

Strategies for a State of the Art SAP Virtualized Storage Infrastructure

*Formerly Optimizing SAP Information Lifecycle
Management*

December 1, 2010

Jim Stephens, Hitachi Solutions Product Manager, SAP

Strategies for a State of the Art SAP Virtualized Storage Infrastructure

Formerly: Optimizing SAP Information Lifecycle

Protecting the SAP production environment from any possible negative impact is always the top priority. The very existence of many businesses depends on the 7x24 availability of their SAP business system. The Hitachi Virtual Storage Platform includes the technologies required for high quality of service (QOS) for production.

Consolidate all SAP production applications onto a single platform to reduce your hardware costs and make management more efficient

Grow and scale your SAP and storage environments seamlessly without impacting production applications, performance or your customer's user experience

Specifically you will learn how to:

- Develop a top down architecture for a state of the art SAP virtualized storage infrastructure
- Successfully integrate the advanced capabilities of the Hitachi Virtual Storage Platform and related technologies
- Deploy a virtualized storage infrastructure for SAP that will enable
 - Protected QOS for mission critical SAP
 - Consolidation, growth and upgrade protection
 - Data replication and replication management
 - Information lifecycle management
 - Optimization of cost and performance

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■ Hitachi and Hitachi Data Systems

■ Hitachi Data Systems and SAP Relationship

■ Maximizing Infrastructure Value for SAP with Hitachi Data Systems

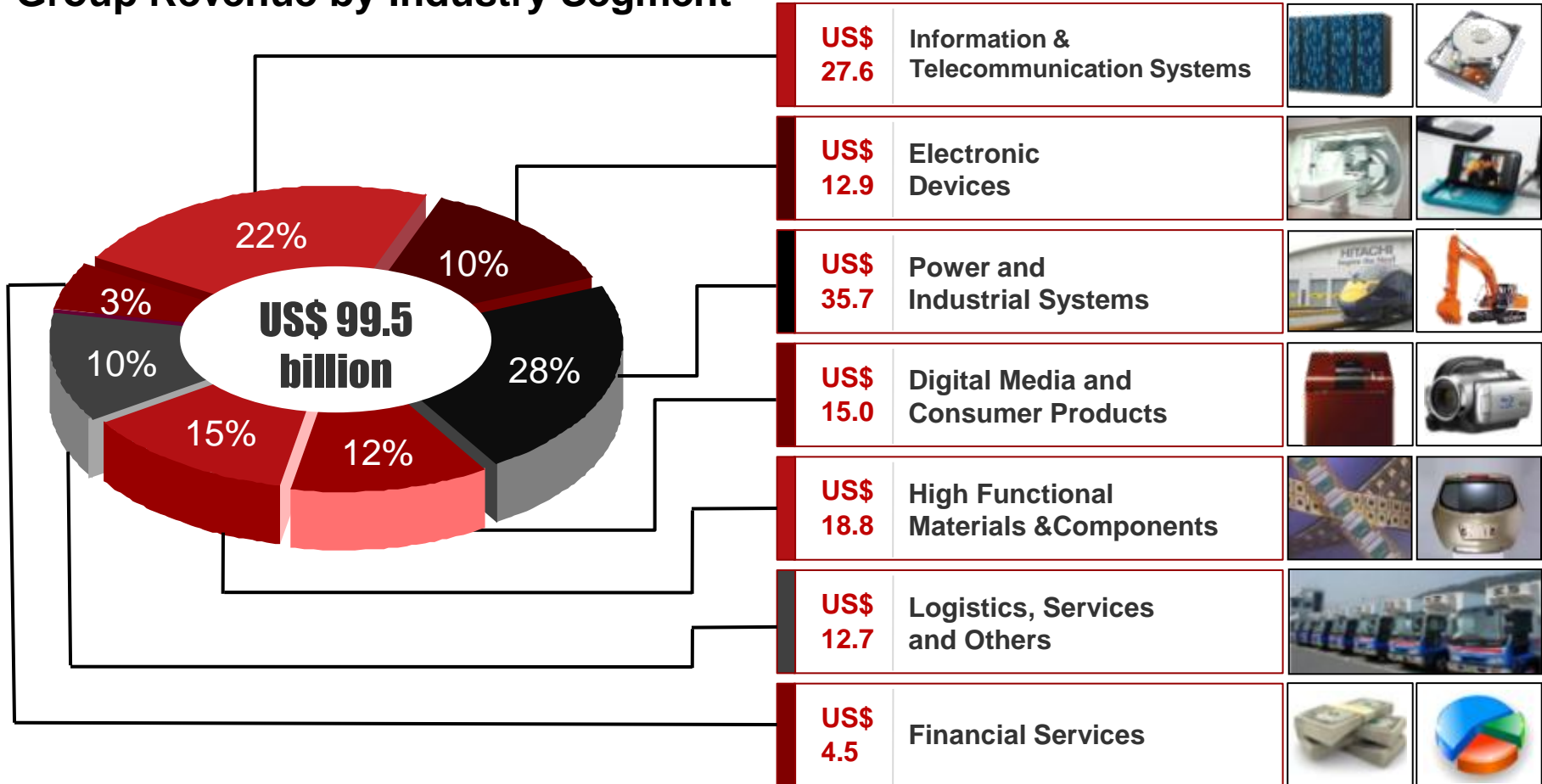
- Consolidation and Performance
- Availability and Replication
- Information Lifecycle Management for SAP

■ Summary

History and Focus

Hitachi Group's 7 Industry Segments

Group Revenue by Industry Segment



The World's Only Vertically Integrated Storage Company



Two Powerful Storage Businesses: US\$9.0B in Sales

- Hitachi Storage Solutions Group: \$3.4B
- Hitachi Global Storage Technologies: \$5.6B



Leveraging Storage Technology Leadership

- Enterprise and midrange storage systems, file and content storage systems, storage management software, data protection software, consulting services, hard disk drives



Expanding and Investing in Emerging Markets

- Intelligent virtual storage controllers, cloud storage, midrange systems, rich media, mobile music, game players, enabling the “terabyte home”

Hitachi Data Systems

Wholly owned subsidiary of Hitachi, Ltd. (NYSE:HIT)

- Formed in 1989
- Direct and indirect sales in over 170 countries and regions
- 4,300 employees and expanding

The focal point for Hitachi, Ltd. for storage infrastructure solutions, storage management software, and storage consulting services

Excellence in Customer Service awarded to Hitachi Data Systems by:



- Hitachi and Hitachi Data Systems



- Hitachi Data Systems and SAP Relationship

- Maximizing Infrastructure Value for SAP with Hitachi Data Systems
 - Consolidation and Performance
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- Summary

- **Software solution partner**
 - Independent Software vendor with certified integration
- **Certified software solutions**
 - SPLITINT
 - ILM
- **Technical best practices**
 - Reference architectures
 - Implementation
 - Performance
 - Replication
 - Availability



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1 Optimize consolidation

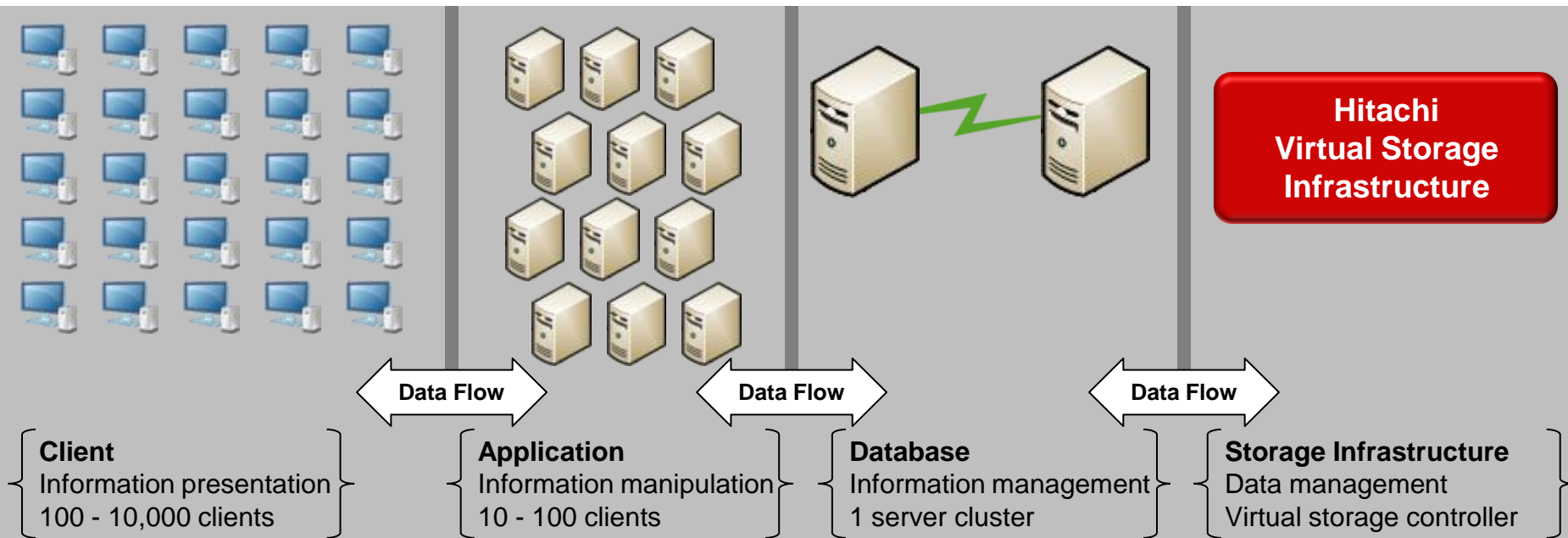
2 Improve performance, management and efficiency

3 Increase availability and business resilience

4 Accelerate application deployment and data migration

5 Simplify SAP data lifecycle management

- **SAP 3 tier strategy**
 - Enables scalability and flexibility
- **Both the client and application tiers are highly scalable**
- **All permanent data is maintained by the database tier**
- **Hitachi Data Systems virtual storage infrastructure: 4th tier**
 - Based on advanced storage technologies and capabilities
 - Provides data management functionality
- **All of the discussion today will be on the functions accomplished in the 4th tier**
 - Hitachi virtual storage infrastructure for SAP



“Ask” for the storage infrastructure

- QOS for production
- Consolidation
- Growth
- Upgrade protection
- Data protection
- Data replication
- Data migration
- ILM
- Manageability
- Cost control



Solution Capabilities

- Provides as many as 32 autonomously manageable dynamic virtual machines
 - Capacity
 - Cache
 - Ports

Benefits

- Guaranteed application QoS across heterogeneous storage environments
- Simplifies management, consolidation and application deployment
- No need to isolate production on a separate hardware platform

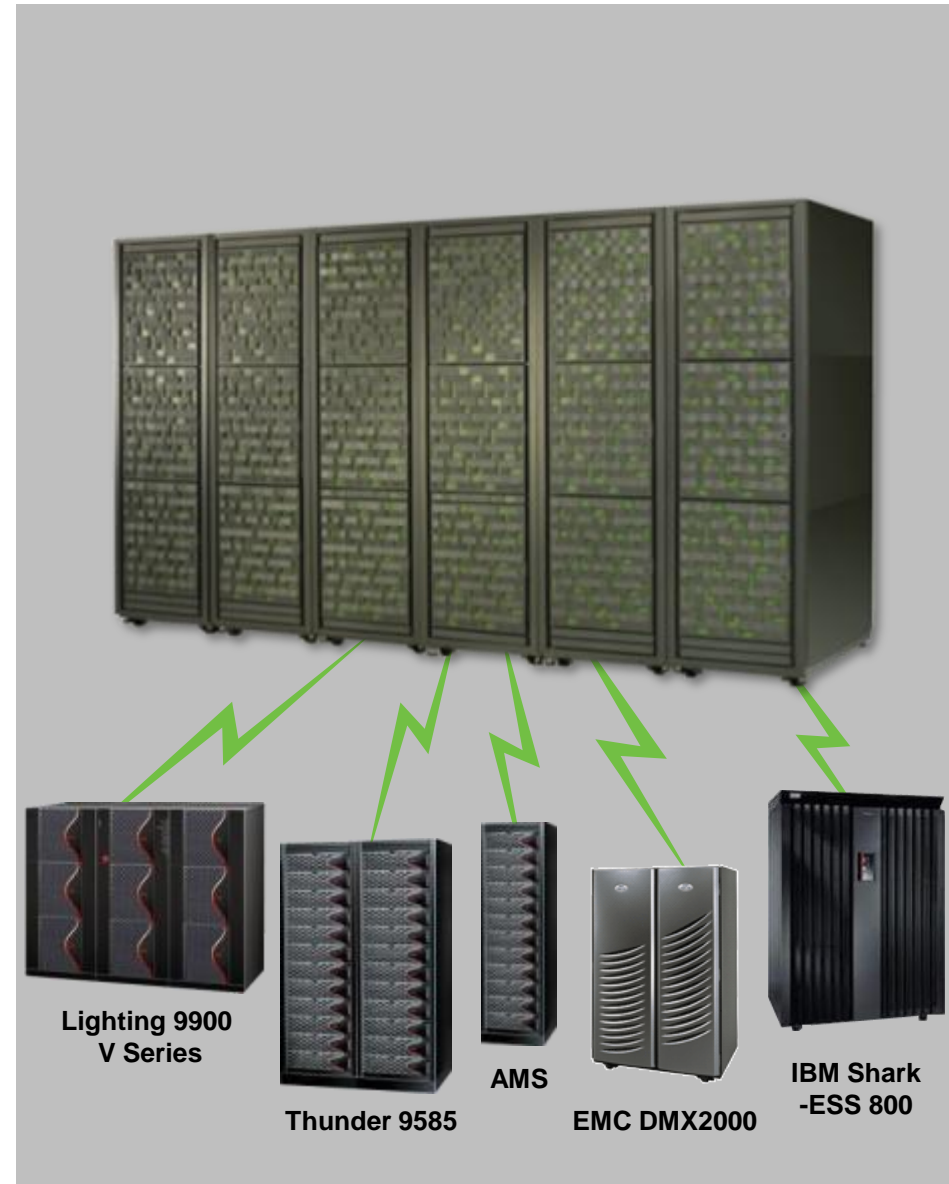


Solution Capabilities

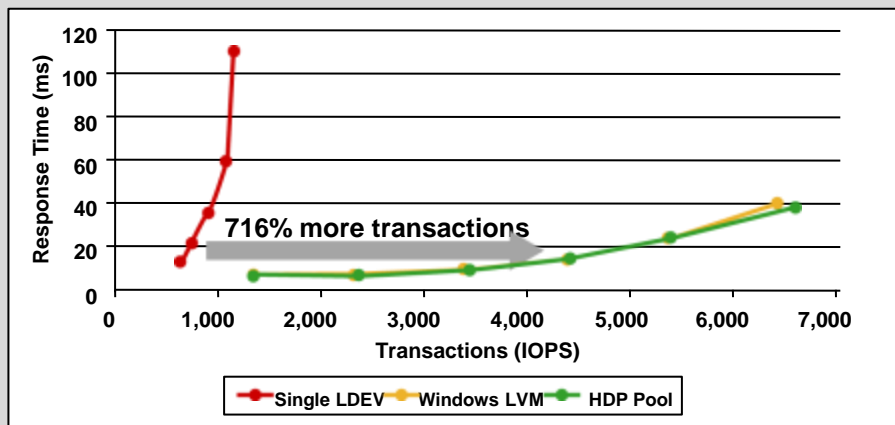
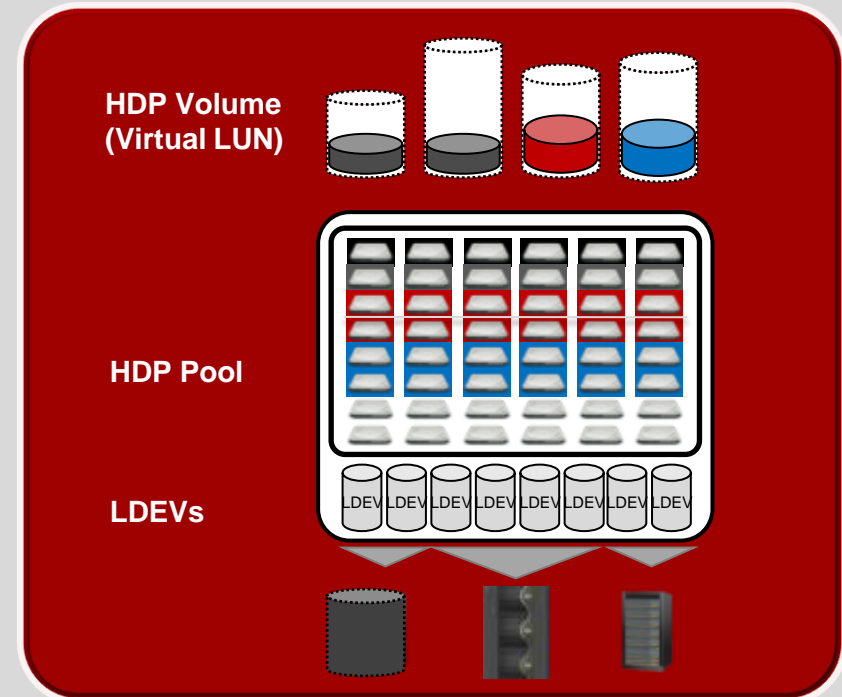
- External storage joins the storage pool with all the functionality of the storage system
- Offloads less demanding data to lower cost external storage
- Simplifies management of external storage with common management, data protection, and search
- Allows use of existing or legacy assets – over 200 storage systems and up to 255PB

Business Value

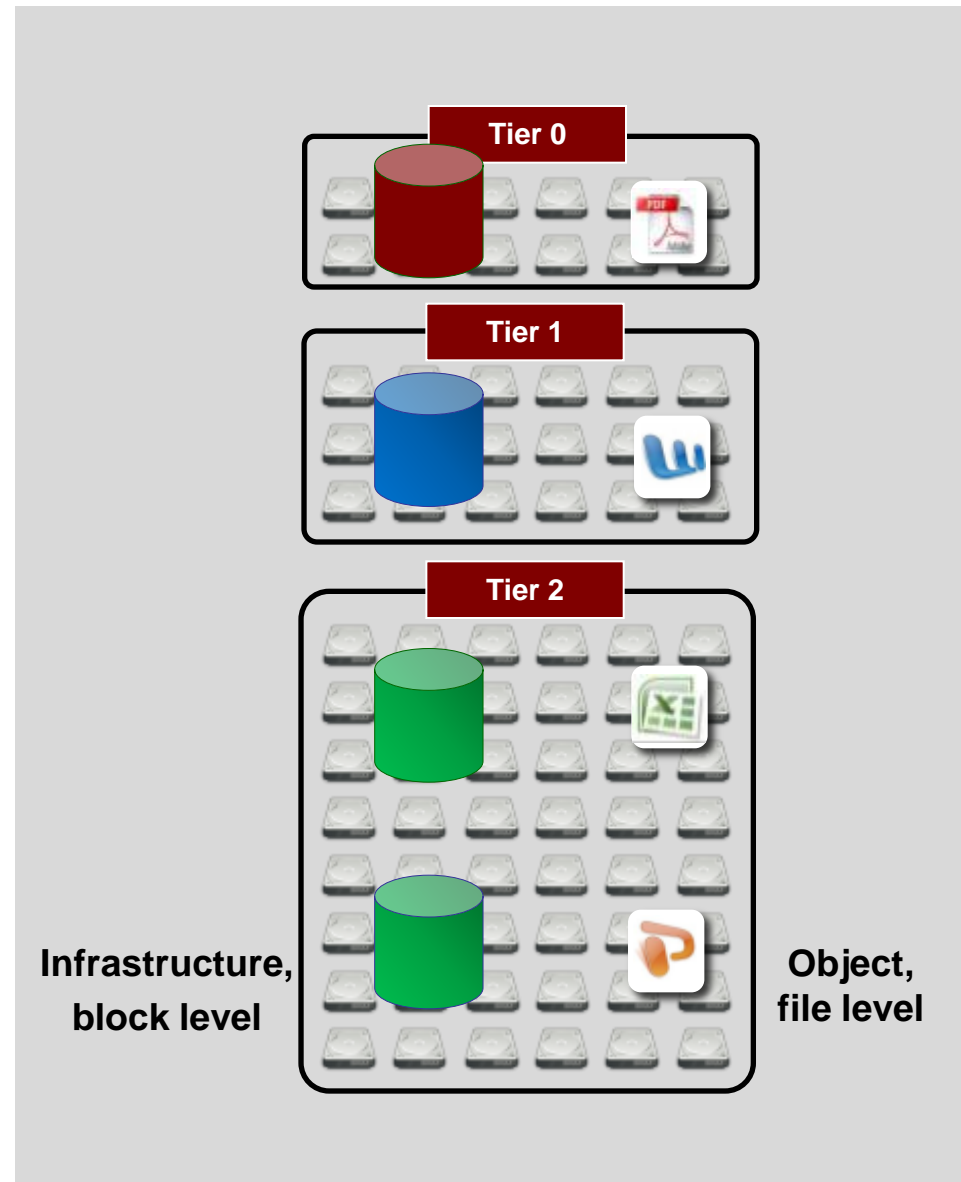
- Increase value and useful life of existing assets
- Reduce OPEX costs through a common management framework
- Reduce CAPEX using lower cost tiers of external storage



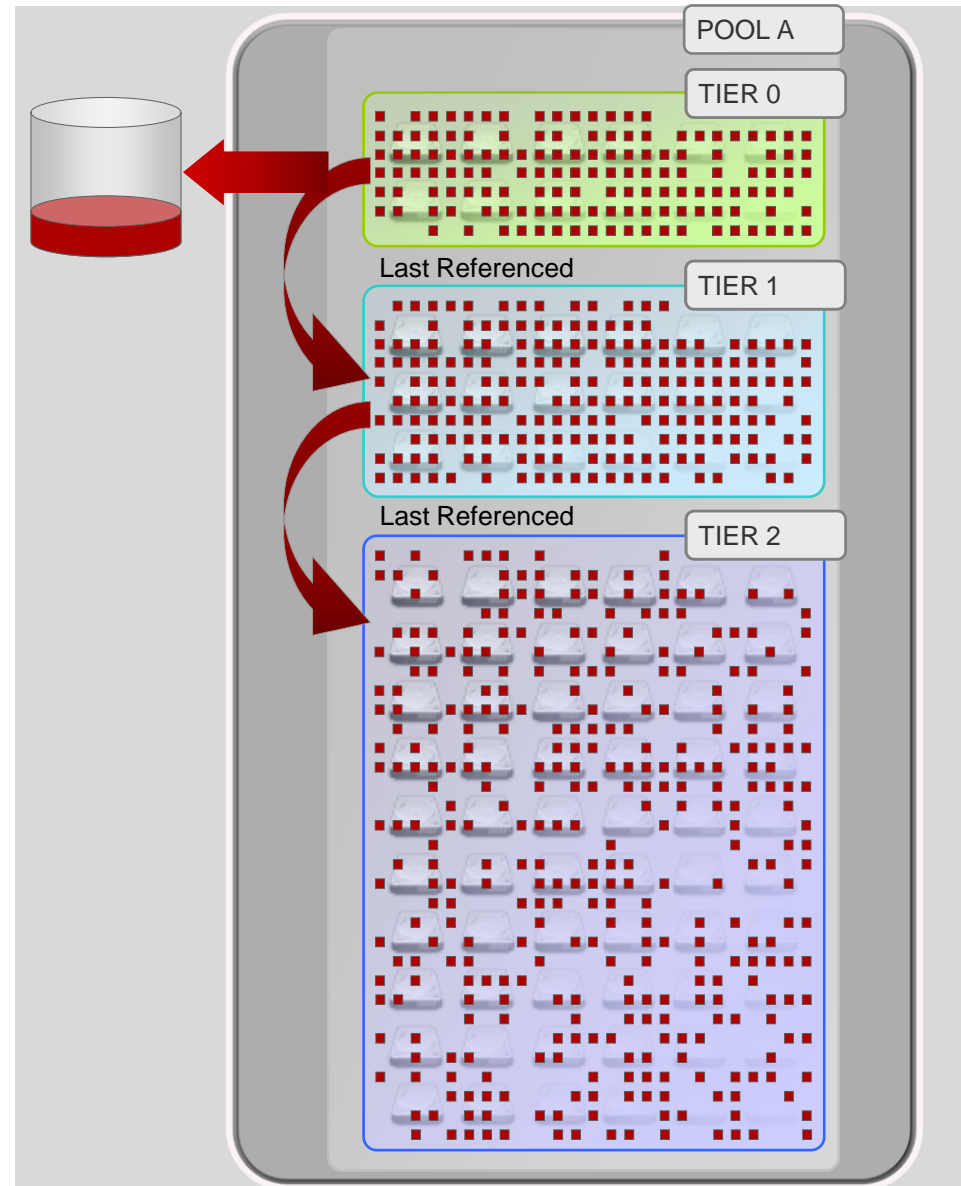
- Virtualize devices into a pool of capacity and allocate by pages
- Dynamically provision new servers in seconds
- Eliminate allocated but unused waste by allocating only the pages that are used
- Extend dynamic provisioning to external virtualized storage
- Convert fat volumes into thin volumes by moving them into the pool
- Optimize storage performance by spreading the I/O across more arms



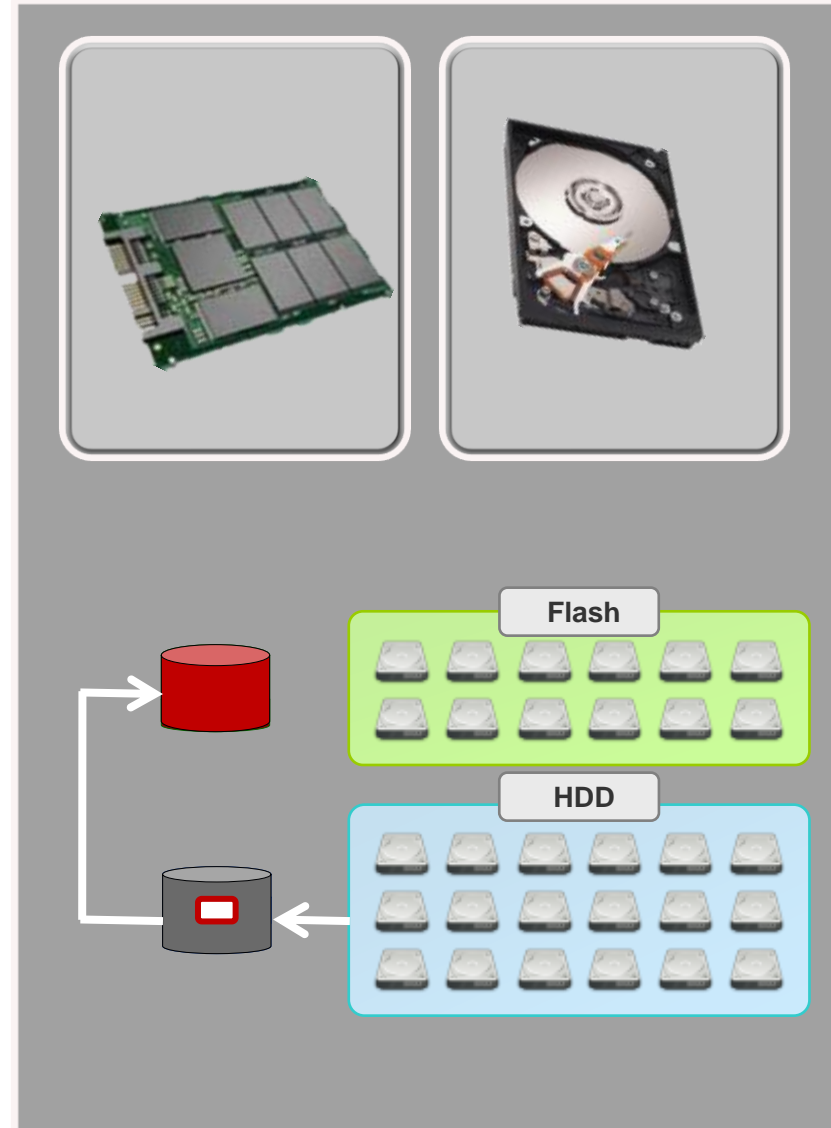
- **Two layers of data mobility**
 - Infrastructure layer or block level
 - Object layer or file level
- **Enterprise SLC Flash has 100,000 write/format cycles**
 - Wear leveling, error recovery, spares
- **Use virtualization and data mobility tools to move (or re-provision) the volume without disruption to any other pool or tier based on**
 - Promotion or demotion
 - Consolidation or migration
 - SLO, performance or cost change
- **Automated with policy based management**
 - Based upon pre-set SLAs



- Different tiers of storage are now in one pool of pages
- Data is written to the highest performance tier first
- As it becomes less active, it migrates to lower level tiers
- If activity increases, it will be promoted back to a higher tier
- Since 20% of data accounts for 80% of the activity, only the active part of a volume will reside on the higher performance tiers



- **Very high performance for critical applications**
 - 70x random reads, 14x random writes
- **50% reduction in power and cooling**
- **Currently 10 times higher cost than HDD**
- **Optimize use of flash with Hitachi Dynamic Tiering**
- **Eliminate waste of allocated unused flash capacity with Hitachi Dynamic Provisioning**
- **Minimize flash with page level tiering of hot spots**



One Size Fits All Strategy
(Easiest and Most Expensive)



Not the Right Strategy

RECOMMENDED: Two Step Strategy

1

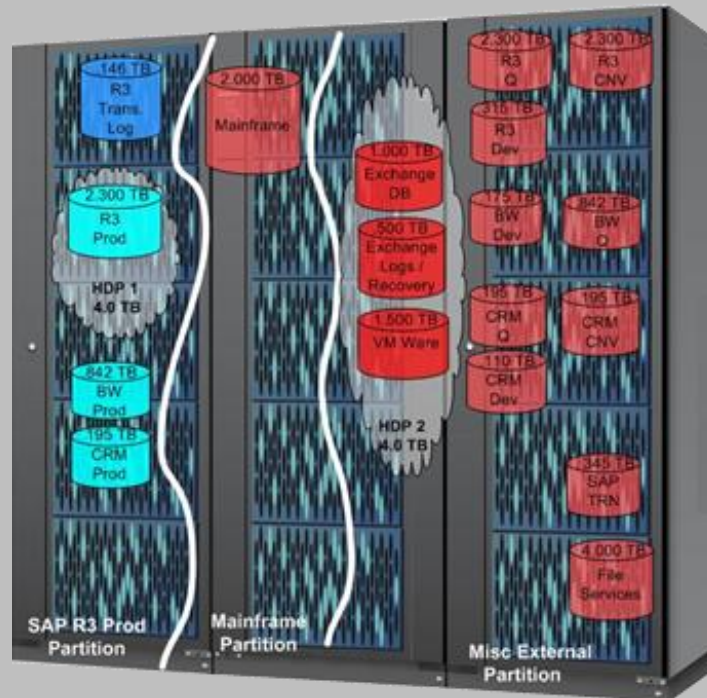
First define data levels or data tiers based on requirements of the data

2

Define storage tiers aligned with data levels

- This is not just something that we *could* do
- This implementation has been in production at a customer site for two years
- Helped the customer define their data levels and then implemented storage tiers to match those requirements

TIER 1	USP 73GB 15K Raid 10 (2+2)
TIER 2	USP 73GB 15K Raid 5 (7+1)
TIER 3	AMS 1000 300GB 10K Raid 10 (2+2)
TIER 4	AMS 1000 300GB 10K Raid 5 (7+1)



Hitachi Universal Storage Platform 7TB

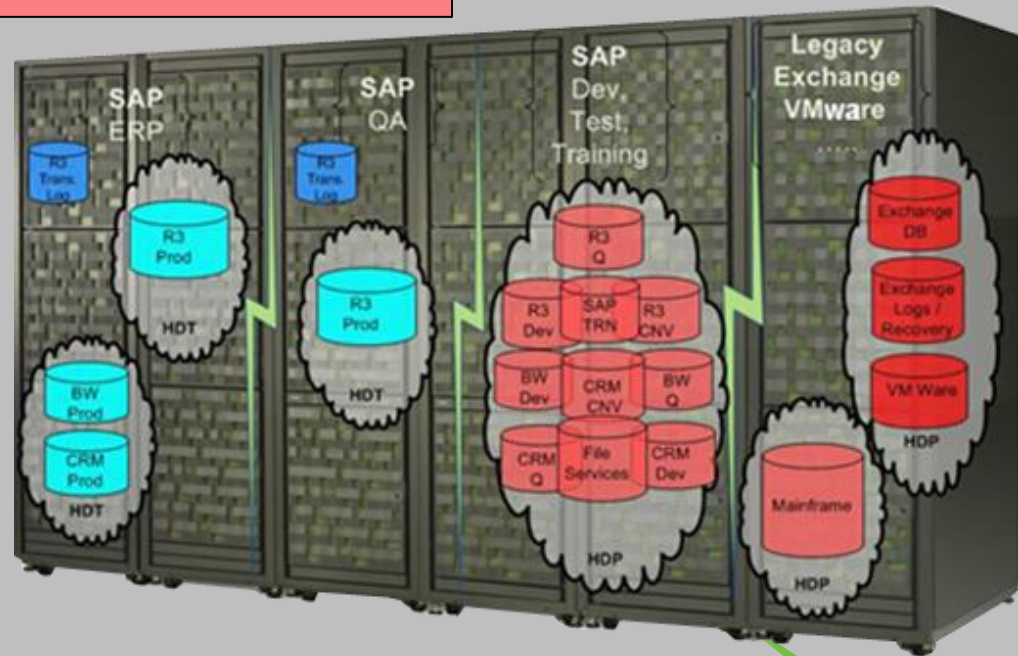


Hitachi Adaptable Modular Storage 43TB

Develop a Plan

- Define virtual partitions
- Develop data levels
- Define matching data tiers
 - Internal
 - External
- Implement pools
 - Hitachi Dynamic Tiering
 - Hitachi Dynamic Provisioning

TIER 1	VSP Raid 10 (2+2)
TIER 2	VSP Raid 5 (7+1)
TIER 3	AMS Raid 10 (2+2)
TIER 4	AMS SATA Raid 5 (7+1)



Hitachi Virtual Storage Platform

Many types of storage infrastructure replication

Each has its own characteristics and uses

1

Local Clone

2

Snapshot, Copy-on-Write

3

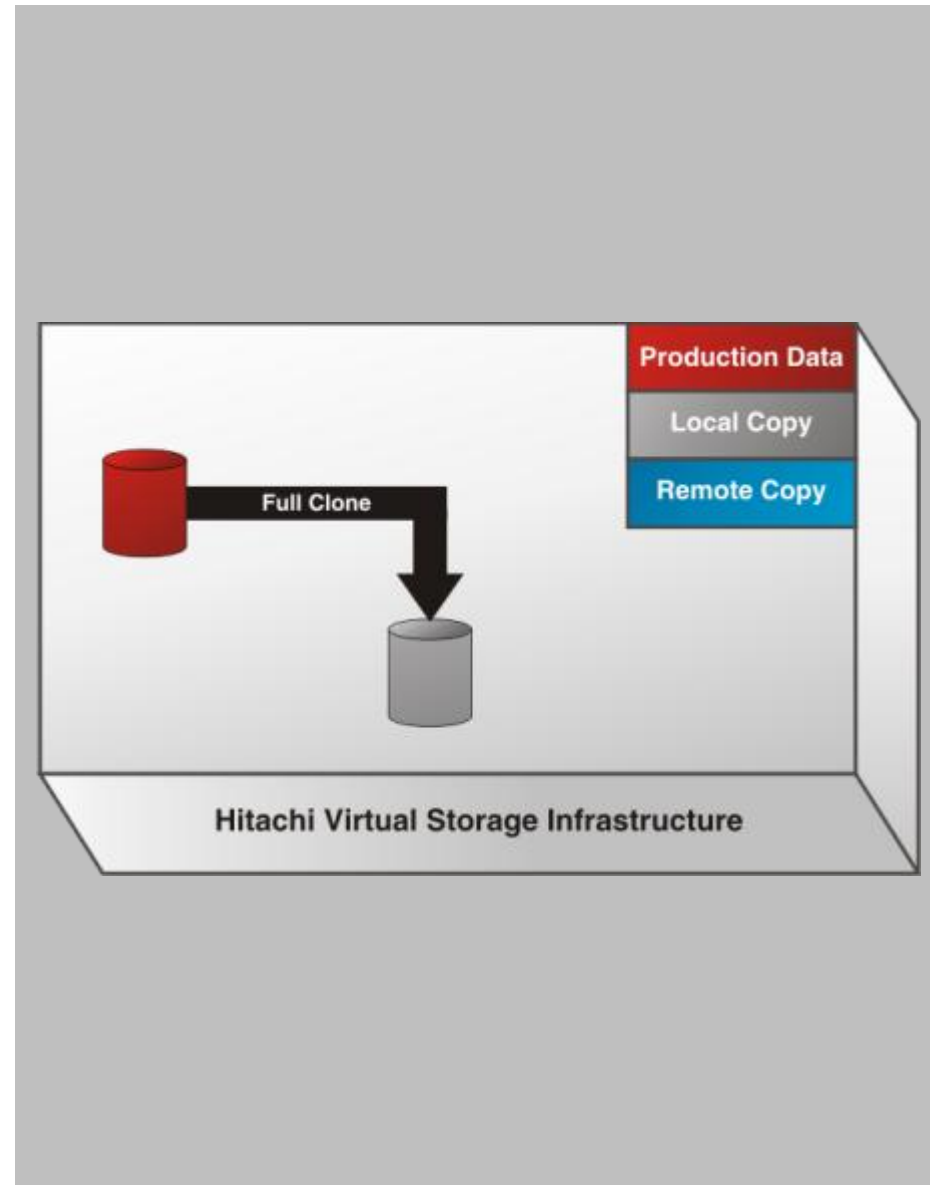
Remote Clone

Solution Capabilities

- Full copy of primary data
- Implement secondary process without impacting performance on primary data base

Use Case

- Back up operations
- Refresh QA
- Refresh reporting or data mining instance

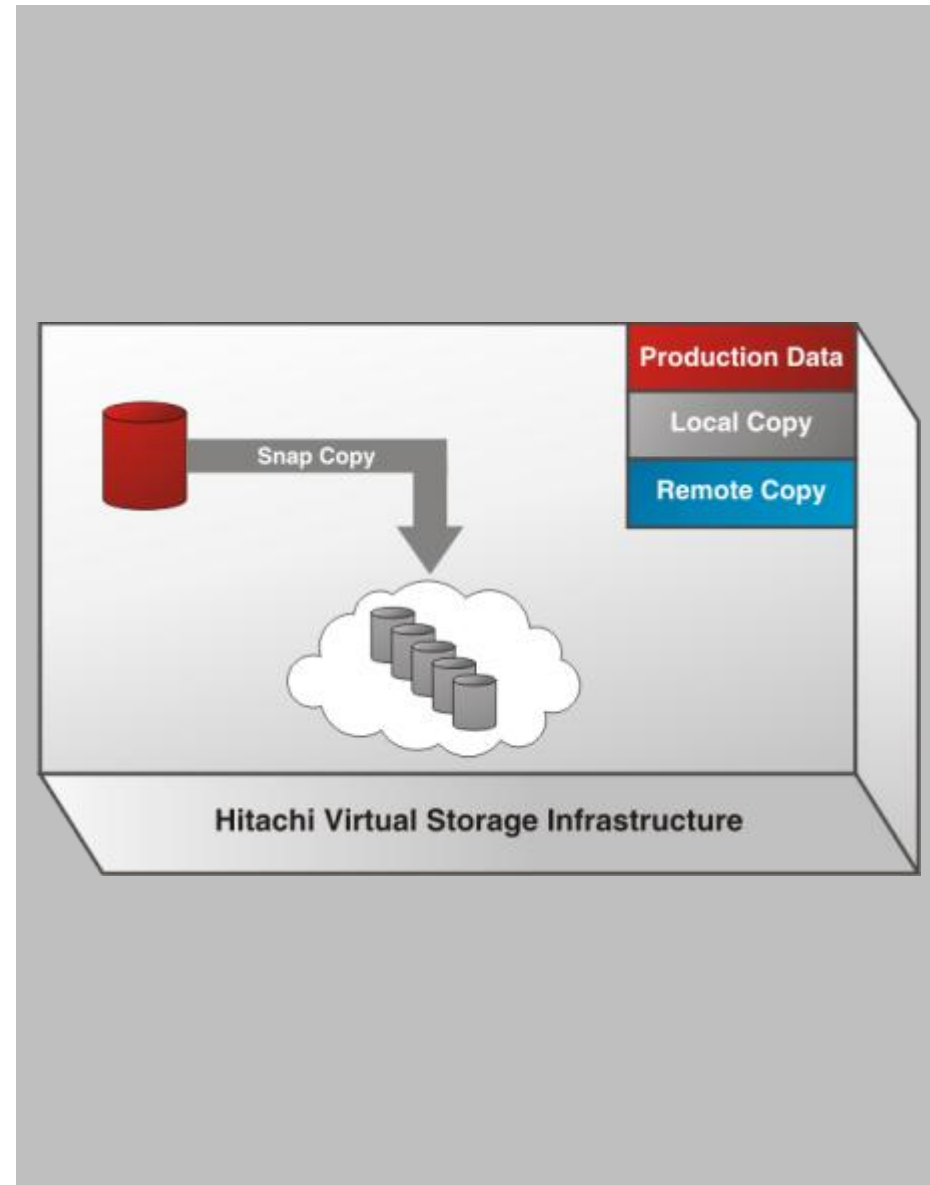


Solution Capabilities

- Provides non-disruptive, volume snapshots
- Uses less space than full copies or clones
- Allows frequent, cost effective, point-in-time copies
- Up to 64 virtual copies of a primary volume
- Immediate read/write access to virtual copy
- Fast restore from any virtual copy

Use Case

- Point in time copy for corruption recovery
- Create copies where performance on primary is not an issue (test or dev)

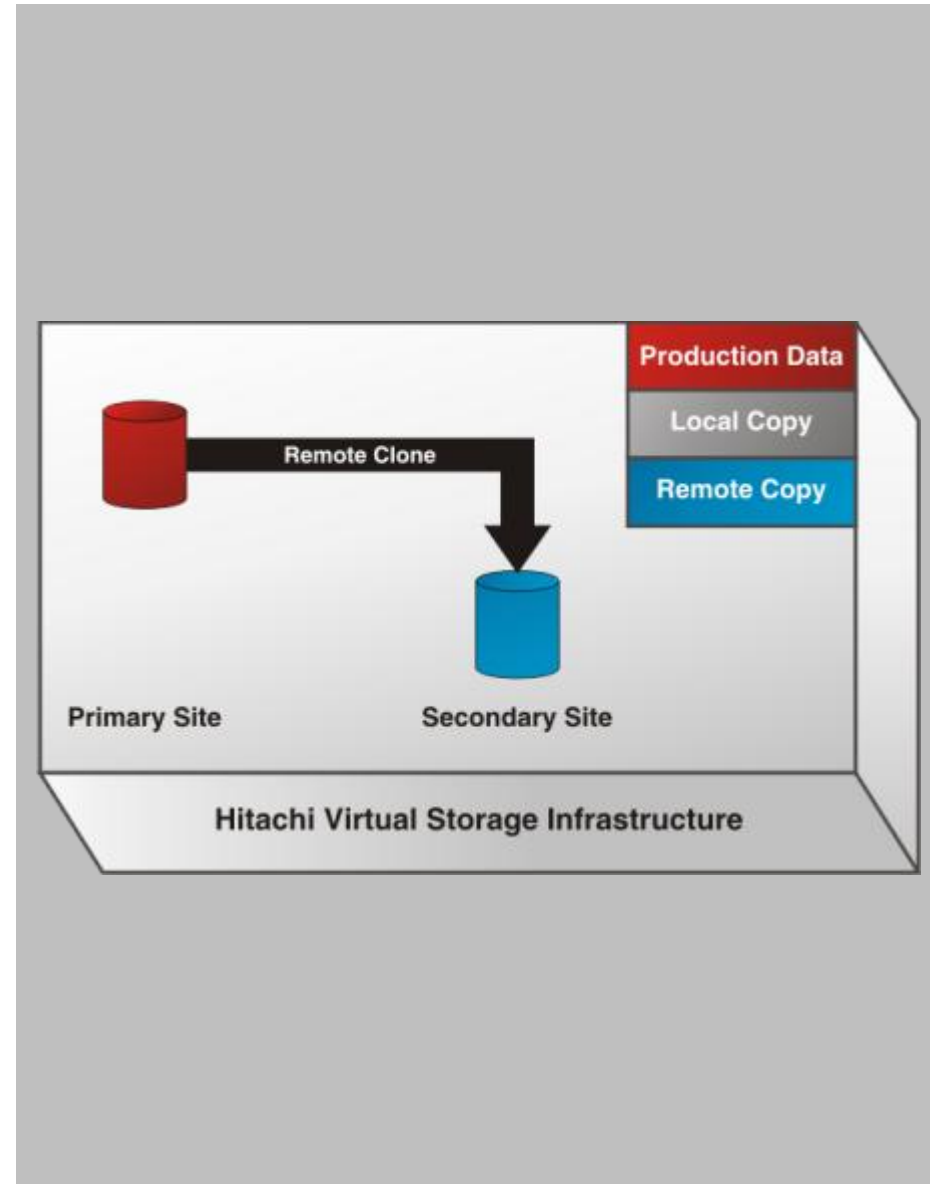


Solution Capabilities

- Remote array based replication
 - Hitachi Universal Replicator
 - Hitachi TrueCopy® Extended Distance
 - Hitachi TrueCopy® Synchronous

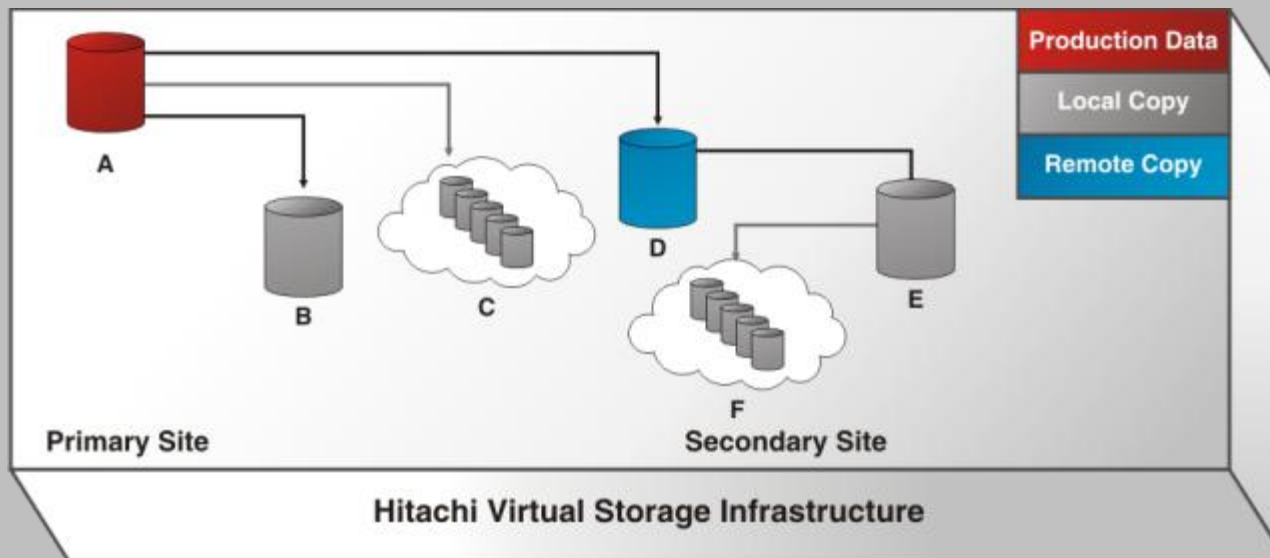
Use Case

- Combined with business continuity strategy
- Often used for data center migration



Combined Applications

- Many combinations to fit the needs at hand
 - A. Primary data
 - B. Local clone for backups / QA /
 - C. Snapshots for recovery
 - D. Remote copy for disaster recover
 - E. Remote clone for testing / data mining / ...
 - F. Remote snapshots for test environments





- **Three ways to manage the replication of SAP data**
 - Graphical user interface
 - Command line interface
 - Scripted solution based on the command line interface

- **Split mirror replication management for SAP**
 - Combination of scripts, customization, and training
 - Manages the Hitachi Data Systems replication elements and the SAP configuration changes required for complete replication of an SAP environment
 - SAP certified

- **Advantages of split mirror replication management for SAP**
 - Certified solution
 - Provides process that is editable, auditable, and repeatable
 - Ensures maximum security for SAP data
 - Planning is the challenge to managing the replication process

Typical Approach

- In a 7x24x“Forever” environment there is no tolerance for planned or unplanned downtime
- Traditionally migrations to accommodate application or hardware upgrades require extensive planning and delays

Our Approach

- Hitachi Data Systems virtualization enables data migration with no impact on the application



Information Lifecycle Management

1

Data Archiving and Data Management

- Categorization and Analysis and Deletion
- Storage
- Indexing and Data Access
- Nearline Storage – SAP NetWeaver® Business Intelligence

2

Retention Management

- Retention Policy Management
- Destruction
- ILM-aware Storage Integration
- Legal Case Management
- Legal Hold Management
- Automated e-discovery Support

3

Retention Warehouse

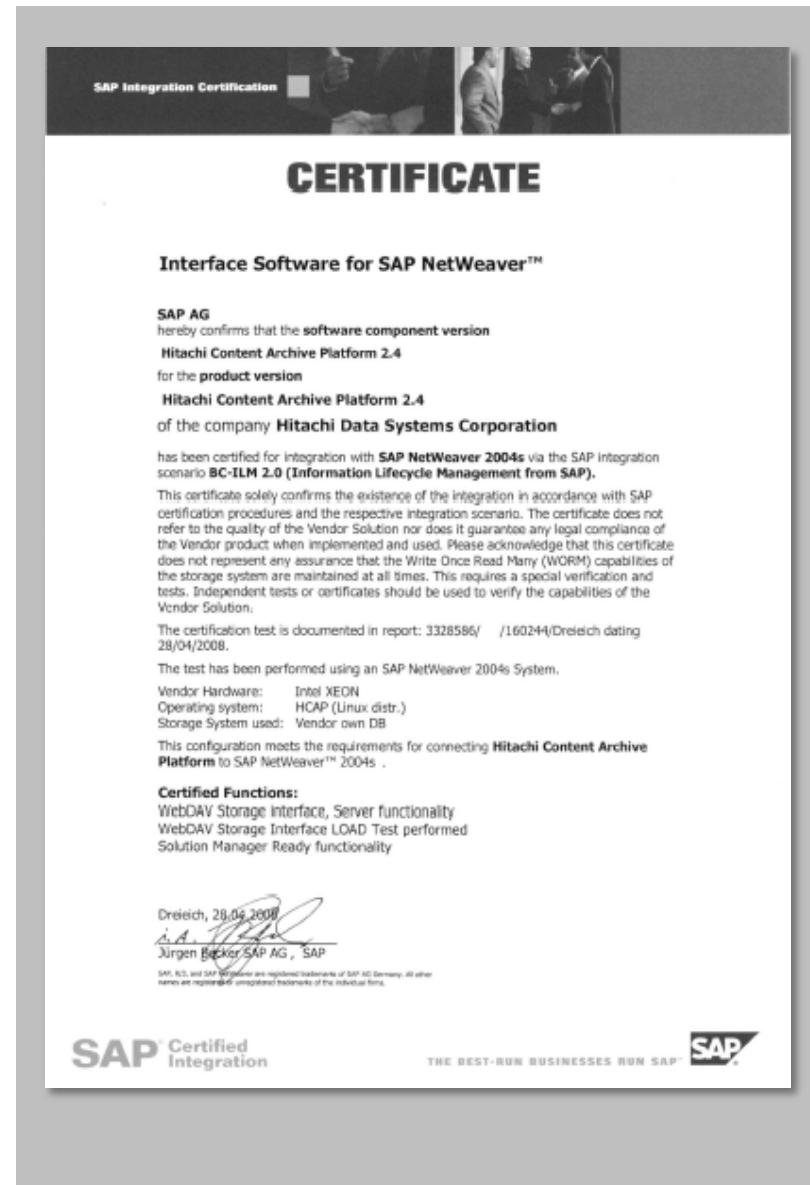
- Snapshot for Context Data
- Enhanced Archiving Objects
- Retention Management
- Reporting Interface
- Text Content – SAP NetWeaver® Business Intelligence

3

Retention Warehouse – Integration of legacy and retired systems and snapshots of SAP data; Standard for tax reporting

Hitachi Content Platform (HCP) is certified as “ILM Aware” archive storage

- We are certified under the ILM 2.0 certification
 - SAP passes data/objects to HCP (via WebDAV)
 - SAP can set retention, legal hold
 - HCP proactively acts on this metadata
 - Enforcing retention and expiring or deleting objects as requested
- HCP is one of the first storage solutions to be certified under the 2.0 ILM specification
 - SAP makes use of HCP policy handling
 - Only HCP is native WebDAV (others require 3rd party connector)



1 Optimize consolidation

2 Improve performance, management and efficiency

3 Increase availability and business resilience

4 Accelerate application deployment and data migration

5 Simplify SAP data lifecycle management



**Questions or
Comments?**

January

- *Live Migration of Hyper-V Environments Over Distance*, January 20, 2011 at 9am PT, 12pm ET

Please check www.hds.com/webtech for:

- Link to the recording, the presentation and Q&A (available next week)
- Schedule and registration for upcoming WebTech sessions
- Check back in a few weeks to see our January topics

Thank you!