Hitachi Storage Economics

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Do More for Less with the Adaptable Modular Storage 2000 Family

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Reducing costs in your midrange storage environment can be as simple as choosing the right foundation. Operational efficiency, efficient utilization, and price-to-performance, are all key metrics in justifying a midrange investment. Attend this WebTech webinar to learn how Hitachi Adaptable Modular Storage 2000 family can drive down operational costs and improve storage utilization and efficiency.

You'll learn how to:

- Lower your total cost of ownership while improving performance
- Grow your midrange storage environment efficiently with increased utilization
- Get more from your assets: Automate and integrate with world-class enterprise storage systems.

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AGENDA

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- **Market View and Storage Economics Strategy**
  - Growth of Data
  - Common IT Challenges
  - Hitachi Storage Economics

- **Adaptable Modular Storage 2000 Family Introduction**
  - Overview
  - How AMS Measures Up

- **Adaptable Modular 2000 Family Economics**
  - Operational Efficiency
  - Efficient Utilization
  - Price and Performance
  - Other Considerations

- **Customer Proof Points**
  - Betonwerk Godelmann KG
  - SquareTwo Financial
  - Pixorial

- **Summary**

Information is fast becoming our most valuable corporate commodity and asset

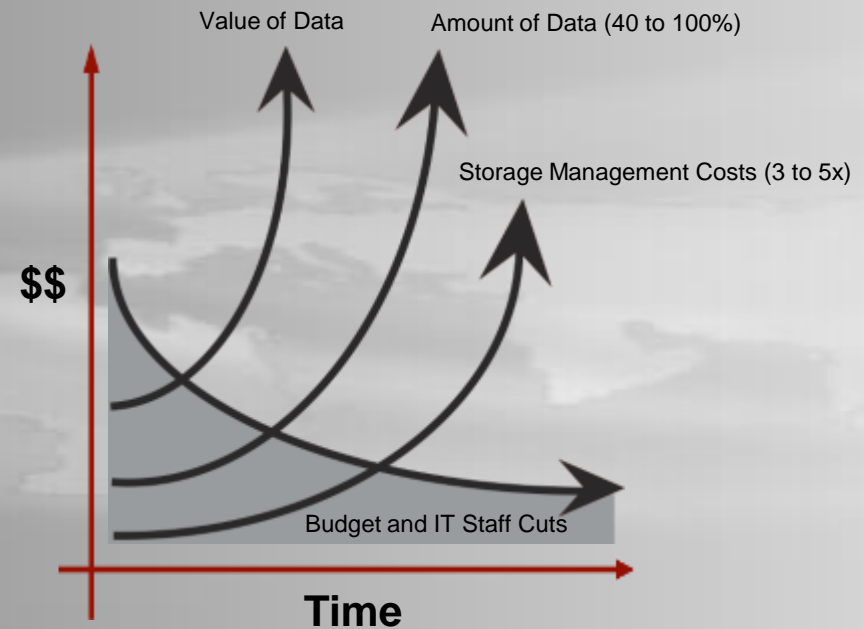Global economic conditions force businesses to grapple with multiple challenges

- Shrinking budgets

- Organizational change

- Increased competition

- Regulation, compliance and data management

- Power, cooling and limiting floor space

- Significant data growth

- Increased cost of managing data

- Inefficient (or old) storage architectures

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Managing Storage Is 60% of Storage Related Spending

- IDC estimates the annual cost to manage storage is about 60% of all enterprise storage-related spending

- Includes: software, power, cooling, administration personnel and services

Value of Data   Amount of Data (40 to 100%)

Storage Management Costs (3 to 5x)

$$

Budget and IT Staff Cuts

Time

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Cost of Acquisition

Total Cost of Ownership

- **Inefficient technologies magnify costs relative to shrinking budgets**
  - Impacts migrations, labor, maintenance costs, environmentals etc.
  - Becomes a growing percentage of your storage budget

- **The problem gets exponentially worse with data growth**
  - The relative cost of maintaining the "status quo" will increase over time

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- **Reduced total cost of ownership**
  - CAPEX and OPEX

- **Improved return on assets**
  - Higher utilization, lower IT spend

- **Improved productivity (lower OPEX)**
  - Single access point

- **Environmentally efficient platforms**
  - Reduced need for physical resources

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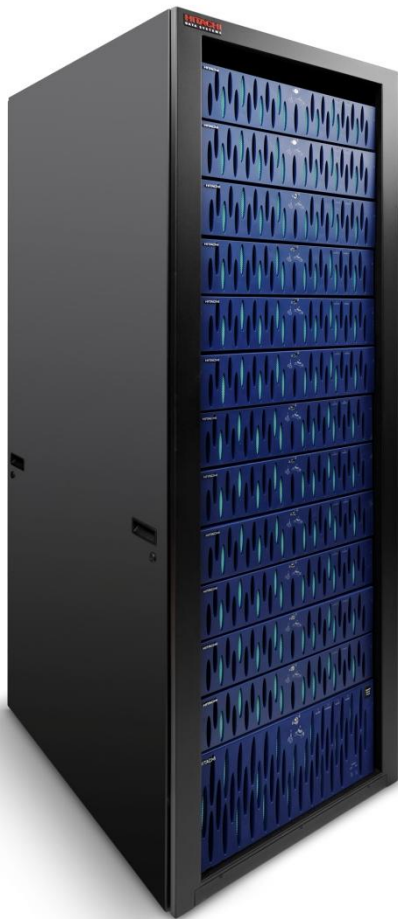 - How AMS Measures Up

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- Highly reliable midrange storage systems that provide for medium, large or enterprise organizations
  - 99.999% data reliability
- Extensive scalability, cost-effective performance and elegant simplicity
- Automation of many complex and time-consuming tasks typically associated with storage management
- Integration with Hitachi Data Systems enterprise class management suite, Hitachi Command Suite
  - Enables administrative and operational efficiencies not available on other modular storage offerings
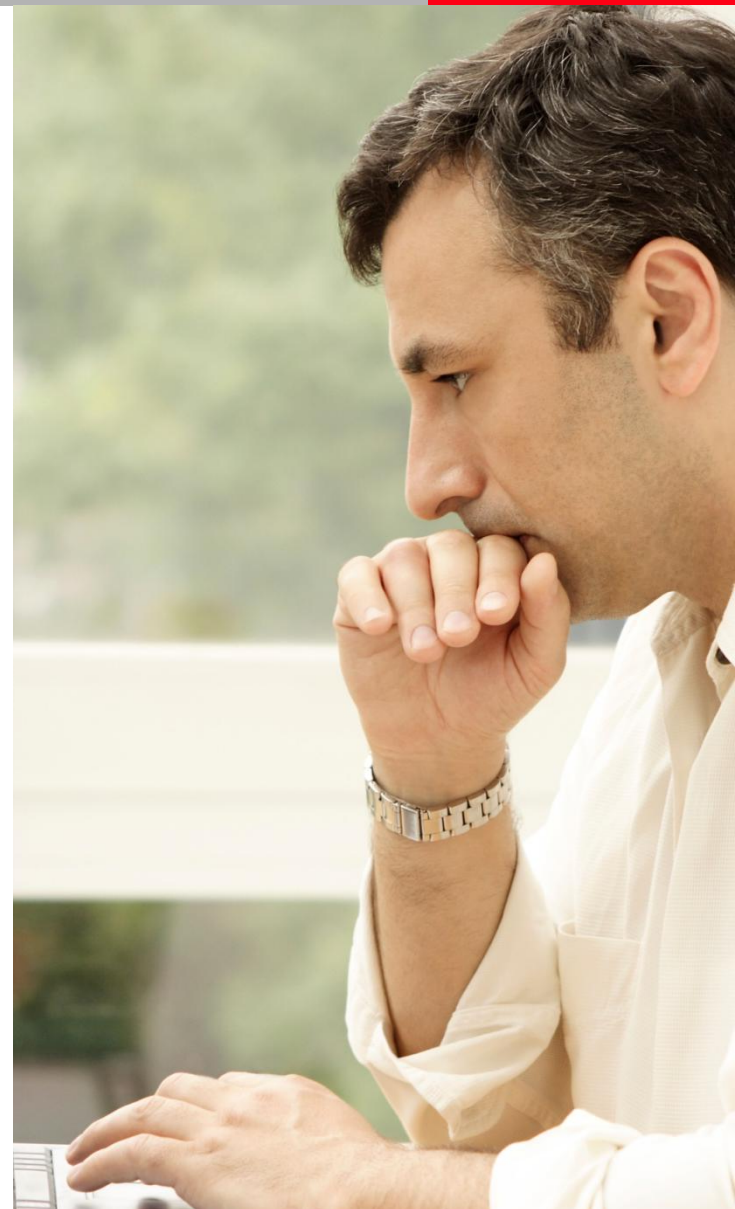
Adaptable Modular Storage 2000 family offers customers superior return on investment

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Top Reasons Customers Purchase the Adaptable Modular Storage 2000 Family*:

- Lower operational expenses (63%)
- Higher reliability (57%)
- Faster performance (54%)
- Better design features (46%)

*TechValidate Survey of Hitachi Adaptable Modular Storage Users

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Adaptable Modular Storage 2000 Systems:

- Improve return on assets (ROA) and return on investment (ROI)

- Reduce total cost of ownership (TCO)

- Minimize capital expenses (CAPEX) and operating expenses (OPEX)

By Focusing on These Main Areas:

- Reduced operating expense through efficiency

- Improved return on asset through increased utilization

- Investment protection with leading price/performance ratio

- Other cost savings and TCO reduction considerations

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Reduce Operating Expenses with Dynamic Load Balancing Controllers to Automatically Balance I/O Workloads

- Higher Performance (reduced OPEX)
    - Reduce controller bottlenecks automatically
    - Ensure performance SLAs are met without manual intervention

- Simplified Management (reduced OPEX)
    - Simplified LUN management
    - Nondisruptive microcode updates
    - Reduced configuration/diagnosis time

- Scalability (reduced CAPEX and OPEX)
    - Automation leads to efficiency as infrastructure grows
    - Save on administrative operating expenses as physical growth management is minimized

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Driving Operational Efficiency

Hitachi Command Suite Helps Reduce Operating Expenses by Simplifying Storage Administration Activities and Improves Productivity

- Reduced administrative time
  - Reduce time provisioning storage with use case oriented operation
  - Reduced time with batch execution – multiple commands executed simultaneously
- Improved workflow management
  - Lower operating costs by employing improved workflow – common tasks are simplified and reduce steps and "clicks"
- Comprehensive business monitoring
  - Customizable business views allows administrators to reduce costly analysis time

How hard do your storage assets work for you?
Hitachi Dynamic Load Balancing Controller and Hitachi Command Suite improve return on assets (ROA) and reduce total cost of ownership (TCO)

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Reduce CAPEX, OPEX and Improve Performance with Dynamic Provisioning for AMS 2000 Family

- Improved utilization efficiency rate
  - Improve utilization from 25% to over 65% (ROA)
  - Delay additional storage purchases (CAPEX)
  - Reduce overall storage requirements (storage "appetite")

- Improved business agility
  - Reduced storage provisioning time = reduced application downtime (reduced OPEX)
  - Reduced administrative costs

- Improved performance
  - Wide striping of data reduces disk "hot spots"
  - Administrators spend less time tuning for performance (reduced OPEX)

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AMS Allows Administrators to Purchase the Right Level of Storage Performance at the Right Price – Reducing TCO

- Support business growth
  - Scalability without performance impact or additional management requirements
  - Linear scalability of capacity AND performance
  - Buy what you need when you need it without worrying about new administrative overhead
  - No need to purchase extra processing power to offset performance degradation
- Investment protection
  - Flexibility and enormous bandwidth of the AMS 2000 SAS architecture delivers the highest performance of any midrange storage system
    - Full SPC-1 benchmark report available at: www.storageperformance.org/results
  - Performance scales with capacity and administrators will spend less time tuning their systems to remove backend bottlenecks

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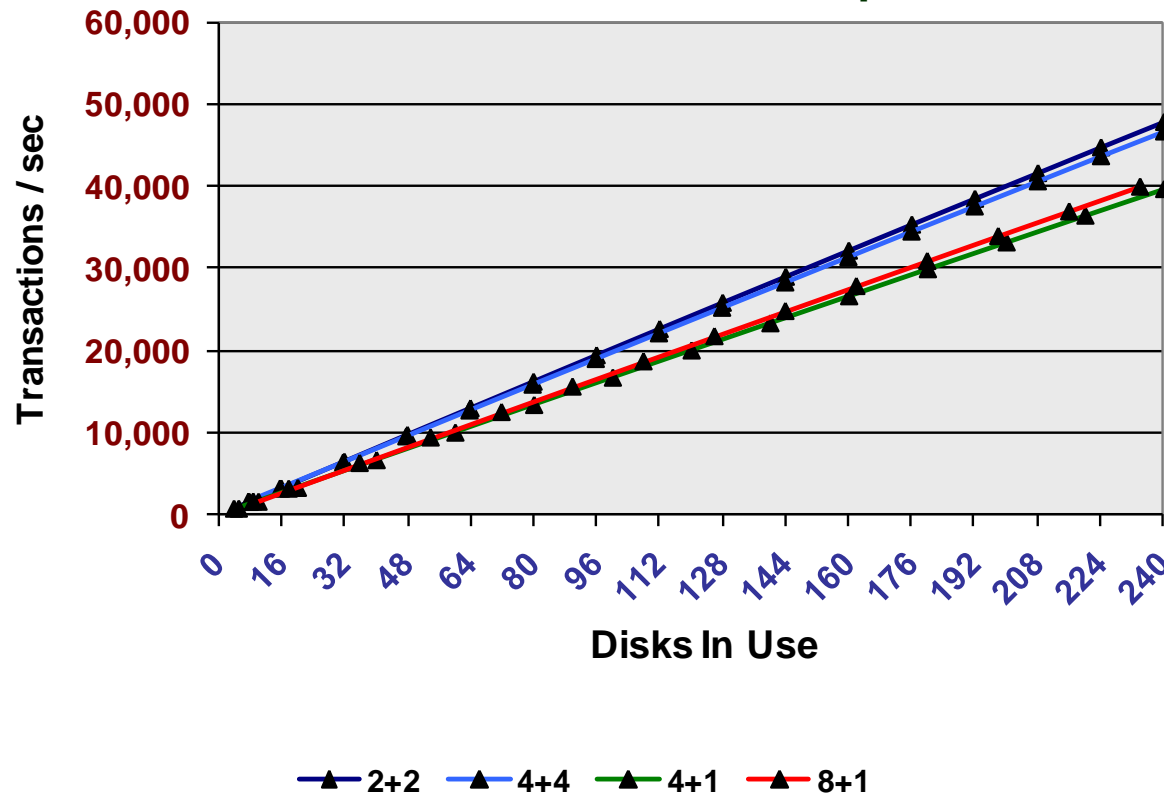
Figure 1. The linear relationship between capacity and performance

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Model	Hitachi Data Systems			IBM			NetApp
	AMS 2100	AMS 2300	AMS 2500	DS5020	DS5300	V7000	FAS3170
Controller Type	Symmetric	Symmetric	Symmetric	Asymmetric	Asymmetric	Asymmetric	Asymmetric
SPC-1 IOPS	31,498.58	42,502.61	89,491.81	26,090.03	62,243.63	56,210.85	60,515.34
Price/Performance	$5.85/IOP	$6.96/IOP	$6.71/IOP	$7.49/IOP	$11.76/IOP	$7.24/IOP	$10.01/IOP
SPC-1 Sustainability Rate (Throughput MB/s)	258MB/s	350MB/s	735MB/s	214MB/s	511MB/s	463MB/s	497MB/s
Average Response Time (50% Load Point)	2.67ms	2.70ms	2.88ms	3.91ms	2.95ms	4.19ms	4.16ms
Average Response Time (80% Load Point)	4.80ms	4.05ms	5.02ms	6.64ms	4.41ms	6,74ms	7.51ms
Average Response Time (100% Load Point)	8.15ms	6.33ms	8.98ms	10.49ms	14.37ms	10.8ms	20.8ms

SPC-1 Benchmark shows the Hitachi Adaptable Modular Storage 2000 systems outperform comparable products from HP, IBM, NetApp and EMC

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Further Options for Reducing Total Cost of Ownership (TCO) with the AMS 2000 Family

- Dense storage solution
  - Reduce storage footprint (OPEX and CAPEX) by enabling high density storage media

- Consolidation
  - Replace multiple systems with a single system from the AMS 2000 family – eliminate OPEX associated with these older systems and provide a rapid ROI

- Energy savings
  - Reduce power and cooling with AMS through host-based execution of spin-up and spin-down commands for designated disk drives to instantly reduce power consumption and the amount of heat dissipated into the data center

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Problem:

- Existing storage could no longer guarantee enterprise applications (ERP and Exchange) reliability
- Backup windows extending beyond appropriate schedule into production hours
- Data center space extremely limited

Solution

- Hitachi Adaptable Modular Storage 2100 paved way for data center transformation
- Performance and availability optimized through Hitachi Dynamic Load Balancing Controller technology in AMS – reduced OPEX
- Virtualization through VMware integration
- Cost effectively managed storage tiers by intermixing drive technology – Drove down average cost of tiers
  - Active data on SAS
 - Backup on SATA

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Problem:

- Significant data growth causing infrastructure inefficiency and instability
- Decentralized environment made for high operating costs

Solution

- Hitachi Adaptable Modular Storage 2500 and Hitachi NAS Platform 3100, powered by BlueArc®
- Centralized single-pane management of SAN and storage architecture – reduced administrative expense
- Dynamic Provisioning to improve application availability and storage utilization rates – defer short term purchases
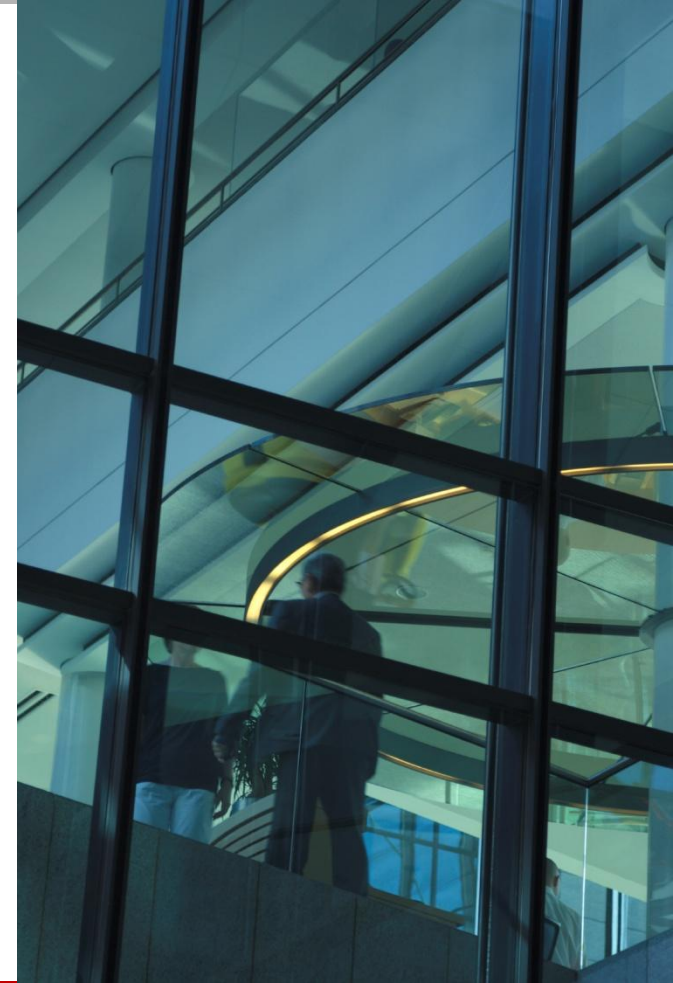
"We can provision a brand new box, with cabling, in less than an hour, and provide systems with high availability, high performance disk in a short amount of time."
– Ken Vandenbark, vice president of IT operations and engineering at SquareTwo Financial

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Problem

- Data growth coupled with need to optimize digital workflow and accommodate throughput needs of network topology

Solution

- Hitachi Adaptable Modular Storage 2500 to meet demands for high availability, performance, scalability and data protection with a modular, cost-effective footprint that reduces space, energy and management concerns

- SAS drives to optimize performance and house an entire cloud infrastructure

- Uses business cost model to measure cost per gigabyte based on account subscriptions – enables company to exploit cost efficiencies at every turn, while still providing fast, easy customer offerings

"We wanted to maximize footprint cost efficiency and performance. Hitachi Adaptable Modular Storage 2500 with high-density expansion trays combined with the high-performance NAS cluster will help decrease overall costs per gigabyte per square foot."
– Joshua Terry, director of systems engineering at Pixorial

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Technical Feature	Cost Saving
Symmetric active-active controller	Reduces operating expenses with simplified storage administration and improved performance
Dynamic load balancing	Reduces operating expenses by resolving performance bottlenecks and providing support for large workloads
Hitachi Command Suite	Reduces operating expenses by reducing administrative management effort and improving system usability
Hitachi Dynamic Provisioning	Helps reduce capital expenses by improving storage utilization
SAS architecture	Provides investment protection: Best price/performance ratio due to lower average cost of storage tiers
High density storage	Reduces storage footprint and datacenter operating expenses by doing more in the same space

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Questions and Discussion

Upcoming WebTech Sessions

March

- *Business Case for VAAI*, March 9, 2011 at 9am PT, 12pm ET

- *How to Deliver Efficient IT to Remote and Cloud Users*, March 16, 2011 at 9am PT, 12pm ET

- *The Six Points of VMware Integration*, March 23, 2011 at 9am PT, 12pm ET

- *Snapshot-based Backup and Data Protection*, March 30, 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

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