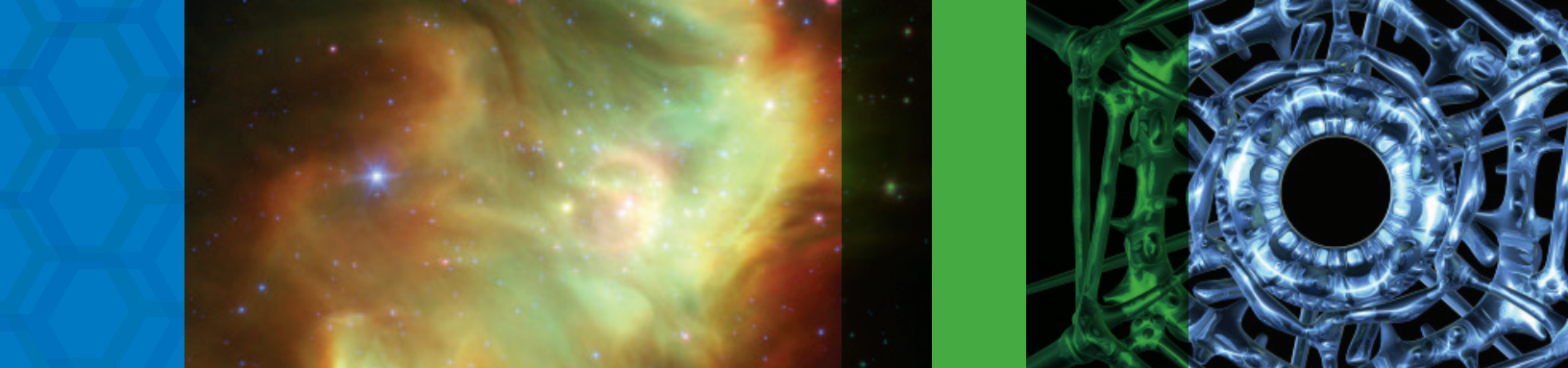# SGI InfiniteStorage 5500 Storage System

A New Standard in Price, Performance and Scalable Flexibility

Key Features

Industry leading price

Space efficiency with highest drive density per U of rack space

Robust and feature-rich SANtricity storage manager

Superior serviceability and easy installation

The IS5500 storage system meets both an organization's demanding performance and capacity requirements while not sacrificing simplicity or efficiency. This sixth-generation storage system offers ultimate flexibility, providing organizations with a storage solution to maximize storage density, reduce operational expenditures through efficiencies, and ensure high productivity.

Unrelenting Performance

Delivering unrelenting throughput and IOPs, the IS5500 Storage system supports SGI's tradition of balanced and sustainable performance. With up to 6,000 MB/s and 150,000 IOPs in sustained drive reads, the IS5500 storage system is equally adept at delivering throughput to bandwidth-intensive applications and IOPs to databases-driven applications. The ability to achieve such high performance benchmarks also places the IS5500 in a position to effectively support environments with massive streaming, capacity an availability requirements such as high performance computing, rich media, and life sciences research.

Two Versions of the Platform

IS5500-SGI tuned & IS5500-standard — The platform comes in the base IS5500 SGI tuned, with especially tuned firmware intended for SGI high-performance compute environments. In addition the IS5500-standard version of the platform comes with generic firmware, and is ideal for customers integrating the platform into heterogeneous environments.

It is application-ready for the Oracle Database, VMWare, and Microsoft enterprise software including: SQL Server, Exchange and SharePoint. The line offers heterogeneous support with the flexibility to tightly integrate with SGI compute environments, to operate as standalone storage, as well as integrating with other non-SGI compute environments.

This versatility extends to the platform itself: The IS5500 comes with following interface options: eight or sixteen 8Gb/s FC; eight 8Gb/s FC and eight 6Gb/s SAS; four 10Gb/s iSCSI and eight 8Gb/s FC or 40Gb/s Infiniband (IB)* and three drive enclosure options supporting up to 384† high performance and nearline SAS drives, self-encrypting drives (SEDs), and solid state disk (SSDs). All of the drive types and enclosures can be intermixed in a single system.

Uptime All The Time

The IS5500 Storage system ensures not only high-speed data access, but continuous access to the data as well. With a legacy of high availability system design, the IS5500 storage system carries on this tradition with redundant components, automated path failover, and extensive online administration capabilities maximizing computational efficiency and productivity ensures no single-point-of-failure exists to keep these environments productive 24x7x365.

*InfiniBand is available only in the IS5500-SGI tuned version.
†For configurations greater than 192 slots premium feature key(s) will be required.

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Front of the IS5500-12: 12-Bay enclosure with (12) 3.5-in drives

Front of the IS5500-24: 24-Bay enclosure with (24) 2.5-in drives

Massive Scalability

Today's storage demands not only call for performance and uptime, but it must also keep up with continuous growth and meet the most demanding capacity requirements. The IS5500 supports multiple expansion enclosure types to support this growth. All drive enclosures can be intermixed in a IS5500 system. These enclosures can be expanded up to 384[†] drives and ensure that you meet a very wide range of tiered data requirements a well as power and density restriction. The IS5500 controllers can also be housed within the ultra-dense 4U 60-drive enclosures, which can be expanded to support up to 384[†] drives. This system is purpose-built for capacity-intensive environments requiring optimal space utilization and reduced power/cooling requirements. By combining dense storage capabilities and intelligent design, the 60-bay enclosure can provide up to 60TB per U, reduce rack space up to 60%, and lower power and cooling requirements.

Green Efficiencies for Today and Tomorrow

Demands for power consumption reduction are at the forefront as energy costs continue to rise—and the IS5500 Storage system was developed with these requirements in mind. With an intelligent design, support for low-power 2.5" drives, power supplies designed to meet multiple efficiency standards, and variable speed fans, you can expect lower overall energy expenditures. In addition, with 60 drives housed in just 4Us of rack space, the IS5500 Storage system has been optimized for maximum storage density.

Flexibility and Consolidation for Lower Overall Costs

The IS5500 storage system can cost-effectively support an organization's complete range of data performance and capacity requirements with support for high performance 6Gb/s SAS drives, nearline SAS drives, self encrypting drives in either 3.5-in or 2.5-in form factors and SSDs in 2.5-in form factor. With intermix support for all these drive types within one enclosure, HPC environments can support both their computational intensive and secondary requirements all with a single system.

Relentless Data Security

Drives will inevitably be out of a user's control, either through theft, off-site service or repair, or disposal of old drives. SafeStore™ encryption services combine local key management and drive-level encryption for comprehensive data security that ensures that data is protected throughout the drive's life cycle without sacrificing storage system performance or ease of use.Intuitive Storage Management that Doesn't Sacrifice Control

SANtricity® storage management software is the perfect combination of robustness and ease-of-use — two attributes not commonly found together in entry priced storage. The SANtricity graphical user interface (GUI) is ideally suited for full-time storage administrators, who want complete control over their storage configuration, and part-time system administrators who need an intuitive interface that helps them ensure optimal storage utilization. And with its industry-unique dynamic capabilities, you can support on-the-fly reconfigurations without interrupting storage system I/O.

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Front of the IS5500-60: 60 3.5-in or 2.5-in drive enclosure

SANtricity software's fully integrated replication features allow administrators to choose the method that best meets their data utilization and protection requirements.

- Snapshot instantaneously creates capacity-efficient, point-in-time volume images, which provide a logical volume for such uses as file-restoration and backup. The Snapshot scheduler can also simply and effectively provide worry-free continuous backups at pre-determined times.

- Volume Copy creates a complete physical copy—or clone—of a volume within a Storage system. This unique entity can be assigned to any host and used for application testing or development, information analysis, or data mining.

- Remote Volume Mirroring, supported on Fibre Channel (FC) host ports, provides storage-based data replication from one system to another to ensure data protection. And with features, such as multiple mirroring modes, dynamic mode switching, suspend/resume, secondary volume access and cross-mirroring, maximum protection and utilization are ensured.

- 512 partitions are included in the base price (limited to 64 for IS5500 w/ IB HICS)

ISSM 10.86 Features	Function and Benefits
Software XOR	Software XOR augments Cache Mirroring Disabled (CMD) and Cache Mirroring Enabled (CME) write performance giving competitive advantage for Intel-based storage controllers. Software XOR boosts performance of the IS5600 which leverages the latest Intel chipset and also the IS5500 without requiring a hardware upgrade.
AutoSupport	AutoSupport provides an easy option for collection and reporting of key operational statistics to central support location for enhanced customer support. Multiple statistics can be collected, including information about misbehaving drives, to enhance the customer support and improve business responsiveness and uptime with SGI's global support capabilities.
Drive Encryption	Drive Encryption secures data while maintaining performance and meets AES-256 security requirements. Storage array password enhancements are provided in ISSM 10.86 to enhance security management and provide new security levels.
Performance Monitor	Provides administrators with graphical displays including quality of service displays at the drive and drive group level to fine-tune and optimize system performance. System performance information is aggregated and can provide both a historical or real-time view of performance.
Dynamic Disk Pools	Dynamic Disk Pools greatly simplifies management for IT generalists through the elimination of RAID and hot spare management and is more efficient than traditional RAID by allowing capacity to be added in single drives increments lowering CapEX. Protection actually increases as drive count increases, and DDP recovers from failed drives in minutes while maintaining performance.
SSD Cache	SSD Cache acts as a memory extension to significantly reduce latency and speed execution of random I/O bound applications without physically moving data to the SSD drive. Set it and forget it. SSD Cache accelerates data access through the intelligent caching use of Solid State Disks located in the drive trays that are expandable up to 5TB per storage system. The Performance Modeling Tool projects performance with added SSD Cache to optimize a customer environment.

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SGI IS5500 System Specifications

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Performance (Raid 5)	• Maximum burst I/O rate from cache: 750,000 IOPs (estimated) • Maximum sustained I/O rate from SSD drives: 350,000 IOPS (estimated) • Maximum sustained I/O rate from SAS drives: 150,000 IOPs (estimated) • Maximum sustained transfer rate from drives: 6,000 MB/s (estimated)
Host Connection Options (Dual Controller)	• Eight or Sixteen 8Gb/s FC; Eight 8Gb/s FC and Eight 6Gb/s SAS • Four 40Gb/s Infiniband(IS5500 SGI-tuned version only) • Four 10Gb/s iSCSI and Eight 8Gb/s FC (IS5500 standard version only)
Drive Connections (Dual Controller)	• Two 6Gb/s SAS drive connections
Drive Types Supported	• SAS, NL SAS, SED*** and SSDs*
Maximum Number of Drives Supported	• 192 using 12-Bay enclosure for FC • 192 using 12-Bay enclosure for IB (IS5500 SGI tuned version only) • 384† using 24-Bay enclosure for FC • 384† using 60-Bay enclosure for FC
OS Version	• ISSM 10.86
Supported Drive Enclosures (enclosures and drive types can be intermixed in a system)	• (4U 60 3.5-in or 2.5-in drives) • (2U 24 2.5-in drives) • (2U 12 3.5-in drives)
Segment Size Value	• 8K, 16K, 32K, 64K, 128K, 256K, 512K
High-Availability Features	• Dual-active controller with automated I/O path failover Supports Dynamic Disk Pools and RAID levels 0, 1, 3, 5, 6, and 10 • Redundant, hot-swappable storage controllers, disk drives, power supplies, and cooling fans • Automatic rebuild following a drive failure (DDP to spare capacity, traditional RAID to hot spare) • Mirrored data cache with battery backup and destage to flash • SANtricity Proactive Drive Health monitoring identifies problem drives before they create issues • SANtricity Persistent Monitor makes periodic copies of the storage system configuration
Premium Software Features	
Standard Premium Features	• Dynamic Disk Pooling • Dynamic Volume Expansion • Dynamic Capacity Expansion • Dynamic RAID Level Migration • Dynamic Segment Size Migration • Persistent Monitor • Proactive Drive Heath Monitoring • Nondisruptive Firmware Upgrades • Media Scan with autoparity check and correction
Optional Premium Features Extended-Value Software	• Drive Encryption • Thin Provisioning • Snapshot Consistency Group • Checkpoint Asynchronous Mirroring • Volume Copy • Remote Mirroring • Turbo Performance

Product And Manufacturing Directive Compliance	• Restriction of Hazardous Substances in Electrical and Electronic Equipment Directive (RoHS, 2002/95/EC) • Waste Electrical and Electronic Equipment Directive (WEEE) • European Technical Standards Institute (ETSI) • IS5500-standard Only: Includes Network Equipment Building System (NEBS) Level 3 standards in the 12 and 24-drive enclosures.
Power Supply Attributes	• Dual output up to 585 watts maximum wide-ranging AC input (12-Bay and 24-Bay) • Dual output up to 1,450 watts maximum wide-ranging AC input (60-Bay) • All drive trays must have dual power supplies • IS5500-standard Only: 48V DC option available for the 12-Bay and 24-Bay drive enclosures
TEMPERATURE	• Operating range: 10°C to 40°C (50°F to 104°F) — for 12 and 24 bay • Operating range: 10°C to 35°C (50°F to 95°F) — for 60 bay • Storage range: -10 °C to 50 °C (14°F to 122°F) • Transit range: -40 °C to 60 °C (-40°F to 140°F)
Supported Operating Systems	• RHEL 5.8, 5.9‡, 6.3, 6.4‡ • SLES 10.4, 11.1‡, 11.2 • Windows Server 2012 (VDS)

DIMENSIONS (CONTROLLER AND DRIVE MODULE)	**Height x Width (incl. mounting brackets) x Depth (incl. drive CRUs and endcaps)**
IS5500-12: 12 3.5-in drive enclosure	• 3.4” x 19” x 21.75” 8.64cm x 48.26cm x 55.25cm
IS5500-24: 24 2.5-in drive enclosure	• 3.47” x 19” x 19.6” 8.81 cm x 48.26 cm x 49.78 mm
IS5500-60: 60 3.5-in/2.5-in drive enclosure	• 7.0” x 19.0” x 32.5” 17.78 cm x 48.26 cm x 825.5 mm
WEIGHT	**Module Weight (max)**
IS5500-12: 12-Bay enclosures with (12) 3.5-in drives	• 59.52 lbs (27 kg)
IS5500-24: 24-Bay enclosures with (24) 2.5-in drives	• 57.32 lbs (26 kg)
IS5500-60: 60-Bay enclosures with (60) 3.5-in drives	• 232.00 lbs (105.2 kg)

Air Flow and Heat Dissipation††	**Controller Enclosure**	**Drive Enclosure**
IS5500-12: with (12) 3.5-in drives	476W (1625 BTU/hr)	223W (761 BTU/hr)
IS5500-24: with (24) 2.5-in drives	522W (1779 BTU/hr)	268W (916 BTU/hr)
IS5500-60: with (60) 3.5-in drives	1102W (3762 BTU/hr)	847W (2889 BTU/hr)

*When ordering SSDs, SSD premium feature key must be ordered to activate them.

**These operating systems available on IS5500-standard only. Failover support by third party suppliers.

***When ordering SED (FDE) drives, FDE premium feature key must be ordered to activate them.

†For configurations greater than 192 slots premium feature key(s) will be required.

††Replication features (such as RVM, SnapCopy, Volume Copy) are not supported over IB HICs

†††Calculated upon typical drive type, may vary

‡Available on SGI-tuned version of the platform

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