



The Marks & Spencer Solution

HDS Reseller Academy

HDS Sefton Park

09 July 2009

Matthew Yeager

Practice Leader, Data Storage and Protection

M&S had a problem ...



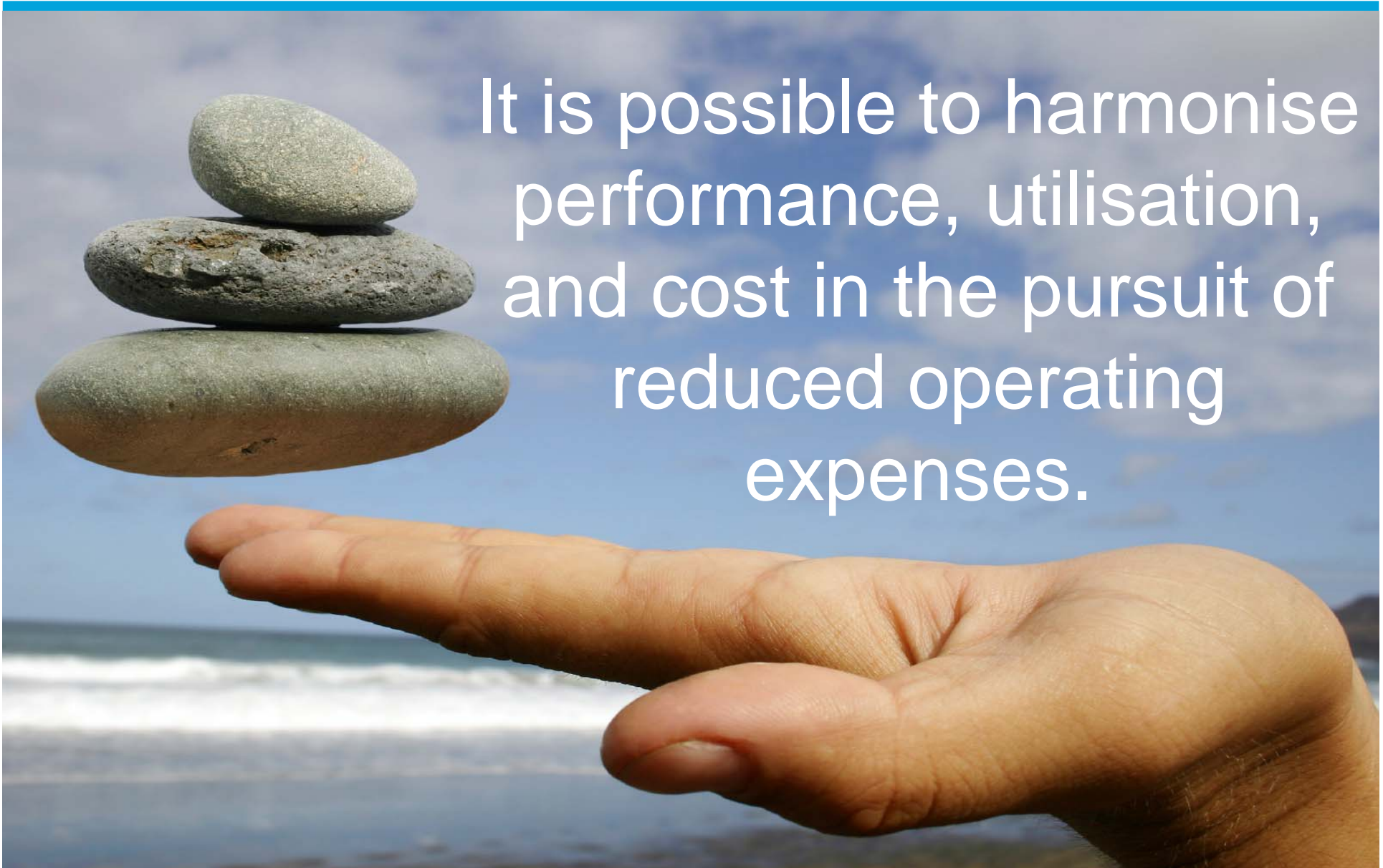
... which frankly wasn't a unique problem.



This was our solution.



It is possible to harmonise performance, utilisation, and cost in the pursuit of reduced operating expenses.



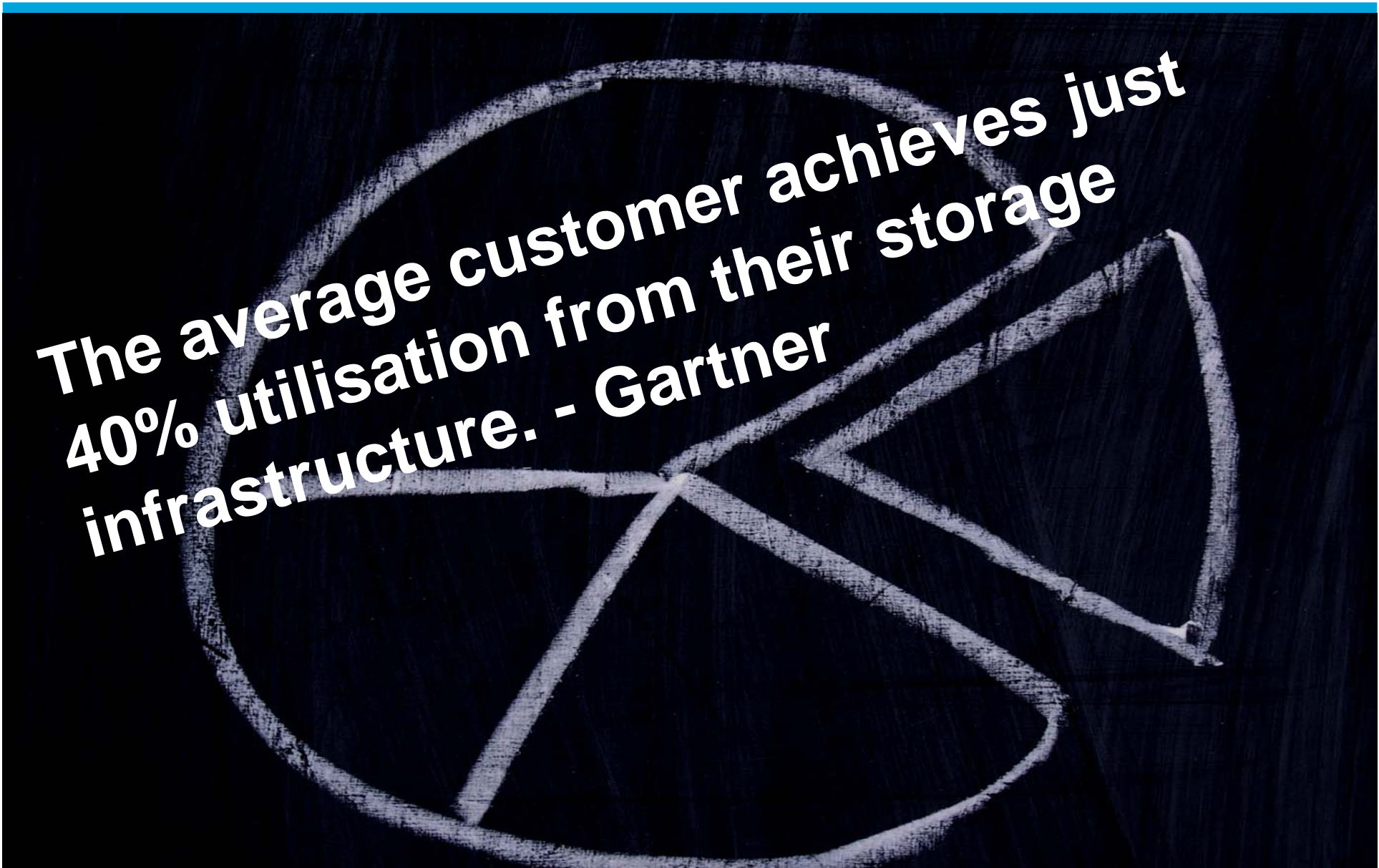
The underlying issues, however ...



When calculating the total cost of ownership, only 30% is acquisition; better than 70% TCO is comprised of operating expenditure.

- IDC

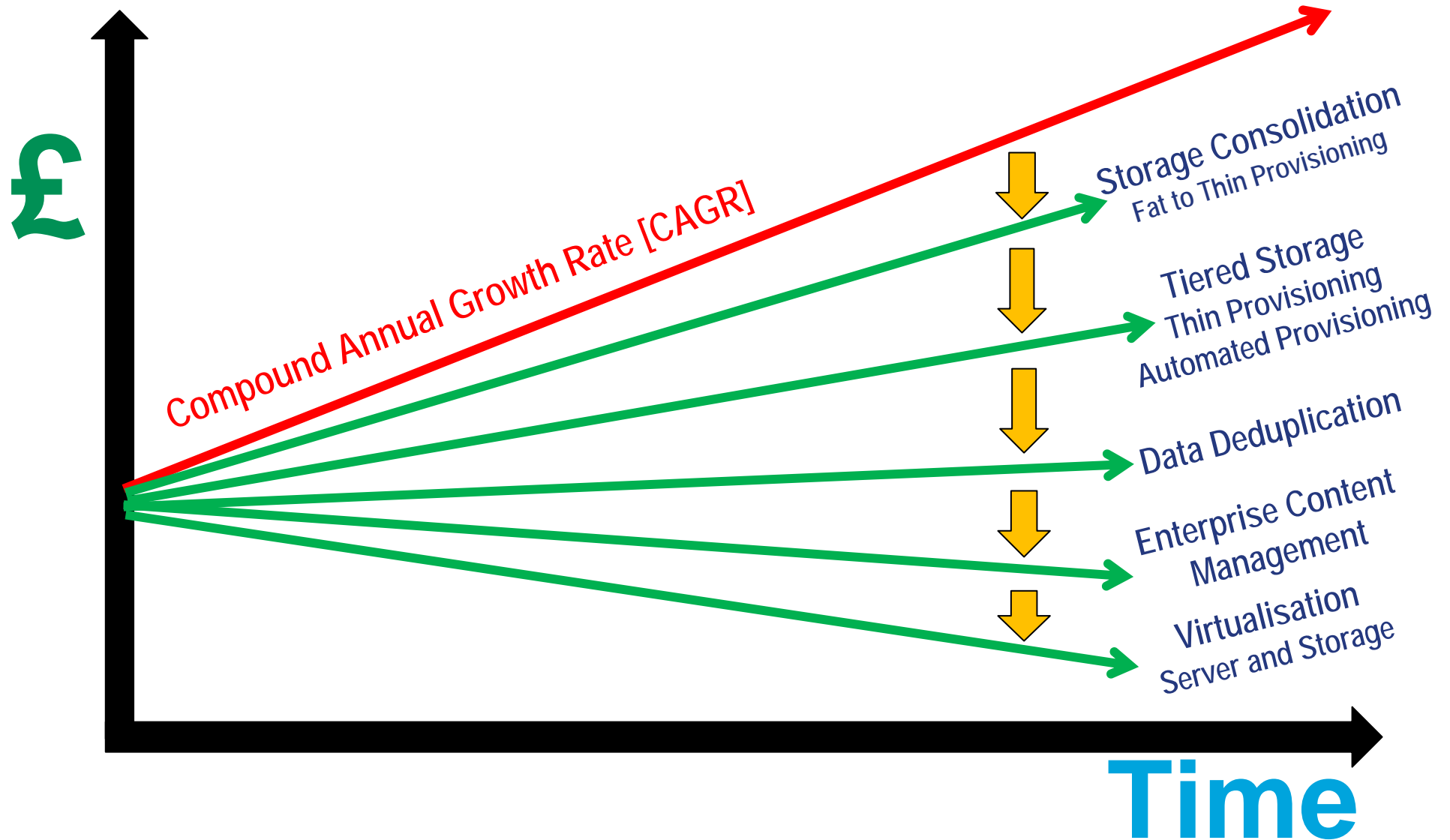
... and no one had told them this, either.



| Our Approach

Computacenter Storage Strategy

CAPEX Avoidance / OPEX Reduction



The Solution

Storage management without data mobility can be complex



... largely manual ...



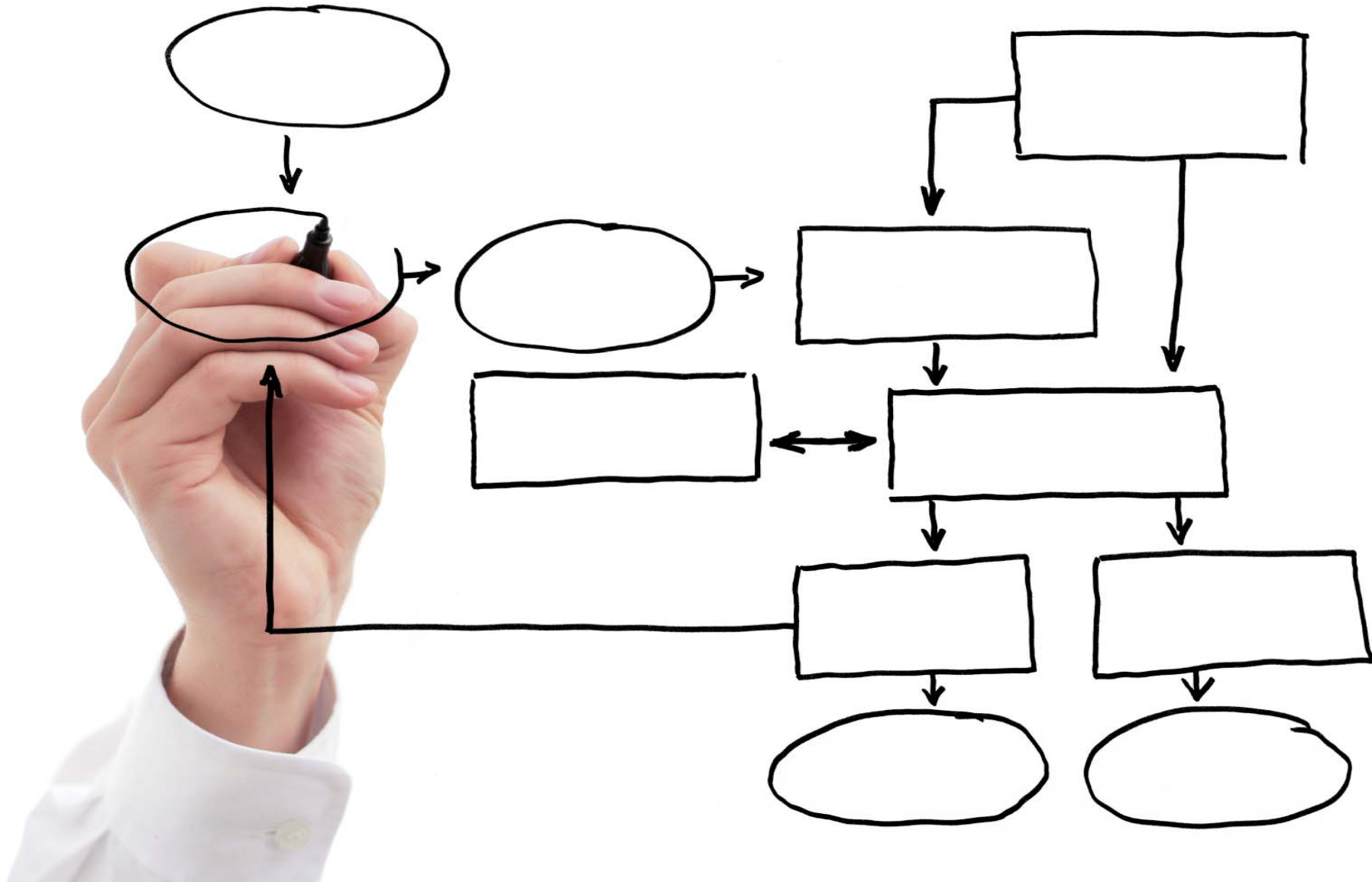
... and terribly inefficient.



So why would you keep just buying more of these?!



We firstly mapped what the data was ...



... knowing all data is just, well ...

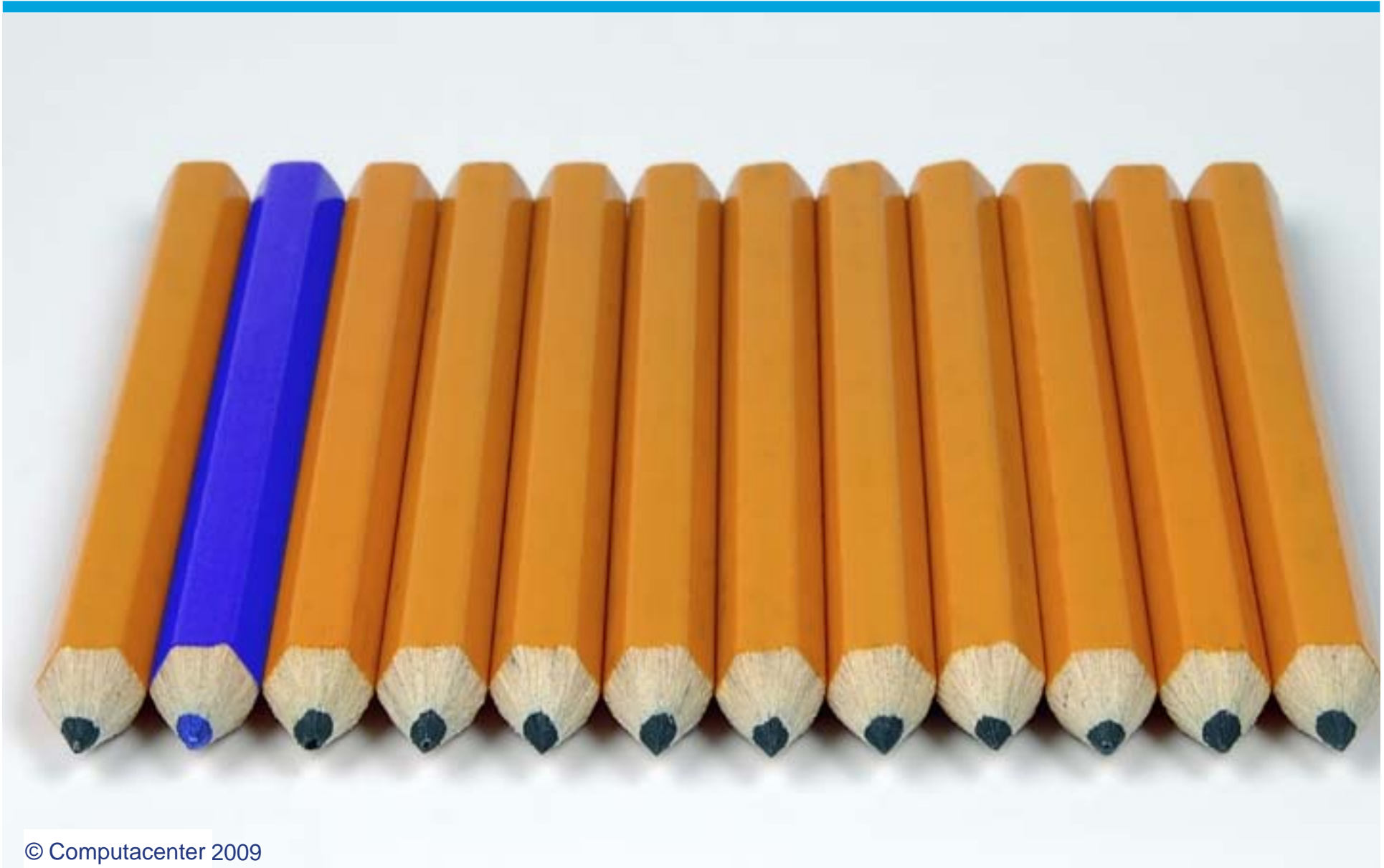


Zero Page Reclamation

Fat to Thin Provisioning Migration



... and thin provisioning.



M&S Solution



Computacenter presented **seven available options** to M&S and helped them to understand why the **HDS solution** was the most viable through composite scoring method.

HDS USPV to provide **40TB** to satisfy immediate storage requirements.

Added benefit of **storage virtualisation** to introduce data mobility and low impact data migrations.

Low impact data migrations will allow the previously non-performant DMXs to be reconfigured and the BIN files updated with minimal disruption to the production business.

HDS AMS and **HCAP** 'pull through' once we had got past the danger zone.

Recent Zero Page Reclaim [ZPR] job migrated a 6TB test volume to a 3.3TB thin provisioned volume amounting to a better than **£25k savings** in disk cost.

Thank You



Sales Track



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real potential

Making the most of our partner programme

IT Culture & Storage Economics
Tony Reid, UK Services Director

- Behind the technology and the solutions

- Some history

- A Service Lead view

- Adoption



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real potential

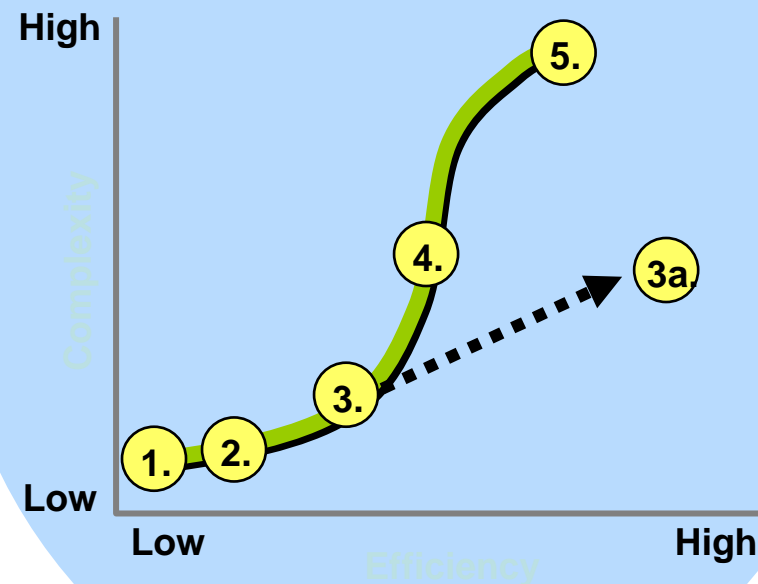
Making the most of our partner programme

Some History

Source: Meta Group – 2000

1. Random server proliferation:
Highly inefficient
2. Physical co-location of systems
(e.g., server and storage)
3. Storage consolidation
- 3a. “Legacy” consolidation of
smaller applications
4. Like-workload consolidation
5. Last and bravest choice:
Mixed workload consolidation

Server Consolidation Decision Points



- Storage Consolidation
- Started with the big multiplatform box
- Lowest platform denominator availability



- **Building a single storage management team**



- Storage Networking
- Next wave of storage consolidation
- Enable early tiered storage concepts
 - Through infrastructure components
 - Through differing storage costs
- **Adoption of Charge Back policies**



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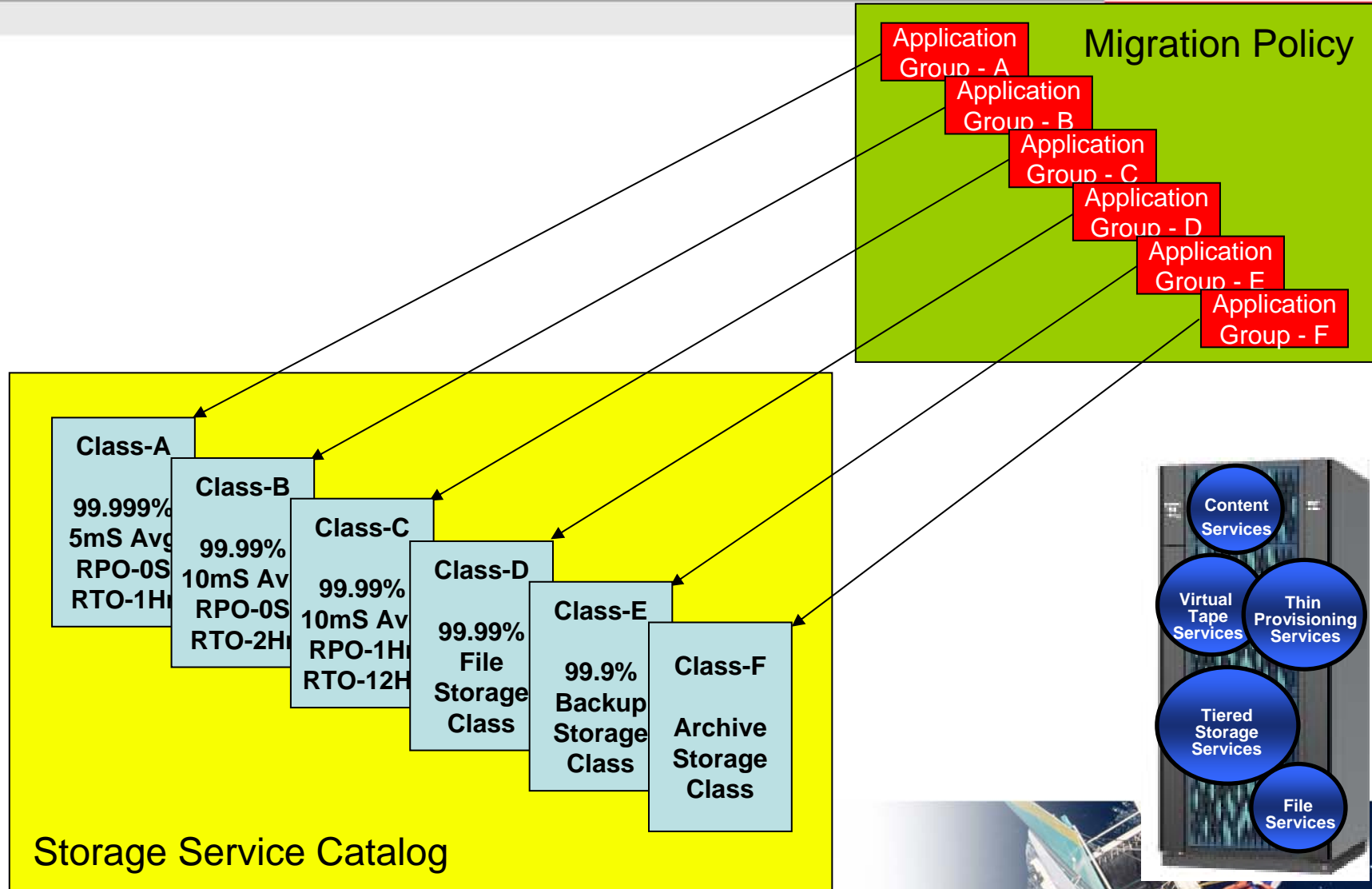
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What's Next

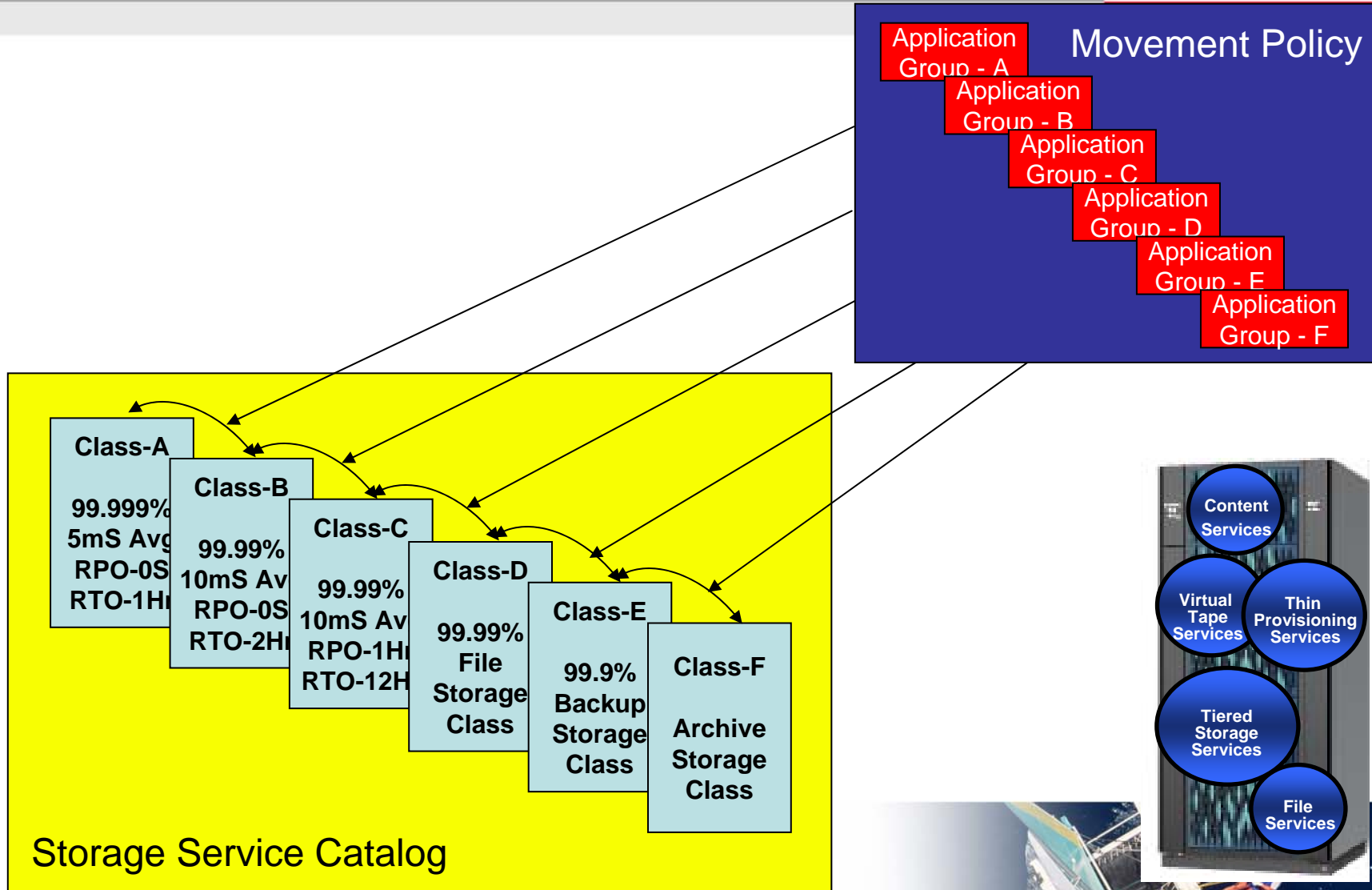
Service Oriented Storage

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Service Oriented Storage

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- How do we deliver storage as a service
 - Technology is ready and in use now
 - True SERVICE catalog skills exist today
 - Design
 - Implementation
 - Management



- But – how do you Charge Back



- ‘Contract’ to deliver Service Levels
- Use the Service Catalog
- Account for the risk
 - Technical
 - Commercial



- Explore the service lead opportunity
 - Don't expect immediate acceptance
- Utilise the technology and solutions now
 - Commercial benefits are too compelling not to
- What can HDS do to help
 - We are experts



Thank you



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real potential

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Modular Solutions

Rupinder Brar, UK & IR Modular Business & Partner Manager

David Parker, Territory Account Manager

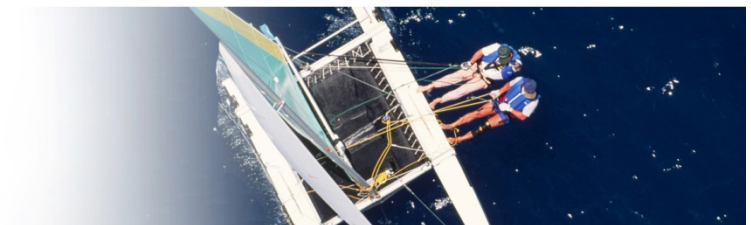
HDS UK Partner Day 2009

Modular Solutions

Thursday 9th July 2009

Rupinder Brar

UK&I Modular Business & Key Partner Manager



- HDS Modular Solutions
 - Sales & Marketing support
 - Qualification questions
 - Applications Solution Sales tools
 - The Proof - *“What the papers say”...*
 - HDS Partner & Customer rewards – modular promotions
- David Parker – UK Sales Account Manager
 - Putting it into practice
- Q & A / Discussion



Sales Tools; Opportunity Qualification Questions

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Application		
QUESTION	LOOK FOR	HOW TO USE THE INFORMATION
What applications will be connected to the storage system?	Databases (Oracle/SQL/Access/Sybase) and OLTP (Online transaction processing) Email (e.g. Microsoft Exchange, Lotus Notes) Unstructured data (e.g. document files, spreadsheets, images, web pages, etc.). Typically accounts for 80% of the data in an organization today.	Performance is the key criteria for storage systems. The design requires: (1) large cache, (2) multiple drives to spread the load, (3) multiple ports to maximise throughput to the servers).
Operational Efficiency		
QUESTION	LOOK FOR	HOW TO USE THE INFORMATION
Are you interested in reducing your operational costs?		The capital cost (product cost) is typically just 20-25% of the storage Total Cost of Ownership. The remaining 75-80% is operational cost. The unique design of the AMS2000 can help reduce the operational cost. Reduced labour cost (storage admin): load balancing is automatic (handled by the Active-Active symmetric controller) so no effort is required to maintain performance. Set-up costs are dramatically reduced (particularly in a VMware environment) because the AMS2000 eliminates the normal labour-intensive mid-range practice of "LUN ownership". Reduced software license cost: No additional path management software is required because the AMS2000 supports the native Operating System multi-pathing. Reduced power consumption cost (see below).
Do you require a performance environment?	These are usually Database, Email and also File-based applications.	
Is space in your datacentre critical?	Space savings = cost savings Some hosting companies charge up to €5000 per "tie" in datacentres.	High density trays provide 48TB capacity in one disk tray and up to 432TB in one Rack(2). This capacity will be doubled when high capacity drives are announced. (2) Dependent on maintenance facilities at the customer site and power consumption limitation in a rack, the total amount per rack could be reduced to 240TB.
Are savings from lower power consumption important to you?		Power Saving software and associated implementation services are available for AMS2000. Also AMS2000 SATA II drives automatically park the drive heads to save consumption and heat. This characteristic is provided by default in our SATA II drives with no additional cost or set-up time for the customer. - Our systems have passed several environmental tests and regulations. The regulatory information is available on request. Additionally, HDS has won the 2008 "Eco-Responsibility" Award with the AMS2500.
Are you able to monitor capacity utilisation?	To measure efficiency and identify when capacity upgrades are required.	HDS offers a number of tools and strategies to help customers reduce costs by making more efficient use of their HDS (and non-HDS) storage assets. One such tool is Hitachi Storage Capacity Reporter (HSCR). It's easy to install and use, and provides the customer with the necessary information regarding storage utilization across their HDS and heterogeneous storage environment.

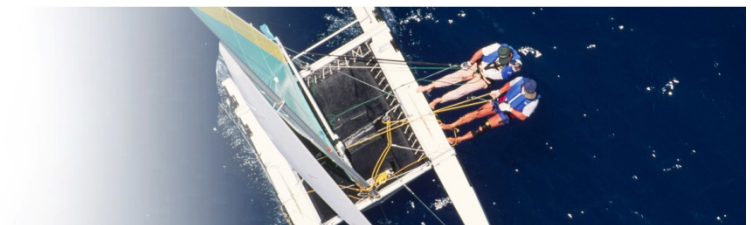
Infrastructure		
QUESTION	LOOK FOR	HOW TO USE THE INFORMATION
Is your environment virtualised?	Server Virtualisation (e.g. VMware or Microsoft Hyper-V)	OLTP and Email applications are often the ones customers select to run in a virtualised environment, so the application-specific guidance above applies.
Do you require a tiered storage environment?	Storage Virtualisation Assignment of different categories of data to different classes of storage to reduce cost whilst meeting performance and availability goals.	
Is High Availability a requirement for this system?	7x24 application availability Demanding Service Level Agreements (SLAs). Concern about cost of outages.	
Backup & Archiving		
QUESTION	LOOK FOR	HOW TO USE THE INFORMATION
Are you aware that HDS provides archiving solutions?	Archiving	Archiving solutions from HDS enables long term preservation, optimisation and discovery of business critical digital unstructured content. Hitachi's solution is based on the AMS2000 storage systems with data management capabilities provided by a combination of the Hitachi Content Archive Platform software and ISV-provided software (e.g. Symantec Enterprise Vault).
Are there any particular content types (email, documents, images, etc.) that you are required to archive?	Businesses need to access archived content for many reasons including regulatory or legal discovery purposes, normal operations, and even decision support and business intelligence purposes	The Hitachi Content Archive Platform is a highly scalable and open standards-based solution for long-term content preservation and high-performance access. It serves as a common platform for archiving all types of content, while enabling easy searches and immediate content discovery and retrieval when needed.
Do you require off-site replication?	Easy management is key for small and midsize customers. Replication can be server based or storage based. Backup windows will define any additional solution you should consider.	Hitachi Replication Manager software provides management of Business Continuity and Disaster Recovery environments (in-system or off-site replication). Synchronous and asynchronous copy, cloning and snapshot are all available with the AMS2000. Depending on the solution, more capacity will be required or an additional system for a remote site. The type of solution will depend on the application to be replicated, the backup windows, RPO and RTO (Recovery Point Objective / Recovery Time Objective). Please review the following HDS white papers: <ul style="list-style-type: none"> - Protecting AMS2000 and Exchange environment with Continuous Replication - Replication solutions for Hitachi Modular systems - Optimized backup and recovery for Oracle databases.
Do you want to use it for backup?		The AMS2000 configured with SATA drives is ideal for disk-to-disk backup or disk-to-disk-to-tape. All server-based backup applications like Hitachi Data Protection Suite and Symantec Backup Exec, as well as VTL applications etc. can use AMS2000 capacity. Also some products can be easily integrated with pre and post scripting to work seamlessly with AMS2000 cloning or snapshot solutions (Hitachi Shadow Image and Copy-on-Write).



Sales Tools; AMS Application Solutions

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Customer concern:	Using a reliable and highly available application platform that is easily scalable		
Solution areas:	Exchange	Oracle/SQL Databases	VMware
What HDS offers:	Proven deployment and management of storage that is easily scalable to meet escalating demands in running Exchange and Database environments		Easy to configure storage for Server Farms . SRM integration. Superior ESX multipathing.
Running on:	Adaptable Modular Storage 2100, 2300 and 2500		
And supported by:	Reference Architectures, Best Practices, Deployment Guides, Monitoring and Managing Guides		



AMS2000 Recommended Configurations for Exchange 2007

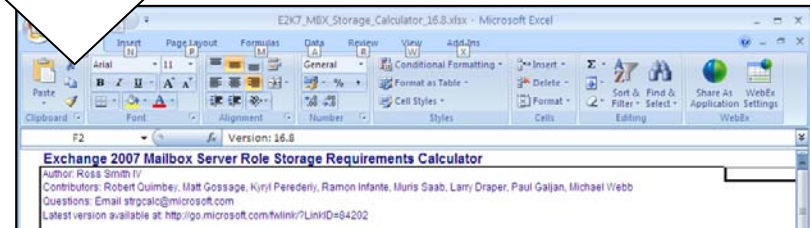


	400 Mailbox	1,000 Mailbox	2,000 Mailbox	3,000 Mailbox	5,000 Mailbox	7,000 Mailbox	9,000 Mailbox	10,000 Mailbox
Mailbox	AWA120	AWA120	AWA120	AWA120	AWA120	AWA120	AWA120	AWA120
Mail Capacity	24 TB	24 TB	24 TB	24 TB	24 TB	24 TB	24 TB	24 TB
Cache Capacity	24 TB	24 TB	24 TB	24 TB	24 TB	24 TB	24 TB	24 TB
Cache Type	AWA120	AWA120	AWA120	AWA120	AWA120	AWA120	AWA120	AWA120
Total Cache Capacity	24 TB	24 TB	24 TB	24 TB	24 TB	24 TB	24 TB	24 TB

**Pre-defined Exchange Packages:
To open discussion with
a tangible offering**

Microsoft & HDS Sizing Tools

• For tailored configurations



Hitachi Adaptable Modular Storage 2000 Family Sizer for Microsoft® Exchange Server 2007

- 1 Enter the Output from Microsoft's Exchange Calculator
- 2 Define Configuration for the Exchange Database
- 3 Define Configuration for the Exchange Logs
- 4 Define Configuration for the Maintenance/Restore LUNs
- 5 Review System Configuration Recommendations

Enter the output from Microsoft's Exchange 2007 Mailbox Storage Calculator. Enter the values from the "Storage Requirements" worksheet found at the bottom of column C. Plus 2 other parameters from the "Input" worksheet.

Select the drive and drive combination and specify an acceptable capacity Utilization. In making your drive/RAID type selection consider the drive costs. The optimum solution is one that balances an acceptable Utilization with an acceptably priced solution (i.e. neither too under or over specified).

Select the Drive Type, RAID Type and Drive Combination. The sizer will calculate the drive quantity required to meet the performance and capacity requirement.

Select the Drive Type, RAID Type and Drive Combination. Given the Maintenance/Restore LUN requirement is purely capacity-bound, for cost effectiveness only a RAID-5 option is provided.

AMS2000 Recommended Configurations for Exchange 2007

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	400 Mailbox ¹	1,000 Mailbox	2,000 Mailbox	3,000 Mailbox	5,000 Mailbox	7,000 Mailbox	9,000 Mailbox	10,000 Mailbox
Overview								
Model	AMS2100	AMS2100	AMS2100	AMS2100	AMS2100	AMS 2100/2300	AMS2300	AMS2300
Raw Capacity	7.3TB	10.8TB	17TB	23.1TB	30.5TB	50.4TB	62.3TB	75.4TB
Usable Capacity	3.9TB	5.4TB	8.1TB	11.4TB	19.7TB	24.5TB	29.8TB	37.9TB
Drive Type	450GB/1TB	450GB/1TB	450GB/1TB	450GB/1TB	450GB/1TB	450GB/1TB	450GB/1TB	450GB/1TB
Total Drive Quantity	15	23	37	50	83	108	136	157
System Design								
Db								
Drive Type & RAID Level	450GB SAS – RAID 1+0	450GB SAS – RAID 1+0	450GB SAS – RAID 1+0	450GB SAS – RAID 1+0	450GB SAS – RAID 1+0	450GB SAS – RAID 1+0	450GB SAS – RAID 1+0	450GB SAS – RAID 1+0
Configuration	2 RAID Groups (2D+2D) 5 DB LUNs (135GB each)	4 RAID Groups (2D+2D) 11 DB LUNs (154GB each)	7 RAID Groups (2D+2D) 24 DB LUNs (140GB each)	10 RAID Groups (2D+2D) 33 DB LUNs (154GB each)	16 RAID Groups (2D+2D) 56 DB LUNs (150GB each)	22 RAID Groups (2D+2D) 80 DB LUNs (148GB each)	28 RAID Groups (2D+2D) 102 DB LUNs (150GB each)	31 RAID Groups (2D+2D) 112 DB LUNs (150GB each)
Logs								
Drive & RAID Level	450GB SAS – RAID 1	450GB SAS – RAID 1	450GB SAS – RAID 1	450GB SAS – RAID 1+0	450GB SAS – RAID 1+0	450GB SAS – RAID 1+0	450GB SAS – RAID 1+0	450GB SAS – RAID 1+0
Drive Combination & Design	1 RAID Group (1D+1P) 5 Log LUNs (12GB each)	1 RAID Group (1D+1P) 11 Log LUNs (14GB each)	2 RAID Groups (1D+1P) 24 Log LUNs (12GB each)	1 RAID Groups (2D+2D) 33 Log LUNs (14GB each)	2 RAID Groups (2D+2D) 56 Log LUNs (13GB each)	2 RAID Groups (2D+2D) 80 Log LUNs (13GB each)	3 RAID Groups (2D+2D) 102 Log LUNs (13GB each)	3 RAID Groups (2D+2D) 112 Log LUNs (13GB each)
Restore LUN								
Drive & RAID Level	1TB SATA – RAID 5	1TB SATA – RAID 5	1TB SATA – RAID 5	1TB SATA – RAID 5	1TB SATA – RAID 5	1TB SATA – RAID 5	1TB SATA – RAID 5	1TB SATA – RAID 5
Drive Combination & Design	1 RAID Group (2D+1P) Restore LUN size: 140GB	1 RAID Group (2D+1P) Restore LUN size: 638GB	1 RAID Group (2D+1P) Restore LUN size: 1754GB	1 RAID Group (3D+1P) Restore LUN size: 1913GB	2 RAID Groups (3D+1P) Restore LUN size: 2871GB	2 RAID Groups (3D+1P) Restore LUN size: 3099GB	2 RAID Groups (3D+1P) Restore LUN size: 4642GB	4 RAID Groups (3D+1P) Restore LUN size: 8709GB
Spare Drive Quantity	2	2	2					
What to Order								
Drives	11 x 450GB SAS 4 x 1TB SATA	19 x 450GB SAS 4 x 1TB SATA	33 x 450GB SAS 4 x 1TB SATA					
Ports	4 FC ports	4 FC ports	4 FC ports					
Cache	4GB	4GB	4GB					
Software	Device Manager	Device Manager	Device Manager					
Price								

Notes

- The configurations are based on typical Exchange environments, using Microsoft's "Exchange 2007 Mailbox Server Role Storage Requirements Calculator" and Hitachi Data Systems' "AMS2000 Simple Sizing Tool for Exchange 2007"
- Both the Exchange performance and capacity requirements are considered with the best practise guidance from Microsoft and lab testing by Hitachi Data Systems.
- Utilisation of each disk tray is optimised where possible.
- Configurations offer approx.75% capacity utilisation, allowing 25% for future growth
- The 400 Mailbox configuration is the minimum configuration given the RAID types used.
- Usable capacity is defined to "Base 2" (i.e. 1TB = 1024GB, not 1000GB).
- The designs assume the storage system will be used solely for Exchange.
- For 99.999% availability, ensure all drives are SAS (i.e. substitute the SATA drives used for the Restore LUN with SAS drives). Use the sizing tools referred to in note 11.

Pre-defined Exchange Packages

- **Open discussion** with a tangible offering
- Based on assumptions of Customers own Exchange environment
- **Next Steps: Engage Exchange specialist to review specific needs.**
- **Use Microsoft & HDS Tools**



Sales Tools; MS Exchange 2007 Storage Calculator

Exchange 2007 Mailbox Server Role Storage Requirements Calculator

Author: Ross Smith IV
Contributors: Robert Quimbey, Matt Gossage, Kyril Perederiy, Ramon Infante, Muris Saab, Larry Draper, Paul Galjan, Michael Webb
Questions: Email strgcalc@microsoft.com
Latest version available at: <http://go.microsoft.com/fwlink/?LinkID=84202>

Legal Information: This is provided "AS IS" with no warranties, and confers no rights. Use of this application is at your own risk.

Instructions: Fill in the blue variables. Choose the appropriate drop-downs for the red variables. The calculator is designed to be used for storage modeling purposes. Please consult with your storage architect during testing processes. The example configuration provided within this calculator is just that, an example.

Note1: This calculator assumes that the only role installed on the server is the Mailbox Server Role.
Note2: The calculated IOPS value has an accuracy of +/- 20% and does not include third-party applications.
Note3: If third-party applications/services will be utilized, please refer to the third-party manufacturer for details.
Note4: This calculator distributes the different tiers of mailboxes across each database (in other words, not all mailboxes are on the same database).
Note5: This calculator assumes that all source storage groups will be replicated to the SCR targets.

Storage Requirements Input Factors - Server Configuration

Step 1 - Please enter in the appropriate information for cells that are blue and choose the appropriate drop-downs for cells that are red concerning your server configuration.

Exchange Server Configuration	
Exchange Server 2007 Version	SP1+
Number of Exchange Mailbox Servers	1
High Availability Model	CCR
Content Indexing?	Enabled
Dedicated Maintenance / Restore LUN?	Yes
LUN Free Space Percentage	20%

Standby Continuous Replication Configuration	
Number of SCR Targets / Source Server	
SCR Target High Availability Configuration	
SCR Log Replay Delay (Seconds)	
SCR Log Truncation Delay (Seconds)	
SCR Recovery Point Objective (Hours)	

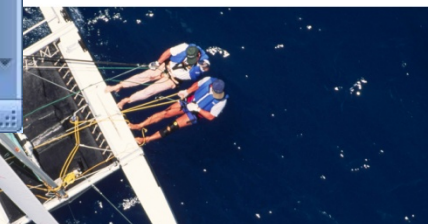
Exchange Data Configuration	

Database Configuration	

Navigation: Input | Storage Requirements | LUN Requirements | Backup Requirements | Log Replication Requirements

Microsoft Exchange 2007 Calculator

- MS recommended tool for Customers and VARs in designing Exchange environments.
- Input Customer's own parameters



Sales Tools; AMS Sizer for Exchange Server 2007

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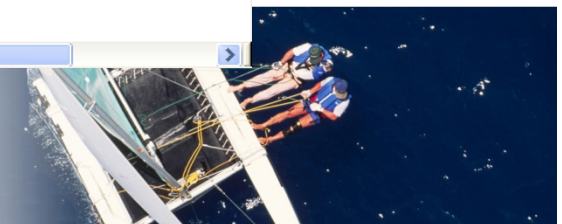
Hitachi Adaptable Modular Storage 2000 Family Sizer for Microsoft® Exchange Server 2007

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- 2** Define Configuration for the Exchange Database
Select the drive and drive combination (In making your drive/RAID type that balances an acceptable cost (under or over specified).
- 3** Define Configuration for the Exchange Logs
Select the Drive Type, RAID Type and quantity required to meet the requirements.
- 4** Define Configuration for the Maintenance/Restore LUNs
Select the Drive Type, RAID Type and Drive Combination. Given the Maintenance/Restore LUN requirement is purely capacity-bound, for cost effectiveness only a RAID-5 option is provided.
- 5** Review System Configuration Recommendations

HDS Sizer

- Cut & paste output from MS Calculator
- Select drive and RAID options
- Recommends the optimum configuration

Introduction Sizer



Sales Tools; Detailed Planning Guide

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Microsoft
GOLD CERTIFIED
Partner

Planning for Microsoft® Exchange Server 2007 Deployments on the Hitachi Adaptable Modular Storage 2000 Family

Reference Architecture and Best Practices Guide

By Rick Andersen, Patricia Bralley, Steven Burns (MCSE 2003 Messaging and Security, MCTP Exchange 2007) and Larry Meese

December 2008

Hitachi Storage Solutions

Hitachi Data Systems

36 Page Planning Guide

- Use with, or independently of, other sales tools
- Best practice guidance
- Reference Architecture
- Perfect for fully customised solutions

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Wake up to a **brighter future**
for your Exchange Server
environment.



Hitachi Storage Solutions for
Microsoft®
Exchange Server 2007

World-record performance, best-in-class price performance.
The ultimate in storage efficiency.

Hitachi Data Systems

Best in class SPC-1 Benchmark results




Model	Hitachi Data Systems			IBM			NetApp	EMC
	Adaptable Modular Storage 2100	Adaptable Modular Storage 2300	Adaptable Modular Storage 2500	DS4300	DS4800	DS5300	FAS3040	CX-3 Ultrastore 40
Controller Type	Active-Active	Active-Active	Active-Active	Active-Passive	Active-Passive	Active-Passive	Active-Passive	Active-Passive
SPC-1 IOPS	31,496.58	42,502.61	89,491.81	12,102.97	45,014.81	62,244.00	30,992.99	24,907.40
Price/Performance	\$5.85/SPC-1 IOPS	\$6.96/SPC-1 IOPS	\$6.71/SPC-1 IOPS	\$11.07/SPC-1 IOPS	\$13.94/SPC-1 IOPS	\$11.76/SPC-1 IOPS	\$13.58/SPC-1 IOPS	\$20.72/SPC-1 IOPS
SPC-1 Sustainability Rate (Throughput MB/s)	258MB/s	350MB/s	735MB/s	99.5MB/s	370MB/s	510MB/s	260MB/s	205MB/s
Average Response Time (10% Load Point)	1.83ms	1.88ms	2.10ms	2.07ms	2.15ms	1.75ms	2.86ms	4.34ms
Average Response Time (50% Load Point)	2.67ms	2.70ms	2.88ms	4.21ms	3.26ms	2.95ms	5.27ms	6.72ms
Average Response Time (80% Load Point)	4.80ms	4.05ms	5.02ms	7.96ms	5.24ms	4.41ms	9.65ms	11.79ms
Average Response Time (100% Load Point)	8.15ms	6.33ms	8.98ms	21.00ms	15.30ms	14.37ms	22.32ms	24.12ms

- ➔ In SPC-1 benchmark testing, the Hitachi Adaptable Modular Storage 2500 achieved the highest throughput results among all midrange storage competitors with dual controllers.
- ➔ With an impressive throughput result of 89,491.81 SPC-1 IOPS™ and an 8.98 millisecond average response time, the Adaptable Modular Storage 2500 provides the best performance and response times for key business applications such as Microsoft Exchange, SQL, Oracle, SAP or any other online transactional processing application, allowing users to more effectively scale their workloads at a best-in-class price point.
- ➔ The Hitachi Adaptable Modular Storage 2100 achieved among the best SPC-1 Price-Performance ratio in its class at \$5.95/SPC-1 IOPS™, bringing high performance to a new affordable price level and allowing customers to realize a lower total cost of ownership.
- ➔ This price-performance ratio reiterates Hitachi's continued efforts to help customers establish a path towards optimizing their storage environment, resulting in greater return on their storage asset investments and lower overall power and cooling consumption.



Sales Tools; Marketing Collateral

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Hitachi Adaptable Modular Storage 2000: The Difference

Hitachi's Adaptable Modular Storage 2000 family has been designed to enable customers to meet business challenges: manage while reducing costs, and prevent interruptions, but secure available data.

The entire Adaptable Modular Storage 2000 family is interoperable with all major business applications, including Microsoft Exchange, Oracle, SQL databases, VMware and Hyper V, where it enables customers to meet service level agreements, minimize unplanned downtime and accelerate administrative efficiencies.

There are 3 models in the family, the 2100, 2300 and 2500. While these models differ in capacity, connectivity, performance and price points, each has the same reliability and enterprise level features.

Active/active symmetrical controller architecture

The symmetrical active/active controller eliminates the complexity of managing preferred paths to a LUN, which means additional software is not required, reducing purchasing costs.

This also allows for quick and easy configuration as there's no need to set up an often complicated path. Active/active controller functionality is ideal for virtual environments as it delivers the resilience, scalability & performance they require.

*Color coding systems (CDS) may not be able to withstand, contact your Hitachi Data Systems Account Manager for current CDS list.

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Hardware RAID controllers

These controllers support a variety of operating systems, giving customers flexibility as well as better performance/scalability from a dedicated chip for RAID parity calculation.

With support for hot swapping, which allows failed drives to be replaced while the system is online.

The competition

- Other modular storage products require every LUN be assigned to one of the controllers, and a preferred path to that LUN to be assigned from the server. Since the AMS2000 can accept I/Os to any LUN through any hot port, this complexity is eliminated.

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Hitachi Adaptable Modular Storage 2000 Family

FAQ

SAS and SATA drives can be installed in any location in any of the drive expansion trays. However, the four system drives need to have the same interface, SAS or SATA.

- Can a common spare drive be used for the SAS and SATA RAID groups?
No. SAS RAID groups require SAS spare drives and SATA RAID groups require SATA spare drives.
- Can SAS and SATA disk drives be intermixed in the same RAID group?
No. SAS and SATA disk drives cannot be intermixed in the same RAID group.
- Can SATA drives be used as system disk?
Yes. SATA drives can be used as system disks to store the microcode, system settings, etc.
- Can user data be stored on the system disk?
Yes.
- What is the supported configuration for the minimum number of drives that need to be installed in

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Hitachi Adaptable Modular Storage 2000 Family

FAQ

Technical

- What are the capabilities of the Hitachi Adaptable Modular Storage 2000 family that support 99.999% data availability?
 - Complete system redundancy. Every part is redundant and hot swappable
 - Every tray has two independent power supplies with two separate power plugs so they can be on two separate power grids. If one power supply fails, the other will automatically take over the full load for the tray
 - Online microcode updates including letting the user do this themselves by pushing one software button. No path fail over is needed (I/Os are automatically re-routed without taking down the port)
 - Each controller can address every disk drive in the system. One would have to lose 8 SAS links to a disk tray before access to any drive is lost
 - Dual controller options only, no single controller options. If one of the controllers fails, the I/Os can be rerouted to the port on the working controller
 - All writes are mirrored across the controllers
 - Multiple version of microcode (4 copies of current microcode and 4 copies of prior generation microcode)
 - RAID-6 for double parity
 - HitTrackB Monitor Service enables Hitachi Data Systems to ship replacement parts and dispatch a person to install them
 - Heads in SATA disks are retraced after two hours of inactivity to prevent head crashes
 - Byte Logical Address Logical Redundancy check on all I/Os, including SATA drives
 - Patrol function continuously looks for drive problems
 - Many disk drive exceeds the failure threshold, its data is copied to a global hot spare
 - Copying data back from a spare drive to the replacement drive is not required, limiting the exposure to a second drive failure
 - Every disk drive undergoes a full disk scan every 72 hours.
 - Up to 16 global hot spares can be installed in any Adaptable Modular Storage 2100 system. Up to 30 global hot spares can be installed in any Adaptable Modular Storage 2300 or Adaptable Modular Storage 2500 system

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HP StorageWorks EVA Competitive Summary

HP	Hitachi	Hitachi Advantages
StorageWorks EVA 4400	Adaptable Modular Storage 2100	<ul style="list-style-type: none"> Industry Leading Reliability Cache Partitioning Copy Back Sparring RAID-6 enhanced data protection Hitachi Channel Load Balancing Controller - Active/active controller with dynamic load balance Controller upgrade with data in place Point to Point Switched Backend Intermix of SAS and SATA drives Shadowimage I/O Switching Data Retention / Self-Consistent Addressability Greater Capacity Adaptive Modular Storage 2000 (118TB) Adaptive Modular Storage 2000 (206TB) 60TB maximum LUN size SATA Read after Write data compare SATA Self-Cleaning Function Power Savings Service Modular Volume Migrator Reduced energy consumption Donea Thin Client (40 HDDs) Unparalleled performance (400MB/s) Native SCSI
StorageWorks EVA 6400	Adaptable Modular Storage 2300	<ul style="list-style-type: none"> All of the above + Unparalleled performance (600MB/s) 400TB of capacity with 400 HDDs Native Multi-Protocol support
StorageWorks EVA 8400	Adaptable Modular Storage 2500	<ul style="list-style-type: none"> All of the above + Unparalleled performance (800MB/s) 400TB of capacity with 400 HDDs Native Multi-Protocol support

Why Hitachi Data Systems Wins against HP

- Hitachi Data Systems is 100% focused on the storage market. HP is focused on the Big Solution Selling Trap and Services of Printing Services.
- Hitachi Data Systems and Hitachi, Ltd. are focused on simplifying the customer's storage solutions. Hitachi Data Systems and Hitachi, Ltd. are focused on simplifying the customer's storage solutions. Hitachi Data Systems and Hitachi, Ltd. are focused on simplifying the customer's storage solutions.

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HP StorageWorks EVA/MSA Competitive Summary

HP says	Hitachi Data Systems Response
Hitachi's lack of end-to-end 40Gb/sec Fibre Channel support limits the capability to support workloads demanding high throughput.	False - Adaptable Modular Storage 2000 family systems boast 40Gb/sec Fibre Channel bandwidth capacity using a higher performing Point to Point switched architecture for exceeding the capacity of current FC loop architectures.
Hitachi can not provide the same level of performance for OLTP workloads as the EVA S400.	False - The Hitachi Adaptable Modular Storage 2000 provides 50% more cache, with less than the best connectivity and 60% more disk drives supporting its data transfer rates as that available on the EVA S400.
Hitachi can not provide customers an integrated solution that has no potential gaps of uncertainty about data security or accessibility and no gray areas of accountability.	False - The Hitachi best-in-class solution philosophy enables Hitachi to deliver certified solutions providing customers with a single point of contact for support, focused on information integrity and availability for mission critical business needs encompassing storage systems, middleware and enterprise servers and combined solution offerings.
Hitachi has a limited solution portfolio and this prevents them from providing the best overall storage solution when tape or a disk/ tape combination might be more appropriate and less expensive.	False - Hitachi philosophy is built based on two key beliefs: "Simplify and minimize the number of technologies required to meet business service level objectives" and "Promote and embrace an open best-of-breed solution philosophy as it relates to building IT infrastructure solutions". Additionally, suppliers that are prone to bundling solutions including multiple products in their portfolio are focused more on product drag and making costs their anything else.

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HP StorageWorks EVA/MSA Competitive Summary

Common HP FUD and Hitachi Data Systems Response

Sales Response (Continued)

- Architect customer solutions which exploit the Power Saving Service for the Hitachi Adaptable Modular Storage 2000 family enabling customers to meet energy consumption and significantly reduce the cost of owning and retaining infrastructure.
- There should be no significant reduction in response time if moving to 40Gb/sec Fibre Channel disk drives. This neutral response time capability when compared to the 3Gb/sec Point to Point switched backend.
- The Adaptable Modular Storage 2000 provides 50% more capacity, double the performance characteristics and the addressability of the HP EVA S400. The HP EVA's target capacity is 100TB. The EVA S400 offers a maximum of 200TB. EVA HDDs and only provide addressability for up to 200TB LUNs, and maximum user connectivity to a 256 high availability nodes.
- HP's lack of a Cache Partition Manager feature increases customer exposure to missed application service level agreements and escalates response times when handling mission-critical workloads on a single array.
- The value of the HP EVA 4400/6400/8400 backend switched loop architecture over the previous EVA 5000/2000 generation switched loop needs to be assessed in total solution which previous models lacked. Addressability for the switched loop back end on the EVA 4400/6400 only provides a benefit to users who are FC loop support for the EVA 4400/6400/8400 FC loop architecture.
- The value of the HP EVA 4400 end-to-end 40Gb/sec Fibre Channel architecture over the previous HP EVA generation 2000s Fibre Channel needs to be assessed in total solution only. According to the 40Gb/sec Fibre Channel back end on the HP EVA 4400 only provides a benefit to users who are FC loop support for the EVA 4400/6400/8400 FC loop architecture.

How HP attacks Hitachi Data Systems

- HP will promote the single vendor strategy
- HP will promote solutions including backup software and tape libraries
- HP will promote the integration capabilities HP storage and servers
- HP will claim market leadership as a solutions provider using reference architectures to promote more complex solutions
- Hitachi Data Systems and analog comparisons with Hitachi Limited
- Overstate the value of active/active symmetrical controller
- Emphasize HP market leadership position
- Focus on hardware, software, services and solutions versus customer satisfaction

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HP StorageWorks EVA/MSA Competitive Summary

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AMS 2000 'What the papers say'

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The Hitachi Adaptable Modular Storage (AMS) Series 2000 was selected by the editors of TechTarget's annual "Storage Products of the Year" ...in the disk, disk subsystems category.

The Hitachi Adaptable Modular System 2500 has won the Eco-Responsibility Award in this year's Information Age Innovation Awards, beating out stiff competition.



Gartner positioned Hitachi & the Hitachi AMS2000 family in its Magic Quadrant... "this quadrant reflects highest scores for their ability to execute and completeness of vision...they are innovators...with a clear understanding of market needs" – Nov 17, 2008

Gartner



"With the AMS, I actually think a layperson could use it. I think that's how easy it is; it's really a point and click deal." – Matthew Colona, IT Manager at Pite Duncan LLP (Storage Magazine, March 2009)

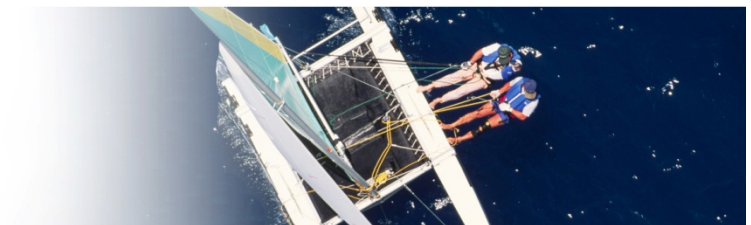
Hitachi achieves overall best-in-class Storage Performance Council (SPC-1™) benchmark results for its midrange storage system (Hitachi AMS2000). March 24, 2009

"The AMS2000 series combination of enterprise class features with easy to manage midrange usability and reduced operational costs is powerful and worthy of serious consideration by an IT organization. "



Hitachi Data Systems has consolidated its claim as the top-rated high-end array vendor by repeating its win..." - Rich Castagna, Editor

Hitachi Data Systems



AMS 2000 Promotions

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Kick starting
our greatest promotion ever!



Extra margin. Extra rewards. From Hitachi Data Systems' Modular Storage Promotion

Click here to find out what makes our AMS range unique

Due to overwhelming demand, Hitachi Data Systems is pleased to announce that we will be extending our popular Adaptable Modular Storage Capital Bonds and extra margin promotion until the end of September. Furthermore, we are offering a substantially improved buy price for the configurations!

The four configurations below have been specially designed for this promotion; offering an impressive margin opportunity, but that is just the beginning! With all of these bundles you also get an exclusive chance to earn yourself Capital Bonds.

With over 140 retailers to choose from, you can spend your Capital Bonds on anything from computer games to clothes! Or put them towards a holiday or gift experience such as kite boarding or scuba diving.

This offer is available until 30th September 2009 and only available to partners buying from Bell Microproducts or Zycro Ltd. To take advantage of this special offer all opportunities must be registered and accepted through the PartnerXchange opportunity registration portal.

Here are the 4 available configurations:

Adaptable Modular Storage Configurations	Reseller Buy Price	Suggested Customer Price	Capital Bonds Earned
2100 SATA, 12x1TB 7.2K Drives, 8GB Cache, 36 months 24x7x4hr support, Storage Navigator S/W and install.	£14,300	£15,770	£1,000
2100 SAS, 12 x 450GB 15K Drives, 8GB Cache, 36 months 24x7x4hr support, Storage Navigator S/W and install.	£15,650	£17,215	£1,500
2300 SATA, 12x1TB 7.2K Drives, 8GB Cache, 36 months 24x7x4hr support, Storage Navigator S/W and install.	£20,000	£22,000	£2,000
2300 SAS, 12 x 450GB 15K Drives, 8GB Cache, 36 months 24x7x4hr support, Storage Navigator S/W and install.	£21,600	£23,760	£2,500

Hitachi Data Systems

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New reasons to switch to
storage solutions
from Hitachi Data Systems



Switch to Hitachi Data Systems and let us do all the work

Dear [customer]

Are you looking for a new storage solution, but don't have the resources to deal with such a time-consuming task?

Physically disposing of the old system can be difficult. Even though you can see the benefits, dealing with the legal requirements for safe and legal data transfer, and the decommissioning of old machines can be extremely time complex. Fortunately, Hitachi Data Systems can help.

Introducing the new Hitachi Data Systems Storage Buy-back Programme

Switch to an Adaptable Modular Storage solution from Hitachi Data Systems to take advantage of their **Storage Buy-back Programme**. Not only will they arrange for your old system to be removed, they'll dispose of it safely and securely, while working through the time-consuming legal and administrative formalities.

What's more, you'll benefit from **trade-in values of up to €6000** on the purchase price of our range of Hitachi Adaptable Modular Storage solutions. This includes the recently launched Hitachi Adaptable Modular Storage 2000 family: highly reliable and cost effective modular storage for organisations of all sizes. Allowing you to benefit from:

- **Advanced capabilities** – certified and tested with the leading business applications
- **An easy-to-use management interface** – for extensive scalability and outstanding system reliability
- **Cost-effective performance and non-disruptive operations** – helping you concentrate on key business goals

Hitachi Adaptable Modular Storage solutions already deliver the best price/performance, availability and scalability in the modular storage market place. And now, with the efficient Hitachi Data System Storage Buy-back Programme, they're an even more attractive proposition.

[CTA - tailored by each reseller so they can add their own]

Kind regards

[reseller name]

Partner Logo



Questions / Discussion



HDS UK Partner Day 2009

Modular Solutions

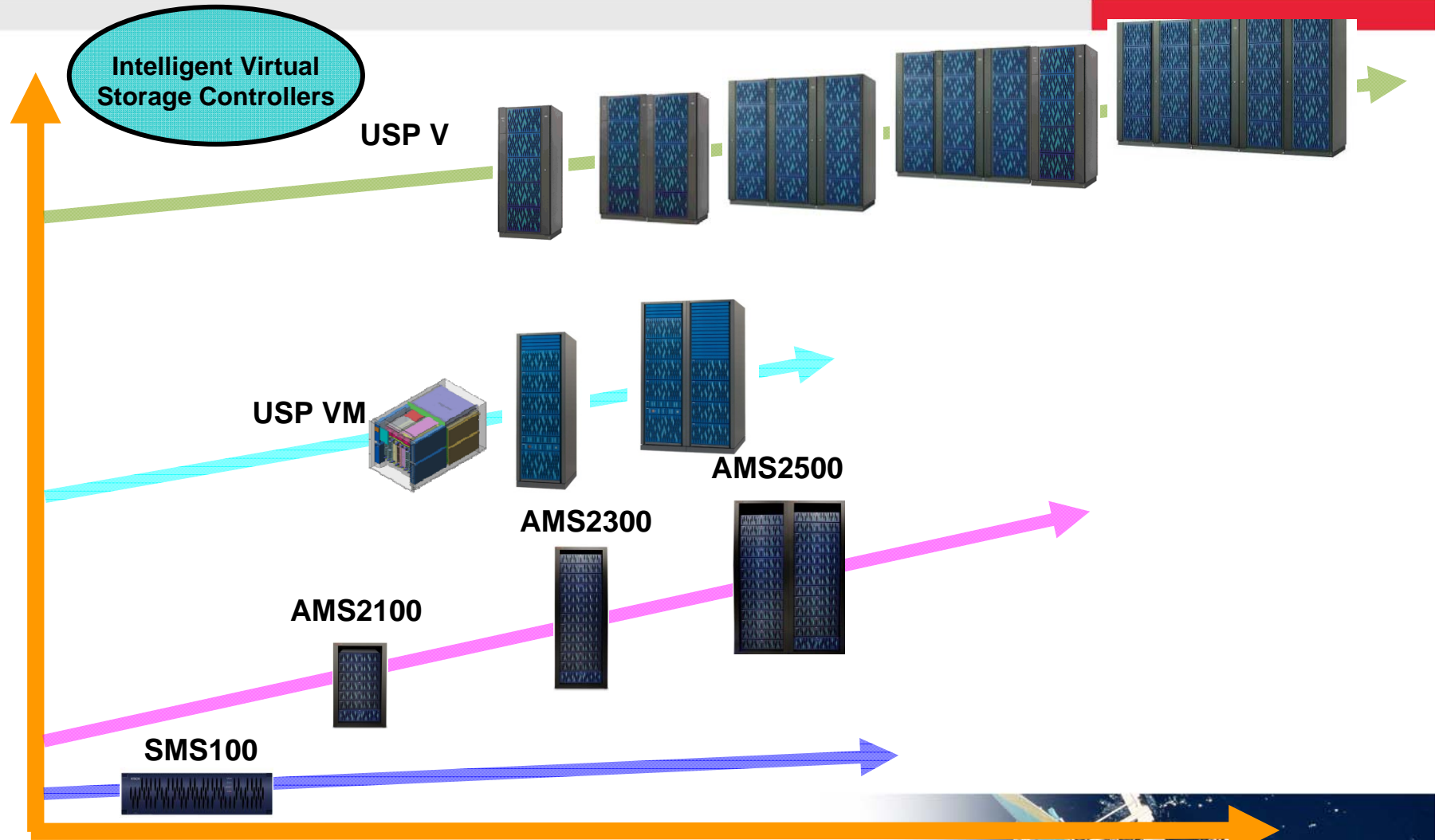
Thursday 9th July 2009

David Parker
Territory Account Manager



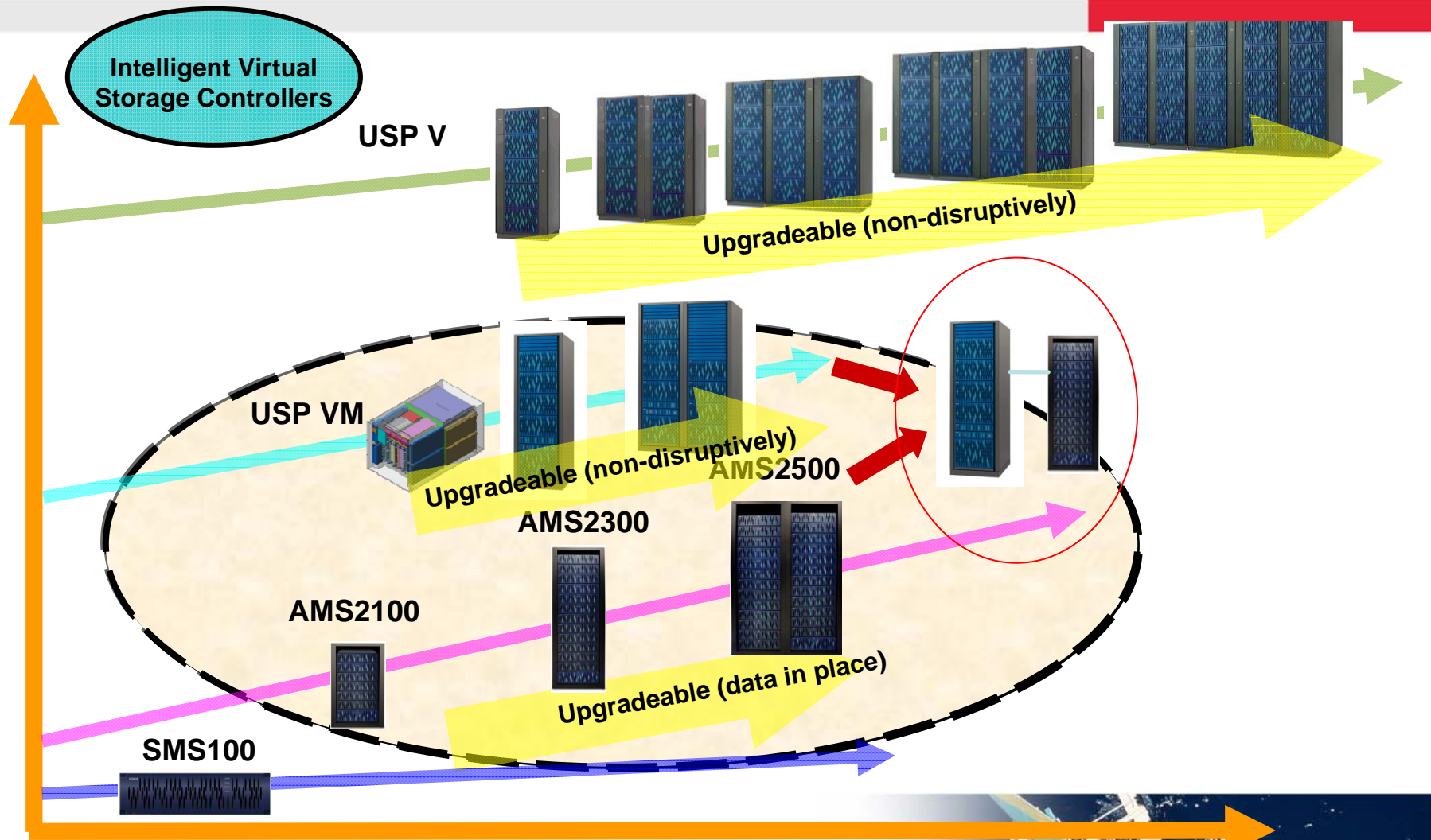
Integrated Scalable Storage Portfolio

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Integrated Scalable Storage Portfolio

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Adaptable Modular Storage *Customer Case Studies*

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Victoria and Albert Museum
Public Sector: The Arts



Insurance

Bradford and Airedale **NHS**
Teaching Primary Care Trust

Health Care



Local Government



Financial



Utilities



Jubilee International High School
Education



Telecommunications



Legal



Government: Public Sector Services



Manufacturing: Automotive

Hitachi Data Systems



Adaptable Modular Storage 2000

Upcoming Customer Case Studies

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Derwent Shared Services

Derwent Shared Services

Health Care



EDF Energy

Utilities



Wrexham County Borough Council

Local Government



Zen Internet

IT Services

LANCASTER
UNIVERSITY



Lancaster University

Education

MARKS &
SPENCER

Marks & Spencer

Retail

CAPSTONE ■ *Mortgage Services*

Capstone Mortgages Services

Financial Services



Inflight Productions

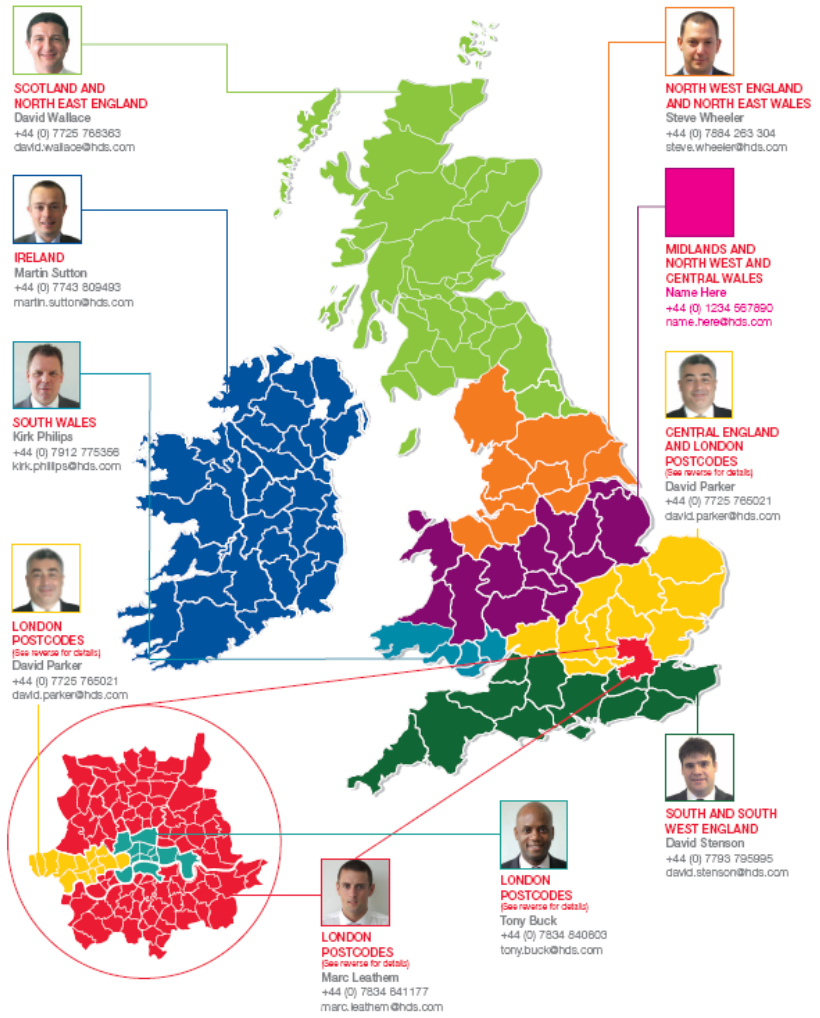
Media



HDS Territory Account Managers

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Hitachi Data Systems Commercial Territory Account Managers



NORTH
Mark Walsh Regional Sales Director - North
Mobile: +44 (0) 7711 650941
Email: mark.walsh@hds.com



MIDLANDS AND NORTH WEST AND CENTRAL WALES
Ceredigion, Derbyshire, Gwynedd (includes Isle of Angelsey), Herefordshire, Leicestershire, Lincolnshire, North Lincolnshire, Nottinghamshire, Powys, Shropshire, Staffordshire, Warwickshire, West Midlands and Worcestershire
Name Here Job Title
Direct: +44 (0) 1234 567890
Mobile: +44 (0) 1234 567890
Email: name.here@hds.com



IRELAND
Martin Sutton Account Manager
Direct: +44 (0) 1619 284243
Mobile: +44 (0) 7743 809493
Email: martin.sutton@hds.com



SCOTLAND AND NORTH EAST ENGLAND
Cleveland, Durham, Northumberland and Tyne and Wear
David Wallace Account Manager
Direct: +44 (0) 1312 284343
Mobile: +44 (0) 7725 768363
Email: david.wallace@hds.com



NORTH WEST ENGLAND AND NORTH EAST WALES
Cheshire, Croyd, Cumbria, East Riding of Yorkshire, Greater Manchester, Lancashire, Merseyside, North Yorkshire, South Yorkshire, West Yorkshire and York
Steve Wheeler Account Manager
Direct: +44 (0) 1619 252852
Mobile: +44 (0) 7884 263304
Email: steve.wheeler@hds.com



SOUTH
David Kennedy Regional Sales Director - Corporate and Commercial - South
Mobile: +44 (0) 7702 353272
Email: david.kennedy@hds.com



LONDON POSTCODES
E1, E14, EC1, EC2, EC3, EC4, WC1, WC2, SW1, SE1, N1 and NW1 only
Tony Buck Account Manager
Direct: +44 (0) 2073 908504
Mobile: +44 (0) 7834 840803
Email: tony.buck@hds.com



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Marc Leatham Account Manager
Direct: +44 (0) 1753 618589
Mobile: +44 (0) 7834 841177
Email: marc.leatham@hds.com



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David Parker Account Manager
Direct: +44 (0) 1753 618498
Mobile: +44 (0) 7725 765021
Email: david.parker@hds.com



SOUTH WALES
Dyfed (except Ceredigion), Gwent, Mid Glamorgan, South Glamorgan and West Glamorgan
Kirk Phillips Account Manager
Direct: +44 (0) 1454 625511
Mobile: +44 (0) 7912 775356
Email: kirk.phillips@hds.com



SOUTH AND SOUTH WEST ENGLAND
Avon, Cornwall and Isles of Scilly, Devon, Dorset, East Sussex, Hampshire, Isle of Wight, Kent, Middlesex, Somerset, Surrey, Wiltshire and West Sussex
David Stenson Account Manager
Direct: +44 (0) 1753 618451
Mobile: +44 (0) 7793 795995
Email: david.stenson@hds.com



Thank you





Hitachi File and Content Services

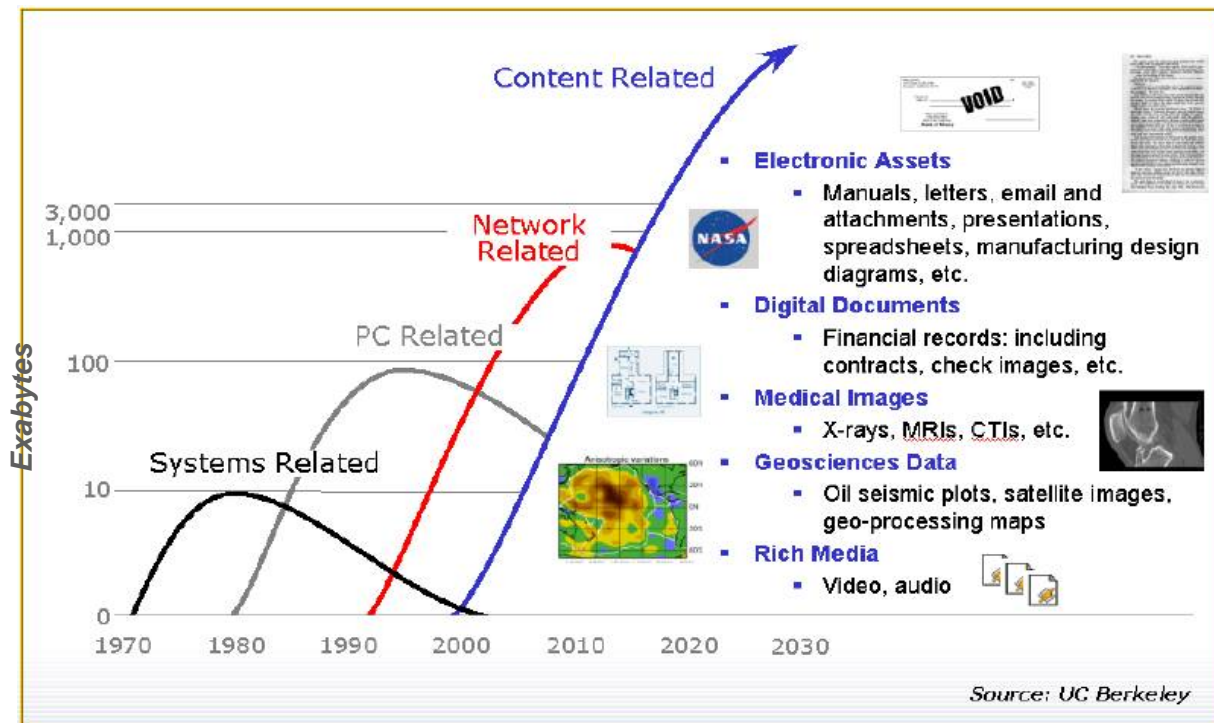
Understanding, Rationalising and Better
Managing your Information



Jez Hoppe, Solutions Consultant

Irrational Data Growth

- Unstructured content growing faster than traditional information or structured content
 - Database or transactional data
- 75% to 90% of data is unstructured
 - Requires unique capabilities for archive management



Key Drivers for Businesses to deploy an Archive?

 **Improve Data Management**



 **Enhance Value of Data /Information**

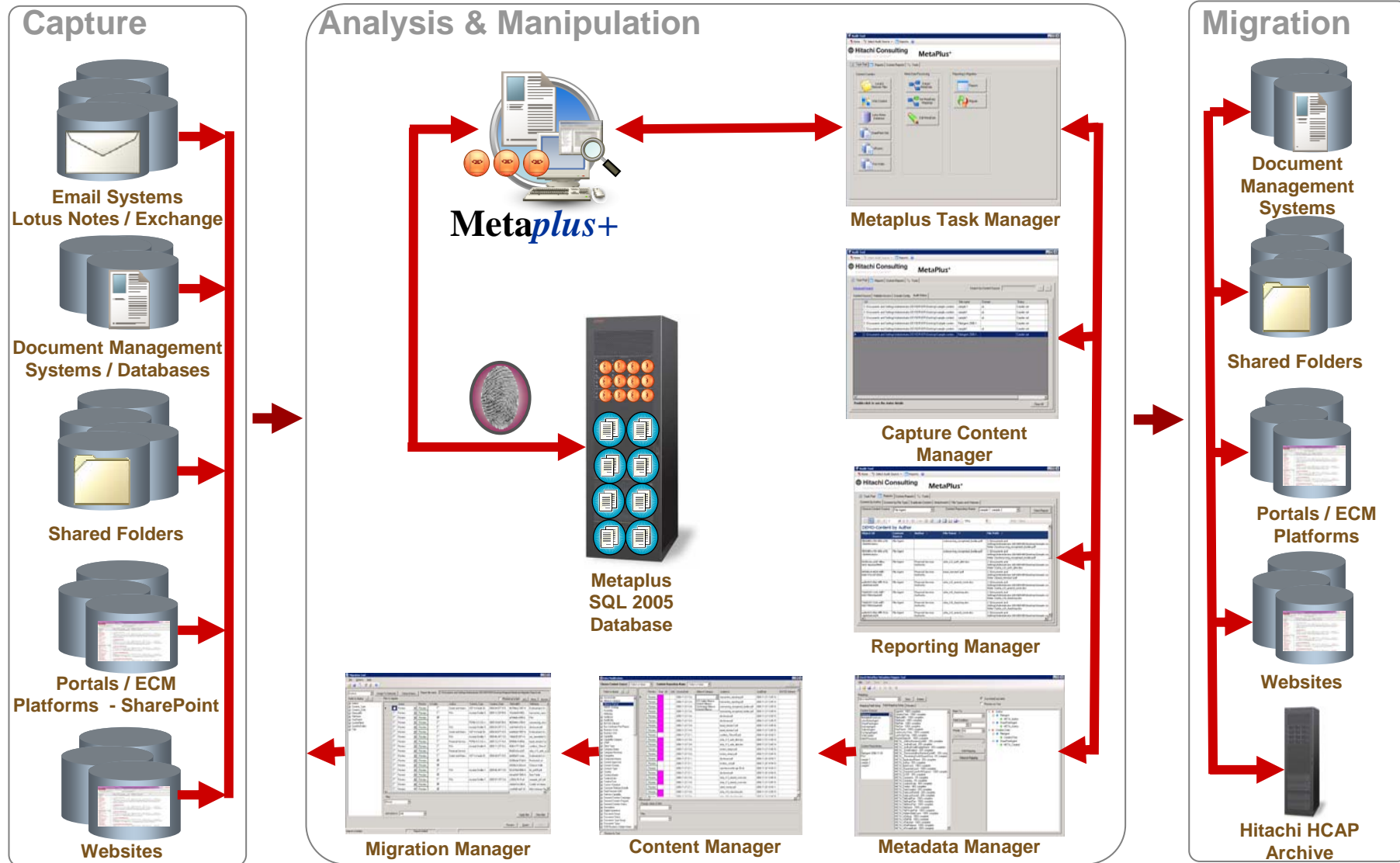


 **Regulatory Compliance / Corporate Governance**



 **E-Discovery / Search**

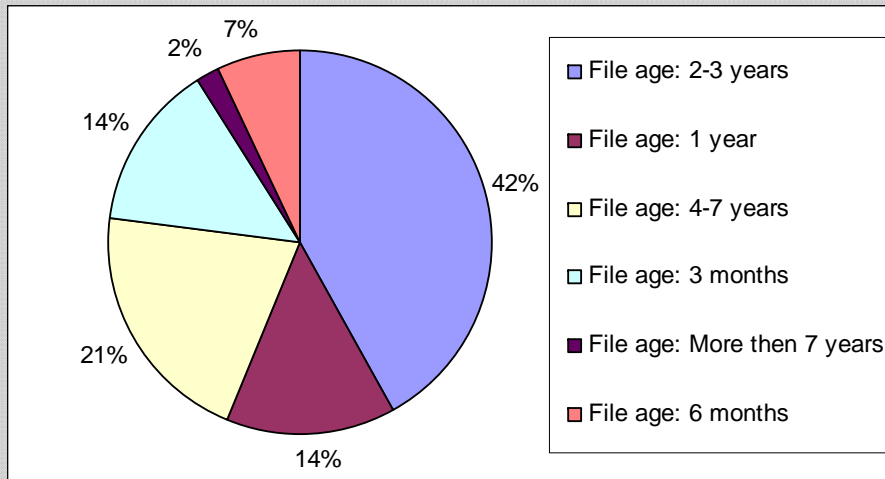




HDS MetaPlus Diagnostics – Sample Output

5 TB Shared Folder stored on T1

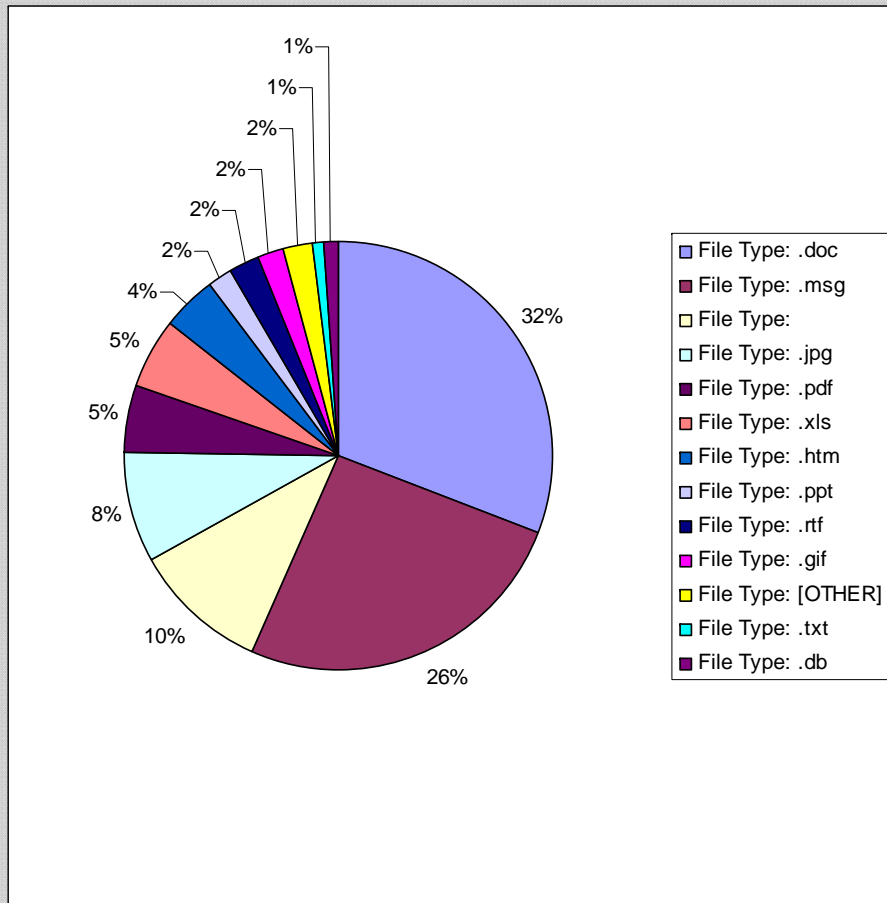
Age of Content



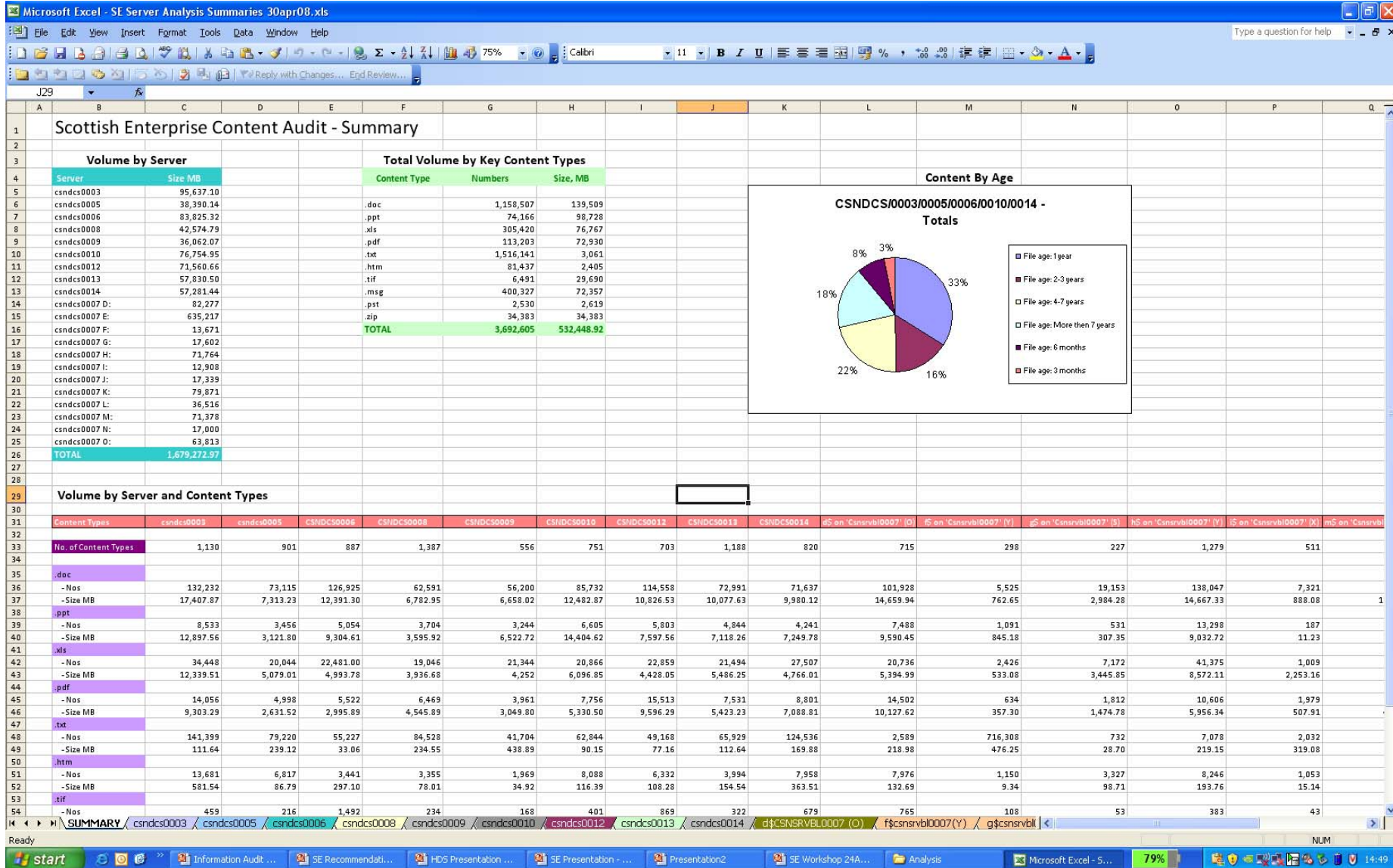
% Duplications Identified:

14%

Content Types



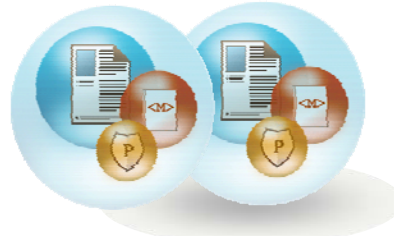
HDS MetaPlus – Sample Output



Information Diagnostics and Migration - Metaplus+ Key Features



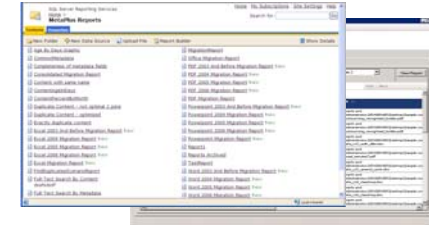
- Analyse** existing content
- Email
 - Web Pages
 - Office Documents
 - PDF's , Images
 - Databases



Identify **duplicate Data / content**

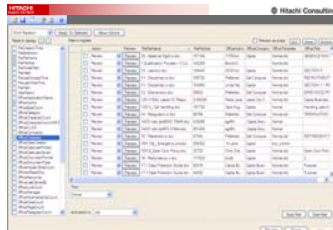
Identify and '**Cleaning-up**' out-of-date Data / content efficiently

Identify Data / Content for archiving



Obtain **management reports** accessible through an executive dashboard interface

Running **structured BI** queries on **unstructured** content



Manipulate metadata and data / content structure through an intuitive interface

Application of **Enterprise Taxonomy**

Metaplus



Providing Plug-ins to enable the migration of content to an Archive.

Improving your Data / Content quality

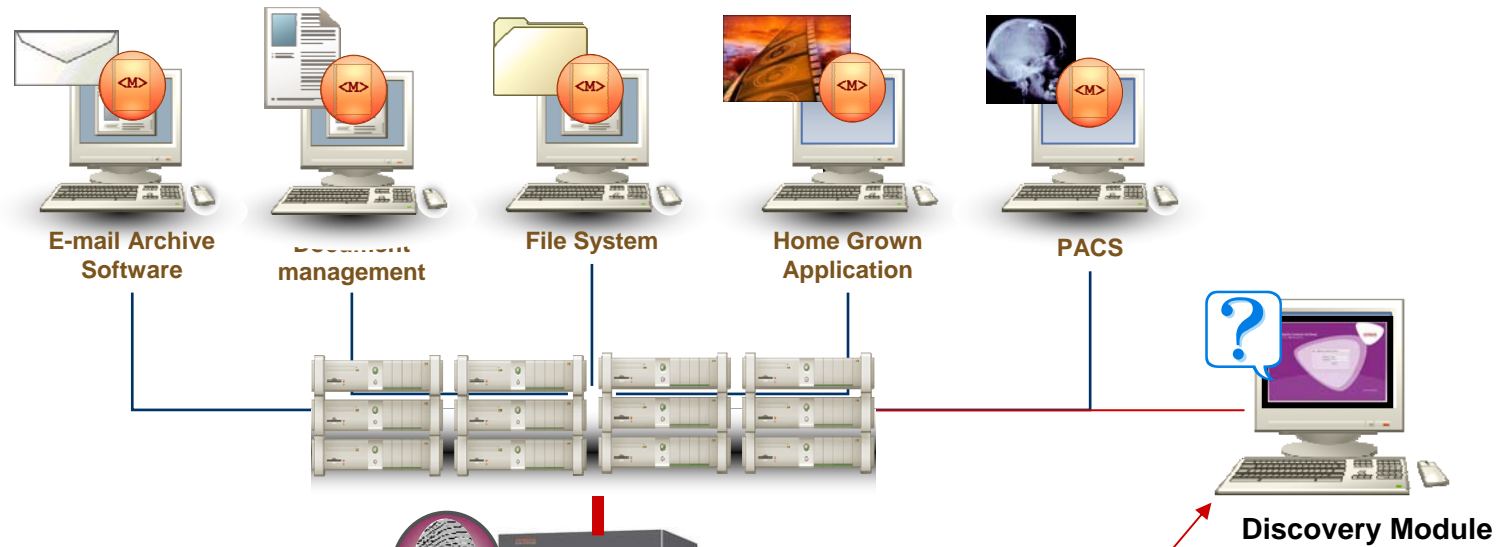
Improving Enterprise Search



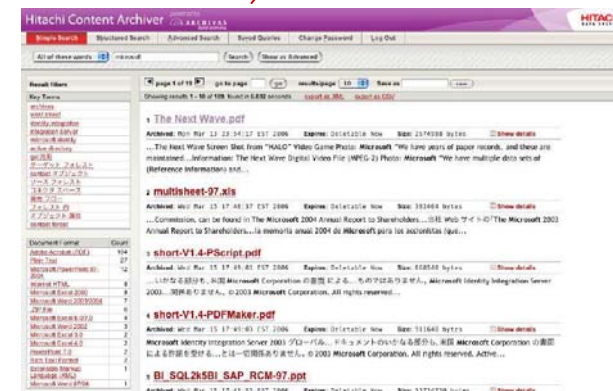
Impact analysis of Data / Content **Management Policy** changes

Creation of Data / Content **rationalisation and archiving** strategies and solutions

Hitachi Content Archive Platform:



Result Set



- Single platform supporting **multiple applications**
- High-performance, **scalable**, and secure storage
- Automatic, Policy Driven Enablement of Data Services to **complement ISV Intelligence**



- Data
 - File contents stored in original, unaltered format
 - Write once read many (WORM) storage
 - Global file system and standard namespace

- Metadata
 - Self-describing attributes
 - User extensible in the future
 - Database for scalability and extensibility

Policies

- Protection of data through mirroring across nodes
- Retention to ensure compliance
- Digital signature for authenticity
- Single Instancing for storage optimization
- Replication



Open Interoperability

- Supports UNIX and Microsoft file systems, can store standard file formats such as XML and HTML, and can leverage other Hitachi SAN storage platforms



WORM, Immutability and Retention

- Write once, read many file system where content is stored in an immutable format with the ability to set file-level retention



Single Archive Name Space

- All objects are stored in a single, archive-wide global name space, a well understood paradigm
- Open and easy to navigate with standard tools and applications



Simple Monitoring and Management

- Can be configured and monitored through a Web-based interface and through SNMP



Search and Indexing

- Provide simple and rapid discovery of archive data (search of files and metadata and custom metadata)



Scalability

- Provide scalability and upgrade paths to create a long term archive
 - Multi-platform migrations
 - Enterprise scalability

HCAP Partner Ecosystem: The World's Leading ISVs

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Questions/Discussion

Awards and Prizes

Neil Evans, RSD UK Indirect

Harvey Smith, RSD UK & IR Channels



Please remember to fill in your survey and hand it in at reception in order to receive your “moleskin” book!

Thank you for coming!

See you at the pub!

