

# Storage Unification – Using iSCSI

## Simplifies and Optimizes Network Storage Resources to Reduce Operating Costs

IP storage networks are a new, cost-effective approach to deriving optimal value from both storage area networks (SANs) and network attached storage (NAS). This leapfrog step provides all the benefits of a SAN, but utilizes a network topology primarily based on IP networking. While IP as a SAN platform may fall in to the “emerging” category in the storage world, IP and Ethernet have longstanding maturity and robustness from decades of use in the networking world.

Balancing a combination of current block-accessed SAN devices with new file-accessed NAS devices increases flexibility, improves manageability, and reduces operating costs.

### The Challenge: Reaping Value from Networked Storage

Enterprises face tremendous pressure to find adequate solutions for storage needs ranging from data storage, protection, distribution, vendor aggregation, and capacity management. In the face of ballooning capacity requirements, companies who rely on traditional storage architectures, such as direct attached storage (DAS) find themselves in a never-ending race to add more storage to more servers even as management and administration costs skyrocket. Many have migrated their servers with block-based DAS devices towards Fibre Channel SANs. While this deployment will provide SAN benefits, such as higher availability, better scalability, and more efficient backup operations, it still falls short, requiring additional solutions such as remote backup and integration with file-based NAS.

Internet Small Computer System Interface (iSCSI) is an emerging technology that creates a cost-effective bridge between these two storage disciplines.

### The Solution: Adaptec Snap Servers Unified Storage Architecture with iSCSI Support

Networked storage is a mature and well-understood technology. The main issues slowing the transition from direct-attached storage solutions to networked storage solutions are the cost and complexity associated with Fibre Channel. iSCSI technology, sometimes referred to as SCSI over IP, addresses these issues.

Snap Servers can support both block data (iSCSI) and file data simultaneously. Now Ethernet-based storage network deployment, utilizing Snap Server units, facilitates more rapid expansion of new storage capacity without directly impacting individual server or application operation. With the flexibility of a networked infrastructure in place, total costs decline.

iSCSI has much to offer. The most obvious benefit is cost. Gigabit Ethernet technology is significantly less expensive than Fibre Channel. Fibre Channel ports cost as much as 50 percent more than copper Gigabit Ethernet ports, and that doesn't include the cost of the optics and host bus adapters (HBAs). In addition, every IT administrator is familiar with the deployment and provisioning of Ethernet and TCP/IP networks. iSCSI can move data great distances over the Internet for light storage traffic or over leased lines without the need for the expensive optical gear Fibre Channel requires.

First-generation iSCSI performance is well suited for the workgroup or departmental storage requirements of medium and large-size businesses. TCP/IP offload engines, as well as faster Ethernet standards, will further improve the performance of iSCSI.

### Key Features

- **Built on familiar standards**
- **Flexible storage infrastructure reduces TCO**
- **iSCSI technology allows rapid storage capacity expansion without impacting server or application operations**
- **Reach greater distances with less infrastructure**
- **Provides a high degree of interoperability**
- **Supports simultaneous transport of both file-level and block-level data**
- **Virtual iSCSI disks are completely protected by the underlying RAID that protects the file-based data**

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### How it Works

Internet SCSI (iSCSI) is a new Internet Engineering Task Force (IETF) standard protocol for encapsulating SCSI commands into TCP/IP packets and enabling block data transport over Gigabit IP networks. The iSCSI protocol is delivered via a standard Gigabit Ethernet port that resides in the Snap Server. The high-level management activities of the iSCSI protocol—such as permissions, device information, and configuration—are built into the GuardianOS and managed through the Snap Server administration application. The iSCSI protocol allows the Snap Server to function as a target (storage array, subordinate to a server.) With iSCSI, the Snap Server is capable of simultaneously transporting both file-level data and block-level data over an IP network. By utilizing an available Gigabit Ethernet port or adding an iSCSI HBA to the enterprise application servers, the existing network infrastructure can be used to connect those servers to Snap Servers, which see them as local drives, using the block-based iSCSI protocol.

### Environments Ideally Suited for the Snap Server Solution

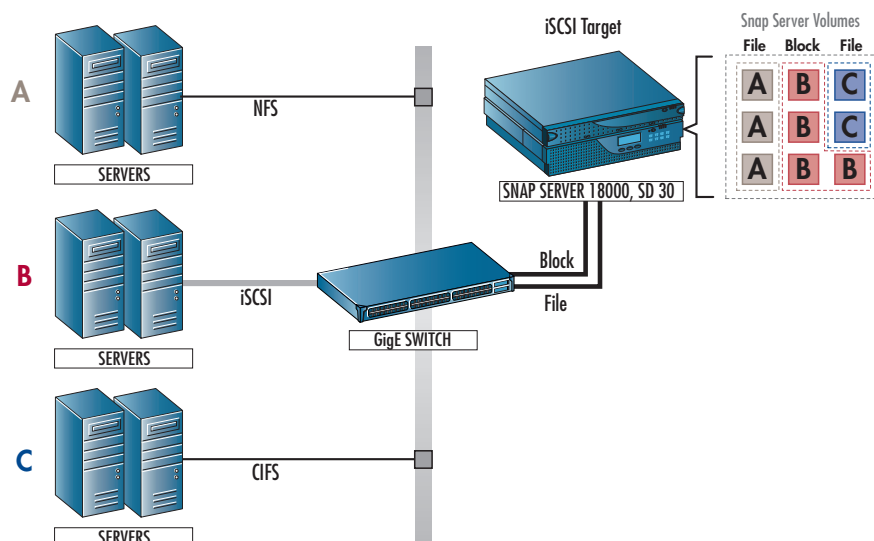
Snap Servers with iSCSI volumes can be used in almost any environment. Companies experiencing data growth will appreciate the value of carrying new types of data traffic

using their existing infrastructure. Organizations considering Fibre Channel architecture may be able to implement a similar solution much more economically.

Existing SAN environments can now scale SAN data onto simple, scalable, and economical hardware platforms and align data value more closely with infrastructure value. Naturally, most enterprises face a proliferation of Intel architecture servers in divisional, departmental, and workgroup environments, and Snap Servers can now allow a common, unified and centralized location for database storage, application storage, data backup, and data archiving.

### Storage Consolidation via iSCSI

Server proliferation is increasing the complexity and expense of storage management in many distributed enterprise environments, particularly for applications experiencing significant data growth, such as: Microsoft Exchange/SQL Server, and Oracle Solutions. To support this growth, Microsoft and others are making large investments in the development and deployment of iSCSI. Snap Servers with iSCSI can centralize network storage for these servers and applications to deliver significant savings in total cost of ownership (TCO), and greatly improve data availability and recoverability.



Storage Consolidation Using Snap Servers for Both File and Block Services

### Network Transport Protocols

- TCP/IP
- UDP/IP
- AppleTalk

### Network File Protocols

- Microsoft Networks (CIFS/SMB)
- UNIX (NFS v2/3)
- Apple (AFP 2.0)
- Internet (HTTP 1.1)
- File Transport Protocol (FTP)

### Network Block Protocols

#### iSCSI Target Support

- Snap Servers running Guardian OS v3 SP1 or higher

#### iSCSI Software Initiator Support

- Windows: Microsoft iSCSI Initiator v1.03, v1.04
- Solaris: Cisco SN 5400 Series iSCSI Driver v3.3.5
- Linux: UNH-iSCSI Initiator v1.5.3

#### iSCSI Hardware Initiator Support

- Adaptec 7211C (copper) iSCSI Adapter
- Intel PRO/1000T IP Storage Adapter v2.0, 2.1
- Alacritech SES 1001 iSCSI HBA Adapter

### Solution Elements:

#### Software

- GuardianOS v3 or higher

#### Snap Server Platforms:

##### Enterprise:

- Snap Server 18000, 15000, 14000; SD 30

##### Departmental:

- Snap Server 4500, 4400, 4200; SD 10

## Storage Unification – Using iSCSI

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### Cost-Effective Storage Consolidation for Linux/UNIX Servers

Many organizations are building “computer farms” consisting of dozens of rack-mounted servers running Linux/UNIX to significantly reduce the cost of running their analytical or computer-intensive applications. Direct attached storage in this environment often makes data management prohibitively complex, while traditional SANs are too costly. However, iSCSI-capable Snap Servers provide a high-performance solution, which solves the complexity problem at an affordable price.

### Centralized SAN/NAS Data Management for Divisional Workgroups

Many companies need to support their departmental and regional data centers with minimal staff. However, the server data management needs often make this impossible. With iSCSI-enabled, easy-to-use Snap Servers, organizations can centralize storage management and use standard Ethernet infrastructure to connect servers to storage.



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