Enterprise Backup Solutions with OpenView Data Protector 5.1

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Solutions and Technology Conference & Expo

Objectives

- Data Backup/Recovery Trends
- What is Data Protector?
  - Features
  - Technology Overview
- Key Data Protector Technologies
  - ZDB
  - Instant Recovery
  - Snapshot Integration
  - Direct Backup (Serverless Backup)
- Data Protector as an EBS solution

Data Backup/Recovery Trends

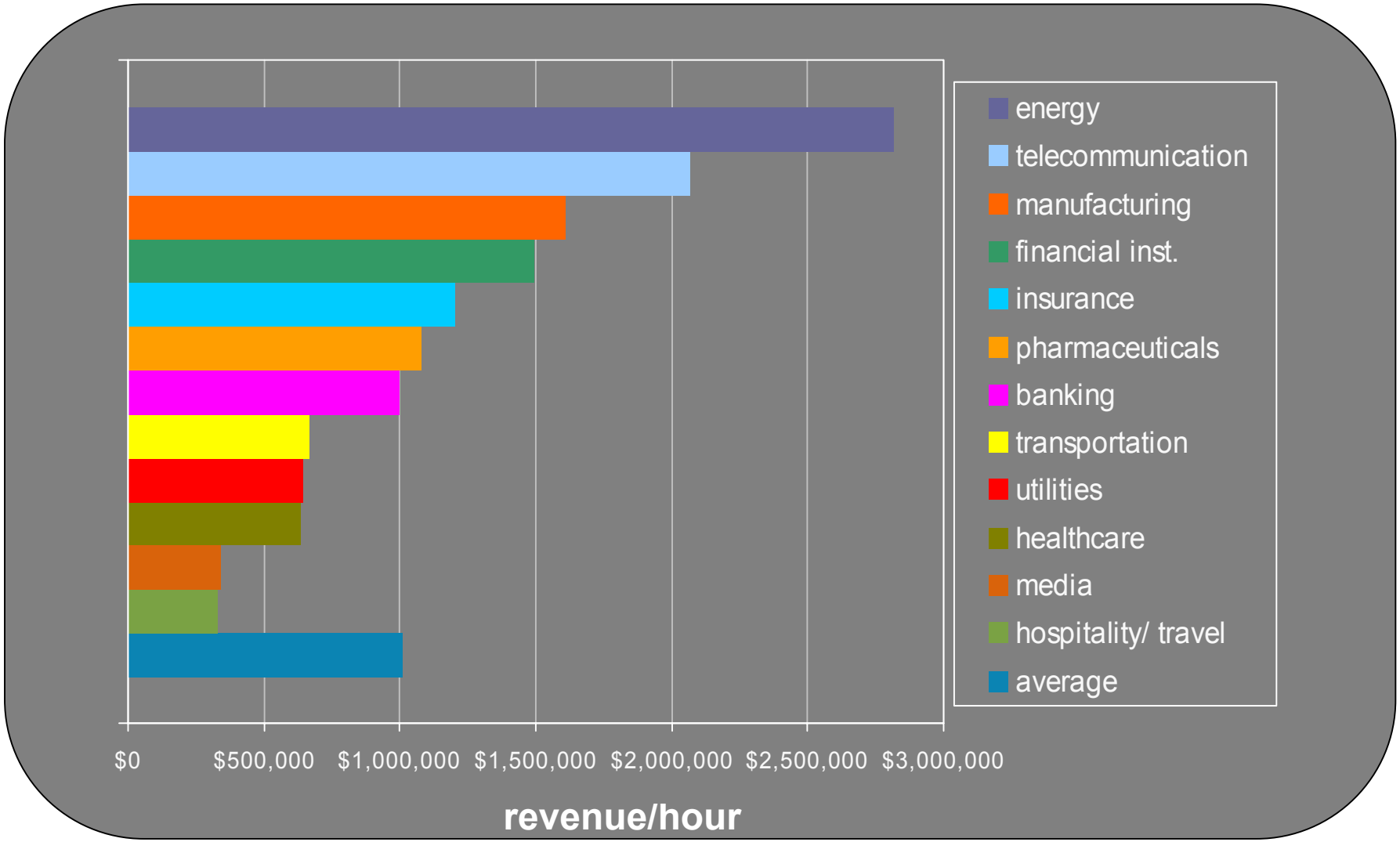
Current Backup Challenges

- Companies with a backup window greater than 5 hours:
  - Unix environment = 47.7%
  - Windows NT environment = 50.4%
- Insufficient backup window for more than 1 year = 56%
- 1st or 2nd largest storage problem today?
  - Backup window = 41.8%

ITcentrix

*** 2000 ITcentrix Study - 300 companies<1000 employees**

Downtime Costs!

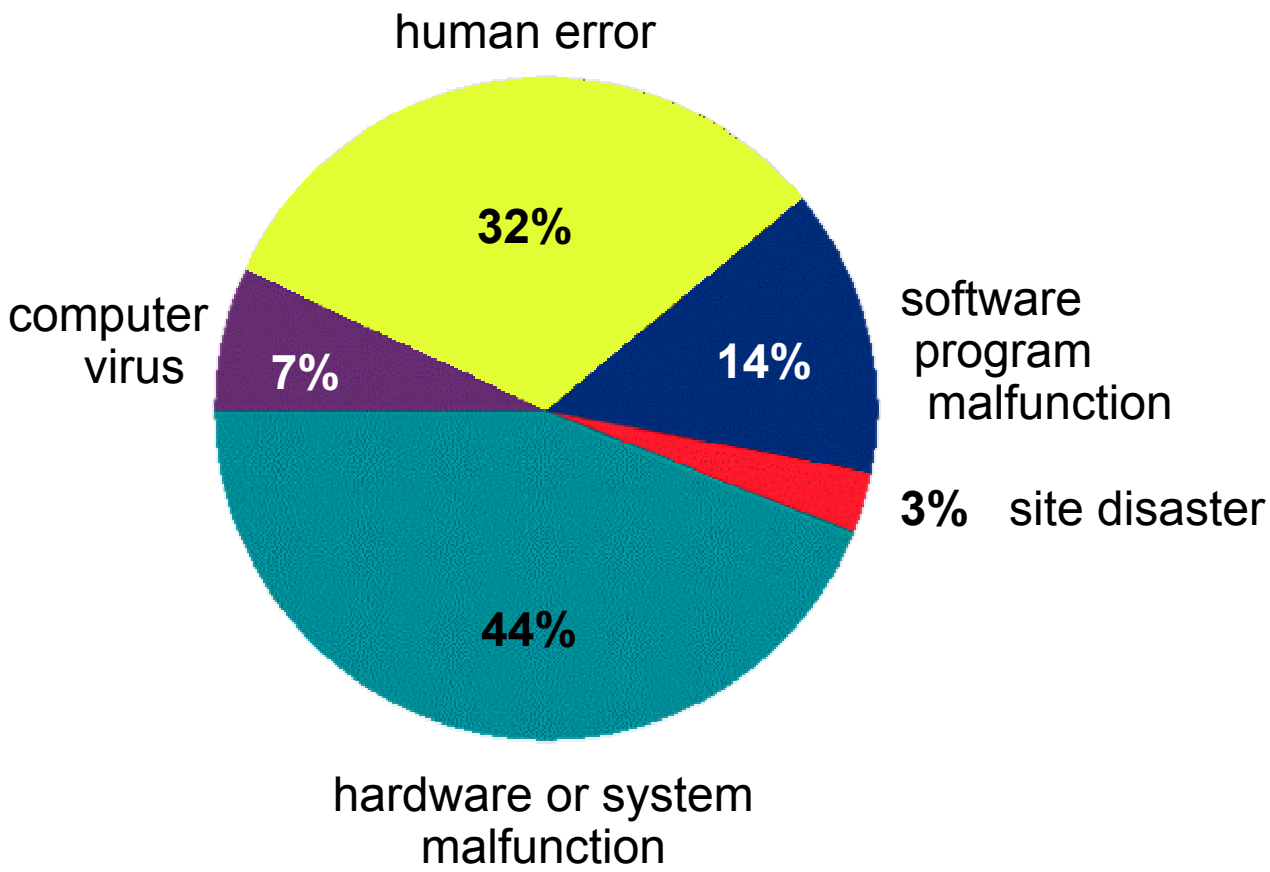


Source: Meta Group, 22 November 2000

What makes data LESS Available?

- Planned Downtime
  - System Maintenance
  - Application Maintenance
- Unplanned Downtime
  - System Failure
  - Application Failure
  - Human Error

What causes unplanned downtime?

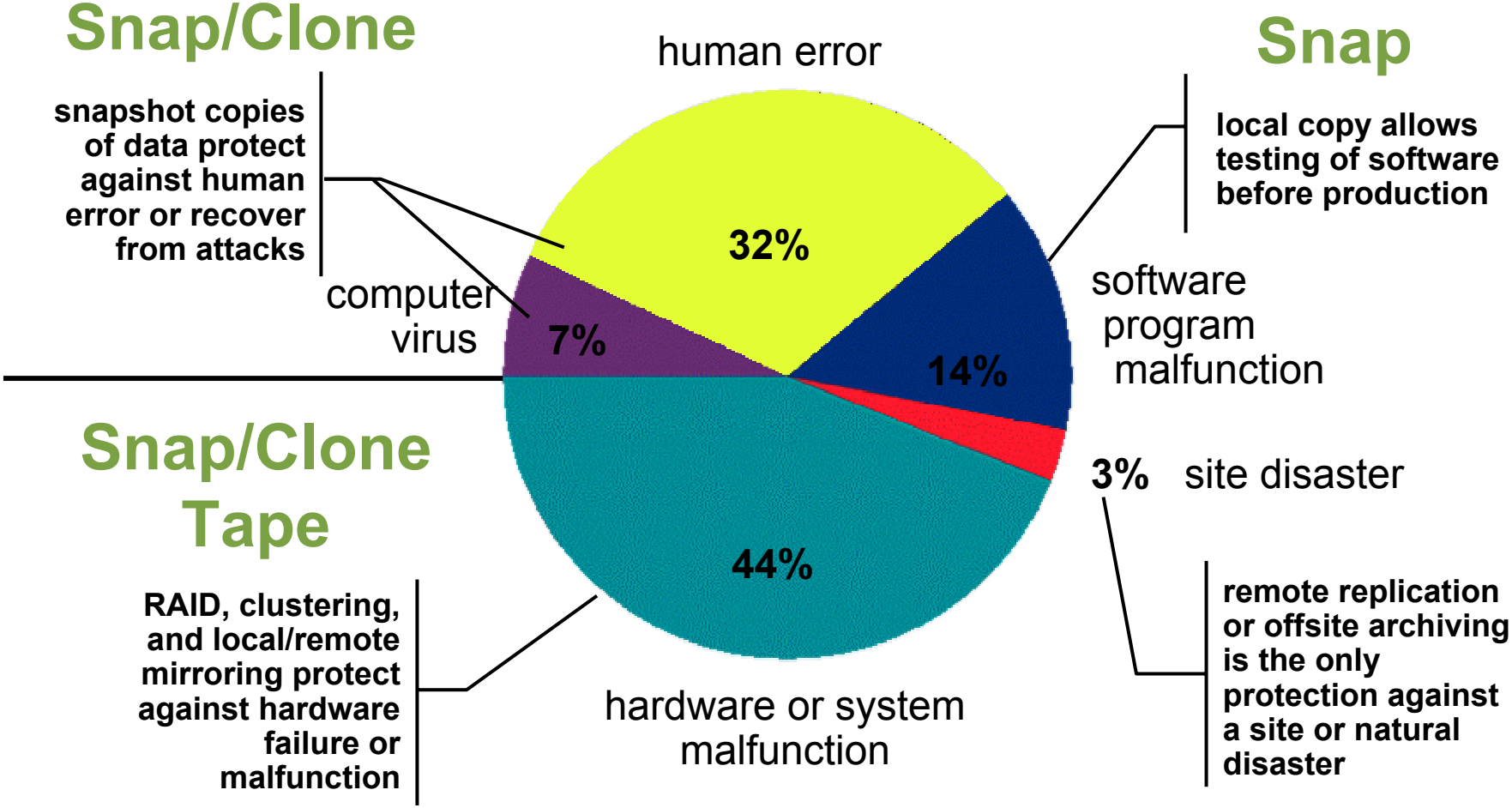


source: Ontrack, a data availability service provider

What Makes Data MORE Available?

- Infrastructure
  - Fault tolerant power
  - Datacenter UPS
- Components
  - Hardware Redundancy
  - RAID
- Replication Strategies
  - Software
  - Hardware
- **Backup Strategies**
- Service Contracts

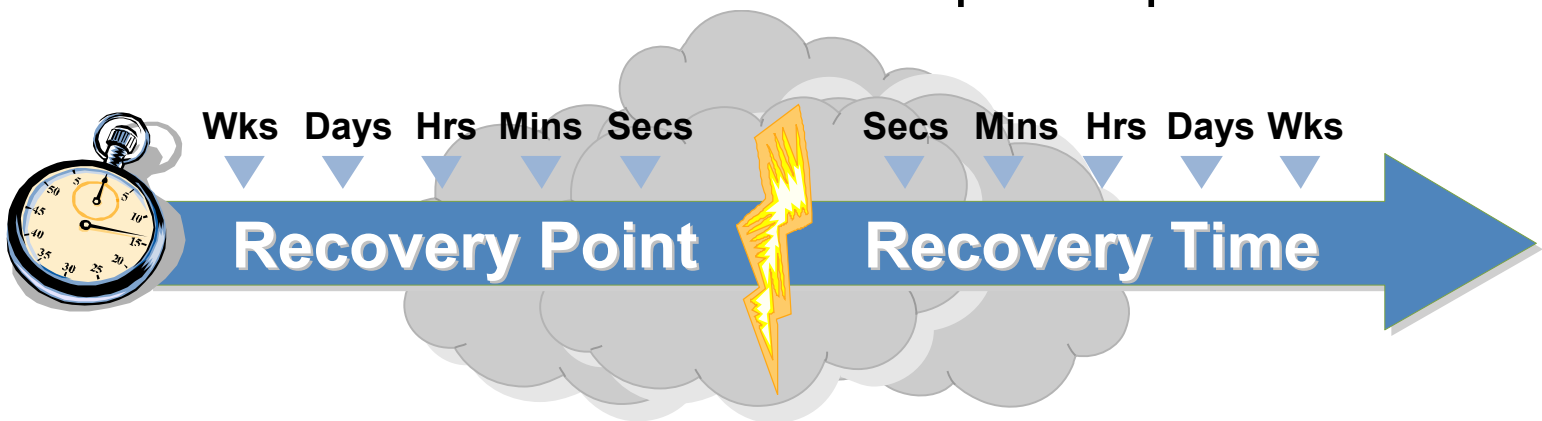
Reducing downtime



source: Ontrack, a data availability service provider

How available does the data need to be?

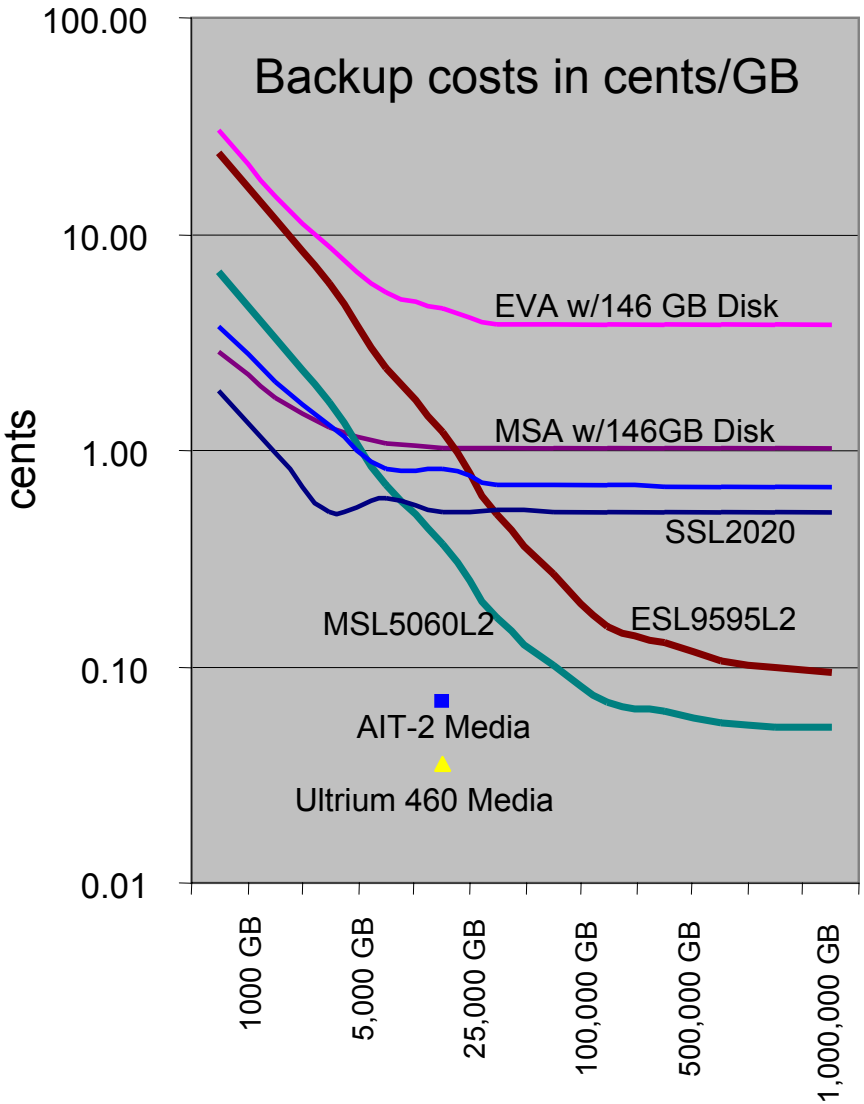
- Usually measured in terms of the maximum acceptable amount of time that the data will not be available.
  - 99% ~3.6 days Tape
  - 99.9% ~8.7 hours Tape + Snap
  - 99.99% ~52.5 minutes Snap
  - 99.999% ~5.2 minutes Snap + Replication



Snap, Clone, Snapclone?

- Snapshot
  - Point in time copy of the metadata
  - Available immediately
  - Copy out/penalty occurs after creation
- Snapclone
  - Point in time copy of the data
  - Available immediately
  - Copy of data/penalty occurs after creation
- Clone
  - Point in time copy of the data
  - Available once cloning is finished
  - Copy of data/penalty occurs before creation

Why Tape?



- Tape and optical products are the only products designed for long term storage
- Tape remains the most cost effective solution because of low cost per MB
- Tape and optical best suited to meet new government regulations

What is Data Protector?

hp OpenView Storage Data Protector 5.1

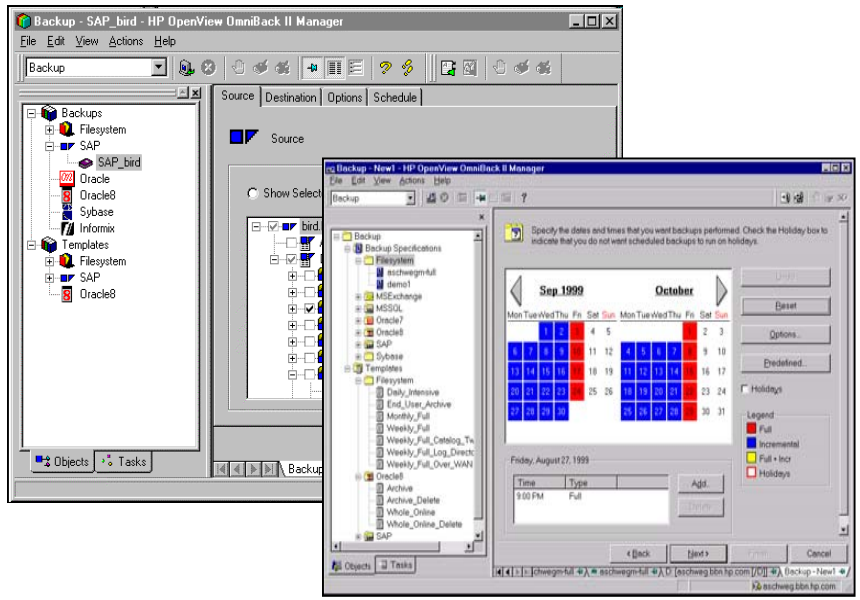
- enterprise data protection that automates routine tasks and ensures recovery from any potential disruption
- distributed architecture with centralized control
- integrated disk and tape recovery in a single product

for maximum protection at the lowest cost

Features

Control:

- Single GUI environment for all backup/restore operations
- Integration agents for Exchange, Oracle, etc.
- SAN Auto-configuration Wizard
- Integration with OpenView apps



Resilience:

- Zero Downtime backup
- Instant Recovery
- Online backup
- Microsoft VSS integration
- Disk Delivery

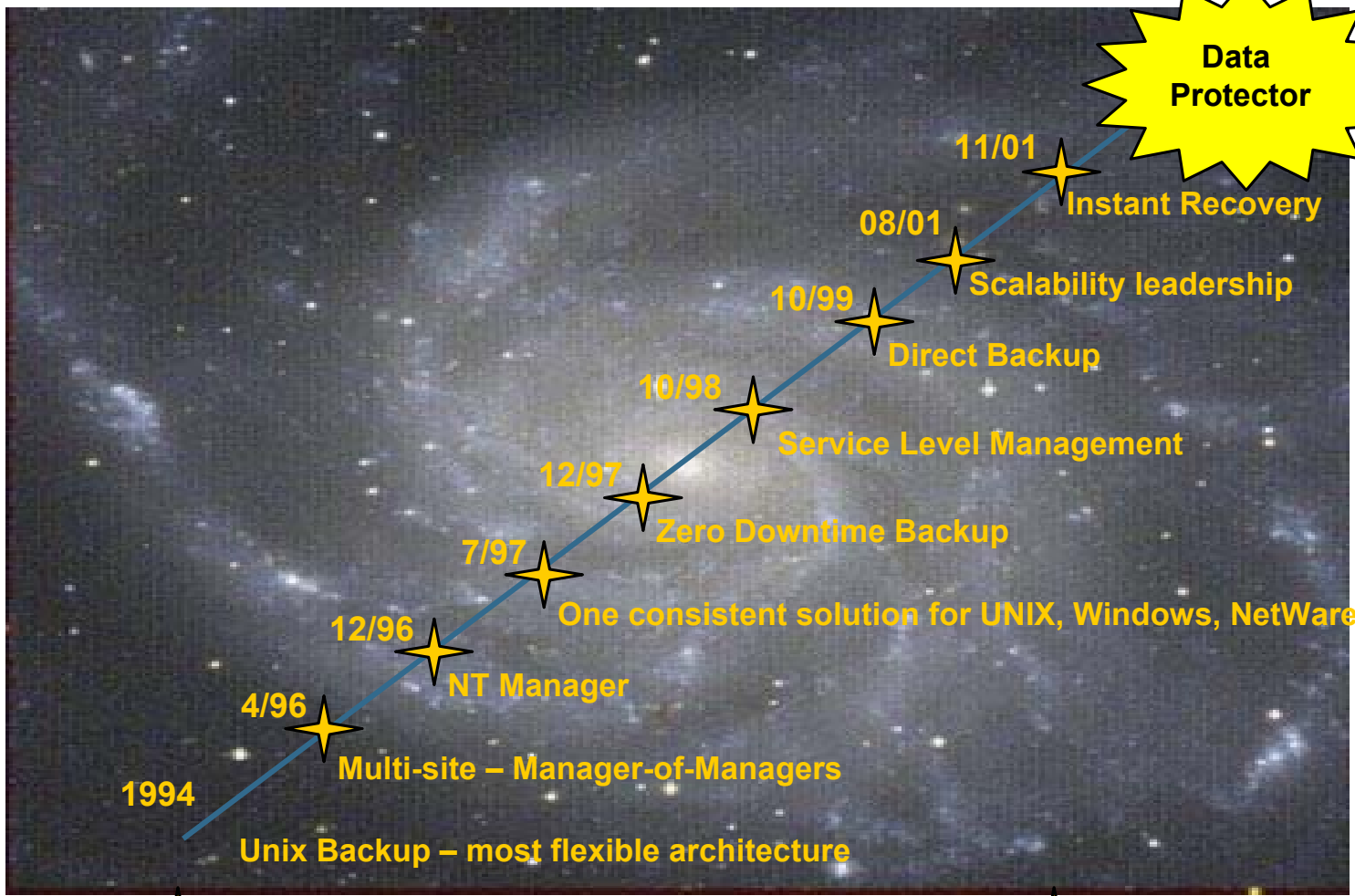
Extensibility:

- Supports Windows, Solaris, Tru64, OpenVMS, HP-UX, Linux and more
- Integrates with snap/clone solutions on XP/EVA/VA, Hitachi and EMC
- Support StorageWorks Tape libraries, StorageTek, ADIC, IBM etc.

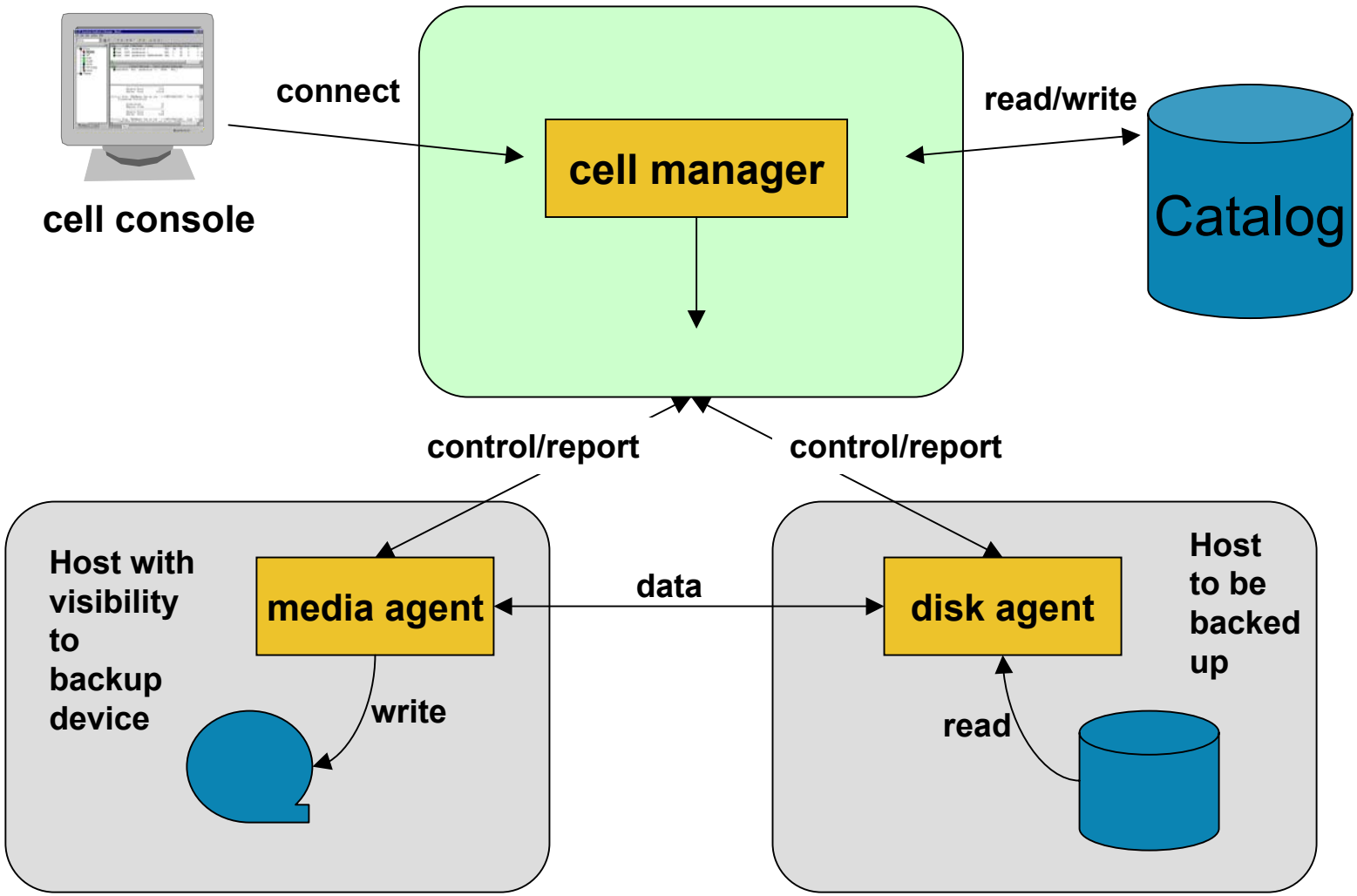
data protector history

- Data Protector builds upon hp OpenView Omniback II, and is fully compatible with existing Omniback tapes, scripts, procedures
- existing Omniback II customers with support contracts can upgrade to the new product at no charge

Evolution

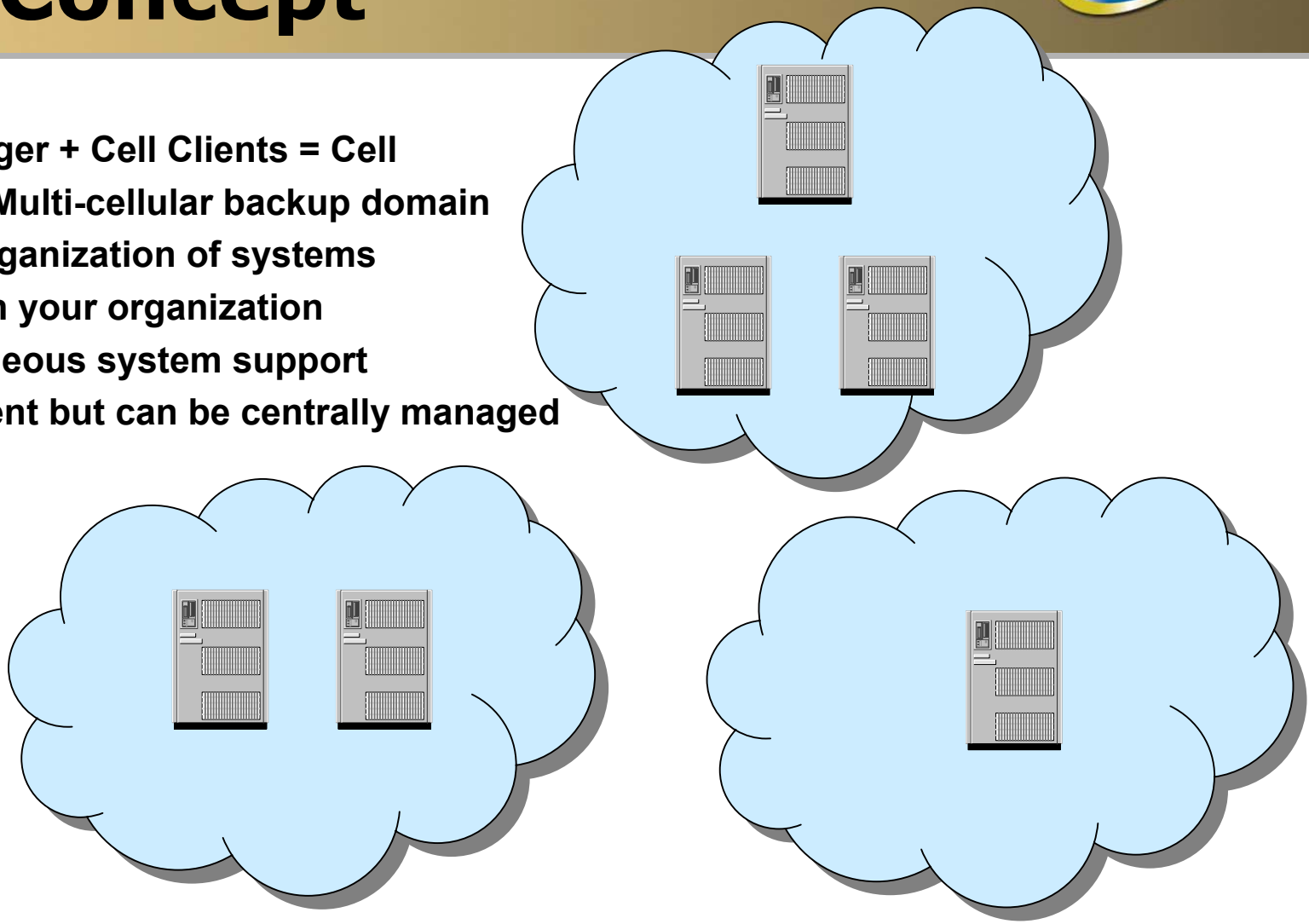

Data Protector
11/01
Instant Recovery
08/01
Scalability leadership
10/99
Direct Backup
10/98
Service Level Management
12/97
Zero Downtime Backup
7/97
One consistent solution for UNIX, Windows, NetWare
12/96
NT Manager
4/96
Multi-site – Manager-of-Managers
1994
Unix Backup – most flexible architecture
1989
OmniBack
OmniBack II
Data Protector

Typical Backup Session



Cell Concept

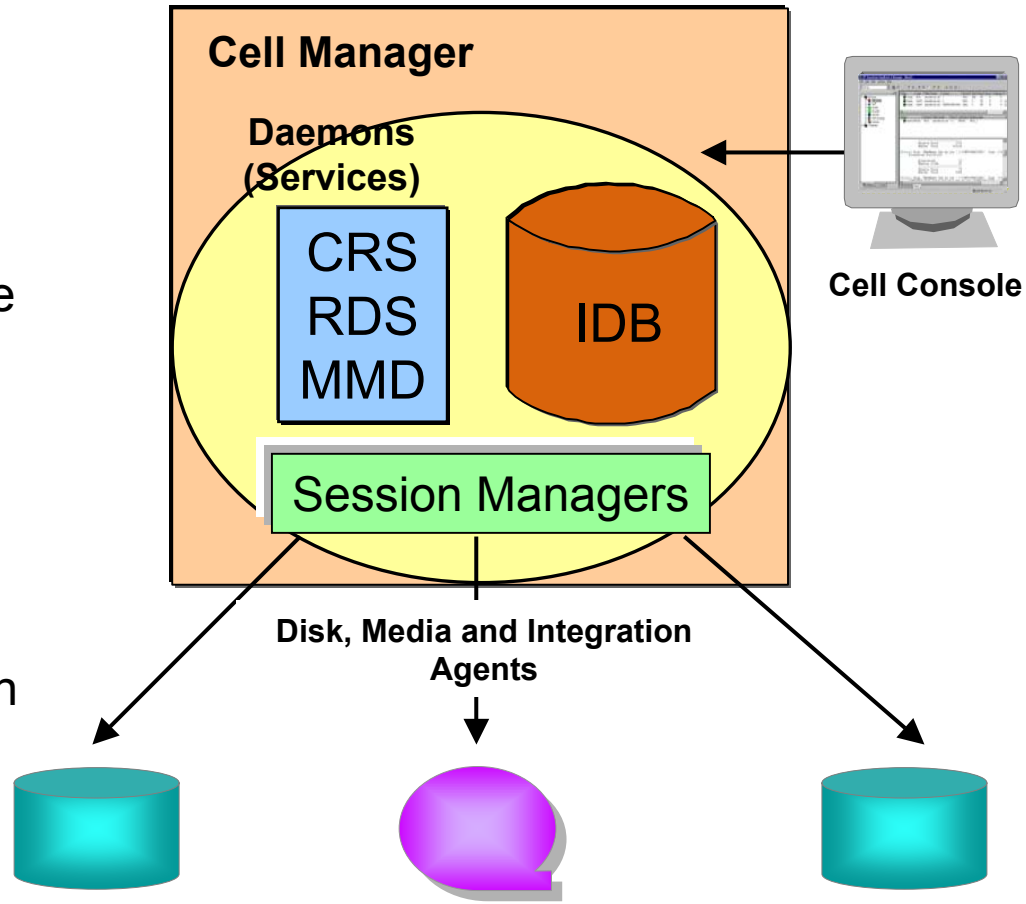
- Cell Manager + Cell Clients = Cell
- Single or Multi-cellular backup domain
- Logical organization of systems
- Can match your organization
- Heterogeneous system support
- Independent but can be centrally managed



- System can only belong to ONE cell

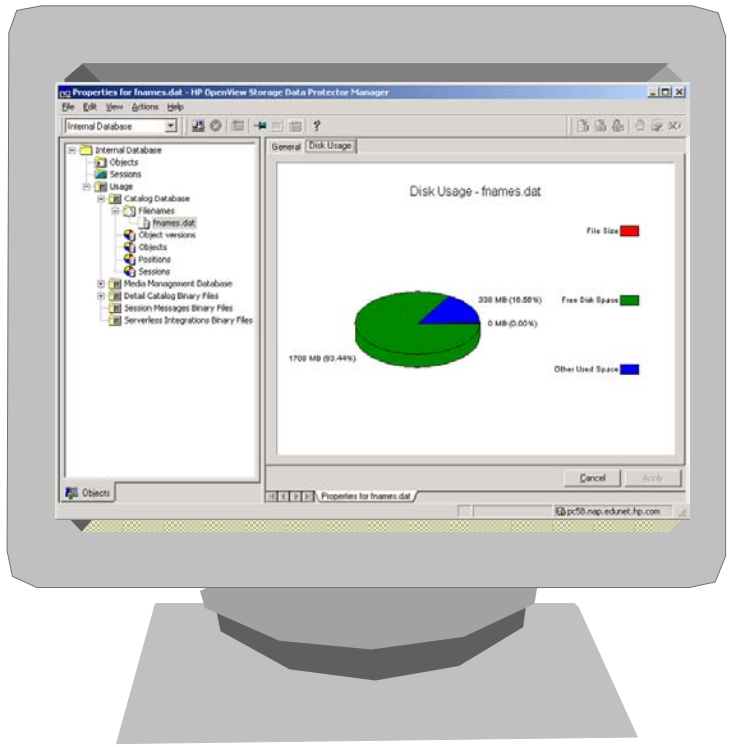
Cell Manager

- HP-UX, Windows, Solaris
- Background daemons
  - **crs** – cell request server
  - **mmd** – media manager
  - **rds** – Raima db server
  - **omnisrv** – controls above daemons
- Internal database
- Session managers
  - **bsm** – backup session
  - **rsm** – restore session
  - **dbsm** – database session
  - **msm**- media session
- Scheduler
- Cell console and agents
- Installation server



Cell Console

- HP-UX, Windows, Solaris GUI
- Used to access Cell Manager
- Local console present on all cell managers
- Downloadable console available from Cell Manager or CD
  - Requires authorization
  - Any OS console can be used to access any OS manager
- Provides:
  - Graphical user interface
  - Command-line interface
  - Web reporting java interface
- No additional license required



Disk Agent

- Required on every cell that will be backed up
- Controls disk access from DP
- May be installed from:
  - Cell manager
  - Media
- Activated by session manager
- Agents:
  - **vbda/vrda** – volume backup/restore
  - **rbda/rrda** – raw backup/restore
  - **fsbrda** – file system browser
  - **dbbda** – database backup

HP- UX
Tru64
NT/2000/XP
Novell
Sun Solaris
Sun SunOS
IBM AIX
Linux
Sequent DYNIX
Digital UNIX
SCO Openserver
Silicon Graphics
NCR
others…

*128 MB recommended

Media Agent

- Required on every cell that has tape resources
- Controls tape access from DP
- May be installed from:
  - Cell manager
  - Media
- Activated by session manager
- Agents:
  - **bma** – backup media agent
  - **rma** – restore media agent
  - **mma** – media management
  - **cma** – copy media agent
  - **uma** – utility media agent

HP- UX
NT/2000/XP
Novell
Linux
Sun Solaris
IBM AIX
Siemens SINIX

*128 MB recommended

Key Data Protector Technologies

Data Protector Technologies

- Zero-Downtime Backup
- Instant Recovery
- Direct Backup (Serverless Backup)
- Disk Delivery

Zero-Downtime Backup

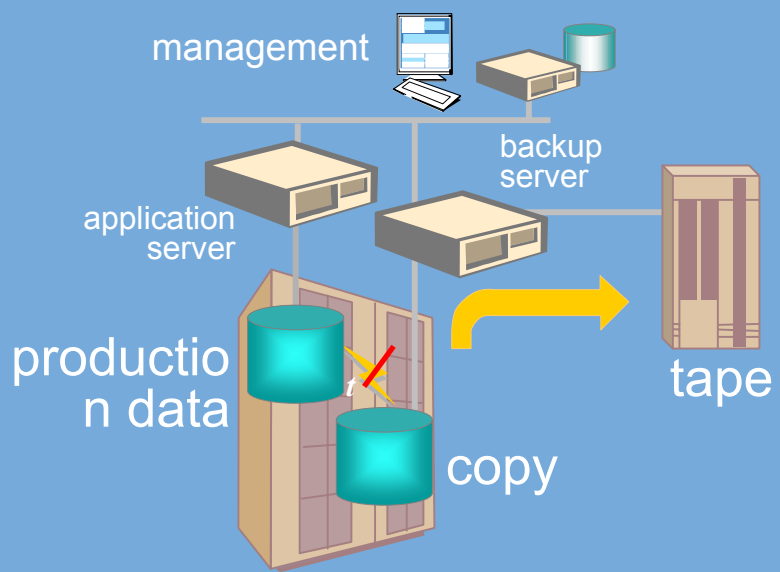
- Utilizes disk array technologies to create temporary copy of data (snapshots or clones)
- Supported disk arrays:
  - hp StorageWorks Virtual Array
  - hp StorageWorks Enterprise Virtual Array
  - hp StorageWorks XP
  - EMC Symmetrix
  - hp StorageWorks Modular SAN Array 1000 (pending hardware snapshot release)

- ZDB options
  - Backup to tape
  - Backup to disk
  - Combination disk and tape
- Copy is deleted after backup, or can be retained for Instant Recovery

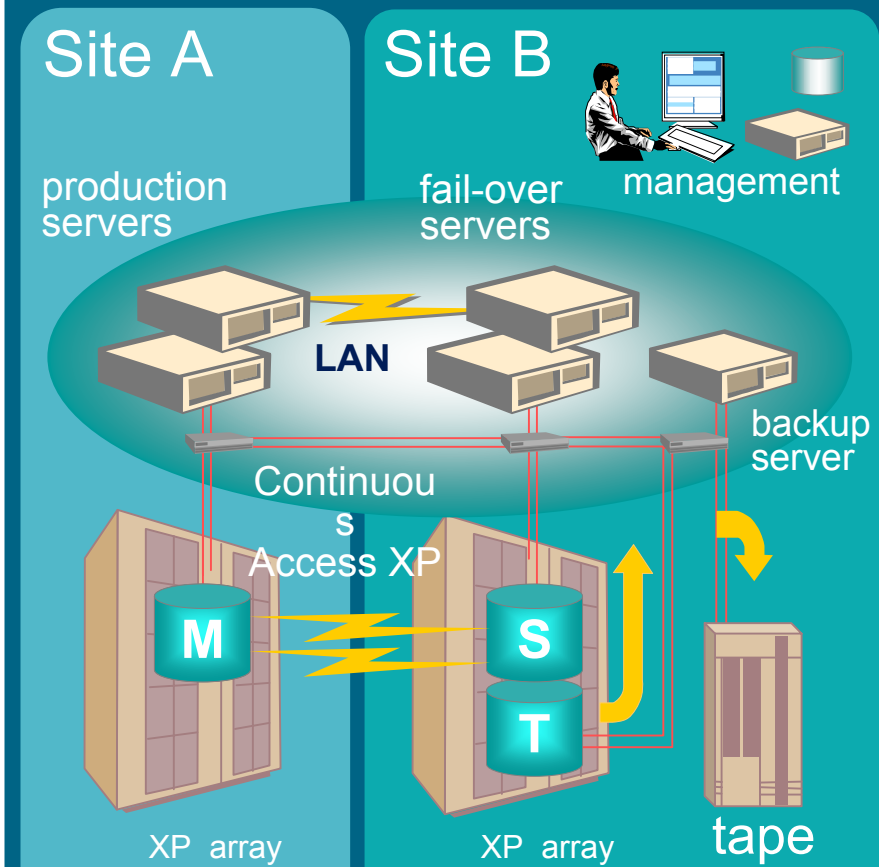
ZDB Configurations

zdb - single site

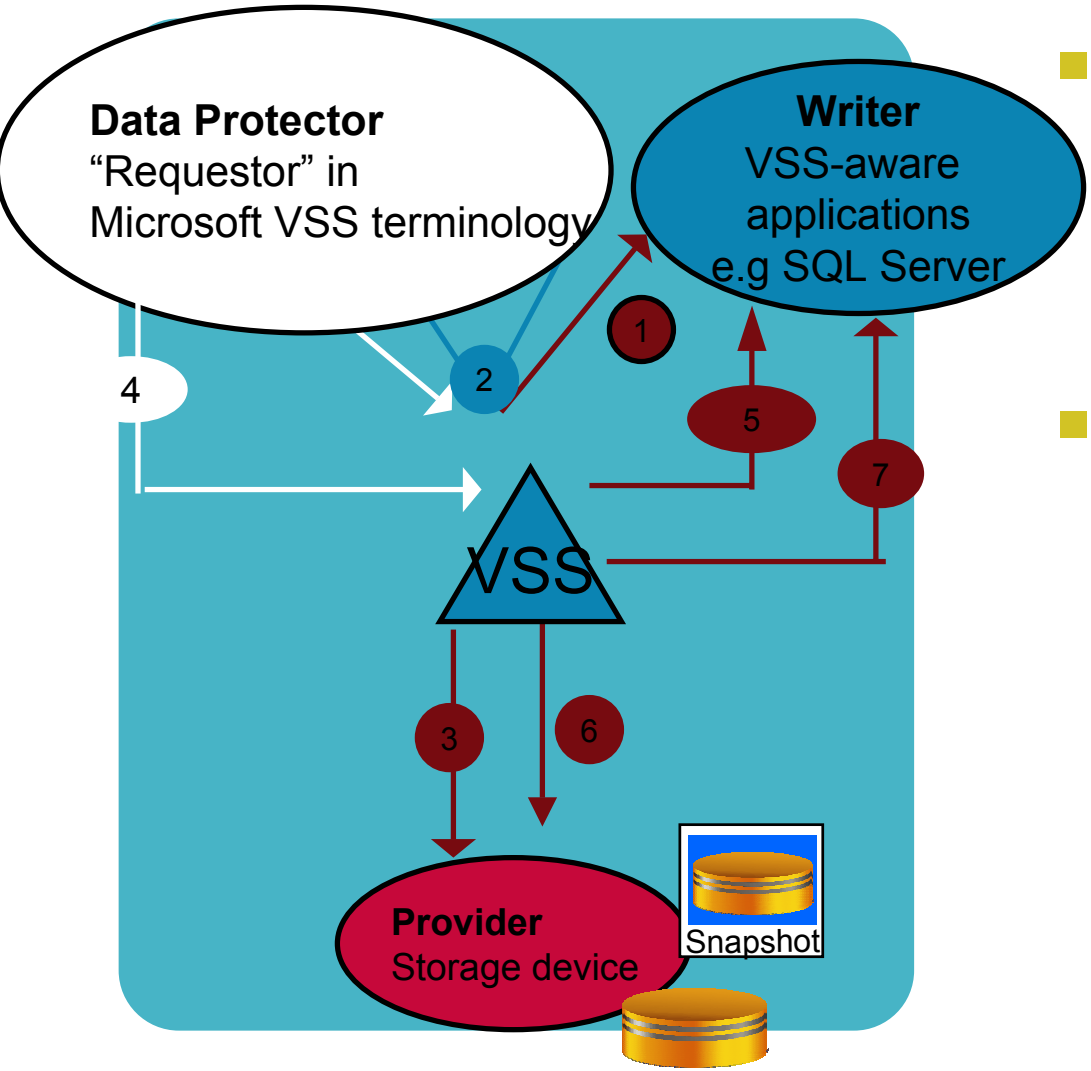
application server-less backup utilizing storage replication and backup processor to isolate application server from backup process.



zdb – disaster tolerant config



Microsoft's Volume Shadow Copy Service:



- VSS allows
  - to create shadow copy backups of volumes
  - coordination of providers, writers and requestors
- Data Protector fully integrated with VSS (support only for Windows 2003) - providing: new
  - backup of open files, databases & applications
  - consistency and integrity of backed up volumes

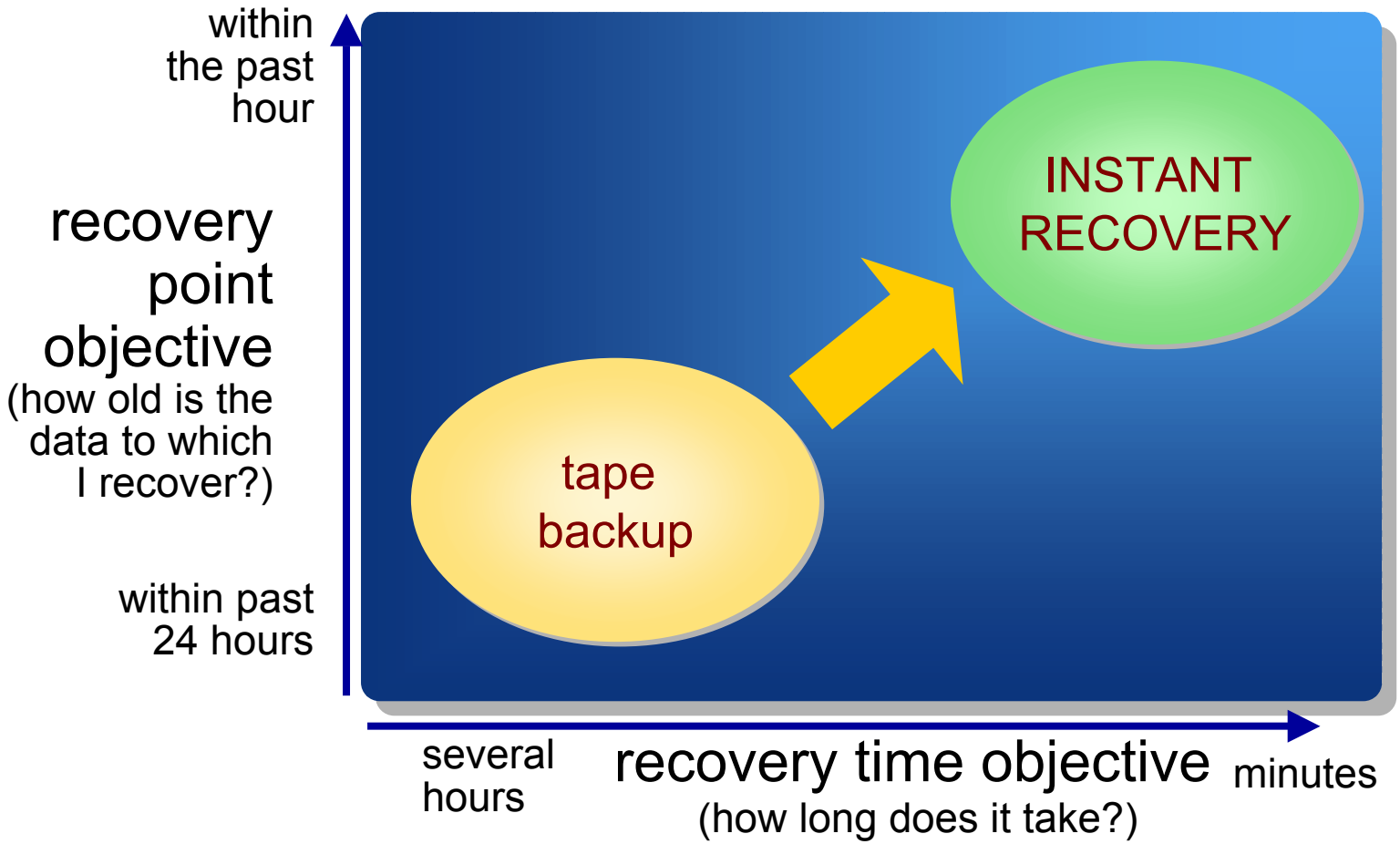
ZDB vs. VSS

new with 5.1

	ZDB	VSS
what it is	array-based data mirroring	host-based data mirroring
disc storage requirements	VA, XP, EVA, EMC Symmetrix, HDS	any disc
OS requirements	HP-UX, Windows 2003, Windows NT, SUN Solaris	Windows 2003 only
software requirements	Business Copy Software	VSS (included in Windows 2003)
applications supported	Oracle, Exchange, SQL, SAP	any VSS compliant application
snapshot mgmt	can manage up to 3 snapshots automatically	any storage supported under VSS (having a VSS snapshot provider)
backup mgmt	backup to tape via a seperate server (application-free backup)	backup to tape can impact performance of application
recovery mgmt	recovery from tape or disc (Instant Recovery)	recovery from tape

Instant Recovery

hp is shifting focus from backup to recovery



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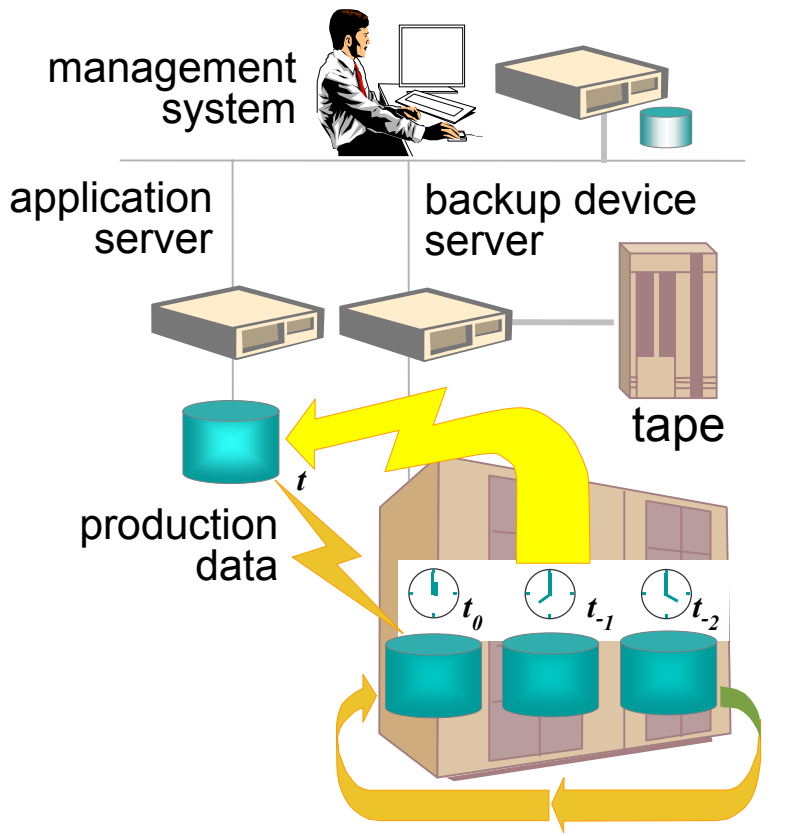
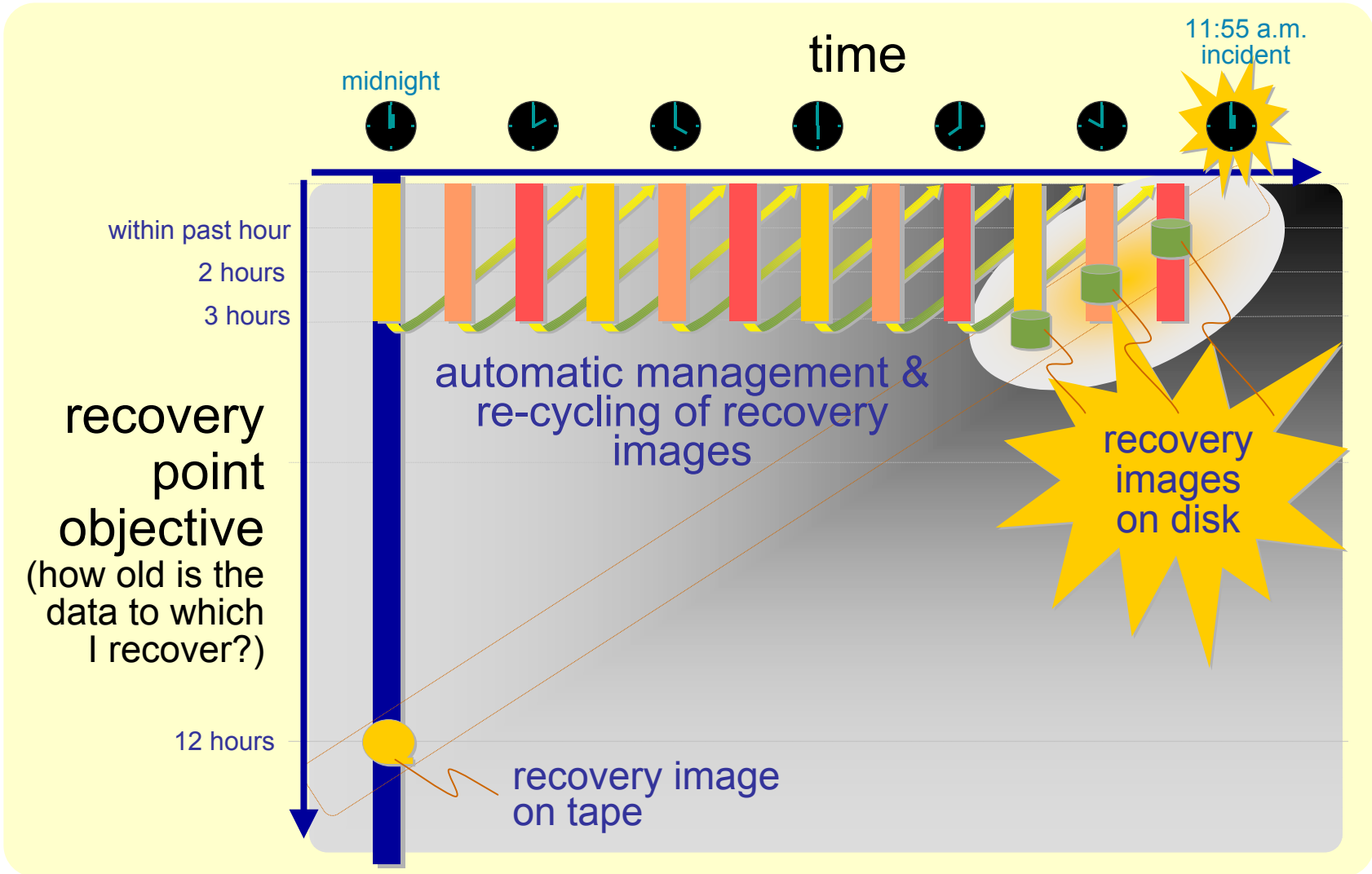
IR Configuration

- Utilizes combination of disk and tape images to speed recovery
- Supports:
  - disk-only protection
  - tape-only protection
  - scheduled combinations
- Process is fully automated including rotation of disk images
- Recovery image selectable from the GUI



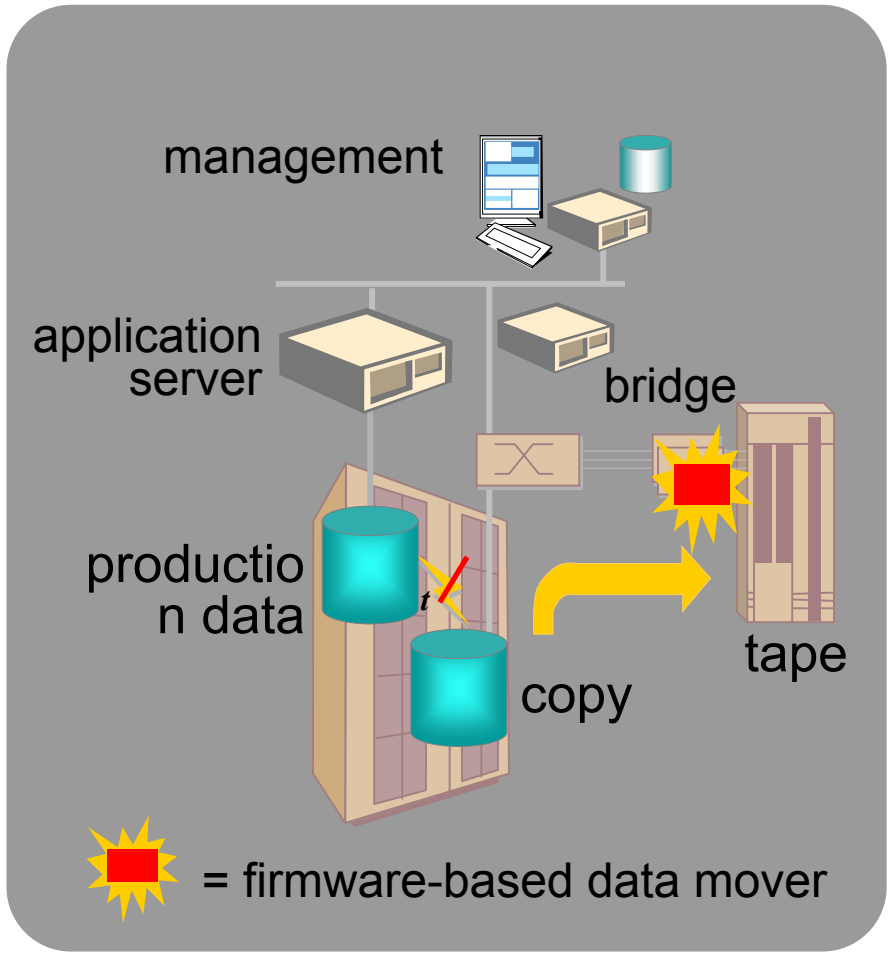
point-in-time copies
(split mirrors or snapshots)

Recovery Image Rotation

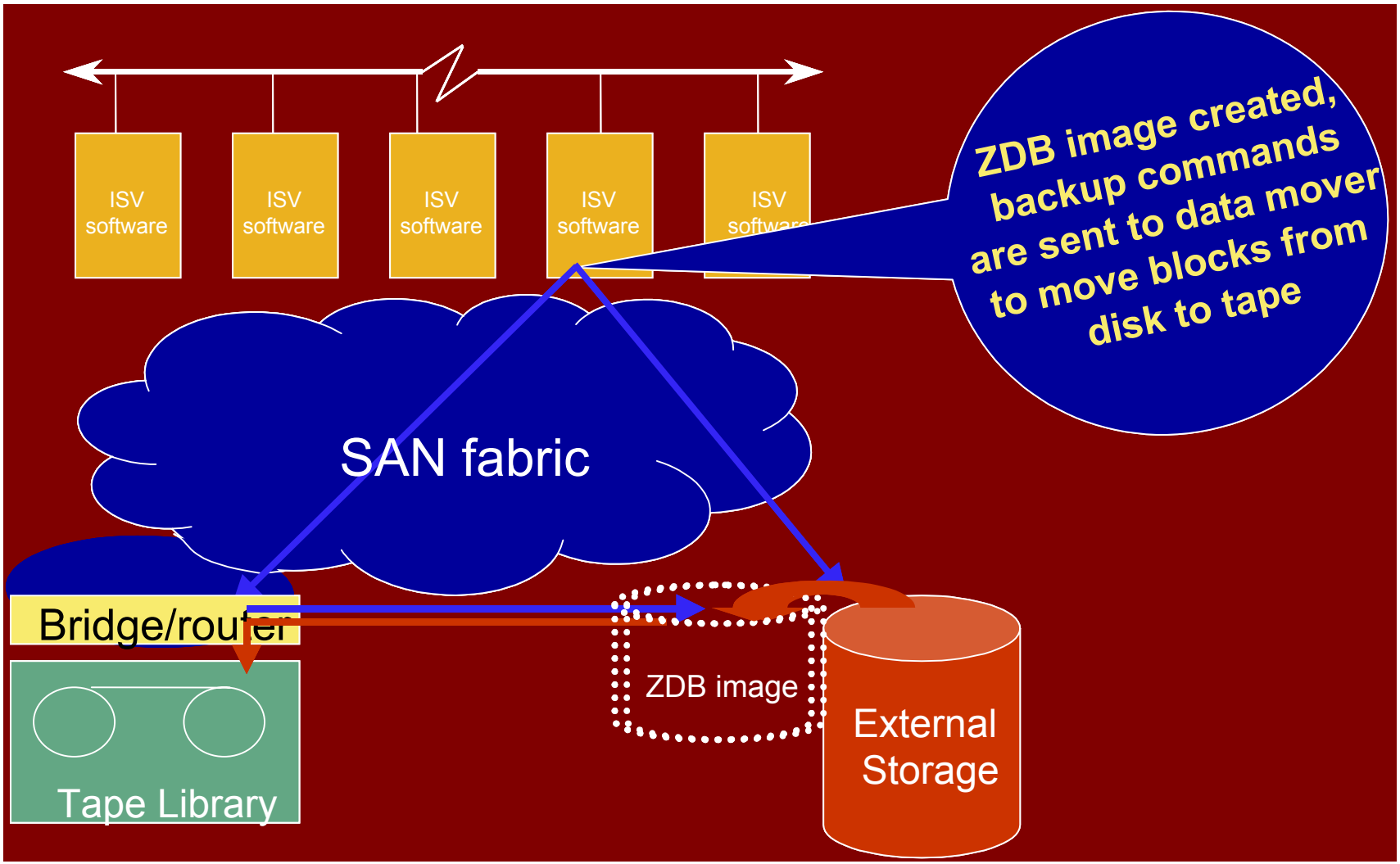


Direct backup

- utilizes SAN data movement for infrastructure efficiency
- true server-less backup utilizing SCSI xCopy standard data movers
- direct disk to tape via SAN
- provides high performance and eliminates server I/O path in moving recovery images to tape
- leverages tape library embedded data mover and/or external bridges



How Direct Backup Works



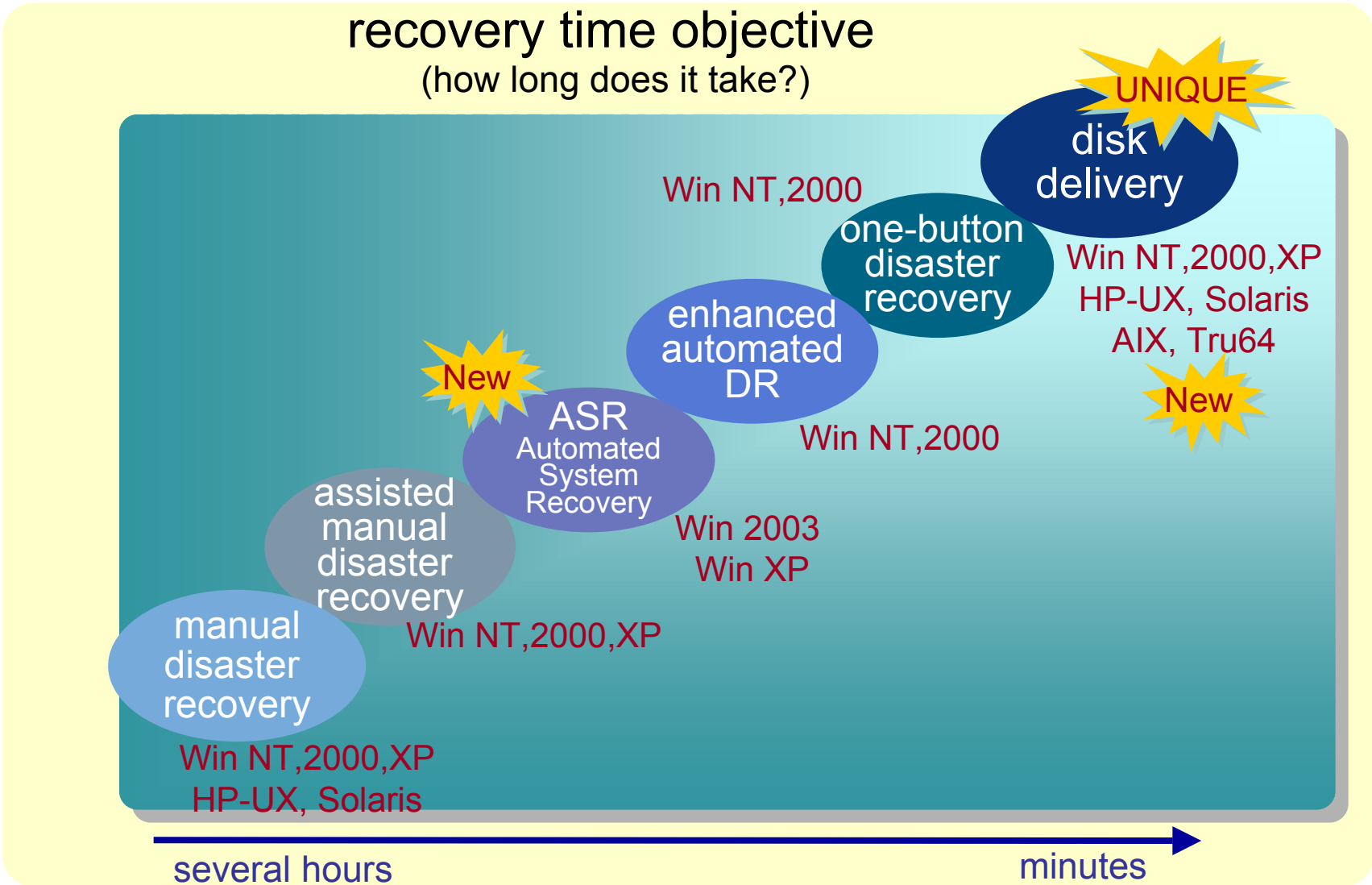
Benefits of Direct Backup

- Frees CPU cycles within server
- Server consolidation
- Increased backup performance
  - Up to 50% increase in performance using server-free backup
- Dedicated Backup Server no longer needed
- Memory usage reduced on Backup Server
- Reduced processor workload
  - Up to 85% reduced server CPU utilization on the backup server

Supported Configurations

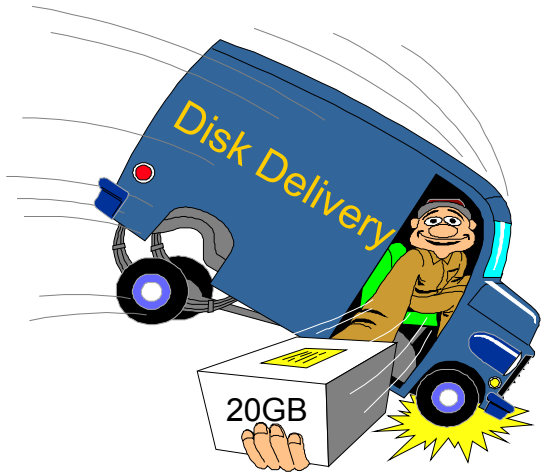
- **software-based data movement**
  - proven solutions
  - rich support matrix
  - supported in both SAN and locally-attached tape environments
  - configuration supports both backup and recovery
  - configurations categorized by host OS, application, storage replication architecture (only three dimensions)
- **xCopy firmware-based data movement**
  - SAN-only solution
  - solutions today require separate backup server to be configured for recovery
  - support is complicated (at least five dimensions to test/support)

disaster recovery options



Disk delivery

- **Fastest method of recovery**
- **Bypasses initial installation steps normally needed for recovery**
  - No need for recovery diskettes
  - No need to install OS from CD
  - No need to install DP agents
- **Two delivery methods**
  - Auxiliary disk method
    - Failed client booted from Auxiliary disk
    - Replacement disk partitioned and formatted
    - DP GUI used to restore to replacement disk
  - Hosting system method
    - Replacement disk attached to another DP client
    - Replacement disk partitioned and formatted
    - DP GUI used to restore replacement disk
    - Replacement disk installed in failed client



Pros and cons of protection technologies

- Zero-Downtime Backup
  + no impact on application performance
  - requires specific arrays and software
- Instant Recovery
  + recovery of TBs in minutes
  - requires Zero-Downtime Backup as a basis
- VSS
  + simple mirroring on any disc
  - supported on Windows 2003 only
- Direct backup
  + no impact on application performance
  - complex to configure and support
  - requires server for recovery

ZDB & IR Solutions

	hp XP *Integrated* Zero Downtime Instant Recovery*	hp EVA *Integrated* Zero Downtime Instant Recovery*	hp VA *Integrated* Zero Downtime Instant Recovery	EMC Symmetrix *Integrated* Zero Downtime
Win 2000	Single-site (b.c.) Multi-Site (c.a.) Exchange 2000 MS SQL 2000 Oracle SAP File System /Raw	Single-site (Bus.Copy) Exchange 2000 MS SQL 2000 File System /Raw NEW	Single-site (Bus.Copy) Exchange 2000 MS SQL 2000 Oracle SAP File System /Raw	
Win 2003 (32-bit) NEW	Single-site (b.c.) Multi-site (c.a.) MS SQL Oracle SAP File System NEW	Single-site * (Bus.Copy) MS SQL 2000 File System /Raw	Single-site * (Bus.Copy) MS SQL 2000 Oracle SAP File System /Raw	
Win NT	Single-site (b.c.) Multi-site (c.a.) Exchange File System			Single-site (TimeFinder) Multi-site (SRDF) File System /Raw
HP-UX 11.0 11.11	Single-site (b.c.) Multi-site (c.a.) Oracle/OPS/RAC SAP File System /Raw	Single-site (Bus.Copy) Oracle/OPS/RAC SAP File System /Raw NEW	Single-site (Bus.Copy) Oracle/OPS/RAC SAP File System /Raw	Single-site (TimeFinder) Multi-site (SRDF) Oracle SAP File System /Raw
Solaris 7,8	Single-site (b.c.) Multi-site (c.a.) Oracle SAP File System /Raw	Single-site (b.c. Oracle SAP File System /Raw NEW		

NOTES:

* Instant Recovery on XP not supported with Continuous Access

* Based on DP 5.1, following features are available after DP 5.1 release:

- Instant Recovery on EVA
- Windows 2003 32- bit support for EVA, VA

NEW

– HP SecurePath, HP AutoPath and EMC PowerPath supported

Data Protector as part of an EBS Solution

Software Components

- **Starter Pack**
  - Contains media and documentation
  - LTU for one cell manager
- **Drive and Library Extensions**
  - One drive included with starter pack
  - Every additional tape drive requires LTU
  - Extended library LTU required for libraries with more than 60 slots
- **Online Backup and Recovery Extensions**
  - Online backup requires LTU
  - Windows Open File backup requires LTU
- **Disk-based Protection**
  - ZDB requires LTU
  - Instant Recovery requires LTU
  - Direct Backup (Serverless Backup) requires LTU

Migrating to Data Protector 5.1

no migration of licenses required:

- all Omniback 3.x, 4.x and Data Protector 5.0 licenses stay valid for Data Protector 5.1
- existing Omniback 4.x and Data Protector 5.0 environments can be extended by ordering the Data Protector 5.1license-to-use products

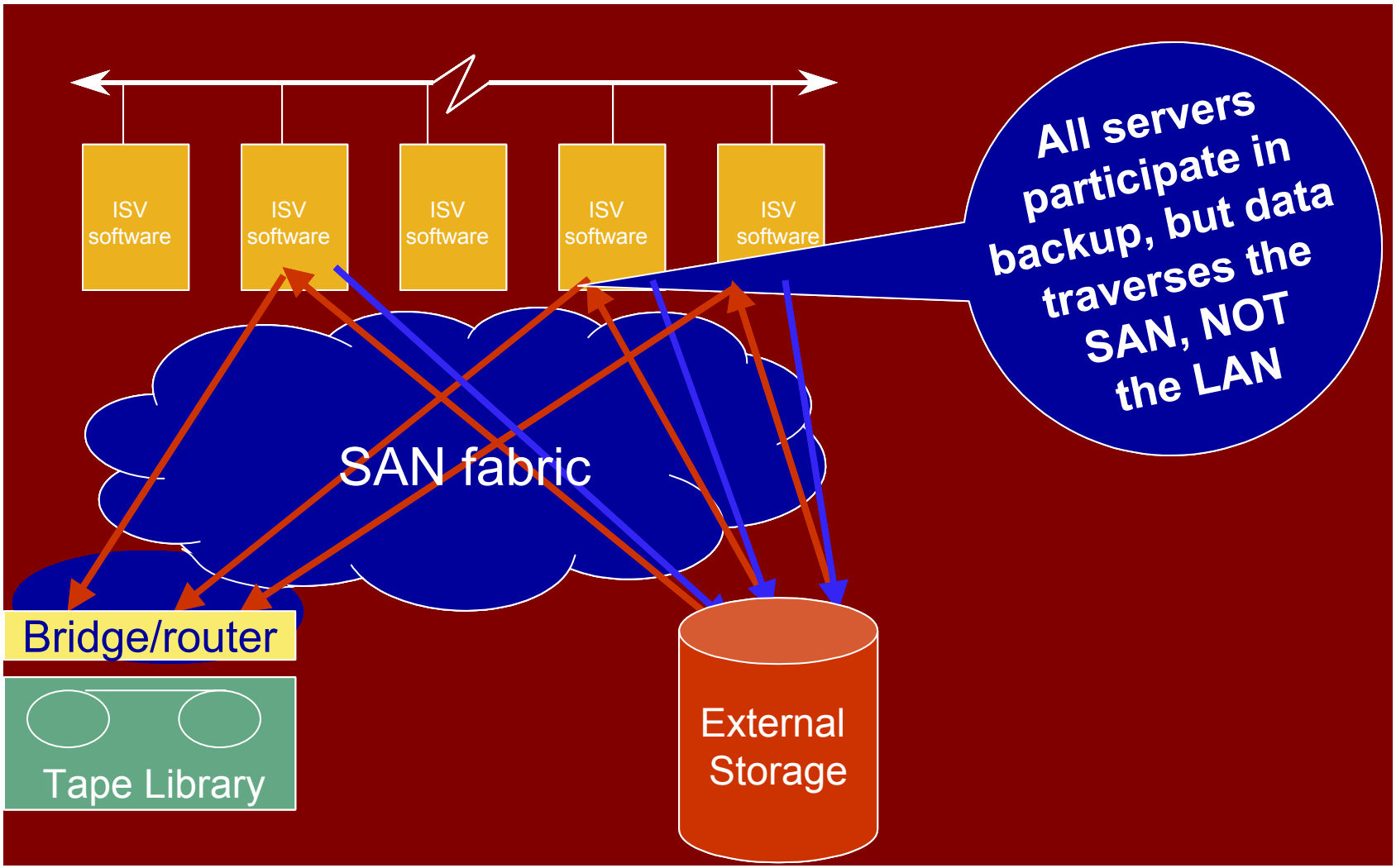
technical migration is supported from:

- Omniback 3.5, 4.x
- Data Protector 5.0

Hardware Components

- SAN fabric
- Tape Library
- Embedded or external data mover
- Supported disk array

EBS Solution Overview

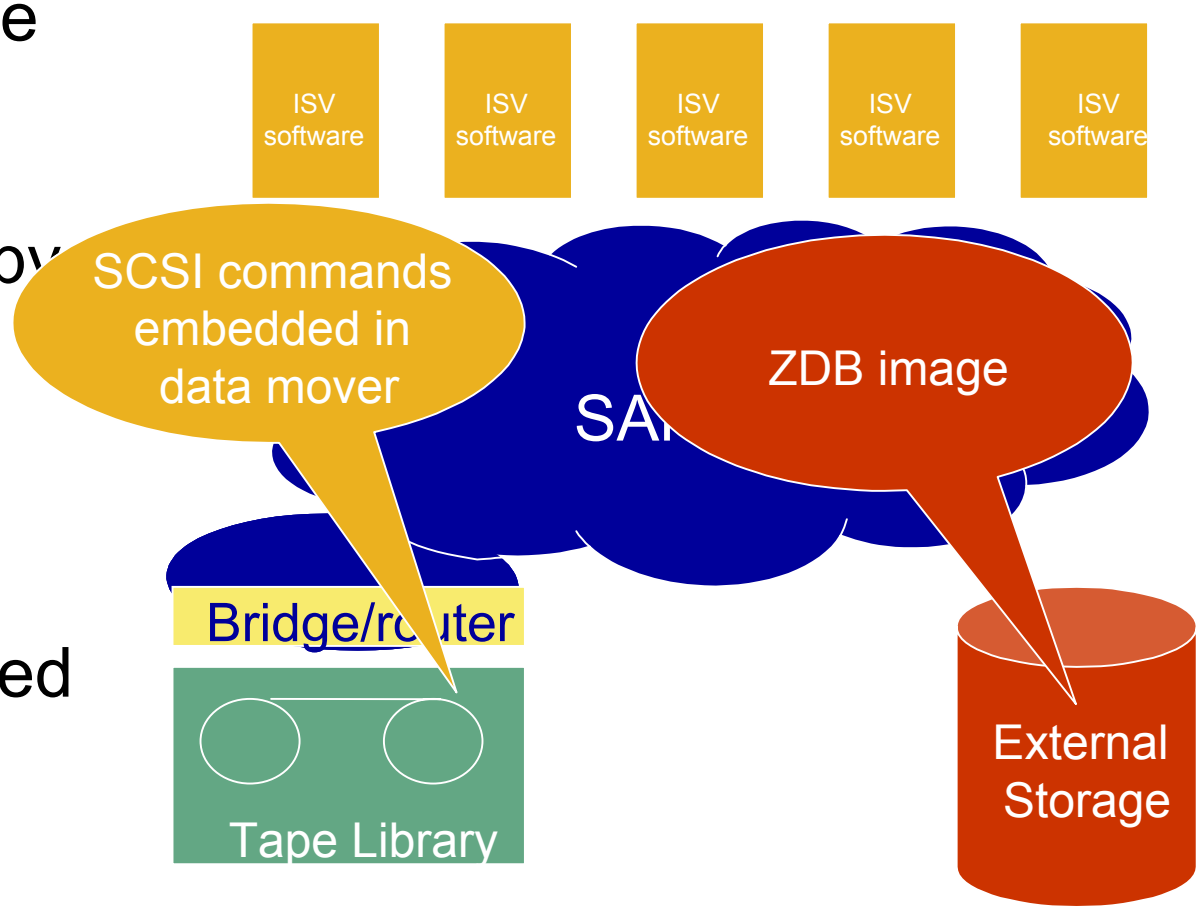


EBS benefits

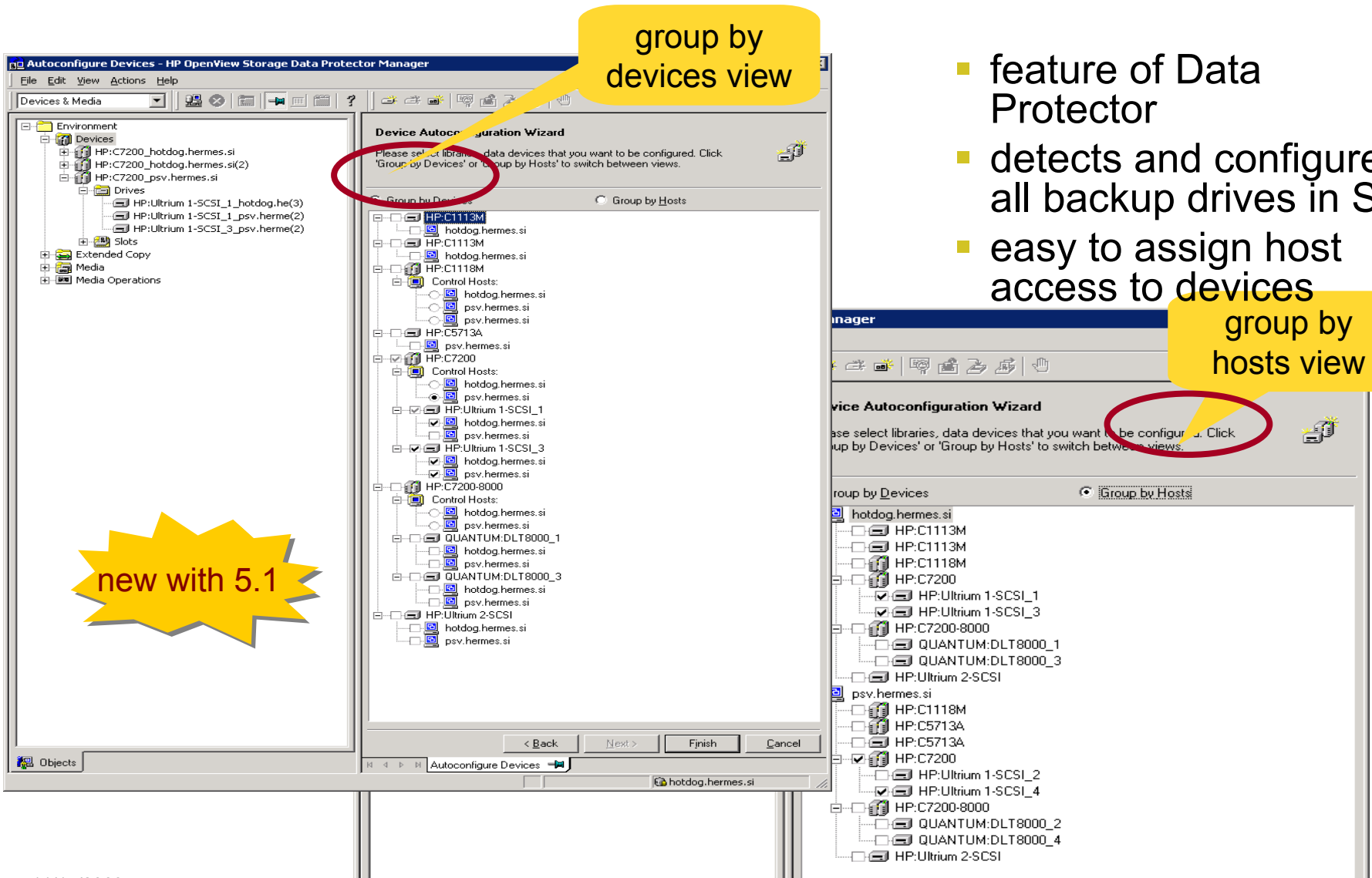
- No LAN congestion (data traverses the SAN)
  - Network performance not impacted
  - Potential to reduce backup window
  - LAN used for administrative communication during backup
- Takes advantage of the SAN foundation
  - High speed (Fibre-channel vs. Ethernet)
  - Easily scalable
  - Centralized management
- Like each server has its own direct backup device

EBS with Direct Backup

- Server intelligence offloaded to data mover
- Device issues copy commands to external storage
- Supported with Data Protector
- Requires supported disk array



SAN auto-configuration



- feature of Data Protector
- detects and configures all backup drives in SAN
- easy to assign host access to devices

For more information

- for more Data Protector information please see:

http://www.hp.com/go/dataprotector

  - product information
  - support matrices
  - Data Protector manuals
  - evaluation software
  - (60-day trial)

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