



The World's Fastest Storage®

256 GB

Texas Memory Systems

RamSan-420

- 256 GB RAM Storage
- 600,000 IOPS (Sustained)
- 4.5 GB/s Bandwidth
- 175 sec Backup/Restore
- 2-8 FC Links (4 Gb)

Solid State Disk



RamSan-420

Solid State Disk (SSD)

Texas Memory Systems' (TMS) RamSan-420 solid state disk (SSD) is the **World's Fastest Storage**. It sits at the top of the storage pyramid and is increasingly referred to as Tier 0 storage. It is used to accelerate applications such as Microsoft SQL Server or Oracle databases. The RamSan-420 accommodates many more concurrent users and simultaneous transactions and is more economical than adding hard disk RAID units, servers, internal RAM, or tuning your application constantly.

By utilizing **RAM chips**, the RamSan-420 delivers much lower latency and higher bandwidth than mechanical spinning hard disks or Flash media. As **Enterprise systems** get faster and more critical, the RamSan-420 is the most cost-effective SSD solution to eliminate I/O bottlenecks.

Increased performance is achieved by using fast RAM chips, and tightly integrating them with the Fibre Channel controllers. With eight Fibre Channel links for multiple accesses to storage during heavy computer activity, the RamSan-420's performance does not degrade.

Installation and Management

All TMS SSDs install quickly as external storage devices attached by Fibre Channel cables. They are integrated into sophisticated SAN systems for use as the top tier storage accessible by hundreds of servers or attached behind storage appliances, virtualization switches, and NAS filers. The RamSan-420 can be monitored and configured from any browser via a protected Java applet. Command line management is also available through secure shell (SSH). The front panel displays instantaneous I/O activity.

TMS SSDs are designed to operate in lights-out data centers. Our systems constantly monitor internal components for error conditions. A system administrator can access our units through a built-in management port that provides remote network connectivity. The management port generates notifications if any errors occur. Also, the RamSan-420 supports SNMP traps and email notification.

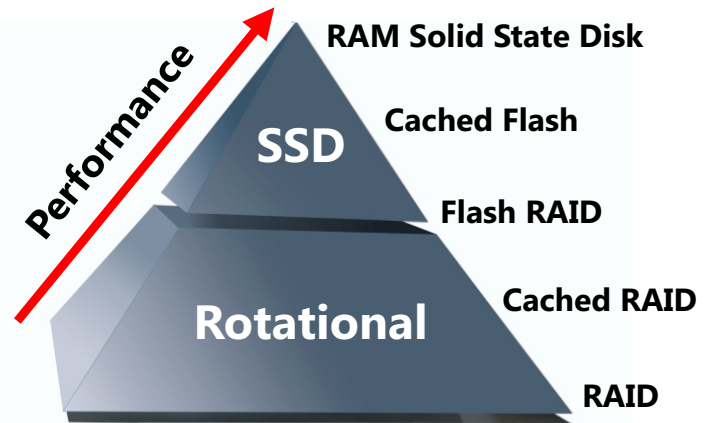
Call or Email TMS at Sales@RamSan.com

Texas Memory Systems, Inc.

10777 Westheimer, Suite 600, Houston, Texas 77042

(713) 266-3200

www.RamSan.com



Typical Storage Hierarchy

Reliable and Highly Available Storage

As with any storage device, reliability is a primary concern. The RamSan-420 is designed to offer superior reliability to other RAID or SSD devices. The primary RAM storage media is protected from RAM chip failures by ChipKill™ and from RAM board failures by RAIDed RAM boards.

The RamSan-420 has redundant hot-swappable power supplies with internal batteries (N+1). For power down conditions, data is stored in an internal Flash subsystem in 175 seconds. In addition, Fibre Channel ports support active/active multipathing.

Management

- Browser-enabled system monitoring and configuration
- Supports SNMP traps and email notification
- Command line management via secure shell (SSH)
- Instantaneous I/O activity displayed on front panel

LUN Support

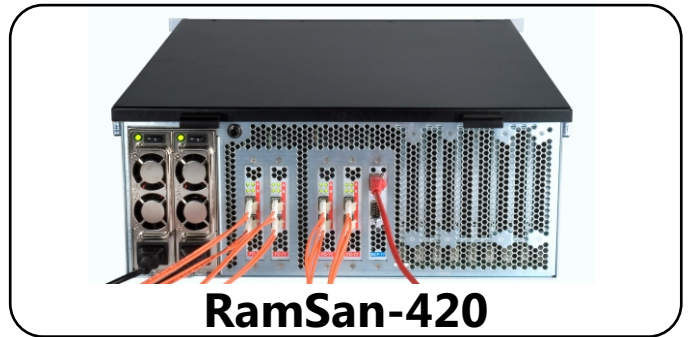
- 1,024 LUNs with variable capacity per LUN
- Flexible assignment of LUNs to ports
- Hardware LUN masking

Fibre Channel Interface

- 4 Gbit Fibre Channel (2 Gbit capable) controllers available
- 2 ports standard; up to 8 ports available
- Supports point-to-point, arbitrated loop, and switched fabric topologies
- Interoperable with Fibre Channel Host Bus Adapters, switches, and operating systems

Patented IO² Technology

The RamSan-420 includes Texas Memory Systems' patented IO² feature. IO² improves system availability by making data in the RamSan-420 instantly accessible after the system is powered on. With competing SSDs, applications wait idly while SSDs fully load data from hard disk drives into memory.



Non-Volatile Backup Methods

- The RAM used to give the RamSan-420 record-breaking performance would lose its data if the power was lost. To transform a box of RAM into a non-volatile storage solution, the RamSan-420 includes batteries and automatic backup methods which copy data at 1.4 GB/sec to the redundant internal Flash-based RAID. This ensures that all data written to the RamSan-420 is safely stored when the system needs to be powered down.
- The RamSan-420 leverages RAM for the primary storage media and Flash memory for backup. Flash, while considerably slower than RAM, is much faster than disks and allows the system to shut down dramatically faster than any other SSD.

Reliability and Availability Features

- High availability architecture
- Primary RAM storage media protected from chip failures by ECC and Chipkill™ technology
- Protected from board failures by RAIDed memory boards
- Soft Error Correction detects and rewrites transient errors
- Internal redundancies:
 - Power supplies and fans
 - Backup battery power (N+1)
 - RAIDed Flash modules
 - RAIDed primary RAM storage media
- Active/Active FC controllers

Backup Procedures

Supports two backup modes that are configurable per system or per LUN:

- Data Sync mode - synchronizes data to redundant internal Flash modules before shut down or with power loss.
- Active Backup mode (optional) - backs up data constantly to internal redundant Flash modules without impacting system performance.

Specifications	
Capacity	256 GB
Random I/Os per second	600,000
Bandwidth	4.5 GB/sec
Fibre Channels: 4 Gb, 2 Gb	2-8
Latency	<15 microseconds
Primary Storage Media	RAM (RAIDed)
Secondary Storage	Flash (RAIDed)
Power Supplies	Redundant Hot-Swap
Batteries	3 Redundant
Size	7" (4U) x 24"
Power Consumption (peak)	650 Watts
Weight (maximum)	90 lbs

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