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# 인터넷 포털/쇼핑몰 업체를 위한 시스코 스토리지 네트워킹

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Veritas  
SAN Training

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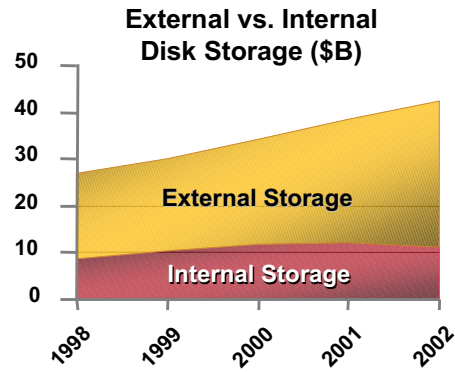
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## 시장의 변화

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### Most Storage Will Be Networked by 2005

- Storage Costs Rising to 80% of Storage & Server Spending
- Storage is Distributed to Departments & Desktops
- Trend to Multihost, Networked External Storage



Source: International Data Corporation

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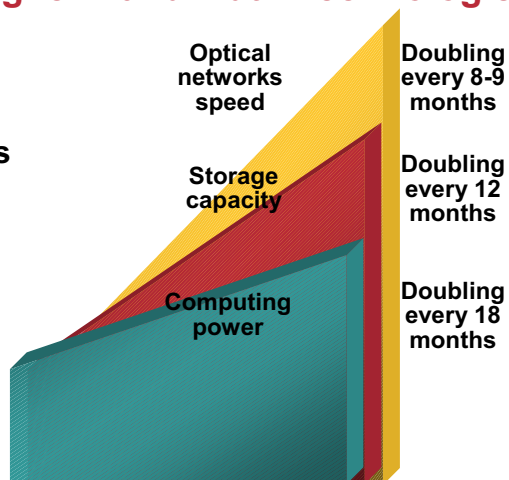
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## 시장의 변화

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### Acceleration of Higher Bandwidth Technologies

- Optical Bandwidth Is Increasing Rapidly
- Bottlenecks Have Shifted Again



Source: Storage Networking Industry Association

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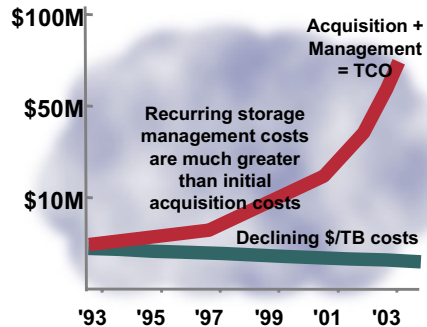
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## 시장의 변화

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### Total Cost of Ownership is Skyrocketing!

- Price Per Gigabyte Declining 40% / Yr.
- For \$1 Invested Today, Management is \$3- \$5
- Acute Shortage of IT Professionals



Source: IDC, Meta Group, Gartner Research, ITAA

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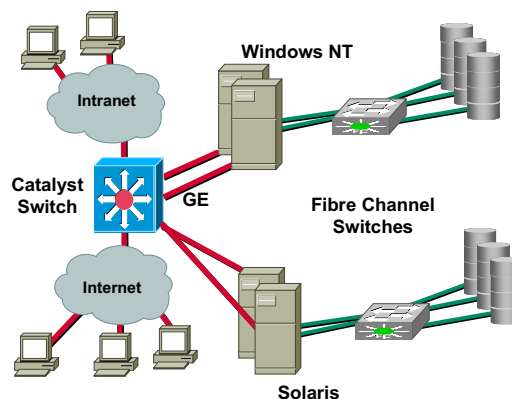
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## 사용자 환경

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### Customers Plan For Storage By Operating System Today

- Multiple Points of Management
- No Sharing
- Large Pools of Unused Storage



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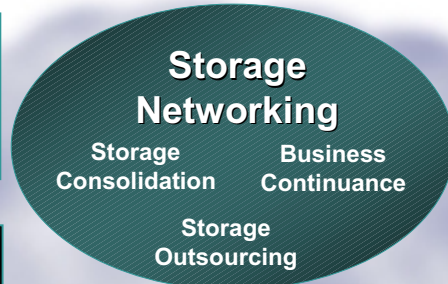
## 스토리지 네트워킹 솔루션

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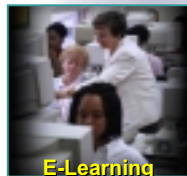
**IP + Gigabit Ethernet + FC + Optical  
Networking + Storage + Partners**



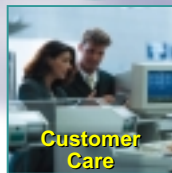
E-Commerce



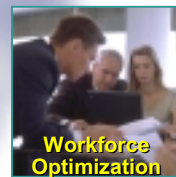
Supply Chain



E-Learning



Customer Care



Workforce Optimization

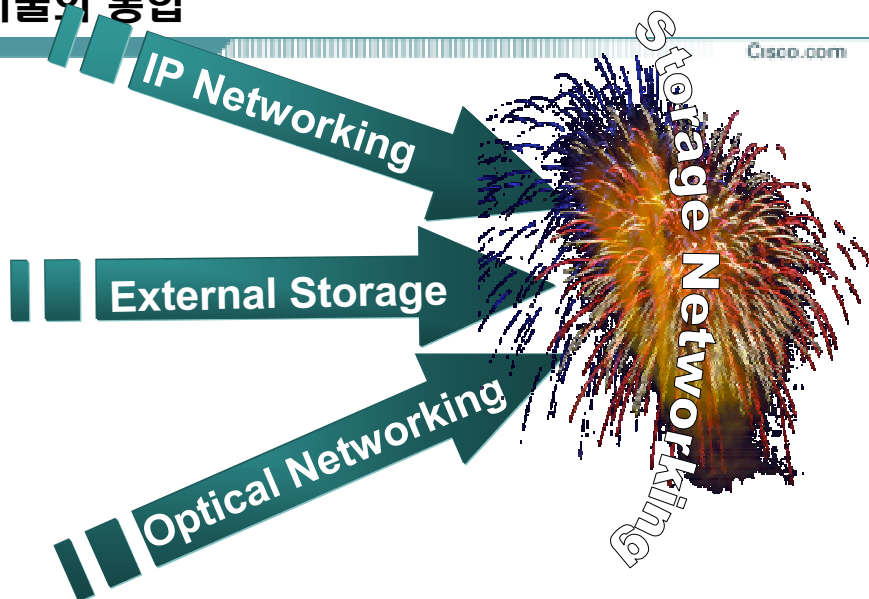
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## 기술의 통합

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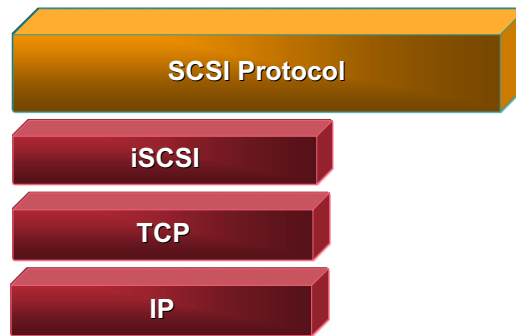
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## iSCSI 란?

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- Protocol originally developed by IBM, Cisco and SANGate
- Submitted to IETF "Internet Draft"
- Objective: to provide *common standard* transport for storage protocols over TCP/IP



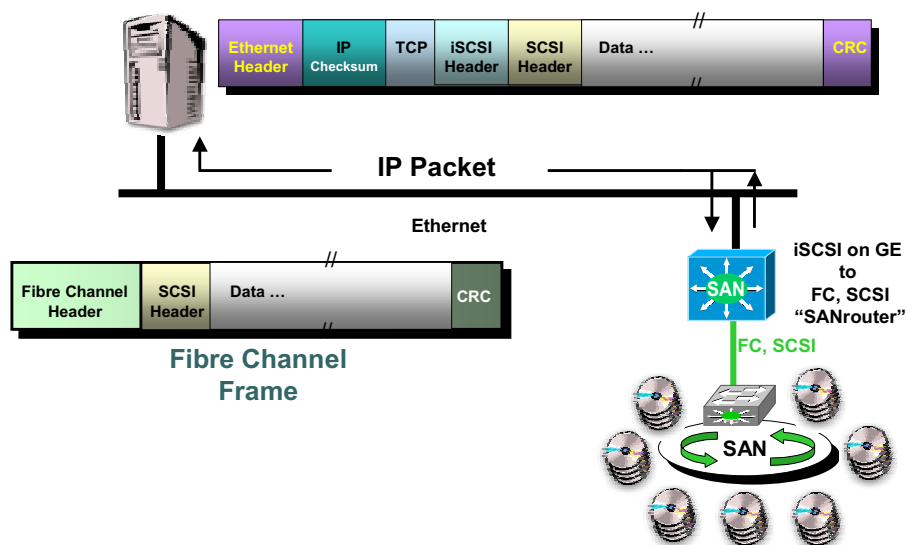
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## 캡슐화 - iSCSI

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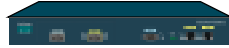
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## 시스코 SN 5420 스토리지 라우터

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- IP Block Level Access To Storage Based On iSCSI Protocol
- Standard Ethernet & Fibre Channel Interfaces
- Scale Storage Networks With IP Hardware
- Leverage Existing Security, Management & QOS Tools
- Optimize Customer's SAN Investment

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## SN5420 스토리지 라우터를 소개합니다 !

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### Universal Access to Storage over IP networks



Fibre Channel

Gigabit Ethernet

RS232 Console

10/100 Ethernet Management

10/100 Ethernet High Availability

Management Interfaces

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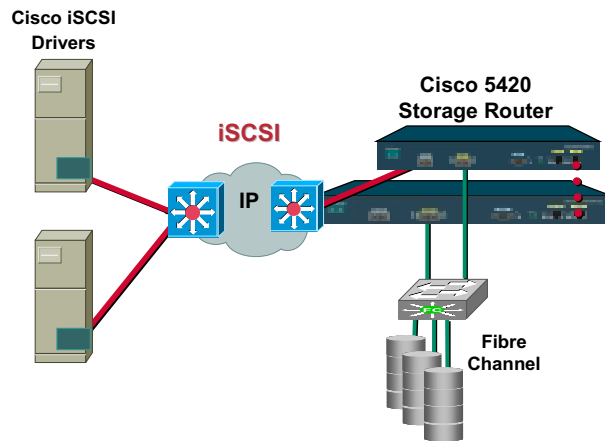
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## SN5420 스토리지 라우터를 소개합니다 !

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### Universal Access to Storage over IP networks

- SN5420 Storage Router
- iSCSI Drivers (Solaris, Linux, NT)
- Ethernet NIC



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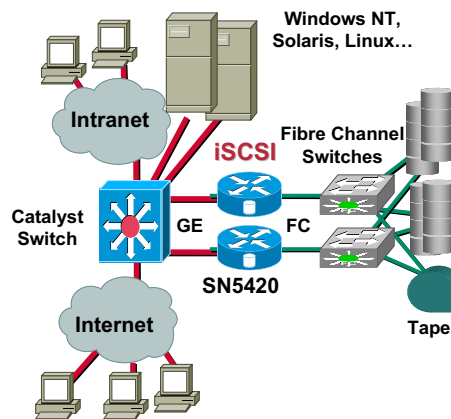
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## 스토리지로의 IP 액세스

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- Storage Resources Appear Local
- No Changes To Fibre Channel Network



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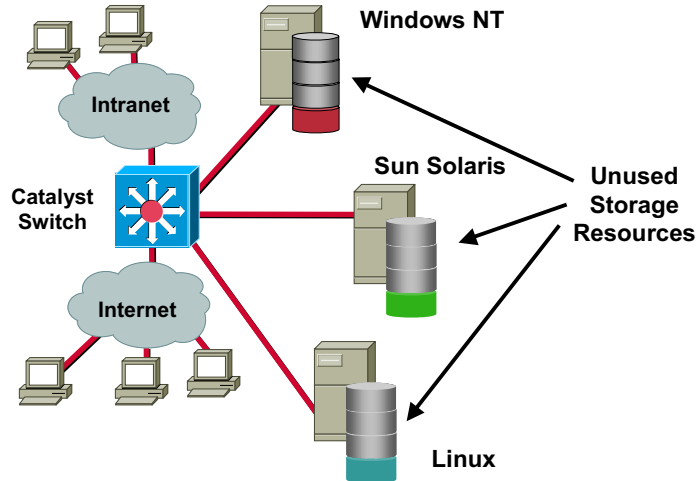
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## 스토리지 통합

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### Direct Attached Storage



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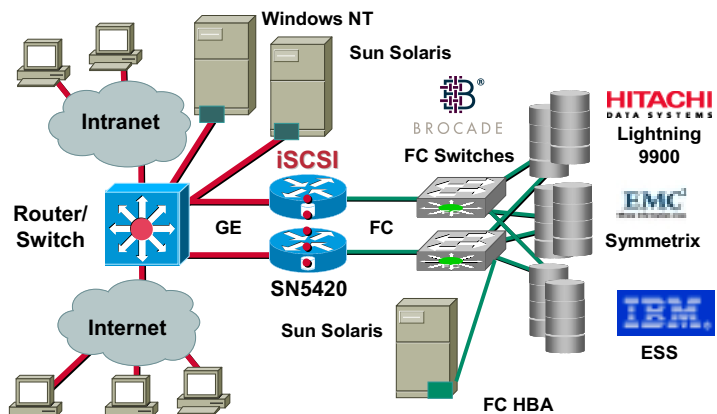
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## 스토리지 통합

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### IP Access to Centralized Storage Pool



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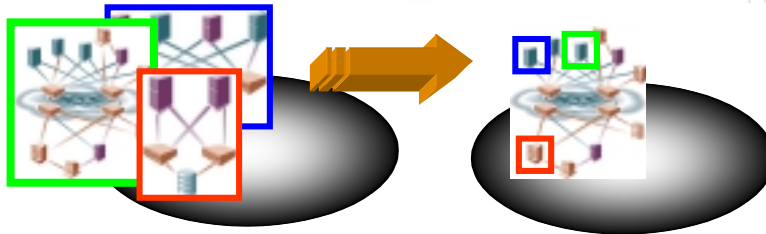
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## 스토리지 통합의 이점

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- **Reduction in data management costs**  
(from 55% to 15% of total storage budget - IDC)
- **Ability to share, manage and protect data across the enterprise**
- **Improved storage scalability**

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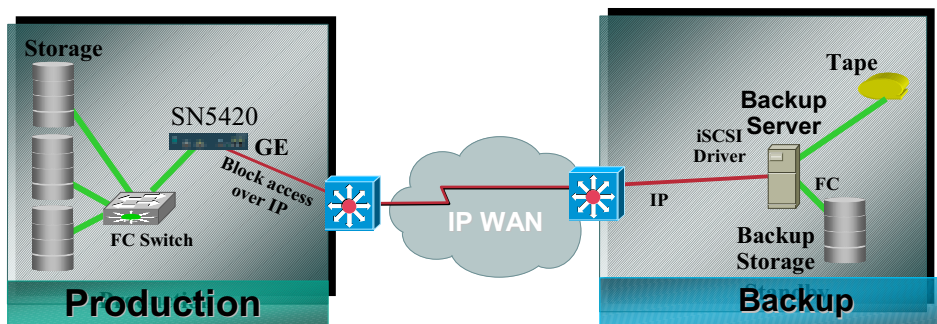
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## IP 블록 액세스 어플리케이션:

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### Backup over IP WAN

- Backup or archiving to disk or tape
- SCSI, FC, or IP attached backup storage



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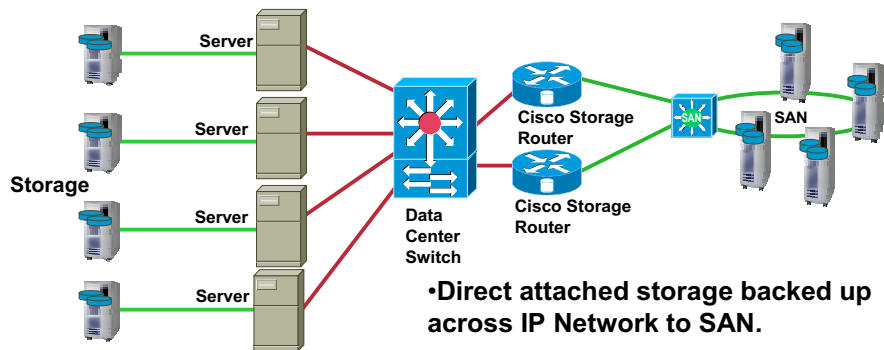
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## 기업 어플리케이션

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### 대형 인터넷 쇼핑몰 사이트



GREEN is Fibre Channel  
RED is Gigabit Ethernet

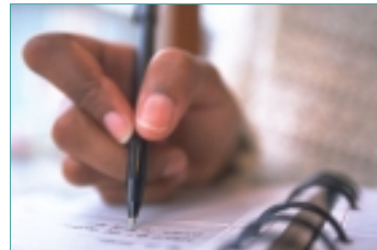
•Direct attached storage backed up across IP Network to SAN.

•Servers 'ghost' image also kept on SAN. Server can be replaced and back online in less than one hour.

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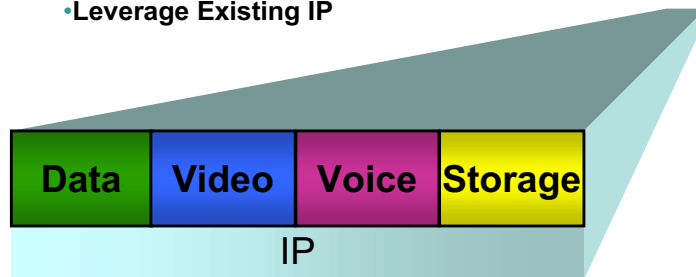


## SCSI over TCP/IP (iSCSI) 기술 개요

## 왜 IP인가?

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- Universal Access
- Connect SAN Islands
- WAN Storage Access
- Cost Effective Scalability
- Ease of Configuration and Use
- Leverage Existing IP



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## 파이버 채널 SAN을 보완하는 IP-SAN

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**FC SANs**

- Storage Connectivity
- High Speed Storage Access
- High Availability



**IP Technology**

- Interoperability
- Scalability
- Familiarity
- Wide Area Access
- Security
- Management
- Quality of Service

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# IP-SAN

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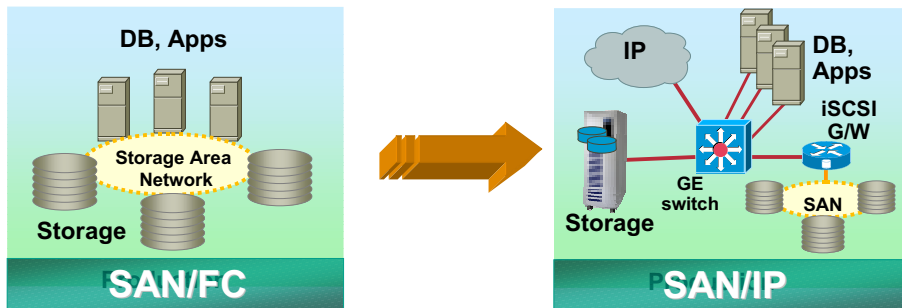
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## FC-SAN 의 IP-SAN 마이그레이션

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- **Benefits:**

- maturity (scalable, secure)
- standards and proven interoperability
- common LAN / SAN / WAN protocol / management
- lower complexity and large pool of expertise
- lower cost



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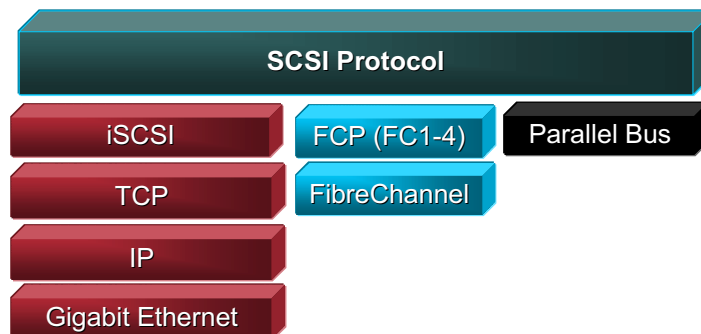
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## 인터넷 SCSI (iSCSI) 란 무엇인가?

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- Transport for SCSI protocol over TCP/IP
- Provides block level access from server to storage
- Protocol originally developed by IBM, Cisco and SANGate
- IETF Internet draft (Final ratification June 2002)  
<http://www.ietf.org/internet-drafts/draft-ietf-ips-iscsi-09.txt>



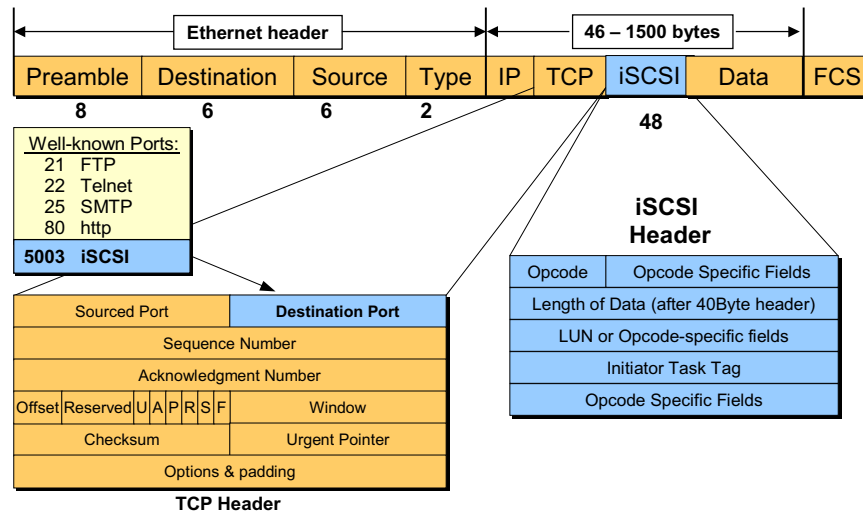
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## iSCSI 패킷

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## iSCSI 참여 회사

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- Adaptec
- Agilent Technologies
- Aristos Logic Corporation
- Brocade
- Cereva Networks
- Cisco
- CNT Corporation
- Emulex Corporation
- Eurologic Systems
- FalconStor Software
- Hitachi Data Systems
- Hewlett Packard
- IBM
- Intel Corporation
- Legato
- LSI Logic Corporation
- Lucent
- NetConvergence
- Nishan Systems
- Pirus Networks
- Platys
- Qlogic
- Rhapsody Networks
- SAN Valley Systems
- SANcastle
- San-Stor
- Spectra Logic
- StoneFly Networks
- StoreAge Networking
- Sun Microsystems
- Troika Networks

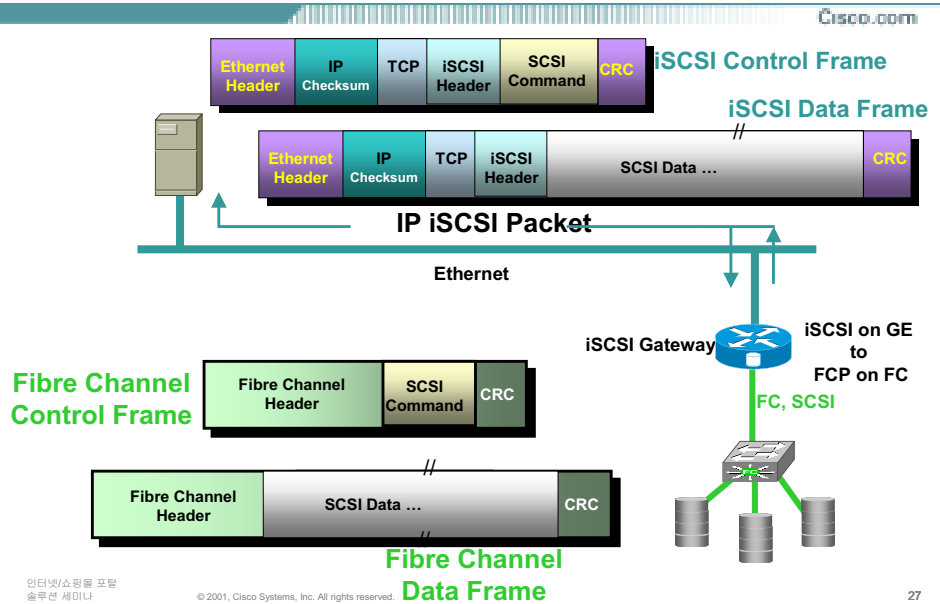
Source: SNIA iSCSI Group Members press release, 5/10/2001

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## iSCSI 라우터 솔루션



## 파이버 채널 vs. 기가비트 이더넷 비교

	<u>Fibre Channel</u>	<u>Gigabit Ethernet/IP</u>
<b>Speed:</b>	1.06Gbps	1.25 Gbps
<b>Future Rates:</b>	2.12 Gbps (2Q 2001) 10 Gbps (?Q ????)	10 Gbps (4Q 2001)
<b>Guaranteed Delivery:</b>	Yes	No
<b>Network Service:</b>	Connection-less; acknowledge and unacknowledged	Connection-less; acknowledge and unacknowledged
<b>Flow Control:</b>	Credit-based	Rate-based
<b>Protocols supported:</b>	Network, video, SCSI	Network
<b>Switch interoperability</b>	No	Yes
<b>Data Field Size:</b>	0 to 2112 Bytes	0 to 1500 Bytes (0 to 9000 Bytes with Jumbo Frames)
<b>Physical Media:</b>	Copper, Fiber	Copper, Fiber

(Betamax)

(VHS)

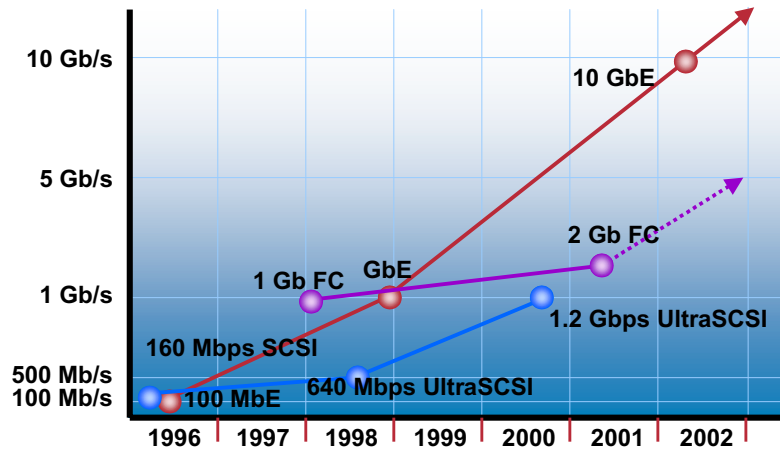
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## 성능 비교

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Source: IDC, Dataquest, and IP Tape initiative

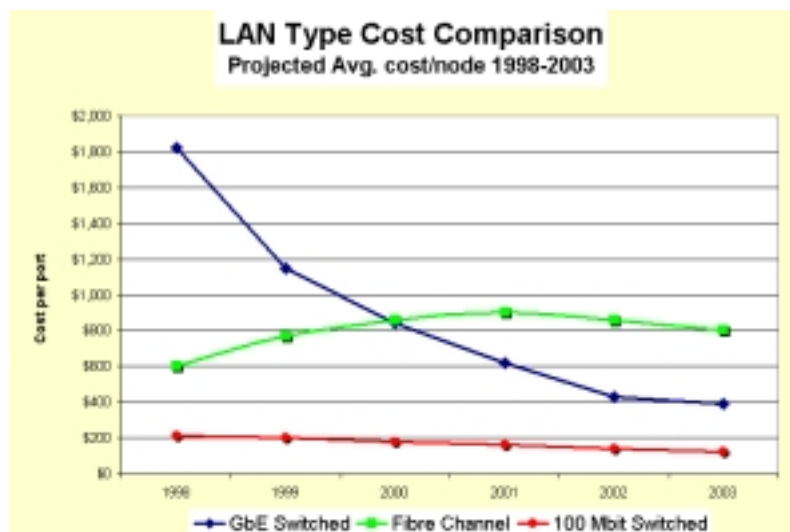
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## 저렴한 이더넷

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Source: IDC Report "2000 Worldwide Fibre Channel Hub and Switch Market Forecast"

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## 파이버 채널 vs. GE 가격 비교

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	<u>Fibre Channel</u>	<u>Gigabit Ethernet</u>
<b>HBA/NIC costs:</b>	<b>\$870.00<sup>1</sup></b>	<b>\$219.00<sup>1</sup></b>
<b>Port costs:</b>	<b>\$1843.75<sup>1</sup></b>	<b>\$999.50<sup>1</sup></b>
<b>Highest Port Density</b>	<b>64(128)</b>	<b>160</b>

### 1. Equipment Used for Price Comparison:

Interphase FIBRE CHANNEL HBA 64 BIT 66MHZ MMF  
Intel® PRO/1000 T Server Adapter PWLA8490T  
BROCADE SILKWORM 2800 16-PORT FC SWITCH  
Catalyst 3550-12T 10-10/100/1000BaseT ports

List Price: \$870.00  
List Price: \$219.00  
List Price: \$29,500.00  
List Price: \$9995.00

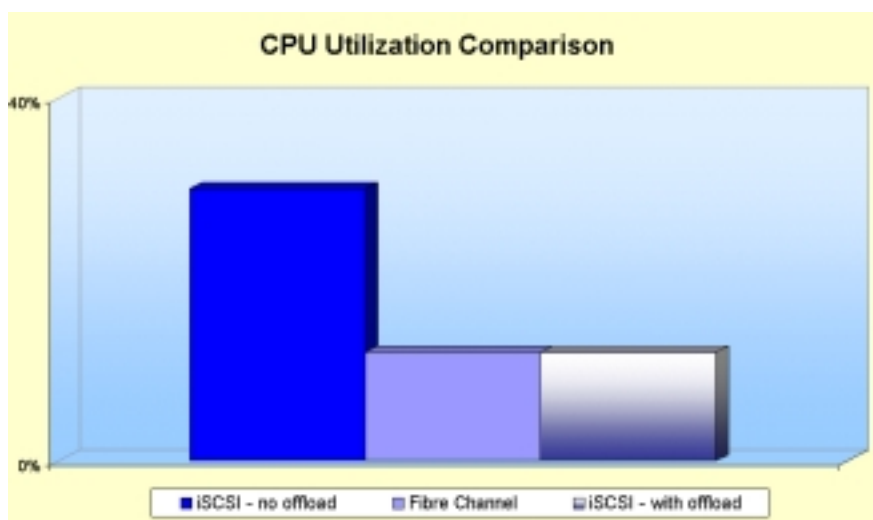
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## CPU 사용도

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## TCP Offload Engine (TOE) NIC 제조사

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Offload network protocol processing, primarily TCP/IP, from the host CPU to the server adapter.

- Interphase 5570 GE/FC NIC
- Alacritec 100x4, 100x2, 100x1 Server Accelerators
  - supports FastEtherChannel
  - GE NIC 4Q2001; 10 GE NIC 2003
- Emulex (GigaNet) GN9000/SI iSCSI GigE NIC
- Adaptec AEA-7110C iSCSI GigE NIC
- Intel (beta)
- Many more next 6 months



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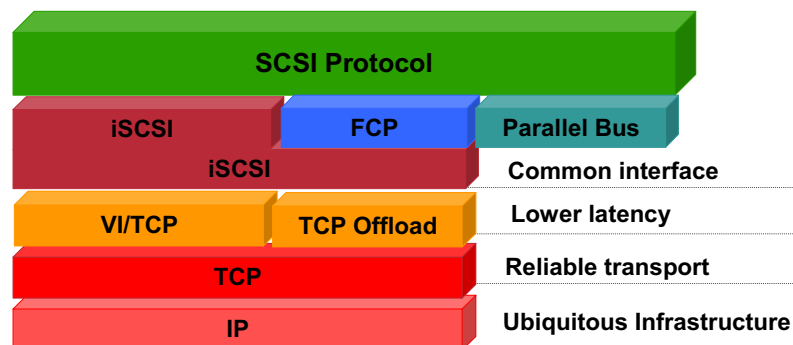
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## iSCSI 의 미래

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- IETF Working Group charter to examine transport of wider range of storage protocols without fundamental changes
- VI/TCP could be used to provide RDMA functions for easier implementation in hardware
- TCP offloaded to server adapter or run natively on storage



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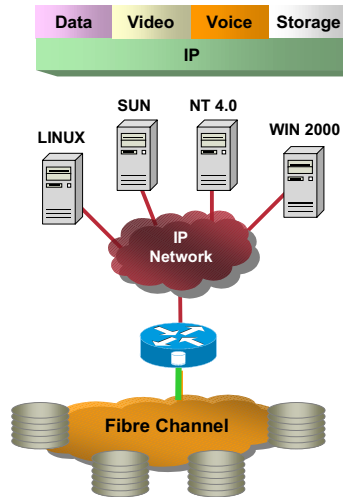
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## IP-SAN/iSCSI

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- Best features of Fibre Channel & IP networks
- Maintain IT infrastructure, security & interoperability
- Ease of configuration and management
- Servers used optimally
- Support IP Quality of Service, Error detection & Prioritization
- Gigabit Ethernet ports are 1/3 the cost of Fibre Channel Ports
- Decrease TCO



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## ONE NETWORK

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# VOICE

# VIDEO

# DATA

# STORAGE

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