

What's New with DFSMS ICF Catalog and IDCAMS

Session 8977

Thursday, March 3, 2011

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New to Catalog and IDCAMS

- **R10 (via APAR)**
 - **REPRO MERGECAT RACF Authorization - OA33013**
- **R11**
 - **Imbed/Replicate Health Check**
 - **DELETE Mask**
- **R12**
 - **DELETE GDG FORCE**
 - **Indirect VOLSERS for zFS**
 - **Catalog Partial Release on Multiple Volumes**
 - **EA Catalogs Contention Detection**
 - **DEFIN Recatalog Volumes Sorted by RBA**
 - **PDSE/PEDS Empty**
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- **R13**
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 - **Alias Number Constraint Relief**
 - **VVDS Expansion**
 - **Catalog Search Interface Redrive**

R10 Catalog: REPRO MERGECAT RACF Authorization

- **REPRO MERGECAT requires RACF Alter authority to the data set being moved.**
 - **IDCAMS REPRO MERGECAT is actually a series of commands:**
 - Locates to gather data set information for each entry
 - DEFINE RECATALOG for each data set entry
 - DELETE NOSCRATCH for each data set entry
- **Long standing requirement to allow REPRO MERGECAT and not require RACF Alter authority to the data set.**

R10 Catalog: REPRO MERGECAT RACF Authorization

- **OA33013 – R10 APAR introduces a new RACF Facility Class - STGADMIN.IGG.DEFINE.RECAT**
 - **Read authority to STGADMIN.IGG.DEFINE.RECAT** – bypasses RACF data set authority checking for DEFINE RECATALOG
- **Existing RACF Facility Class - STGADMIN.IGG.DELETE.NOSCRATCH**
 - **Read authority to STGADMIN.IGG.DELETE.NOSCRATCH** – bypasses RACF data set authority checking for DELETE NOSCRATCH
- **REPRO MERGECAT can be performed without ALTER to the data sets if you have**
 - **ALTER authority to both catalogs:** ALTER authority to both catalogs: source and target
 - **READ authority to the existing RACF facility class:** STGADMIN.IGG.DELETE.NOSCRATCH
 - **READ authority to the new RACF facility class:** STGADMIN.IGG.DEFINE.RECAT

R11 Catalog: Imbed/Replicate Health Check

- **Imbed/Replicate is an obsolete performance function**
- **Define support for Imbed/Replicate removed in z/OS V1R5**
- **IBM Health Checker for z/OS for Imbed/Replicate is for Catalogs only**
 - **Has no input parameters**
 - **Invoked when Health Checker starts**
 - **Every 24 hours thereafter**

R11 Catalog: Imbed/Replicate Health Check

■ Processing:

- Reads all user catalog connectors in the master catalog using the Catalog Search Interface
- Issues a catalog call for each user catalog connector to get the Imbed/Replicate information
- Call causes each catalog to be opened
 - May cause messages if user catalog volumes are non-existent or offline.
 - You may not want catalogs opened simultaneously
 - Should activate/deactivate only as needed
 - Issues messages to console and report to message buffer

R11 Catalog: Imbed/Replicate Health Check

- **Messages:**

- IGGHC103I No catalogs were found defined with IMBED and/or REPLICATE attributes.
- IGGHC104E The health check has detected one or more catalogs defined with the IMBED and/or REPLICATE attributes.
- IGGHC106I Following catalog(s) were detected with the IMBED and/or REPLICATE attributes.

CATALOG NAME	ATTRIBUTE
--------------	-----------

catname	attribute
---------	-----------

catname	attribute
---------	-----------

LOW SEVERITY EXCEPTION

R11 IDCAMS: DELETE Mask

- **Delete Mask uses the entry name parameter as a mask that cause selective deletion of multiple catalog entries.**
- **New IDCAMS DELETE parameter “MASK”**
- **R11 needs APARs for full function**
 - **OA32220 fixes various issues including eliminating the 100 entry limit**
 - **TSO support requires OA31526 & OA32763**
 - **“Entry name” is now a filter key, so userid is not prefixed when no quotes - consistent with ISPF Option 3.4**

R11 IDCAMS: DELETE Masking

The entry name is used as input filter mask

- **Uses Common Filter Services, a DFSMS service, to select entries based on a filter key.**
 - **** zero or more levels**
 - *** 0 to 8 characters**
 - **% exactly 1 character (can have up to 8 in a row)**
- **Same selection criteria as ISPF Option 3.4**
- **Must specify fully qualified high level qualifier**

R11 IDCAMS: DELETE Masking

- Examples:

DELETE USER1. MASK**

Deletes all data sets belonging to USER1 (be careful!).

DELETE USER2..JCL MASK NONVSAM**

Deletes all data sets beginning with “USER2” and ending with “JCL” and nonVSAM

USER2.TSO.JCL type (A)	deleted
USER2.UTIL.DB2.JCL type (A)	deleted
USER2.VSAMDEF.JCL type (C)	not deleted – type C is cluster
USER2.ZFS.DEF.UTIL.DS.JCL type (A)	deleted

DELETE USER3.*.* MASK

Deletes all data sets beginning with “USER3 and having 3 levels

USER3.TSO.JCL	deleted
USER3.UTIL.DB2.JCL	not deleted – too many levels
USER3.VSAMDEF.JCL	deleted
USER3.ZFS	not deleted - too few levels
USER3.ZFS.DEF.UTIL.DS.JCL	not deleted - too many levels

R11 IDCAMS: DELETE Masking

- Examples:

DELETE USER%.*.ABC MASK

Not allowed – not fully qualified high level qualifier.

DELETE USER5.*.*.JCL% MASK NONVSAM

Deletes all data sets beginning with USER5 having four levels where the last level ends in JCL and one character.

USER5.TSO.JCL	not deleted – two few levels
USER5.UTIL.DB2.JCL1	deleted
USER5.UTIL.DEF.JCL	not deleted – no character after JCL
USER5.ZFS.DEF.JCL23	not deleted – to many characters after JCL

DELETE USER6.%%%.* MASK

Deletes all data sets beginning with USER6 having 3 levels, the 2nd of which has exactly 3 characters

USER6.TSO.JCL	deleted
USER6.UTIL.JCL	not deleted - UTIL has 1 too many characters
USER6.DEF.JCL	deleted
USER6.ZFS.UTIL.JCL	not deleted – too many levels

R12 Catalog: DELETE GDG FORCE

- **DELETE GDG FORCE** deletes all GDSs before deleting the base GDG.
- **Before R12, DELETE GDG FORCE** recalled any migrated GDSs before deleting them.
 - Recalls are serial
 - Can have 255 GDSs
 - Big performance bottleneck
 - SHARE requirement: SSMVSS064933
- In R12, **DELETE GDG FORCE** processing invokes HSM HDELETE rather than recalling the GDS.
- **Benefit - Improved performance**

R12 Catalog: Indirect VOLSERs for zFS

- **Starting with z/OS V1R12, you can make a clone, or copy, of a zFS and use indirect volume serials to access it.**
- **The new function lets you define a catalog entry for a zFS to specify different volume serials for different systems.**
- **The user can continue to use of existing processes for cloning systems when zFS is used for the version root file system.**

R12 Catalog: Indirect VOLSERs for zFS

- **The system programmer has to define a system symbolic in SYS1.PARMLIB member (IEASYSMxx)**

example: SYSDEF SYMDEF(&VOL01.=‘1P0301’)

- **A VSAM LDS is then defined using the real volume serial**

example:

```
DEFINE CLUSTER (NAME(ZFS.LDS) CYL(1 1)
VOLUMES(1P0301) STORCLAS(S1P03S02) -
LINEAR)
```

- **Run the USS IOEAGFMT utility against the data set. This formats the LDS as a zFS data set by setting the zFS indicator in the catalog record (VVR) for the data set.**

example:

```
//CREATE EXEC PGM=IOEAGFMT,REGION=0M,
// PARM=('-aggregate ZFS.LDS -compat')
//SYSPRINT DD SYSOUT=*
//STDOUT DD SYSOUT=*
//STDERR DD SYSOUT=*
//SYSUDUMP DD SYSOUT=*
//CEEDUMP DD SYSOUT=*
```


R12 Catalog: Indirect VOLSERs for zFS

- Run an IDCAMS DELETE NOSCRATCH against the data set.

example: DELETE ZFS.LDS NOSCRATCH

This deletes the catalog entry of the data set.

and now finally..

- Run an IDCAMS DEFINE RECATALOG using the system symbolic (indirect volser) for the data set

example: DEFINE ZFS.LDS VOLUMES(&VOL01) RECATALOG

This defines the data set with the system symbolic

- A subsequent IDCAMS LISTCAT after either of the previous method for creating the zFS data set will show the following:

R12 Catalog: Indirect VOLSERs for zFS

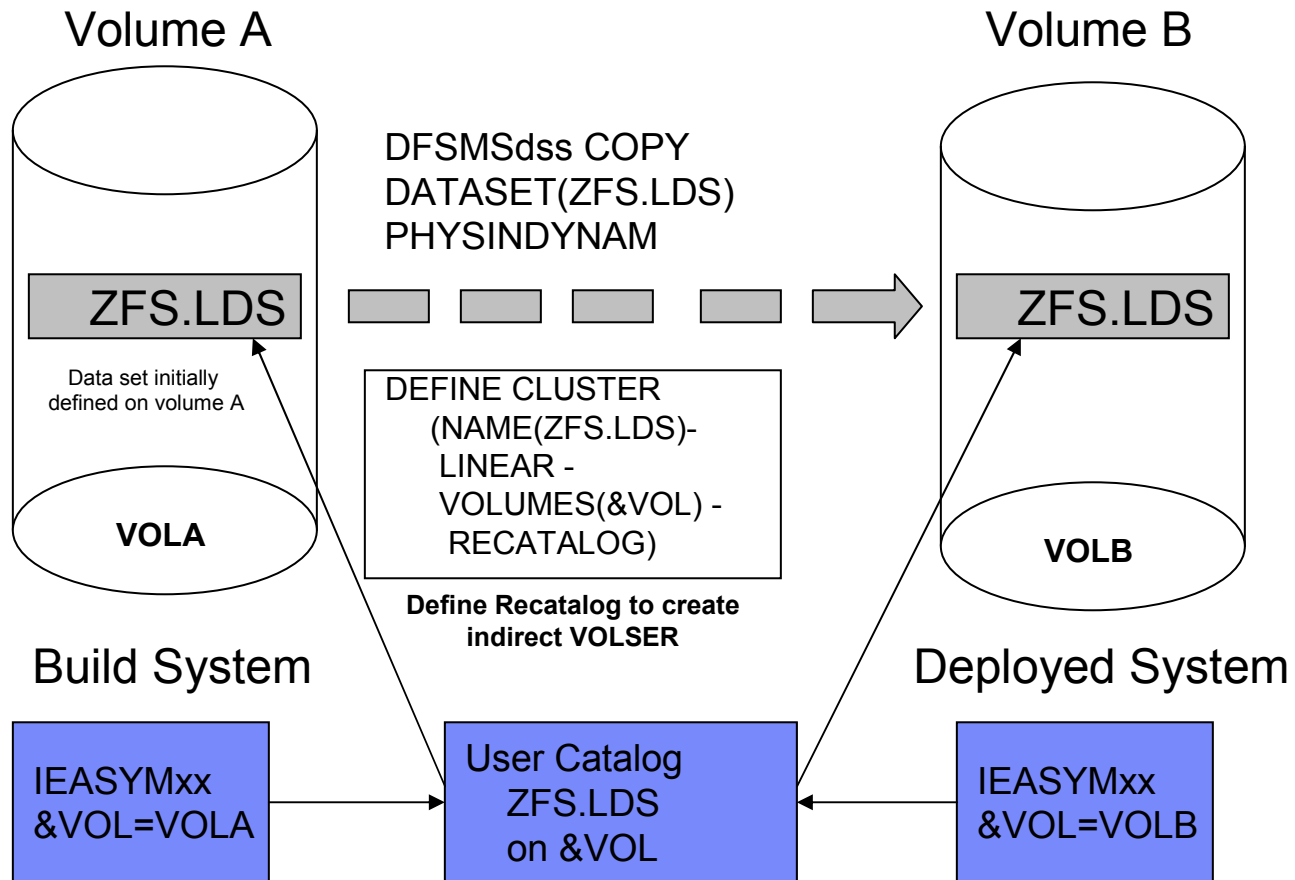
- **Example LISTCAT**

```
CLUSTER ----- ZFS.LDS
...
DATA ----- ZFS.LDS.DATA
...
VOLUME
VOLSER-----&VOL01
DEVTYPE-----X'00000000'
```

- **Hot Topics article**
- **For existing zFS data sets...**

R12 Catalog: Indirect VOLSERs for zFS

zFS Cloning Support Using Indirect VOLSERs

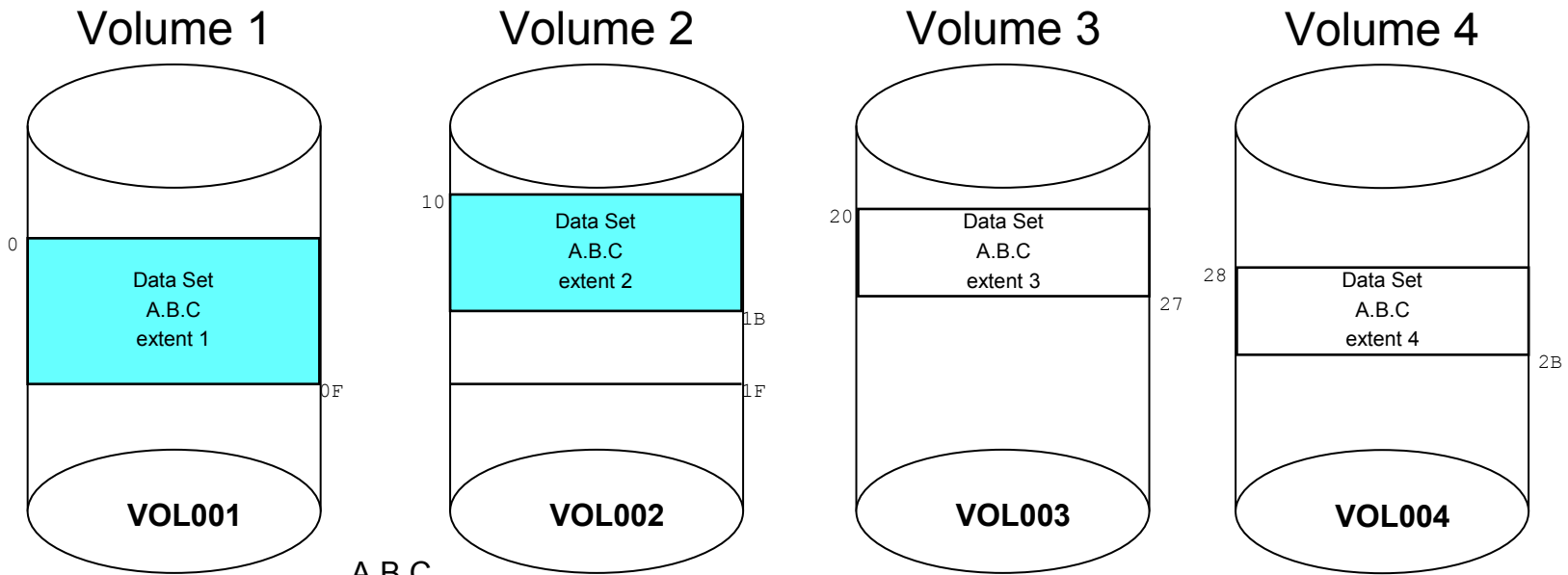


R12 Catalog: Partial Release on Multiple Volumes

- **Prior to z/OS V1R12, partial release only releases space on volumes where the high-used RBA (HURBA) and the high-allocated RBA (HARBA) are on the same volume**
 - Partial release requires EF which is SMS only.
 - Problem introduced by SMS Space Constraint Relief, aka “Best Fit”
 - When the HURBA and the HARBA are not on the same volume, no space is released.
- **In z/OS V1R12, processing is enhanced to SCRATCH any volumes on which the HURBA is not on the volume.**
 - SCRATCHed volumes are changed to candidate volumes in the catalog
- **Partially fulfills SHARE Requirement SSMVSS08002: “Space Release Will not Release Over-Allocated Space for Multi-Volume Files”.**
 - It only addresses VSAM data sets.
 - BAM data sets will be addressed in another release.

R12 Catalog: Partial Release on Multiple Volumes

Before Partial Release



A.B.C

VOL001 extent 1 RBA 00-0F

VOL002 extent 1 RBA 10-1F

VOL003 extent 1 RBA 20-27

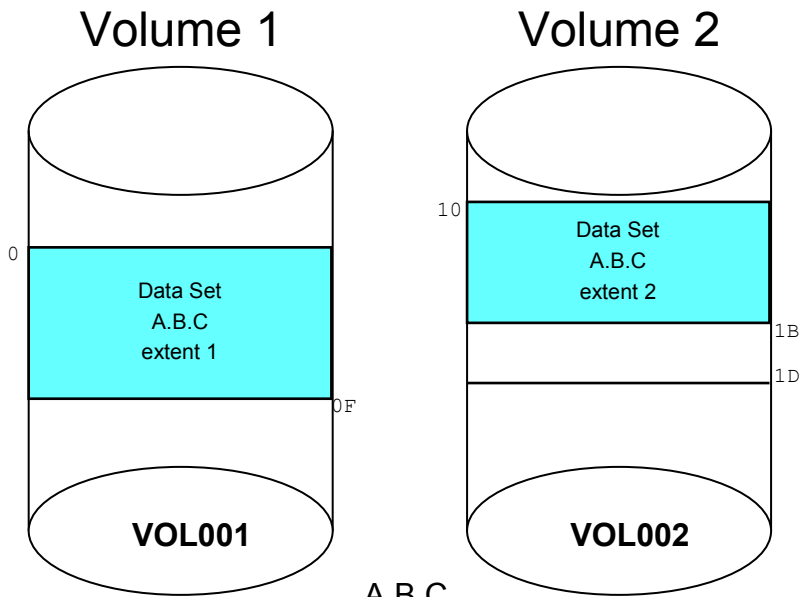
VOL003 extent 1 RBA 28-2B

HARBA 2B

HURBA 1B

R12 Catalog: Partial Release on Multiple Volumes

After Partial Release



A.B.C

VOL001 extent 1 RBA 00-0F

VOL002 extent 1 RBA 10-1D

*

*

HARBA 1D

HURBA 1B

R12 Catalog: EA Catalogs

- **Before R12, Catalogs cannot be bigger than 4 GB**
 - Scalability issue
 - Share requirement: SSMVSS08006
- **In R12, Extended addressable (EA) Catalogs can be the same as EA VSAM data sets**
- **EA allows Catalogs to be bigger than 4GBs (theoretical maximum of 32K x 4GB)**

R12 Catalog: EA Catalogs

- **To DEFINE an EA Catalog, it must also be defined as an Extended Format data set**
 - **Must be SMS Managed**
 - **Must have Data Class with DATA SET NAME TYPE of EXT and IF EXT (P= Preferred or R = Required)**
 - **EF Catalog does not have other EF options such as compaction, striping or partial release**
- **Data Class must have Extended Addressable set to “YES”**
- **Attempt to DEFINE an EF Catalog with Extended Addressable set to “NO” results in IDC3009I message with return code 60 and reason code 54.**

R12 Catalog: EA Catalogs

- **Warning:**
 - **All systems in sysplex must be R12 or higher if attempting to share an EA Catalog. APAR OA30000 must be on down level systems accessing EA Catalogs or THEY WILL BREAK.**

R12 Catalog: EA Catalogs

- Example LISTCAT showing EA Catalog:

```

LISTCAT CAT(ICFUCAT1.FOURGB) ALL
IDCAMS  SYSTEM SERVICES                TIME: 16:05:30          06/28/10
                                LISTING FROM CATALOG -- ICFUCAT1.FOURGB
CLUSTER ----- 0000000000000000000000000000000000000000000000000000000
:
:
DATA ----- ICFUCAT1.FOURGB
:
:
ATTRIBUTES
KEYLEN-----45      AVGLRECL-----24500      BUFSPACE-----73728      CISIZE-----24576
RKP-----9         MAXLRECL-----32400      EXCPEXIT----- (NULL)      CI/CA-----2
BUFND-----0         STRNO-----2
STRIPE-COUNT-----1
SHROPTNS (3,4)      SPEED      UNIQUE      NOERASE      INDEXED
SPANNED      NOECSHARE      ICFCATALOG      EXTENDED      EXT-ADDR
    
```

R12 Catalog: Contention Detection

- **Runs as part of the existing Catalog Address Space Analysis Task**
 - **Analysis Task runs every 30 seconds or when a specific analysis is requested**
 - **Contention Detection is executed every time the Analysis Task runs**
- **Contention Detection scans the Catalog Service Tasks list**
 - **Checks for service tasks that are active and waiting on the SYSZTIOT enqueue. It sets timer for each waiting task.**
 - **On subsequent checks, if the service task timer exceeds the allowed interval wait time (default 10 minutes) ,**
 - **Symptom records (SYMREC) are created**
 - **Messages are written to the console on the first occurrence. If wait persists, another message issued at 5 minutes, and then at 15 minute intervals thereafter**

R12 Catalog: Contention Detection

- **MODIFY CATALOG console command changes**
 - **MODIFY CATALOG,CONTENTION(reason class, wait-time)**
 - (reason class) Specifies the group of events which the wait-time field will apply to. Currently, the only reason class available is SYSZTIOT
 - (wait-time) Specifies how long a CAS Service Task may wait on an event before notification by a symptom record. If time is zero, contention detection is disabled. The default value for this field is 10, indicating 10 minutes valid values are 0, >=5, <=999
 - **New line in the MODIFY CATALOG,REPORT console command output**
 - * CONTENTION SYSZTIOT TIME = 10

R12 Catalog: Contention Detection

- **Console Messages**

IEC353I INVALID DATA VALUE | INVALID REASON CLASS

INVALID DATA VALUE – The data value specified for the function was either nonnumeric or outside the allowable range.

INVALID REASON CLASS – The specified reason class does not match any of the existing supported values. (currently SYSZTIOT is the only valid value)

IEC393I WARNING: CATALOG TASK CONTENTION WAIT-TIME WAS EXCEEDED

REASON CLASS <Reason Class>:JOBNAME <JOBNAME> : STEPNAME <STEPNAME> : ASID <ASID>: CAS TCB <TCB>

Or

REASON CLASS <Reason Class> :JOBNAME <JOBNAME> : ASID <ASID> : Number of tasks <#number of tasks>

R12 Catalog: DEFINE Recatalog Volumes Sorted by RBA

- **VSAM Extent Constraint Relief in z/OS V1R7**
 - New support allowed for 123x59 extents (previous limit was 255)
 - VSAM needed an index over the Extent Descriptor Blocks.
 - VSAM could not build the index if volumes were not in ascending Relative Byte Address (RBA) order
 - DEFINE RECATALOG recataloged volumes in the order they were entered in the IDCAMS command

R12 Catalog: DEFINE Recatalog Volumes Sorted by RBA

- **Volumes now in correct, ascending RBA order**
 - VSAM Volume Records (VVRs) read and RBA information gathered
 - Volumes sorted in RBA (or RBA/Stripe if a striped data set)
- **Benefit**
 - Volumes always in correct RBA order for Extent Descriptor Block index build
 - Improved checking for missing volumes

R12 Catalog: DEFINE Recatalog Volumes Sorted by RBA

- **Example**

```
DEFINE CLUSTER (NAME(ABC.DEF) -  
    VOLUMES(VOL008, VOL007, VOL006, VOL005,  
            VOL004, VOL003, VOL002, VOL001) -  
    RECATALOG INDEXED )
```

Assume the data set:

- has 3 stripes data set
- the primary volume for the data is VOL001
- the primary volume for the index is VOL002

R12 Catalog: DEFINE Recatalog Volumes Sorted by RBA

- **Example (cont)**

Currently, after the recatalog, the result would look as follows:

VOLSER	RCI	Stripe #	
Data			
VOL001	0	1	This is the prime volume and is always forced first.
VOL008	6	2	
VOL007	6	1	
VOL006	5	2	
VOL005	5	1	
VOL004	4	2	
VOL003	0	3	
VOL002	0	2	
Index			
VOL001	1		This is actually the second volume but is forced first because the data VOL001 is prime and first.
VOL002	0		

Note: Indexes are not striped and do not contain stripe numbers.

R12 Catalog: DEFINE Recatalog Volumes Sorted by RBA

- **Example (cont)**

With the new support, the result would be:

VOLSER	RCI	Stripe #
Data		
VOL001	0	1
VOL002	0	2
VOL003	0	3
VOL004	4	2
VOL005	5	1
VOL006	5	2
VOL007	6	1
VOL008	6	2
Index		
VOL002	0	
VOL001	1	

Note: Indexes are not striped and do not contain stripe numbers.

R12 IDCAMS: PDSE/PDS Empty

- **DELETE pdsname(*) will result in a STOW macro being issued with the INIT option to remove all members.**
 - **The result is an empty partitioned data set.**
 - **Valid for PDSs and PDSEs**
 - **Share requirements SSMVSS063070 for PDSE and SSMVSS063069 for PDS**

IDCAMS R12: DCOLLECT Currency

- **New DCOLLECT Fields added due to:**
 - Client requests
 - New function enhancements
- **DC record type fields added:**
 - VSAM SPEED and REUSE
 - Tailored Compression
 - CICSVR Forward Log
 - RLS Greater Than 4K Cache
 - Block Size Limit SPE
 - Dynamic Volume Count
 - Scaling Constants for tape Support Use
 - RLS 64 Bits virtual
 - Ventana 3 SPE
 - SMB VSP
 - Tape Encryption SPE
 - R12 CA Reclaim

IDCAMS R12: DCOLLECT Currency

- **V or VL record fields:**
 - R11 DADSM Save Job-name
- **SG record fields:**
 - R11 LI2/LI3 DFSMS OAM Enhancements
 - BMF Enhancements. New **STORCLAS** attribute

Catalog R13: Catalog Parmlib Member

- **Currently, SYS1.NUCLEUS (SYSCATxx) or SYS1.PARMLIB (LOADxx)**
 - Limited to 80 byte record
 - Changes via **MODIFY CATALOG**
 - **IPL to take effect**

Catalog R13: Catalog Parmlib Member

- **New Catalog SYS1.PARMLIB member – IGGCATxx**
 - “xx” suffix can be any 2 alphanumeric or national characters (\$, #, @); the default is “00” (zeros).
 - New IEASYSxx parameter, CATALOG=
 - Default is 00
 - Members processed in the order specified
 - When same parm specified in multiple members, the parm in the last member is used

Catalog R13: Catalog Parmlib Member

- The following syntax rules apply to IGGCATxx:
 - The content of the member is one or more Catalog parameters whose format is shown in the table below.
 - Input ends with the end of file (EOF). No explicit continuation syntax is required.
 - Blanks in any combination constitute a delimiter.
 - Delimiters are not required between parameters with values; the right parenthesis after the specified parameter value is sufficient.
 - Comments begin with /* and end with */.
 - Multiple declarations of any parameters are allowed. The last valid value will be used for the parameter. For example , the following is allowed:
 - VVDSSPACE(10,10) VVDSSPACE(14,14)
 - VVDSSPACE(10,10)
 - VVDSSPACE(14,14) will be used as the final value for VVDSSPACE in this case.
 - No blanks will be allowed between digits. For example: VVDSSPACE(1 0, 14) is not valid for a VVDSSPACE(10,14) declaration or NOTIFYEXTENT(6 6) for NOTIFYEXTENT(66) is not a valid declaration.
 - The following declaration is valid.
 - VVDSSPACE(10, 14) for VVDSSPACE(10,14) or NOTIFYEXTENT(55) for NOTIFYEXTENT(55)
 - All parameters should start and finish on the same line. For example the following is not a valid syntax:


```
VVDSSPACE( 10, 14
                ).
```

 There is no continuation character.

Catalog R13: Catalog Parmlib Member

- **Syntax continued:**
 - The parameters **DO NOT** have to start in column one. They must fit entirely within columns 1 and 71. Any text beyond column 71 will be ignored by the parser.
 - If an error is found during parsing of any parameter, message IEC386W will be issued and display the text in error up to column 71. The parser will continue to parse any parameters on the next line(s). If the same parameter that was found to be in error on any earlier line(s) is found and valid, its value will be used.
 - If the parser detects an error in any parameter on a line, parsing for that line stops at the last valid parameter on that line. The parser will continue to parse any parameter(s) on the next line(s).
 - If all instances of a specific parameter are invalid or the parameter is not specified at all in any of the IGGCATxx parmliib members during an IPL, then the default value will be substituted for the parameter. During a restart of the Catalog address space, the value that existed prior to the restart will be retained for the parameter.
 - If a zero secondary value is specified on a VVDSPSACE(pri,sec) parameter and the primary value is valid, then on an IPL, a default of 10 tracks will be substituted for the secondary, while on a restart of the Catalog Address Space the value that existed prior to the CAS restart will be retained.

Catalog R13: Catalog Parmlib Member

- Parameters:

Parameter Name	Description
VVDSSPACE(pri,sec)	Primary and secondary space for VVDS implicit defines. Default is 10 tracks for both values.
TASKMAX(n)	Where n is the Catalog Address Space user service task upper limit. Default is 180; minimum is 24, maximum is 360.
NOTIFYEXTENT(n)	Where n is the percentage threshold to warn when a Catalog is getting full. Default is 80%.
DELFORCEWNG(YES/NO)	Enables/Disables the ability to issue the IDC1997I or IDC1998I warning message.
DSNCHECK(YES/NO)	Enables/Disables syntax checking on names being added to a Catalog.
SYMREC(YES/NO)	Enables/Disables the ability to create a SYMREC.

Catalog R13: Catalog Parmlib Member

- Parameters (Cont):

Parameter Name	Description
UPDTFAIL(YES/NO)	Enables/Disables the message IEC390I when a VSAM update request against a catalog has been abnormally terminated.
VVRCHECK(YES/NO)	Enables/Disables enhanced VVR checking on VVDS I/O.
DELRECOVWNG(YES/NO)	Enables/Disables the ability to issue the IDC1999I warning message when issuing the DELETE UCAT RECOVERY command. New keyword introduced in z/OS DFSMS V1R13.
EXTENDEDALIAS(YES/NO)	New keyword introduced in z/OS DFSMS V1R13. Enables/Disables the ability to create extension records for user catalog aliases on the current system. New keyword introduced in z/OS DFSMS V1R13.

Alias Number Constraint Relief

- Currently, limit of approximately 3500 aliases per catalog
- New support allows at least 10 times as much
- New extension record to the user catalog connector
- All systems should be at R13 for this support
 - Must be enabled
 - see new PARMLIB member parm EXTENDEDALIAS
 - F CATALOG,ENABLE (EXTENDEDALIAS) console command
 - Mixed system support is limited
 - OA33517 – coexistence APAR

VVDS Expansion

- Currently the catalog VSAM Volume Data Set (VVDS) is limited in size to xFFFF (65535 in decimal) VSAM Control Intervals (CI).
- Each 4K CI can hold one to several VSAM volume records (VVR) or non-VSAM volume records (NVR) for datasets that reside on the VVDS of the volume.
- The number of data sets that may reside on a volume is therefore limited then by the size of the VVDS.
- This line item increases the size of the VVDS from xFFFF to xFFFFFF (1048575) CI's, a sixteen fold increase, allowing for larger VVDS's supporting more data sets per volume.
- OA34940 Coexistence APAR - only limitation is that lower level MAY NOT DEFINE VVDS or extend a VVDS to the new larger size.

Catalog Search Interface Redrive

- This support will make sure that Catalog Search Interface invocations are redriven in the event of a CAS RESTART (return code 246 and reason code 0).
- As more and more components and ISVs make use of CSI, the ability to redrive CSI requests provides more uninterrupted access to Catalog.

LISTCAT NOIMBED and NOREPLICATE removal

- Just the NOIMBED and NOREPLICATE information is removed from the **LISTCAT** listing!
- IMBED and REPLICATE will still appear on the LISTCAT if the data set is IMBED or REPLICATE.

DELETE UCAT WTOR

- Specifies that IDCAMS will issues WTOR message IDC1999I for DELETE CATALOG RECOVERY
- Enabled by PARMLIB member parameter DELRECOVWNG(YES) or MODIFY CATALOG,ENABLE(DELRECOVWNG)
- Status setting can be checked with MODIFY CATALOG,REPORT
- No TSO support

LISTCAT support of Catalog CSI CTGCDI

- This support provides new parameter CDILVL | NOCDILVL for LISTCAT LVL only
- NOCDILVL is default – works as today. Data and Index names are not returned if they do not match the LVL
- CDILVL returns data and index names if the cluster name matches the LVL.

The End

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