.

Table 21) FAS2240-2 mounting kits.

Part Number	Manufacturing Part	Description
X5526A-R6	111-00593	R6,RKMT KIT,4-POST,UNIVERSAL
X5527A-R6	111-00864	R6,RKMT KIT,2-POST,DS2246

Can DC power be used with the FAS2240?

Answer: No, the FAS2240 does not support DC power supplies.

Revisions

Revision	Date	Comment
1.0	10/11/11	Initial release
1.1	10/12/11	– Restriction against mixing SAS and SATA disks in Data ONTAP 8.1 RC1 has been removed. Updated questions 6.6, 6.9, 6.10, and 6.11.
1.2	10/28/11	– Changed SSDs to being supported on FAS2240 (6.7) – Added 7.11 about FAS2240-4 PSU policies
1.3	1/25/2012	– Added questions 2.10, 6.6, 6.9, 6.13, 6.14, 6.16, 7.6 – Updated questions 2.9, 5.16, 7.11, 7.12
1.4	3/1/2012	– Corrected heading for table 11 in question 6.4
1.5	3/23/2012	– Updated question 6.10 about maximum SSDs. – Added question 6.11 about NSE support – Added question 6.18 about MP-HA cables – Updated 7.12 with new power policy information
1.6	August 2012	– Reformatted to latest tech FAQ template – Added PCM blanks to FRU list in 2.1 – Added item in 2.3 to cover using local SyncMirror on FAS2240 – Updated supported disks to include 300GB 10K – Reworked section 2.5 extensively to accommodate SSDs, Flash Pools, and DS4486 information – Added support in 8.1 for 144Gb 15K FC disks to section 2.5 – Added footnote in section 2.5 minimum root volume size increases to 162GB in Data ONTAP 8.1.1 – Added comments external shelves purchased with FAS2240 can be migrated to higher end controllers as part of an upgrade
1.7	November 2012	– Increased the maximum Flash Pool size to 400GB starting in Data ONTAP 8.1.2 in section 2.5.



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