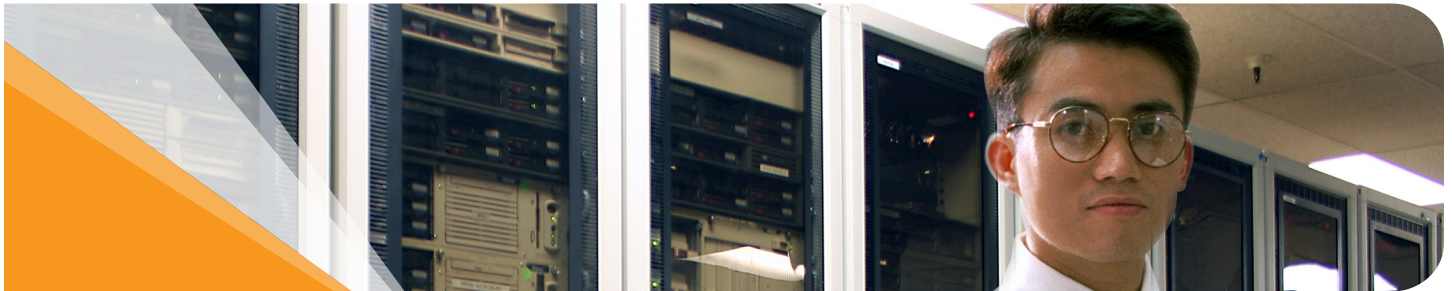


iGLASS Selects Solid Access USSD 200 with LSI SAS HBA Solution to Achieve a Remarkably Fast Storage System



EXECUTIVE SUMMARY

CHALLENGE

- iGLASS was producing and consuming more data at an ever increasing rate.
- Reliance on large amounts of disk storage, requiring additional I/O performance.
- I/O performance needs to match server demands.
- Need for accessing more storage capacity leads to a large gap between server and storage I/O performance, which results in bottle-necks and decreased productivity.
- Eliminate data-center I/O bottlenecks.

SOLUTION

- Addressed the root cause of I/O bottlenecks by off-loading I/O-demanding files onto USSD 200 for processing RAM speed.
- First SSD designed for mainstream applications and non-disruptive implementation.
- Employed LSI SAS HBA solution designed to revolutionize I/O performance through processing transaction-intensive databases with microsecond access time.

RESULTS

- Improved efficiency of application servers by recovering CPU cycles formerly lost in I/O wait loops.
- Downsized and simplified data center.
- Included best-of-breed components.
- Enabled rapid upgrade integration/standards and commoditization; mission critical reliability.
- Increased flexible interfacing/multiprotocol access.

Serial Attached SCSI (SAS) User Sees Dramatic Productivity Improvement by Adopting the Newly Developed SSD Device from Solid Access Technologies with its Breakthrough IOPS Performance/Cost Metric

Introduction

iGLASS Networks (<http://www.iglass.net>) provides innovative, measurable, network monitoring and management solutions for companies of all sizes. By combining its knowledge of networks with its in-depth understanding of the underlying principles of network communications, iGLASS offers a variety of services customized to meet each client's individual needs. As a SaaS (Software as a Service) provider of innovative outsourced network-monitoring solutions, it provides accurate, proactive monitoring of 6.5 million devices and management services for clients in the U.S.

iGLASS's key goals were to:

1. Help businesses reduce downtime.
2. Protect revenue and increase efficiency.
3. Prevent service interruptions by immediately notifying its clients when a server goes down or a network element is no longer responding by using its Internet-based monitoring tools.
4. Implement service more quickly and less expensively than any comparable solution.

Tim Bolden, president of iGLASS says, "We are proud of our system architecture in that we gather data from probes across the country every two minutes and while our applications are constantly having to read and write data." In searching for a solution, iGLASS recognized a trend: every computer IT hardware platform was moving from proprietary (one vendor) to open (cost effective and performance optimized) solutions. More importantly, iGLASS' past infrastructure did not operate at full capacity. Since iGLASS gathers data in real-time and the data are constantly changing, I/O was always the largest performance bottleneck.

The IT savvy iGlass team had kept an eye on developments in SSD technology for some time and decided to investigate further to see if it fit their situation. They found that the Solid Access USSD innovation lowered the acquisition cost for ultra-fast SSD devices, which accelerated the deployment decision. Many customers are on the fence when budgeting and assessing SSD implementation.



Market: Cable/Tecom, Professional, Infotech, and Retail

However, they evaluate the wrong metric, looking at cost per GB storage capacity when the relevant metric should be cost per IOPS.

“We have struggled with the I/O issue for years. With traditional technologies, we would add servers and spindles to try to increase speed. We could tell from the system stats that most of our delays were caused by I/O wait states,” said Bolden.

Recognizing the server-storage performance gap, iGLASS wanted to solve the problem for its clients. Being both proactive and innovative, iGLASS searched for ways to streamline its data center, which must run 24 hours a day, seven days a week at full capacity.

The new breed device, USSD 200, was an appropriate fit for iGLASS. USSD 200 was designed to be a mainstream application that mid-size and lower budget companies could implement. USSD 200 represents the future of SSD technology and offers the lowest cost per IOPS for any SAS, SCSI and FC connectivity. The USSD 200 SAS uses LSI (<http://www.lsi.com>) SAS3442E-R HBAs exclusively. Each of these Host Bus Adapters is also bundled with the LSI My Storage™ management software.

About USSD 200

In short, the Solid Access (<http://www.solidaccess.com>) USSD 200 had performance, price, reliability, and flexibility covered. iGLASS did not have to change anything in its existing infrastructure because of USSD 200's non-disruptive implementation.

“The USSD 200 was simple to implement and appeared to be standard disks to our LINUX server. The solution was truly “plug and play,” said Bolden. iGLASS implemented a new NFS server with two USSD memory arrays attached in a Raid 1 configuration as the disk storage, and is using the LSI SAS HBA to provide the interface between the NFS server and the USSD 200.

The high degree of efficiency reached on all levels was the primary quality that iGLASS noticed in the USSD 200. Its platform is well-positioned for future use as well, since every hardware piece is made of existing, best-of-breed server components. The USSD 200 is a firmware-driven innovation, powered by Intel® Xeon® general-purpose processor, its components have been battle-tested and building block upgrades can all be easily integrated. This results in more reliable and capable technology.

About LSI SAS3442E-R

The LSI SAS3442E-R HBA with Integrated RAID provides ultra-high speed data transfers for large-capacity server storage and mission-critical applications. Integrated RAID (RAID levels 0, 1, 1E and 10E) avoids additional host CPU overhead by leveraging the advanced Fusion-MPT™ architecture on the LSI SAS1068E controller, which delivers over 140,000 IOPs. This HBA is a cost-effective solution that attains superior system performance from its 2.5Gb/s 8-lane PCI Express bus.

Benefits of the Solution

The main issue at iGLASS was the processors waiting for I/O from the disk, which caused the load average to be high. The load average, or the average number of processes waiting to run on the servers at iGLASS during each 1.5 and 15 minute intervals, was in excess of five. This was because a particular server had an average load of six. The load average should have matched the number of CPU's at iGLASS, which would have been around two. Using the USSD 200, iGLASS has seen the load average for gathering data and alarming customers rapidly decrease to a load average of 1.2 for 1.5 and 15 minute intervals.

In addition, of particular benefit to iGLASS, is that USSD 200 SAS benchmarks run up to 71,500 IOPS (55,000 IOPS random), 750MB/s and have an access time of less than 15 microseconds on a single SAS wide port.

With these results, the number of data gathering servers could be reduced from seven to four, which easily handles the load and allows room for growth. Fewer servers mean less equipment to maintain, less rack space, less power and a lower total cost of ownership," said Bolden, who also performed installation testing and verification.

The USSD 200 implementation improved response time dramatically, and iGLASS servers were less inundated with high volume traffic. The CPU's on the servers were no longer waiting for disk I/O, thus allowing them to do more work. iGLASS is now reaping the benefits of a streamlined and less complicated infrastructure with savings in hardware, less energy needed to cool the servers and a decrease in the space needed to host the servers.

Bolden added, "The USSD 200 technology addressed the single largest performance challenge we faced. Solid State Disks are significantly faster than traditional magnetic disks. By placing our frequently accessed files on the USSD 200, we almost completely eliminated I/O wait states on our servers."

"Ultimately this means that we can service more customers with fewer servers. We are also able to process data quicker, meaning that alerts go out sooner when we detect outages. The bottom line is that we deliver a better service to our customers with the USSD 200," said Bolden.

iGLASS' software and system management team were instrumental in evaluating and implementing the USSD 200 solution. The team included: George Woodring, Marc Wiatrowski and Tim Bolden. From Solid Access, Tomas Havrda provided support and direction during implementation.

How the Solution Works

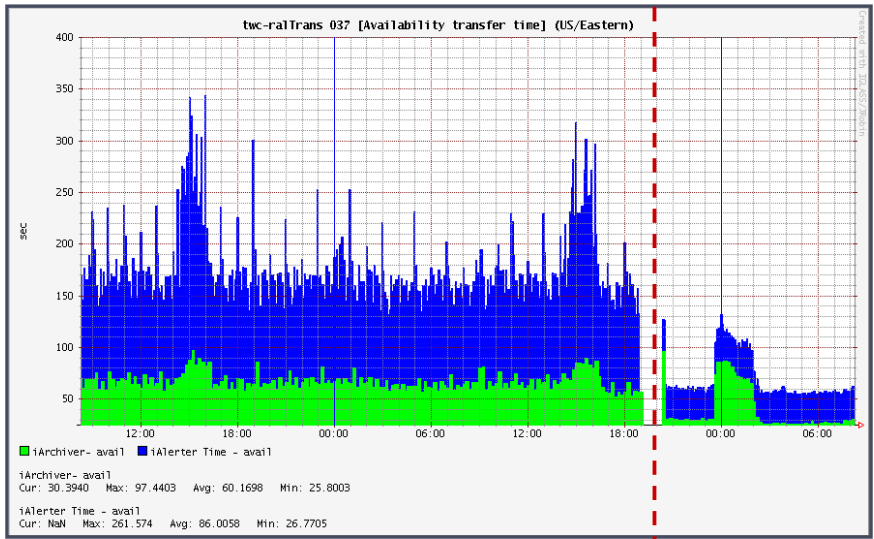
USSD 200 with LSI SAS HBA Solution supports 3Gb/s SAS interfaces and up to eight full duplex SAS host connections per 2U chassis. USSD 200 supports SSP, STP, and SMP as defined in the Serial Attached SCSI (SAS) specification (version 1.0). The USSD 200 SAS benchmarks run up to 71,500 IOPS, 750MB/s and access time of less than 15 microseconds on a single SAS wide port.

Offered in a 2U rack mount form factor, the USSD 200 has a maximum storage capacity of 64Gb per unit. The capacity can be scaled up by daisy chaining USSD devices in industry standard EIA-310-D 19" rack cabinets. It has the capacity options of 8/16/32/64 GB and supports FC 4Gb/s, SCSI 320MB/s, SAS 3Gb/s, in low profile format. nUSSD 200 offers the lowest cost per IOPS of any storage device.

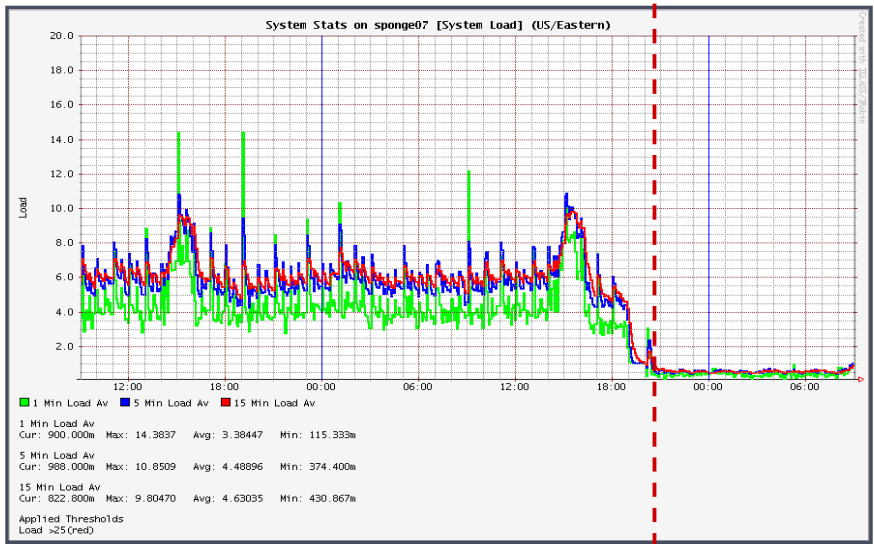
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Figure 1. The USSD 200 Implementation Point



Graph courtesy of iGlass Networks



Graph courtesy of iGlass Networks

For additional information, please visit:

<http://www.iglass.net> <http://www.solidaccess.com>

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