

Improve the management of your growing mainframe storage environments

Apr. 26, 2012



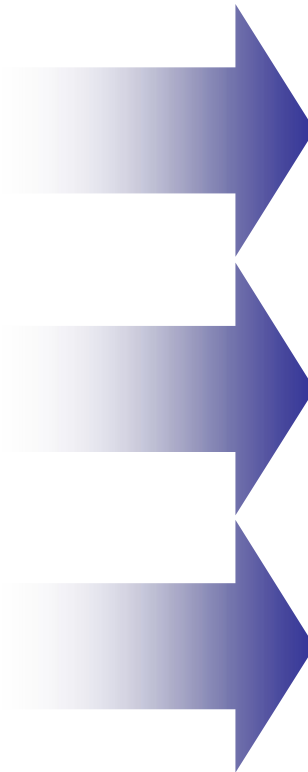
Kevin Hosozawa – Tivoli z/OS Storage Product Manager (khosozaw@us.ibm.com)



Tivoli's zStorage solution can increase productivity, reduce costs and foster synergy

Customer Challenges

- ***Simplifying the management of multi-vendor storage devices***
- ***Minimizing outages & managing changes in the storage environment***
- ***Declining staffs, skills & budgets***



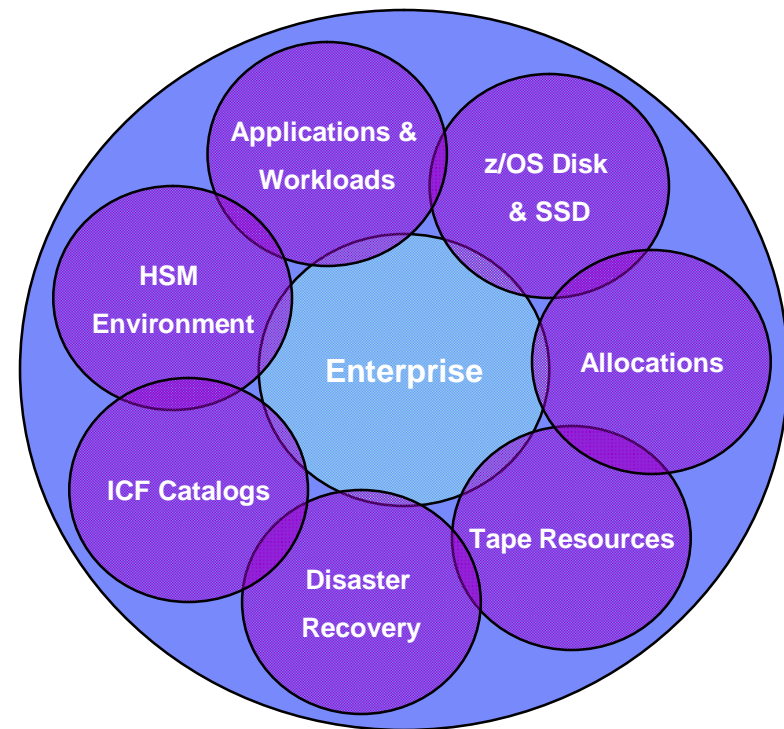
Overcoming Challenges

- ***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

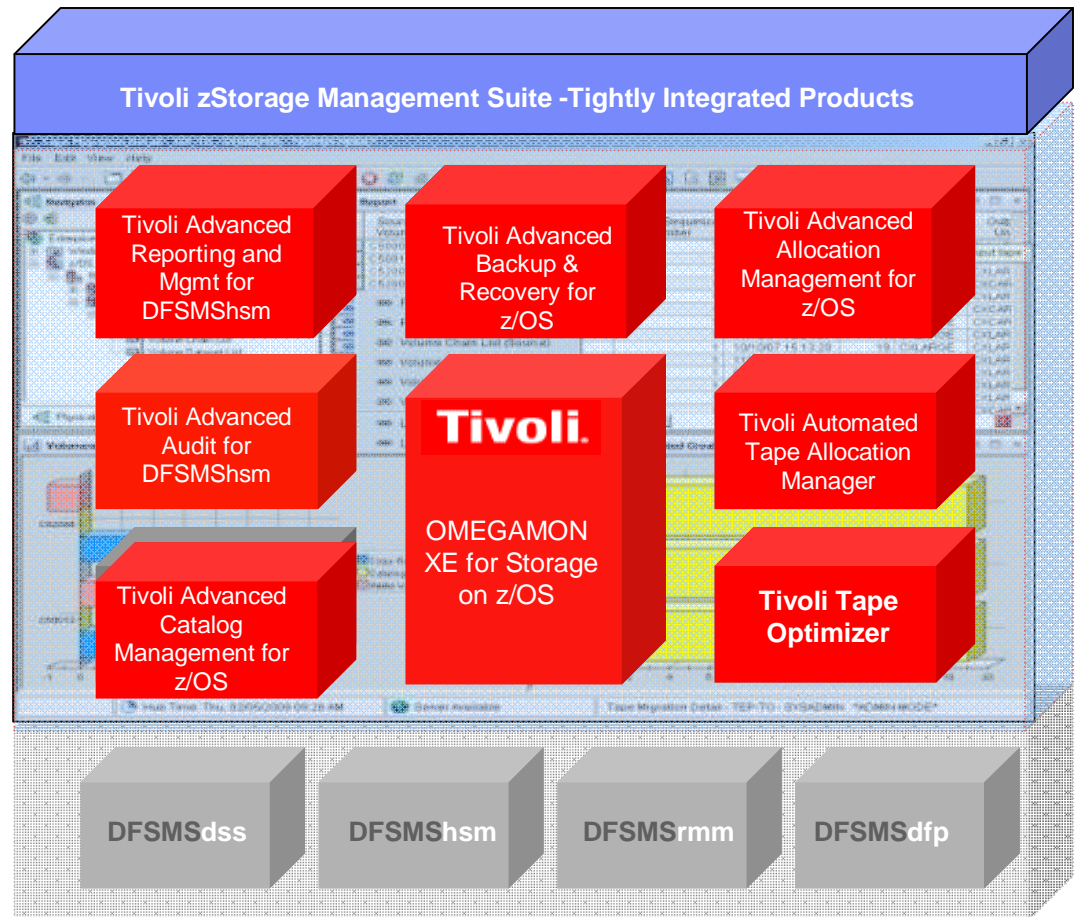


Increase Productivity, Reduce Costs & Foster Synergy

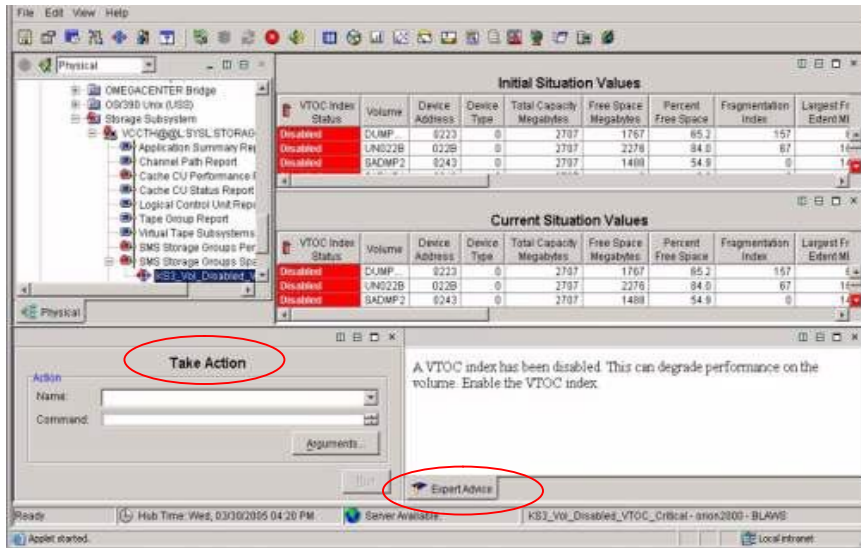
Tivoli zStorage Integration - Unmatched Capability

Differentiators

- Seamless Integration with other IBM/Tivoli management and automation offerings
- Application view of I/O Performance
- 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



Focus Visibility and Control to key areas – Maximize efficiency



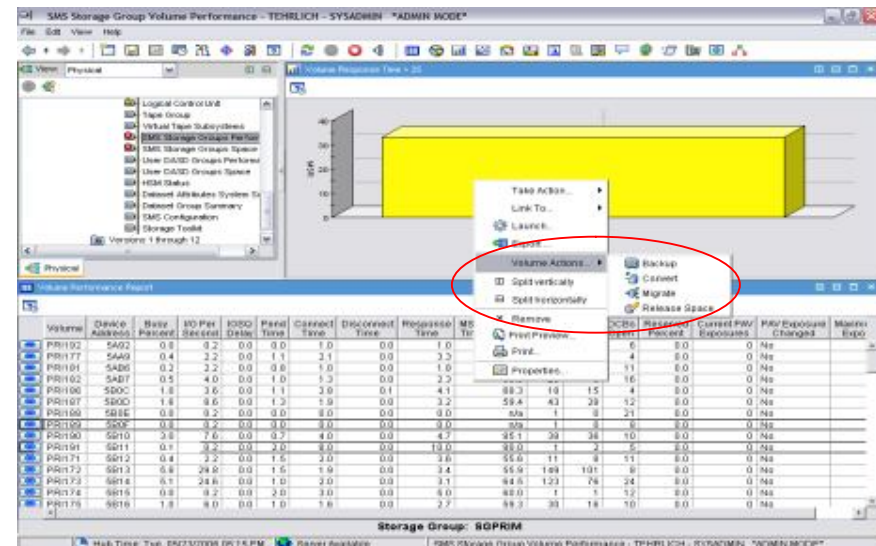
Manage by exception – monitor key applications and limit visible information to what is needed

When situations “fire” quickly see what caused the alert, and compare current status of the situation to the initial condition that caused this alert

Pre-programmed actions can respond automatically to situations – or - Take Action by issuing commands

“Reduce time in manual tasks, e.g. reading reports, physically monitoring environment”

From monitoring you can issue commands for HSM, DSS, IDCAMs, ICKDSF, RMM and JCL, use the Tools to generate automated or manual batch job responses directly from your monitoring activity



Effective Problem Identification reduces cost

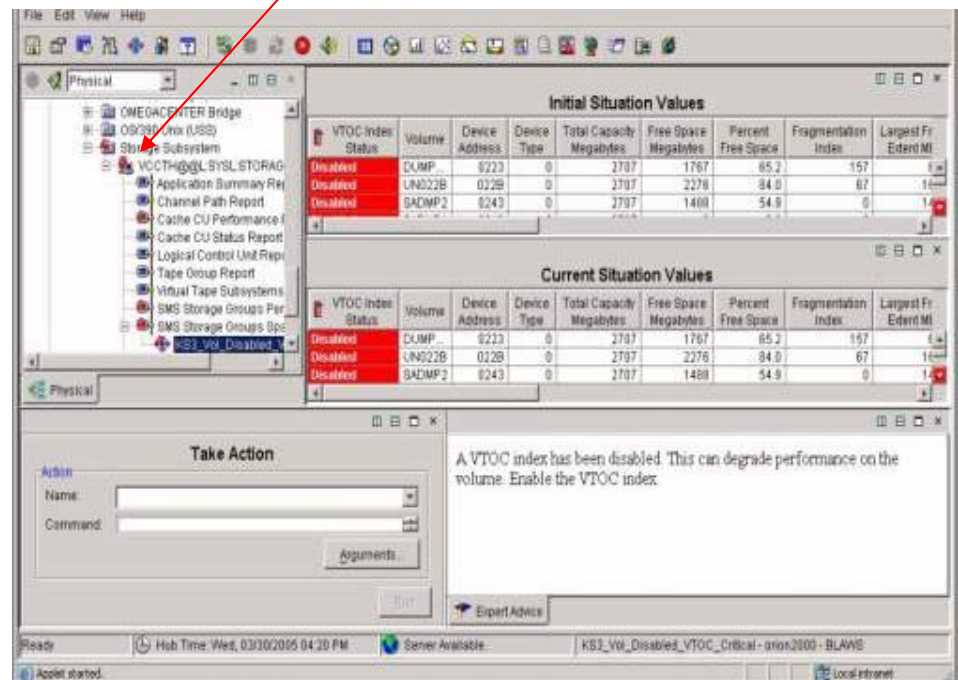
Situations: What are they?

A **situation** is an intelligent alert that can utilize and/or logic to *monitor* a condition or set of conditions that you want to be notified about, which would indicate a potential problem with an identified workload and/or resource

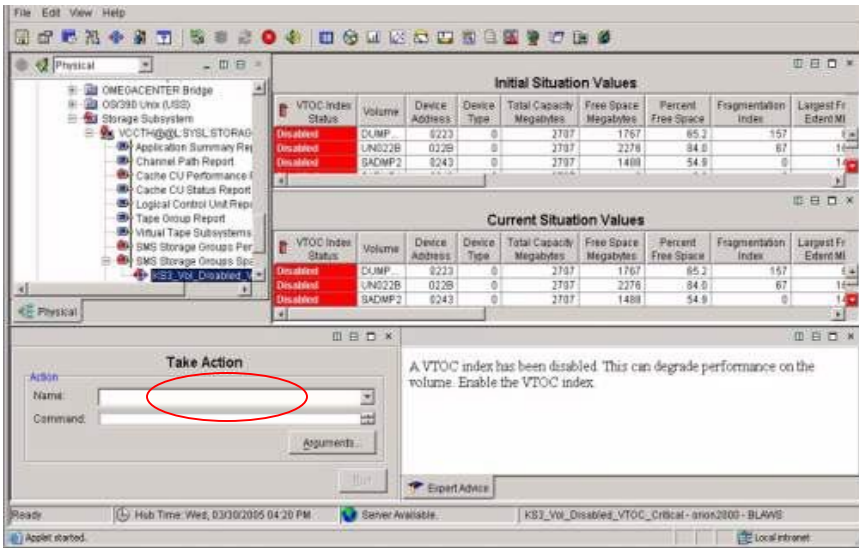
Situation “fires” and you quickly navigate to what triggered the alert

Situations: Why use them?

- Proactively detect and resolve problems before end users report impact.
- Minimize time determining root cause (Alert if stor class=PRILRG and free space < 10% or largest free space < X MBs)
- Create alerts based on multiple conditions ranging from simple to complex
- Customize for specific conditions and environment
- Automate problem resolution using Take Action (reflex automation)



Fostering teamwork and efficiency – Break down the silos



Quickly identify the problem, exploit Expert Advice, and Take action to reduce meantime-to-resolution and knowledge transfer

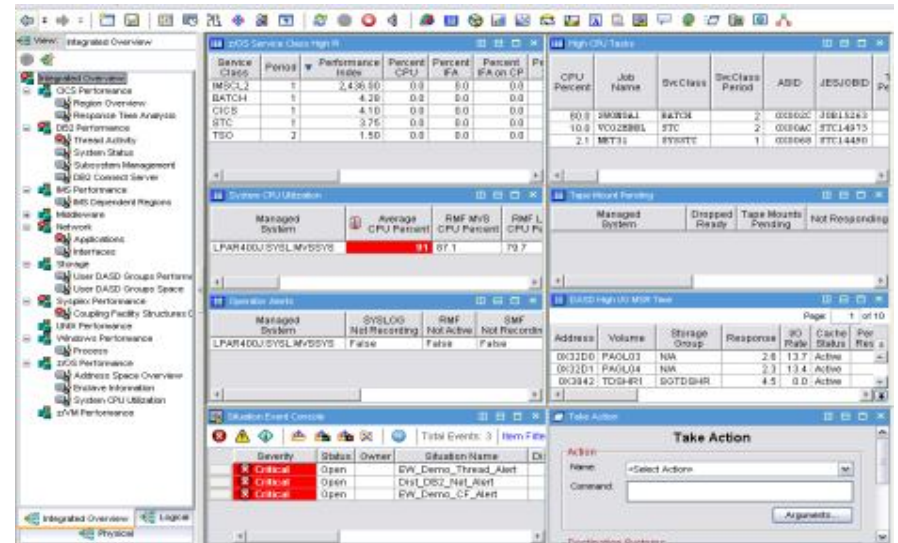
Separate teams using common tools and processes can collaborate easily on problem determination and resolution, breaking down the silos

Intelligent tooling and knowledge capture reduces 24x7 reliance on experienced “gurus”.

Storage is a common entity with any z/OS workload, regardless spanning CICS, DB2, IMS, middleware, networking and z/OS operating system information

Integration at this level:

- Increases ability to identify and address problems
- Fosters greater communication
- Prevents issues from impacting service levels
- Reduces down time and business impact from issues



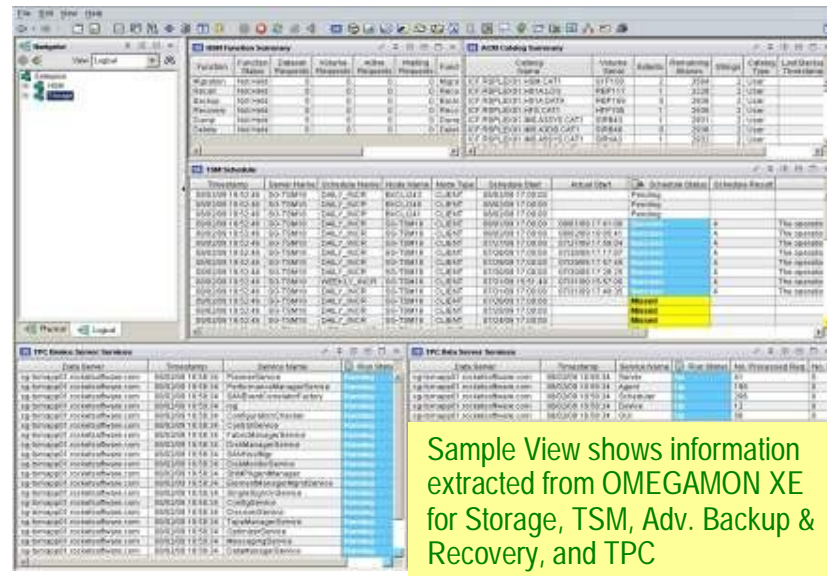
Enterprise wide Storage – z/OS and Distributed storage for End-To-End management

Create views of storage information spanning System z, Distributed and Cloud with integration across enterprise wide management functionality

Increasingly, storage administrators are being tasked with managing enterprise storage

■ Examples:

- Monitor cross platform backups
- Monitor storage configuration
- Monitor performance
- Identify bottlenecks
- Monitor Storage space availability



<ftp://public.dhe.ibm.com/software/systemz/whitepapers/TivoliEnterpriseStorageMonitoring-v2.pdf>

Tivoli System z Storage Updates – Continuing Drum Beat in 2012

Delivered in 2011:

- Advanced Reporting & Mgmt V2.4 (GA – Feb 11th):
 - Detailed cost of HSM workload – tune system, reduce cost
 - Maintain HSM CDS while HSM is active – reduce downtime
- Advanced Catalog V2.4 (GA - Aug. 25th):
 - Expanded tracking of catalogs backed up by different tools
- Advanced Backup & Recovery V2.3 (GA - Sept. 9th):
 - Uses storage controller fast replication, eliminating CPU overhead while making backups instantaneous. Allows more frequent backups and faster recovery
 - Additional ease-of-use features
 - Additional backup utilities supported
- Advanced Allocation Mgmt V3.2 (GA – Oct 21st):
 - New ease of use and flexibility enhancements with additional filtering capability
- Advanced Audit for DFSMSHsm V2.4 (GA – Oct 28th):
 - Enhanced reporting on estimated of HSM errors, costs , Rebuild HSM managed tape data to recover from error or disaster, New HSM auditing reports
- OMEGAMON XE for Storage on z/OS (GA – Nov. 14th)
 - New Actioning capabilities
 - Expanded hardware support



New in 2012

- **IBM Tivoli Advanced Storage Management Suite for z/OS V1.1** (GA – Feb.17th)
- Advanced Allocation Mgmt V3.2 (GA – Mar. 16th)
 - Additional filtering capability

Continue enhancements based on customer driven input!



IBM Storage Management Software Future Outlook

- Our focus moving forward
 - Continue focus on enterprise level storage management integration
 - Continue addressing customer enhancement requests
 - Increase integration with IBM z/OS Storage components
 - Improve Time-To-Value
 - Improve Total Cost-of-Ownership
 - Improve hardware/software resource utilization
 - Improve IT management personnel efficiency



Save the Date

IBM Edge2012

IBM's Premier Storage Conference
June 4-8 | Orlando, FL

3 events under one roof:

- **Executive Edge**
2-Day IT and Business Leaders Track
- **Technical Edge (Storage Technical University)**
4.5-Day Technical Tracks
250 sessions, labs, certifications
- **Business Partner Forum**
Half-Day IBM Business Partner Briefing

**Exclusive offer for IBM Pulse attendees:
Use promotion code P5A
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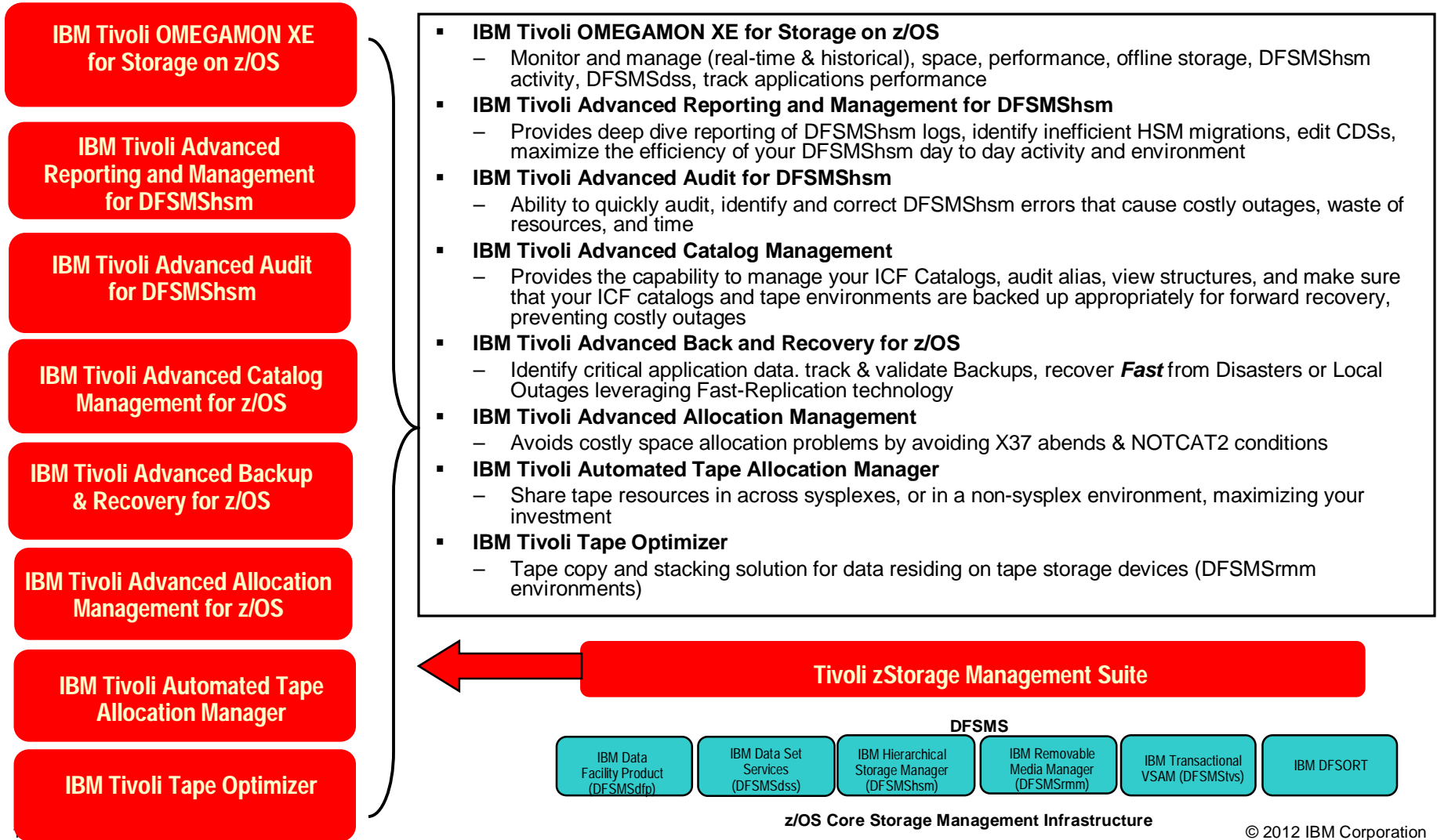
Backup



System z Storage Management Solutions (box)

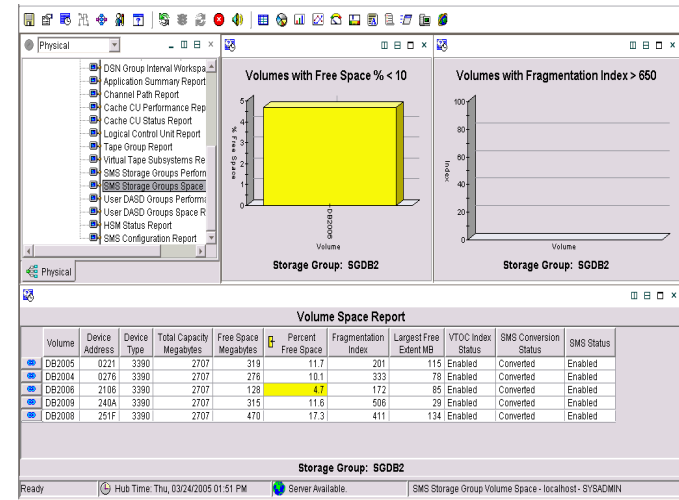
Tivoli zStorage Management Suite -Tightly Integrated Products

Set of tools needed by a storage administrators to monitor, automate, and tune for the day-to-day management of a complex environment



OMEGAMON XE for Storage on z/OS v420

- **A mainframe STORAGE monitor, real-time and historical**
- **Powerful alerting and “Take Action” capability**
- **Daily Storage management capability and functions**
- **A wide breadth of mainframe storage information:**
 - Space and Performance management (storage groups all the way down to data set groups, define your own for reporting)
 - Tape / VTS
 - Channels (FICON), Control Units, CACHE
 - DFSMSHsm (View and administer your active HSM queues, control Datasets, etc.)
 - DFSMSHsm / DFSMSdss / ICKDSF / IDCAMS online toolkit
 - Batch JCL creation from toolkit – any JCL
 - SMS constructs
 - DS8000 support
 - Ability to see all logical volumes on a physical disk
 - Powerful applications view
 - Powerful dataset view and action capability
 - Integration capabilities from TEP interface to



– **Dynamic Workspace Linking to:**

- IBM Tivoli Advanced DFSMSHsm Reporter (ITAARD)
- IBM Tivoli Advanced DFSMSHsm Audit (ITAAD)
- IBM Tivoli Advanced Catalog Management (ITACM)
- IBM Tivoli Advanced Backup and Recovery (ITABR)
- IBM Tivoli Advanced Allocation Manager (ITAAM)
- IBM Tivoli Tape Optimizer (ITTO)
- IBM Tivoli Automated Tape Allocation Manager (ATAM)

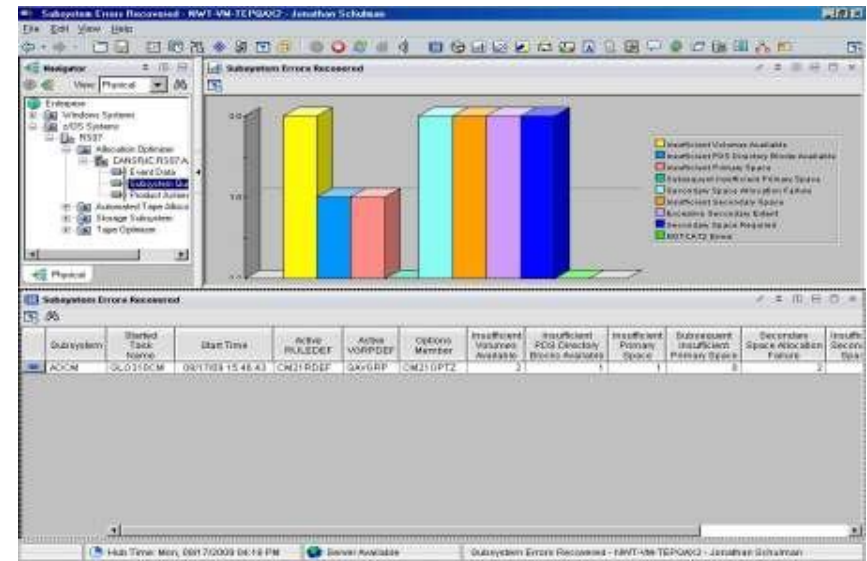
– **DFSMSrmm reporting and toolkit functions**

Cornerstone for every zStorage management Tool box!

Advanced Allocation Management for z/OS

Formerly Tivoli Allocation Optimizer:

- Enables users to avoid and recover from X37 type abends such as B37, D37, and E37 abends and NOTCAT2 situations
- Provides ability to simulate changes before implementing
- Handles all DASD data sets, both SMS and non SMS-managed (VSAM and non-VSAM). Used with SMS, all unsuccessful DASD allocations are eligible for recovery
- Maximizes use of the current volume before attempting to allocate additional volumes - dynamically adjusting catalog and control blocks only when an extent is needed
- Limits fragmentation of a data set on a single volume and across multiple volumes, preserving valuable catalog space and memory-based control block storage
- TEP integration and take-action makes it easy to see issues and intervene



New in V3.1 - Overall Control of Allocation

- Greater control with SMS and non-SMS
- Non-SMS volume group definition
- Re-direction of unit type
- Allocation based on variety of variables
- Non-SMS placement based on resource metrics
- Set or override over 50 allocation attributes
- Make DATACLAS, override JCL

Advanced Reporting and Management for DFSMSHsm

Provides Detailed HSM Reporting Capability

Daily Health Reports

- Provides reports for:
 - ▶ DFSMS Mounted Volumes
 - ▶ DFSMSHsm Managed Volumes
 - ▶ DFSMSHsm Space Management
 - ▶ DFSMSHsm Automatic Backup
 - ▶ DFSMSHsm Autodump Activities
- Automatic Spreadsheet Charting

Ad-hoc reports

- Fast and highly interactive
- Easily find areas of concern
 - ▶ Drive the view to the area of concern
 - ▶ Look around, Act on what you see

Perform “what-if” analysis

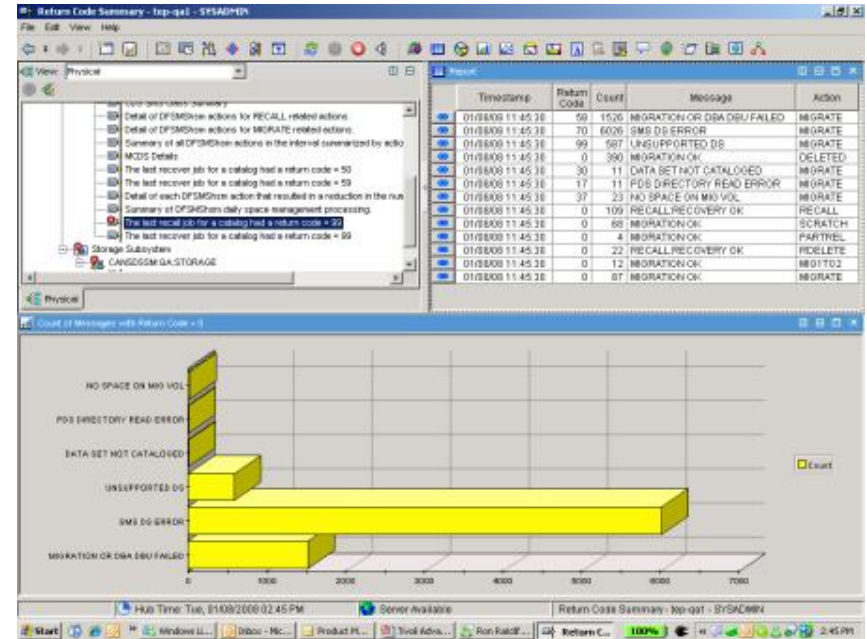
- Migration thresholds
- Recycle percent valid

“Plans” Feature makes new reports simple to create and save

- Provides filtering logic so you can drill down

Automated command generation

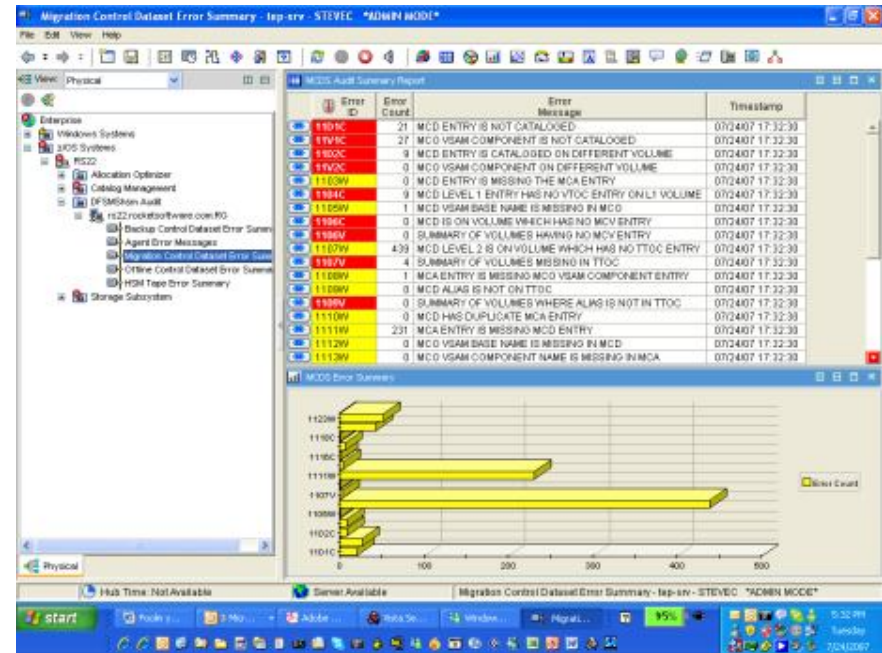
- Allows wrapping action commands around listed data sets
- Go from “Now I know what to do” to “I’ve already done it”
- Add your own customized commands to the command library



- TEP Interface makes it much easier to detect and diagnose problems – even linking to other products, and supports key take-action commands issued from the TEP
- Easy-to-Use ISPF User Interface

IBM Tivoli Advanced Audit for DFSMSHsm

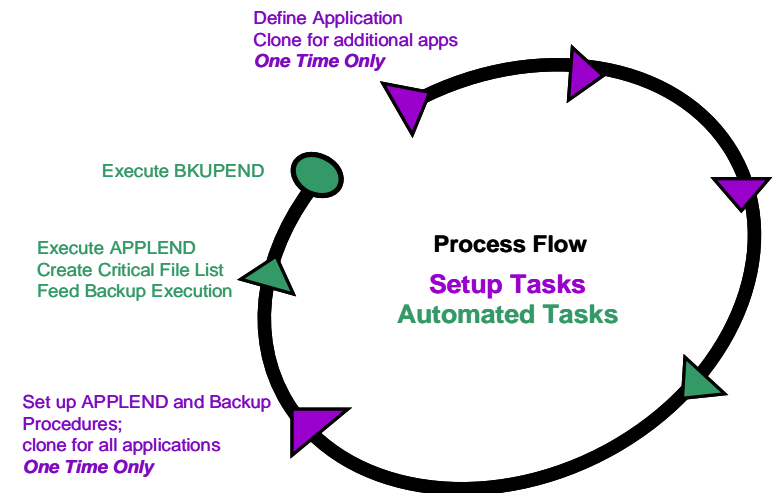
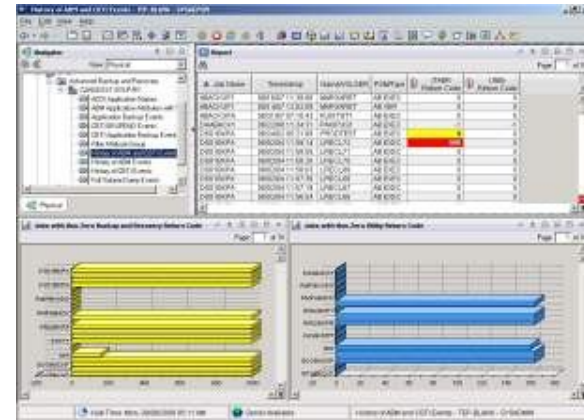
- Audits, repairs, and ensures integrity of the DFSMSHsm environment, including tape.
- Automates data collection and corrective actions
- Proactive notification and alerts to critical problems which can be expertly resolved before a system outage occurs
- Finds and can correct 100% of DFSMSHsm errors
- Prove integrity of DFSMSHsm environment
- Operates many times faster than native DFSMSHsm commands, without performance impact on DFSMSHsm
- Ease-of-Use and performance permits regular rather than periodic audits
- TEP Interface makes it much easier to detect, drill down, and diagnose problems – even linking to other products, and allowing key actions to be initiated from the TEP in response to situations



Regular HSM audits help Maintain the complex data structure of the DFSMSHsm Control Datasets (CDS) to prevent outages and improve efficiency

Advanced Backup & Recovery for z/OS

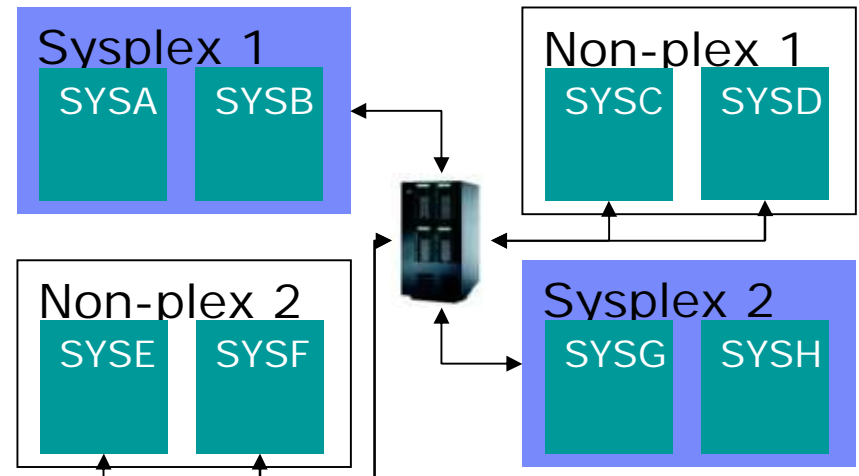
- **Single Toolset to automatically:**
 - Identify critical application data
 - Track & Validate Backups
 - Where they are
 - Currency
 - Support removable or non-removable media types
 - Recover **Fast** from Disasters or Local Outages
 - Either at Local or DR site
 - From one central location
 - With one simple process
 - Eliminates guesswork and manual processes
 - Eliminate duplicate backups
 - Comply with governance requirements – always be audit-ready!
 - Easy to use TEP interface makes it easy to stay on top of backup status and spot problems before they cause outages!



Automated Tape Allocation Manager for z/OS

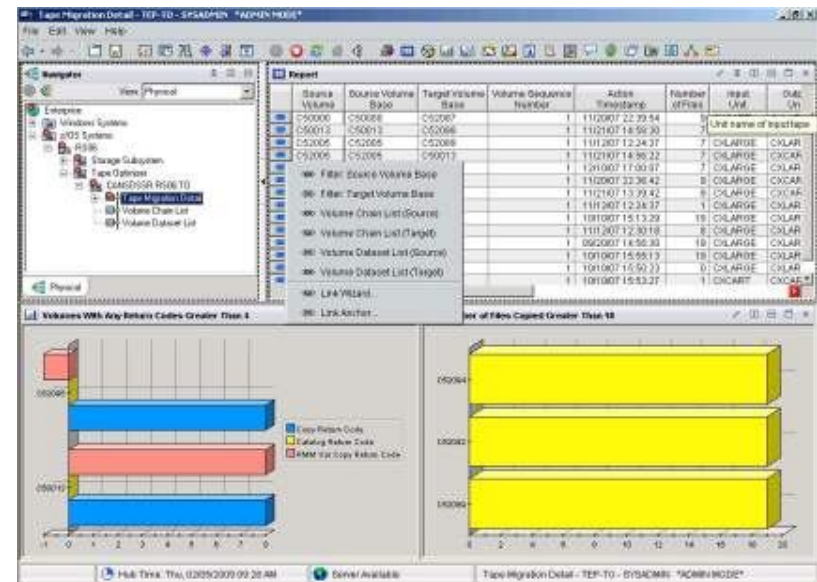
- **Automated Tape Allocation Manager (ATAM):**
 - Share tape devices between multiple images: sysplex, nonplex, multiple standalone in any combination - even legacy devices such as 3420
- **Improves Operational Efficiency:**
 - Maximize the use of existing tape devices
 - Reduce operational overhead
 - Minimize backlogs of job requests
 - Improve ROI on tape hardware investments
 - Support hardware acquisition decisions
 - Single Point of Control without the Single Point of Failure – no shared control file to fail
 - Responds automatically and directly to user/job resource requests at “machine speed” instead of “operator speed”
 - Real-time and historical reporting – built-in
 - TEP Integration and Take-Action capability makes it easier to detect, drill down, diagnose, and correct problems – even linking seamlessly to other products as needed

Wklyr Base	Data Def Volume	Data Def Name	Data Def Sequence Number	Original Class
CS2000	CS2000	CSLA01 TAPE FBA	1	1 1P/UT
CS2000	CS2000	CSLA01 TAPE YBA	1	1 1P/UT
CS2000	CS2000	CSLA01 TAPE FB	1	1 1P/UT
CS2000	CS2000	CSLA01 TAPE FBE	4	1 1P/UT
CS2000	CS2000	CSLA01 TAPE F	6	1 1P/UT
CS2000	CS2000	CSLA01 TAPE YBM	6	1 1P/UT
CS2000	CS2000	CSLA01 TAPE VM	7	1 1P/UT
CS2000	CS2000	CSLA01 TAPE FBA	1	1 1P/UT
CS2000	CS2000	CSLA01 TAPE YBA	1	1 1P/UT
CS2000	CS2000	CSLA01 TAPE FB	1	1 1P/UT
CS2000	CS2000	CSLA01 TAPE FBE	4	1 1P/UT
CS2000	CS2000	CSLA01 TAPE F	6	1 1P/UT
CS2000	CS2000	CSLA01 TAPE FBM	6	1 1P/UT
CS2000	CS2000	CSLA01 TAPE VM	7	1 1P/UT
CS2000	CS2000	CSLA01 TAPE YBM	6	1 1P/UT
CS2000	CS2000	CSLA01 TAPE VM	7	1 1P/UT
CS2000	CS2000	CSLA01 TAPE FBA	1	1 1P/UT
CS2000	CS2000	CSLA01 TAPE YBA	1	1 1P/UT
CS2000	CS2000	CSLA01 TAPE FB	1	1 1P/UT
CS2000	CS2000	CSLA01 TAPE FBE	4	1 1P/UT
CS2000	CS2000	CSLA01 TAPE F	6	1 1P/UT
CS2000	CS2000	CSLA01 TAPE YBM	6	1 1P/UT
CS2000	CS2000	CSLA01 TAPE VM	7	1 1P/UT



Tivoli Tape Optimizer

- Copy individual tape data sets by name, expiration date, catalog status, and many other filter criteria
- Optionally rename tape data sets during copy operations
- Support for 3592 tape drives and high-capacity tape media
- Optionally continue copy processing after certain types of failures or errors, such as tape I/O errors
- Uses relative generation data group (GDG) catalog entries to help identify generation data sets for a copy request
- Edit copy options for requests pending restart
- Run multiple, concurrent copy tasks for a copy request
- Reporting for stacked tapes
- TEP Integration and Take-Action capability makes it easier to detect, drill down, diagnose, and correct problems – even linking seamlessly to other products as needed



- Use Full Tape Media Capacity – reduce waste
- Automatically updates DFSMSrmm
- Ensures system catalog accuracy



New Offering: “IBM Tivoli Advanced Storage Management Suite for z/OS”

- A new **consolidated offering** containing 4 Tivoli z/OS Storage Management products:
 - Advanced Reporting and Management for DFSMSHsm
 - Advanced Audit for DFSMSHsm
 - Advanced Catalog Management
 - Advanced Allocation Management
- **Addresses reducing costs and maximizing administration and personnel efficiency:**
 - HSM administration and management capability
 - ICF Catalog management and integrity
 - z/OS Storage allocations and availability
- **Benefits:**
 - Maximize efficiency of managing HSM, both environment and personnel
 - Lower cost of maintaining HSM
 - Increase availability of DASD storage, Catalogs, and HSM
 - Maximize efficiency of catalog integrity and management
 - Can integrate tools for better management capability – synergy and leveraging technology/products
 - Links to “OMEGAMON XE for Storage on z/OS” for wide breadth and depth of storage functions
 - Single vendor that can provide all your needs for z/OS Storage Management
 - Easier to order / pricing benefit
 - Expand and integrate at the enterprise and business levels with other IBM Tivoli solutions
 - Best capabilities, currency and overall service