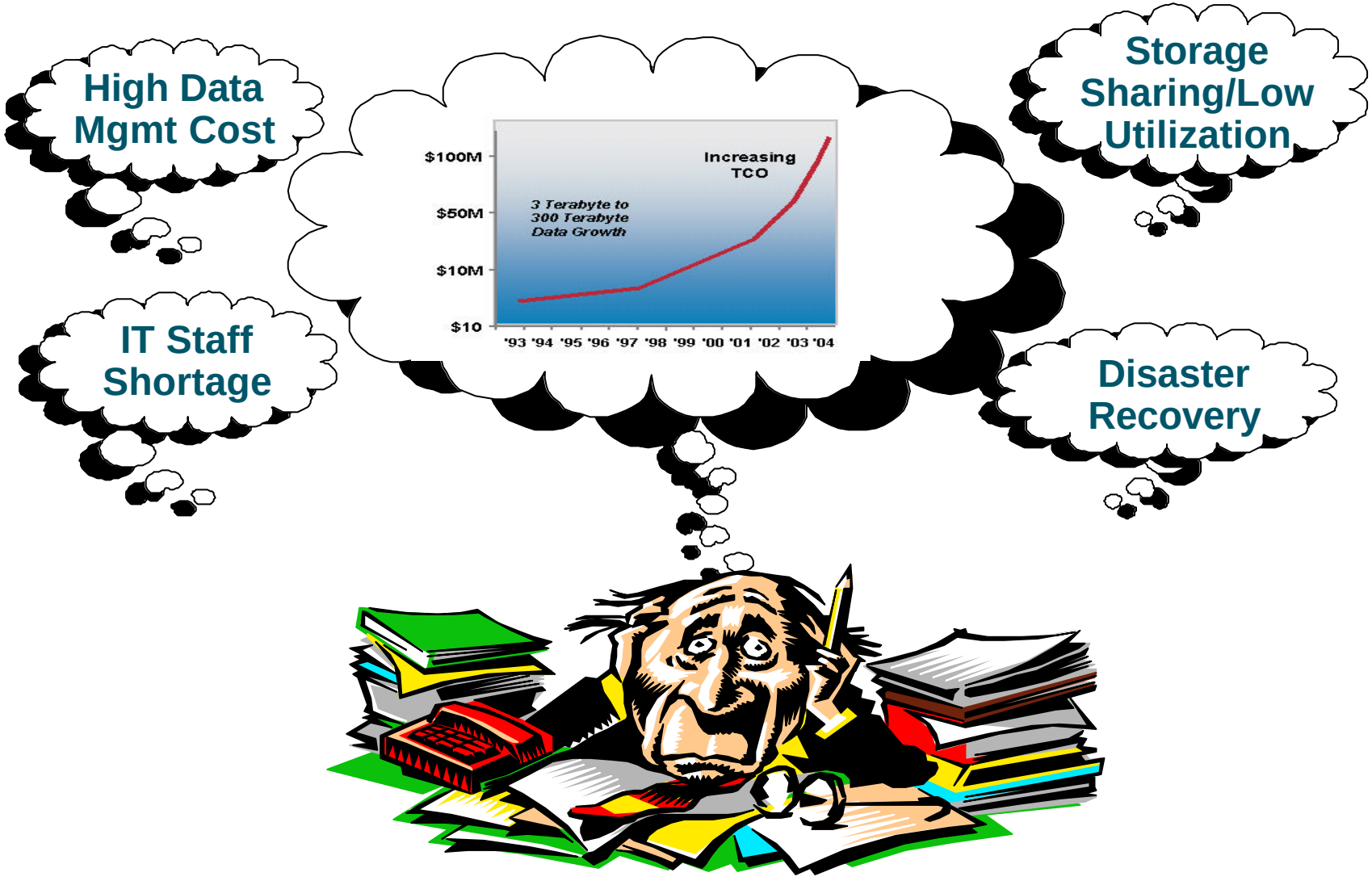
The Next Wave in Storage Networking Technology

Kim, MinSe

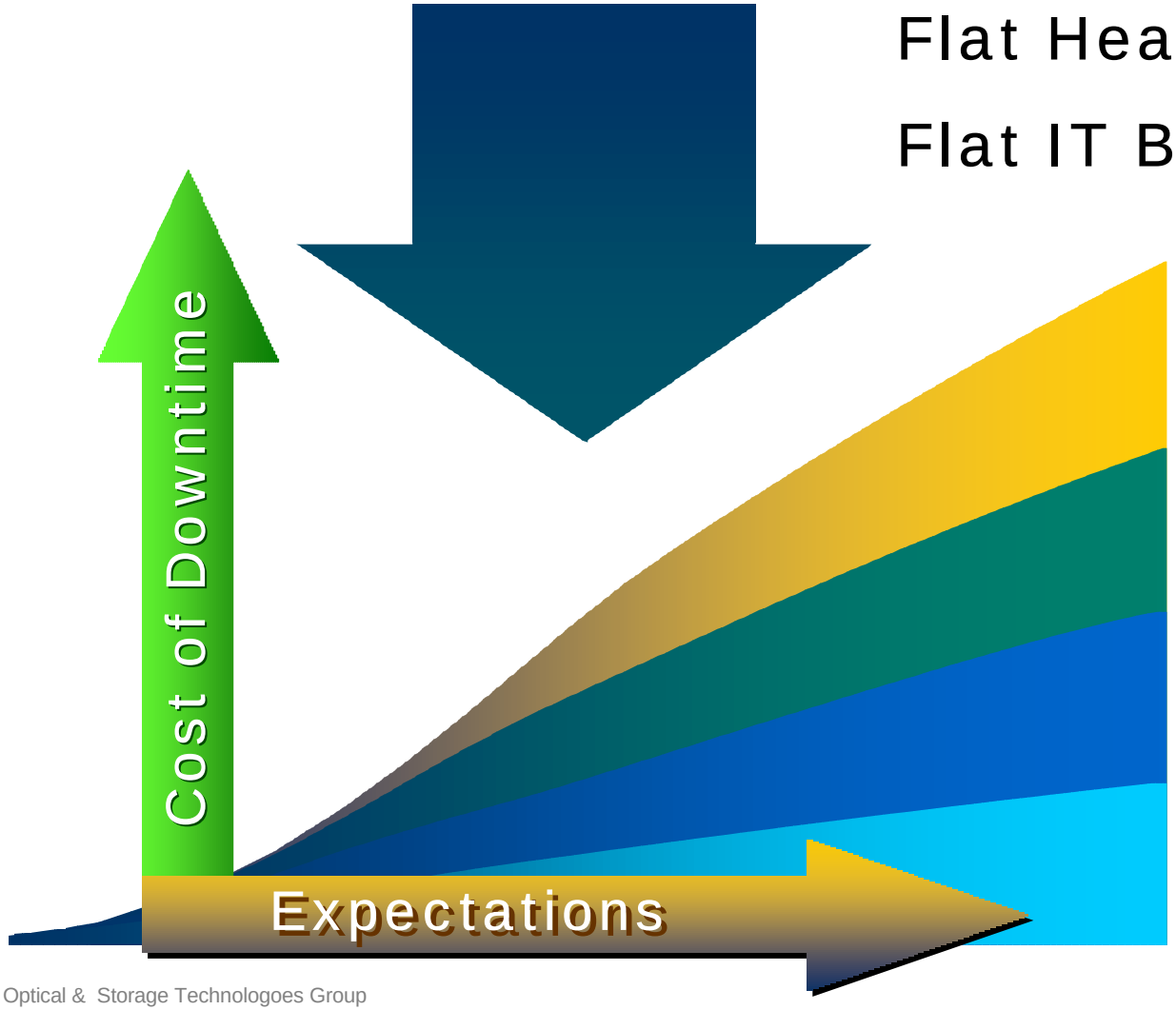
Technical Solution Engineering

Cisco Systems, Inc.

폭등하는 스토리지 총소유비용 !



새로운 업무 환경



Flat Head Count

Flat IT Budgets

Instant Data Access

E-business

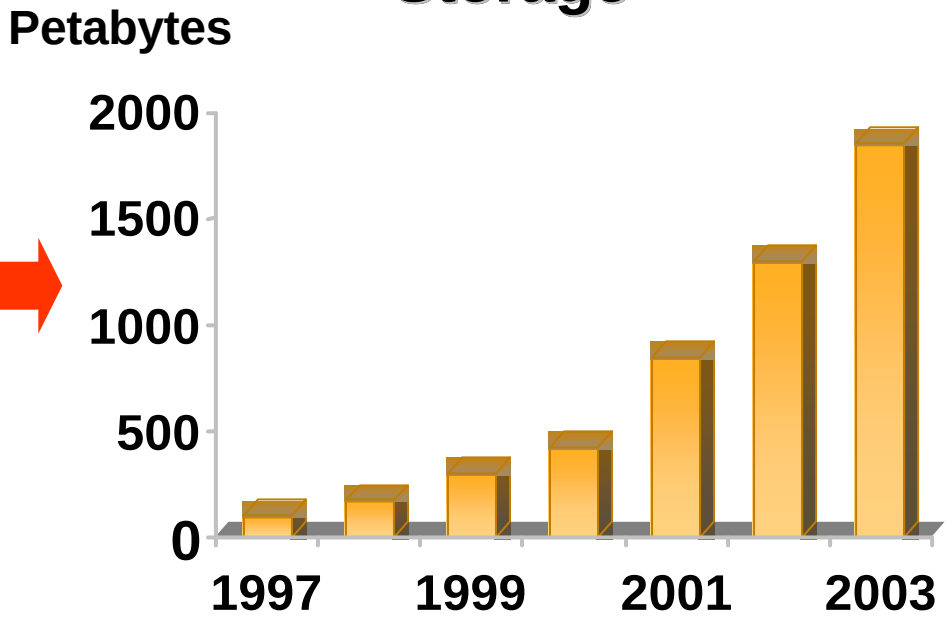
7 by 24 Operations

New Applications

폭팔적인 스토리지의 성장

Velocity of information accumulation

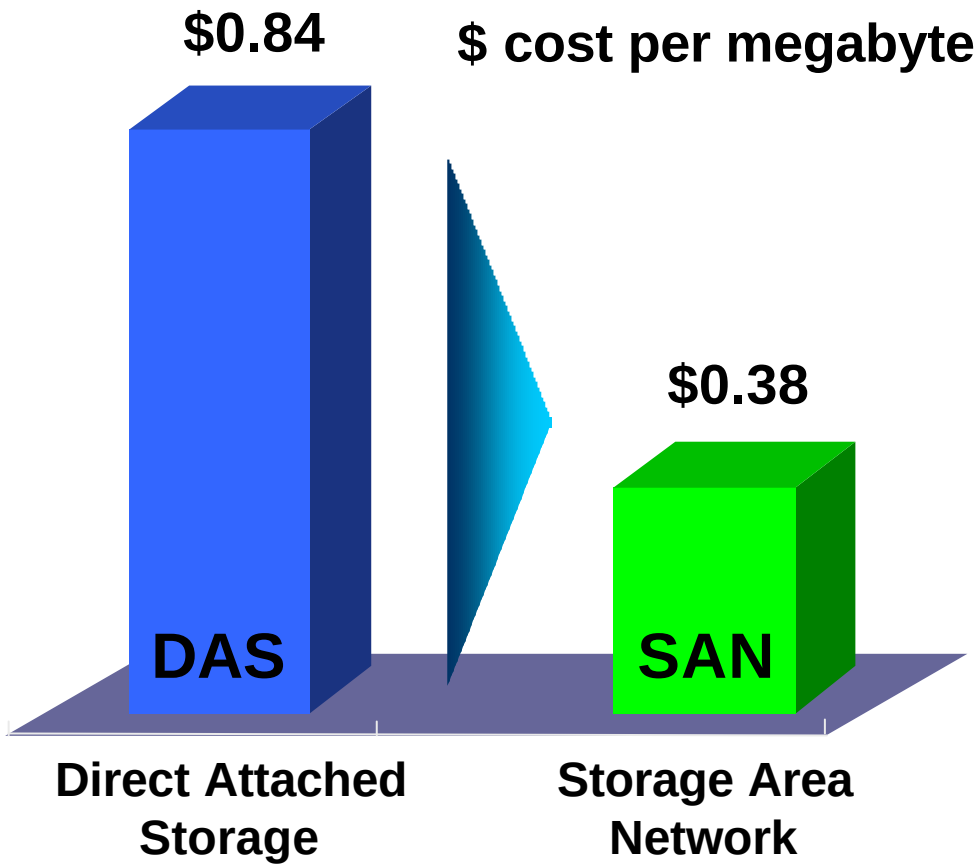
Content Digitization ➡ Exponential demand for Storage



Source: IDC

1 Petabyte = 1000 Terabytes

TCO 를 감소시키는 스토리지 네트워킹



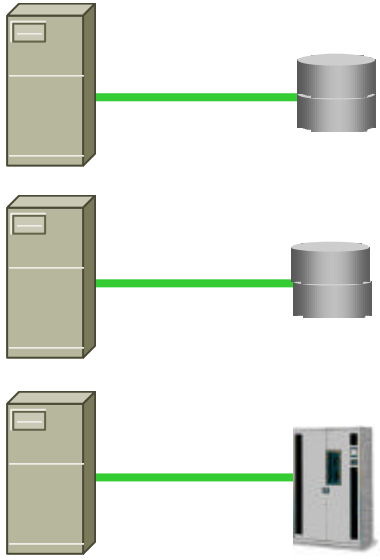
Based on a 3-Year total cost of ownership

Source: McKinsey & Company, Merrill Lynch June 19, 2001

네트워을 통한 스토리지 전송

Then

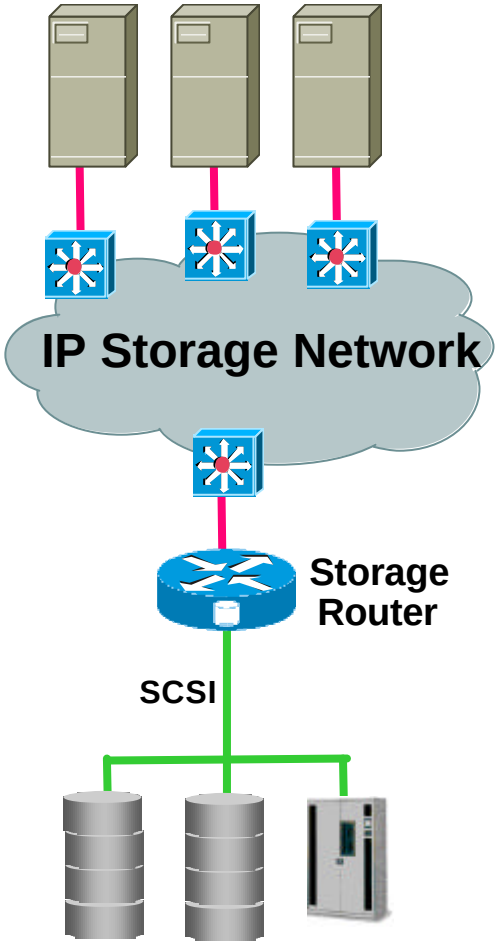
IT $ = 70% servers / 30% storage

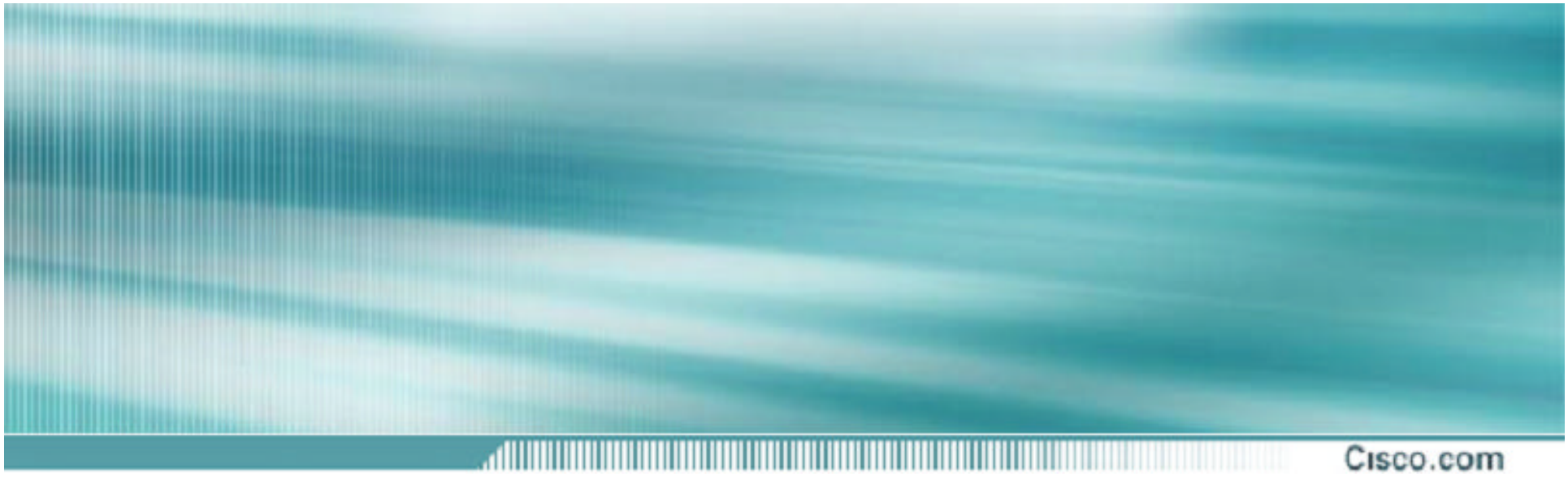


Direct Attached Storage

2002

IT $ = 30% servers / 70% storage



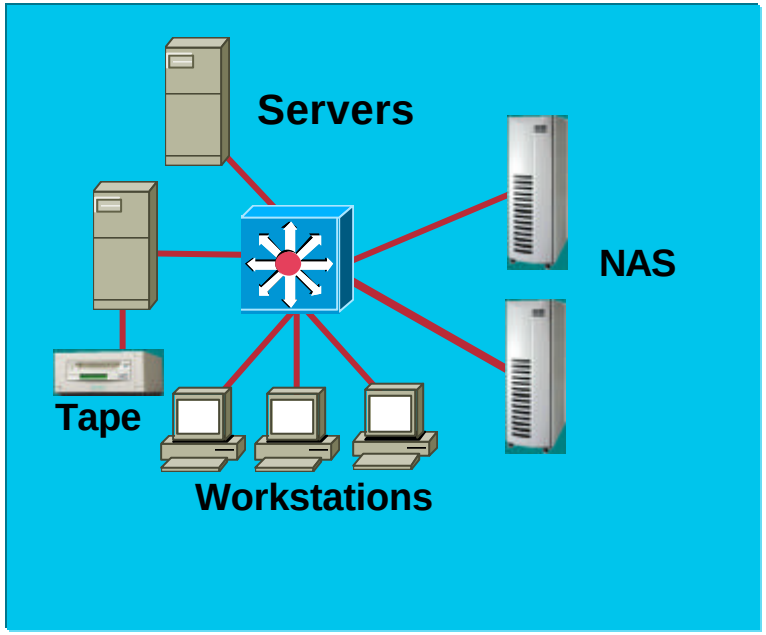


스토리지 기술 개요

스토리지 네트워킹의 진화

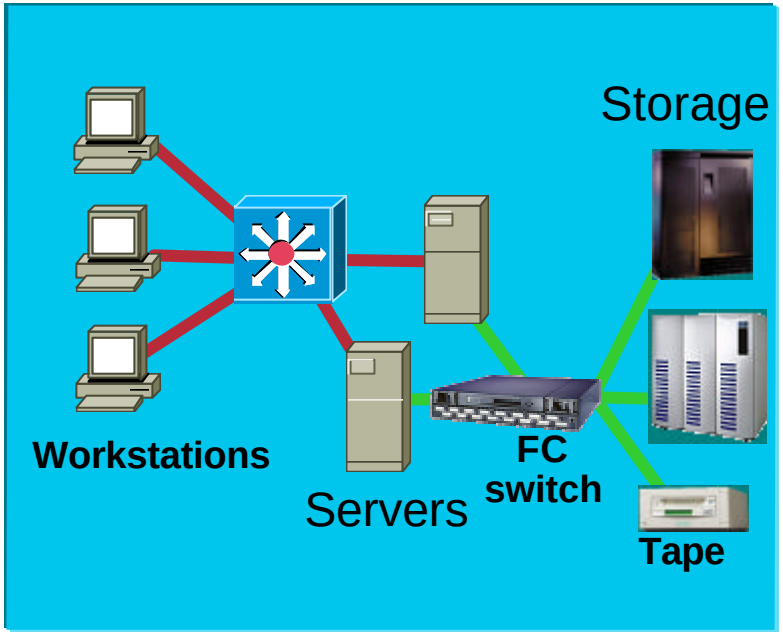
NAS 와 SAN

NAS File Access



- File level operations: opn/rd/wrt/close/mkdir/rmdir
- easy extension over data networks
- NFS, CIFS, HTTP

SAN Block Access

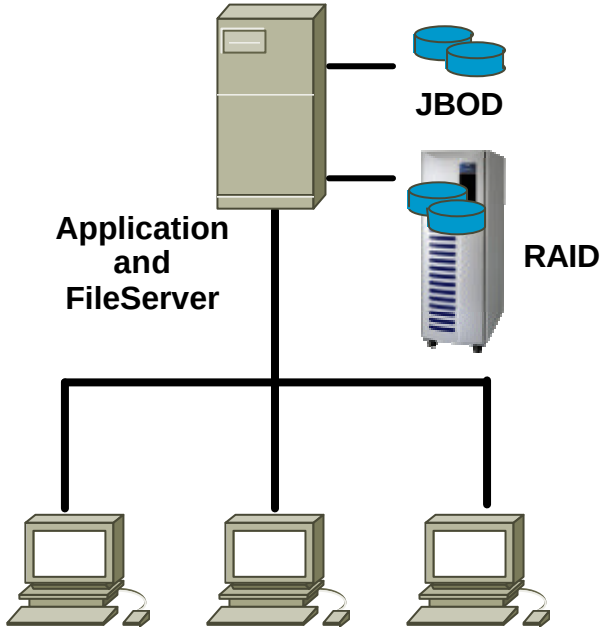


- large datablocks efficiently moved
- more difficult to extend over data networks due to strict timing & protocols (SCSI)
- Database applications

네트워크 스토리지 – 1 세대 서버 연결형

- All storage attached to servers
- Limited to server vendor for storage
- Storage sharing creates CPU overhead
- Server burdened with disk I/O traffic
- Limited scalability and low performance

Server-based Storage

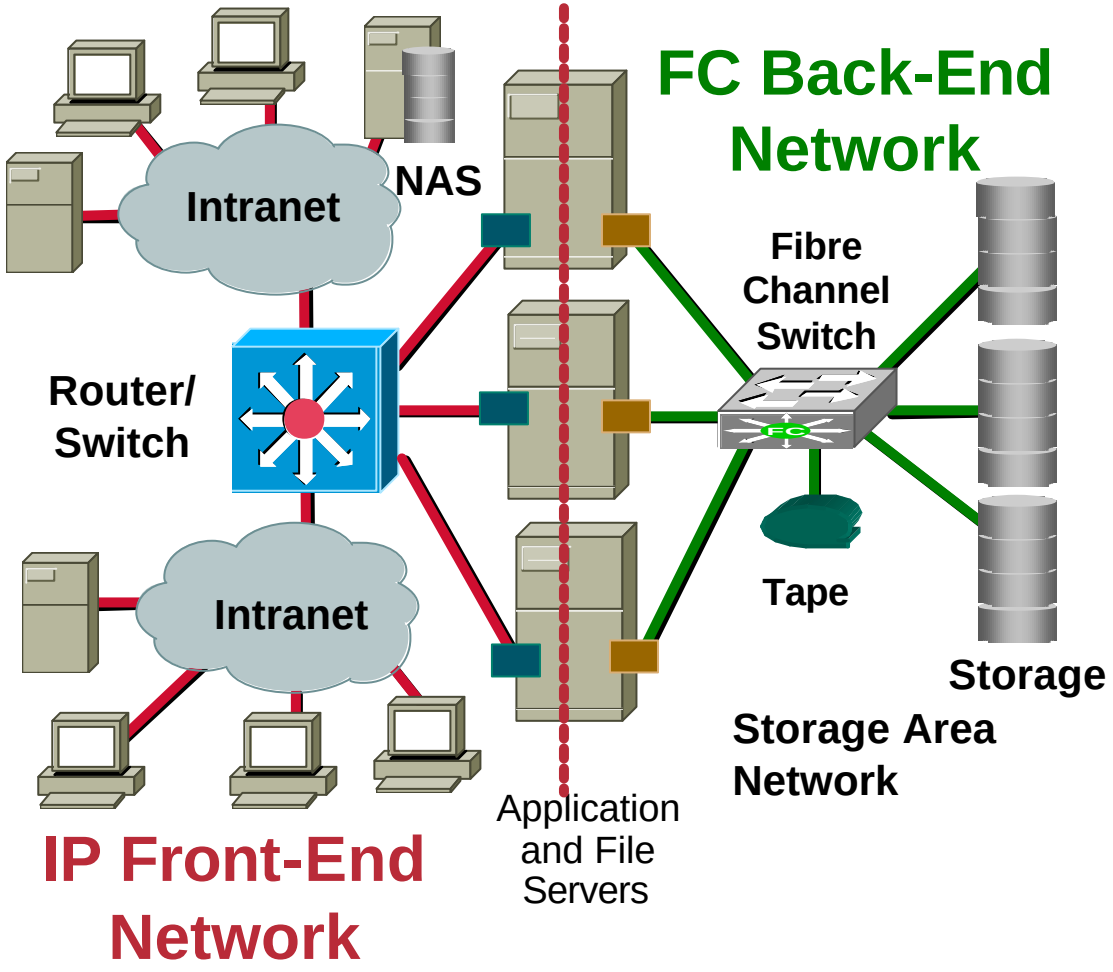


Network Attached Storage (NAS)

네트워크 스토리지 – 2세대
SAN 와 NAS

SANs Create Two Separate Networks

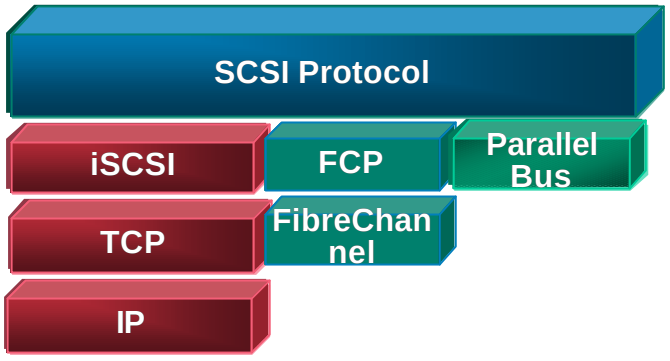
- **Two different networks**
  - Different Mgt tools
  - Different Monitoring tools
  - Different Security tools
- **Limited Interoperability**
- **Isolated “SAN Islands”**
- **Minimal storage security**

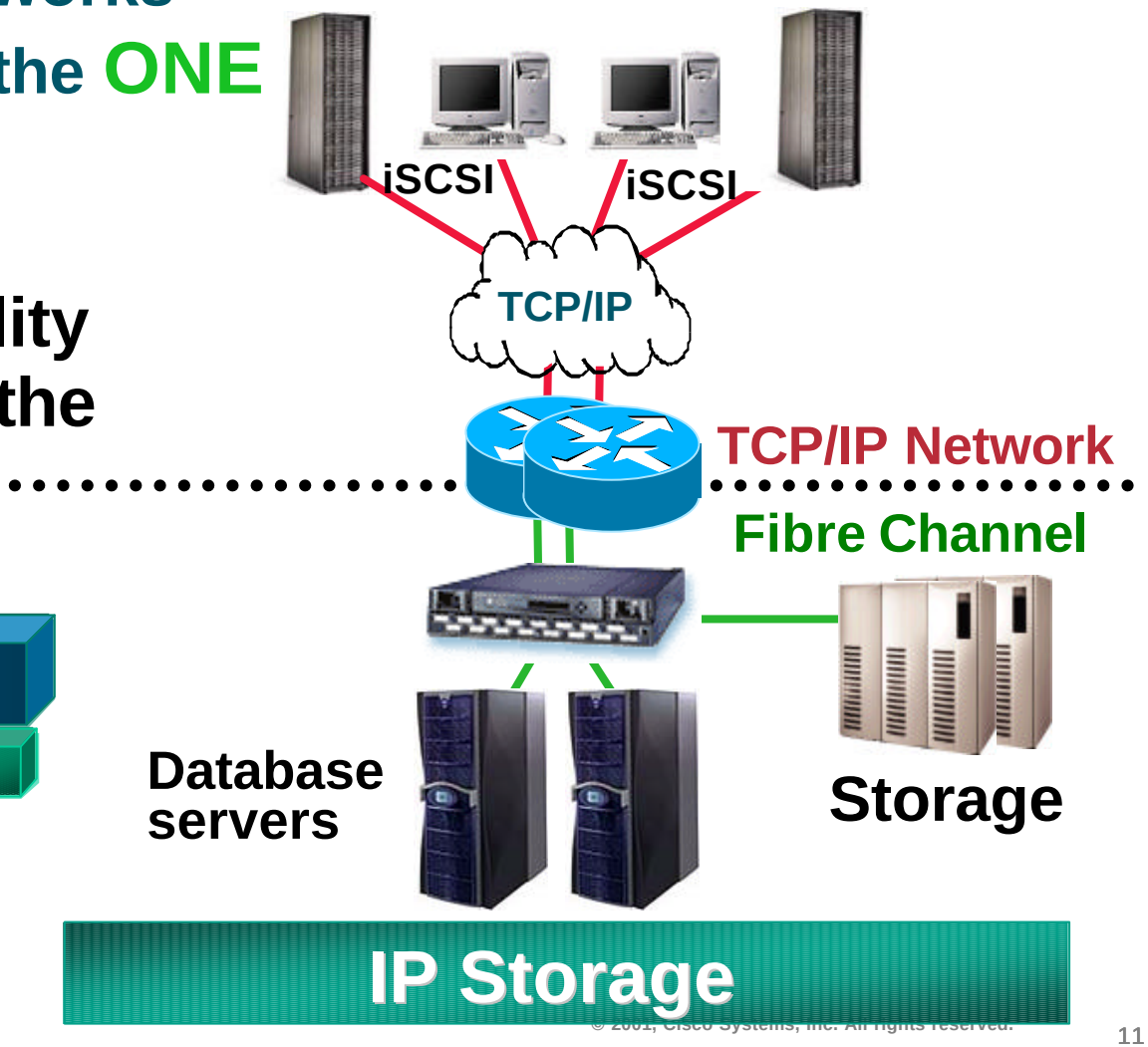


네트워크 스토리지 – 3세대
IP 스토리지 – 새로운 패러다임

Why use TWO networks when you can use the ONE you have ??

- **Extend accessibility of FC SANs to IP the world**





왜 IP기반의 스토리지 네트워킹인가?

- **IP makes 'SCSI' distance-independent**
- **Ubiquitous & mature nature of IP**
- **Single technology for Enterprise and Storage Network**
- **Low support cost**
- **Scalability- Media, distance, node count, performance**
- **Manageable, secure and interoperable**
  - Supporting technologies: SNMP, MIBs, DNS, LDAP, QoS, IPSEC, VLANs, Firewalls…..
- **R&D investment on Ethernet/IP far outstretches other technologies**

IP-SAN 은 파이버 채널 SAN 의 개선

FC SANs

- Storage Connectivity
- High Speed Storage Access
- High Availability

IETF +

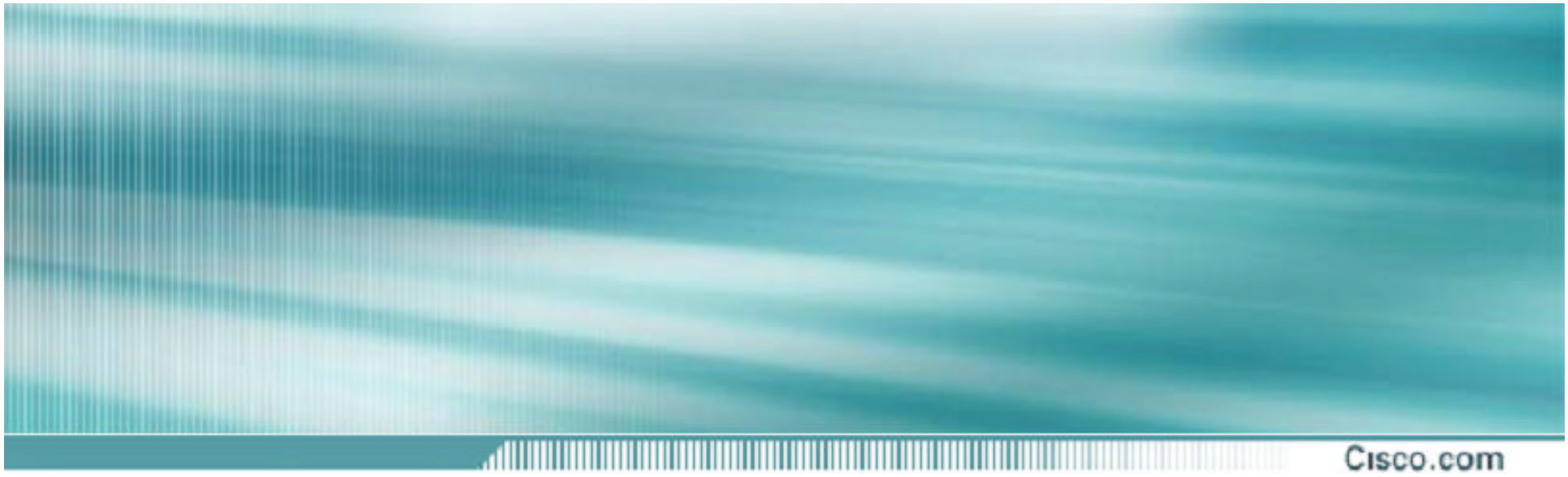
IP Technology

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

IP-SAN

10 GEA
10 Gigabit Ethernet Alliance

Storage Networking
Industry Association



시스코 스토리지 네트워킹 전략

세계 최초 iSCSI 제품 출시. 차세대 제품 발표

Universal Access to Storage over IP Networks

Cisco SN 5420

Cisco SN 5428 Storage Router

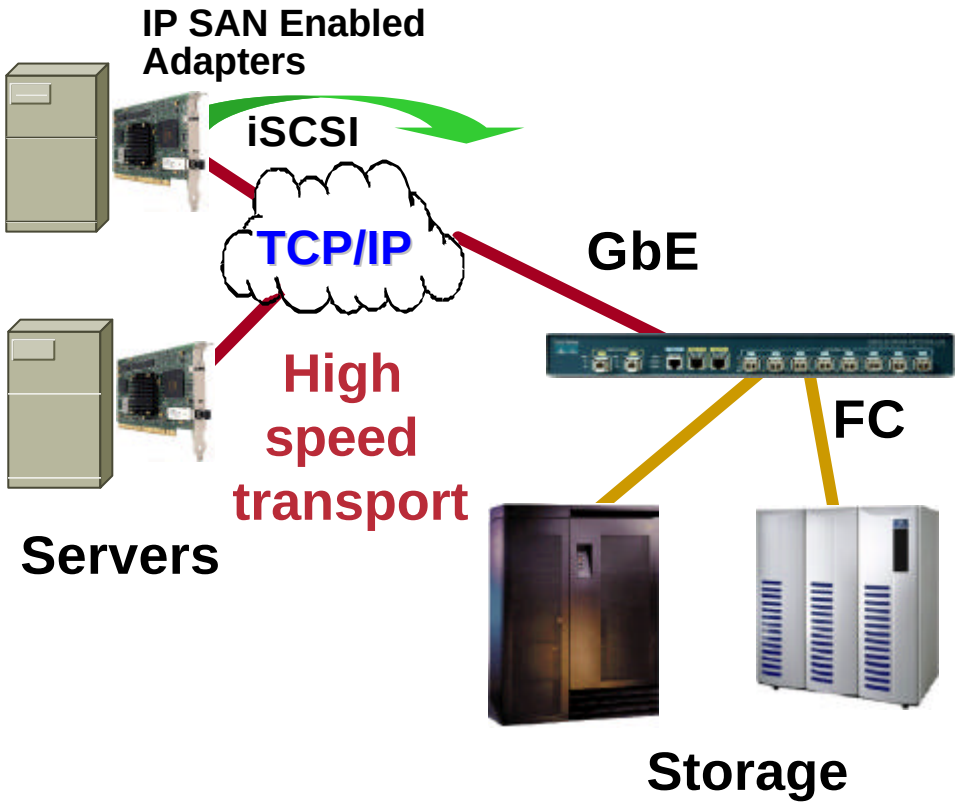
Introducing:
시스코 SN 5428 스토리지 라우터

- **Departmental/Workgroup storage networking router**
- **Storage Router for small/medium business**
- **Customer will couple with a Cisco Ethernet Switch for a total Storage Network solution**
- **Two Gigabit Ethernet ports**
  - **Fanout to 10/100 servers using Cisco Switches**
- **Eight 1 & 2-gig Fibre Channel ports**
  - **Connection to storage devices**
  - **Connection to high-performance servers**

SN 5428 스토리지 라우터

Features and Benefits

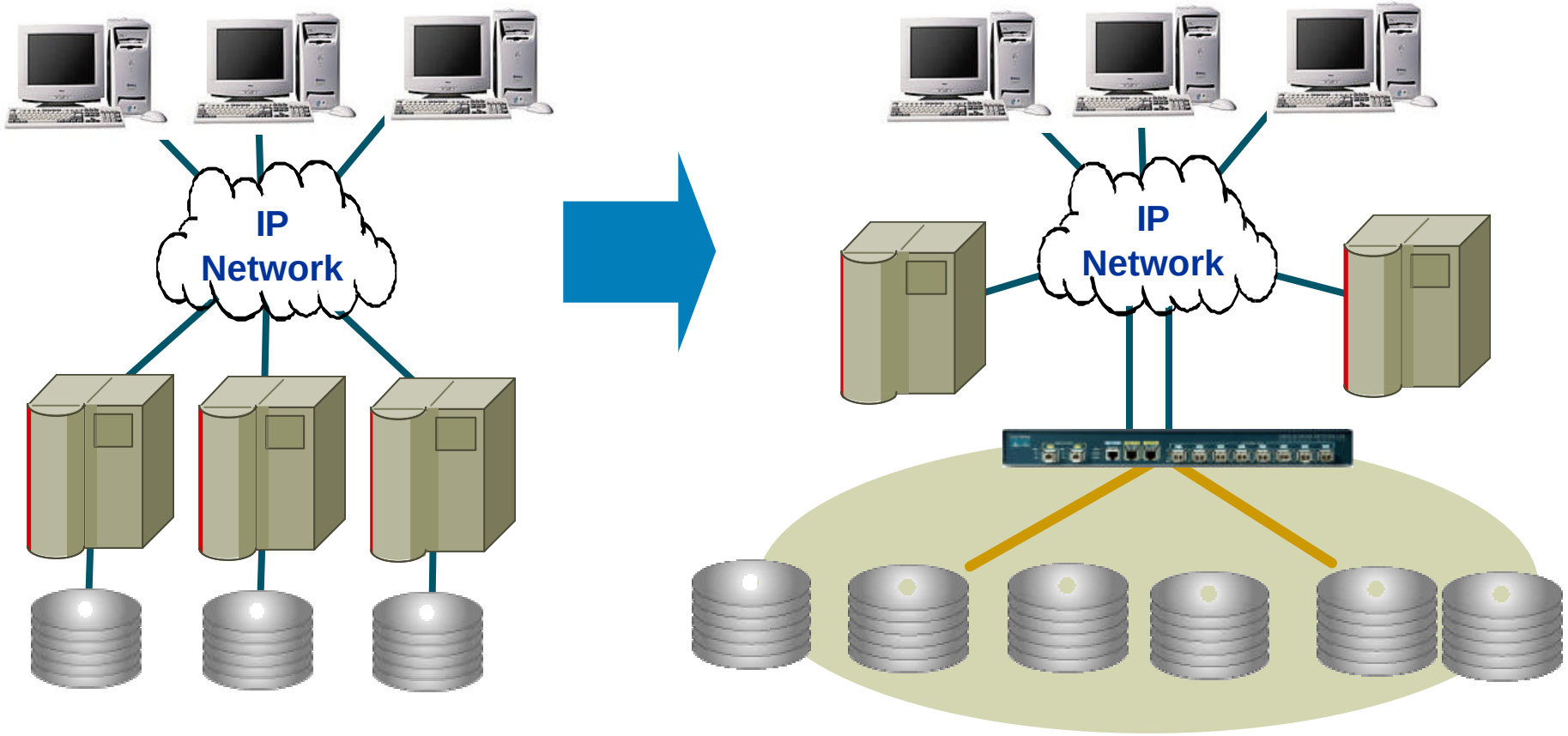
- Extend storage over IP networks
- iSCSI Transparent Routing
- iSCSI SAN interconnect (iSCSI back-to-back)
- Security ACLs/LUN Mapping
- TACACS+/RADIUS/CHAP user authentication
- VLAN Support
- 4-node clustering for high availability



어플리케이션 : 스토리지 통합

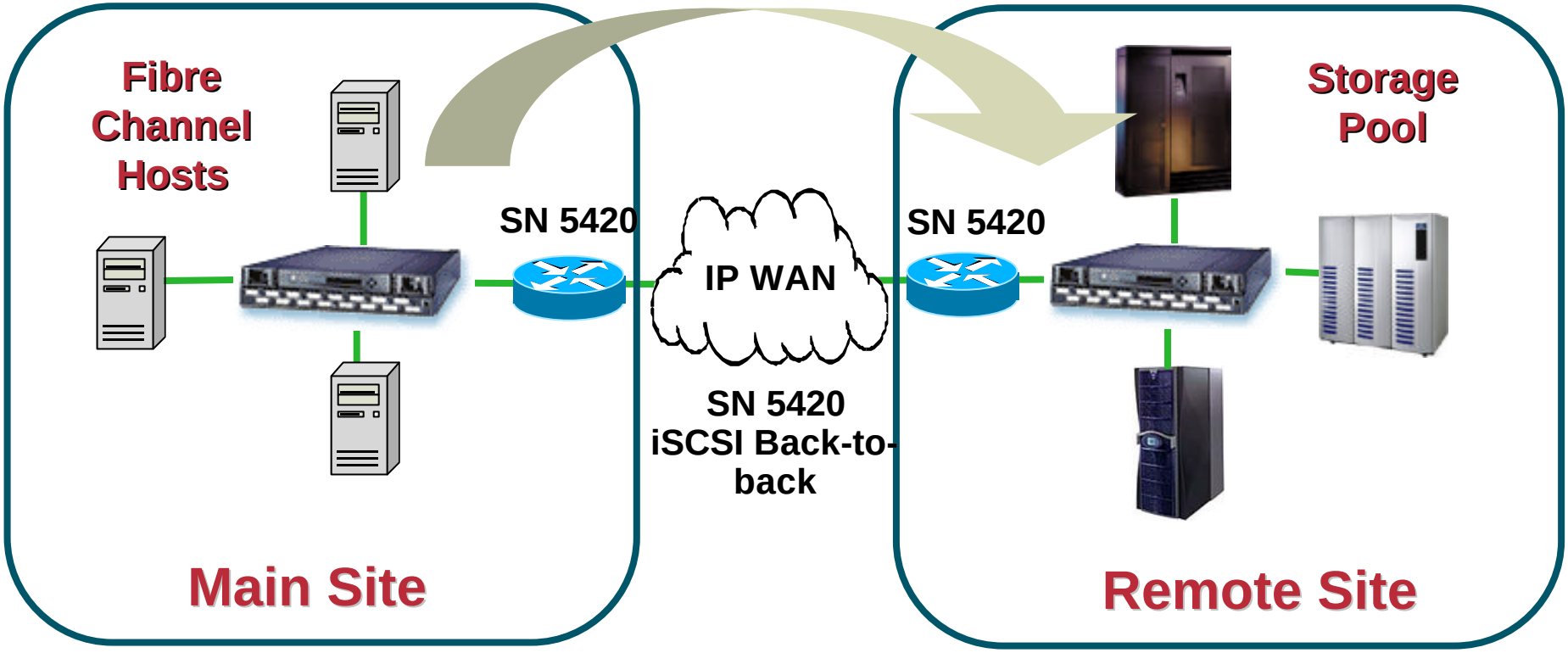
- Difficult to manage
- Low storage utilization
- Difficult to expand/scale

- Centralized management
- Easier to share & scale
- Servers dedicated to appl. services



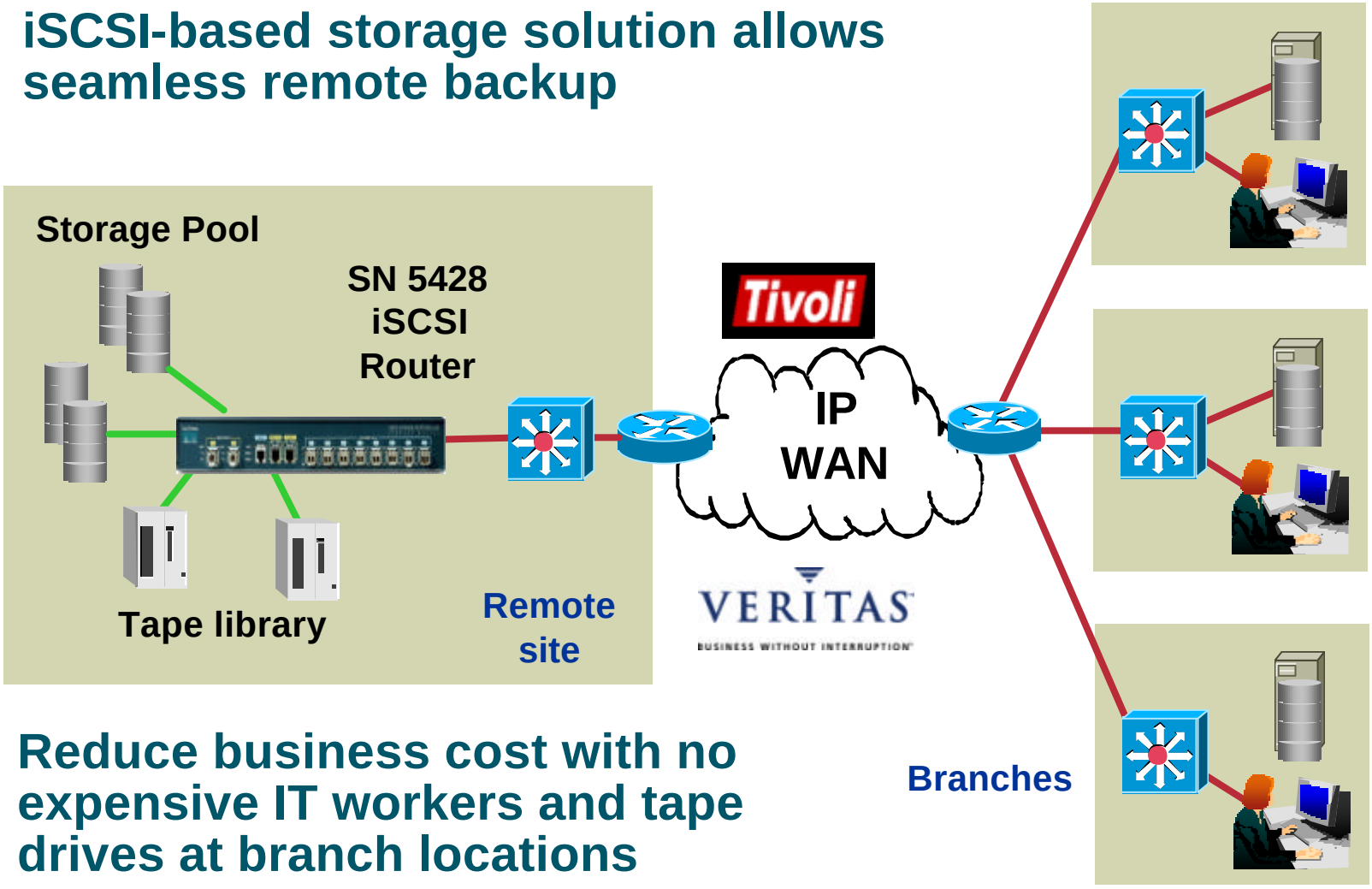
어플리케이션 :
FC 호스트에서 억세스 리모트 SAN 으로

iSCSI SAN Interconnect provides an FC host access to storage devices in a remote Fibre Channel SAN



어플리케이션 :
SN5428 을 통한 리모트 데이터 백업

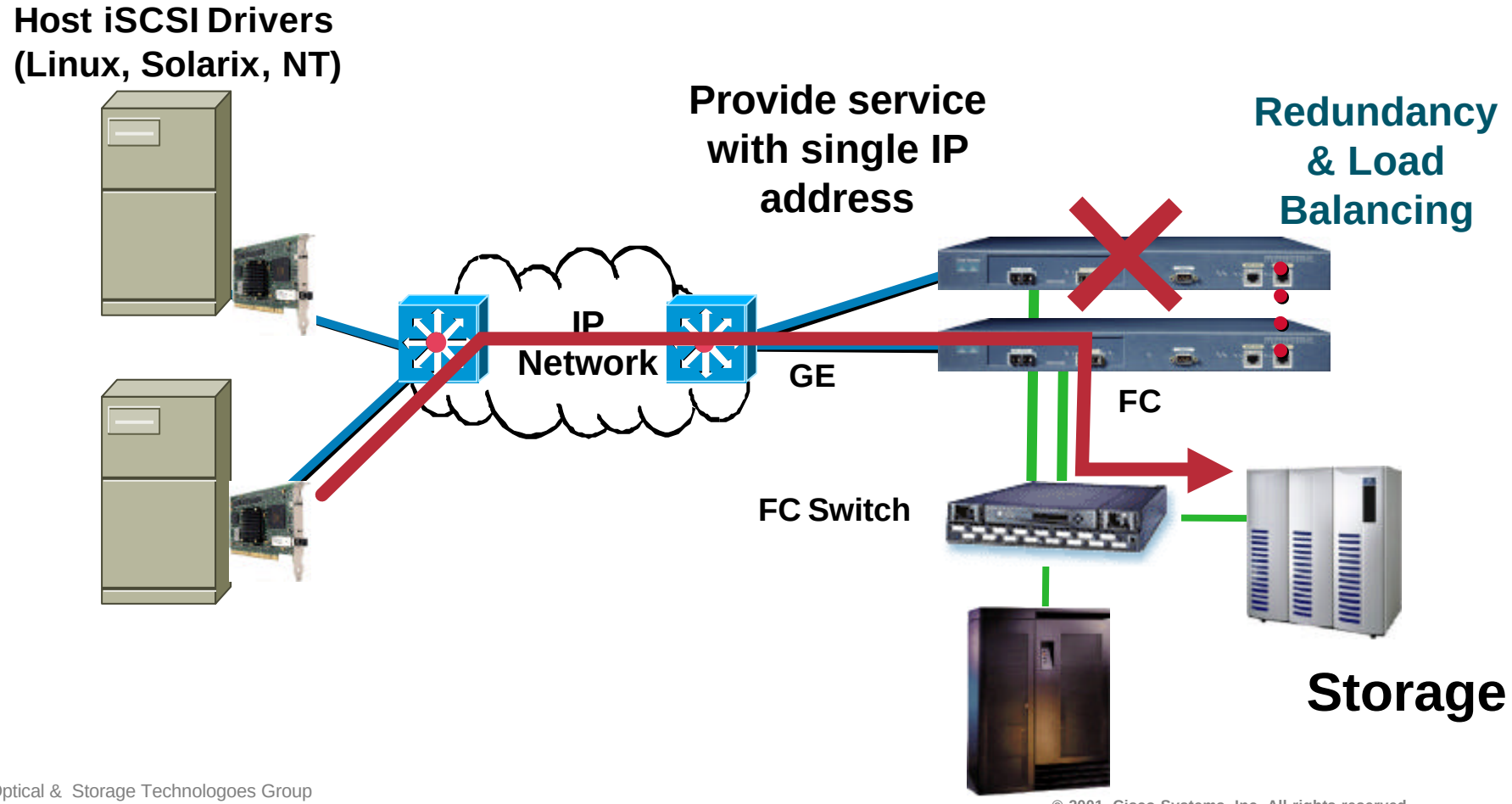
iSCSI-based storage solution allows seamless remote backup



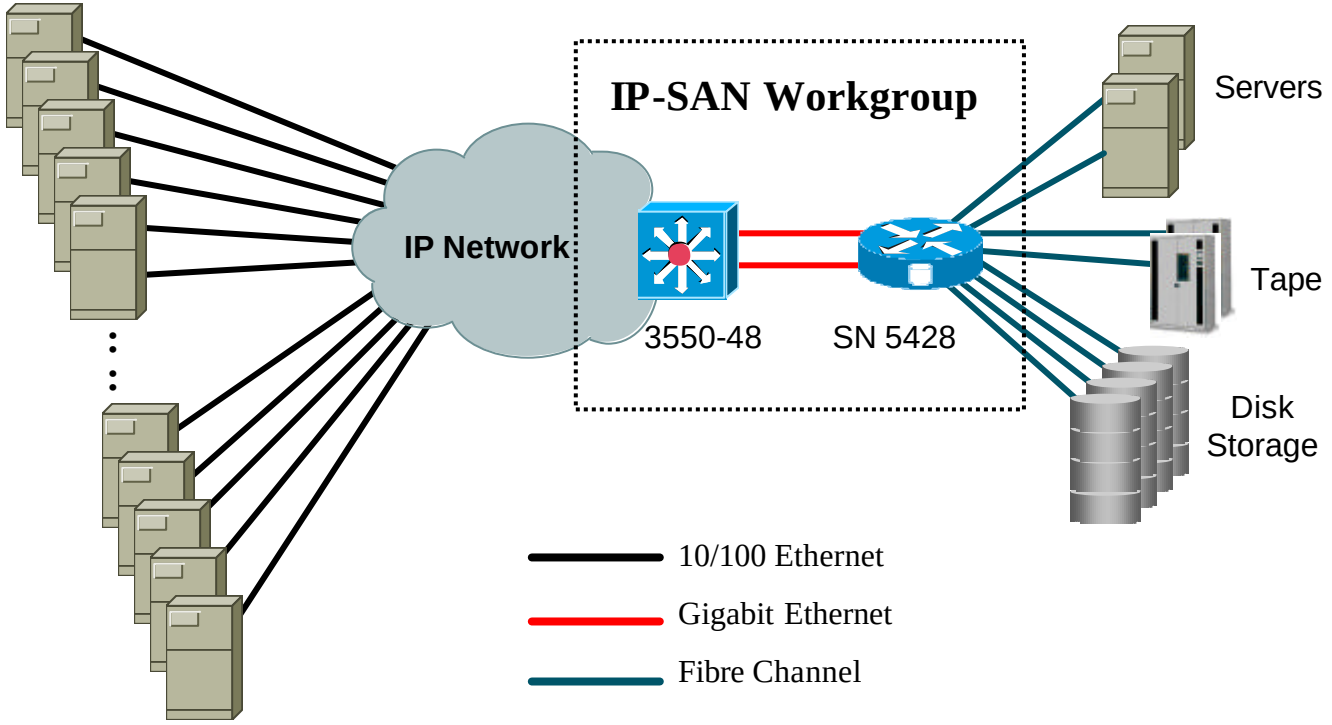
Reduce business cost with no expensive IT workers and tape drives at branch locations

스토리지 라우터 고가용성 솔루션

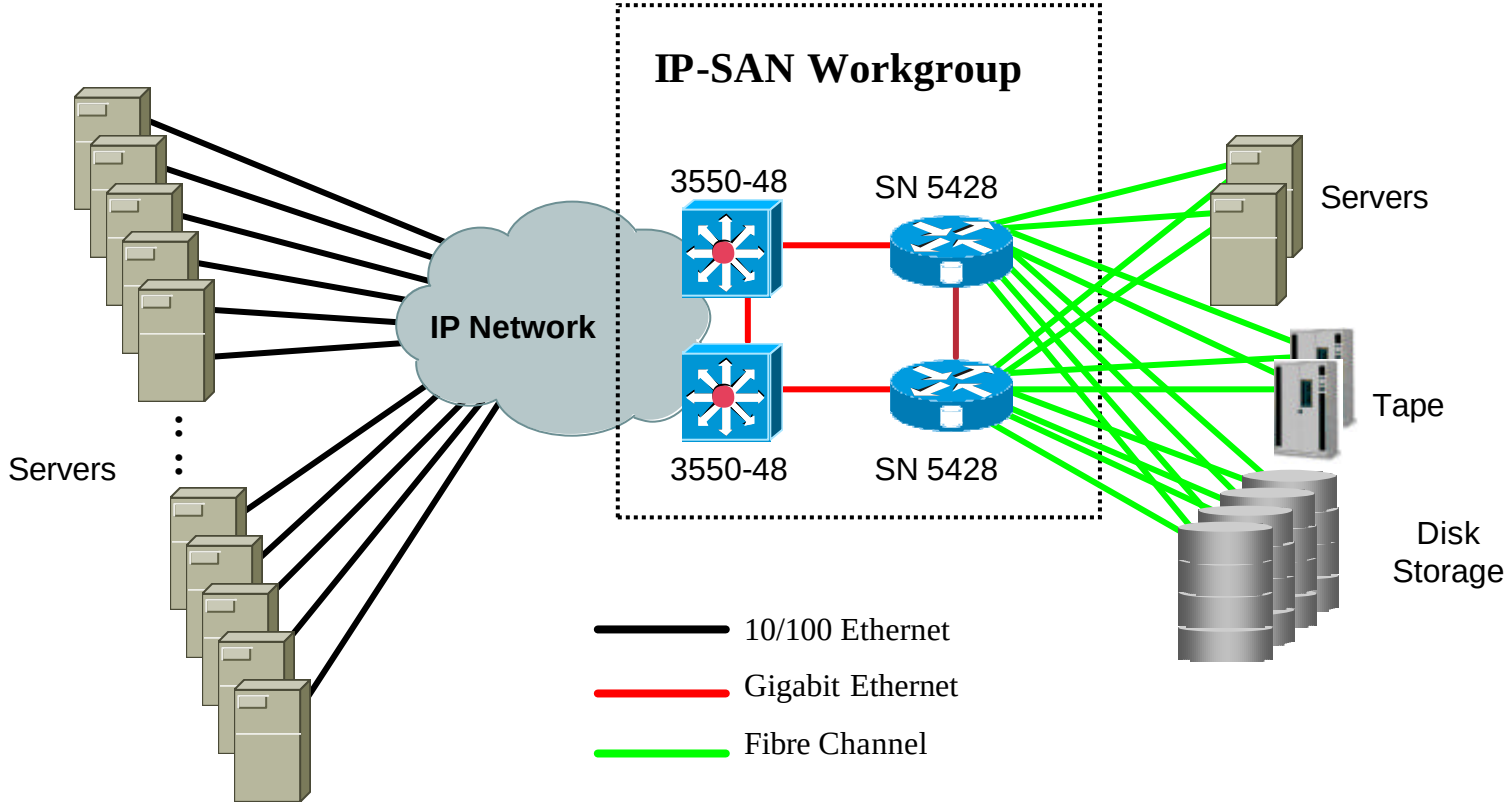
Two-node/Four-node high availability cluster

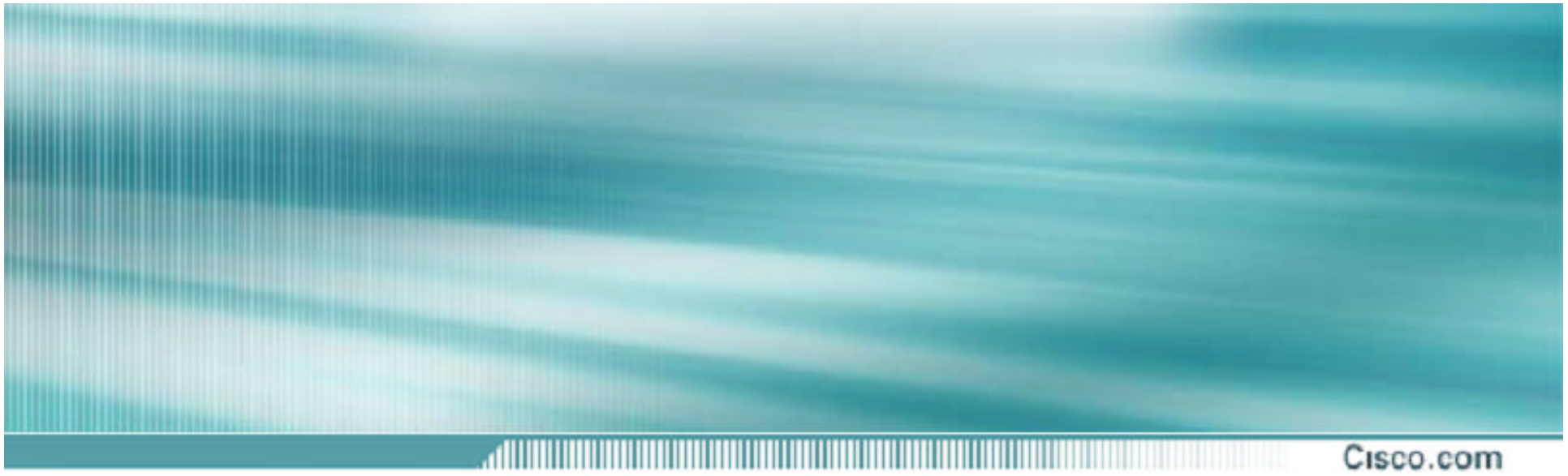


기본 구성



완전한 고가용성 HA 구성



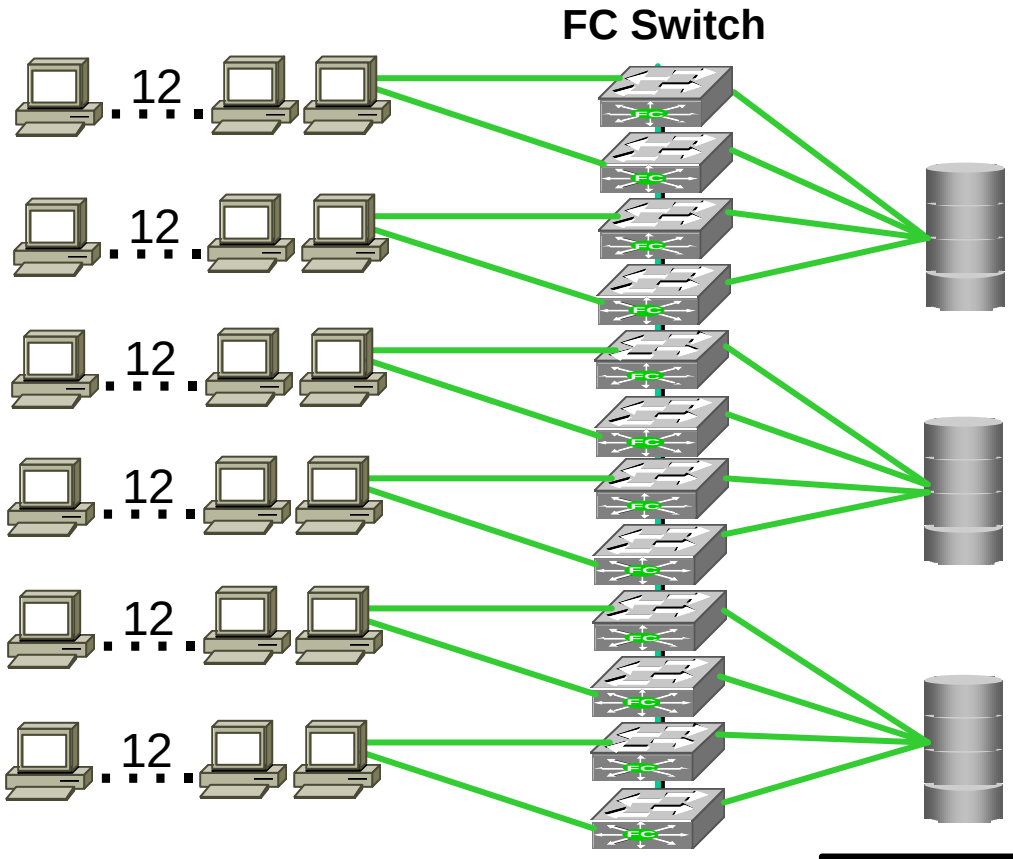


사례 연구

스토리지 통합 사례연구
의료 기관

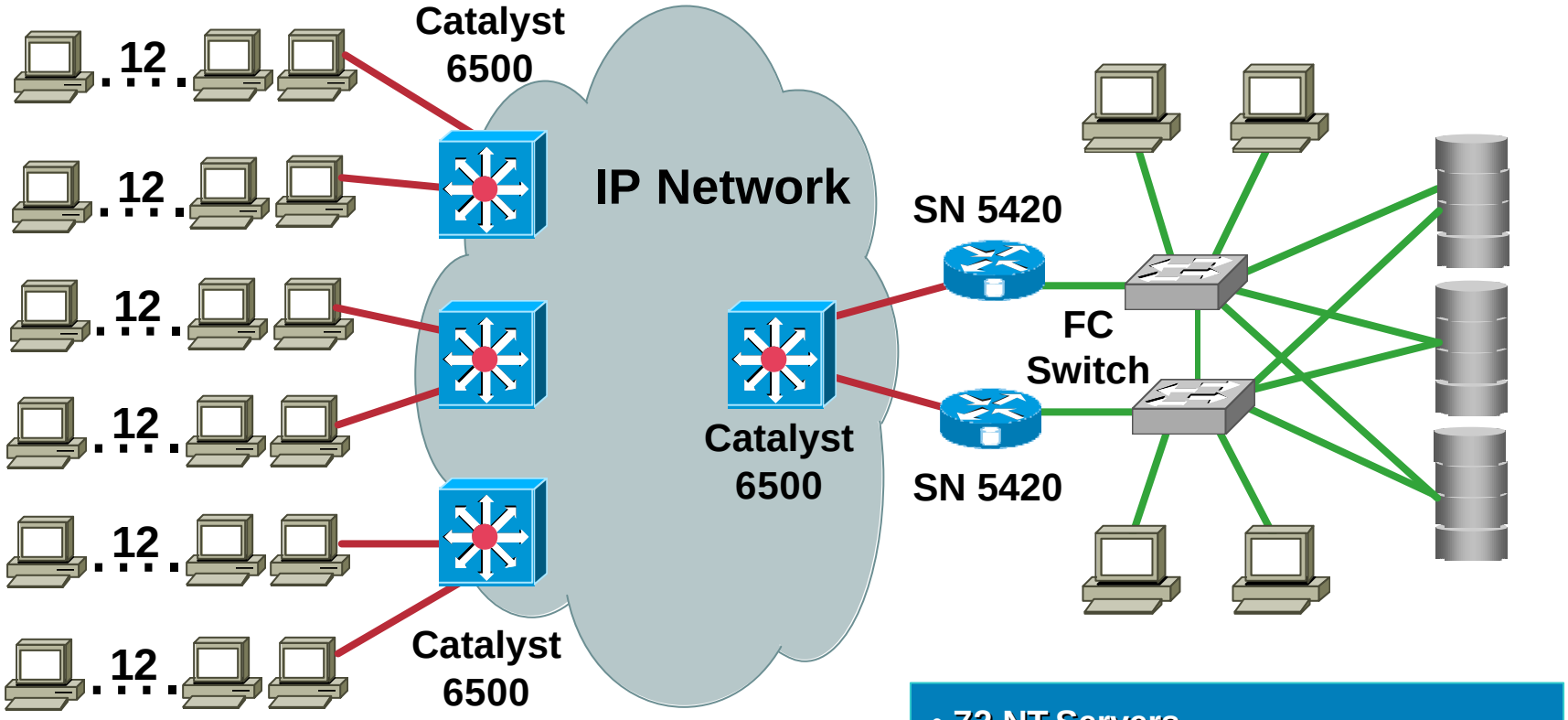
Problem	• Required inexpensive access to pooled storage • Adding storage to existing servers too expensive to manage • Low levels of storage utilization
Solution	• Redundant Cisco SN5420 Storage Router • Pooled storage • Centralized backup and recovery
Financial Impact	• Initial capital cost reduction of over **$600,000** • Reduced cost of data management by **80 %**
Operations Impact	• Met performance requirements of 94% server utilization • Centralized storage management • Improved security for users • Flexible access for remote locations

의료 기관을 위한 파이버 채널 채용시



- 72 NT Servers
- Compaq StorageWorks – 4 TB Disk
- 12 Fibre Channel Switches
- Dual path between all devices

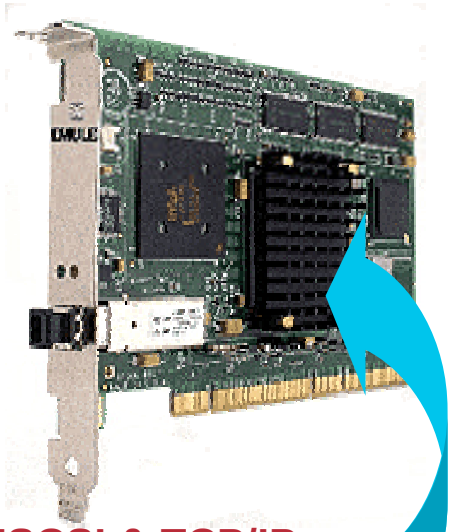
의료 기관의 iSCSI 채용시



- 72 NT Servers
- Compaq StorageWorks – 4 TB Disk
- 2 Fibre Channel Switches
- Dual path between all devices

업계의 다양한 iSCSI 제품 출시

- IBM TotalStorage IP Storage 200i
- Cereva 5000 Internet Storage System
- Emulex GN9000/SI 1Gb/s iSCSI Host Bus Adapter
- Adaptec EtherStorage Adapter
- Intel PRO/1000 T IP Storage Adapter
- netConvergence iSCSI NIC & iSCSI device driver
- Lucent OptiStar GE1000 NIC



ISCSI & TCP/IP processing in ASIC to boost performance!