

Sun StorageTek™ 2500 Series of Arrays

Simple, reliable, affordable storage solutions



Highlights

- Simple and cost-effective storage supporting a variety of configurations, and flexible for use with Sun x64 and SPARC® servers
- The Sun StorageTek™ 2510 array iSCSI model supports low-cost IP networks consolidating existing Direct Attached Storage (DAS) implementations
- The Sun StorageTek™ 2540 array's Fibre Channel (FC) model supports existing FC infrastructures and entry-level storage area networks (SANs)
- The Sun StorageTek™ 2530 array's Serial Attached SCSI (SAS) model delivers optimal performance and reliability at lower costs for external DAS environments, overcoming SCSI's limitations
- Financial value—Cost savings, “start small, grow big” scalability
- Operational value—Easy to use and deploy, easy to service
- Sun StorageTek™ Common Array Manager (CAM) software—Simple to implement and manage, scalable across Sun's modular disk array portfolio



The Sun StorageTek™ 2500 series of arrays is ideal for primary and secondary storage within entry and workgroup application environments, and leverages Sun's expertise in data storage development to ensure “best of breed” technology, reliability, and affordability. An affordable entry point into the Sun modular family of arrays, the Sun StorageTek 2500 series of arrays utilizes new-generation SAS point-to-point disk subsystem technology, enabling growing organizations to take advantage of improved performance and reliability at lower costs.

Meeting storage demands

Workgroup, enterprise, and NEP/telecom customers each face their own distinct challenges. The workgroup customer struggles to keep pace with their applications' data growth, which often accounts for the majority of their business issues. Enterprise customers, with departmental and remote offices, seek secondary Tier 2 storage—reliable and centrally manageable, from a name they can trust. And NEP/telecom customers look for storage to address their ruggedization requirements and new application buildouts. While each user faces unique storage demands, Sun satisfies all three markets' data requirements with the affordable, available, high-performance Sun StorageTek 2500 series of arrays.

With a choice of iSCSI, FC, or SAS host interface options, the Sun StorageTek 2500 series of arrays satisfies a wide range of storage

requirements. It is an ideal solution for end users struggling with managing data growth within the limits of their current IT configurations. Each of the Sun StorageTek 2500 series of arrays is strategically positioned for a wide range of customers' unique data requirements.

A key attribute of the Sun StorageTek 2500 series of arrays is the integration of SAS and SATA technologies within the same tray. Where SAS drives are notable for high availability and typically utilized for main-stream transaction-based applications, SATA technology is generally deployed for near-line data and can drastically reduce the cost of a storage investment when cost/GB is the most important factor. By optimizing the right workload demand with the appropriate drive technology, the Sun StorageTek 2500 series of arrays can cost-effectively

support an organization's entire range of data capacity requirements.

Sun StorageTek 2510 array (iSCSI)

Utilizing iSCSI host connectivity, the Sun StorageTek 2510 array enables simple and rapid setup of SANs without the cost and complexity of FC switches. It is offered at a very affordable price for businesses looking to move from direct attached storage to their first SANs, for remote offices needing to be networked, and for businesses requiring a cost-effective business continuity/disaster recovery (BC/DR) solution.

Scalable up to three Ethernet switches, the Sun StorageTek 2510 array utilizes reliable IP networks around the globe with great expandability and no distance limitations. It also leverages an enormous knowledge and experience base—as some level of network expertise is typically present in organizations of all sizes.

Sun StorageTek 2540 array (FC)

The Sun StorageTek 2540 array incorporates the latest 4 Gb/sec FC technology necessary when deploying in new enterprise/workgroup SAN environments. By combining FC host interface architecture with next-generation SAS drive and expansion technology, growing organizations can take advantage of improved performance and reliable data protection in an array that can be shared across an entire SAN. With up to four auto-negotiating 4 Gb/sec FC host ports and 256 volumes per array, the Sun StorageTek 2540 array supports the direct attachment of two to four servers, or support for additional servers through SAN connectivity. It is an ideal choice for small storage consolidation environments, and it provides reliable storage at an affordable price.

Sun StorageTek 2530 array (SAS)

With up to six host-side 3 Gb/sec SAS interfaces, the Sun StorageTek 2530 array can provide support for up to three servers with

The Sun StorageTek 2500 series of arrays extends Sun's modular family

Customer needs:	The Sun StorageTek 2500 series of arrays delivers:
<ul style="list-style-type: none"> > Simple management <ul style="list-style-type: none"> •As easy as provisioning a server •Eases application optimization •Common management with modular 	<ul style="list-style-type: none"> > Simple management <ul style="list-style-type: none"> •Server-oriented management (CAM) •Application-oriented provisioning •Common management with modular
<ul style="list-style-type: none"> > Flexibility and small footprint <ul style="list-style-type: none"> •Maximum storage density (spindles/RU) •Multiple drive and connectivity options 	<ul style="list-style-type: none"> > Flexibility and small footprint <ul style="list-style-type: none"> •Six drives per RU •iSCSI, FC, SAS host options •Tiered storage to meet all data levels
<ul style="list-style-type: none"> > Strong price/performance <ul style="list-style-type: none"> •Keep application and business running 	<ul style="list-style-type: none"> > Strong price/performance <ul style="list-style-type: none"> •Maximum of over 100K IOps and 1 Gbps
<ul style="list-style-type: none"> > Reliable, cost-effective data protection <ul style="list-style-type: none"> •Trusted solution with no points of failure •Data protection software and services 	<ul style="list-style-type: none"> > Reliable, cost-effective data protection <ul style="list-style-type: none"> •Fully redundant RAID array •Data snapshot capabilities

redundant connections—enabling capacity-efficient storage consolidation without the need of a storage network. It provides an affordable, reliable, and robust storage solution designed to improve productivity through higher performance, availability, scalability, and functionality.

Entry-level and workgroup users might also be struggling with their internal DAS strategy. Newly purchased servers typically house several drives, and for an organization with a restrictive budget, this is often viewed as a convenient, low-cost solution. However, this distributed storage strategy leads to wasted data space, duplicated functions, inefficiencies in data protection, and availability inconsistencies. The Sun StorageTek 2530 array breaks through the capacity barriers of internal storage and provides increased capacity and performance by taking storage externally.

Start small, grow big

The Sun StorageTek 2500 series of arrays' modular design creates an affordable entry

point without sacrificing future scalability—enabling customers to start small and scale incrementally when they're ready to address data growth. Dual-active controllers and up to 12 drives combine to create a feature-rich and highly available storage system within a space-efficient 2 U enclosure. When capacity or performance requirements change, the Sun StorageTek 2500 series of arrays supports up to a total of up to a total of 48 drives, enabling further investment protection and flexibility without the need to move to another platform architecture. The Sun StorageTek 2500 series of arrays is ideal for a server-clustering environment. By utilizing up to two active/active RAID controllers with mirrored cache—redundant components including power and cooling, hot-spare drives that can be available as a spare to any virtual disk in any enclosure, and automated I/O path failover—the arrays are well suited for clusters in which continuous application and data availability are key requirements.

Simple installation and management

SMI-S-compliant Sun StorageTek Common Array Manager software ensures a user-friendly interface from setup to administration. Its web-like, task-based management interface significantly reduces the complexity of installation, configuration, and management. Online capacity expansion, data-volume creation, and host-to-volume mapping give the user control of their array and the ability to make quick changes when necessary. Accessible from anywhere in the world with the use of a secure Internet connection, CAM includes automated diagnostics so users can focus on precise, predictable, repeatable results. CAM also scales across Sun's entire modular disk portfolio, and is provided at no added cost to the user.

Premium features provide additional functionality only when and if storage demands call for it. As businesses continue to grow, administrators have the flexibility to add premium features to support data utilization and protection requirements:

- Sun StorageTek™ Storage Domains logically divide a single array into multiple arrays by defining which host or host group can access each volume in the array. This enables a wide range of servers—with different capacity, performance, or data protection demands—to effectively share a single array. Two domains are included with the array. Additional domains are available through a licensable upgrade
- Sun StorageTek™ Data Snapshot creates capacity-efficient, point-in-time volume images, providing a logical volume for such uses as file restoration and backup. Sun StorageTek Data Snapshot is available through a licensable upgrade

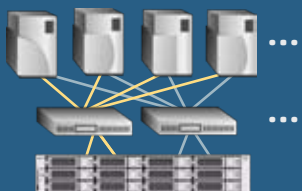
SAS drives

As the next chapter of SCSI technology, SAS benefits from more than 20 years of SCSI technology, incorporating SCSI command sets while taking full advantage of serial architecture and bringing FC-class capabilities to the

Sun StorageTek 2510 iSCSI array
> Up to four 1 Gbps iSCSI ports/array


Sun StorageTek 2540 FC array
> Up to four 4 Gbps FC ports/array

SAN and external DAS connectivity
DAS to SAN migration
Small server storage consolidation



Sun StorageTek 2530 SAS array
> Up to six 3 Gbps SAS ports/array

Shared external DAS connectivity
External DAS environments
2-3 node clusters



Typical deployment topologies for the Sun StorageTek 2500 series of arrays.

table. Comparatively priced to SCSI drives, SAS enables users to scale and add drives for their critical and transaction-based applications without extending their budget.

SAS has several key benefits:

- **Universal connection** – Interoperability with SATA drives, supporting SAS and SATA on the same controller
- High performance with 3 Gb/sec throughput with 10,000 rpm and 15,000 rpm options
- **Dual-porting** – Provides redundancy capabilities, increasing availability with each drive having an alternate link and maintaining that connectivity in the case that one link fails
- **Point-to-point architecture** – Provides direct contact with each drive, enabling the locating of problem drives more quickly than parallel-loop topology where communication travels through each node

SATA drives

Serial ATA is the latest generation of the ATA (Advanced Technology Attachment) disk interface. SATA uses a less expensive protocol and costs less to implement than other drive technologies. With a new,

emerging market comprising unique applications where low-cost storage is a priority—such as near-line storage, virtual tape, tape replacement, fixed content, and Web caching—SATA technology fits the bill. With SATA technology, organizations can enable data that would otherwise be archived on tape to be cost-effectively brought online, thereby improving reliability, access rates, and service levels. In addition, with SATA's larger drive capacity, fewer drives are needed to reach a desired system capacity, resulting in larger savings for secondary storage applications.

Added value and cost savings with Sun™ System Packs

Sun™ System Packs exceed the traditional warranty, and include 24-hour technical support by phone, extended onsite coverage hours, SunVIP™ cross-vendor/-platform interoperability problem management, and access to online learning resources. With Sun System Packs, customers can achieve flexible storage and services at a price that's less than that of purchasing the hardware and services separately.

Sun StorageTek 2500 Series of Arrays Specifications— 2510, 2530, and 2540 Models

Sun StorageTek 2500 series of arrays

Controller card	2510: Dual and single iSCSI RAID controller 2530: Dual and single SAS RAID controller 2540: Dual and single Fibre Channel RAID controller
Cache size (with ECC protection)	512 MB/controller to 1 GB/system
Host interfaces/link speeds	2510: Two to four 1 Gb/sec iSCSI host ports per controller tray 2530: Three to six 3 Gb/sec SAS host ports per controller tray 2540: Two to four 4 Gb/sec FC host ports per controller tray
Other interfaces (FC or SAS)	Up to two 10/100 Base-T Ethernet Up to two nine-pin RS-232 serial ports per dual controller tray
RAID levels	0, 1, (1+0) 3, 5
Cache battery backup	Up to 72 hours (depending on cache size)
Integrated data services	<ul style="list-style-type: none"> • Sun StorageTek Data Snapshot (optional)— supports four snaps per volume, 128 per array • Sun StorageTek Storage Domains—two domains included; (optional)—four, eight, or 16
Dynamic capacity expansion	Five to 48 drives – 365 GB to 48.0 TB
Expansion tray	Up to three expansion trays
Drive depopulation	Scales from five to 12 hard disk drives per tray
Volume	Up to 256 (32/host)
Global hot spares	Up to 15
Maximum array capacity	10.8 TB (300 GB SAS drives) 48.0 TB (1.0 TB SATA drives)

Disk drives

Form factor	3.5 in., low-profile
Interface	Dual-ported SAS
Supported drives/system per tray capacity: raw, unformatted	73 GB, 15,000 rpm 3 Gb/sec, 876 GB per tray 146 GB, 15,000 rpm 3 Gb/sec, 1.75 TB per tray 300 GB, 15,000 rpm 3 Gb/sec, 3.6 TB per tray 400 GB, 10,000 rpm 3 Gb/sec, 4.8 TB per tray 500 GB 7,200 rpm 3 Gb/sec, 6.0 TB per tray 750 GB 7,200 rpm 3 Gb/sec, 9.0 TB per tray 1.0 TB, 7,200 rpm 3 Gb/sec, 12.0 TB/per tray
SAS drives	73 GB, 15,000 rpm 3 Gb/sec, 876 GB per tray 146 GB, 15,000 rpm 3 Gb/sec, 1.75 TB per tray 300 GB, 15,000 rpm 3 Gb/sec, 3.6 TB per tray 400 GB, 10,000 rpm 3 Gb/sec, 4.8 TB per tray 500 GB 7,200 rpm 3 Gb/sec, 6.0 TB per tray 750 GB 7,200 rpm 3 Gb/sec, 9.0 TB per tray 1.0 TB, 7,200 rpm 3 Gb/sec, 12.0 TB/per tray
SATA II drives	73 GB, 15,000 rpm 3 Gb/sec, 876 GB per tray 146 GB, 15,000 rpm 3 Gb/sec, 1.75 TB per tray 300 GB, 15,000 rpm 3 Gb/sec, 3.6 TB per tray 400 GB, 10,000 rpm 3 Gb/sec, 4.8 TB per tray 500 GB 7,200 rpm 3 Gb/sec, 6.0 TB per tray 750 GB 7,200 rpm 3 Gb/sec, 9.0 TB per tray 1.0 TB, 7,200 rpm 3 Gb/sec, 12.0 TB/per tray

Supported software

- Sun™ Cluster Software
- Sun StorageTek™ Enterprise Backup Software (EBS)
- Veritas NetBackup (NBU)
- Veritas Storage Foundation (2540)
- Oracle® Database — Oracle Real Application Clusters (RAC)
- Red Hat Enterprise Linux — Red Hat Cluster Suite
- Windows Server 2003 — Server Cluster

Management software support

Sun StorageTek Common Array Manager—included

Operating system (OS) support

- Solaris™ 10 OS and x86
- Microsoft Windows 2003
- SUSE Linux 9, 10
- Red Hat Enterprise Linux 4, 5
- Solaris™ 9 OS (2540)
- VMware ESX 3.0.2 and higher—2540
- VMware ESX 3.5—2510

Learn More

Learn more about the Sun StorageTek 2500 series of arrays by contacting sun.com/st2500.

Host connectivity

Host/HBA/FC switches	https://extranet.stortek.com/interop/interop
Multipath driver	All HBAs supported in SAN 4.4.12

Warranty

Duration	Three years—parts exchange
Phone support	8 a.m.-5 p.m., Mon.-Fri.
Other	Additional support and extended onsite coverage available through Sun System Pack

Dimensions

Height x width x depth	86.1 mm (3.39 in.) x 448.6 mm (17.66 in.) x 540 mm (21.26 in.)
Weight (maximum)	59.55 lbs.

Power requirements

AC power	515 W (+5 V @ 19 A/+12 V @ 35 A)
DC	17 A max operating (-42 to -60 VDC)

Environmental (operating)

Temperature	10°C to 40°C (50°F to 104°F), without battery 10°C to 40°C (50°F to 104°F), 10°C to 35°C (50°F to 95°F) with battery
Relative humidity	20–80% noncondensing
Operating altitude	68.3 kPa (3,200m), 40°C, four-hour dwell ¹
Operating shock	5.5 Gs, 11ms, half-sine, 10 shocks per direction, all six directions
Operating vibration	All three axes: 0.25 Gs, 5 to 500 Hz, swept-sine, five sweep cycles, one octave per minute
Heat output	460 W (1,571 BTU/hr.)

Environmental (nonoperating)

Temperature (storage)	-10°C to 50°C (-14°F to 122°F) without battery -10°C to 45°C (-14°F to 113°F) with battery (three-month maximum)
Temperature (transit)	-40°C to 60°C (-40°F to 140°F) without battery -20°C to 60°C (-4°F to 140°F) with battery (one-week maximum)
Humidity (storage)	10–90%, max. dew point is 26°C (79°F), 10% per hour gradient
Humidity (transit)	5–95%, max. dew point is 26°C (79°F), 10% per hour gradient
Altitude	18.8 kPa (12,200m), 0°C, four-hour dwell
Shock	20 G, 8.0 ms square wave in each direction along x, y, and z axes
Shock	33 Gs, 11 ms, half-sine, three shocks per direction, all six directions
Vibration	All three axes: 1.2 Gs, 5 to 500 Hz, swept-sine, five sweep cycles, one octave per minute

Regulations

Safety and emissions	FCC Class A VCCI Class A, EN55022 Class A, EN 55024 UL BSM, C-Tick RoHS WEEE
NEBS Level 3	GR-63 CORE requirements, GR-1089 CORE requirements

¹ Commencing upon product reaching temperature stability.