

FlashDisk® RAID 2U24 RF-2500 Series

Rugged RAID at COTS Prices with 2.5" Disks for Field Deployments Virtual Storage - RAID 6 - Fibre Channel and iSCSI Hosts

FlashDisk COTS Rugged disk arrays are designed to protect data from certain environmental perils - at COTS prices. Far less expensive than fully rugged systems, the FlashDisk RF-2500 Series is a "hybrid" system that supports both Fibre Channel and iSCSI hosts in the same system. It supports (24) 2.5" disks in the RAID unit and (24) 2.5" or (12) 3.5" disks in expansion shelves. Both HDD and SSD disks are supported. The RF-2500 RAID unit provides up to 48 TB of storage, expandable to 432 TB with 4 TB drives. As COTS rugged, it is protected against dust, moisture, shock and vibration not offered on standard commercial units. The US Army approved these units for field use and has deployed them worldwide in HUMVEE communication trailers in harsh environments. The front door is crafted of sturdy milled aluminum that provides rigidity and structural integrity. It also houses a heavy-duty dust filter to constrict particle flow and provide a moisture shield to protect internal components. The LCD front panel is easily viewed by field personnel, is EMI protected and uses long life pushbuttons. The door features a dust and raindrop seal. Optionally, the US Army, Navy and Air Force mount the unit to a chassis using five bolts, secured in a triangulated pattern for strength, to a rugged heavy-duty base plate for ground, sea and air operations.



RF-2500 RAID systems feature a 2U RAID unit with (24) 2.5" HDD or SSD disks and are ideal for mobile applications - providing field durability and data protection at COTS prices.

FlashDisk Global Manager™ provides all storage services and a centralized management pane for multiple systems. FlashDisk RF-2500 supports a base unit with single or dual redundant controllers with mirrored cache and up to 6 expansion shelves. It delivers over 1 million IOPS. RAID 6 provides dual parity for large arrays to protect against two drive failures and to ensure successful disk rebuilds.

Redundant Controller Systems		
Host Interface	Fibre Channel 8Gb + iSCSI 1Gb	Fibre Channel 16Gb + iSCSI 1Gb
Models	RF-2542R	RF-2588R
Number of Host Ports	8 + 4	4 + 4
RAID 5/6: IOPS (R/W)	1,404K Read IOPS / 540K Write IOPS	1,421K Read IOPS / 544K IOPS
RAID 5/6: MB/s (R/W)	5,106 Read MB/s / 2,089 Write MB/s	5,291 Read MB/s / 2,778 Write MB/s
Single Controller Systems		
Host Interface	Fibre Channel 8Gb + iSCSI 1Gb	Fibre Channel 16Gb + iSCSI 1Gb
Models	RF-2546S	RF-2584S
Number of Host Ports	4 + 2	2 + 2
RAID 5/6: IOPS (R/W)	643K Read IOPS / 462K Write IOPS	649K Read IOPS / 467K Write IOPS
RAID 5/6: MB/s (R/W)	2,847 Read MB/s / 1,571 Write MB/s	2,898 Read MB/s / 1,599 Write MB/s
Number of Total SAS/SSD Disks	168 with 2.5" disks in 6 expansion shelves; 120 with 3.5" disks in 8 expansion shelves	
3.5" SAS Disks	SAS: 15K rpm: 450, 600 GB; 7.2K rpm: 2, 3, 4 TB in expansion shelves only	
2.5" SAS Disks	15K rpm: 146, 300 GB; 10K rpm: 600, 900 GB & 1.2 TB; 7.2K rpm: 1 TB	
2.5" SSD Disks	SAS SLC: 100, 200, 400 GB - SAS MLC: 200, 400, 800 GB, 2.0 TB	
Compatibility	Supports any open O/S; Supports VMware, Citrix, Hyper-V	
Reliability	RAID 0, 1, 3, 5, 6, 10, 15, 16, 30, 50, 60; Hot swap components; Hot spare drive; Automatic rebuild; Path failover	
Manageability	FlashDisk Global Manager manages multiple FlashDisk units over network; Automated alerts	
Warranty and Service	One year warranty; On-site service; 24x7 automated "call home" to US call center; Live technical phone support	

Storage Services

Virtual Storage Pools

Create, expand, and delete storage volumes as requirements change to maximize storage utilization.

Snapshots

Up to 256 snapshots per volume with 4,096 total snapshots and 256 volume copies. Mount and read snapshots, restore files and databases. Rollback to selected time. Host flush agents are available for Windows applications.

Mirroring

Create mirror volumes, split mirrors, fast resync for data redundancy, backup, data mining and analysis.

Volume Copy

Reconstitute full volumes from snapshots, create multiple full versions to avoid overloading production.

FlashD2D Backup

Scheduled zero-downtime tiered primary to secondary disk-to-disk backup. Enables off-line copy to tape.

Global Management

Manage multiple FlashDisk systems from a single, easy to use GUI from any browser on the web.

Storage Wizard

Wizard simplifies initial setup and enables advanced settings.

Visual Calendar Scheduler

Schedules all storage services including snapshots, volume copies, split mirrors, fast resync and replication easily and intuitively.

RF-2500 Base Unit with Expansion Shelf



RF-2500 RAID systems feature a 2U base unit and up to six 2U expansion shelves with a total of 168 disks for maximum random access speed.

RF-2500 Models Rear View



RF-2542R with 8 FC 8Gb + 4 iSCSI ports.



RF-2588R with 4 FC 16Gb + 4 iSCSI ports..



RF-2510R expansion with 4 SAS 6Gb ports.

System Options

Thin Provisioning
Remote Replication
Advanced Storage Services

LUN Masking
Cache upgrade

External Options

FlashNAS Appliance

2U RAID Base Unit

RAID controller
RAID levels supported
Host interfaces
Expansion shelf interface
Number of drives - Total capacity
On-line capacity expansion
Cache memory capacity
Non-volatile cache
Maximum LUNs
Maximum number of hosts
LUN mapping/filtering
Host adapters available for
Power supplies and AC inlets

2U/3U Expansion Shelves

Expansion architecture
Expansion shelf architecture
Maximum drives/capacity
Removable drive trays
Power supplies
Cooling system
Active components
S.E.S. monitoring controllers

Controls and Indicators

LCD front operation panel
LED indicators
Alerting
Component failure
LCD front operating console

Compatibility

Operating systems
Platforms supported
Cluster support
Hypervisor support
Remote monitoring ports
Communication protocols

Storage Management

Event notification
FlashAlert call home service
Manage out of band
FlashDisk Global Manager GUI

General

Uninterruptible power supply
Redundant AC power
Power consumption
RAID unit dimensions
RAID unit weight
Operating temperature
Cooling system
Compliance

Warranty & Service

Standard warranty
Installation and service

Enables high storage utilization with virtual storage on demand.
Available on "multi-protocol" models with added iSCSI replication ports.
Increases snapshots from 64 to 256 per volume; from 1,024 to 4,096 total and increases volume copies from 64 to 256 total.
Enables volume protection needed in SAN environment.
Expands 2 GB controller cache memory to 4 GB cache.

High performance NAS filer with snapshots; CIFS/NFS/AFP; NSPP

Single/Dual redundant 64-bit, 11th generation controller
0, 1, 3, 5, 6, 1+0, 15, 16, 30, 50, 60
Fibre Channel 8Gb, Fibre Channel 16Gb
SAS 6Gb, 4 lanes - 24Gb per port - up to 48Gb per array
(12) 3.5" disks per base unit - 432 TB maximum with expansion
Automatically adds new drives to existing array - "on-the-fly"
Max. 8 GB per controller included standard
Li-ION battery powered backup to flash memory
1024 total, 64 per host ID
4 SAS, 64 iSCSI or 64 Fibre Channel
Configurable per logical partition
PCI-X, PCI Express
Dual hot-swap redundant 460 W each; dual AC inlets

Single/Dual SAS (Serial Attach SCSI) bus
Multiplexed access to each drive within the shelf
12, 16 or 24 disks per expansion shelf - 48 TB per shelf maximum
Hot swappable; individual drive locks
Dual hot-swappable; 460/530 Watts each
Dual hot-swappable fan modules
No active data path components on the midplane
Dual, hot-swappable SCSI Enclosure Services modules

2 x 16 character display, push button controls.
LED power, battery, controller, and system status
Audible and visual alerts
Failure indication through LCD and GUI
View/edit logical RAID/physical drives, setup hot-spare drives, map hosts, check parity, enable write-back cache, rebuild failed drive, view logs...

Supports 14 O/S including Windows, Linux, AIX and UNIX
Intel, SUN, HP, IBM RS-6000, Apple, SGI
Supports 9 industry-standards including Windows, Linux, and Veritas
VMware ESX, Citrix XenServer, Windows Hyper-V, RHEL KVM
RJ45 10/100 Ethernet
TCP/IP, SNMP, SSH

Automatic event and problem alert notification
24-hour call center available for immediate action
Ethernet
Manage storage services of multiple FlashDisks from any web browser

Required when using write-back cache
Dual 90-260 VAC Inlet, 47-63 Hz
100 VAC @ 8/10A; 240 VAC @ 4/5A; 460/530 W with PFC
3.5"/5.1" h x 17.5" w x 19.2" d
Approximately 62 lbs. fully loaded with drives
0° to 40° C operating; -40° to 60° C non-operating
Two dual hot-swap, ball bearing blowers; <51 dB-A
FCC, UL, CE, CSA

One year, next day on-site and toll-free hotline; Options up to 24x7 on-site
On-site installation; 24x7 service available

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