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Introduction to IBM Tivoli System z Storage Management

Visibility

See your Business

Respond faster and make better decisions.

Control

Manage risk and Compliance

Assure quality and reduce risk.

Automation

Improve your Business

Lower costs and build agility.

e business on demand software

IBM System z Storage Solution

Unified Suite of Tightly Integrated Products

Agenda:

Introduction

How zStorage Issues Affect the Organization

Overview of IBM System z Storage Solution

IBM Tivoli System z Storage Management

Enterprise Storage Integration

Q&A

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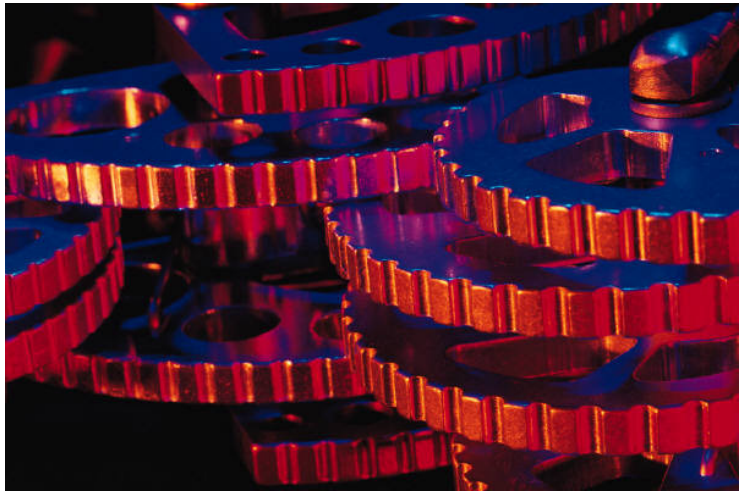
How Does Storage Management Affect the Organization?

- **Storage affects many key operational aspects of your organization**
  - **Application performance, throughput, and availability**
  - **Effective and Efficient Storage Device Utilization**
  - **CPU Utilization & Batch Processing**
  - **DR Planning: Backup & Recovery, Data loss, Regulatory Compliance**



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How Does Storage Management Affect the Organization?

- **Effects of Storage Issues can be easily masked or overlooked**
  - **Performance impacts related to storage issues**
  - **Growing requirements for CPU, storage devices and media: "cost of doing business"**
  - **Planned outages (e.g. ICF Catalog maintenance) are a "necessary evil"**
  - **Hidden problems that can cause unplanned outages or application failures**
  - **Data Integrity - Failing/struggling DR exercises**

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How Does Storage Management Affect the Organization?

- **Storage Administration Staff Stretched to Keep Up**
  - **Monitoring daily/weekly/monthly activity**
  - **Device management**
  - **"Process of elimination" problem resolution**
  - **Wasted time on repetitive tasks**
  - **Lack of time to research what's going on in the system**
  - **Labor intensive activities such as backup & recovery**
  - **Learning Curve**

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IBM Tivoli System z Storage Solution

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The Value of the z Storage Solution

- **Application Performance**
- Device Management
- CPU & Storage Cost
- Storage Related Outages
- Data Integrity
- Storage Admin Productivity

- Monitor Application Performance
  - Evaluate Storage Impact
  - Alerts to problem situations
  - Drill “down” or “sideways”
  - Implement corrective action
  - Automate appropriate response

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Application Performance – Managing Workload

- Mainframe subsystem I/O resources become congested, affecting application performance, availability – and cost!

- IBM's zStorage Solution gives you the ability to monitor and manage the impact of storage on an application basis as well as on physical devices.

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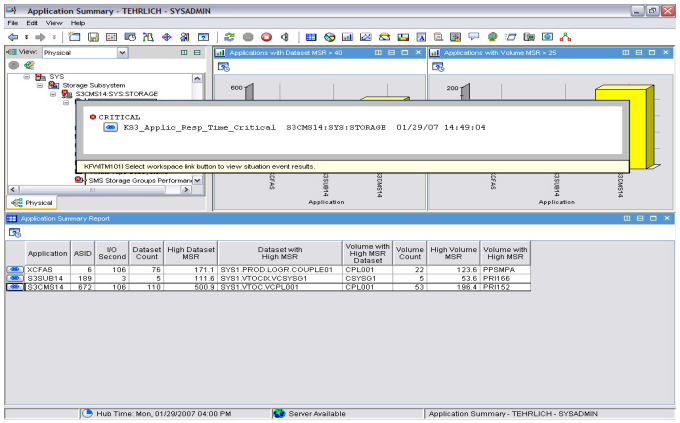
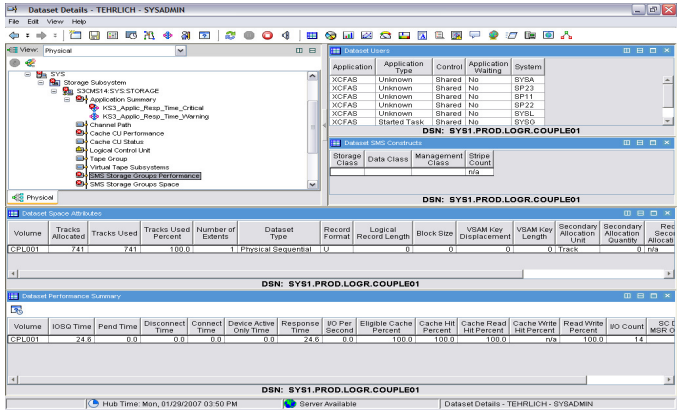
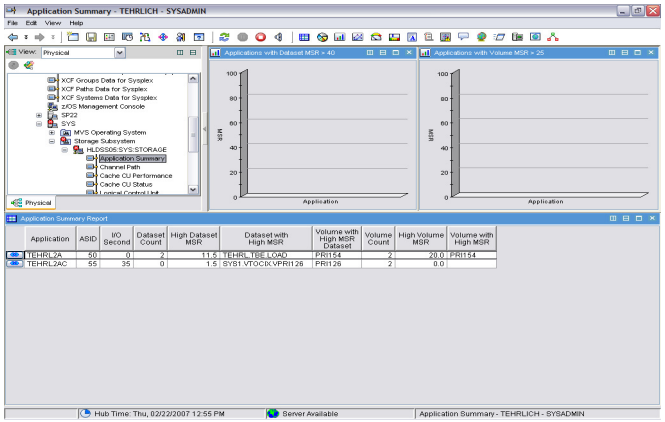
Ability to focus on workload



Application Response Time Unsatisfactory - Hover on situation icon and navigate to situation event workspace.



Data set details - Notice access across all systems.



Easily define a z/OS address space and identify all data sets being accessed and associated information to determine the health of that ASID's I/Os

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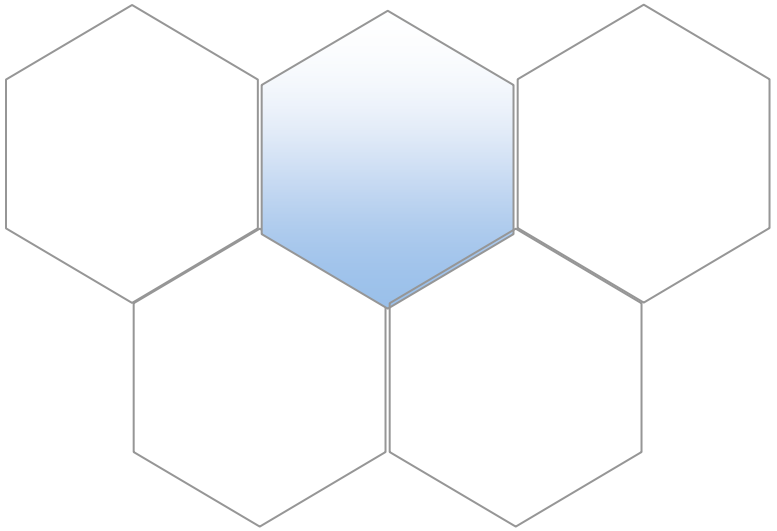
The Value of the z Storage Solution

- Application Performance
- **Device Management**
- CPU & Storage Cost
- Storage-Related Outages
- Data Integrity
- Storage Admin Productivity

- Optimize your existing infrastructure…
  - Eliminate common problems
  - Maximize utilization
  - Minimize contention



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Device Management

- Device issues will cause problems in the z/OS I/O subsystem that are costly:
  - Space problems
  - DASD contention (within LPARs or Sysplexes)
  - DS8000s, PAV, stripped and multivolume data sets
  - Offline (Tape) storage devices
  - Logical volumes and physical disks
  - Control Units and Cache
  - Balanced I/O subsystem from Channels down to volumes
  - New solid state devices – are they performing?
- Proactive vs. reactive
- Problem identification made easier

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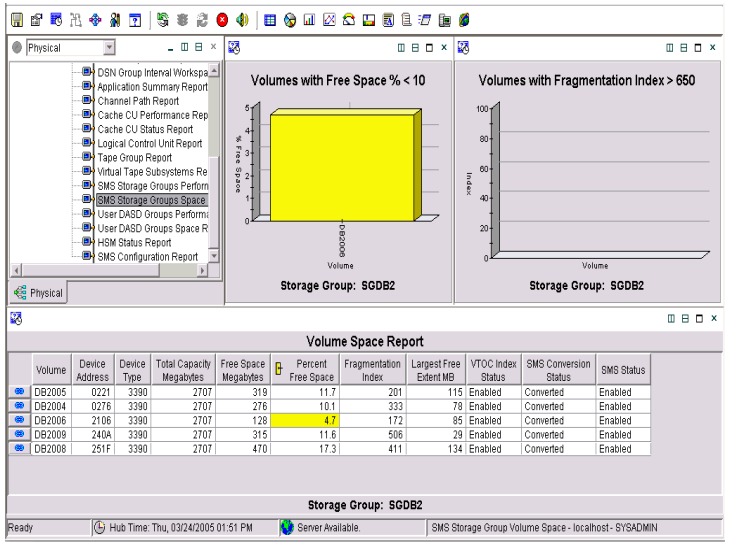
Managing z/OS Storage resources – Device Management

- **Mainframe STORAGE monitoring, real-time and historical reporting**
- **Powerful alerting and "Take Action" capability**
- **Mainframe storage management:**
  - **Space and Performance management**
  - **DASD**
  - **Allocation Management / X37 ABEND prevention**
  - **DFSMShsm Administration**
  - **SMS constructs**
  - **Channels (FICON), Control Units, CACHE**
  - **Tape / VTS**
  - **DFSMSrmm reporting/administration**
  - **Share Tape resources/Maximize tape utilization**
  - **Online toolkit for productivity**



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The Value of the z Storage Solution

- Application Performance
- Device Management
- **CPU & Storage Cost**
- Storage-Related Outages
- Data Integrity
- Storage Admin Productivity

- Identify and correct hidden cost drains in your HSM environment
- Optimize HSM operation
- Reduce storage requirements
- Ask whether a free HSM Health Check is right for you

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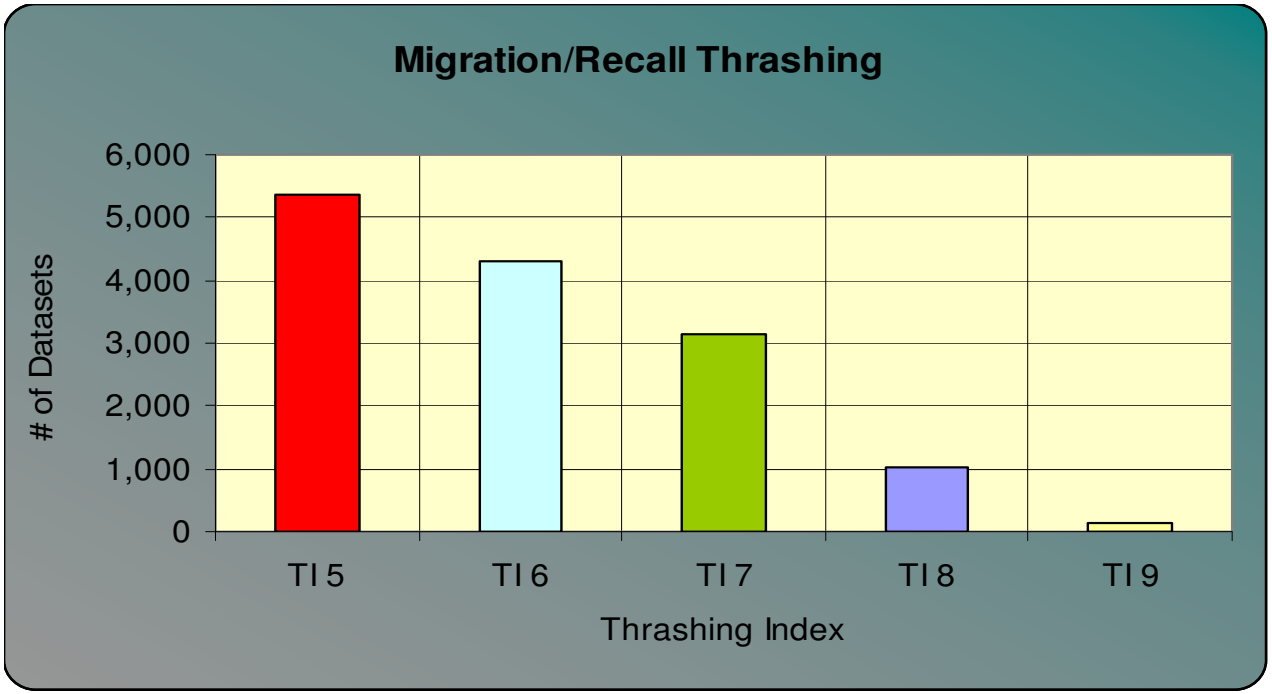
DFSMShsm

- Aggressive or outdated migration policies can result in overhead that can actually make life cycle management more expensive than doing nothing at all!



- IBM's zStorage solution can identify and help correct these issues, even providing what-if analysis so you can preview migration policy changes before committing them.
- Batch job execution can be improved by optimizing migration – reduced waiting for data

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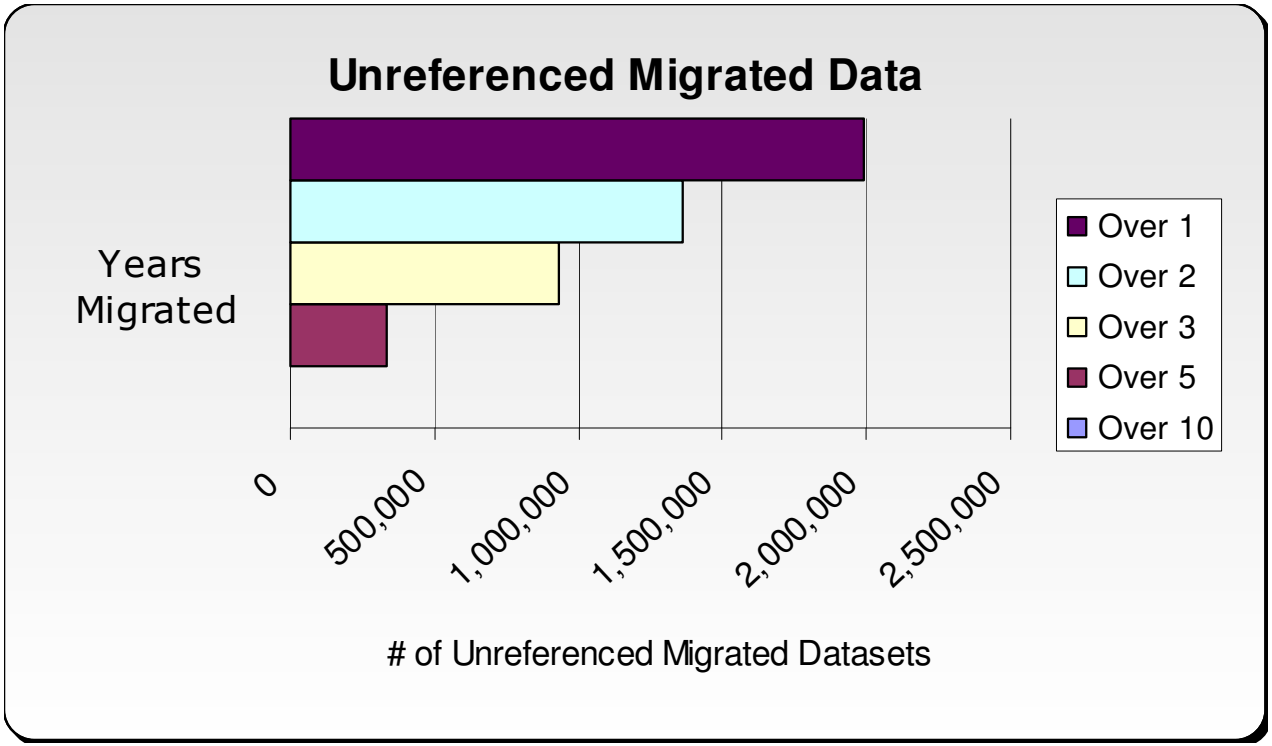
DFSMShsm

- Over time this processing can result in huge quantities of old, unreferenced data being managed by DFSMShsm



- This old, unreferenced data can be eliminated, freeing up storage resources!

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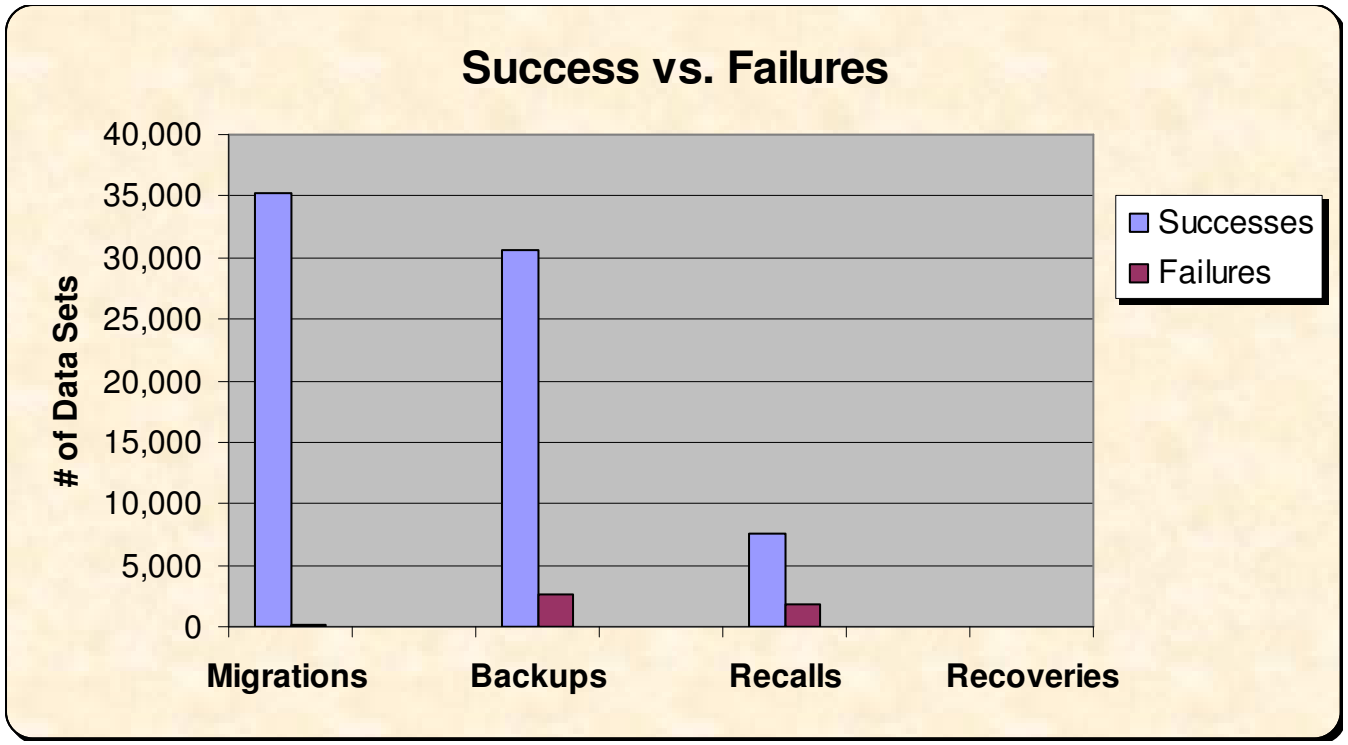
DFSMShsm

- Nightly execution cycles can churn on errors that are lost in the "haystack" of work



- The IBM Tivoli zStorage Solution can pinpoint and in many cases automatically correct the underlying issues that cause the failures that sap CPU resources.

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The Value of the z Storage Solution

- Application Performance
- Device Management
- CPU & Storage Cost
- **Storage-Related Outages**
- Data Integrity
- Storage Admin Productivity

- Catalog Issues can cause outages
  - Catalog Failures – rare but deadly
  - Needed Catalog maintenance (merge, split, reorg, etc) can cause application downtime
  - Recovery delays can be costly

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Common Scenario

	# Data Sets	% of Total	Cumulative %	# Aliases
SYS1.USR2.DEV.CATALOG	683,027	43%	43%	51
SYS1.TST1.DEV.CATALOG	274,644	17%	60%	293
SYS1.TST3.DEV.CATALOG	193,212	12%	72%	222
SYS1.PRD1.DEV.CATALOG	118,877	8%	80%	665
SYS1.DBNT.DEV.CATALOG	84,756	5%	85%	78
SYS1.DBTD.DEV.CATALOG	65,727	4%	89%	206
SYS1.DEV.PXCJ	39,841	3%	92%	11
SYS1.TST2.DEV.CATALOG	35,037	2%	94%	230
SYS1.GRP.DEV.CATALOG	30,174	2%	96%	33
SYS1.ENV.DEV.CATALOG	29,173	2%	98%	15
SYS1.USR4.DEV.CATALOG	10,336	1%	. . .	2,898
SYS1.USR3.DEV.CATALOG	7,242	1%	. . .	1,807
SYS1.USR1.DEV.CATALOG	6,484	<1%	. . .	980
SYS1.DRD.CATALOG	2,099	<1%		23
SYS1.DFHSM.DEV.CATALOG	1,595	<1%		1
SYS1.CADISK1.DEV.CATALOG	355	<1%		3
SYS1.LOGR.DEV.CATALOG	187	<1%		5
SYS1.DEV.CPYCROSS	137	<1%		1
SYS1.PLEX.DEV.CATALOG	48	<1%		2
SYS1.CADISK2.DEV.CATALOG	5	<1%		2

Number of catalogs:	20
Total data sets:	1,582,956
Avg data sets/catalog:	79,148
Number of aliases:	7,526

Largest Catalogs	Top 2	Top 5
Total data sets:	957,671	1,354,516
% of total data sets:	60%	85%
Total aliases:	344	1,309

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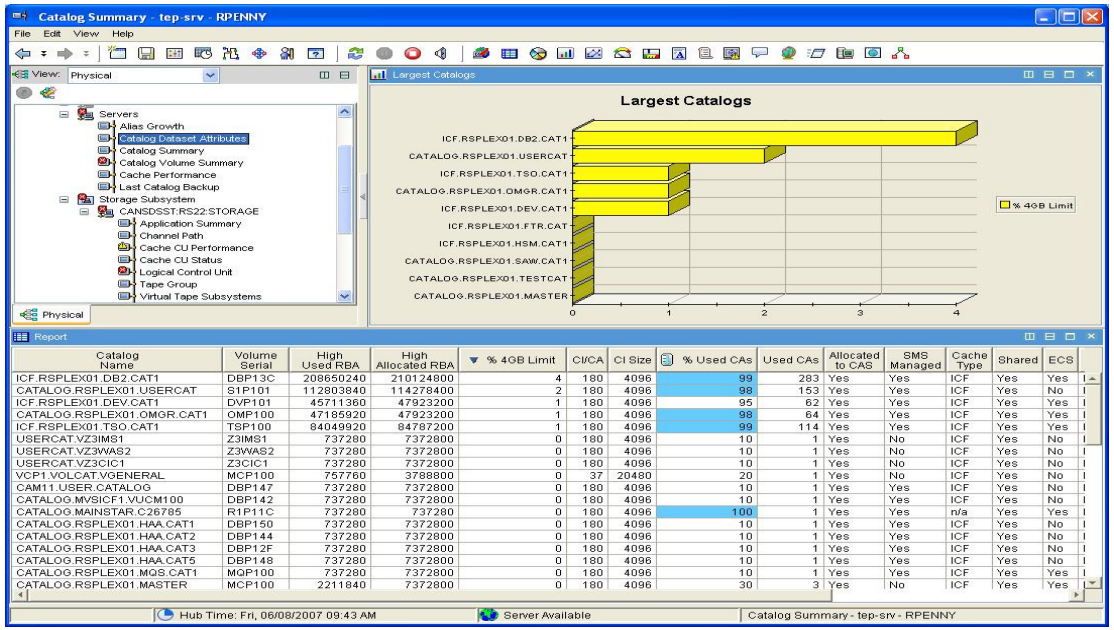
Avoid Catalog Issues

- Powerful, safe, reliable, and easy ICF catalog and VSAM backup and *fast* forward recovery
- Protects a catalog's complex structural integrity, alerts for potential errors, and reduces recovery time
- Reduces application down-time by permitting catalog maintenance while open (e.g. Split, Merge, Reorg, etc.)
- Alerts let you know of potential problems ***before*** they cause outages
- "What-if" simulation to preview effects of actions
- Easy-to-use interface improves staff productivity



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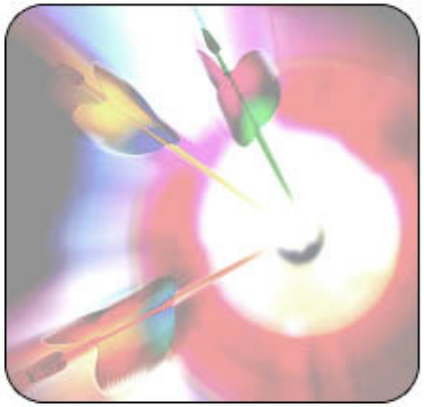
The Value of the z Storage Solution

- Application Performance
- Device Management
- CPU & Storage Cost
- Storage-Related Outages
- **Data Integrity**
- Storage Admin People Cost

- Identify what needs backup
- Do all the backups (once)
- Verify all the backups are there
- Quickly & accurately recover from either local outage or Disaster



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Disaster Recovery Management

- The ability to recover a failed operating environment often involves huge amounts of data manipulation
- Currency is a key factor in managing DR cost and validity
  - Time for backup as well as recovery is a ‘cost’ factor
- Mirrored environments can still benefit from tools to help manage the DR environment

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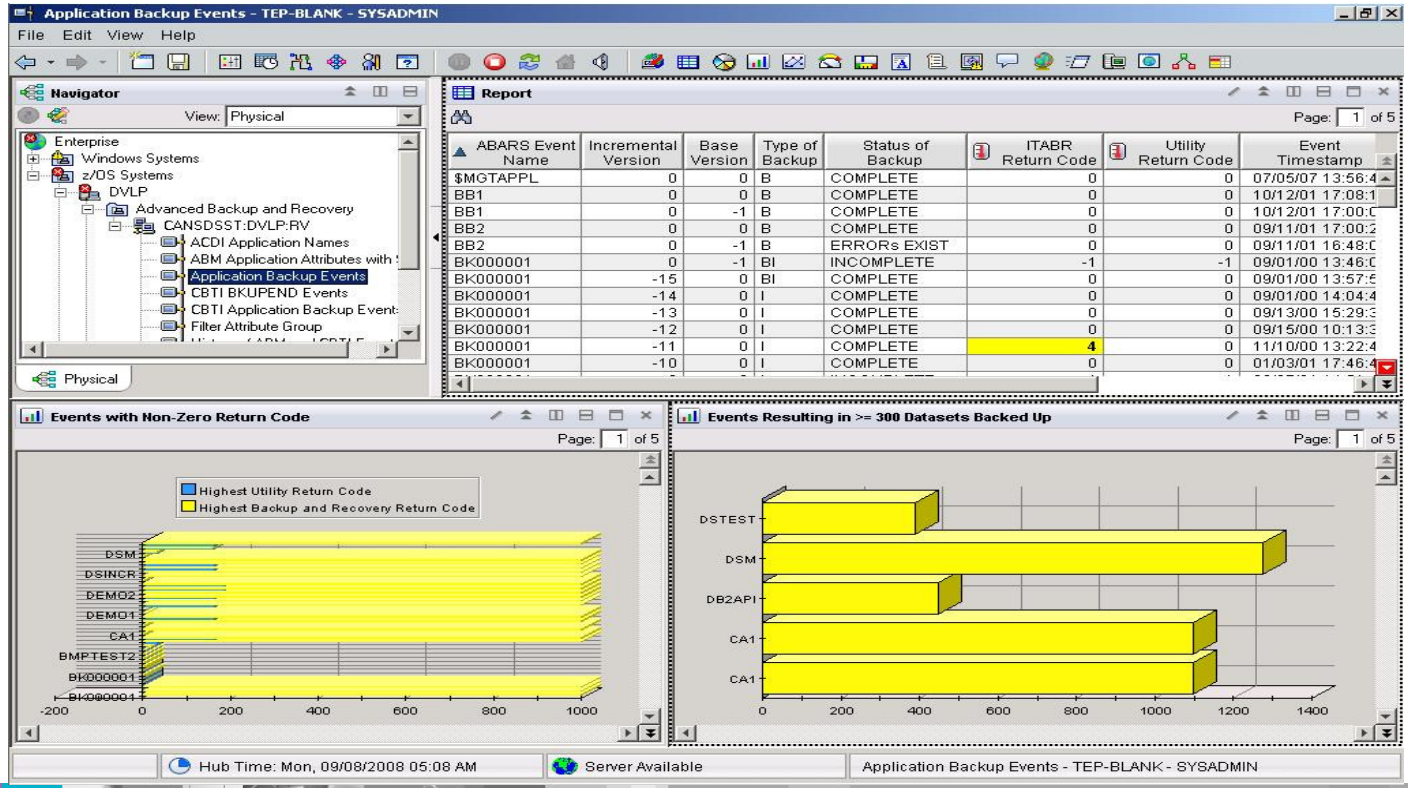
Disaster Recovery Management

- Effective DR depends on several factors
  - Identify what needs to be preserved
  - Backup/Copy what needs to be preserved
  - Validate data capture and eliminate redundancy



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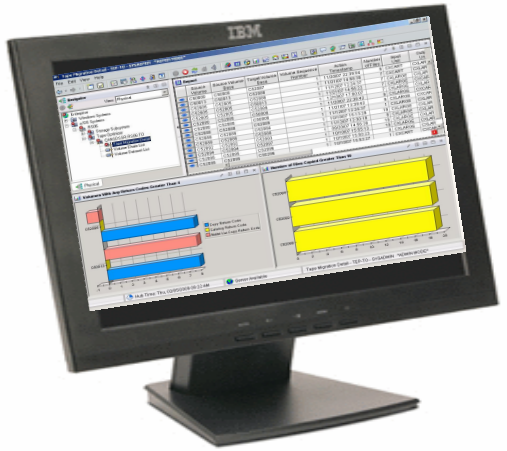
The Value of the z Storage Solution

- Application Performance
- Device Management
- CPU & Storage Cost
- Storage-Related Outages
- Data Integrity
- **Storage Admin Productivity**

- Productive and efficient leveraging to tools and information
- zStorage management is not a silo, it's a part of everything



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IBM Tivoli Enterprise Portal Interface - Productivity

Navigator – Integrate and leverage other TEP enabled products

Selectable Chart Options - Versatility

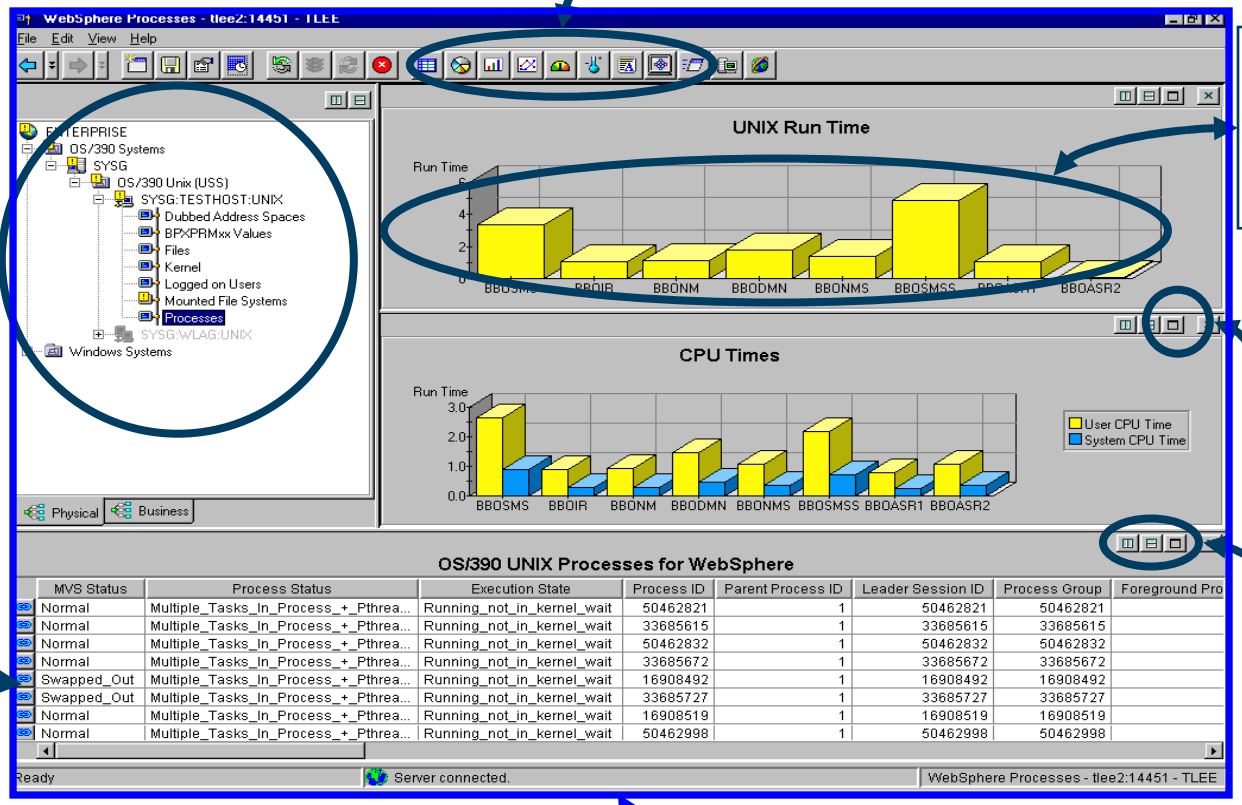
Personalized Views – Customizable for different views

Intelligent Linking – Link to associated workspaces and actions for problem determination and resolution

View Zoom

Splitter controls

Persistent customized workspaces



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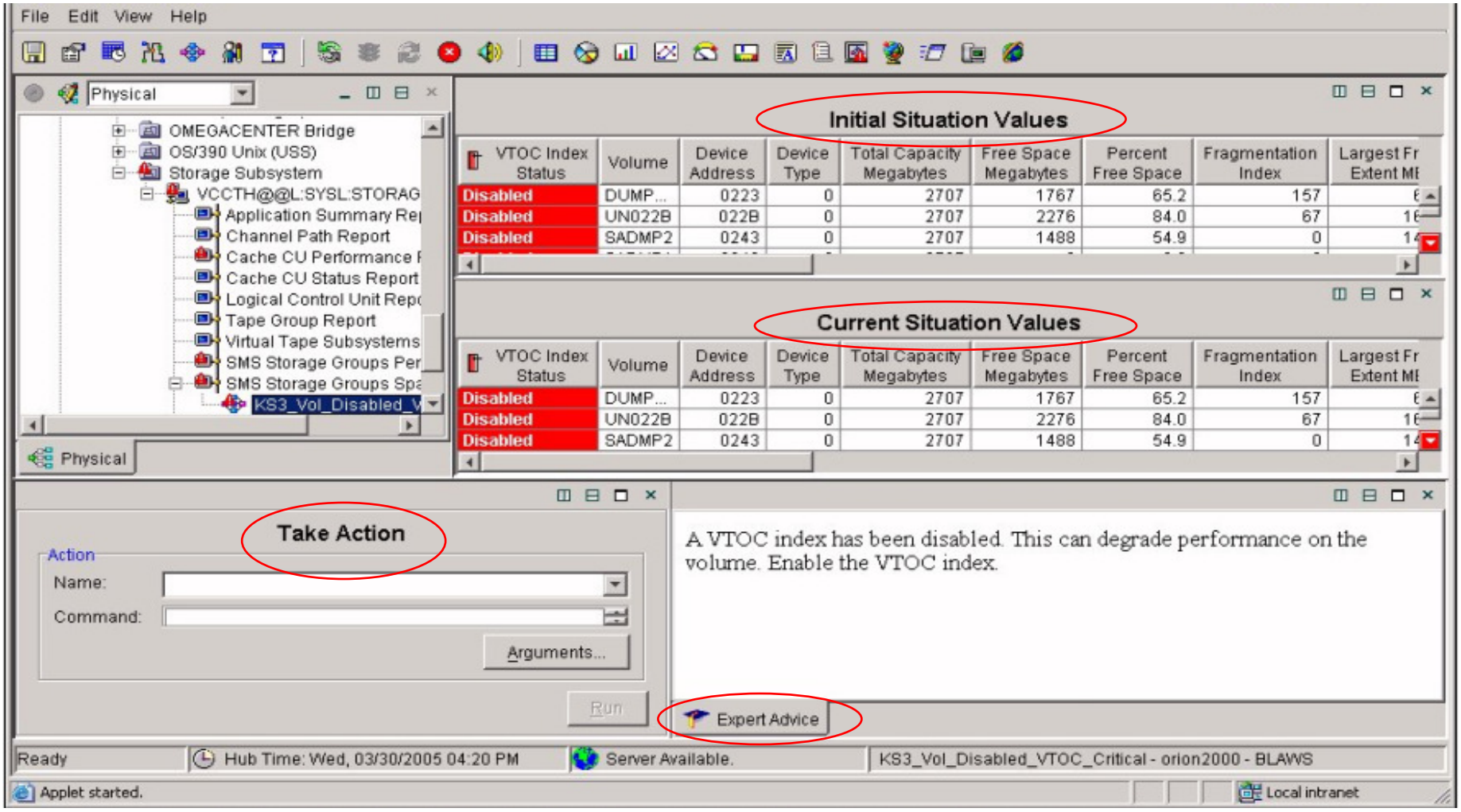
Events, details, get Expert advice and Take Action



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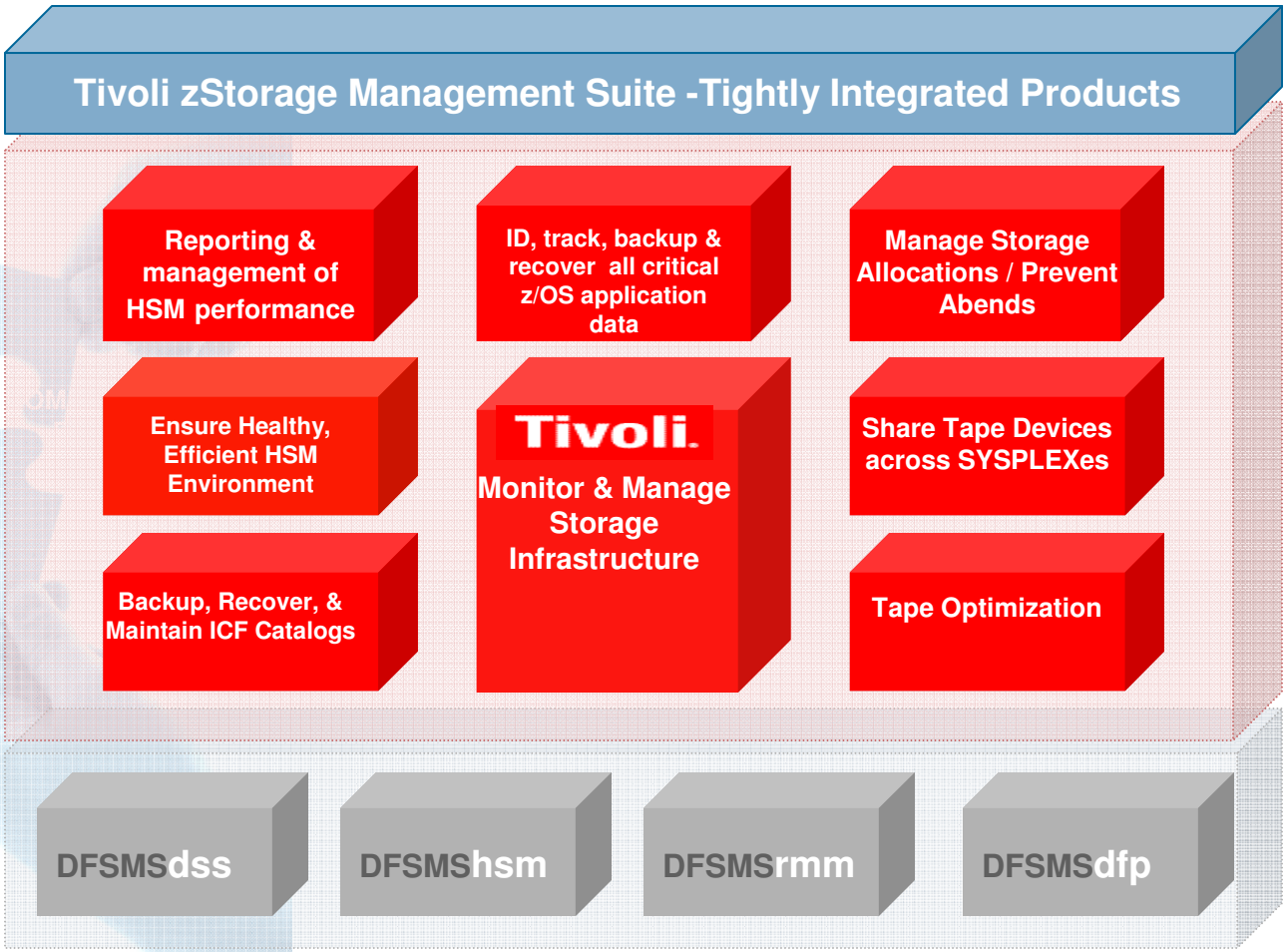

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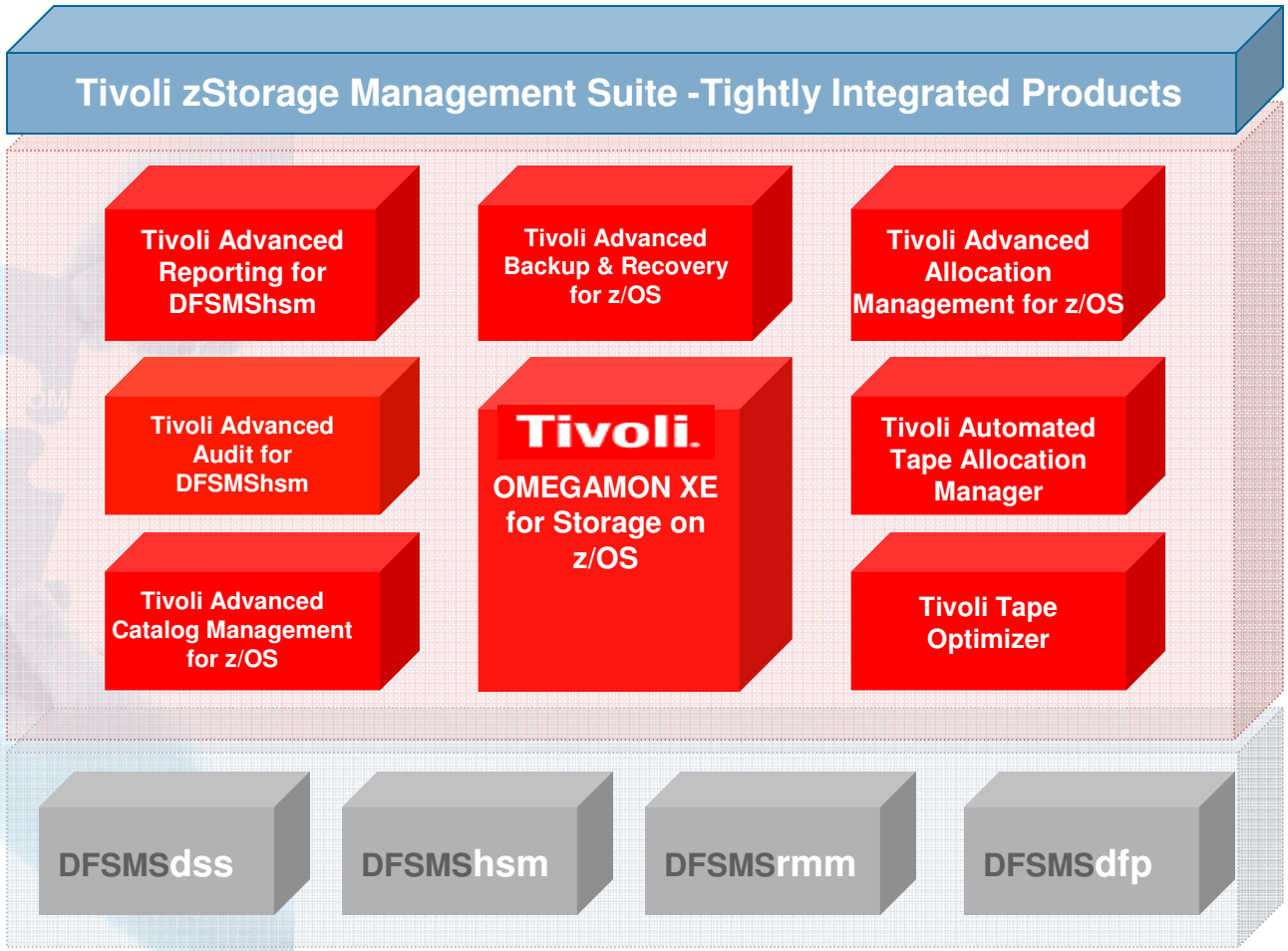

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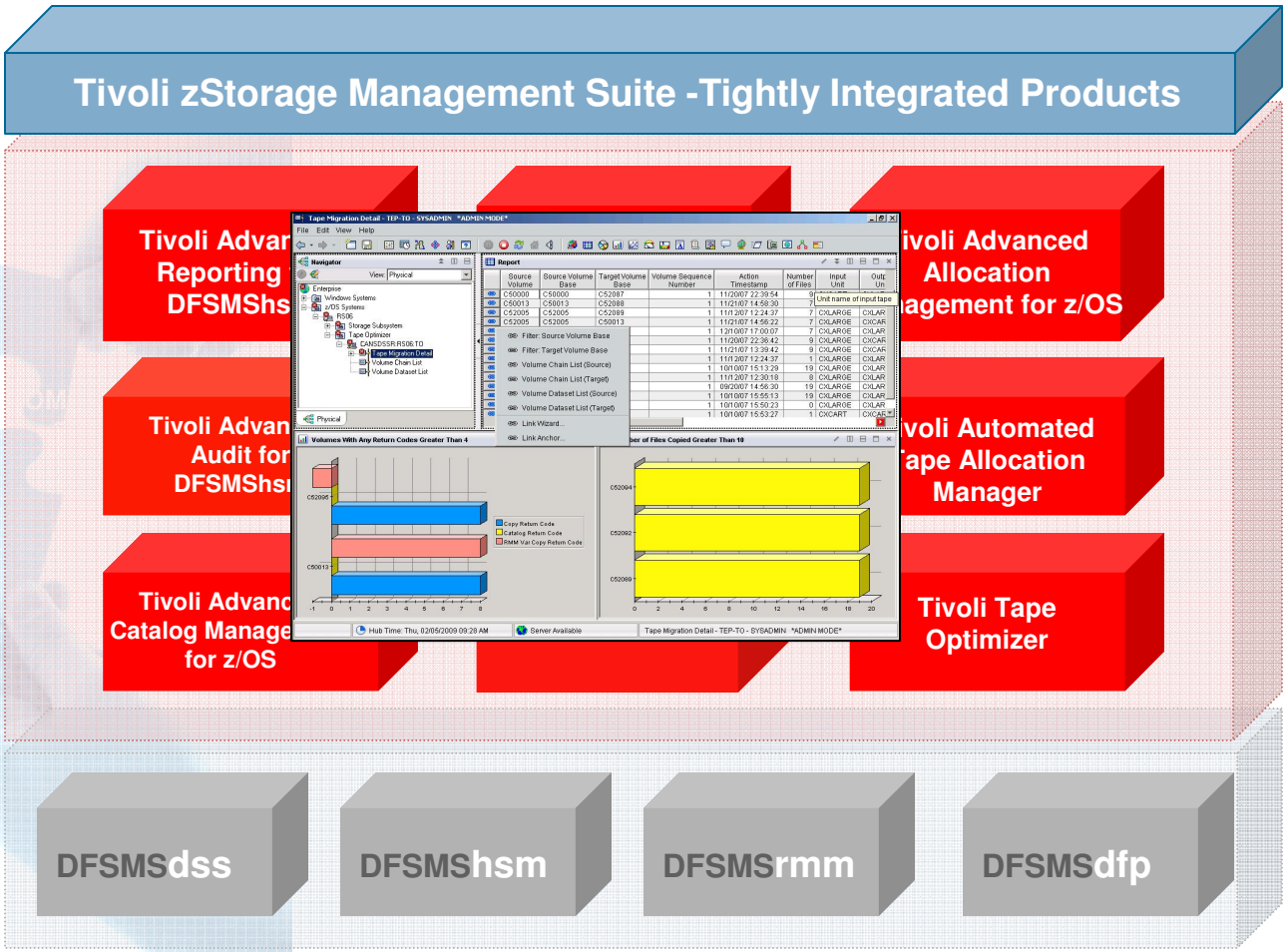

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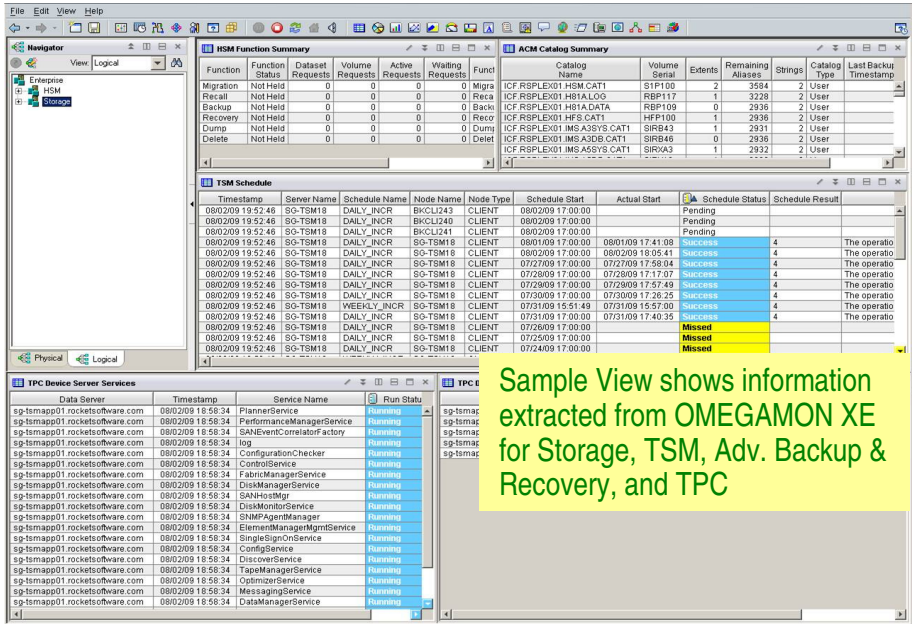
Enterprise Storage Integration:

•Customers are beginning to ask “What can you do in cross-platform storage management?”

- Today using OMEGAMON Dashboard Edition (DE) we can create views of storage information that span both System z and Distributed storage encompassing:

  - OMEGAMON XE for Storage
  - Advanced Catalog Management
  - Tivoli Storage Manager (TSM)
  - Tivoli Productivity Center (TPC)
  - Advanced Backup & Recovery for z/OS
  - Advanced Audit for DFSMShsm
  - and more….



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IBM Tivoli System z Storage Management

- IBM Tivoli Solution Addresses Key Storage Management Issues:
  - Application Performance
  - Efficient Device Management
  - CPU & Storage Cost
  - Storage-Related Outages
  - Data Integrity
  - Storage Administration Productivity
- Easy to use GUI interface shared with other System Management tools
  - Improves efficiency
  - Provides visibility into your storage environment
  - Gives you the control you need to manage
  - Automates repetitive or programmable actions
  - Fosters integrated management methodology (breaking down organizational silo's)
  - Reduces learning curve

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