

Increase System z storage visibility with OMEGAMON Monitoring

Sept. 13, 2012



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IBM Tivoli System z Storage Management Reduce Costs, Increase Productivity & Fosters Collaboration

Key Takeaways



1. Tivoli z/OS Storage portfolio brings together a rich set of z/OS Storage management capabilities together including hardware and software monitoring, HSM management, ICF Catalog management, Data Allocation & Tape management to prevent costly outages and reduce CPU and storage hardware costs
2. Common interfaces, standard methods of operation, built-in subject matter expertise, consolidated information views, intelligent alerting, and automation of routine tasks all combine to make users more efficient and reduce 24X7 reliance on subject matter “gurus”
3. Tivoli OMEGAMON XE for Storage on z/OS is the hub that integrates with an array of powerful specialty management components to break down organizational silos, share expertise and foster collaboration in solving problems and optimizing the environment .

Tivoli Storage Management provides integrated end-to-end integration and simplification

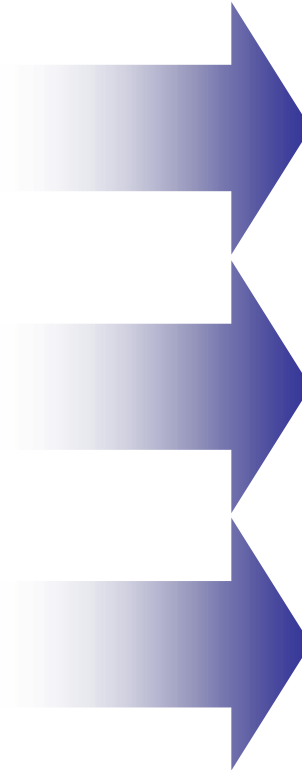
- Issues in z/OS Storage management
- Tivoli z/OS Storage Management portfolio and value
- IBM Tivoli z/OS Storage Management enhancements
- IBM Tivoli OMEGAMON XE for Storage on z/OS Overview
- New OMEGAMON XE for Storage V5.1



Tivoli's z/OS Storage solution meets today's challenges

Customer Challenges

- ***Simplifying management of multi-vendor storage devices***
- ***Minimizing outages & managing changes in storage environment***
- ***Growing workloads vs. Tight staffs, skills & budgets***



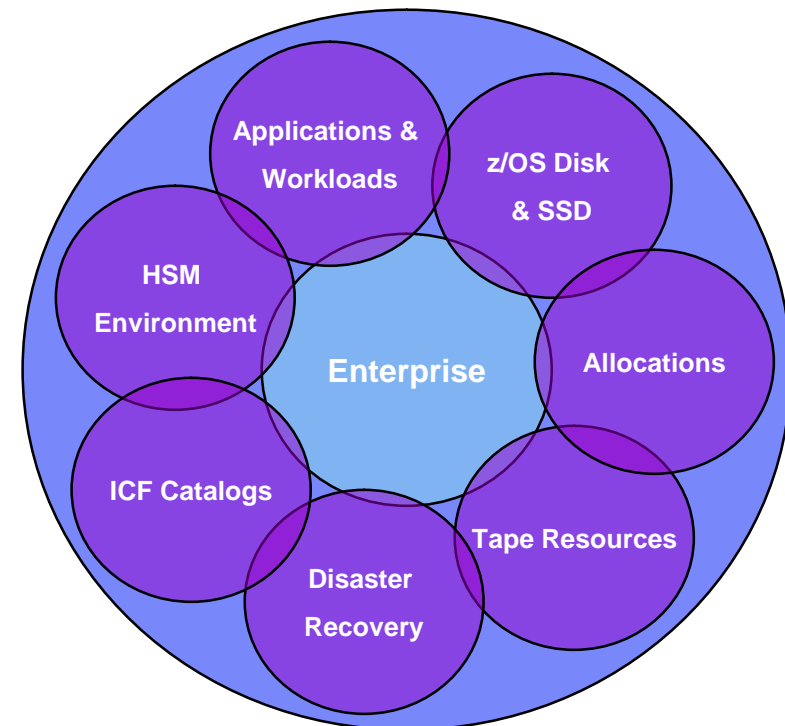
Overcoming Challenges

- ***Common set of tools across many storage systems***
- ***Tailored alerts and automation of tasks and preplanned corrective actions***
- ***Comprehensive, enterprise-wide view of storage infrastructure to support resource management, risk mitigation, cost savings and compliance***

IBM Tivoli System z Storage Solution – Leading Edge

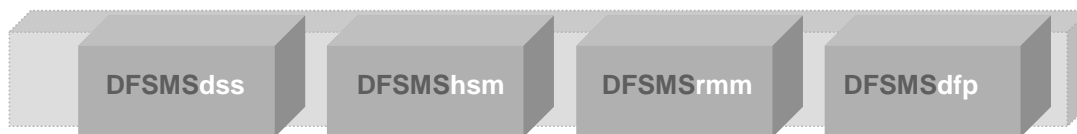
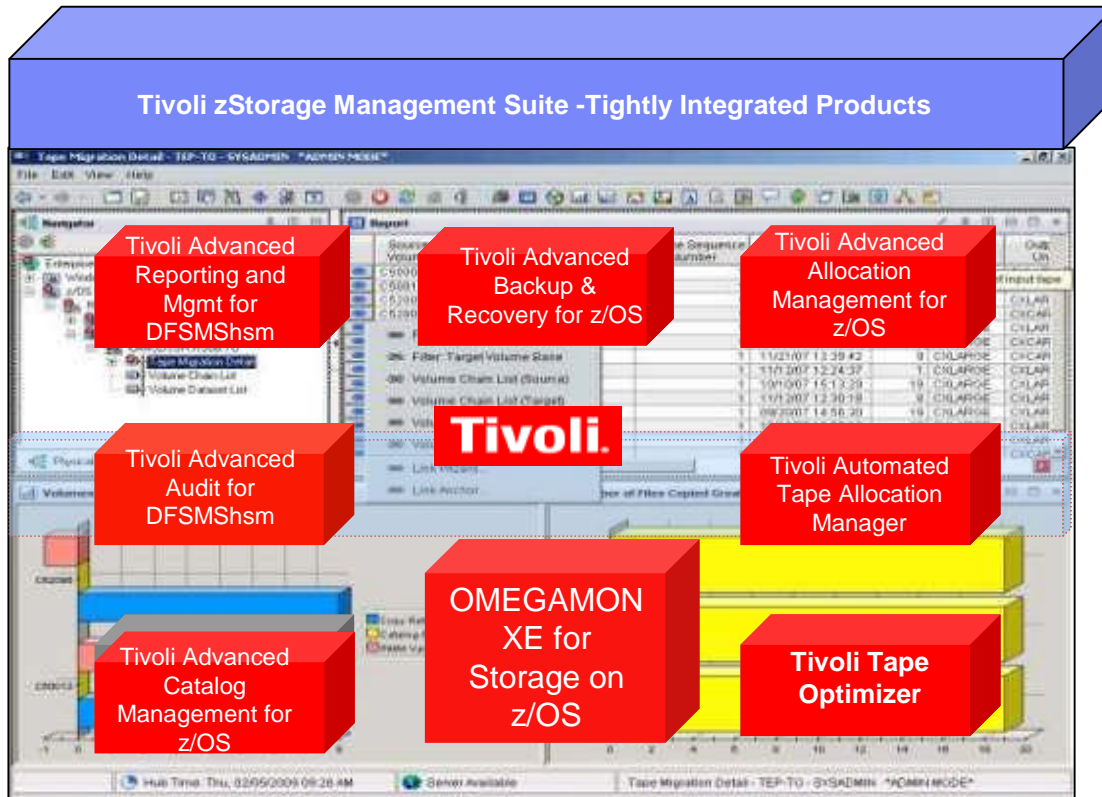
- Unmatched breadth and depth of z/OS storage management capability
- Powerful integrated storage monitoring
- Heterogeneous HW/SW environments
- Flexible reporting options & analytics
- Intelligent alerts & automated problem responses (manage by exception)
- Reduce resource consumption and cost
- Increases efficiency and staff productivity
- Reduce dependency on ‘gurus’
- Common interface and linkage to ISM components, breaks down silos, increases staff efficiency

Tivoli System z Storage Solutions address many key disciplines



Reduce Costs, Increase Productivity & Foster Collaboration

Tivoli zStorage Integration - Unmatched Capability



Differentiators

- Seamless Integration with other IBM/Tivoli management and automation offerings
- Application view of I/O Performance and Cross System support
- Deep availability & performance capability
- Situations – Manage by Exception
- Best in class HSM reporting, audit & error correction
- Allocation Management provides more preventive/corrective function
- IBM exclusive capability for fast replication in Backup & Recovery management
- Suite packaging and pricing advantages

Tivoli z/OS Storage Updates: Continuing Drum Beat

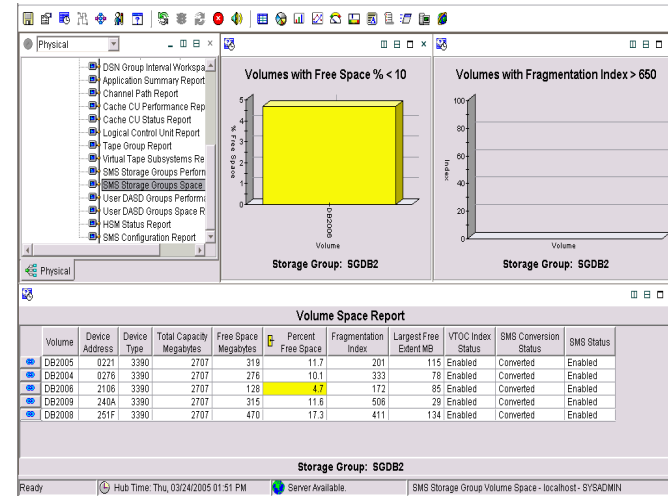
Within the last 18 months:

- Advanced Reporting & Mgmt V2.4
 - Detailed cost of HSM workload
 - Reduce downtime by maintaining HSM CDS while HSM active
- Advanced Catalog V2.4
 - Expanded tracking of catalogs backed up by different tools
- Advanced Backup & Recovery V2.3:
 - Uses storage controller fast replication, eliminating CPU overhead
 - Make backups instantaneous.
 - Frequent backups and faster recovery
 - Additional backup utilities supported
- Advanced Allocation Mgmt V3.2
 - New ease of use and flexibility enhancements with additional filtering
- Advanced Audit for DFSMSHsm V2.4
 - Enhanced reporting of HSM
 - Rebuild HSM managed tape data
 - New HSM auditing reports
- OMEGAMON XE for Storage on z/OS
 - New Actioning capabilities
 - Expanded hardware support
- IBM Tivoli Advanced Storage Management Suite for z/OS V1.1
- Advanced Allocation Mgmt V3.2
 - Additional filtering capability
- **OMEGAMON XE for Storage on z/OS v5.1.0 (GA – Sept. 14th)**



OMEGAMON XE for Storage on z/OS V5.1 - Overview

- Mainframe storage monitor, real-time and historical
- Powerful alerting and “Take Action” capability
- Daily Storage management capability
- Wide range of mainframe storage info:
 - Space and Performance management
 - Tape / VTS
 - Channels (FICON), Control Units, CACHE
 - DFSMSHsm support
 - DFSMSHsm / DFSMSdss / ICKDSF / IDCAMS online toolkit
 - Batch JCL creation from toolkit – any JCL
 - Ability to see all logical volumes on a physical disk
 - Powerful applications and data views
 - Integration capabilities from TEP interface
 - DFSMSrmm reporting and toolkit functions



Cornerstone for every z/OS Storage management Tool box!

Key Enhancements to OMEGAMON V5.1

OMEGAMON v5.1 enhancements that provide more cost savings, efficiency and collaboration

- Self Describing Agent & Parmgen technology
- Dynamic dataset attribute groups
- Dynamic DASD user groups
- Additional historical reporting enabled for TDW
- DFSMSHsm common recall queue support
- Define application groups via menu
- Execute storage toolkit requests from situation
- Support for Hitachi Data Systems storage facilities
- Initial support for STK (Oracle) tape devices
- New e3270 User Interface



Enhanced Install, Configuration and Maintenance capability with Self-Describing Agents

Faster, easier, less error-prone for improved reliability and productivity

- Eliminate monitoring outages caused by ITM Server recycles
 - Product upgrades/maintenance requires agent or RTEMS recycles only
- Eliminate maintenance upgrade errors:
 - Applies to new installs, staged upgrades, and maintenance
 - Crosschecks and validates version with installed data and framework
 - Avoids inconsistent application data in ITM framework layers
- Self-describing framework extensible to new capabilities
- Eliminates application data DVDs and CDs:
 - No extra distributed installs or upgrades for mainframe-centric customers



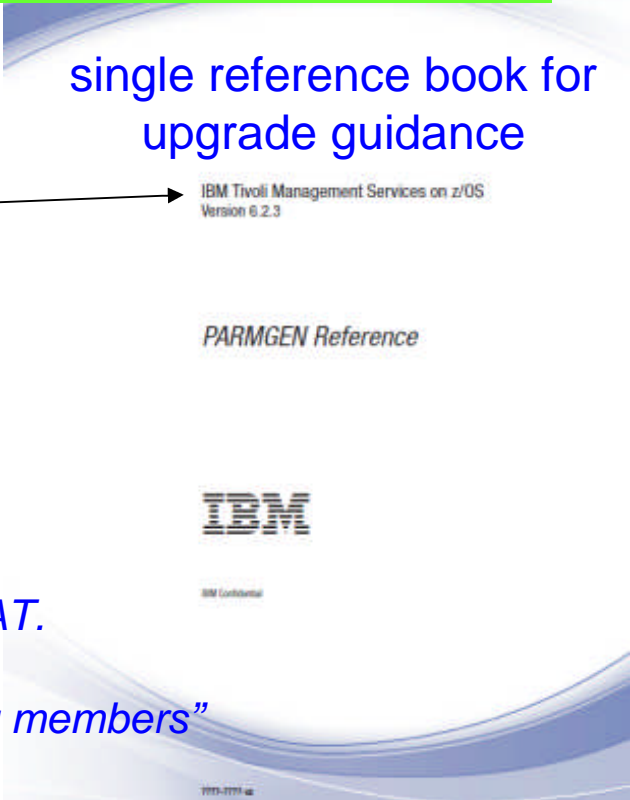
- Moving from 40 hours a week to 4 hours a week maintenance
- 80% improvement in time for installation and maintenance
- 30% improvement in time to configure post installation

Customer Driven improvements simplify Installation and Configuration using Parmgen

Removal of ICAT as primary way to install and configure

*Before -145 ICAT **product-centric** jobs to configure 38 components for 1 LPAR RTE
Today – 8 Parmgen **function-centric** jobs to configure components for 1 LPAR RTE
Customers experiencing over 35% improvement in install and configuration time*

- Install without requirement of distributed server
- Easy to walkthrough steps to complete configuration and customize profile
- Automatically updates hundreds of configuration artifacts according to profile, including auto-discovery of system values

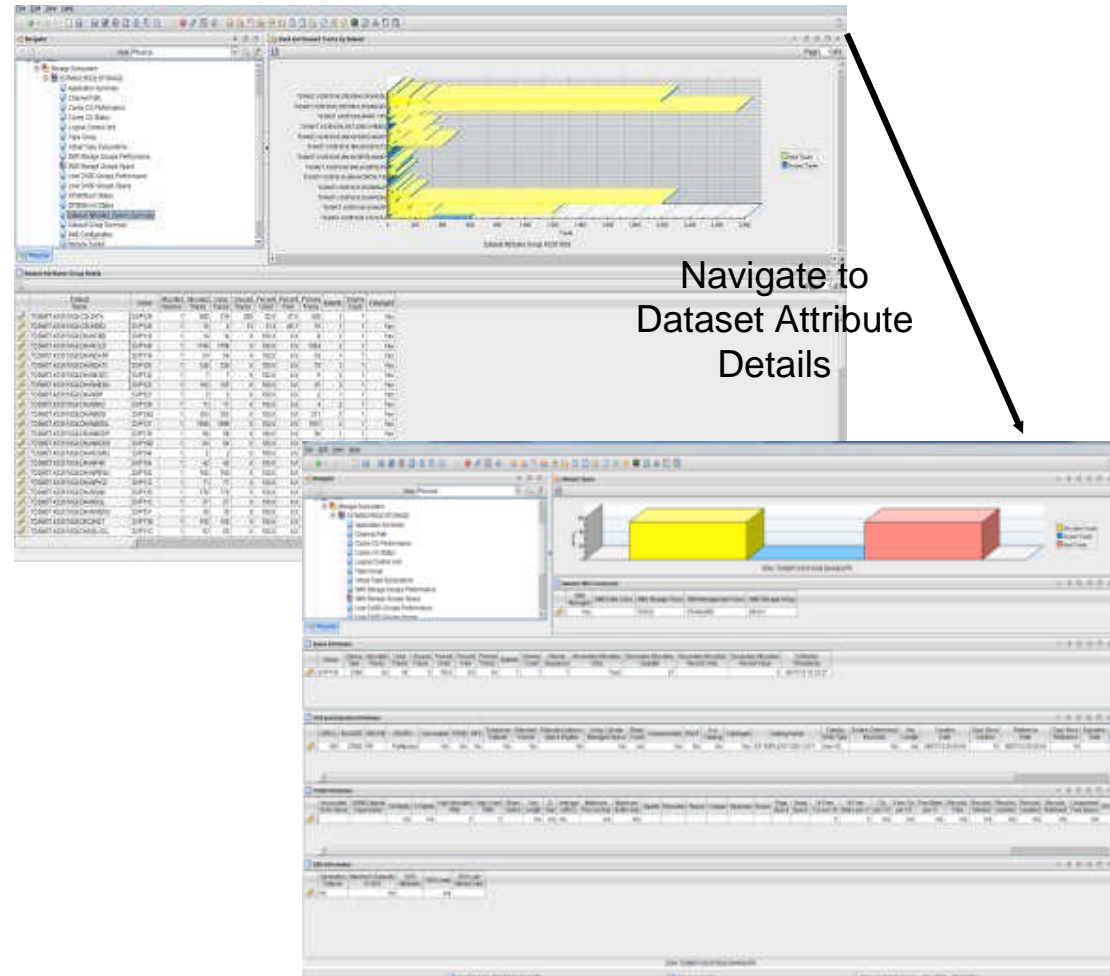


single reference book for upgrade guidance

“I like using the Parmgen approach better than CICAT/ICAT. I find it much easier to make things repeatable... I like the fact that Parmgen does not overwrite my running members”
Typical quotes from early adopters program

Save hours of research and problem correction effort with enhanced Dynamic Dataset Attribute & DASD User Groups

- Ability to define a group of datasets & DASD based on almost any attribute group that is tracked
- Datasets & DASD in the group change dynamically based on the attribute values at time of collection
- May issue storage toolkit requests against the group



Enhanced historical reporting adds new data to the Tivoli Data Warehouse (TDW)

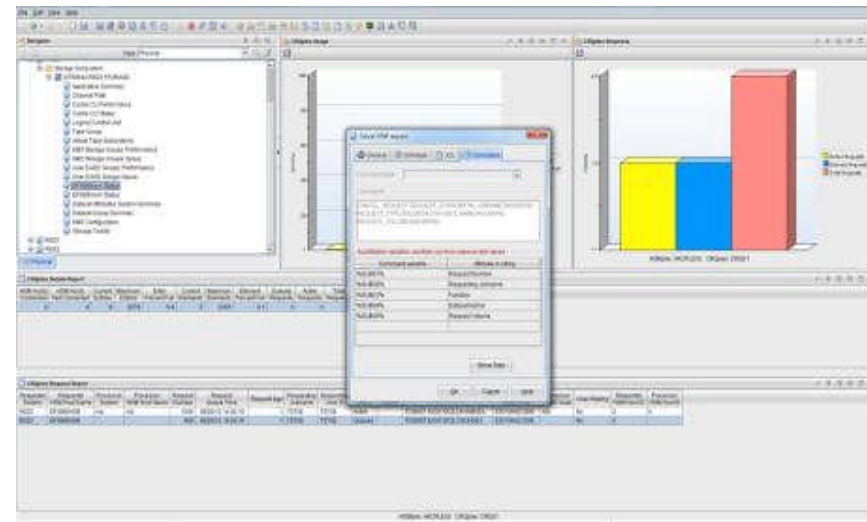
- Allows summarization of historical data
- Collection of historical data supported via TEP GUI interface
- Data is collected on the RMF interval
 - Written to PDS and TDW on interval set in TEP GUI
 - Never more often than RMF interval
- “NEW” key attribute groups enabled:
- Trend analysis supports better capacity planning

S3_Cache_Control_Unit	S3_Cache_Devices
S3_Channel_Path	S3_DASD_Volume_Performance
S3_DASD_Volume_Space	S3_Volume_Group_Summary
S3_DASD_Group_Vol_Perform	S3_DASD_Group_Vol_Space
S3_Logical_Control_Unit	

DFSMSHsm Common Recall Queue updates

For Common Recall Queue Problems, OM Storage can reduce CRQ problem determination by 70% to 90%

- Monitors the health of HSM CRQ
- Cancel tasks via Storage Toolkit
 - Tasks waiting for execution
 - Executing and 'presumably hung' tasks
- See status of all HSM hosts in CRQplex
- See requests waiting and executing on CRQ

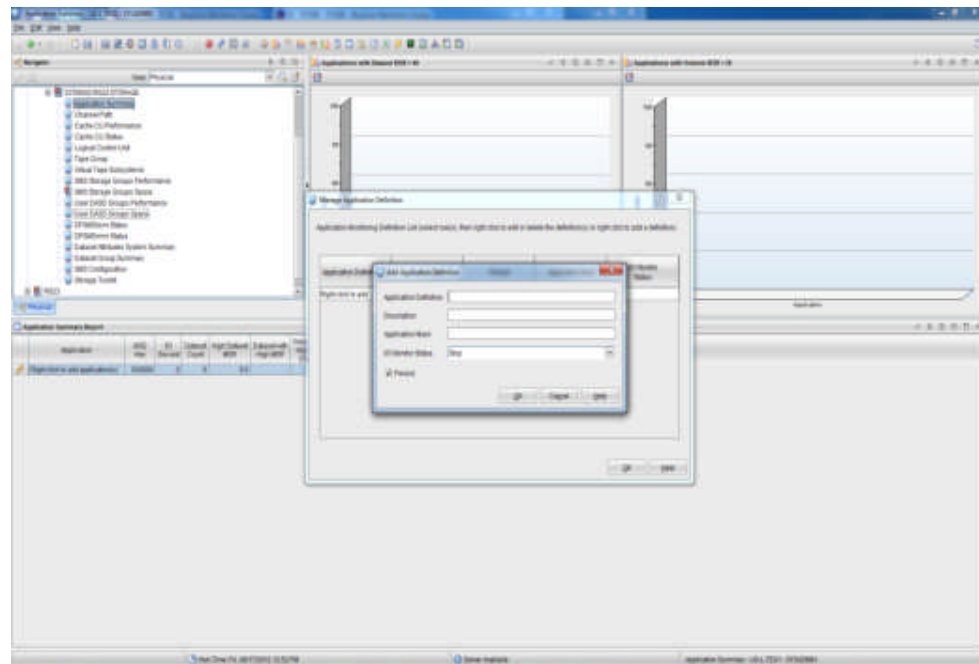


Select the request to be cancelled, right click, and invoke the cancel dialog. Cancel request will be routed to the appropriate HSM host for processing.

Simplify definition of workload for tracking

70% improvement in defining Workload tracking via Tivoli Enterprise Portal User Interface

- Set of menus to define applications to monitor
- Replaces original 'situation' method to define an application
 - Situation method still supported
- Ability to delete applications
- Ability to alter application masks

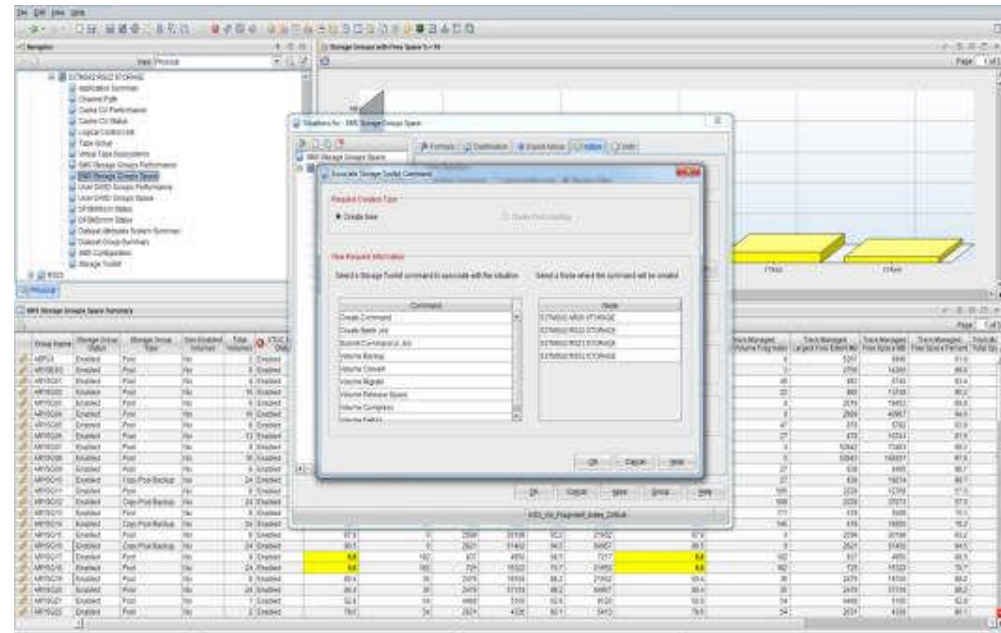




Easily Automate Responses to Common Problems

Stronger problem resolution capabilities can save you 80% in setup effort for automated actions to address problems

- Situation editor now has Storage Toolkit option as part of Take Action
- Menu interface from Situation Editor to build Storage Toolkit requests
- Requests execute under z/OS id of last modifier of situation
- Requests and results are visible in the Storage Toolkit leaf

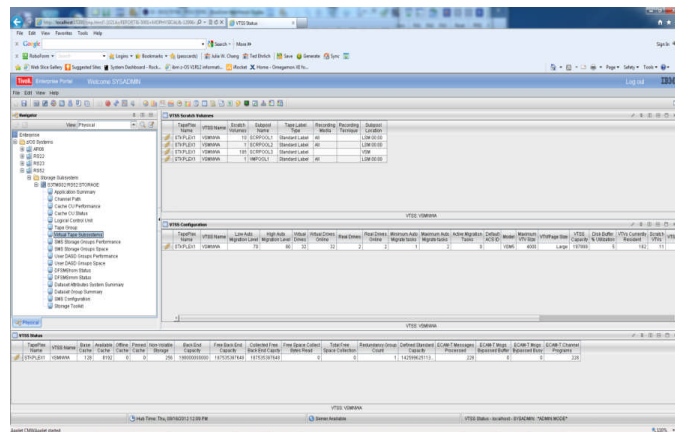


Expanded support for HDS and STK storage hardware

In addition to IBM and EMC physical device support, now include HDS and STK, for a full range of hardware views

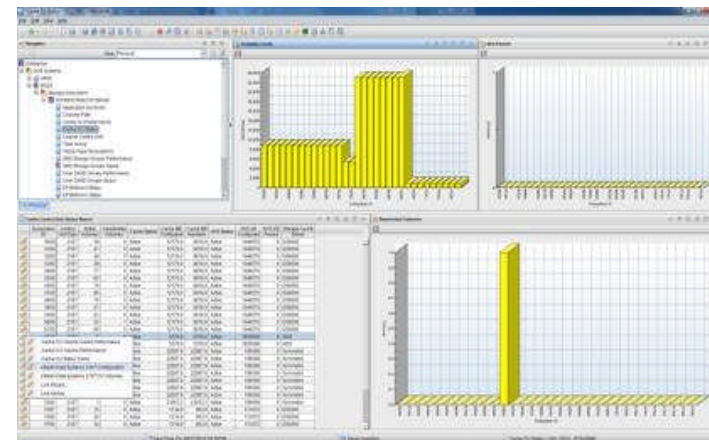
Full HDS physical disk support

- Workspace structure similar to that of TotalStorage DS
- Uses same attribute groups as TotalStorage support
- Navigation from Cache CU Performance and Status workspaces



Full STK physical tape support

- STK tape libraries (virtual and real) appear in existing workspaces
- STK linklib must be in a linklisted dataset (part of STK standard install)
- Tape Groups
- Standard navigation to tape drive workspace



Redesigned and simplified e3270 UI in OMEGAMON v5.1

```

    EITe Edit View Tools Options Help 06/16/2012 13:59:08
    Command ==>
    KS35GSD SMS Storage Group Space details
    Auto Update : off
    Plex ID : RSPLEX01
    Sys ID : RS23
  
```

Storage Groups Space Details

Group Name.....	SGD9X2	Storage Group Status.....	Enabled
Storage Group Type.....	Pool	Non-Enabled Volumes.....	No
Total Volumes.....	1	VTOC Index Status.....	Enabled
Low Volume Free Space %.....	0.0	High Volume Fragmentation Index.....	846
Largest Free Extent MB.....	1	Free Space MB.....	2
Free Space %.....	0.0	Total Space MB.....	2707
Track Managed Low Volume Free Space %.....	0.0	Track Managed High Volume Frag Index.....	846
Track Managed Largest Free Extent MB.....	1	Track Managed Free Space MB.....	2
Track Managed Free Space %.....	0.0	Track Managed Total Space MB.....	2707
Used Space %.....	100.0	Track.....	100.0

Volume Space Report

Volume Address	Device Address	Device Type	Total Capacity Megabytes	Free Space Megabytes	% Free Space	Fragmentation Index	Largest Free Extent MB	VTOC Index Status	SMS Conversion Status	SMS Status	+Extend Address
222222	67A0	3390	2707	2	0.0	846	1	Enabled	converted	Enabled	No

Lowest Volume Free Space

Volume Address	Device Address	Free Space Megabytes	Device Type	Total Capacity Megabytes	% Free Space	Fragmentation Index	Largest Free Extent MB	VTOC Index Status	SMS Conversion Status	SMS Status
222222	67A0	2	3390	2707	0.0	846	1	Enabled	converted	Enabled

Lowest Volume Free Space Percent

Volume Address	Device Address	% Free Space	Total Capacity Megabytes	Free Space Megabytes	Fragmentation Index	Largest Free Extent MB	VTOC Index Status	Device Type	SMS Conversion Status	SMS Status
222222	67A0	0.0	2707	2	846	1	Enabled	3390	converted	Enabled

Highest Volume Fragmentation Index

Enhanced 3270 user interface for SMEs – Leverage valuable information



- Built-in Problem Solving Scenarios
- Increased availability via faster problem resolution
- Improved Productivity through integration
- Customizable / Flexibility



Quickly find and repair DFSMSHsm CRQ Problems

Storage SMSplex Overview

(Proactive – Reducing time and costs)

Command ==> _____ Auto Update : Off
 KOBSTART _____ Plex ID : _____
 _____ Sys ID : _____

Enterprise Summary

Storage SMSplex Overview

Columns 2 to 9 of 18 Rows 1 to 2 of 2

*SYSplex Name	High Volume Response Time	High Volume Fragmentation Index	HSM Max Entry % Full	HSM Max Element % Full	HSM Oldest Request Age	Storage Grp Low Free Space %	Storage Grp Low Free Space GB	+Low Track Manage Free Space %
RSPLEX02	3.8	835	0.1	0.0	n/a	1.1	0.0	1.1
RSPLEX01	21.4	1000	88.5	85.0	122	0.0	0.0	0.0

Place the cursor and hit ENTER to zoom.

User sees high values for HSM for RSPLEX01. Place the cursor on one of the HSM columns and hit ENTER to navigate to the appropriate workspace.

Gain insight into DFSMSHsm CRQ Problem

CRQplex Details Workspace

Command => K53CD
Auto Update : Off
Plex ID : RSPLEX01
Sys ID : RS23

HSMplex: ARCPLEX0
CRQplex: CRQ01

CRQplex Details Report

HSM Hosts Connected.....	2	HSM Hosts Not Connected.....	0
Current Entries.....	2018	Maximum Entries.....	2279
Entry % Full.....	88.5	Current Elements.....	2010
Maximum Elements.....	2365	Element % Full.....	85.0
Queued Requests.....	2010	Active Requests.....	0
Total Requests.....	2010	Oldest Request Age.....	122

CRQplex Host Details Report

*System	*HSM Host Name	HSM Host ID	HSM Host ASID	HSM Host CRQ State	HSM Host CRQ Held	HSM Host CRQ Recall Held	HSM Host CRQ Recall Place Held	HSM Host CRQ Recall Select Held	HSM Host CRQ User Connect	HSM Host CRQ User Disconnect
RS23	DFSMSHSM	3	0089	Connected	No	No	No	External	No	No
RS22	DFSMSHSM	2	0033	Connected	No	No	No	External	No	No

Problem resolution

- Problem has been identified
 - Someone has issued the HOLD COMMONQUEUE(RECALL(SELECTION)) against the HSM hosts
- Action: RELEASE COMMONQUEUE(RECALL(SELECTION)) to each HSM host that has been held

No active requests

You see the warnings for the Entry and Element values. Also, the HSM hosts are not pulling recall requests from the CRQ; however, they are putting requests on it.

Checking your Results

Updated CRQplex Details Workspace

```

Command ==>
K53CD
Auto Update : Off
Plex ID : RSPLEX01
Sys ID : RS23
CRQplex Details
HSMplex: ARCPLEX0
CRQplex: CRQ01
CRQplex Details Report
HSM Hosts Connected..... 2
Current Entries..... 2020
Entry % Full..... 88.6
Maximum Elements..... 2365
Queued Requests..... 1996
Total Requests..... 2012
HSM Hosts Not Connected..... 0
Maximum Entries..... 2279
Current Elements..... 2012
Element % Full..... 85.1
Active Requests..... 16
Oldest Request Age..... 1.4
CRQplex Host Details Report
Columns 3 to 11 of 18
Rows 1 to 2 of 2
+System +HSM Host HSM Host HSM Host HSM Host HSM Host HSM Host HSM Host HSM Host HSM Host
| Name | Host ID | ASID | CRQ State | CRQ Held | Recall Held | Recall Place Held | Recall Select Held | User CRQ | User CRQ
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| RS23 | DFSMSHSM | 3 | 0089 | Connected | No | No | No | No | No
| RS22 | DFSMSHSM | 2 | 0033 | Connected | No | No | No | No | No
    
```

Requests are active

Checking results:
 The status of the HSM hosts has changed. Recall is no longer held. Also, there are now active requests, i.e., work is being done.

Monitor results DFSMSHsm CRQ Problem

CRQplex Details Improving

Command => K53CD Auto Update : Off
Plex ID : BSPLX01
Sys ID : RS23

CRQplex Details

HSMplex: ARCPLEX0
CRQplex: CRQ01

CRQplex Details Report

HSM Hosts Connected.....	2	HSM Hosts Not Connected.....	0
Current Entries.....	211	Maximum Entries.....	2279
Entry % Full.....	9.3	Current Elements.....	203
Maximum Elements.....	2565	Element % Full.....	8.6
Queued Requests.....	184	Active Requests.....	16
Total Requests.....	203	Oldest Request Age.....	145

CRQplex Host Details Report

Columns 3 to 11 of 18 Rows 1 to 2 of 2

*System	*HSM Host Name	HSM Host ID	HSM Host ASID	HSM Host CRQ State	HSM Host CRQ Held	HSM Host CRQ Recall Held	HSM Host CRQ Recall Place Held	HSM Host CRQ Recall Select Held	HSM Host CRQ User Connect	HSM Host CRQ User Disconnect
- RS23	DFSMSHSM	3	0089	Connected	No	No	No	No	No	No
- RS22	DFSMSHSM	2	0033	Connected	No	No	No	No	No	No

Element and Entry Percents are down, as is total requests

Most of the backlog has been eliminated. Things are looking vastly improved.

Business Leaders Depend on IT to Enable Business Agility with:



VISIBILITY



CONTROL



AUTOMATION

React with agility to diverse IT landscape

Execute with reduced risk & cost

Achieve desired business outcomes

Tivoli z/OS Storage Management portfolio working with IT to drive improved visibility

IBM Tivoli System z Storage Management Reduce Costs, Increase Productivity & Fosters Collaboration

Key Takeaways



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