

What's New with DFSMS ICF Catalog and IDCAMS

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Agenda

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Catalog

Record Level Sharing (RLS) for Catalog

- Optionally access individual user catalogs with VSAM RLS in a parallel sysplex.
- RLS record level locking replaces catalog level sharing (SYSIGGV2).
- RLS 64 bit buffering and CF caching replaces VLF/ICS and ECS.
- Sysplex wide command /ALTER support to:
 - Quiesce/Enable catalogs for RLS access.
 - Suspend/Resume catalog access.
 - Lock/Unlock catalog access.
- New Vendor interface (IGGQUIES)
 - Programmable interface for sysplex command/alter support
 - Quiesce for copy RLS catalogs
- See SHARE Sessions 12977 and 12978 for more information

GDG Support for PDSEs

- Currently partitioned data sets (PDSs) are supported as GDSs (generation data sets). However, partitioned data set extensions (PDSEs) are not supported as GDSs.
- A PDSE can be defined as a GDS by specifying DSNTYPE=LIBRARY or a DATACLAS that specifies DSNTYPE=LIBRARY on the GDS define command.
- Example of defining a PDSE as a GDS using IEFBR14

```
//DEFINE EXEC PGM=IEFBR14  
//DD1 DD DSN=A.GDG(+1),DISP=(,CATLG),  
// STORCLAS=S1P03S01,VOL=SER=1P0301,  
// DCB=(LRECL=133,RECFM=FBM),DSNTYPE=LIBRARY,  
// UNIT=3390,SPACE=(TRK,(1,1,1))
```

GDG Order Enhancement

- When a GDG name is specified on a DD statement, the GDS are concatenated in the requested order.
- This function can be exploited via new IDCAMS keywords LIFO and FIFO for DEFINE and ALTER.
 - LIFO - the order is the newest GDS allocated to the oldest GDS. (Default and current order)
 - FIFO - the order is the oldest GDS allocated to the newest GDS.
- Sorting for GDGs with GDSs containing records in date/time order is not necessary (SMF records for instance)
- Catalog Parmlib option GDGFIFOENABLE must be set
- JCL keyword overrides whatever is specified for GDG on DEFINE or ALTER

New Catalog Search Interface (CSI)

Field names

Type	Length	Name	Description
Character	45	ASSOC	A repeating list of catalog records associated with this entry. Consists of a 1-byte value similar to field name ENTYPE, followed by the 44-byte name of the association. If the name contains system symbolics, the name and type are resolved before being returned.
Bitstring	1	ASSOCSYB	Indicates if the entry is a symbolic-relate x'80' if it is. x'00' otherwise.
Fixed	2	BUFND	Number of buffers requested for Data (only valid for Catalogs)
Fixed	2	BUFNI	Number of buffers requested for Index (only valid for Catalog indexes)
Fixed	4	HILVLRBA	RBA of High Level Index Record
Fixed	2	INDXLVLS	Number of Index Levels
Fixed	4	SEQSTRBA	RBA of First Sequence Set Record
Fixed	1	STRNO	Number of concurrent requests
Fixed	4	TRACKS	Total number of tracks per volume

Contention Management Enhancement

- ***Contention Management introduced in Z/OS R1.12***
 - It was designed to **ONLY** to detect SYSZTIOT contention with in Catalog.
 - It introduced a new and an altered catalog modify command
 - (New) F Catalog,Contention(SYSZTIOT,<WAIT_THRESHOLD>) - modified the amount of time to wait before reporting contention.
 - (ALTERED) F Catalog,Report – The report included a line displaying the current wait time for SYSZTIOT contention.
 - **The only action taken when the wait threshold was crossed was notification to the console and a one time symrec to the logrec.**
 - **Threshold times set would survive a CAS restart, but did not survive an IPL of the system.**

Contention Management Enhancement

- **Expand the resources being monitored to include (in addition to SYSZTIOT)**
 - SYSZVVDS – Serialization on the VVDS dataset of a volume.
 - SYSIGGV2 – provide an essential mechanism to facilitate cross system sharing of catalogs.
 - ALLOCLCK -- an internal CAS lock which protects allocations, de-allocations, opens and closes.
- **A new action, REDRIVE, can be associated with a resource and triggered when the wait threshold is reached.**
 - The REDRIVE action will abend 91A the catalog task which has currently past wait time threshold, freeing its serialization, and restarting the task. In some circumstances, like deadly embraces, the source of contention may be resolved.
- **Contention wait-time and actions per resource can be set in the Catalog parmlib.**
 - This allows values set in the parmlib to be retained or re-established on upon IPL.

Contention Management Enhancement

- **2 Modify commands added:**

- F Catalog,Contention

- *Reports current threshold wait times and associated actions with contention.*

```
*CAS*****  
* RESOURCE          THRESHOLD (MIN)      ACTION (S)          *  
*CAS*****  
* SYSZTIOT           10                N                   *  
* SYSZVVDS           5                  N                   *  
* SYSIGGV2           10                N                   *  
* ALLOCLCK           200               NR                  *  
*CAS*****  
* ACTION KEY                          *  
* N = NOTIFY OPERATOR  R = REDRIVE REQUEST          *  
*CAS*****
```

- F Catalog,Contention(<Resource>,<WAIT_THRESHOLD>,<ACTION>)

- *Sets both wait time and action for a resource.*
- *Supports the resources SYSZTIOT, SYSZVVDS, SYSIGGV2, and ALLOCLCK*

Contention Management Enhancement

- **Modify command changed:**
 - F Catalog,Report
 - *The report will no longer display wait time for SYSZTIOT.
Now contained in the new contention report.*

Catalog Parmlib Enhancements

- Member name IGGCATxx
 - *Values loaded on IPL or RESTART*
 - override equivalent parameters in SYSCATLG or LOADxx.
- TASKMIN(n) – Low limit on the number of catalog service tasks that can run at any given time. Default is 60. Possible values between 24 and 180.
- TAPEHLQ(String) – High Level Qualifier for a Volume catalog. Default is SYS1. String can contain alphabets, numbers, or the national characters (@, \$, #).
- ALIASLEVEL(n) – Alias name qualification level. Default is 1. Possible values are 1 to 4.

Catalog Parmlib Enhancements

- **TASKTABLESIZE(n)** – Maximum number of service tasks (catalog and non-catalog combined) that can run at any given time. Default is 200. Possible values are 200 to 400.
- **CATMAX(n)** – Maximum number of catalogs that can be open at any given time. Default is 1024. Possible values are 1 to 9999.
- **SYS%(ON|OFF)** – Specifies if SYS% to SYS1 conversion is allowed. Default is OFF.
- **AUTOADD(ON|OFF)** – Specifies if ECS Autoadd is to be enabled or disabled. Default is OFF.
- **DUMP(ON|OFF)** – Specifies if dynamic dumping is to be made available or not. Default is OFF.

Catalog Parmlib Enhancements

- **DUMPON(rc,rsn,mod)** – Specifies the catalog return code, reason code and 2 character catalog module id to take a dump.
 - Possible values for Return code and Reason code are 1 to 255
- **DUMPON(rc,rsn,mod,count)** – Specifies the catalog return code, reason code, 2 character module id and the number of times to skip before taking a dump.
 - Possible values for Return code, Reason code and count are 1 to 255
- **Resourcename(delay,action)** – Specifies the resource name, delay and the action to be taken for contention detection.
 - Possible values for resource name are SYSZTIOT, SYSZVVDS, SYSIGGV2 and ALLOCLCK
 - Possible values for delay between 0 and 65535. Anything above 65535 will be converted to a 9999
 - Possible values for action are N (Notification) and R (Redrive)

Externals Enhancement

- Latch number added to F CATALOG,LIST
 - Added to message IEC347I when there is latch contention

```
IEC347I LIST CATALOG TASK(S)
*CAS*****
* FLAGS - TASK ADDRESS - JOBNAME / STEPNAME - ELAPSED TIME - ID      *
* ----- NOACTIVE / NONE 00.00.00                                  *
*****
* O-OLDEST, W-WAIT, A-ABEND, E-ENQ, R-RECALL, L-RLS                *
*CAS*****
```

is changed to:

```
IEC347I LIST CATALOG TASK(S)
*CAS*****
* FLAGS - TASK ADDR - JOBNAME / STEPNAME - ELAPSED TIME - ID        *
* ----- 00891D78 DUMPSRV / DUMPSRV 00.01.55 02                    *
*   WAITING FOR Get LatchShr # 00001 FROM 09F06730 FOR 00.01.23    *
*****
* O-OLDEST, W-WAIT, A-ABEND, E-ENQ, R-RECALL, L-RLS                *
*CAS*****
```

where 00001 is the latch number in hexadecimal. Note that the "WAITING FOR" line is indented an additional space to help indicate it is related to the line above.

Externals Enhancement

- Provide date and time from export data set used by ICFRU
 - Added new line to CRURRAP as follows in red:

```
INTEGRATED CATALOG FORWARD RECOVERY UTILITY R1M0
CRURRAP      SYSPRINT                01/31/13 (13.031) 11:16:39 PAGE 01
          RECORD SELECTION AND VALIDATION REPORT
          EXECUTION PARAMETERS
CATALOG NAME                CATEI001.UCAT1
RECORD SELECTION START      01/31/13 (13.031)  11:16:11
RECORD SELECTION STOP      01/31/13 (13.031)  11:16:29
SIGNIFICANT GAP TIME       0030 MINUTES
MAXIMUM CLOCK DIFFERENCE   NONE SECONDS
CATALOG WAS EXPORTED ON    01/31/13 AT 11:16:11
```


Externals Enhancement

- HSM Message Enhancement: Fix return & reason code returned to HSM as described in APAR OA23698
 - Enhances the HSM message ARC0936I so that it is more meaningful when the system detects an error other than in the VVDS
 - ARC0936I ERROR RETRIEVING SMS VTOC/VVDS DATA, FUNC = (ACCESS | FREE), RC=retcode, REASON=reas1, SUBREAS=reas2
 - It might end with “RC=12, REASON=98-CATALOGENTRYMGR SUBREAS=reas2” where reas2 is four characters:
 - 1 - Catalog RC (See IDC3009I)
 - 2 - Catalog reason. (See IDC3009I)
 - 3, 4 - Catalog module identifier

Externals Enhancement

- IEC363D to accept 'Yes' and 'No'
 - For message IEC363D IS THIS RESTART RELATED TO AN EXISTING CATALOG PROBLEM (Y OR N)?
 - Added capability to respond with “YES” or “NO” in addition to “Y” or “N”
 - Message text was not changed and remains as seen above
 - Follow on message IEC364D will also accept “YES” or “NO”

Externals Enhancement

- Support ABEND Async Events Task Support
 - Support added so three additional CAS specialty tasks (Async Events, Sysplex Command, and Sysplex Quiesce) can be ABENDED by the Modify command.
 - Added TCB addresses for each task to the F CATALOG,REPORT output in message IEC359I
 - Added new keywords for each task to the F CATALOG,ABEND command.

Externals Enhancement

- Support ABEND Async Events Task Support

F CATALOG,REPORT output changed from:

```
*CAS*****  
* CATALOG COMPONENT LEVEL = HDZ2210 *  
* CATALOG ADDRESS SPACE ASN = 002A *  
* *  
* *  
* *  
* CAS ANALYSIS TASK = 00995A28 *  
* CAS ALLOCATION TASK = 00995C58 *  
* CAS ECS TASK = 009957F8 *  
* VOLCAT HI-LEVEL QUALIFIER = SYS1 *
```

Externals Enhancement

- Support ABEND Async Events Task Support

To (note "ECS" changed to "ASYNC"):

```
16.48.03 SYSTEM1 IEC359I CATALOG REPORT OUTPUT
```

```
*CAS*****  
* CATALOG COMPONENT LEVEL = HDZ2210 *  
* CATALOG ADDRESS SPACE ASN = 002A *  
.  
.  
.  
* CAS ANALYSIS TASK = 00995A28 *  
* CAS ALLOCATION TASK = 00995C58 *  
* CAS ASYNC TASK = 009957F8 *  
* CAS SYSPLEX COMMAND TASK = 00996AC8 *  
* CAS SYSPLEX QUIESCE TASK = 00996BC0 *  
* VOLCAT HI-LEVEL QUALIFIER = SYS1 *
```

Externals Enhancement

- Support ABEND Async Events Task Support

Added to F CATALOG,ABEND command as follows:

```
F CATALOG,ABEND (ASYNC)
```

```
F CATALOG,ABEND (SYSPCMD)
```

```
F CATALOG,ABEND (SYSPQUI)
```

Externals Enhancement

- Change STGADMIN.IGG.DEFINE.RECAT and STGADMIN.IGG.DEFDEL.UALIAS from LOG=NONE to LOG=NOFAIL
 - These facility classes are used by Catalog Administrators to perform REPRO MERGECATs without having ALTER access to the catalogs involved
 - Done so that unauthorized use can be detected (logged) and audited.

Health Check

- Checks Global Resource Serialization (GRS) Resource Name Lists to insure they match IBM recommendations for SYSIGGV2, SYSZVVDS and SYSVTOC
 - IBM recommends that all SYSIGGV2, SYSZVVDS, and SYSVTOC reserves be converted to systems enqueues, unless the client shares DASD outside the sysplex
 - You can prevent deadlocks, by always converting the SYSIGGV2, SYSZVVDS and SYSVTOC reserves to systems enqueues using Global Resource Serialization (GRS) or an equivalent product

Alias Enhancements

- Adds a creation date to the alias entry.
 - Can be used to detect obsolete aliases
 - Valid for User catalog aliases and nonVSAM aliases
 - Reported using LISTCAT

```
LISTCAT ALIAS ALL
ALIAS ----- SMS
  HISTORY
    RELEASE-----2          CREATION-----2013.003
  ASSOCIATIONS
    USERCAT--SMSCAT
```

```
LISTCAT ALIAS ALL CAT(SMSCAT)
ALIAS ----- SMS.STEVE
  HISTORY
    RELEASE-----2          CREATION-----2013.008
  ASSOCIATIONS
    NONVSAM--SMS.NONVSAM
```

Alias Enhancements

- Association verification during data set deletion.
 - If data set A has an alias association B, but the alias entry for B points to data set C, then, when data set A is deleted, association B should not be deleted.

Data Set A -> Alias B

Alias B -> Data Set C

Data Set C -> Alias B

Alias B is not deleted when Data Set A is deleted.

Alias Enhancements

- Symbolicrelate Same Catalog Restriction Removed
 - **Restriction:** The RELATE and SYMBOLICRELATE parameters are mutually exclusive and cannot be specified at the same time. **The resolved value for *entryname* must be a catalog entry that is located in the same catalog that contains the value for *aliasname*.**
 - The code is enhanced to re-drive Catalog orientation (selection) after the name is resolved.

Alias Enhancements

- Symbolicrelate Same Catalog Restriction Removed

Example:

1. SYSDEF SYMDEF(&SYMBO='PRD1') IN IEASYM00

2. F CATALOG,ALIASLEVEL(2)

3. DEFINE UCAT(NAME(PRD1) -

STORCLAS(S1P03S02) -

VOL(1P0301) -

CYL(1 1))

4. DEFINE ALIAS(NAME(SYS5.PRD1) RELATE(PRD1))

5. DEFINE ALIAS(NAME(SYS5.MVS1.DB2.DSNLOAD) -

SYMBOLICRELATE('SYS5.&SYMBO..DB2.DSNLOAD'))

(No alias for SYS1 or SYS1.MVS1 so this alias is put in the master catalog)

6.

```
//DD1 DD DSN=SYS5.PRD1.DB2.DSNLOAD,DISP=(,CATLG),
```

```
// STORCLAS=S1P03S02,VOL=SER=1P0301,
```

```
// DCB=(LRECL=80,BLKSIZE=6400,RECFM=FB),
```

```
// UNIT=SYSDA,SPACE=(TRK,(1,1))
```

(Data set is cataloged in PRD1)

7.

```
//STEP1 EXEC PGM=SOMEJOB
```

```
//DD1 DD DSN=SYS5.MVS1.DB2.DSNLOAD,DISP=SHR
```

(SYS5.MVS1.DB2.DSNLOAD is converted to SYS5.PRD1.DB2.DSNLOAD and PRD1 is searched)

IDCAMS

Delete PDS/PDSE Members Using a Mask

- **Enhances the IDCAMS DELETE command to be more flexible in performing the deletion of the members in a partitioned data set (PDS/PDSE).**
 - **It allows a mask for member names to be specified in a DELETE command for PDS/PDSEs.**
 - **A mask for a member name can contain an asterisk (*) or percent sign (%).**
 - Asterisk means 0 or more characters
 - % means 1 and only 1 character
 - **A single asterisk (*) still means delete all members in the PDS/PDSE. Performed by issuing a STOW INIT**
 - **Double asterisk (**) means delete all members in the PDS/PDSE. Performed by issuing a STOW DELETE for each Member in the PDS/PDSE. Lists members deleted.**

Delete PDS/PDSE Members Using a Mask

- **Examples (assume A.PDS has members ABC, ABCDEFGC, AC, A1C and DEF before each DELETE command) :**

- **DELETE A.PDS(A*C)**

- Deletes members ABC, ABCDEFGC, AC and A1C but not DEF

```
IDC0549I MEMBER ABC DELETED
IDC0549I MEMBER ABCDEFGC DELETED
IDC0549I MEMBER AC DELETED
IDC0549I MEMBER A1C DELETED
```

- **DELETE A.PDS(A%C)**

- Deletes members ABC and A1C, but not AC, ABCDEFGC or DEF

```
IDC0549I MEMBER ABC DELETED
IDC0549I MEMBER A1C DELETED
```

- **DELETE A.PDS(*) existing function in R13**

- Deletes all members in A.PDS

```
IDC0553I ALL MEMBERS IN DATA SET A.PDS DELETED
```

- **DELETE A.PDS(**)**

- Deletes all members in A.PDS

```
IDC0549I MEMBER ABC DELETED
IDC0549I MEMBER ABCDEFGC DELETED
IDC0549I MEMBER AC DELETED
IDC0549I MEMBER A1C DELETED
IDC0549I MEMBER DEF DELETED
```

Large Block Interface Support

- REPRO and PRINT can now use the Large Block Interface (LBI)
 - LBI used for tape, dummy, and z/OS UNIX files
 - Supports a block sizes up to the access method limit, which currently is 256 KB
 - SYSIN and SYSPRINT do not support LBI

VSAM Record Level Sharing Support

- PRINT, REPRO, IMPORT and EXPORT can open VSAM data sets using Record Level Sharing (RLS)
- New optional keywords RLSSOURCE ({NO|YES|QUIESCE}) and/or RLSTARGET ({NO|YES|QUIESCE})
 - NO – Default uses Non-Shared Resources (NSR). Abbreviation: N
 - YES - Indicates that the data set will be opened using record level sharing (RLS) and the data set will have consistent read integrity. Abbreviation: Y
 - QUIESCE – Indicates that the data set will be quiesced before opening and processing any entries. Abbreviation: Q
- The abbreviation for RLSSOURCE and RLSTARGET are RLSS and RLST, respectively

VSAM Record Level Sharing Support

- PRINT: RLSSOURCE ({NO|YES|QUIESCE}) for the input data set
- REPRO: RLSSOURCE ({NO|YES|QUIESCE}) and RLSTARGET ({NO|YES|QUIESCE})
- IMPORT: RLSTARGET ({NO|YES|QUIESCE}) for the target data set
- EXPORT: RLSSOURCE ({NO|YES|QUIESCE}) for the source data set

DIAGNOSE GDG Enhancement

- IDCAMS DIAGNOSE command does not currently detect a mismatch in the actual number of extension cells versus how many GDG BCS records exist. This can lead to GDG processing errors that are undetectable until batch processing fails.
- AMS DIAGNOSE is enhanced to crosscheck the extension cells and the GDG BCS record, so the mismatch can be detected.
- New Messages
 - IDC31378I GDG BASE EXT CELL COUNT IS ZERO, BUT EXT CELLS EXIST
 - IDC31379I GDG BASE EXT CELL COUNT DOES NOT MATCH THE EXT CELLS COUNT

AMS ALTER NULLIFY Management Class

- Removes the Management Class from a Catalog record
- ALTER entryname NULLIFY(MGMTCLAS)