Hitachi Data Systems
WebTech Educational Seminar Series

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Storage Reclamation: A Case Study

"How to Live off your Body Fat in a Down Economy"

Average storage utilization in most data centers is around 30% due to the way storage is designed and architected. With new technologies and services, it is now possible for customers to reclaim this stranded capacity. This is especially important in a down economy because customers can utilize the storage that they have already paid for and delay or cancel the purchase of new storage capacity. Hear David Shepard, Product Manager, of Exacent tell how they reclaimed storage, and the results they have achieved.

Attend this session and learn to:

- reclaim storage capacity
- understand the technologies and services available
- achieve similar results by hearing how other customers have done this

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Storage Reclamation: *"How to live off body fat in a downturn economy"*

Case studies reflecting customer experiences in reclaiming storage to extend the life of existing assets and reduce costs

Joseph Jose, Senior Product Marketing Manager,
Hitachi Data Systems

Rob Zwick, Engagement Manager,
Hitachi Data Systems

David Shepard, Product Manager,
Exacent

About this presentation

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- Average storage utilization in most data centers is around 30%
- With new technologies and services, it is now possible for customers to reclaim this stranded capacity.
  - Important in a down economy because customers can utilize the storage that they have already paid for
  - Can delay or cancel the purchase of new storage capacity.
- What we'll cover
  - Introduction to Storage Reclamation
  - Customer Experience #1: Exacent
  - Customer Experience #2: Global Financial Institution
  - Hitachi Data Systems accelerating time to results – Storage Reclamation Service
  - Questions
- Please provide comments and feedback to joe.jose@hds.com

What's on Everyone's Mind

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"We need to increase our management capability with a decreasing budget"
IT Director

"How can I have a better visibility of my infrastructure efficiency?"
Storage Manager

"How can I agree to new investments when we are unable to understand our current utilization rates?"
CIO

"We need to reduce CAPEX spend"
Controller

Hitachi Data Systems continues to help customers do more with less

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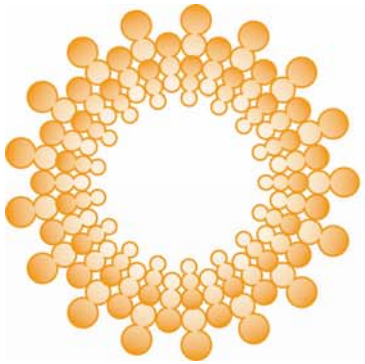
In the current economic climate, customers are reducing operating and capital costs

- ***leveraging current investments***
- ***increasing return on assets (ROA)***

while trying to increase value to the business

Service Levels

Economize your Storage.
Savings strategies for a sustainable future.



EXACENT®

Virtually, unbeatable.

David Shepard
Product Manager

About EXACENT

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- The EXACENT® platform is based on using the best, most-proven components in the industry. This allows us to offer our clients true enterprise-grade IT solutions without the initial capital investment and operating expenses associated with building it from scratch.

EXpress *Servers & Hosts*

- Server-Custom dedicated virtual servers starting with 1 GB of Memory 1 Core Processor and 80 GB SAN storage.
- Host-Private physical server with VMware capable of supporting 64 individual servers

EXtreme *Security*

- Storage-secure san storage starting a $1/GB/Month
- Archive-Long term storage on disk instead of tape, high reliability and security. $.75/GB/Month

EXceed *Dedicated Cluster*

- Combined benefits of Express servers and hosts to create a high performance on demand network capable of supporting the most demanding and high performance networks and applications with unlimited scale.

EXigent *Disaster Recovery*

- Custom hot disaster recovery sites capable of scaling up to production in minutes in the case of a disaster.

Global Financial Institution

- Presence in 100 countries
- 200 million customer accounts
- Diverse and large portfolio
  - Credit cards
  - Mortgage
  - Insurance
  - Global Wealth Management
  - Hedge Funds
  - Private Equity
  - Corporate Finance
- US$40+ billion in revenue

Business Challenges

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- Pressure to Increase Shareholder Value and Return to Profitability Expense Management

- IT Operations and Technology initiatives
  - IT Transformation and CAPEX/OPEX reduction Initiative
  - Global Data Center Optimization Strategy
    - Storage Optimization Initiative

- Total cost of ownership with aging storage assets
  - Maintenance costs
  - Under utilized storage assets

Operational and IT Challenges

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- Operational Challenges
  - Excessive waste in allocated, but unused capacity because:
    - Lack of Demand Management Process and Tools
      - Poor forecasting of business requirements
      - No or limited visibility
  - Elongated procurement process resulting in over buying and over provisioning
  - Workforce reduction resulting in resource constraints
- Technical Challenges
  - Multiple global data centers
  - 9 Data Centers in US alone
    - Mix of EMC and Hitachi storage
  - 6 PB of storage and growing at annual rate of 20 to 30%

Decision Criteria for Technology Refresh/Migration

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- Limit application downtime
- Limit involvement of system administrators
- Zero data loss
- Absolutely limit IT Risk (human involvement)
- Migrate data by lines of business or server use
- Full control on storage movement; Move all storage for impacted servers at one time or within selected outage windows
- Impact: Increases the number of servers migrated per session
- Impact: Reduces System Administrators involvement during the session

The Solution

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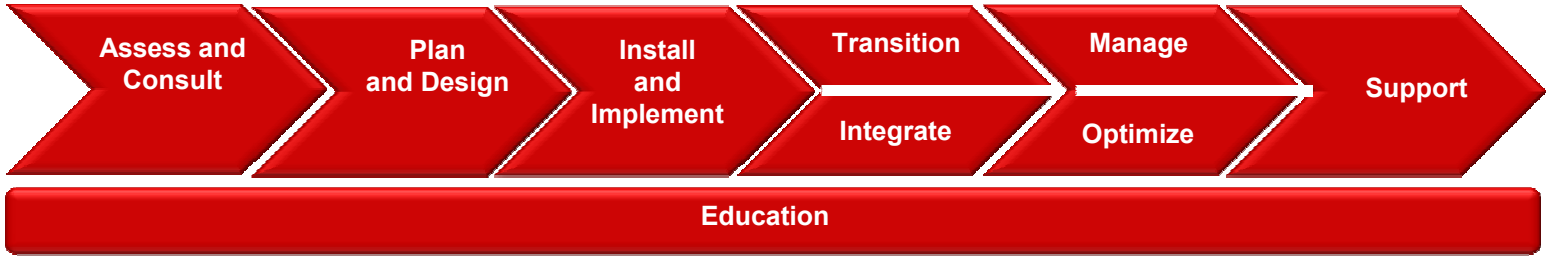
Engaging Hitachi Data Systems Global Solution Services to conduct end-to-end service to Reclaim Storage



- Analyze current storage usage and identify storage to be reclaimed
- Design new Dynamic Provisioning environment
- Migrate storage to new environment non-disruptively
- Run Zero Page Reclaim feature to reclaim storage
- Provide reports and recommendations on dynamic provisioning best practices

Results

- Lower Total Cost of ownership
- Savings in maintenance
- Savings in power and cooling
- Improved utilization and ease of management due to consolidation

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Hitachi Data Systems Strategy for Technology Refresh

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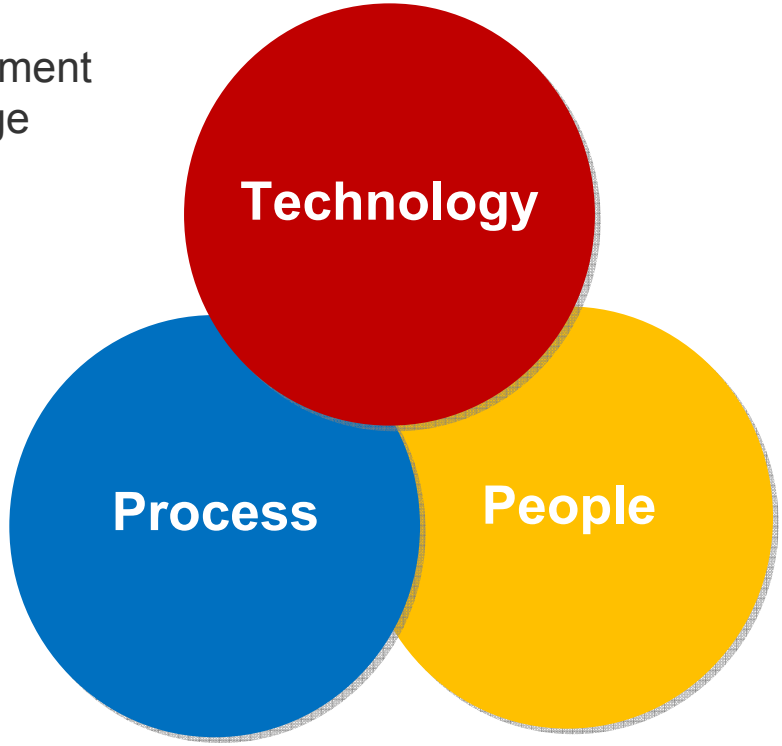
- Technology
  - Based upon Hitachi virtualization and data mobility software – Hitachi Tiered Storage Manager
  - Segregates migration and actual data movement substantially reducing down time and Storage Administrator involvement
- Processes
  - Predictable
  - Limited Storage Administrator involvement
  - Scripted
  - Checks and Balances
  - Limited finger checks
  - Repeatable
  - Scalable : allow migration of 5 to 6 servers per session
- People
  - Certified pool of resources
  - Consistency
  - Track record



Global Financial Institution : Technology Refresh Findings

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- Migration using Virtualization and Hitachi Tiered Storage Manager
  - Offered superior and scalable solution
  - Any to any platform migration
  - Major reduction to server downtime
  - Major reduction for the number of server reboots
  - Heavily minimized amount of involvement by System Administrators
  - Offering highest level of productivity during migration **compared to any other alternate technology**

Hitachi Global Solution Services processes, people and technology moved data at 2x the competition resulting in significant OPEX savings in the technology refresh process

Benefits of Dynamic Provisioning

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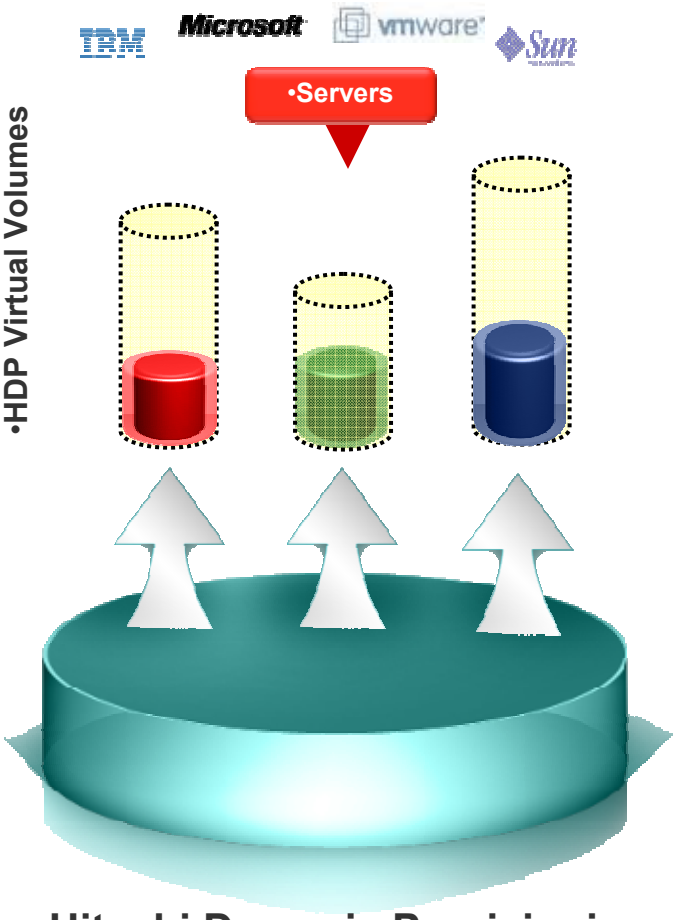
Efficient Storage Allocation - Use only what you need, where you need it and when it's needed



- Challenges
  - High cost of storage
  - Cumbersome provisioning
  - Expensive optimization
- Solution Capabilities
  - Simplify provisioning
  - Provision only what is used
  - Automates performance optimization
  - Replication Savings
- Business Benefits
  - Reduce storage expense
  - Reduced operational expense
  - IT Agility

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Opportunity for Capacity Reclamation with Hitachi Dynamic Provisioning

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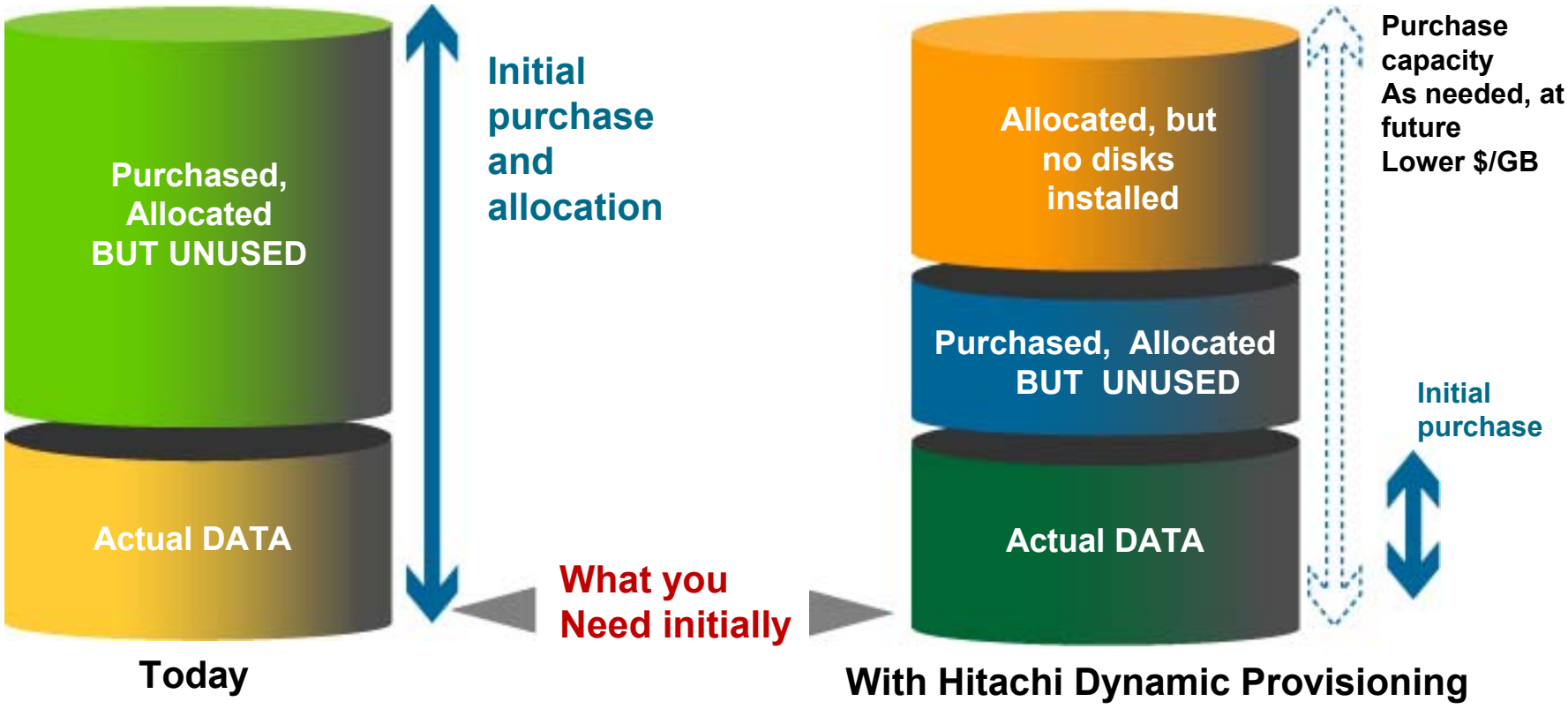
To avoid future service interruptions and improve operational efficiencies most customers use fixed size volumes resulting in over allocating storage by 75% or more



Capacity Reclamation Results

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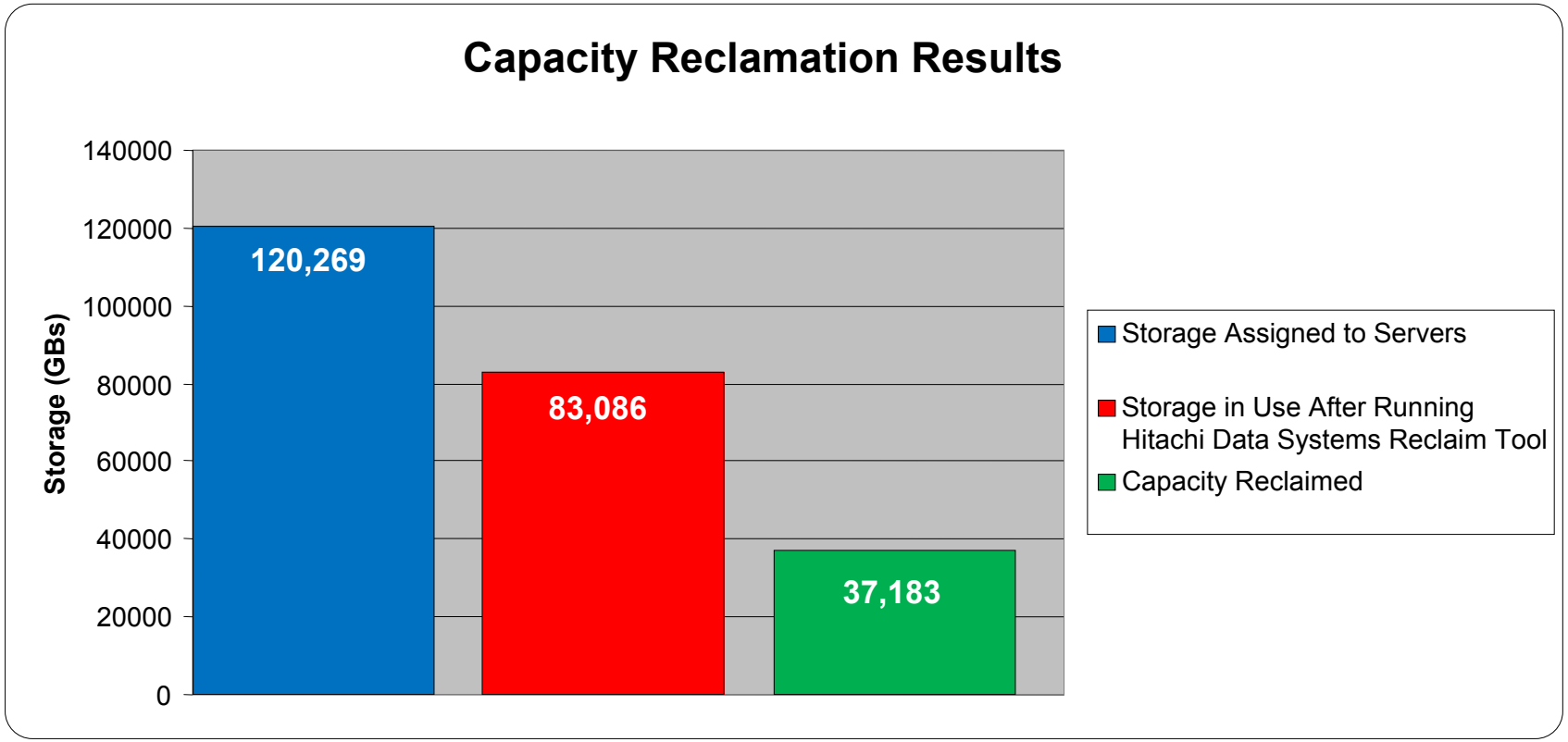
Operating Systems	Number of servers	Average % Reclaimed
IBM ® AIX®	66	25
Solaris	93	37
Microsoft ® Windows	120	29
VMware	2	34
Linux/HP-UX	27	30

VMware has 7 hosts running as guests

On Average Capacity Savings* of 31% realized at GFI

*Sample across 300 plus severs; standard deviation of capacity savings per server was high

Global Financial Institution Capacity Reclamation Results



Sample capacity savings realized at GFI across 300 plus servers

Global Financial Institution – Before and After Results

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	Before	After
Storage Utilization	40-60% in static fixed size volumes	80%+ in dynamic pools
Storage provisioning philosophy	To peak capacity requirements	On demand (as they grow)
Volume (LUN) Sizes	Fixed	Customized (no wastage)
Storage provisioning: Volume Size Increase	Disruptive, OPEX intensive	On the fly
Performance Management	Hot spots need to be managed	Hot spots eliminated due to wide striping
File system characteristics	Thick	Thin (Zero pages reclaimed)
Previous capacity	~380TB	~260TB
Maintenance of older assets	2M	N/A
Floor space, Energy consumptions		40% reduction

Quantifiable Benefits to Global Financial Institution

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- Reclamation of ~185TB usable valued at excess of US$2 million
- Maintenance Avoidance of additional US$2 million
- Move data at 2x the competition resulting in significant OPEX savings
- Footprint consolidation resulting in reduction in power and cooling requirement and simplified management
  - Frame consolidation
  - RAID-1 to RAID-5 conversion
  - Tiering in a box

Hitachi Global Solution Services migrated 76 EMC frames connected to 2500 plus servers saving GFI in excess of US$ 4 million through consolidation and thin provisioning

Sustainable Cost Advantage – Improving Storage Management Processes

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- Lessons Learned about Dynamic Provisioning
  - Modify process to take advantage of Thick to Thin Provisioning
  - Introduce dynamic allocation
  - Reclaim storage now and on an ongoing basis to reduce storage capacity overhead

- Experience
  - Working with Hitachi Data Systems consultants who have deployed these technologies before led to reclaiming unused storage capacity
  - Hitachi Data Systems consultants were able to help with the behavioral change necessary to ensure the changes to the provisioning processes are sustained

Hitachi Advances in Technology and Services

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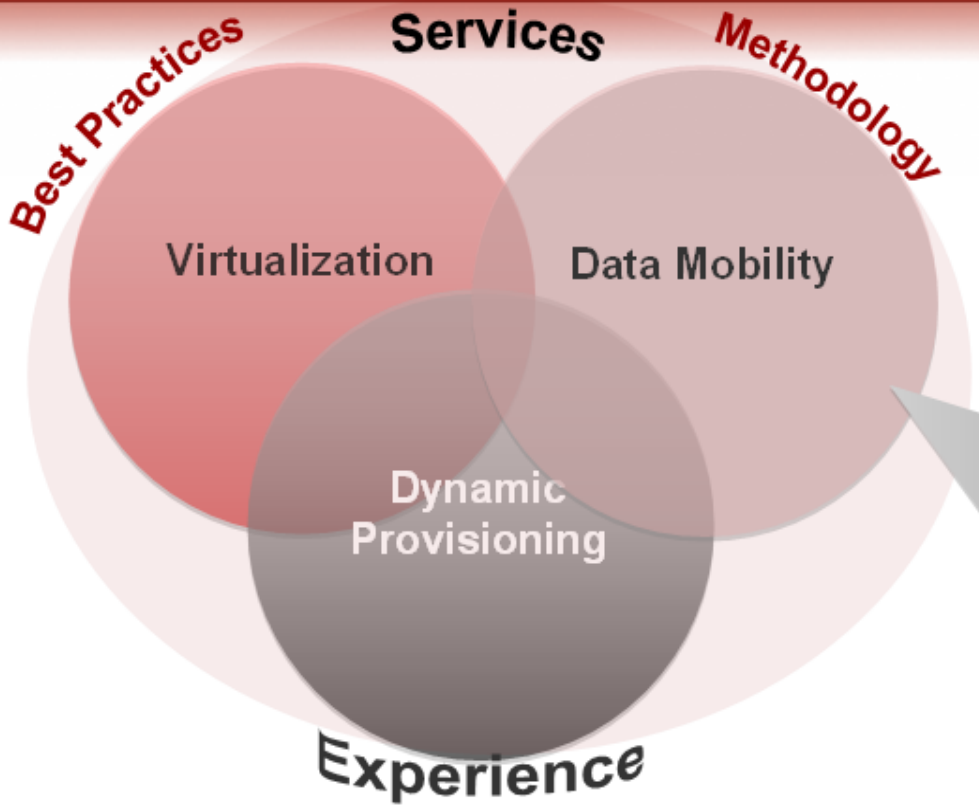
Advanced Hitachi Virtualization Technologies And Dynamic Provisioning



- Extensive experience migrating customers data
- Methodology simplifies migration and aligns to business
- Nondisruptive migration
- Seamlessly move data between tiers

Storage Reclamation Service integrates best practices, key technologies to reclaim storage

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Increasing value to customers, delivering tangible results more quickly with less risk

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Hitachi Dynamic Provisioning software

Storage Reclamation Service

Value to customers

- **Ensured cost savings**
- **Speed time to value**
- **Reduced risk**
- **Realize operational efficiencies**

Economize your Storage.
Savings strategies for a sustainable future.

Next Steps

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- Consider Hitachi Dynamic Provisioning technology for your environment
- Talk with us about how to lower costs and transform your storage infrastructure
- Conduct a Quick Analysis of your storage environment to identify the storage reclamation potential

Total Records : 14

Server Name	IP Address	OS	Total (MB)	Filesystem Total (MB)	Filesystem Used (MB)	% Used
KDC2K3SQL04	10.42.7.25	Windows 2003 Server	0	34726¶	25850¶	74
KDCD4PCMS04	10.30.12.20	Windows 2003 Server	417969	627499¶	424683¶	68
KDCD4PCMS05	10.30.12.21	Windows 2003 Server	244191	418864¶	122347¶	29
KDCD4PCMS06	10.30.12.23	Windows 2003 Server	139959	139953	63182	45
KDCD4PSUM01	10.42.2.136	Windows 2003 Server	69453	70451	61631	87
KDCDASM05[8]	10.41.128.108	Windows VMware	31769	31753	24992	79
KDCQVMIG03[8]	10.41.143.80	Windows VMware	20480	20466	8348	41
donner	204.63.58.50	HP-UX	0	1861982¶	432829¶	23
elara0	10.42.2.37	HP-UX	0	80719234¶	27823175¶	34
elara1	10.42.2.38	HP-UX	0	85125658¶	31011525¶	36
larissa	10.42.2.40	HP-UX	0	84678790¶	30025001¶	35
lino2	10.42.2.60	HP-UX	0	81775006¶	28121649¶	34
pianoman	204.63.58.9	HP-UX	0	4968218¶	2165702¶	44
sd2n2v4	10.7.8.172	HP-UX	207960	209440¶	139882¶	67

Questions/Discussion

Upcoming WebTech Seminars

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- **Upcoming Webcasts**
  - What's Next for Sustainable IT?, July 29, 2009, 9 a.m. PT
- **Please check www.hds.com/webtech for:**
  - Link to the recording, the presentation, and Qs&As (available next week)
  - Schedule and registration for upcoming WebTech sessions

Fall WebTech sessions to be announced in August.

Thank You