

# iSCSI Solutions over Storage Networking

*the New Era for Total Storage*



# Agenda



1. Storage Networking

2. iSCSI Technology

3. iSCSI Solutions

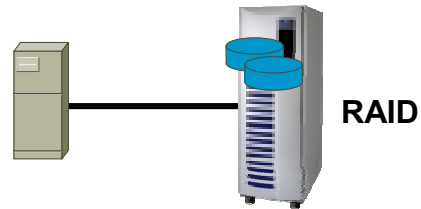


# Storage Networking

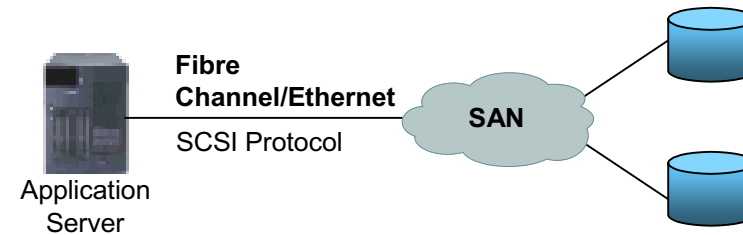
# The Type of Storage

## 스토리지 구현형태

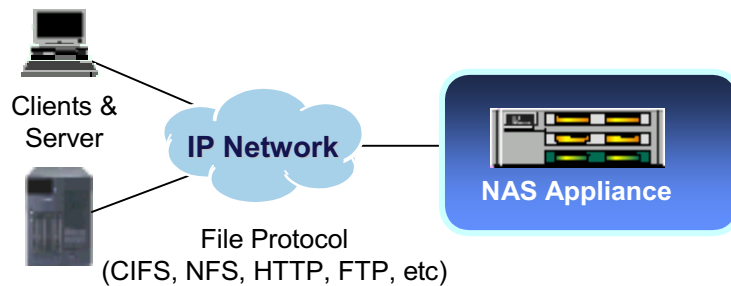
### Server Based Storage



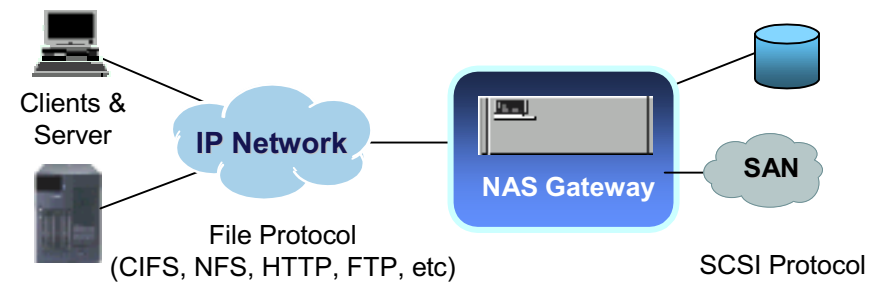
### SAN Attached



### Network Attached Storage



### NAS Gateway





# Applications related with Storage

*file I/O & Block I/O*



Typical applications using file I/O	Typical applications using block I/O
<p>Lotus Notes</p> <p>Lotus Domino – Server</p> <p>Lotus Approach</p> <p>Power Point</p> <p>MS Word</p> <p>MS Excel</p> <p>Freelance</p> <p>Word Pro</p>	<p>DB2</p> <p>Oracle</p> <p>Microsoft Exchange</p> <p>Informix</p> <p>Video Streaming</p> <p>ERP applications</p>



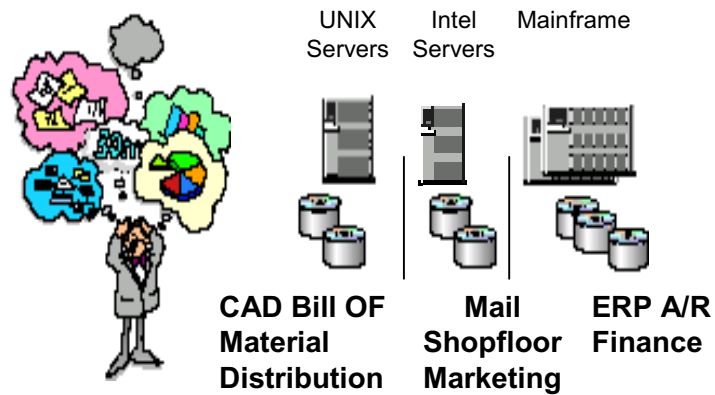
# The Type of Storage

## 2 Main Technology

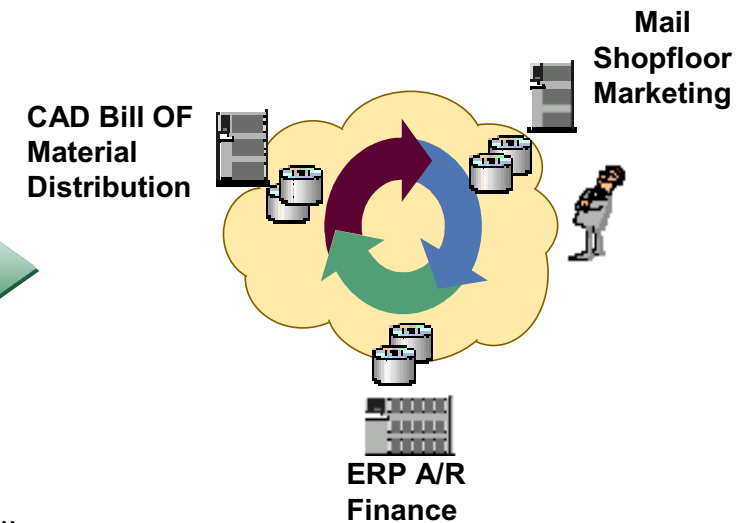
NAS	SAN
<ul style="list-style-type: none"> <li>● Better with File I/O applications</li> <li>● IP Based</li> <li>● File Sharing</li> <li>● slower database performance than SAN or iSCSI</li> </ul>	<ul style="list-style-type: none"> <li>● Better with Block I/O(database) applications</li> <li>● FC</li> <li>● Storage Sharing</li> </ul>
<ul style="list-style-type: none"> <li>● Midmarket</li> <li>● xSPs</li> <li>● Ease of Management</li> </ul>	<ul style="list-style-type: none"> <li>● Larger Environment</li> <li>● Requirement for Highest</li> <li>● Performance &amp; Scalability</li> </ul>

# Need for Storage Networking

현재의 정보 공유 인프라



통합된 스토리지 인프라

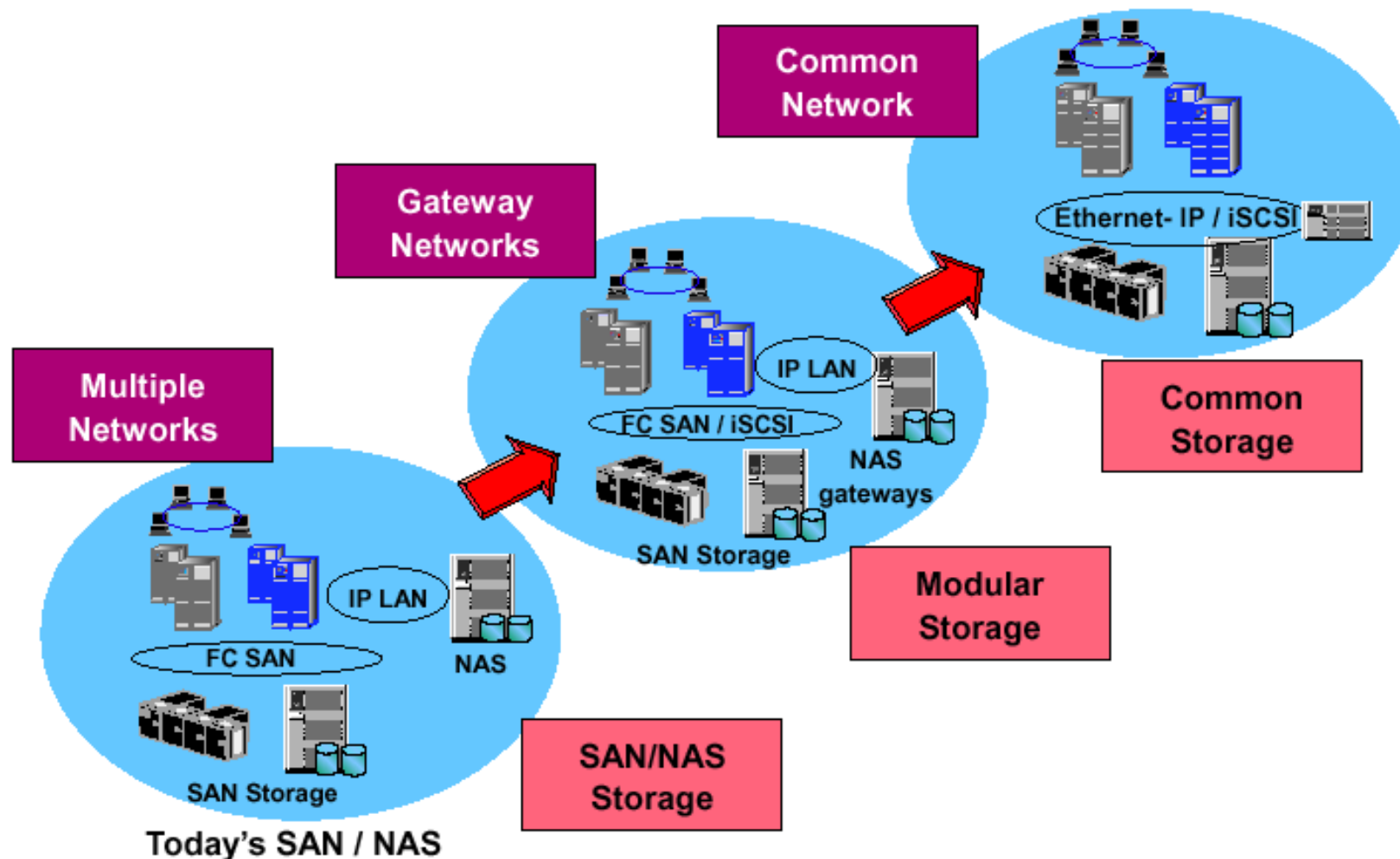


- 정보공유의 확대
- 위험 최소화
- 유연성과 관리의 확장
- 단순화, 비용절감



# The Future of Storage

## Storage Networking Evolution





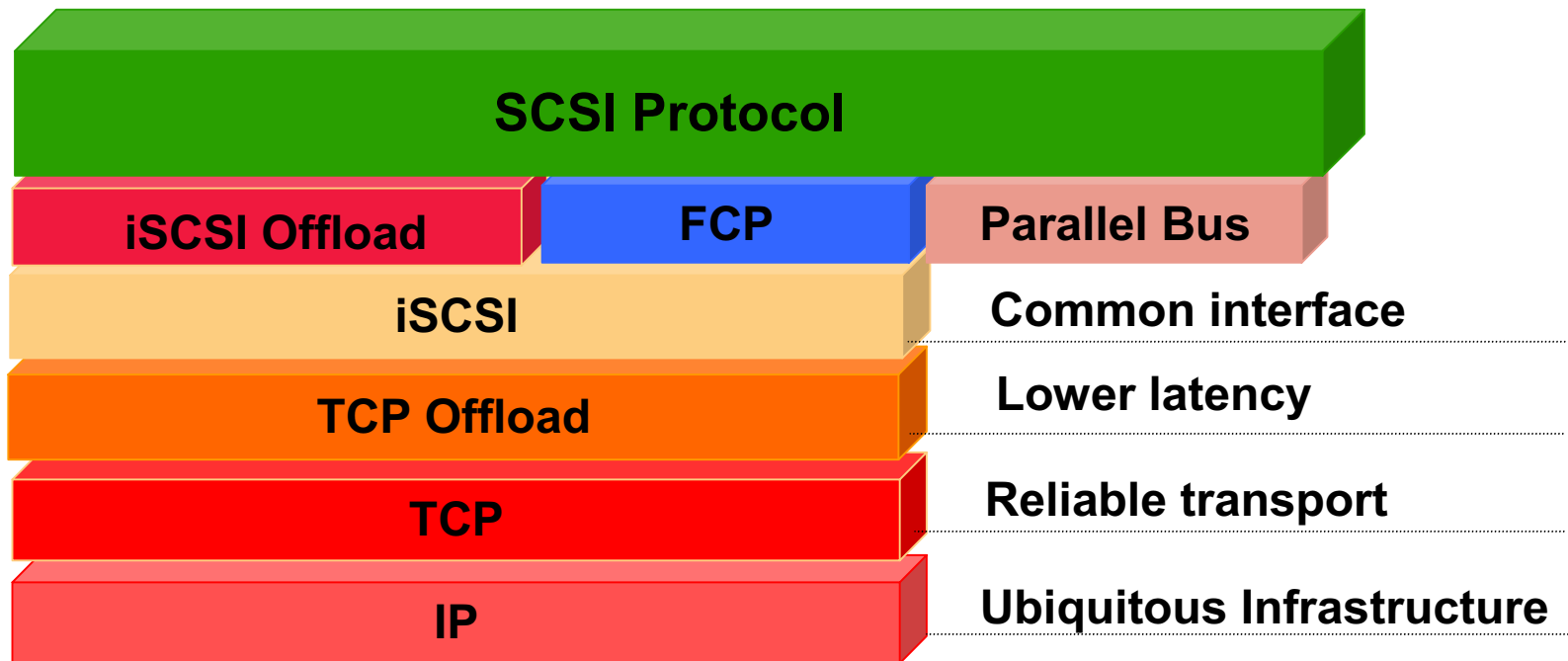


# iSCSI Technology

# iSCSI

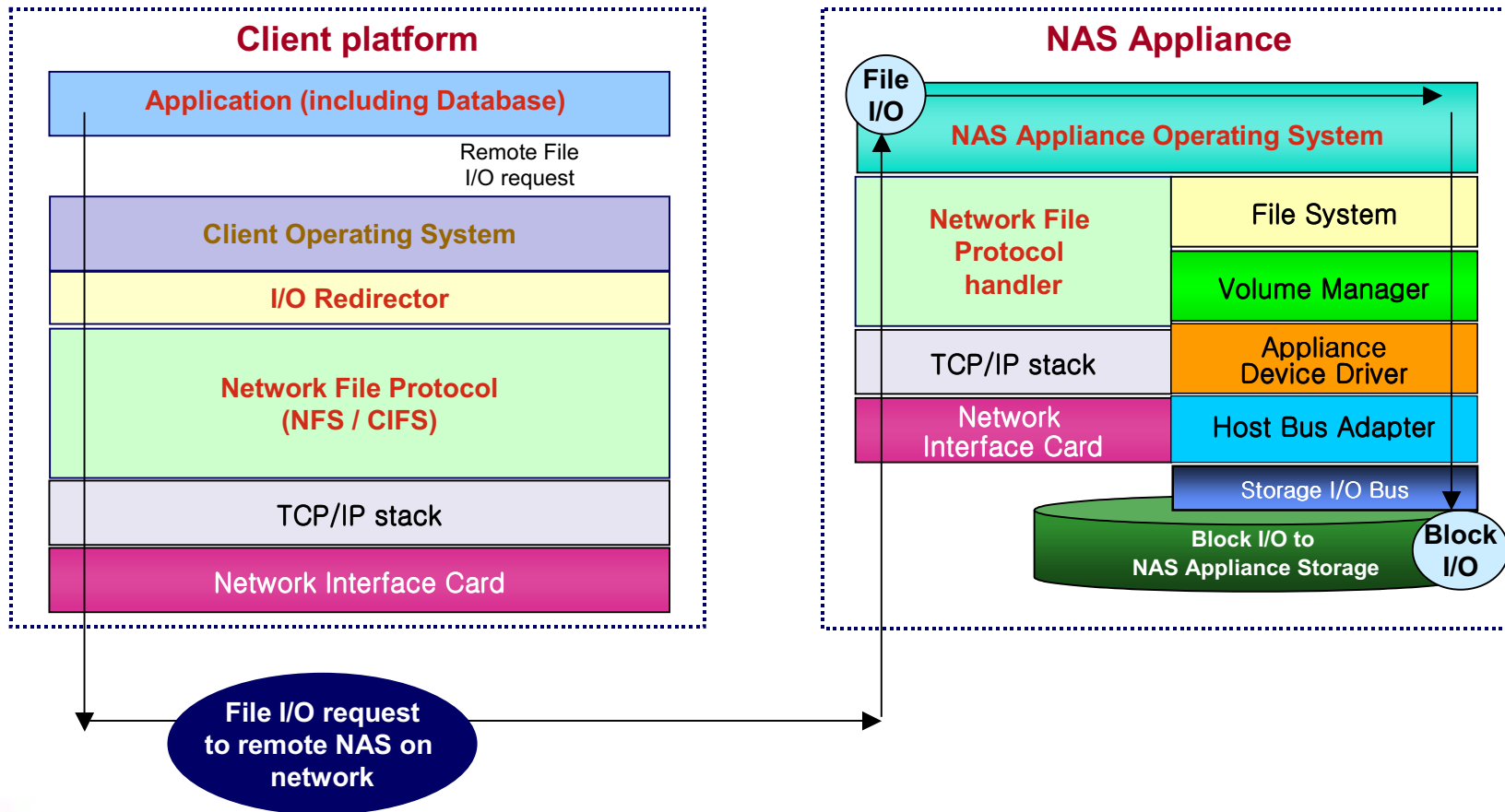
## *What is iSCSI?*

- ▶ <http://www.ietf.org/internet-drafts/draft-ietf-ips-iscsi-05.txt>
- ▶ 목표: TCP/IP위에서 스토리지 프로토콜 전송을 위한 표준화 방식 제공



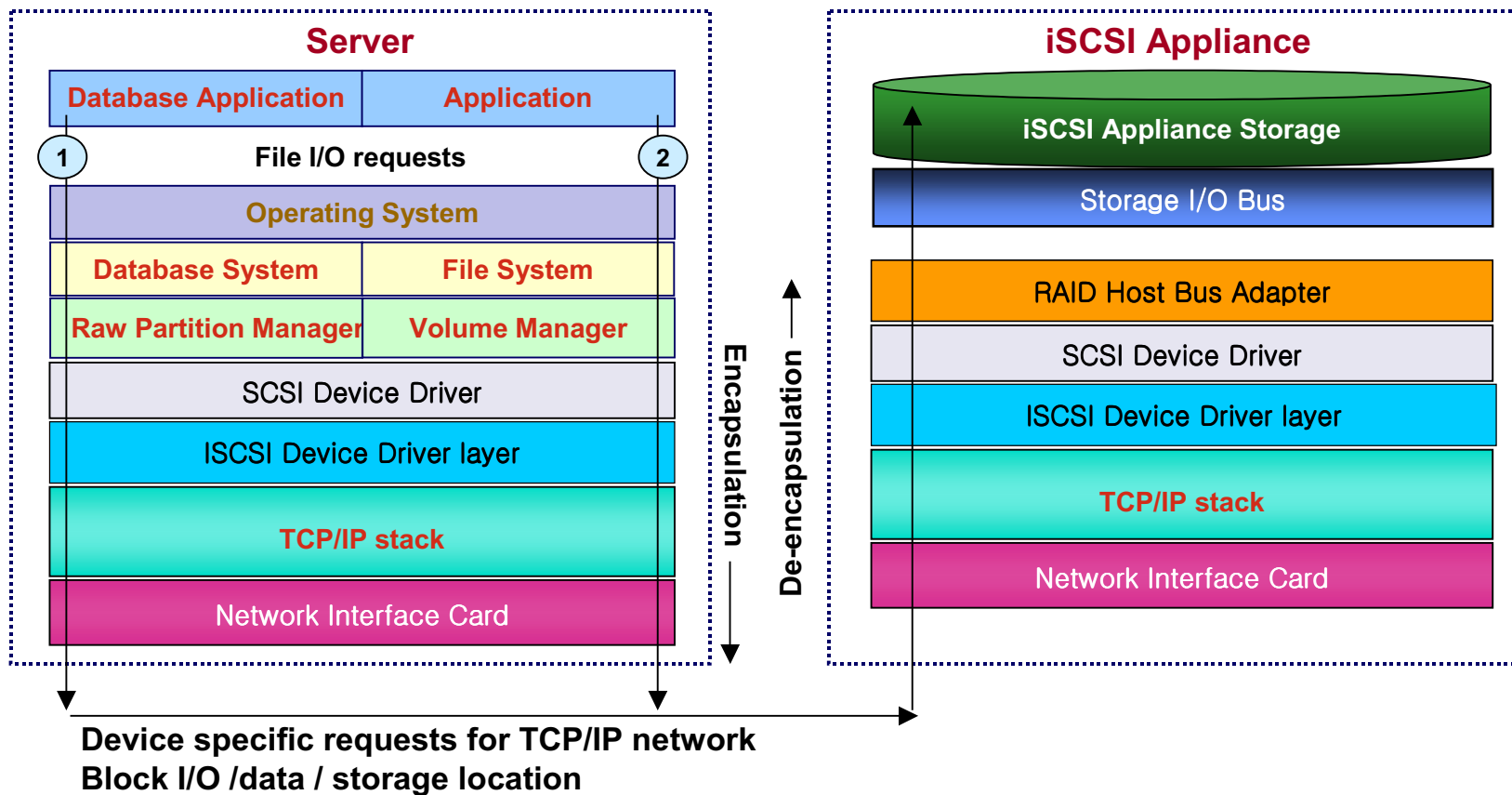
# iSCSI

## Network File I/O



# iSCSI

## Block I/O



# Storage Architecture

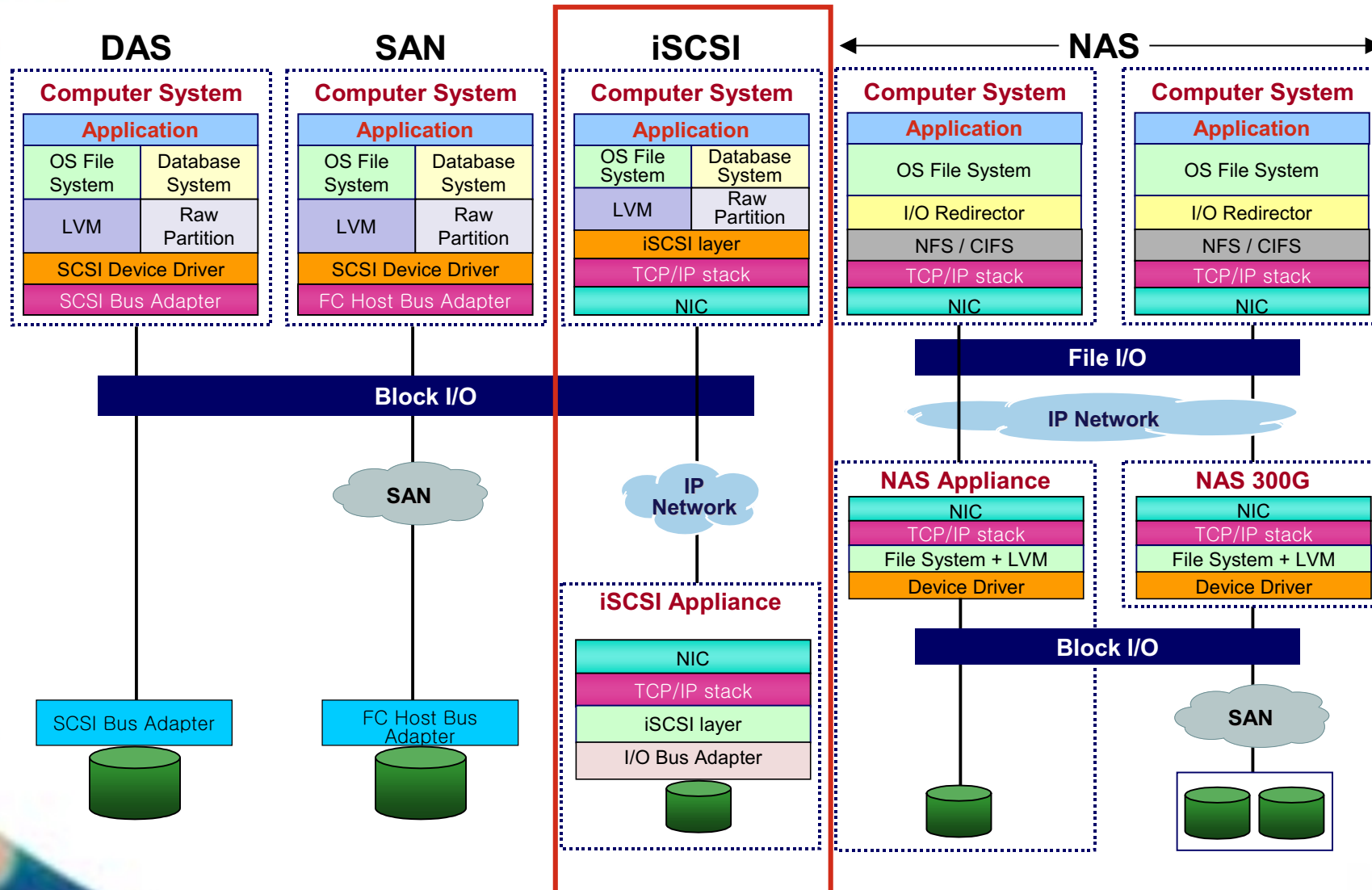
## *Differentiating Between Storage Networks*



	FC SAN	iSCSI SAN	NAS
Protocol	FCP	Serial SCSI	NFS. CIFS
Network	Fibre Channel	Ethernet, TCP/IP	Ethernet, TCP/IP
Source / Targer	Server / Device	Server / Device	Client / Server or Server / Server
Transfer	Blocks	Blocks	Files
Storage Device Connection	Direct on Network	Direct on network	I/O bus
Embedded file System	No	No	Yes

# Storage Architecture

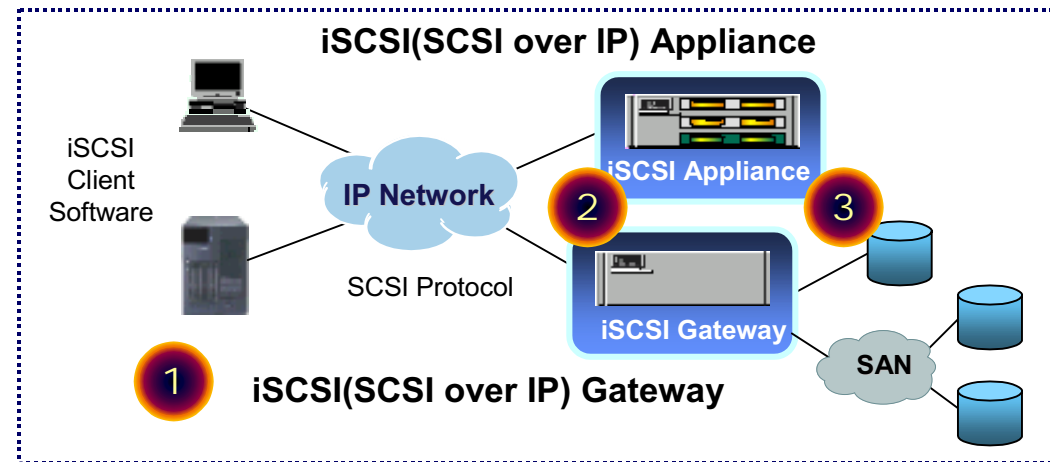
## 스토리지 구현 기술



# iSCSI Components

*iSCSI – An emerging technology*

SCSI over IP Networks  
"SAN" with IP fabric



2가지 제품형태

iSCSI Appliances (w/ Embedded Storage)

iSCSI Gateways (IP/ FC Bridges)

- 1 iClient (initiator)는 SCSI commands 를 IP network로 전송
- 2 iSCSI Appliance 및 Gateway는 SCSI commands를 IP network로 부터 수신.
- 3 SCSI commands 는 서버에 직접 전송 혹은 FC SAN S/W를 통해서 전달됨.





# iSCSI Solutions



# BackUp Applications

## *The Scope of Backup*



### 보 호

- ▼ NetBackup
- ▼ Backup Exec

### 엑 세 스

- ▼ Cluster Server
- ▼ Volume Replicator
- ▼ File System
- ▼ Cluster File System
- ▼ Storage Migrator

### 관 리

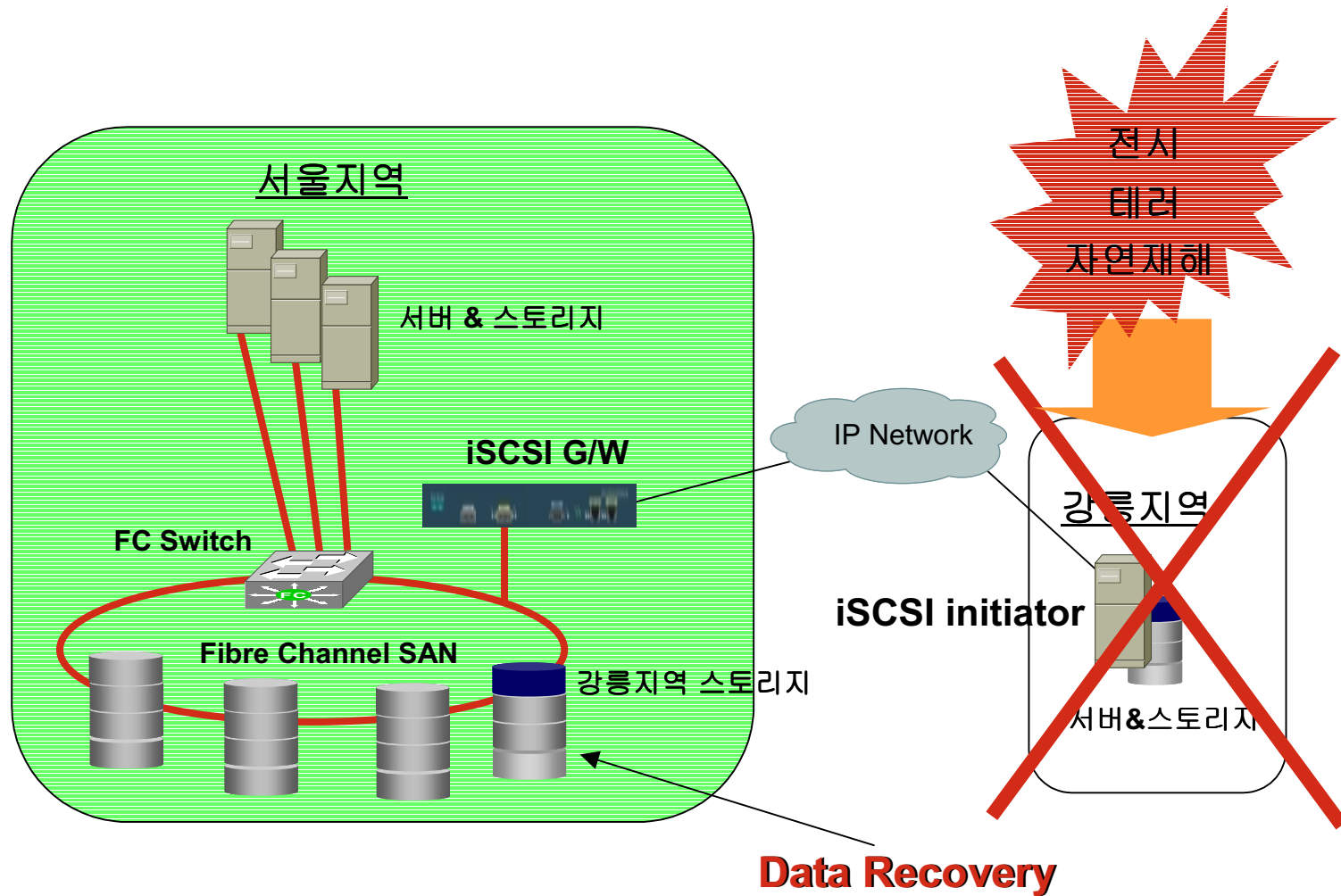
- ▼ Volume Manager
- ▼ Global Data Manager

## Product Suites

- ▼ Foundation Suite
- ▼ Storage Edition
- ▼ Database Edition

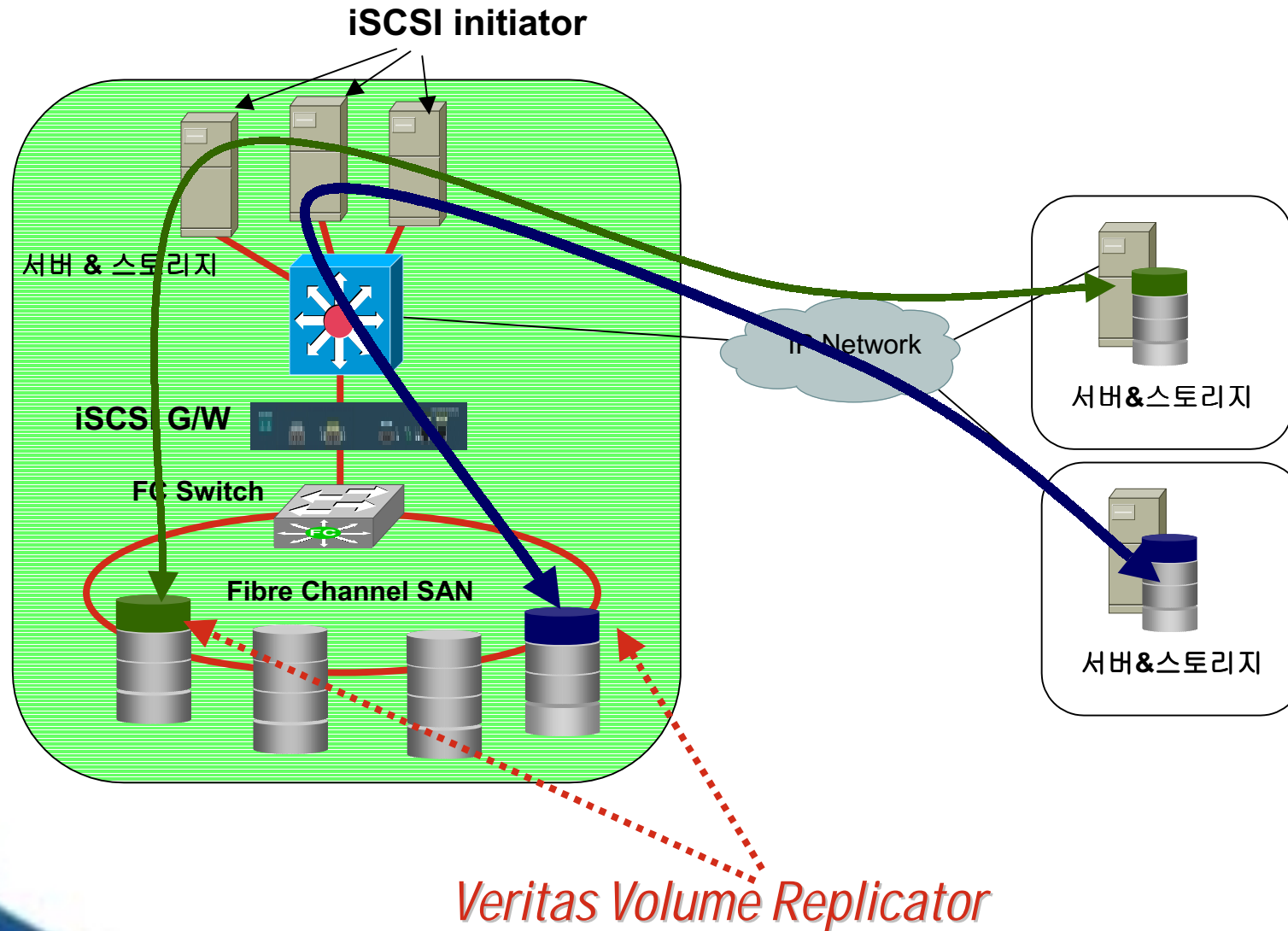
# Disaster Recovery

## Disaster Recovery Solution



# Disaster Recovery

## Veritas Volume Replicator





인생정보

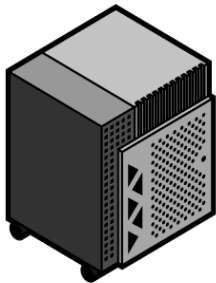
19 ▶

# Disaster Recovery

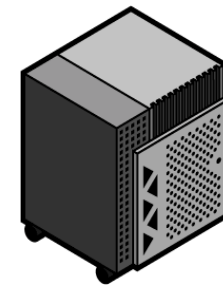
## Veritas Volume Replicator



PRIMARY SITE



SECONDARY SITE



VM Mirror

Storage Network Mirror

Storage Level Replication

SITE SEPARATION

1M

10M

1KM

10KM

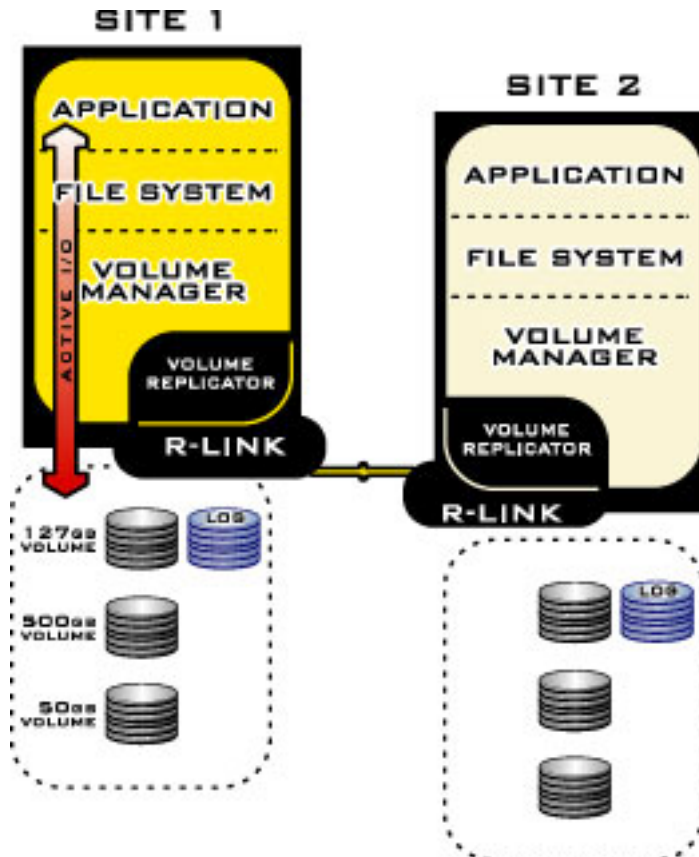
100KM

1,000KM

10,000KM

# Disaster Recovery

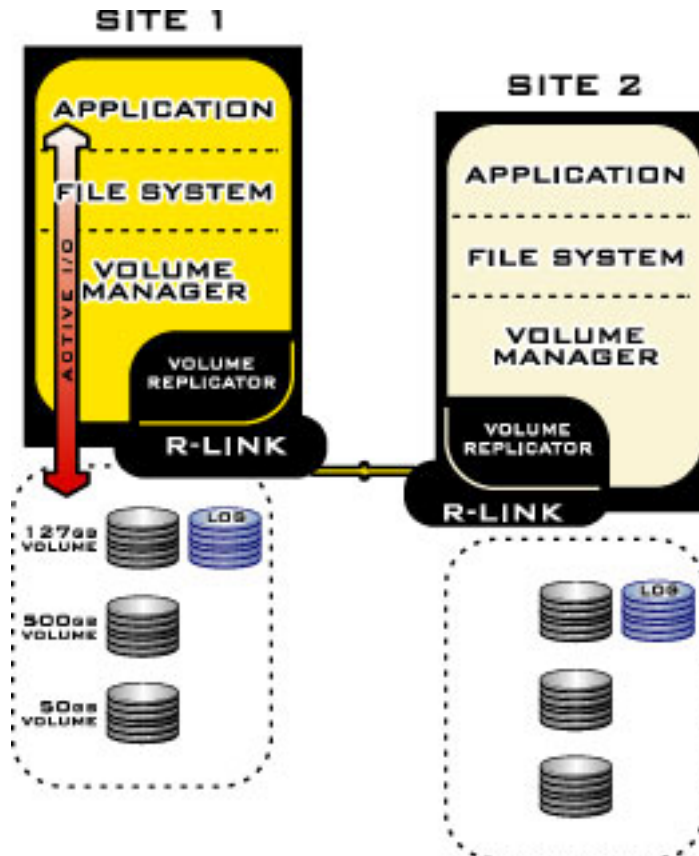
## 볼륨 복제



- VxVM과 연동하여 사용
- 재난 복구 솔루션
- 주 사이트의 데이터 블록 단위 미러를 보조 사이트로 동기(Syn) 및 비동기(Asyn) 복제
- 복제중에는 보조 사이트의 데이터 사용이 불가능
- 업무용 데이터베이스를 사용하는 사이트에 적합

# Disaster Recovery

## 동기 복제

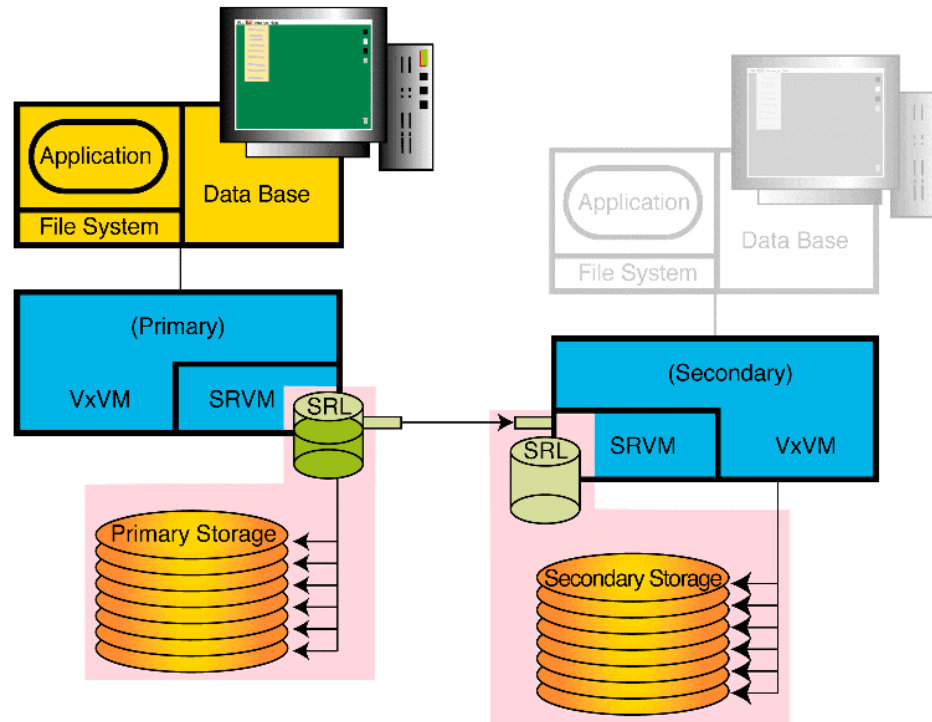


- 주/보조 사이트에서  
변경작업 동시 수행
- 데이터 쓰기 작업에 대한  
네트워크 지연 영향
- 어플리케이션의 유형에  
따른 성능의 차이 발생



# Disaster Recovery

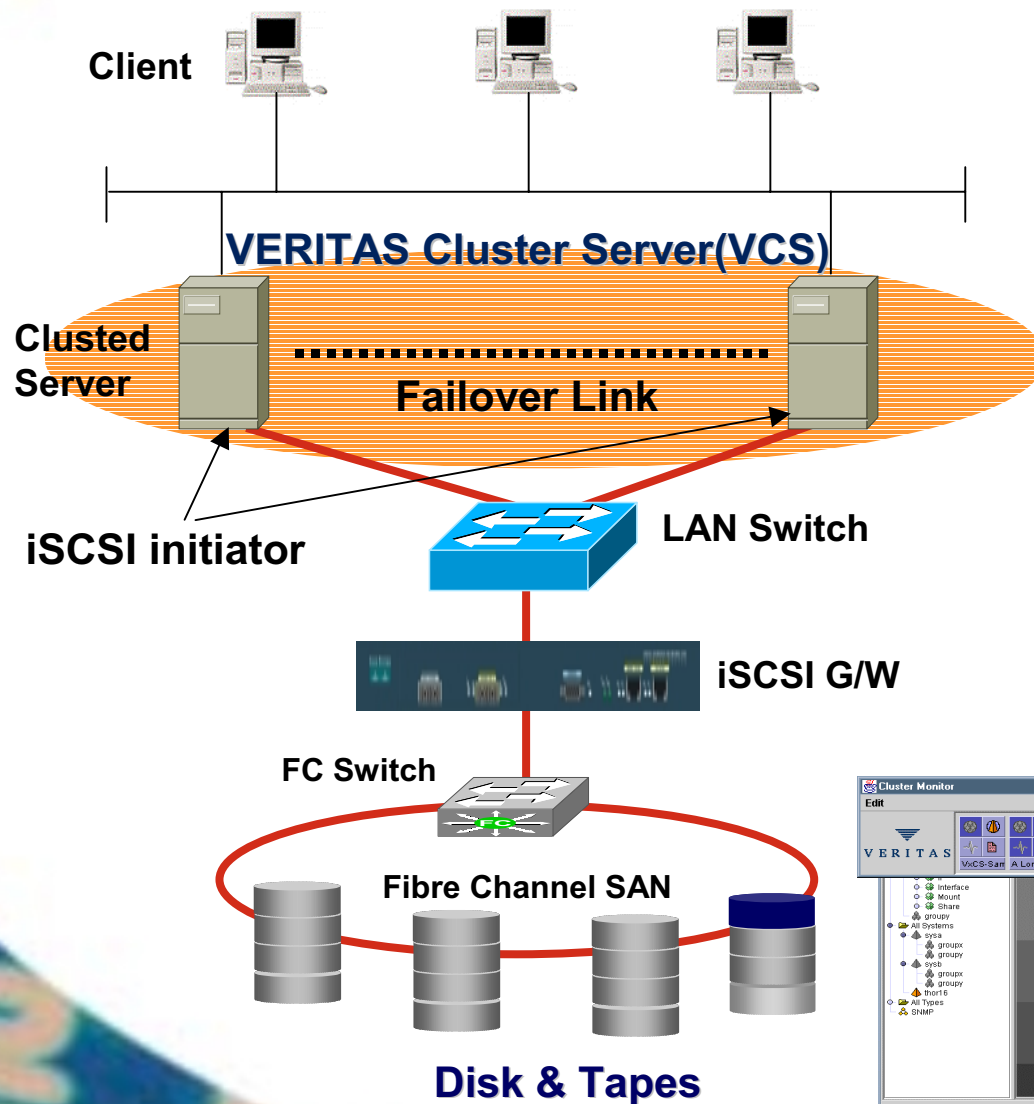
## 비동기 복제



- 주 사이트에서 데이터 접근이 가능
- 보조 사이트의 데이터는 일치된 상태를 유지
- 보조 사이트의 데이터는 지연 쓰기
- 쓰기 작업의 큐(queue)를 위해 로그 디바이스를 사용하는 경우:
  - 네트워크 대역폭 부족 시
  - 네트워크 장애 시
  - 보조사이트 장애 시

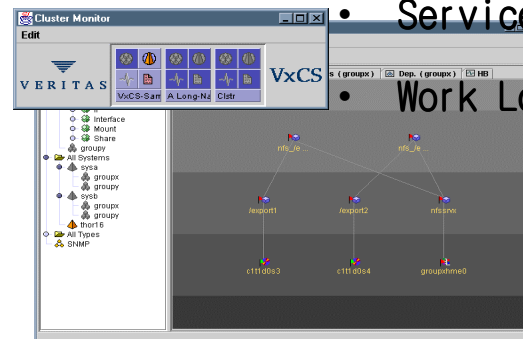
# Clustering

## High Availability Clusters



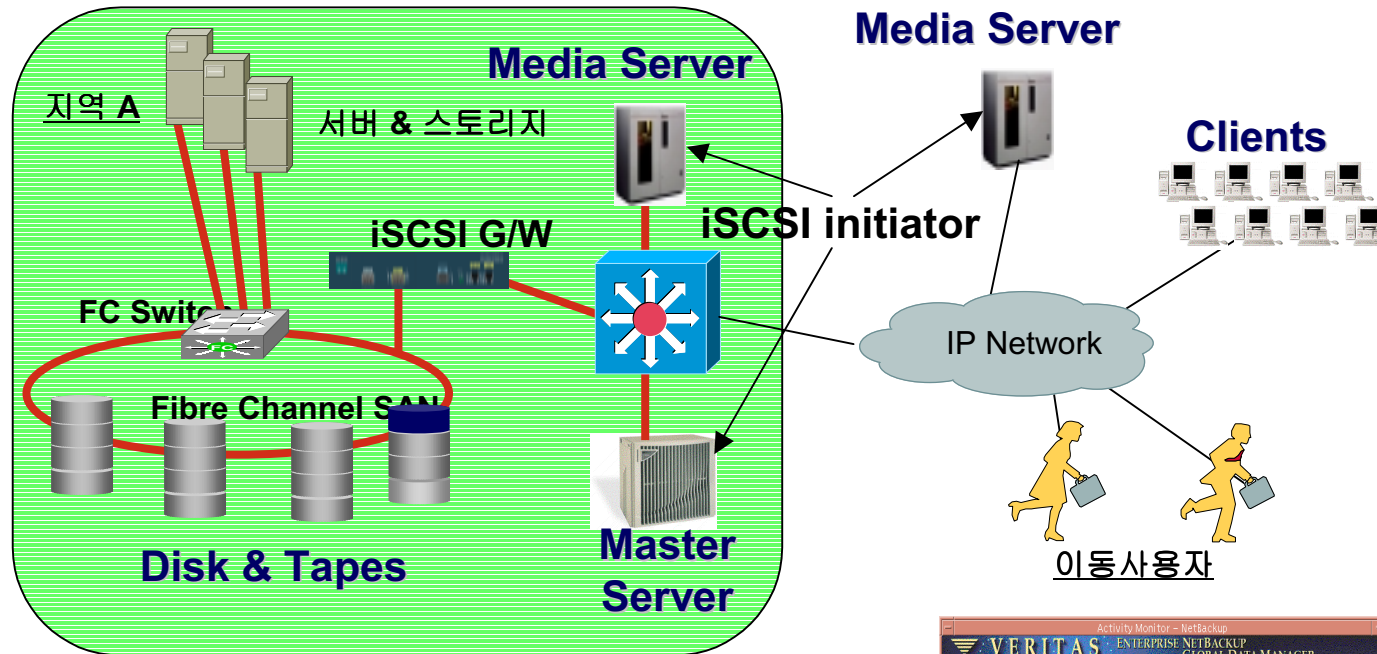
- ▶ 확장 가능 솔루션 - up to 32 노드
- ▶ 손쉬운 설치, 구성, 운영
- ▶ SAN(Storage Area Network)환경지원
- ▶ 광범위한 3rd party hardware 지원
- ▶ 광범위한 3rd party software 지원
- ▶ Java-based GUI 중앙집중 관리
- ▶ SLF(Service Level Failover) 지원
- ▶ Cascading Failover 지원

- Hardware Detection
- Service Detection
- Work Load Balancing

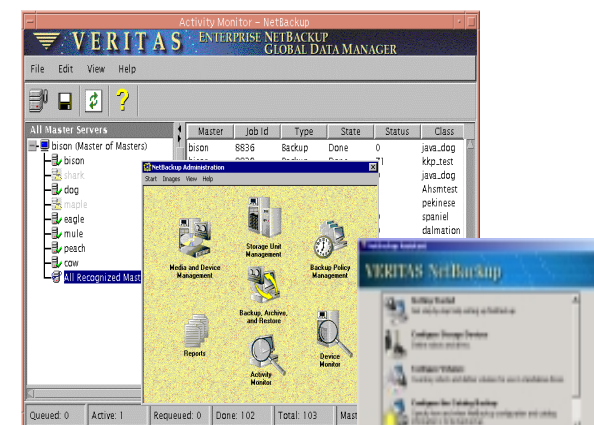


# Remote Backup

## Veritas NetBackup

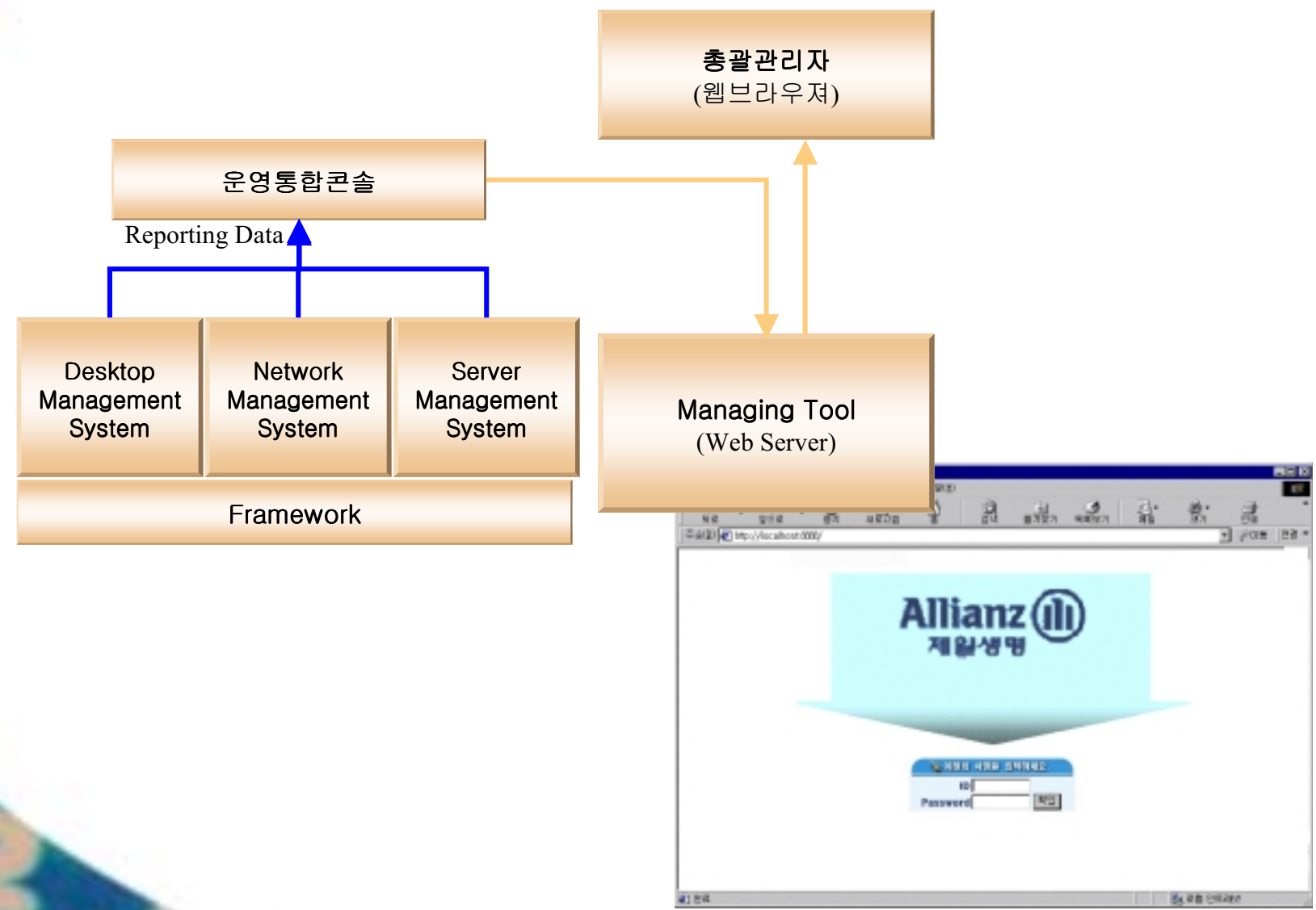


마스터 서버	중앙 통제 관리 기능을 탑재한 서버
미디어 서버	백업 장치가 연결되어 직접 SCSI 케이블이나 SAN을 통하여 데이터를 백업/복구 하는 서버
클라이언트	백업할 데이터를 가지고 있는 서버



Global Data Manager

# Management SMS



# Blue Print

## The Future of Storage

E-Business 확대  
정보 공유 확대

진정한 데이터 공유  
스토리지 통합

Standard interface for Storage

IP + SCSI interface

Lower latency

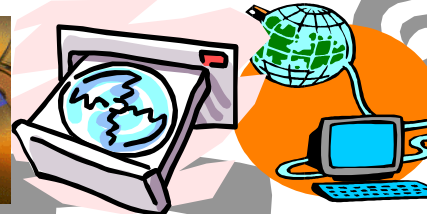
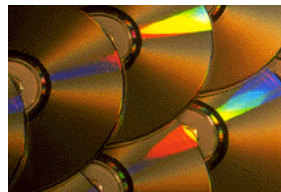
인터넷의 기반

SCSI Protocol

iSCSI

TCP Offload

TCP/IP



# *Special Thanks*

