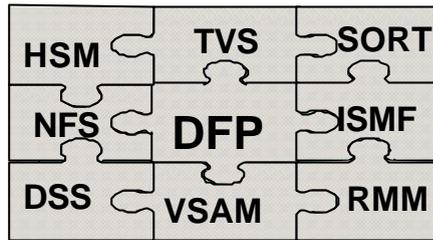




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## Z07 – What's New with DFSMS



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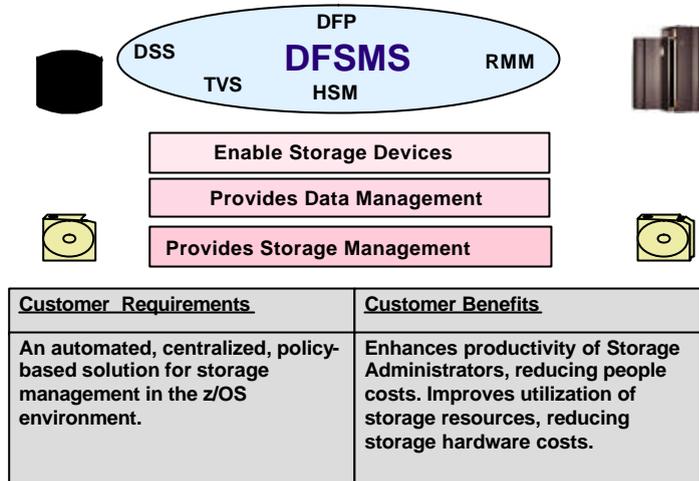
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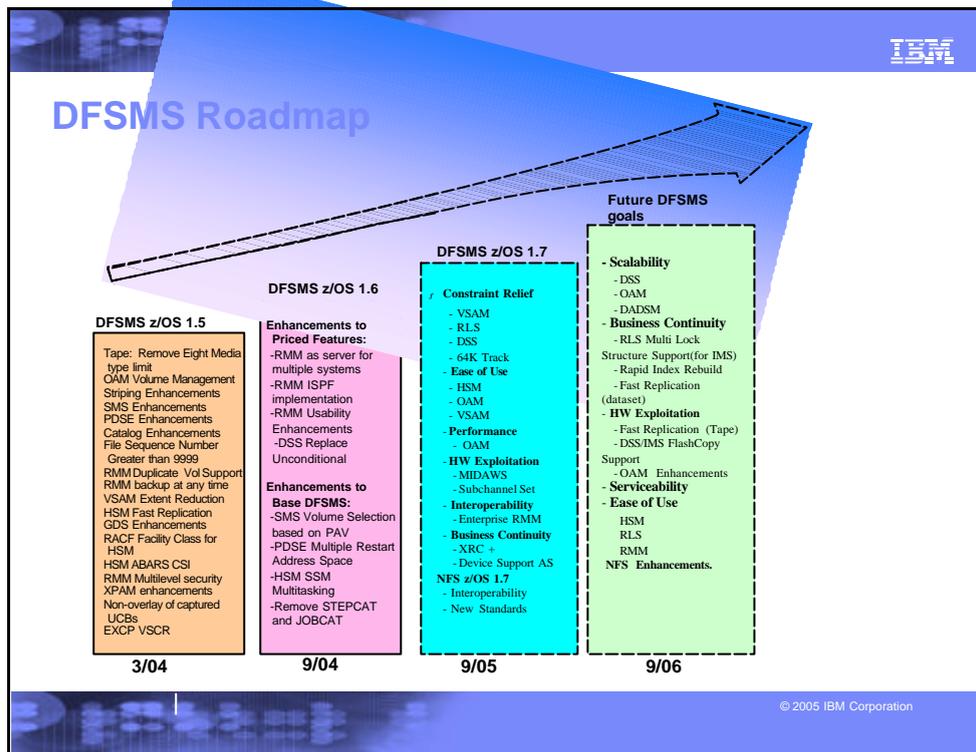
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## DFSMS - z/OS Storage Management



## Agenda

- **DFSMS Release Strategy**
- **DFSMS z/OS 1.7**
  - Scalability
  - Better Performance
  - Ease of Use
  - Business Continuity
  - Hardware Exploitation
  - Interoperability
- **Copy Service Enhancements**
- **DFSORT Items**
- **DFSMS Potential next steps**
  - Business Continuity
  - Infrastructure Simplification
  - Information Life Cycle Management
- **Other DFSMS Future Candidate Line Items**
- **Sources for more information**



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## DFSMS Release Strategy

- DFSMS R10 is the level for OS/390 R10, z/OS V1 R1, and z/OS V1 R2
- DFSMS z/OS 1.3 is the level for z/OS V1 R3 and z/OS V1 R4
- DFSMS z/OS 1.5 is the level for z/OS V1 R5
- DFSMS z/OS 1.6 is the level for z/OS V1 R6
- DFSMS z/OS 1.7 is the level for z/OS V1 R7
- DFSMS Releases will match z/OS annual release in the future
- Some functions will be made available to earlier DFSMS releases via PTF

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## Future DFSMS and z/OS Announcements

- **Preview** - About 6 months before general availability
- **Formal Announcement** - About 1 month before general availability

## z/OS DFSMS V1R7 (7/26/2005 Ann)

- **Scalability and Growth**
  - Sequential and EXCP data sets Greater than 64k tracks
  - Greater than 255 extents per VSAM component
  - VSAM RLS 64 bit Virtual
  - DFSMSShsm enhancements
  - DFSMSdss VSCR
- **Ease of Use**
  - DFSMSShsm Enhancements for Usability
  - OAM Volume Management Enhancements
  - SMS Enhancements
  - DFSMSrmm Enterprise Enablement
  - ICFRU – Catalog Recovery
  - NFS version 4 protocol security
- **Reliability, Availability and Serviceability (RAS)**
  - DADSM/CVAF Device Support Address Space
  - PDSE Enhancements
  - IDCAMS REPRO MERGECAT FromKey/ToKey
- **Optimization**
  - OAM Immediate Recall to Disk (DB2)
- **Removal of Function**
  - ISAM
  - JOBCAT/STEP CAT

## Scalability

- **Support for Sequential and EXCP data sets larger than 64K tracks**
  - Ability to utilize the larger disk volumes by creating single large data sets; more in line with disk volume size
  - Addition to existing support for Extended Format Sequential data sets >64K tracks
  - Systems and applications can utilize the capability of larger data sets
- **More than 255 VSAM Extents**
  - Reduce out-of-space type failures as data sets grow
  - Less need to redefine/reorganize data sets as they grow
  - 123 Extents per volume still remains as the limitation (multiple volumes)
  - 59 volumes times 123 extents for the new limit



## Scalability

- **RLS 64-bit virtual**
  - Provides a solution to the VSAM RLS DATASPACE storage constraint problem by exploiting 64-bit addressable virtual storage. This enhancement will allow the continued growth of applications using VSAM RLS.
- **DFSMSDss: DSS Virtual Storage Constraint Relief**
  - This relief is provided by changing the type of channel programs used by DFSMSDss to a type that can reside above the 16 MB line. The will allow DFSMSDss to handle more volumes while processing data sets during COPY and DUMP operations.
- **DFSMSHsm: Extend TTOC record to support more than 330,000 data sets per volume**
  - Better support for high capacity tape
- **DFSMSHsm: Allow DFSMSHsm Journal to be greater than 64K track sequential data set**
  - Journal should not fill as quickly, reduces need to backup DFSMSHsm CDSs due to journal full condition



## Scalability - Growth with HSM and DSS

- DSS moving EXCP above 16MB line
- HSM TTOC with Greater Than 330,000 data set names
  - Better utilize large capacity tape cartridges
- HSM RECYCLE processing improvement
  - Return more volumes to SCRATCH sooner

## Performance

- OAM Immediate Recall to DB2
  - Recall accessed objects from removable media (tape or optical) to DB2 table on disk
  - Data remains on disk for installation-specified number of days
  - Faster access for subsequent reads of the data



## Improved Ease of Use - OAM

- Improved Volume Management Phase 2 (object-related enhancements):
  - support for a tape expiration notification exit on return to scratch
  - MOVEVOL with DELETE option for scratch volumes
  - new SETOAM TAPEDISPATCHERDELAY keyword to wait on tape demount
  - new SETOSMC CLEAROLDLOC keyword for object transitioning

## Improved Ease of Use - SMS

- Volume Status Change
  - allows users to use the V SMS,VOLUME command to alter the status of the volume from NOTCON to any other status
- Volume Selection Messages and Trace Enhancements
  - Provide summarized and detailed analysis messages on request
  - Externalize DADSM failure reasons and diagnostic codes in summarized analysis messages
  - Externalize volume selection data in SMS trace
  - Add new trace data for SMS and non-SMS managed VSAM allocations
- ACS Allocation Test
  - A new value (**ALLOCTST**) defined to the ACS read-only variable &ACSENVIR will allow pre-allocation programs by ISVs to indicate that the environment is ALLOCTST
- Improve Performance of VARY commands
  - Processing to update the volume list is modified to improve performance.

## DFSMSHsm Ease of Use - DFSMS1.7

- ***Cancellation of individual DFSMSHsm tasks:*** This enhancement allows DFSMSHsm users to cancel all active DFSMSHsm data movement tasks, including ABARS tasks that process in their own address space. Previously, when you needed to cancel an active individual DFSMSHsm data movement task, you had to bring down the entire DFSMSHsm address space. Now an active data movement task can be cancelled without impacting other ongoing DFSMSHsm activity. This enhancement will promote higher DFSMSHsm availability and better end-user satisfaction.
- This capability will be incorporated into z/OS V1.7. Support is planned to be made available via PTFs for z/OS V1.4 and higher in 2005.

## Improved Ease of Use - DFSMSHsm

- **DFSMSHsm Recycle Enhancement**
  - Allow Recycle of connected sets to not require first volume of connected set to meet PERCENTVALID as long as average for connected set meets the criteria
- **Improvements to Fast Subsequent Migration**
  - Allow FSM to apply to data sets that got migrated to ML2 tape without a valid backup copy.
    - TMM candidates usually fall into this category
- **Improvement to HMIGRATE usability**
  - Eliminate multiple error messages when attempting to migrate already migrated data set
    - These data sets now skipped

## Improved Ease of Use - HSM

- Fast Subsequent Migration available to data sets without backup
- ABARS aggregates may include only ACCOMPANY or ALLOCATE (no need for INCLUDE statement)
- RECYCLE may include connected sets where the first volume does not meet the percent valid criteria
- TTOC support of up to 1,060,000 data set names
- LRECL and EMPTY indicators in MCD record and display in LIST and IDCAMS DCOLLECT commands
- Error handling improvements for duplex tape processing
- Improvements in HMIGRATE processing
- Provide capability in native DFSMSHsm to cancel all active data movement tasks

## Improved Ease of Use - ICFRU

- ICF Catalog Forward Recovery was a Program Product (5798-DXQ)
- Now part of DFSMS
  - No functional changes have been made.
  - Module names and error messages have been renamed to conform to IBM naming policies. Prefix changed from ICF to CRU.
  - ICFRU is documented in Appendix A of DFSMS: Managing Catalogs, SC26-7409.
- This utility allows you to recover a damaged catalog to a correct and current status using SMF records. This utility allows you to build your own catalog recovery solution and has been used successfully for many years. If a more complete solution is required, the Mainstar Catalog RecoveryPlus (5620-FGY) product is recommended.

## Improved Business Continuity - RAS

- **DFSMSHsmr** Allow ABARS aggregate definition without INCLUDE statement
- DADSM/CVAF Device Support Address Space
  - Automatically restartable
  - Separates resources used for Device support
- PDSE Enhancements
- IDCAMS REPRO MERGECAT FromKey/ToKey
  - Remove a range of entries from a damaged catalog to expedite the restoration of a catalog
  - Improved overall performance of REPRO MERGECAT

## Hardware Exploitation - DFSMS 1.7 Some UCB Constraint Relief

- **Subchannel Set Support:**
  - *The multiple subchannel set line item begins to address the 64K subchannel limit for UCBs in z/Series software.*
  - *By defining a second subchannel set within the channel subsystem, the number of devices available to customers is doubled.*
  - *The device numbers can be duplicated in the same channel subsystem by being in both subchannel sets*
  - *The four digit device number limit remains unchanged.*
  - *This support will be limited to Parallel Access Volumes (PAVs) alias devices on the Enterprise Storage Server (device types 3390A, 3380A).*

## Improved Ease of Use – RMM Enterprise Enablement

- The RMM high-level language application programming interface (API) is enabled via Web Services.
- A Java class is provided for use on z/OS to enable RMM subcommands to be run via the high-level API.
- A plug-in adapter is created for the CIM environment based on the SNIA SMIS and extension to that interface to support removable media.
- The DFSMSrmm JOURNAL and temporary work files and journal backup file can be large format sequential data sets.

## Interoperability - z/OS NFS: What does it do?

**Network File System (NFS)** provides a flexible option for exchange of data between like and unlike systems that support the NFS protocols. The current version of z/OS NFS supports the Sun NFS specification for Versions 2 and 3 and IPv4. With the planned enhancement in z/OS V1R7, z/OS NFS will support IPv6 and server support for the Sun NFS v4 protocols

## The Importance of Supporting the NFS v4 Protocols

### ▪ **NFS v4 Highlights**

- f* **Improved access and good performance on the internet** through the ability to transit firewalls easily, perform well where latency is high and bandwidth is low, and scale to very large numbers of clients per server
- f* **Strong security with negotiation built-in**
- f* **Enhanced cross-platform interoperability** through a file system model that provides a useful, common set of features that does not unduly favor one file system or operating system over another
- f* **Extensibility of the protocol** through a design to accept standard extensions that do not compromise backward compatibility
- f* **Globalization (UTF-8)**

## NFS z/OS Enhancements

- **NFS z/OS V1R7**
  - f* IPv6 Support
  - f* NFS v4 Server Support
- **NFS Future Release**
  - f* NFS v4 Client Support
  - f* Full Globalization Support including translation enablement

## Final Good-bye to ISAM

- ISAM will no longer work in future releases of DFSMS z/OS
  - Target is DFSMS z/OS 1.7 and after
- Customers who are current on z/OS maintenance now receive a warning message when ISAM is used
- ISAM has been obsolete for over 25 years
- It is long past the time to say, "Good-bye"
- **Also – Good-bye to JOBCAT/STEPCHAT!**

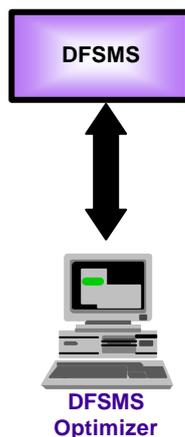
## Copy Services Enhancements

- DFSMS support (API and TSO commands) for
  - Sept. 2004
    - Incremental Flash Copy
    - Inband Commands for FlashCopy via PPRC Links
    - FlashCopy NOCOPY to COPY
    - OPEN LUN Support from z/OS for FlashCopy and PPRC
  - Feb. 2005 (API) and April 2005 (TSO)
    - PPRC Global Mirror
    - Failover/Failback for PPRC
    - Failover/Failback for planned and unplanned outages
    - FlashCopy Consistency Groups
  - Support available on zOS 1.4 and above

## DFSMS Support for Copy Services

- **Planned Availability 1Q 2006**
  - DFSMSdss Support for:
    - FlashCopy No Copy to Copy
    - Incremental FlashCopy
    - FlashCopy Consistency Groups

## DFSMS Optimizer



- Current DFSMS Optimizer Product will be withdrawn from marketing in 2005
- It will be replaced by the IBM Tivoli Storage Optimizer (ITSO) for z/OS V3.1

## DFSORT Enhancements

- DFSORT PTFs for z/OS DFSORT V1R5 (and z/OS V1R6) and DFSORT R14, available since December, 2004, provide important enhancements to DFSORT and DFSORT's ICETOOL for:
  - Conditionally reformatting records (IFTHEN clauses)
  - Overlaying only selected parts of records (OVERLAY)
  - Larger numeric fields and constants (up to 31 digits)
  - New data formats for extracting digits (UFF, SFF)
  - New data formats for displaying TOD date and time values (DCn, TCn)
  - New data formats for displaying ETOD date and time values (DEn, TEn)
  - Restarting sequence numbers (RESTART=(p,m))
  - Join and match operations (KEEPBASE, VLENMAX, VLENOVLY)
  - Date and time constants (YDDD, YDDDNS, etc)
  - Conversion of statistical and count values (TO=fo)
  - Reports (HEADER('s1','s2','s3'), Gn, X'string', etc)
  - Easier migration from other sort products, and more

paper "User Guide for DFSORTPTFs UQ95214 and UQ95213"

Website: <http://www.ibm.com/servers/storage/support/software/sort/mvs/pdug/>

## Future DFSMS Enhancement Themes

### ▪ Business Continuity

- Nondisruptive Backup and Quick Recovery
- Higher Availability
- Improved Security

### ▪ Infrastructure Simplification

- Scaling up with DFSMS
- Support Customer Growth
- Ease of Use (z/OS skilled resources are nearing retirement)

### ▪ Information Life Cycle Management (ILM)

- DFSMS has provided life cycle management for OS/390 and z/OS data for over 17 years

## Business Continuity

- **Fast Replication Data Set Recovery**
  - Capability to restore individual Data Sets from Fast Replication Copy Pools. Required for complementary functions planned by DB2
- **RLS MLS Support for IMS DBRC/TVS**
  - Capability to isolate IMS from general RLS applications. Customers could also use this capability to isolate test RLS applications
  -
- **Fast Replication Tape Support**
  - Capability for full volume dumps to tape of the Fast Replication Copy Pools
- **Rapid Index Rebuild**
  - Provides the ability to quickly rebuild a disabled index VTOC

## Infrastructure Simplification

- **DFSMSrmm VRS Policy Management Simplification**
  - Simplifies RMM retention and movement policies by reducing the number of VRS's required by separating the data set names from the policy specifications for
- **PDSE 64-bit Virtual Storage**
  - Provides Storage constraint relief for users with large numbers of PDSE members s
  -
- **AMS LISTCAT and Delete Masking**
  - Improve performance of AMS LISTCAT and enhance filtering on DELETE
- **VSAM Code Modernization**
  - Provides additional reliability, availability, and serviceability characteristics to VSAM in order to reduced errors
- **DFSMSrmm Usability**
  - Enhances the usability of DFSMSrmm by improving Dialog Commands

## Infrastructure Simplification

- **DFSMSrmm Enterprise Level Interface**
  - Allows easy access to RMM from other platforms and applications
- **DFSMSrmm UTC Implementation**
  - Allows DFSMSrmm to span multiple time zones
  -
- **SMS Fast Path Volume Selection Performance Enhancement**
  - Provides a new user-selectable approach to speed up volume selection processing
- **Copy SCDS as ACDS**
  - This new function will provide a new SETSMS subcommand, COPYSCDS, that will make it possible to create an ACDS from any valid SCDS
- **OAM Enhancements**
  - Provides support for very large objects

## Information Life Cycle Management

- **DFSMShsm Customer Satisfaction Enhancements**
  - Provides improved error handling and improved tuning capabilities
- **DFSMSdss IMS BWO Support during Copy**
  - Allows IMS to exploit FlashCopy which will provide faster copies of IMS data sets

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## Other DFSMS Future Candidate Line Items

- 1 DSS: Improve DEFRAG
- 2 AMS: Allow Dataclass to be Altered
- 3 Encryption
- 4 High Performance FICON
- 5 NFS: V4 Client
- 6 OAM: Large Objects Stage 2
- 7 RLS: Striping and Dynamic Volume Count
- 8 HSM: Performance Improvements
- 9 HSM /DSS: Fast Replication; Finish Stage 3
- 10 RMM Ease of Use Enhancements
- 11 OAM: Tape Enhancements to Better Exploit VTS
- 12 RLS: Multiple Address Space for IMS
- 13 SAM EF: Remove Volume Boundary Restriction for FlashCopy
- 14 HSM: Customer Satisfaction Enhancements
- 15 DFSMS CIM Implementation
- 16 Generic Tagging and Conversion Support
- 17 RLS: Finish 64 Bit Exploitation
- 18 SMS: Enforce Use of FlashCopy on Initial Allocate/Extend
- 19 PDSE: Performance Improvements
- 20 Catalog: Dynamic TIOT Expansion
- 21 VSAM EOV Exit for ISV's
- 22 TVS: Log of Logs
- 23 ISMF/Navquest: New Sort Capability for Batch Jobs and Report Space in GB's

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## Mainstar News – Backup and Recovery Suite

- Backup & Recovery Manager Suite™
  - Release 4.03 available on June 14, 2005
  - Major ABARS Manager Enhancements
    - ABACKUP keyword to reset the change bit indicator after successful backup
    - ARECOVER keyword selects only generation zero(0) data sets
    - New token to select return code (0,4,8) when no data sets are included in the selection data set
  - Major All/Star Enhancements
    - New “What Isn’t Backed Up Report”
    - Tracking of Catalog RecoveryPlus and ABARS Manager backups
    - Interface to ASAP to prove critical data is backed up

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## Mainstar News – ASAP™

- Release 5.401 available on June 14, 2005
- Major Enhancements
  - ASAP now supports Cybermation's ESP scheduling system
  - ASAP and All/Star interface
    - Backup and restore by application
    - Identify invalid backups; data has been modified since the last backup
    - Prove critical data is backed up
    - Tivoli Workload Scheduler interface enhanced to collect job information for all applications

## Mainstar News – Catalog RecoveryPlus™

- Features Available in the Current Release (6.31) of Catalog RecoveryPlus™ (CR+)
  - VSAM SPHERE support in BACKUP and RECOVER
  - DIAGNOSE VOL-BCS command provides better performance and complete support for multi-volume data sets
  - Significant performance enhancements to RECOVER, MERGECAT and REORG processing
  - Automatic removal of IMBED and REPLICATE during REORG and RECOVER processing
  - Functional enhancements to disaster recovery support features CATSCRUB and selective RECOVER

## Summary

- **DFSMS and z/OS now on consistent delivery schedule**
- **IBM continues to enhance DFSMS between releases**
- **DFSMS z/OS is focused to meet customer objectives in 2005 and beyond**

## Sources of additional information

- **Information about DFSMS and components**
  - [www.storage.ibm.com/software/sms/index.html](http://www.storage.ibm.com/software/sms/index.html)
- **Additional Information**
  - [www.redbooks.ibm.com](http://www.redbooks.ibm.com)
  - **z/OS V1R6 DFSMS Technical Guide - SG24-6651- 01**