



## Alternate Backup Methods for HP/UX

An Overview of Alternative  
Backup & Rapid Recovery Solutions

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# Agenda

- ▼ VERITAS Overview
- ▼ Storage Issues
- ▼ Alternate Backup Methods
- ▼ Questions and Answers

Data  
Access

Data  
Protection

# VERITAS

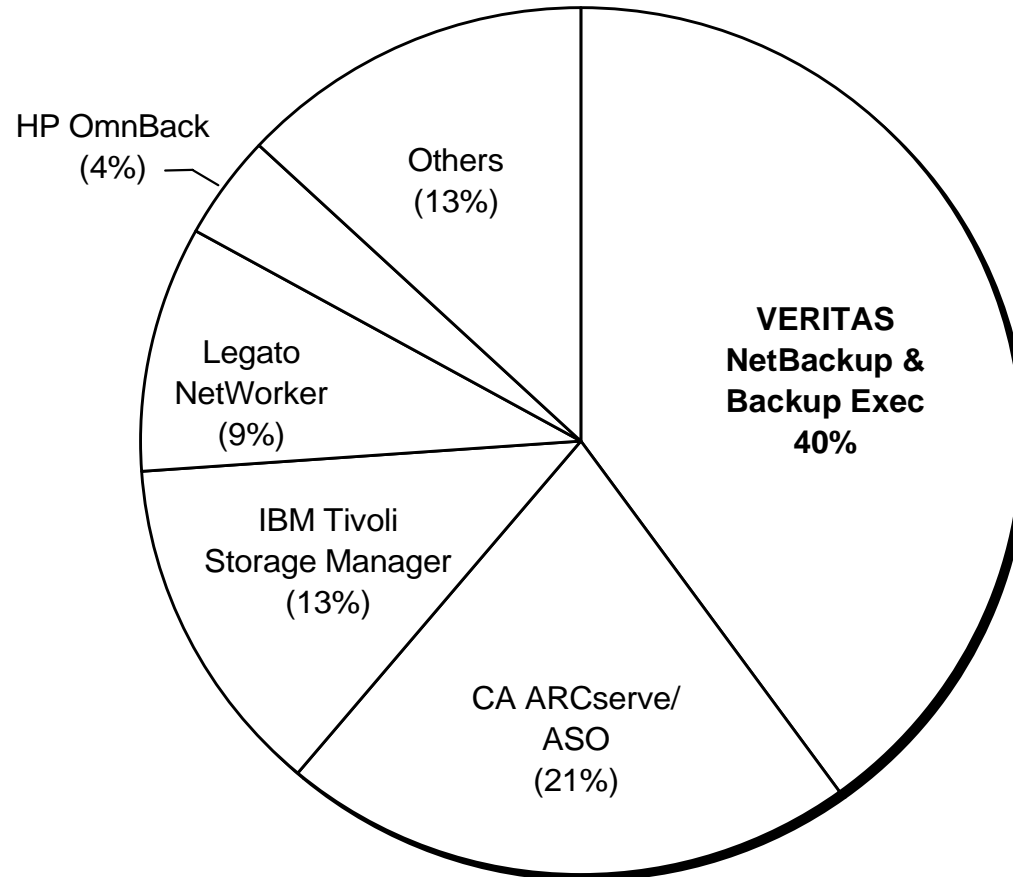
- ✓ The only end-to-end application storage management software company in the world
- ✓ The #1 backup software company in the world
- ✓ Core technology embedded in HP-UX, Windows NT/2000, etc.

Data  
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# Preliminary Distributed Network Backup Product Leaders

Based on 2000 New-License Revenue



New License Sales = \$1.3 Billion

Source: Gartner/Dataquest, "Selling Storage Management Software Through Partners," March 26, 2001.

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# VERITAS Backup Solutions



Large Server (UNIX/NT)

Mid-size Server  
(UNIX/NT/NetWare)

Desktop to Small Server  
(Mostly NT/NetWare)

NetBackup  
DataCenter

NetBackup  
BusinessServer

Backup Exec  
Single Server

Backup Exec  
Advanced Server

Backup Exec  
SBS

NetBackup Professional

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## Storage Issues

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A blurred, blue-tinted photograph of an office environment. In the foreground, a woman is smiling with her hands clasped. In the background, two men are looking at a computer monitor. The overall scene suggests a collaborative business setting.

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# Storage Issues

## ▼ Backup Window:

- ✓ Non-existent - 24 by forever
  - ✓ UNIX, Windows NT, NetWare
  - ✓ Oracle, Informix, Sybase, DB2, SQL Server, etc.

## ✓ Recovery:

- ✓ Non-existent - 24 by forever
  - ✓ Recovery SLA's
  - ✓ Simplification

## ✓ New hardware

- ✓ New technologies such as SAN, NAS, Appliances

## ✓ Amount of data:

- ✓ Current technology cannot keep up
  - ✓ Traditional backup to tape
  - ✓ More data, more files, but not more staff

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# Storage Issues

| Application             | Industry       | Average Hourly Loss |
|-------------------------|----------------|---------------------|
| Brokerage Operations    | Finance        | \$7,840,000         |
| Credit Card/Sales Auth. | Finance        | \$3,160,000         |
| Pay-Per-View            | Media          | \$183,000           |
| Home Shopping (TV)      | Retail         | \$137,000           |
| Catalog Sales           | Retail         | \$109,000           |
| Airline Reservations    | Transportation | \$108,000           |
| Tele-Ticket Sales       | Media          | \$83,000            |
| Package Shipping        | Transportation | \$34,000            |
| ATM Fees                | Finance        | \$18,000            |

Sources: Contingency Planning Research; Datamation

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## **The Solution:**

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# **Alternate Backup/Recovery Methods**



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# Alternate Backup Methods

## ▼ Today

- SAN
  - Being implemented by many IT departments today
- NDMP
  - Growing to \$5 billion market
- Frozen Image
  - Hardware & software based

## ▼ Around the corner

- Serverfree Backup
  - The next big thing or big hype?

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**Data**  
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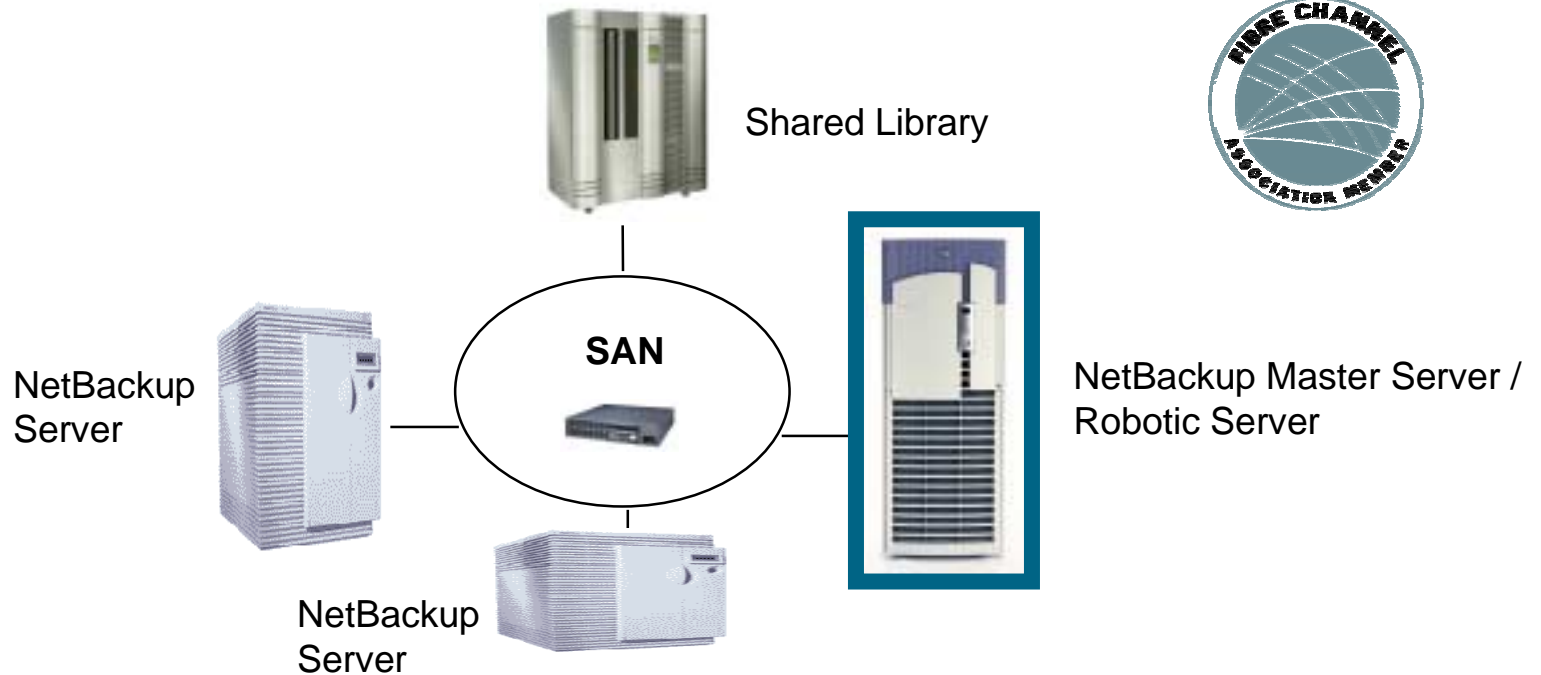
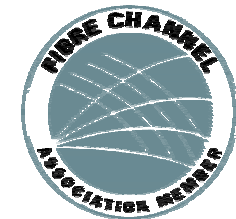


# SAN

# SAN

## ▼ SAN - NetBackup Shared Storage Option (SSO)

- Support for switched fibre environments
  - Heterogeneous support
  - Dynamic tape drive sharing
    - Via SAN and switched SCSI environments



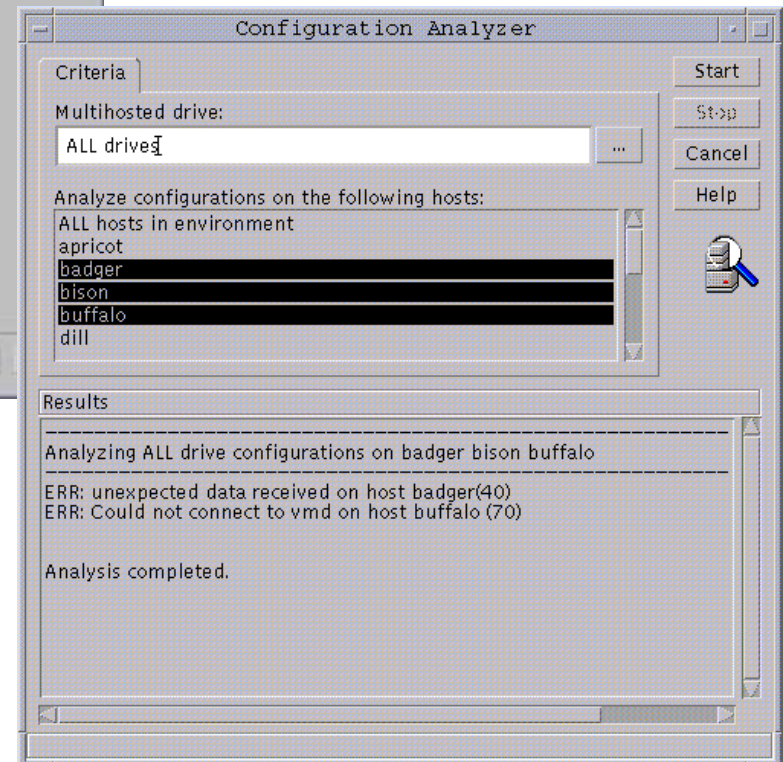
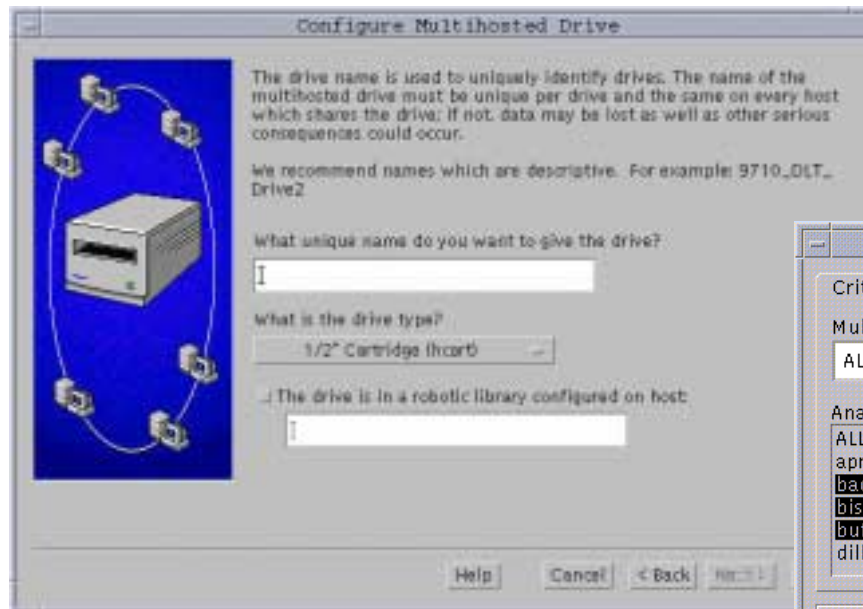
## ▼ SSO Highlights

- ▼ Industry's first heterogeneous SAN ready solution
- ▼ “Virtualizes” tape resources
  - Enables dynamic sharing of libraries and standalone drives
  - Reduces user's costs by allowing for efficient use of tape hardware resources
- ▼ Over 16,000 copies sold to date

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## ▼ SSO's intuitive administration interface



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# NDMP

# NDMP

## ▼ Backup and Restore Flexibility



### Local Area Network



NetworkAppliance®



NetworkAppliance®



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# Frozen Image

# Frozen Image

## ▼ Software

- NetBackup FlashBackup
  - Copy-on-Write
- NetBackup for Oracle Advanced Agent
- NetBackup and VxVM

## ▼ Hardware

- NetBackup for HP SureStore E Disk Array XP Family - Integration with SureStore E Business Copy XP

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# FlashBackup

## ▼ Backup and Restore Flexibility

- FlashBackup for HP-UX
  - Full or incremental “Snapshot” backup of live file system
  - Physical backup, low overhead
    - Ideal for backing up thousands or millions of small files
  - Supports JFS or VERITAS File System (VxFS)
  - Restore individual files or directories
  - Remote or local file system

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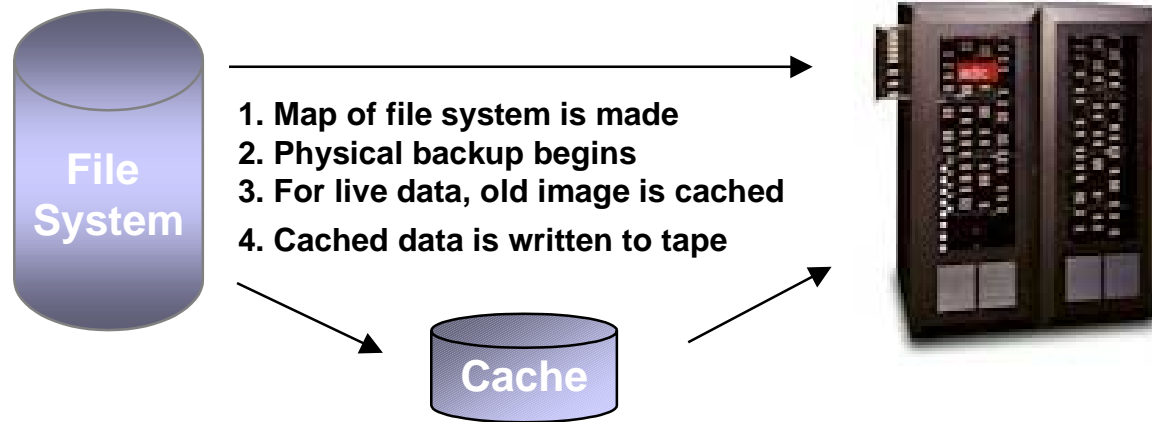
# Copy-on-Write Snapshot

- NBU FlashBackup is an example
- File system frozen for moments to take snapshot
- Backup begins (Raw disk reads)
- New writes to disk are intercepted by copy-on-write driver
  - Old data copied to cache
  - New data written to disk
- Backup process captures consistent point-in-time image of the disk
- File names are mapped to disk block addresses for single file recovery

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# Copy-on-Write Snapshot



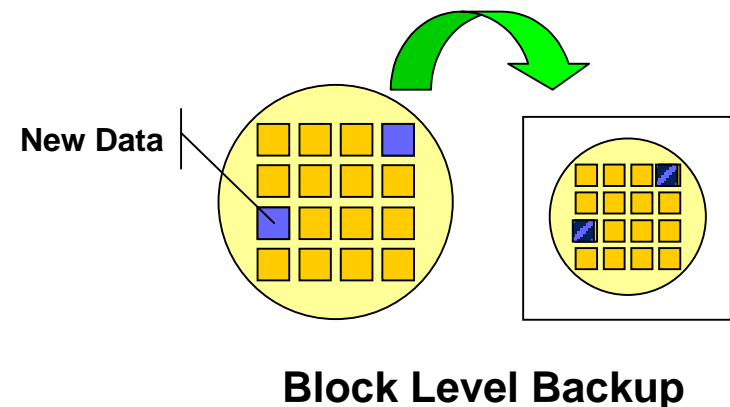
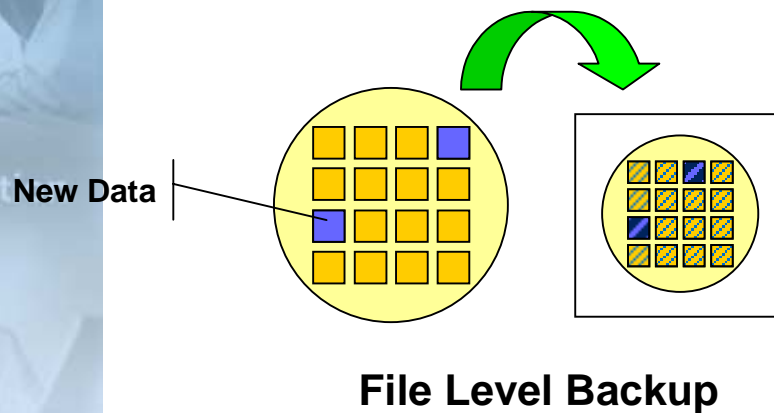
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# NetBackup for Oracle

## Advanced Block Level Incremental Backup

- ▼ **Breakthrough technology redefining db backup**
- **FAST** - 10-100X faster than File Level backup
- **HIGH CAPACITY** - Protects the largest multi-terabyte databases.
- **EFFICIENT** - Back up changed blocks only, min. disk I/O & server overhead
- **SAFE** - Non-disruptive. Tested and endorsed by Oracle.
- **EASY** - Simple as file backup, only faster. Integrated with Oracle8 RMAN
- **INEXPENSIVE** - Fraction the cost of alternatives. Use any disks and less of them.



# Hardware Snapshot

## Hardware based snapshot backup

- ▼ NetBackup for HP SureStore E Disk Array XP Family – Integration with SureStore E Business Copy XP
  - NetBackup Integration with Business Copy XP
  - Zero downtime backup for Oracle
    - Removes the backup workload from Oracle
    - Removes the I/O overhead from Oracle
  - Support for raw partitions and file systems





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# Serverfree Backup



# Serverfree Backup

## ▼ Serverfree Backup

- Pros:
  - Provides on-line, point-in-time backup
  - Leverages SAN
  - Great for systems with “many files”
  - Removes backup workload from application server
- Cons:
  - Complexity
  - Limited number of 3PC engines available today
  - Limited number of applications that are truly “3PC snapshot” ready today
  - Limited Platforms

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# Serverfree Backup

## Application

- ▼ Pause application and flush buffers long enough to establish frozen, stable image of data

## Frozen Image

- ▼ Includes locking/flushing file systems
- ▼ With *ServerFree Agent*, may be hardware- or software-based
- ▼ *Snapshot* or mirror options are supported

## Disk Object Mapping

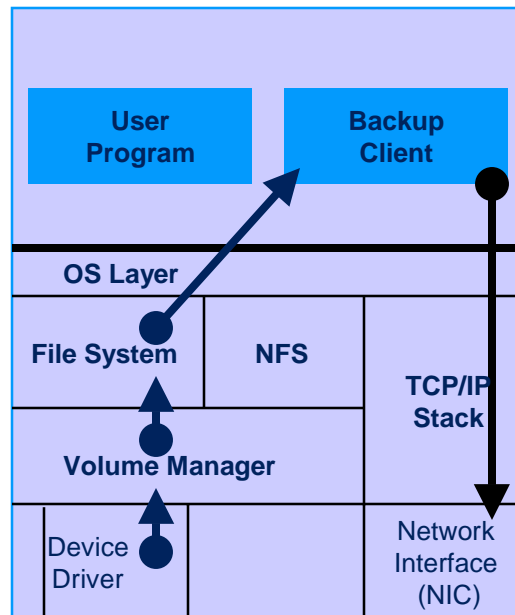
- ▼ Mapping logical (files) to physical (SCSI blocks)
- ▼ Device relative mapping of files -> file system -> volume -> partition -> SCSI-blocks

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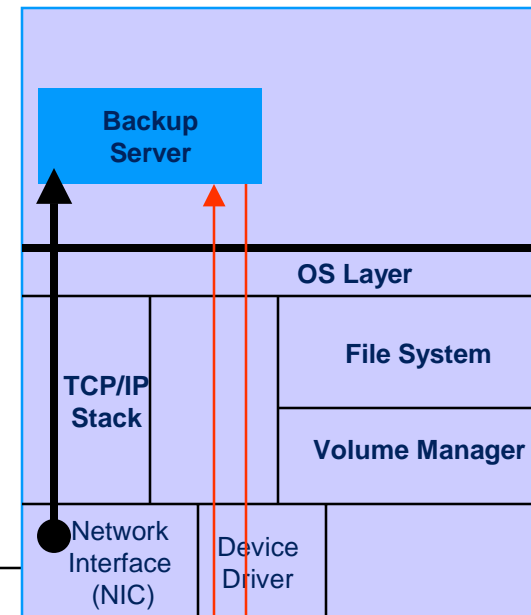
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# Serverfree Backup

## Backup Client (server)



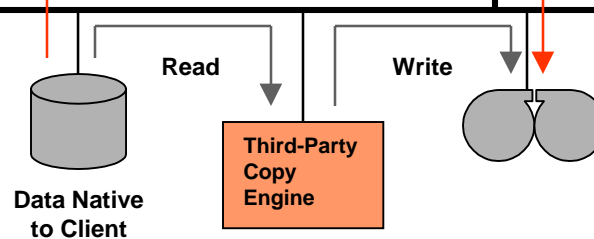
## Backup Media Server



LAN

SAN

- Object decomposition
- Data addresses
- Copy manager requests
- Raw I/O requests  
Media Server SAN copy



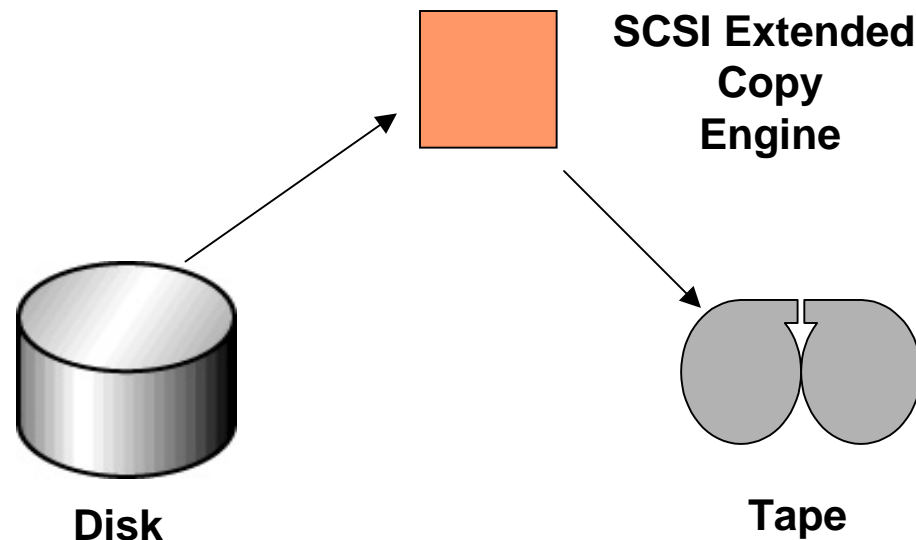
Data Access

Data Protection

# Serverfree Backup

## Data Movement (Export I/O)

Several possibilities exist to shift I/O traffic away from application or database servers  
Requires the use of the SCSI Extended Copy or XCOPY protocol



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# VERITAS/HP Relationship

## ▼ Long Standing Partnership

- HP represents one of VERITAS' most important and strategic partners
- HP's Online JFS is VxFS
- HP resells VERITAS solutions

## ▼ VERITAS Support for HP Technology

- Superdome and HP-UX 11.i support
- FlashBackup and Shared Storage Option on HP-UX
- NetBackup for HP SureStore E Disk Array XP Family – Integration with SureStore E Business Copy XP

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# Summary

## ▼ SAN:

- ✓ LAN Free backup and recovery
- ✓ Cost, expertise

## ✓ NDMP:

- ✓ Fast, server to tape; limited scalability

## ✓ Frozen Image:

- ✓ Hardware or software?

## ✓ Serverfree Backup:

- ✓ Light backup footprint, no benefit to recovery

## ✓ VERITAS/HP Relationship:

- ✓ The established leaders in storage

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# Questions?



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