



What's New in DFSMSdss and System Data Mover

Session 9945

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Agenda

- **What's New in System Data Mover**
 - Functions available in z/OS V1R12
 - Preview of New Functions in z/OS V1R13
 - New Function APARs

- **What's New in DFSMSdss**
 - Functions available in z/OS V1R12
 - New Function APARs
 - Preview of New Functions in z/OS V1R13

What's New in DFSMS SDM z/OS V1R12 ANTTREXX



- Previously unsupported SDM interface to copy services
- In use by small set of customers
 - Several marketing requirements for formal support going back several years
 - Goal was to update the interface so it could be supported, while not impacting customers using the interface unsupported



What's New in DFSMS SDM z/OS V1R12 ANTTREXX

- ANTTREXX Callable from any REXX environment with 2 positional input parameters
 - First parameter = request type
 - Matches ANTRQST request types (e.g., FCQUERY or PFREEZE)
 - Second parameter = REXX compound variable containing keywords for the request
- The commands and keywords supported by ANTTREXX are not case sensitive.
- REXX commands use same facility classes as their associated ANTRQST requests

What's New in DFSMS SDM z/OS V1R12 ANTTREXX

- CALL ANTTREXX 'FCQUERY' , 'INOUT'
 - or
- result=ANTTREXX(?FCQUERY?,?INOUT?)
- Command parameters passed in the input compound variable, cannot contain imbedded blanks.
 - For instance, code 'DEVN(0A00)', but not 'DEVN (0A00)'
or 'DEVN(0A00)'.

What's New in DFSMS SDM z/OS V1R12 ANTTREXX

- Samples
 - ANTFREXX for FlashCopy commands
 - ANTPREXX for PPRC commands
 - ANTRREXX for Global Mirror commands
 - ANTXREXX for XRC commands
 - Can actually use any of the above for all commands, differ only slightly
- Samples shipped in SYS1.DGTCLIB
- Query output available via variable or printed in dump format



What's New in DFSMS SDM z/OS V1R12 Support for Alternate Subchannel Set

- Alternate Subchannel Set Devices
 - A *special device* is one that is defined in the alternate subchannel set 1 (not subchannel set 0, which where real devices are defined)
 - In HCD, the device type is shown as “3390D” for secondary devices
 - Defining devices in alternate subchannel set frees up device numbers for later usage
 - Intended to be used in a Hyperswap environment
 - New keywords added to FlashCopy, PPRC, and XRC commands to request subchannel
 - For example for ANTRQST FCESTABLISH and FCWITHDRAW SUBCHSET=0|1 and TSUBCHSET=0|1 is valid
 - Please see APAR OA26522 for more details



HyperSwap Exploitation of Alternate Subchannel Set

➤ HyperSwap Setup

➤ Only one device of PPRC pair ever online

➤ Define 2 UCBs, With Same 4 digit device #.

➤ Primary devices defined as 3390-B in Subchannel Set 0.

➤ Secondary 'paired' device defined as 3390-D in Subchannel Set 1.

➤ Application I/O directed to PPRC primary

➤ HyperSwap substitutes subchannel 1 PPRC secondary for subchannel 0 primary device

➤ Non-disruptive – applications keep running

➤ After HyperSwap Event

➤ Application still does I/O to same 4-digit device number

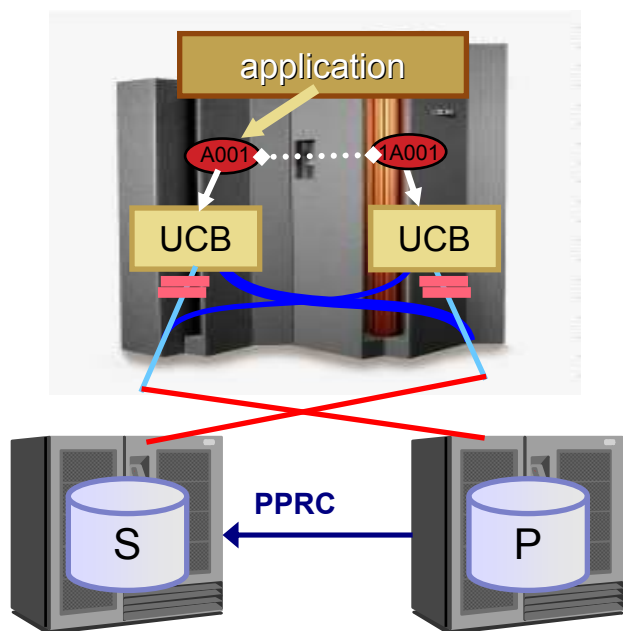
➤ Subchannels associated with 'partner' UCBs

➤ Non-disruptive – applications keep running

➤ Single device number used

➤ Management of devices simplified with a Cloned I/O Configuration.

➤ Same as today, but without 'wasting' device number



Preview for SDM in z/OS V1R13

- CC Parm Lib Support for member ANTMIN00
 - CCREADAHEAD(3-64)
 - Allows SDM to read updated track data from the controller cache at an installation determined maximum rate
 - Value controls the number of additional buffers obtained at the host for the read I/O for each CC session
 - Example: if the CCREADAHEAD value is set to 32, SDM will obtain 32 additional data buffers from Auxiliary Storage ($32 \times 64k = 2MB$) and back these in fixed storage during the I/O
 - CCATTNTHROTTLE(YES|NO)
 - Aids in tuning the system to operate more efficiently during periods of high application updates
 - YES: Throttles parallel attention behavior to a maximum of two parallel processes per controller session
 - NO: Does not restrict parallel attention
 - Both can be set via MODIFY ANTMMAIN command

Preview for SDM in z/OS V1R13

- XRC TIMESTAMP Suppression
 - Continuation of OA24780
 - Added the ability to suppress channel program timestamping on XRC data mover systems
 - APAR enabled zapping or patching a bit in a SYS1.NUCLEUS
 - Line item adds an ANTXIN00 PARMLIB parameter, SuppressTimestamp(NO|YES), default is NO
 - The recommended use of this parameter is:
 - *SuppressTimestamp(NO) on application systems with a common time reference*
 - *SuppressTimestamp(YES) on remote systems processing XRC, GDPS control systems (K-systems) and z/OS systems that have access to XRC primary volumes and do not share a common time reference with production systems.*
 - Do not use SuppressTimestamp(YES) on application systems,
 - *Would defeat the data consistency mechanism of XRC*

Preview for SDM in z/OS V1R13

- PPRC CQUERY LINKINFO
 - New option to query PPRC linkage
 - Linkage info displays subchannel set, node name, and ID's of primary and secondary linkage adapters

```

ANTP0259I CQUERY FORMATTED LVL 1
LINKINFO REPORT
***** PPRC REMOTE COPY CQUERY - LINKINFO *****
*
*                               DEVN SCH          WNN          *
*-----*
* PRIMARY      SECONDARY      PRI: 0F50   0 5005076303FFC061 *
* ADAPTER      ADAPTER        SEC: 0F60   0 5005076303FFC05F *
* IDS          STAT  IDS
*-----*
* 0100         0 0200 0202 0330 0331 *
* 0030         0 0200 0202 0330 0331 *
* 0101         0 0200 0202 0330 0331 *
* 0102         3 *
* 0103         3 *
* 0031         0 0200 0202 0330 0331 *
* 0032         3 *
* 0033         3 *
*****

```

New Function APARs for SDM

- OA33715: zIIPEnable Parmlib option to ANTXIN00
 - Addresses problem where not all XRC work was being offloaded to zIIP
 - zIIPEnable = YES|FULL: ANTAS000, ANTAS0nn, and ANTCL0nn address spaces are enabled for running on zIIP
 - zIIPEnable = NO: ANTAS000, ANTAS0nn, and ANTCL0nn address spaces are enabled for running on zIIP

New Function APARs for SDM

- OA32141: Zero Suspend FlashCopy Enhancement
 - Background: Ability to FlashCopy XRC secondary to make a tertiary copy
 - Prior to this a SUSPEND and resync was needed to Flash secondary's
 - Flash can be established as background copy or nocopy
 - New option to request FlashCopy be established as incremental
 - Reduces background copy time

New Function APARs for SDM

- OA32141: DS8000 Resource Groups (available in R6.1)
 - Ability to administratively specify policy-based limitations which volumes can participate in copy services relationships with other volumes
 - Prevents a user from accidentally targeting a volume in a copy services relationship that was not supposed to be overwritten by a user or application
 - Applies to FlashCopy, Metro Mirror, and Global Mirror
 - DS/CLI must be used to configure Resource Group
 - Volumes and LSS are associated with a single resource group
 - APAR includes message support when failures occur due to violation

What's New in DFSMSdss z/OS V1R12

- Indexed VSAM defined with IMBED, REPLICATE, or KEYRANGE attributes:
 - Less efficient than more recent enhancements to VSAM
 - Customers have requested assistance in identifying and converting these data sets
 - Solution
 - New messages identifying indexed VSAM data sets with these attributes and will convert some data sets automatically
 - Benefit
 - Reduces customer effort to identify and convert their data sets

What's New in DFSMSdss z/OS V1R12

- Indexed VSAM defined with IMBED, REPLICATE, or KEYRANGE attributes:
 - IMBED/REPLICATE
 - Will be restored without these attributes
 - ADR507I will be issued identifying the data sets being converted
 - *ADR507I DATA SET dsn WAS RESTORED WITHOUT THE IMBED OR REPLICATE ATTRIBUTES*

ADR442I (001)-FRLBO(01), DATA SET C9SDSS.VRDS.REPIMB01 PREALLOCATED WITH NEW NAME TARGET.VRDS.REPIMB01, IN CATALOG TEST.CAT.TARGET ON VOLUME(S): T9SS02

ADR507I (001)-TDVSM(01), DATA SET C9SDSS.VRDS.REPIMB01 IS BEING RESTORED WITHOUT THE IMBED OR REPLICATE ATTRIBUTES

What's New in DFSMSdss z/OS V1R12

- Indexed VSAM defined with IMBED, REPLICATE, or KEYRANGE attributes:
 - IMBED/REPLICATE/KEYRANGE
 - During Logical/Physical DS DUMP/RESTORE ADR508I will be issued when encountered (not converted)
 - ADR508I THE FOLLOWING DATA SETS REQUIRE SOME ACTION TO BE TAKEN

ADR508I (001)-TDDS (01), THE FOLLOWING DATA SETS REQUIRE SOME ACTION TO BE TAKEN

TARGET.KSDS.IMBEDX01

TARGET.KSDS.IMBREP01

TARGET.KSDS.IMBREP02

TARGET.KSDS.REPLICAT

BSAM I/O for DUMP, COPYDUMP, RESTORE

- Problem Statement / Need Addressed:
 - Reason behind enhancement, for example:
 - Performance
 - Customer requirements addressed
 - MR1012016646, MR0201023028, MR0104024924, MR0614075419, MR0929036619, MR1213042842
- Solution:
 - Allow more options for DFSMSDss produced backups
- Benefit:
 - Increased flexibility for dump data set types
 - Elapsed time improvement up to 36% (~20-30%)

Overview

- With BSAM I/O
 - Use the DFSMSdss DUMP, COPYDUMP and RESTORE commands to
 - Create copy and restore backups on tape with larger than 65520 byte blocks
 - Create copy and restore backups in the extended format on DASD
 - Fallback to the old method of EXCP instead of BSAM at the JOB, application or installation level
- Value:
 - Faster throughput, shorten batch window for backups
 - Elapsed time improvement up to 36% (~20-30%)
 - Backups greater than 4GB, SMS compression, striped backups

Overview

- Using the new support:
 - BSAM I/O is the default method for backups on tape and extended format data sets on DASD
 - EXCP I/O continues to be the default method for basic and large format sequential backups on DASD
 - EXCP fall back support valid values are YES or NO
 - Invoked by a new PARM on the EXEC statement called USEEXCP
 - Applications can set UFOUEXCP=ON during EXIT 13
 - System administrators can set UFOUEXCP=ON in installation wide options exit (ADRUIXIT)
 - Overridden when EXCP is inappropriate for the dump data set during RESTORE

Overview

- The DFSMSdss DUMP command now supports BLKSZLIM on Dump data set DD statement
 - supports values between 65520 and 2GB
 - values 32760 through 65519 are treated as if BLKSZLIM was not specified
 - values over 262,144 are currently rounded down to 262,144

Installation

- Prerequisites for installation
 - Coexistence PTFs must be installed on all the systems in a SYSPLEX environment before using the new function
 - Allows the ability for backups on tape with larger than 65520 byte blocks to be restored in V1R10 and V1R11
 - Does not allow backups that reside on extended format on DASD to be restored
 - Can COPYDUMP to nonEF data set so it can be used prior to V1R12

What's New in DFSMSdss z/OS V1R12

- BSAM I/O for DUMP output, COPYDUMP, and RESTORE input
 - Changed Messages
 - ADR009T – Invalid value in PARM statement
 - ADR030I - Indicates DCB values have been modified
 - ADR331E – Output block size greater than input block size on COPYDUMP
 - ADR347E – Permanent I/O error

What's New in DFSMSdss z/OS V1R12

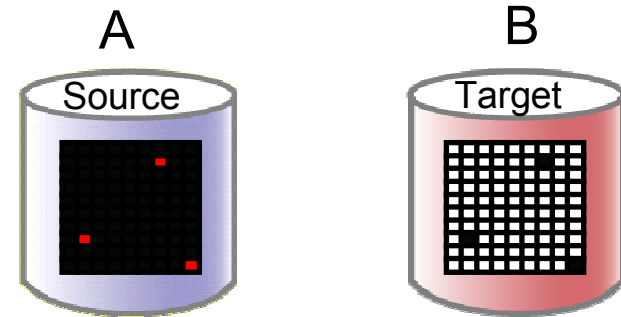
- BSAM I/O for DUMP output, COPYDUMP, and RESTORE input
 - New Messages
 - ADR054I Indicates USEEXCP was specified
 - ADR502I Indicates USEEXCP=YES was specified but DFSMSdss is going to ignore the request and use BSAM instead
 - Issued during a RESTORE when USEEXCP=YES was specified but EXCP cannot be used to process the input dump data set
 - Exploiters
 - DFSMSHsm BACKVOL DUMP and Automatic DUMP
 - Applications that invoke DFSMSdss and do not specify a block size and dumping to tape

What's New in DFSMSdss z/OS V1R12

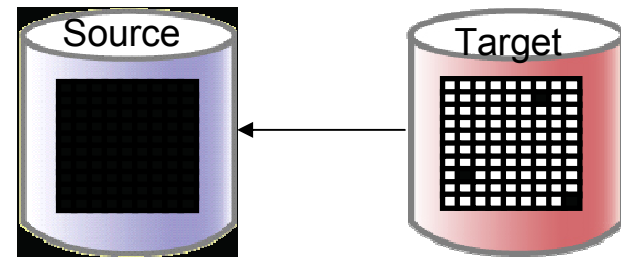
- FlashCopy Fast Reverse Restore
 - Allows recovery from an active FlashCopy target volume back to original source volume
 - Does not have to wait for the background copy to finish
 - Only allowed when the volume pair is in a full-volume (tracks 0-n) FlashCopy relationship
 - Allowed during COPY FULL and COPY TRACKS operations
 - COPY TRACKS operations when all tracks (0 –n) are specified

FlashCopy Fast Reverse Restore

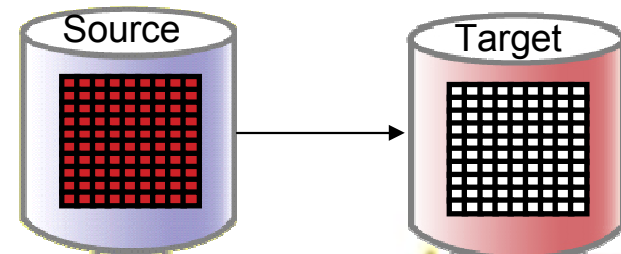
Stop updates to the A volume



Perform a Fast Reverse Restore B>A to create consistent data on the A volume



Once the background copy B>A is complete, Flash A back to B



What's New in DFSMSdss z/OS V1R12

- FlashCopy Fast Reverse Restore
 - FCFastReverseRestore Keyword
 - Option to restore the FlashCopy source from its FlashCopy target
 - If volume specified are not in a full volume FC relationship with each other operation will fail
 - Relationship reversed may be Space Efficient or Incremental
 - Not required
 - FCFullVolumeRelation Keyword
 - Option to create a single FlashCopy relationship that covers the entire volume
 - When not specified DFSMSdss excludes free space
 - Relationship is not eligible for Fast Reverse Restore
 - Only applies if FlashCopy is used as the data mover

What's New in DFSMSdss z/OS V1R12

- FlashCopy Fast Reverse Restore
 - ADRUFO Installation-wide options
 - Option UFFCFRRT bit at offset 20 (X'14')
 - RETRY FLASHCOPY WITHOUT FAST REVERSE RESTORE OPTION
 - Creates a new FC relation
 - Option UFBYFRVF bit at offset 20 (X'14')
 - BYPASS VERIFICATION DURING FAST REVERSE RESTORE
 - Debugging FCFRR problems will be cumbersome
 - New RACF Facility Class Profile
 - STGADMIN.ADR.COPY.FCFRR
 - When defined user must have READ access to use FCFRR keyword

What's New in DFSMSdss z/OS V1R12

- FlashCopy Fast Reverse Restore
 - Changed Messages
 - ADR835E, ADR842E, ADR846E, ADR931W
 - New Messages
 - ADR851I
 - Gives specific reason why FCFRR could not be used
 - More for debugging purposes
 - Will not be issued if Installation Exit requests bypass verification
 - ADR852E
 - Will usually follow ADR851I
 - Unless Installation Exit requests retry option
- Support has been rolled back to V1R10/R11 in OA31765

What's New in DFSMSdss z/OS V1R12

- Extended Address Volume Support
 - Introducing support of the remaining unsupported data set types
 - In z/OS V1R10 VSAM data sets (except catalogs and VVDSs)
 - In z/OS V1R11 Extended Format sequential data sets
 - In z/OS V1R12 All sequential, partitioned data sets, catalogs, and VVDSs
 - Data sets that remain ineligible for the EAS are:
 - HFS
 - VTOC (continues to be restricted to within first 64K-1 tracks)
 - VTOC index
 - Page data sets
 - VSAM data sets with imbed or keyrange attributes
 - VSAM data sets with incompatible CA sizes
 - Compatible CA sizes are 1, 3, 5, 7, 9 and 15 tracks

New Function APARs for DSS

- OA33789: New message ADR987I
 - Issued when two specific FlashCopy errors are encountered
 - When target tracks are currently in a source FlashCopy relationship
 - When target tracks are currently involved in an existing copy services relationship
 - CC, Metro Mirror, Global Mirror, zOS Global Mirror (XRC)
 - Only applies to logical copy

New Function APARs for DSS

- DFSMSDss FlashCopy Batch Protection
 - Directs data set Flashcopies to a specified Storage Group
 - No need to change existing batch jobs *
 - Must add the following line to SG ACS routine
IF &ACSENV2 = 'FLASHCPY' THEN SET &STORGRP = 'fcstrgrp';

fcstrgrp can be either a new or existing Storage Group that contain volsers that DFSMSDss is to use for allocation

- Must ensure that the target volume specified in the fcstrgrp are capable of FlashCopy
 - *Don't include volumes that are in an async copy*
- Must have OA32101 (DSS) and OA32103 (SMS) installed

* So as long as jobs are NOT specifying a GS storclass

Preview for DFSMSdss in z/OS V1R13

- Customized Offering Driver
 - A stand-alone z/OS driving system available at no additional charge to new or currently licensed z/OS customers
 - Using the COD applies if you
 - Don't have an existing system to use as a driving system
 - Or your existing system does not meet driving-system requirements
 - Previously only available on tape media
 - 34xx support withdrawn
 - 359x only choice
 - COD now available in DVD format
 - Consists of DSS full volume dumps
 - Will IPL the DVD using the HMC to bring up DSS SA program
 - Can then execute SA RESTORE
 - NOVERIFY support
 - "Rated z: The hottest DVD release from IBM" article
 - Hot Topics article August 2011

Preview for DFSMSdss in z/OS V1R13

- Sysplex-wide Event Notification 64
 - REFUCB option in DEVSUPxx Parmlib
 - Applies to COPY and RESTORE (FULL/TRACKS) target volumes
 - When VOLSER or VTOC size/location change
 - Unconditional vary online is issued to devices online to sharing systems
 - Allows UCB to be refreshed
 - Must specify REFUCB in DEVSUPxx parmlib
 - OA31785
 - Support to issue ENF64 when VVDS changes
 - Applies to COPY and RESTORE (FULL/TRACKS) target devices
 - Allows VVDS Manager to refresh VVDS
 - Available in all supported releases

Preview for DFSMSdss in z/OS V1R13

- Timestamp in DSS SYSPRINT messages
 - Capability to have DSS add timestamp to messages
 - Requested through new EXEC PARM or ADRPATCH
 - PARM='MSGTIME=I|W|E|T'
 - Patch byte at offset X'58'
 - X'80' Informational messages
 - X'40' Warning messages
 - X'20' Error messages
 - X'10' Terminating messages
 - Patch values may be added together to get combinations of messages
 - For example: Timestamps on warning and error messages set the value to X'60'

Reference Materials

- Publications:
 - SC35-0428: DFSMS Advanced Copy Services
 - SC35-0423: DFSMSdss Storage Administration
 - GA22-7499: z/OS V1R12 Migration
- Redbooks
 - SG245680: IBM TotalStorage Enterprise Storage Server Implementing ESS Copy Services with IBM eServer zSeries
 - SC26-7445: IBM TotalStorage Enterprise Storage Server User's Guide

Summary

- DFSMS SDM What's New
- DFSMSdss What's New
- Questions?