



## What is IP SAN?

White Paper

## Introduction

Internet Protocol, or IP, has grown to become the most widely used telecommunications standard worldwide. The technology is well understood, easy to implement and affordable. Most corporate data traffic uses a common IP network, except for storage data.

Access to high performance storage data has often required direct-attached storage (DAS) or a Fibre Channel (FC) storage area network (SAN or FC-SAN)

Increasingly, IP storage has grown to be viewed as an extremely cost effective, easier to manage, and less complex storage solution than either DAS or FC-SAN. Internet SCSI (iSCSI) can transport traditional high performance "block-based" storage data over a common IP network. Consequently, IP network storage has been found most frequently in remote mirroring, remote backup and similar applications, since an IP network has no distance limitations. And because it offers centralized management and control, IP storage is easier to manage and keep running than multiple DAS systems, and typically requires less management effort to do so.

As IP network storage achieves continued market adoption, application barriers to implementing and managing networked storage are dropping rapidly. And with the introduction of scalable, enterprise-level 10 gigabit/second Ethernet (10GbE) IP storage networks by Intransa, many more applications are able to take advantage of the ultra-high performance delivered by this technology. Intransa IP storage solutions start with as little as 3.75 terabytes (TB) and are architected to grow to 1,000TB or more of RAID protected storage.

## The Challenge: Competing Technologies Access Storage

Most servers access storage devices through the Small Computer Systems Interface (SCSI) standard, moving "blocks" of data among computer systems. But limitations become clear as the demand for storage capacity grows. SCSI's built-in limitations on distance, the number of devices supported and exclusive ownership of a server to its respective SCSI storage device have prohibited the creation and sharing of a common pool of storage.

Enabling a shared storage environment is best done with networked storage. Fibre Channel (FC) – both a protocol and a technology – is the basis for building common SANs (storage area networks) and popular for high performance, support of longer distance implementations and SCSI, the ability to transport block-level data, and the capability to scale to large network configurations.

However, although no longer proprietary, storage networks based on FC retain high hurdles to overcome for many customer environments, including complexity, the difficulty to install and manage, and the cost of wide implementation

Another method of networking storage is to attach the storage device directly to an existing Ethernet network in a Network Attached Storage (NAS) configuration, and providing a file system to the application environment. NAS is typically a simpler and lower cost solution than a Storage Area Network (SAN) as it leverages the benefits of using an IP network, such as support for significantly longer distances

Unfortunately, NAS is slower in performance than FC-SAN, somewhat limiting its value. NAS data transport is not managed at the granular block level, but instead at a file level. This interjects another layer, and thereby slows data access in transactional or database type applications. Many application environments, such as video surveillance, digital imaging, medical imaging, video on demand, and IPTV have their own native file systems, and interjecting a NAS and another layer is not of benefit. Further, issues of scalability, centralization and management of a single pool of storage increase directly as the number of NAS systems deployed in a site increase.

*A new solution is needed, designed with the low cost and ease of deployment of NAS systems and the functionality of SAN.*

## Leveraging the Most Widely Used Standard on the Planet

Internet SCSI (iSCSI) enables server host applications to perform traditional "block-level" transactions over a common IP network. The primary benefits of IP network storage leveraging IP are clear: no distance limitation, lower cost, well understood technology, easy administration and management, high availability (multiple connection paths), better performance than NAS (block level access instead of file level) and maximum utilization of resources (share disk and tape devices across a heterogeneous environment).

Intransa StorStac Systems go a step further, and allow the applications that do require a file system to implement the most common ones in conjunction with the IP network storage, including file systems from Hewlett-Packard/PolyServe, IBRIX, Quantum StorNext, Sanbolic, etc., with access to the high performance of a SAN backend storage system. Those applications that do not require a file system can continue to leverage all of the benefits of the IP network storage system, without any additional overhead.

Traditional FC-SANs have been available on the market longer, and thus have greater adoption. However, IP network storage systems remain simpler to manage and more affordable to implement than traditional FC-SANs, and can be used to complement their legacy SAN cousin for new, capacity heavy applications environments, secondary storage, and tiered storage applications including disk to disk backup and recovery, data mining, and storage consolidation. In the case of DAS, IP network storage systems offer better use of resources, less management challenge, and competitive pricing.

With the standard adoption of 10 GbE, first available as a scalable, high performance solution from Intransa, IP network storage will benefit from the faster transfer rates that are above that of even the fastest, 4Gb FC-SANs. But IP network storage need not replace FC to fit in the enterprise.

## The Solution: Enterprise Systems and Storage are Tiered

It would be prohibitively expensive to maintain all company data on instantly available and immediately recoverable storage systems. Enterprises routinely move less critical data to less available storage or archive it offline. But business and regulatory compliance requirements are beginning to demand rapid access to some of these archived records, which are no longer on immediately available storage.

- **Intransa network storage solutions support 1, 2 and 10GbE connection speeds, and based completely on IP.**



**Start** inexpensively & affordably with a single PCU controller & one SCE enclosure with 3.75TB of RAID storage

**Grow** a single StorStac System to over 100TB in a single rack, matching your IT needs as they evolve

**Expand** your StorStac System to support even the largest & highest demand environments, architected for 1,000TB or more in a single system

Availability of on-demand data can be a key business differentiator by providing better customer service or a greater ability to execute. Competitive pressures quickly transform this differentiator into another standard requirement of doing business. And, compliance to regulatory requirements ranging from SOX to HIPAA to GLBA in the U.S. and similar legislation worldwide, all make this situation worse, mandating that large amounts of information be readily available.

These business and compliance forces pressure an enterprise to move data onto higher performance systems, away from DAS. But redundant systems, backup and restore policies, snapshot or mirrored copies, and administration resources to manage data are being wasted if data that is of less critical value to the business is moved to high cost FC-SAN systems. Moving volumes of data onto higher cost FC-SAN storage can be prohibitively expensive and result in wasted resources.

More important data could be supported with a higher service level of protection, such as mirroring, automated snapshots and remote replication for recovery. But the cost for this level of service is high when using FC-SAN. Less critical data could be archived to slower media at a much lower cost. With a hierarchy of storage devices in place, storage administrators can match the level of service available to the requirements of the business application.

Most enterprises tier their server and storage system into three or four categories, roughly: Business-critical, Business-essential and Business-utility applications. Of course, which applications are critical, essential and utility varies by the enterprise and their own needs and requirements.

## IP network storage Fits in the Tiered Enterprise

The price per port, to connect a server with Fibre Channel remains high and limits the number of servers that can affordably be attached to a FC-SAN. For most IT budgets, storage and associated costs are well documented as a continual expense that eats up from one-third to one-half of total IT spending. A tiered-storage approach (matching relative value of data to associated storage cost) can substantially reduce costs and management challenges.

### Medical Imaging



### Server & Storage Consolidation



### Host & Network Connectivity



### Data Management/ILM/CDP/Backup



### File Systems and Operating Systems



### Video Surveillance/Video-On-Demand/IPTV



### Technology Partners



Intransa Technology Partner Program members cover a wide range of technologies and applications, ensuring that customers are able to purchase complete solutions to their needs for IT, video surveillance, media and entertainment, medical imaging, document management, and other areas.



As far back as 2004, the *Enterprise Systems Journal* had reported that connecting high-availability servers can cost \$3,300 less with IP network storage (See <http://www.esj.com/enterprise/article.aspx?EditorialsID=1161>), enabling an enterprise to increase the number of servers that will attach to a SAN. IP network storage is appealing for companies with remote sites, bringing stranded servers into the storage network, and to consolidate backups. Intransa StorStac Systems also include asynchronous replication as a standard feature to help address this need.

In a tiered-access strategy, IP network storage is a complementary technology to Fibre Channel.

IP network storage enables access to networked storage for servers that might never have been connected, if it were not for the significantly lower cost of connecting to a SAN. Intransa StorAlliance Technology Partner ABREVIITY (See <http://www.abrevity.com>) offers advanced data management features discover, classify and manage information, and help identify which data can be moved to less expensive storage, including to IP SAN systems like the StorStac System.

In addition to ABREVIITY, Intransa StorAlliance Partners Asempra, Atempo, CommVault, DoubleTake Software, FilesX, and Sonasoft all offer comprehensive solutions for backup and recovery, continuous data protection (CDP), information lifecycle management (ILM), and other data management applications, integrated with StorStac System 1, 2 and 10GbE solutions.

So, on one hand, an FC-SAN is well suited for the high performance and functionality of the highest tiers, and may be able to justify the expense to connect and maintain a select number of servers to a high performance storage network. On the other hand, IP network storage is a better fit in first tiers with greater economies of scale, ease of use and the ability to bring more servers into the SAN than would otherwise be possible. With 10GbE performance now available in a scalable, enterprise-ready platform, the Intransa StorStac System is able to match the speed requirements of FC-SAN, making it ideal as part of a complementary, tiered solution.

For the enterprise, it is no longer a question of either FC or IP network storage. These are now both enabling technologies that work hand-in-hand, as complementary technologies that fit together, in a tiered enterprise.



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