HALDB Documentation Updates

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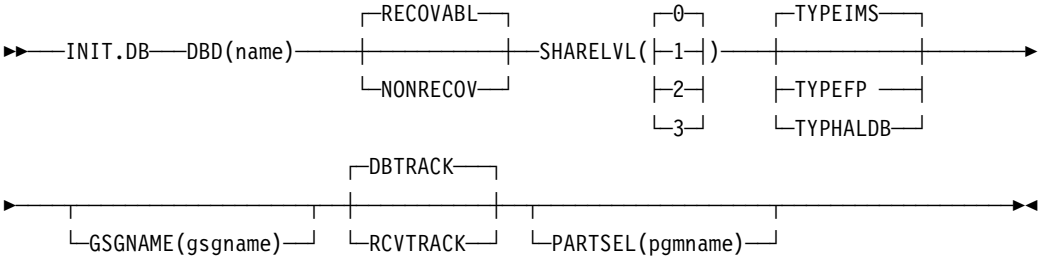
PQ35893 - DBRC Commands

The DBRC batch commands grammar is extended to incorporate HALDB definitions into the existing DBRC batch commands.

- **INIT.DB**
- **INIT.PART**

INIT.DB



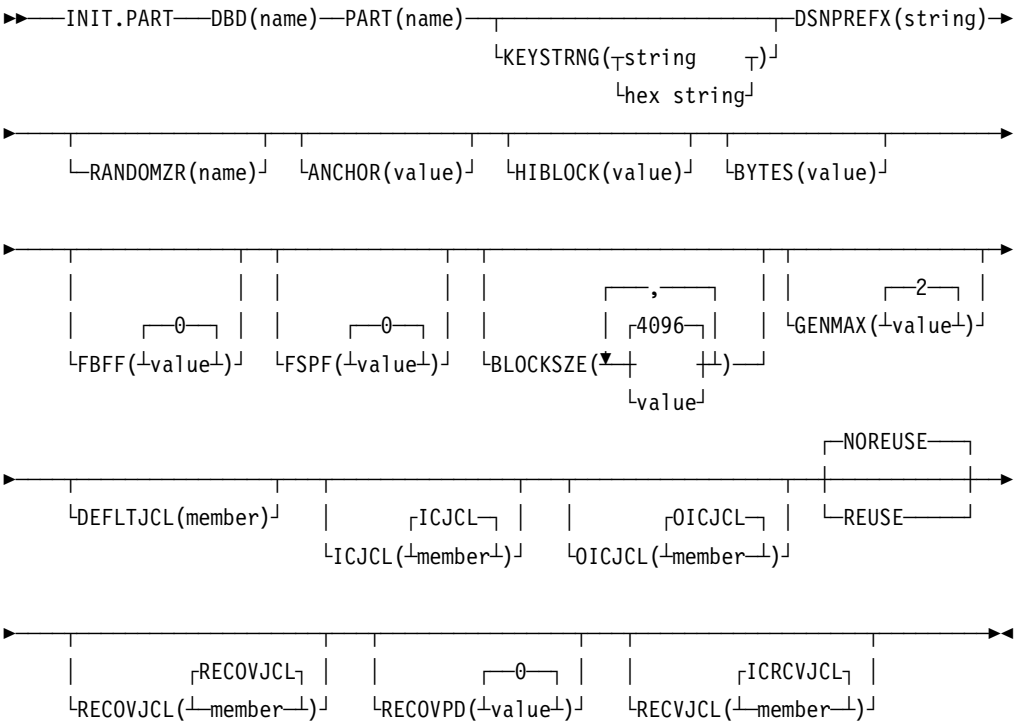
Use an INIT.DB command to register a database with DBRC and specify the level of database sharing. A database must be registered with DBRC before you can initialize a new DBDS, HALDB partition, or DEDB area with the INIT.DBDS or INIT.PART command.
When registering a TYPHALDB, the IMS DBDLIB data set must be identified in the job stream for the Recovery Control utility with a ddname of IMS.

Parameters

- **TYPEFP | TYPEIMS | TYPHALDB**
  Mutually exclusive, optional parameters you use to specify whether the database is a Fast Path DEDB, a DL/I database or a HALDB.
  TYPEIMS Specifies that the database is a DL/I database (non-HALDB).
  TYPHALDB Specifies that the database is a DL/I database (HALDB).

- **PARTSEL(*pgmname*)** Optional parameter that identifies a user Partition Selection Exit program name for a **TYPHALDB**. Specified as a value up to 8 characters long that is a valid program name. If not specified, the Partition Selection Exit name is obtained from the DBD (if one was specified).

INIT.PART



Use an INIT.PART command to register a HALDB Partition. The INIT.PART command creates the RECON HALDB partition structure (a PART record, the partition DB record and one or more DBDS records according to the DBD specification). The INIT.PART command will fail if the HALDB is being used by the HALDB Partition Definition Utility. The IMS DBDLIB data set must be identified in the job stream for the Recovery Control utility with a ddname of IMS.
Some parameters (identified below in the parameter description) apply to all the partition DBDSs created as a result of this command. This differs from the HALDB Partition Definition utility where these parameters may be specified separately for each partition DBDS being created. These parameters can later be changed individually with the CHANGE.DBDS command.

Parameters

- **DBD(*name*)** Required parameter you use to identify the HALDB for which the partition is to be defined.

- **PART(*name*)** Required parameter you use to identify a HALDB partition name. Specified as an alphanumeric value, up to 7 characters long, with the first character being alphabetic.

- **KEYSTRNG(*char or hex value*)** Optional parameter you use to specify a HALDB partition high key value or a selection string for use by a partition selection exit. Specified as a character value up to 256 characters long or a hexadecimal value up to 512 characters long. Character values must be alphanumeric (with no embedded blanks or commas unless the string is enclosed by single quotes). Unless enclosed by single quotes, the character string will be folded to upper case. Hexadecimal values must be enclosed by single quotes and preceded by the letter X, for example: KEYSTRNG*(X'D7C1D9E3D2C5E8').*
  If no partition selection routine was specified in the HALDB master definition, KEYSTRNG defines the Partition high key and is required. The high key length cannot be longer than the root key length. If the high key length is less than the defined root key length, the high key value is padded with hex 'FF's up to the defined root key length. The partition high key values must be unique for each partition within a HALDB.
  If a partition selection routine was specified in the HALDB master definition, KEYSTRNG defines a Partition Selection String which is passed to the partition selection routine. Your installation partition selection routine may or may not require a Partition Selection String. If required, the content of the string is determined by your installation. It can be up to 256 bytes long and consist of simple character information. If it contains non-printable characters, it must be identified using hex notation. A hex character string is enclosed by single quotation marks and prefixed with an X.

- **DSNPREFX(*string*)** Required parameter you use to specify the data set name prefix for the partition data sets contained in a HALDB. Specified as a value, up to 37 characters long, that is a valid JCL data set name.
  .
- **RANDOMZR(*name*)** Optional parameter used to specify the name of the randomizing module for HALDB PHDAM databases only. If RANDOMZR is omitted, the name of the randomizing module is obtained from the DBD. A randomizing module controls root segment placement in, or retrieval from, the PHDAM HALDB.

- **ANCHOR(*value*)** Optional parameter used to specify the number of root anchor points (RAPs) desired in each control interval or block in the root addressable area of a PHDAM HALDB. The value specified must be between 1 and 255. Typical values are from 1 to 5. If ANCHOR is omitted, the value is obtained from the DBD. This parameter is for PHDAM HALDBs only.

- **HIBLOCK(*value*)** Optional parameter used to specify the maximum relative block number value that the user wishes to allow a randomizing module to produce for this HALDB. This value determines the number of control intervals or blocks in the root addressable area of an PHDAM HALDB. The value may range between 1 and 16,777,215 (2**24 - 1). If HIBLOCK is omitted, the value is obtained from the DBD. This parameter is for PHDAM HALDBs only.

- **BYTES(*value*)** Optional parameter used to specify the maximum number of bytes of a HALDB record that can be stored into the root addressable area in a series of inserts unbroken by a call to another HALDB record. The value may range between 1 and 16,777,215 (2**24 - 1). If BYTES is omitted, the value is obtained from the DBD. This parameter is for PHDAM HALDBs only.

- **FBFF(0 | *value*)** Optional parameter used to specify the free block frequency factor (fbff) which specifies that every nth control interval or block in this data set group is left as free space during database load or reorganization (where ***FBFF=n***). The range of FBFF includes all integer values from 0 to 100 except 1. The default value for FBFF is 0.

- **FSPF(0 | *value*)** Optional parameter used to specify the free space percentage factor. It specifies the minimum percentage of each control interval or block that is to be left as free space in this data set group. value may be any number between 0 and 99. The default value for FSPF is 0.

- **BLOCKSZE(4096 | *nnnnn*)** Optional parameter you use to specify the block size for OSAM data sets. Specify an even number no greater than 32,766. The block size value is used for OSAM only. The default is 4096. You may specify up to 10 values, one for each data set group defined in the DBD. See the SIZE keyword on the DATASET statement in the chapter on Database Description (DBD) Generation in the Utilities Reference: Database for further information on specifying the block size for OSAM data sets (although DBDGEN is not used to define HALDB partitions).

- **GENMAX(2 | *value*)** Optional parameter you use to specify the maximum number of image copies that DBRC is to maintain for the partition DBDSs. If you identify a partition DBDS with the NOREUSE parameter, the oldest image copy beyond the recovery period is deleted when the number of image copies exceeds the GENMAX value. If you identify it with the REUSE parameter, the oldest image copy beyond the recovery period is reused. Specified as a numeric value from 2 to 255. All partition DBDSs will be created with this GENMAX value. The CHANGE.DBDS command can be used to change this for individual partition DBDSs. The default value for GENMAX is 2.

- **DEFLTJCL(*member*)** Optional parameter you use to specify an implicit skeletal JCL default member for a HALDB Partition DBDS. The specified member is used by the GENJCL.IC, GENJCL.OIC, and GENJCL.RECOV commands in order to resolve keywords you have defined. All partition DBDSs will be created with this DEFLTJCL member. The CHANGE.DBDS command can be used to change this for individual partition DBDSs.

- **ICJCL(ICJCL | *member*)** Optional parameter you use to specify the name of a member of a partitioned data set that contains skeletal JCL. When you issue a GENJCL.IC command, DBRC uses this member to generate the JCL to run the Database Image Copy utility (or the Database Image Copy 2 utility) for the partition DBDS specified on the GENJCL command. All partition DBDSs will be created with this ICJCL member. The CHANGE.DBDS command can be used to change this for individual partition DBDSs.

- **NOREUSE | REUSE** Mutually exclusive, optional parameters you use to specify whether the supported image copy utilities are to reuse previously used image copy data sets. REUSE allows the GENJCL.IC command or the GENJCL.OIC command to generate a job that causes the supported image copy utilities to reuse the oldest image copy data set (for the DBDS specified on the GENJCL command) when the GENMAX value for it is exceeded. REUSE requires that you create empty image copy data sets for future use by the supported image copy utilities. In addition, you must use an INIT.IC command to record their existence in RECON. The NOREUSE parameter prohibits such actions. All partition DBDSs will be created with the parameter specified. The CHANGE.DBDS command can be used to change this for individual partition DBDSs.

- **OICJCL(OICJCL | *member*)** Optional parameter you use to specify the name of a member of a partitioned data set that contains skeletal JCL. When you issue a GENJCL.OIC command, DBRC uses this member to generate the JCL to run the Online Database Image Copy utility for the partition DBDS specified on the GENJCL command. All partition DBDSs will be created with this OICJCL member. The CHANGE.DBDS command can be used to change this for individual partition DBDSs.

- **RECOVJCL(RECOVJCL | *member*)** Optional parameter you use to specify the name of a member of a partitioned data set that contains skeletal JCL. When you issue the GENJCL.RECOV command, DBRC uses this member to generate the JCL to run the Database Recovery utility for the partition DBDS specified on the GENJCL command. All partition DBDSs will be created with this RECOVJCL member. The CHANGE.DBDS command can be used to change this for individual partition DBDSs.

- **RECOVPD(0 | *value*)** Optional parameter you use to specify the recovery period of the image copies for a specified partition DBDS. Specify a numeric value from 0 to 999 that represents the number of days the image copies are to be kept in RECON. The default is 0 which means there is no recovery period. All partition DBDSs will be created with this RECOVPD value. The CHANGE.DBDS command can be used to change this for individual partition DBDSs.

- **RECVJCL(RECVJCL | *member*)** Optional parameter you use to specify the name of the skeletal JCL member to be used by the GENJCL.RECEIVE command. RECVJCL can be specified for both RSR-covered and non-covered HALDB DBDSs. All partition DBDSs will be created with this RECVJCL member. The CHANGE.DBDS command can be used to change this for individual partition DBDSs.

Messages & Codes

New Messages

DSP1050I DATABASE NOT DEFINED IN DBD LIBRARY DBD=*dbname*
Explanation: The member named *dbname* does not exist in the DBD library identified to DBRC.
System Action: The command fails and subsequent commands are not processed.
Programmer Response: Either correct the *dbname*, identify the correct DBD library, or add the member to the DBD library. Then resubmit the command.
Problem Determination: 2, 3.

DSP1051I DBD MEMBER *dbname* IS NOT A HALDB
Explanation: The member named *dbname* was read from the DBD library, but is not defined as a HALDB.
System Action: The command fails and subsequent commands are not processed.
Programmer Response: Either correct the dbname, or define the DBD member as a HALDB. Then resubmit the command.
Problem Determination: 2, 3.

DSP1052I DATABASE *dbname* IS IN USE BY HALDB PARTITION DEFINITION UTILITY
Explanation: A HALDB cannot be changed by DBRC when it is under the control of the HALDB Partition Definition utility.
System Action: The command fails and subsequent commands are not processed.
Programmer Response: Either make changes using DBRC or the Partition Definition utility, but not both.
Problem Determination: 2, 3.

DSP1053I KEYSTRNG LENGTH MUST BE AN EVEN NUMBER WHEN A HEX VALUE
Explanation: The KEYSTRNG value was entered in hex (in the form X'0FACDE'), but there was not an even number of hex characters.
System Action: The command fails and subsequent commands are not processed.
Programmer Response: Supply a correct hex value and resubmit the command.
Problem Determination: 2, 3.

DSP1054I PARTITION *dbname partname* ALREADY DEFINED TO DBRC
Explanation: The partition on the INIT.PART command already exists. In the message text:
- ***dbname*** The database that contains the partition.
- ***partname*** The partition already defined to DBRC.

System Action: The command fails and subsequent commands are not processed.
Programmer Response: Correct the partition name and resubmit the command.
Problem Determination: 2, 3.

DSP1055I PARTITION NAME *partname* IS GREATER THAN 7 CHARACTERS
Explanation: The partition name supplied on an INIT.PART command (*partname*) cannot be greater than 7 characters long.
System Action: The command fails and subsequent commands are not processed.
Programmer Response: Supply a partition name no greater than 7 characters long and resubmit the command.
Problem Determination: 2, 3.

DSP1056I DSNPREFX IS LONGER THAN 37 CHARACTERS
Explanation: The DSNPREFX name supplied on an INIT.PART command is greater than 37 characters long. DBRC constructs a dataset name (limited to 44 characters) by appending a 7 character suffix (beginning with a period ('.')) to the DSNPREFX, so it is limited to a maximum of 37 characters.
System Action: The command fails and subsequent commands are not processed.
Programmer Response: Supply a DSNPREFX no greater than 37 characters long and resubmit the command.
Problem Determination: 2, 3.

DSP1057I KEYSTRNG PARAMETER (HIGH KEY VALUE) IS REQUIRED
Explanation: The KEYSTRNG parameter was not specified on an INIT.PART command for a HALDB that does not have a partition selection exit defined. When there is no partition selection exit, each partition must be defined with a high key value which is specified by the KEYSTRNG parameter.
System Action: The command fails and subsequent commands are not processed.
Programmer Response: Either supply a KEYSTRNG value, or define the HALDB with a partition selection exit and resubmit the command.
Problem Determination: 2, 3.

DSP1058I KEYSTRNG PARAMETER (HIGH KEY VALUE) IS TOO LONG, MAX= *nnn*
Explanation: The KEYSTRNG parameter exceeded the maximum length allowed for the HALDB. The maximum length allowed is the length of the root segment key and is given as *nnn*.
System Action: The command fails and subsequent commands are not processed.
Programmer Response: Correct the KEYSTRNG value and resubmit the command.
Problem Determination: 2, 3.

DSP1060I *parameter* NOT ALLOWED FOR NON-PHDAM DATABASE
Explanation: On an INIT.PART command for a HALDB which is not a PHDAM database, a parameter (*parameter*) was specified which is allowed only for PHDAM databases. The parameter may be RANDOMZR, ANCHOR, HIBLOCK, or BYTES.
System Action: The command fails and subsequent commands are not processed.
Programmer Response: Remove the parameter and resubmit the command.
Problem Determination: 2, 3.

DSP1061I FBFF VALUE CANNOT BE 1
Explanation: FBFF (Free Block Frequency Factor) can be a number between 0 and 100, excluding the number 1.
System Action: The command fails and subsequent commands are not processed.
Programmer Response: Change the FBFF value and resubmit the command.
Problem Determination: 2, 3.

DSP1062I MORE BLOCKSZE VALUES SPECIFIED THAN DATASET GROUPS (*nn*)
Explanation: More BLOCKSZE values were specified than there are dataset groups (given by *nn*).
System Action: The command fails and subsequent commands are not processed.
Programmer Response: Supply at most *nn* BLOCKSZE values and resubmit the command.
Problem Determination: 2, 3.

DSP1063I BLOCKSZE VALUE *number* MUST BE AN EVEN NUMBER
Explanation: The BLOCKSZE value can be an even number no greater than 32,766. At least one value supplied was not an even number.
System Action: The command fails and subsequent commands are not processed.
Programmer Response: Correct the BLOCKSZE value (and verify all values) and resubmit the command.

Problem Determination: 2, 3.

DSP1064I KEYSTRNG (HIGH KEY VALUE) MUST BE UNIQUE, DBD= *dbname* PART= *partname*
Explanation: The high key value specified by the KEYSTRNG parameter on an INIT.PART command is the same as the high key value for an existing partition. High key values must be unique for each partition. In the message text:

- ***dbname*** The database that contains the partition.
- ***partname*** The existing partition with the same high key value.

System Action: The command fails and subsequent commands are not processed.
Programmer Response: Supply a unique high key value and resubmit the command.
Problem Determination: 2,3.

DSP1065I INIT COMMAND FAILED, RC= *rc* RSN= *rsn*
Explanation: An INIT.PART command failed with return code *rc* and reason code *rsn*. Usually this is the result of encountering errors on the RECON data set.
System Action: The command fails and subsequent commands are not processed.
Programmer Response: Corrective action will depend on whether there are messages indicative of a problem with the RECON. If there is a correctable problem with the RECON, resubmit the command after the RECON has been repaired. Otherwise, contact the IBM Support Center for further assistance.
Problem Determination: 2, 3.

DSP1066I KEYSTRNG CONTAINS AN INVALID HEX VALUE
Explanation: The KEYSTRNG value was entered in hex (in the form X'0FACDE'), but contains an invalid hex character. Valid hex characters are 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E and F.
System Action: The command fails and subsequent commands are not processed.
Programmer Response: Correct the hex value and resubmit the command.
Problem Determination: 2, 3.

DSP1067I PARTITION NAME *partname* IS NOT UNIQUE
Explanation: The name specified on the PART parameter for the INIT.PART command already exists for either a HALDB master, another partition, or a non-partitioned database.
System Action: The command fails and subsequent commands are not processed.
Programmer Response: Select a different partition name and resubmit the command.
Problem Determination: 2, 3.

DSP1068I KEYSTRNG PARAMETER LONGER THAN 256
Explanation: The maximum length of the KEYSTRNG parameter is 256 characters. When specified as a hex value, the maximum length is 512 since the two hex characters result in one hex value, i.e. the string X'AB' contains two characters within the quotes but results in one byte. Although the absolute maximum is 256, if KEYSTRNG is defining a high key value (as opposed to a partition selection string), then the maximum length is limited to the length defined for the root segment key.
System Action: The command fails and subsequent commands are not processed.
Programmer Response: Supply a value no greater than 256 bytes long (or no longer than the root segment key length if a high key value).
Problem Determination: 2, 3.

DSP1069I ALREADY AT MAX NUMBER OF PARTITIONS
Explanation: An INIT.PART command failed because the maximum number of partitions (1,001) has already been defined for the HALDB.
System Action: The command fails and subsequent commands are not processed.

Programmer Response: This situation cannot be corrected by fixing a parameter and resubmitting the command. A partition will have to be deleted before a new partition can be defined.
Problem Determination: 2, 3.

DSP1070I CANNOT INSERT PARTITION, NEXT ONE IS AUTHORIZED
Explanation: An attempt to 'insert' a partition failed because the 'next' partition is in use (authorized). The high key value (defined by the KEYSTRNG parameter) specified on an INIT.PART command is less than the high key value of an existing partition. Thus the new partition is being 'inserted' (as opposed to being added to the end). A partition cannot be inserted while the next one is in use.
System Action: The command fails and subsequent commands are not processed.
Programmer Response: Stop the next partition (/DBR) and resubmit the command.
Problem Determination:2, 3.

DSP1071I DATABASE *dbname* IS NOT A HALDB
Explanation: An INIT.PART command failed because the database (identified by *dbname*) has not been defined to DBRC as TYPHALDB.
System Action: The command fails and subsequent commands are not processed.
Programmer Response: Either correct the *dbname* or delete the database (DELETE.DB) and redefine it as a TYPHALDB (INIT.DB). Caution: deleting a database removes all it's associated DBDS records and all recovery related records. Before doing this, be sure it is the correct thing to do.
Problem Determination: 2,3.

DSP1072 PARTSEL ENTERED WITHOUT TYPHALDB
Explanation: An INIT.DB command was entered with the PARTSEL parameter, but without the TYPHALDB parameter. PARTSEL is valid only for a HALDB.
System Action: The command fails and subsequent commands are not processed.
Programmer Response: Either remove the PARTSEL parameter, or add the TYPHALDB parameter and resubmit the command.
Problem Determination: 2,3.

DSP1073I BLOCKSZE IS ALLOWED ONLY FOR OSAM DATABASES
Explanation: BLOCKSZE was specified for a HALDB partition which is not an OSAM database.
System Action: The command fails and subsequent commands are not processed.
Programmer Response: Remove the BLOCKSZE parameter and resubmit the command.
Problem Detremination: 2, 3.

Appendix - Sample RECON Listing

```
 DB
  DBD=DBHDOK01                          DMB#=1      CHANGE#=6     TYPE=HALDB
  SHARE LEVEL=0               GSGNAME=**NULL**
  PSNAME=**NULL**
  FLAGS:                                COUNTERS:
    RECOVERABLE           =YES          PARTITIONS              =4
-------------------------------------------------------------------------------
 DB
  DBD=PDHDOKA   MASTER DB=DBHDOK01                CHANGE#=6     TYPE=PART
  USID=0000000003  AUTHORIZED USID=0000000003  HARD USID=0000000003
  RECEIVE USID=0000000003  RECEIVE NEEDED USID=0000000000
  DBRCVGRP=**NULL**
  RANDOMIZER:
    NAME=DFSHDC40  ANCHOR=3    HIGH BLOCK#=3         BYTES=25
  FREE SPACE:
    FREE BLOCK FREQ FACTOR=0    FREE SPACE PERCENTAGE=0
  PARTITION HIGH KEY/STRING (CHAR):               (LENGTH=5  )
    K0200
  PARTITION HIGH KEY/STRING (HEX):
    D2F0F2F0F040404040404040404040404040404040404040404040404040
  OSAM BLOCK SIZE:
    A = 2048
    B = 2048
    C = 4096
    D = 4096
  FLAGS:                                COUNTERS:
    BACKOUT NEEDED        =OFF          RECOVERY NEEDED COUNT   =0
    READ ONLY             =OFF          IMAGE COPY NEEDED COUNT =0
    PROHIBIT AUTHORIZATION=OFF          AUTHORIZED SUBSYSTEMS   =0
                                        HELD AUTHORIZATION STATE=0
                                        EEQE COUNT              =0
    TRACKING SUSPENDED    =NO           RECEIVE REQUIRED COUNT  =0
    OFR REQUIRED          =NO
    PARTITION INIT NEEDED =NO
-------------------------------------------------------------------------------
 DBDS
  DSN=IMSTESTS.DBHDOK01.A00001                                    TYPE=PART
  DBD=PDHDOKA   DDN=PDHDOKAA DSID=001 DBORG=HDAM   DSORG=OSAM
  CAGRP=**NULL**  GENMAX=3     IC AVAIL=0     IC USED=0     DSSN=00000002
  NOREUSE         RECOVPD=3
  DEFLTJCL=**NULL**  ICJCL=PICJCL    OICJCL=POICJCL   RECOVJCL=PRECOJCL
  RECVJCL=PRECVJCL
  FLAGS:                                COUNTERS:
    IC NEEDED      =OFF
    RECOV NEEDED   =OFF
    RECEIVE NEEDED =OFF                 EEQE COUNT              =0
```

```
---------------------------------------------------------------------------
 DBDS
  DSN=IMSTESTS.DBHDOK01.B00001                                  TYPE=PART
  DBD=PDHDOKA   DDN=PDHDOKAB DSID=004 DBORG=HDAM   DSORG=OSAM
  CAGRP=**NULL**  GENMAX=4     IC AVAIL=0     IC USED=0     DSSN=00000002
  NOREUSE         RECOVPD=4
  DEFLTJCL=**NULL**  ICJCL=PICJCL    OICJCL=POICJCL   RECOVJCL=PRECOJCL
  RECVJCL=PRECVJCL
  FLAGS:                             COUNTERS:
    IC NEEDED      =OFF
    RECOV NEEDED   =OFF
    RECEIVE NEEDED =OFF                EEQE COUNT              =0
---------------------------------------------------------------------------
 DBDS
  DSN=IMSTESTS.DBHDOK01.C00001                                  TYPE=PART
  DBD=PDHDOKA   DDN=PDHDOKAC DSID=005 DBORG=HDAM   DSORG=OSAM
  CAGRP=**NULL**  GENMAX=2     IC AVAIL=0     IC USED=0     DSSN=00000001
  NOREUSE         RECOVPD=2
  DEFLTJCL=**NULL**  ICJCL=PICJCL    OICJCL=POICJCL   RECOVJCL=PRECOJCL
  RECVJCL=PRECVJCL
  FLAGS:                             COUNTERS:
    IC NEEDED      =OFF
    RECOV NEEDED   =OFF
    RECEIVE NEEDED =OFF                EEQE COUNT              =0
---------------------------------------------------------------------------
 DBDS
  DSN=IMSTESTS.DBHDOK01.D00001                                  TYPE=PART
  DBD=PDHDOKA   DDN=PDHDOKAD DSID=006 DBORG=HDAM   DSORG=OSAM
  CAGRP=**NULL**  GENMAX=2     IC AVAIL=0     IC USED=0     DSSN=00000001
  NOREUSE         RECOVPD=2
  DEFLTJCL=**NULL**  ICJCL=PICJCL    OICJCL=POICJCL   RECOVJCL=PRECOJCL
  RECVJCL=PRECVJCL
  FLAGS:                             COUNTERS:
    IC NEEDED      =OFF
    RECOV NEEDED   =OFF
    RECEIVE NEEDED =OFF                EEQE COUNT              =0
---------------------------------------------------------------------------
 DBDS
  DSN=IMSTESTS.DBHDOK01.L00001                                  TYPE=PART
  DBD=PDHDOKA   DDN=PDHDOKAL DSID=003 DBORG=INDEX  DSORG=VSAM
  FLAGS:                             COUNTERS:
    RECOV NEEDED   =OFF                EEQE COUNT              =0
---------------------------------------------------------------------------
 DB
  DBD=PDHDOKB   MASTER DB=DBHDOK01                CHANGE#=3     TYPE=PART
  USID=0000000002  AUTHORIZED USID=0000000002  HARD USID=0000000002
  RECEIVE USID=0000000002  RECEIVE NEEDED USID=0000000000
  DBRCVGRP=**NULL**
```

```
 RANDOMIZER:
   NAME=DFSHDC40  ANCHOR=3    HIGH BLOCK#=3         BYTES=25
 FREE SPACE:
   FREE BLOCK FREQ FACTOR=0    FREE SPACE PERCENTAGE=0
 PARTITION HIGH KEY/STRING (CHAR):               (LENGTH=5  )
   K0400
 PARTITION HIGH KEY/STRING (HEX):
   D2F0F4F0F040404040404040404040404040404040404040404040404040
 OSAM BLOCK SIZE:
   A = 4096
   B = 4096
   C = 4096
   D = 4096
 FLAGS:                              COUNTERS:
   BACKOUT NEEDED        =OFF          RECOVERY NEEDED COUNT   =0
   READ ONLY             =OFF          IMAGE COPY NEEDED COUNT =0
   PROHIBIT AUTHORIZATION=OFF          AUTHORIZED SUBSYSTEMS   =0
                                       HELD AUTHORIZATION STATE=0
                                       EEQE COUNT              =0
   TRACKING SUSPENDED    =NO           RECEIVE REQUIRED COUNT  =0
   OFR REQUIRED          =NO
   PARTITION INIT NEEDED =NO
-------------------------------------------------------------------------------
 DBDS
  DSN=IMSTESTS.DBHDOK01.A00002                                    TYPE=PART
  DBD=PDHDOKB   DDN=PDHDOKBA DSID=001 DBORG=HDAM   DSORG=OSAM
  CAGRP=**NULL**  GENMAX=2     IC AVAIL=0     IC USED=0     DSSN=00000001
  NOREUSE         RECOVPD=2
  DEFLTJCL=**NULL**  ICJCL=PICJCL    OICJCL=POICJCL   RECOVJCL=PRECOJCL
  RECVJCL=PRECVJCL
  FLAGS:                              COUNTERS:
    IC NEEDED      =OFF
    RECOV NEEDED   =OFF
    RECEIVE NEEDED =OFF                 EEQE COUNT              =0
-------------------------------------------------------------------------------
 DBDS
  DSN=IMSTESTS.DBHDOK01.B00002                                    TYPE=PART
  DBD=PDHDOKB   DDN=PDHDOKBB DSID=004 DBORG=HDAM   DSORG=OSAM
  CAGRP=**NULL**  GENMAX=2     IC AVAIL=0     IC USED=0     DSSN=00000001
  NOREUSE         RECOVPD=2
  DEFLTJCL=**NULL**  ICJCL=PICJCL    OICJCL=POICJCL   RECOVJCL=PRECOJCL
  RECVJCL=PRECVJCL
  FLAGS:                              COUNTERS:
    IC NEEDED      =OFF
    RECOV NEEDED   =OFF
    RECEIVE NEEDED =OFF                 EEQE COUNT              =0
-------------------------------------------------------------------------------
 DBDS
  DSN=IMSTESTS.DBHDOK01.C00002                                    TYPE=PART
```

```
 DBD=PDHDOKB   DDN=PDHDOKBC DSID=005 DBORG=HDAM   DSORG=OSAM
 CAGRP=**NULL**  GENMAX=2     IC AVAIL=0     IC USED=0     DSSN=00000000
 NOREUSE         RECOVPD=2
 DEFLTJCL=**NULL**  ICJCL=PICJCL    OICJCL=POICJCL   RECOVJCL=PRECOJCL
 RECVJCL=PRECVJCL
 FLAGS:                             COUNTERS:
   IC NEEDED      =OFF
   RECOV NEEDED   =OFF
   RECEIVE NEEDED =OFF                EEQE COUNT              =0
-------------------------------------------------------------------------------
DBDS
 DSN=IMSTESTS.DBHDOK01.D00002                                    TYPE=PART
 DBD=PDHDOKB   DDN=PDHDOKBD DSID=006 DBORG=HDAM   DSORG=OSAM
 CAGRP=**NULL**  GENMAX=2     IC AVAIL=0     IC USED=0     DSSN=00000000
 NOREUSE         RECOVPD=2
 DEFLTJCL=**NULL**  ICJCL=PICJCL    OICJCL=POICJCL   RECOVJCL=PRECOJCL
 RECVJCL=PRECVJCL
 FLAGS:                             COUNTERS:
   IC NEEDED      =OFF
   RECOV NEEDED   =OFF
   RECEIVE NEEDED =OFF                EEQE COUNT              =0
-------------------------------------------------------------------------------
DB
 DSN=IMSTESTS.DBHDOK01.L00002                                    TYPE=PART
 DBD=PDHDOKB   DDN=PDHDOKBL DSID=003 DBORG=INDEX  DSORG=VSAM
 FLAGS:                             COUNTERS:
   RECOV NEEDED   =OFF                EEQE COUNT              =0
-------------------------------------------------------------------------------
DB
 DBD=PDHDOKC   MASTER DB=DBHDOK01                CHANGE#=4     TYPE=PART
 USID=0000000002  AUTHORIZED USID=0000000002  HARD USID=0000000002
 RECEIVE USID=0000000002  RECEIVE NEEDED USID=0000000000
 DBRCVGRP=**NULL**
 RANDOMIZER:
   NAME=DFSHDC40  ANCHOR=3    HIGH BLOCK#=3         BYTES=25
 FREE SPACE:
   FREE BLOCK FREQ FACTOR=0    FREE SPACE PERCENTAGE=0
 PARTITION HIGH KEY/STRING (CHAR):               (LENGTH=5  )
   K0600
 PARTITION HIGH KEY/STRING (HEX):
   D2F0F6F0F0404040404040404040404040404040404040404040404040404040
 OSAM BLOCK SIZE:
   A = 4096
   B = 4096
   C = 4096
   D = 4096
 FLAGS:                             COUNTERS:
   BACKOUT NEEDED        =OFF         RECOVERY NEEDED COUNT   =0
   READ ONLY             =OFF         IMAGE COPY NEEDED COUNT =0
```

```
   PROHIBIT AUTHORIZATION=OFF         AUTHORIZED SUBSYSTEMS   =0
                                      HELD AUTHORIZATION STATE=0
                                      EEQE COUNT              =0
   TRACKING SUSPENDED    =NO          RECEIVE REQUIRED COUNT  =0
   OFR REQUIRED          =NO
   PARTITION INIT NEEDED =NO
--------------------------------------------------------------------------------
 DBDS
  DSN=IMSTESTS.DBHDOK01.A00003                                    TYPE=PART
  DBD=PDHDOKC   DDN=PDHDOKCA DSID=001 DBORG=HDAM   DSORG=OSAM
  CAGRP=**NULL**  GENMAX=2     IC AVAIL=0     IC USED=0     DSSN=00000001
  NOREUSE         RECOVPD=2
  DEFLTJCL=**NULL**  ICJCL=PICJCL    OICJCL=POICJCL   RECOVJCL=PRECOJCL
  RECVJCL=PRECVJCL
  FLAGS:                             COUNTERS:
    IC NEEDED      =OFF
    RECOV NEEDED   =OFF
    RECEIVE NEEDED =OFF                EEQE COUNT              =0
--------------------------------------------------------------------------------
 DBDS
  DSN=IMSTESTS.DBHDOK01.B00003                                    TYPE=PART
  DBD=PDHDOKC   DDN=PDHDOKCB DSID=004 DBORG=HDAM   DSORG=OSAM
  CAGRP=**NULL**  GENMAX=2     IC AVAIL=0     IC USED=0     DSSN=00000001
  NOREUSE         RECOVPD=2
  DEFLTJCL=**NULL**  ICJCL=PICJCL    OICJCL=POICJCL   RECOVJCL=PRECOJCL
  RECVJCL=PRECVJCL
  FLAGS:                             COUNTERS:
    IC NEEDED      =OFF
    RECOV NEEDED   =OFF
    RECEIVE NEEDED =OFF                EEQE COUNT              =0
--------------------------------------------------------------------------------
 DBDS
  DSN=IMSTESTS.DBHDOK01.C00003                                    TYPE=PART
  DBD=PDHDOKC   DDN=PDHDOKCC DSID=005 DBORG=HDAM   DSORG=OSAM
  CAGRP=**NULL**  GENMAX=2     IC AVAIL=0     IC USED=0     DSSN=00000000
  NOREUSE         RECOVPD=2
  DEFLTJCL=**NULL**  ICJCL=PICJCL    OICJCL=POICJCL   RECOVJCL=PRECOJCL
  RECVJCL=PRECVJCL
  FLAGS:                             COUNTERS:
    IC NEEDED      =OFF
    RECOV NEEDED   =OFF
    RECEIVE NEEDED =OFF                EEQE COUNT              =0
--------------------------------------------------------------------------------
 DBDS
  DSN=IMSTESTS.DBHDOK01.D00003                                    TYPE=PART
  DBD=PDHDOKC   DDN=PDHDOKCD DSID=006 DBORG=HDAM   DSORG=OSAM
  CAGRP=**NULL**  GENMAX=2     IC AVAIL=0     IC USED=0     DSSN=00000000
  NOREUSE         RECOVPD=2
  DEFLTJCL=**NULL**  ICJCL=PICJCL    OICJCL=POICJCL   RECOVJCL=PRECOJCL
```

```
 RECVJCL=PRECVJCL
 FLAGS:                              COUNTERS:
   IC NEEDED      =OFF
   RECOV NEEDED   =OFF
   RECEIVE NEEDED =OFF                 EEQE COUNT              =0
-------------------------------------------------------------------------------
DBDS
 DSN=IMSTESTS.DBHDOK01.L00003                                    TYPE=PART
 DBD=PDHDOKC   DDN=PDHDOKCL DSID=003 DBORG=INDEX  DSORG=VSAM
 FLAGS:                              COUNTERS:
   RECOV NEEDED   =OFF                 EEQE COUNT              =0
-------------------------------------------------------------------------------
DB
 DBD=PDHDOKD   MASTER DB=DBHDOK01                CHANGE#=5     TYPE=PART
 USID=0000000003  AUTHORIZED USID=0000000003  HARD USID=0000000003
 RECEIVE USID=0000000003  RECEIVE NEEDED USID=0000000000
 DBRCVGRP=**NULL**
 RANDOMIZER:
   NAME=DFSHDC40  ANCHOR=3    HIGH BLOCK#=3         BYTES=25
 FREE SPACE:
   FREE BLOCK FREQ FACTOR=0    FREE SPACE PERCENTAGE=0
 PARTITION HIGH KEY/STRING (CHAR):               (LENGTH=5  )
   .....
 PARTITION HIGH KEY/STRING (HEX):
   FFFFFFFFFF4040404040404040404040404040404040404040404040404040
 OSAM BLOCK SIZE:
   A = 4096
   B = 4096
   C = 4096
   D = 4096
 FLAGS:                              COUNTERS:
   BACKOUT NEEDED        =OFF          RECOVERY NEEDED COUNT  =0
   READ ONLY             =OFF          IMAGE COPY NEEDED COUNT =0
   PROHIBIT AUTHORIZATION=OFF          AUTHORIZED SUBSYSTEMS   =0
                                       HELD AUTHORIZATION STATE=0
                                       EEQE COUNT              =0
   TRACKING SUSPENDED    =NO           RECEIVE REQUIRED COUNT  =0
   OFR REQUIRED          =NO
   PARTITION INIT NEEDED =NO
-------------------------------------------------------------------------------
DBDS
 DSN=IMSTESTS.DBHDOK01.A00004                                    TYPE=PART
 DBD=PDHDOKD   DDN=PDHDOKDA DSID=001 DBORG=HDAM   DSORG=OSAM
 CAGRP=**NULL**  GENMAX=2     IC AVAIL=0     IC USED=0     DSSN=00000002
 NOREUSE         RECOVPD=2
 DEFLTJCL=**NULL**  ICJCL=PICJCL    OICJCL=POICJCL   RECOVJCL=PRECOJCL
 RECVJCL=PRECVJCL
 FLAGS:                              COUNTERS:
   IC NEEDED      =OFF
```

```
    RECOV NEEDED   =OFF
    RECEIVE NEEDED =OFF                EEQE COUNT              =0
-------------------------------------------------------------------------------
 DBDS
  DSN=IMSTESTS.DBHDOK01.B00004                                    TYPE=PART
  DBD=PDHDOKD   DDN=PDHDOKDB DSID=004 DBORG=HDAM   DSORG=OSAM
  CAGRP=**NULL**  GENMAX=2     IC AVAIL=0     IC USED=0     DSSN=00000002
  NOREUSE         RECOVPD=2
  DEFLTJCL=**NULL**  ICJCL=PICJCL    OICJCL=POICJCL   RECOVJCL=PRECOJCL
  RECVJCL=PRECVJCL
  FLAGS:                           COUNTERS:
    IC NEEDED      =OFF
    RECOV NEEDED   =OFF
    RECEIVE NEEDED =OFF                EEQE COUNT              =0
-------------------------------------------------------------------------------
 DBDS
  DSN=IMSTESTS.DBHDOK01.C00004                                    TYPE=PART
  DBD=PDHDOKD   DDN=PDHDOKDC DSID=005 DBORG=HDAM   DSORG=OSAM
  CAGRP=**NULL**  GENMAX=2     IC AVAIL=0     IC USED=0     DSSN=00000001
  NOREUSE         RECOVPD=2
  DEFLTJCL=**NULL**  ICJCL=PICJCL    OICJCL=POICJCL   RECOVJCL=PRECOJCL
  RECVJCL=PRECVJCL
  FLAGS:                           COUNTERS:
    IC NEEDED      =OFF
    RECOV NEEDED   =OFF
    RECEIVE NEEDED =OFF                EEQE COUNT              =0
-------------------------------------------------------------------------------
 DBDS
  DSN=IMSTESTS.DBHDOK01.D00004                                    TYPE=PART
  DBD=PDHDOKD   DDN=PDHDOKDD DSID=006 DBORG=HDAM   DSORG=OSAM
  CAGRP=**NULL**  GENMAX=2     IC AVAIL=0     IC USED=0     DSSN=00000000
  NOREUSE         RECOVPD=2
  DEFLTJCL=**NULL**  ICJCL=PICJCL    OICJCL=POICJCL   RECOVJCL=PRECOJCL
  RECVJCL=PRECVJCL
  FLAGS:                           COUNTERS:
    IC NEEDED      =OFF
    RECOV NEEDED   =OFF
    RECEIVE NEEDED =OFF                EEQE COUNT              =0
-------------------------------------------------------------------------------
 DBDS
  DSN=IMSTESTS.DBHDOK01.L00004                                    TYPE=PART
```

```
  DBD=PDHDOKD   DDN=PDHDOKDL DSID=003 DBORG=INDEX  DSORG=VSAM
  FLAGS:                              COUNTERS:
    RECOV NEEDED   =OFF                 EEQE COUNT             =0
-------------------------------------------------------------------------------
```

PQ36991 - HD Reorganization Reload Utility

Publications Changes

IMS V7 Utilities Reference: Database and Transaction Manager

Chapter 6: HD Reorganization Reload Utility (DFSURGL0)

Section: DD Statements: Add the following information for a SYSIN DD:

SYSIN DD Defines the input control statement data set for HALDB Migration Reload statements NOILDS and ILDSMULTI. The data set can reside on a tape, or a direct-access device, or it can be routed through the input stream. This DD statement is not necessary if no utility control statements are provided as input to the utility.

New section: Utility Control Statements: Input statements are used to describe processing options for the HD Reorganization Reload utility. Input statements must be one of the following two statements.

- NOILDS Disables ILDS processing during a migration reload.
- ILDSMULTI Enables multi-task ILDS processing.

Section: Return Codes:
8 Reload count differs from unload count or error encountered during ILDS processing

Section: Examples: Add the following two examples:

- Example 3

This example shows the JCL for a HIDAM HALDB migration reload with the NOILDS option. The new HALDB has two partitions.

```
//MIGRATLD JOB 1,1,MS LEVEL=1
//STEP1 EXEC PGM=DFSRRC00,PARM='ULU,DFSURGL0,PHIDMSTR',
//STEPLIB DD DSNAME=IMS.SDFSRESL,DISP=SHR
//DFSRESLB DD DSNAME=IMS.SDFSRESL,DISP=SHR
//IMS DD DSNAME=IMS.DBDLIB,DISP=OLD
//SYSPRINT DD SYSOUT=A
//RECON1 DD DSN=IMS.RECON1,DISP=SHR
//RECON2 DD DSN=IMS.RECON2,DISP=SHR
//RECON3 DD DSN=IMS.RECON3,DISP=SHR
//DFSUINPT DD DSNAME=IMS.UNLOAD1,DISP=OLD,
//UNIT=TAPE,VOL=SER=TAPE11,LABEL=(,SL)
//DFSVSAMP DD DSNAME=IMS.VSAM.PARM(OPTIONS),DISP=SHR
//DFSCTL DD *
SBPARM ACTIV=COND
//SYSIN DD *
NOILDS
.
//STEP02 EXEC PGM=DFSRRC00,REGION=1300K,
//PARM='ULU,DFSPREC0,PHIDMSTR,,,,,,,,,,Y,N'
//STEPLIB DD DSNAME=IMS.SDFSRESL,DISP=SHR
//DFSRESLB DD DSNAME=IMS.SDFSRESL,DISP=SHR
//IMS DD DSNAME=IMS.DBDLIB,DISP=OLD
//SYSPRINT DD SYSOUT=A
//RECON1 DD DSN=IMS.RECON1,DISP=SHR
//RECON2 DD DSN=IMS.RECON2,DISP=SHR
//RECON3 DD DSN=IMS.RECON3,DISP=SHR
//DFSVSAMP DD DSNAME=IMS.VSAM.PARM(OPTIONS),DISP=SHR
//SYSIN DD *
PARTITION=PDHIDMA,RECOVTYP=ILE
.
//STEP03 EXEC PGM=DFSRRC00,REGION=1300K,
//PARM='ULU,DFSPREC0,PHIDMSTR,,,,,,,,,,Y,N'
```

```
//STEPLIB DD DSNAME=IMS.SDFSRESL,DISP=SHR
//DFSRESLB DD DSNAME=IMS.SDFSRESL,DISP=SHR
//IMS DD DSNAME=IMS.DBDLIB,DISP=OLD
//SYSPRINT DD SYSOUT=A
//RECON1 DD DSN=IMS.RECON1,DISP=SHR
//RECON2 DD DSN=IMS.RECON2,DISP=SHR
//RECON3 DD DSN=IMS.RECON3,DISP=SHR
//DFSVSAMP DD DSNAME=IMS.VSAM.PARM(OPTIONS),DISP=SHR
//SYSIN DD *
PARTITION=PDHIDMB,RECOVTYP=ILE
```

- Example 4

This example shows the JCL for a HIDAM HALDB migration reload with the ILDSMULTI option.

```
//MIGRATLD JOB 1,1,MS LEVEL=1
//STEP1 EXEC PGM=DFSRRC00,PARM='ULU,DFSURGL0,PHIDMSTR',
//STEPLIB DD DSNAME=IMS.SDFSRESL,DISP=SHR
//DFSRESLB DD DSNAME=IMS.SDFSRESL,DISP=SHR
//IMS DD DSNAME=IMS.DBDLIB,DISP=OLD
//SYSPRINT DD SYSOUT=A
//RECON1 DD DSN=IMS.RECON1,DISP=SHR
//RECON2 DD DSN=IMS.RECON2,DISP=SHR
//RECON3 DD DSN=IMS.RECON3,DISP=SHR
//DFSUINPT DD DSNAME=IMS.UNLOAD1,DISP=OLD,
//UNIT=TAPE,VOL=SER=TAPE11,LABEL=(,SL)
//DFSVSAMP DD DSNAME=IMS.VSAM.PARM(OPTIONS),DISP=SHR
//DFSCTL DD *
SBPARM ACTIV=COND
//SYSIN DD *
ILDSMULTI
```

Messages And Codes: Add the following message:

DFS871E error_type ERROR ENCOUNTERED LOADING ILDS WITH DDNAME=ddname RC=nnnnnnnn REASON=yyyyyyyy
.
Explanation:Module DFSURIT encountered an error during ILDS dataset processing for the ILDS identified by DDNAME=ddname while migrating to a HALDB.Value error_type describes the error encountered.Possible errors are GETMAIN, FREEMAIN, VSAM, LOAD, SORT, DSPSERV and ABEND. For RC=nnnnnnnn (with the exception of ABEND)nnnnnnnn is the return code found in register 15 when the error was encountered;for ABEND it is the abend code.For REASON=yyyyyyyy,(with the exception of ABEND)yyyyyyyy is the reason code;for ABEND it is left blank.
.
System Action:Processing terminates with return code 8.The affected ILDS is marked recovery needed in RECON.
.
Programmer Response:Run the ILDS/INDEX Rebuild Utility (DFSPREC)to rebuild the ILDS identified by the value ddname.
.
Problem Determination:2,3,8,36.Not a valid message for UCF.
.
Module:DFSURGL

PQ37015 - HD Reorganization Unload Utility

Description

Migration unload requires running HD Unload of each secondary index database. Additionally the primary database is read to resolve source and target segments needed to construct the ILK and EPS information for the migration unload record destined for the new PSINDEX. Sequential processing of secondary index segments causes many random reads of the primary database.

These random accesses of the primary database across multiple secondary index unloads causes poor overall performance of the migration unload of DL/I secondary index databases to HALDB PSINDEX.

For example, if a single primary database has seven secondary index databases and each migration unload job takes thirteen

hours then the total time spent unloading all of the secondary index databases would be 7x13 or 91 hours total. A significant portion of this time is spent reading the prime database multiple times.

Restriction: This APAR **REQUIRES** applying APAR PQ42142 (The AE APAR) as well.

Publications Changes

Messages And Codes update abend codes:

U0827 - Indicate that this abend may be set in DFSURGU0
U0835 - Indicate that this abend may be set in DFSURGU0
U0840 - Indicate that this abend may be set in DFSURGU0

IMS V7 Utilities Reference: Database and Transaction Manager

Chapter 5. HD Reorganization Unload Utility (DFSURGU0)

Update the DDNAMES list with:

1. DFSWRKnn where nn=01 to nn and nn is the number of secondary indexes. The DFSWRKnn dataset is for the secondary index migration unload records.

2. DFSSRTnn where nn=01 to nn and nn is the number of second- ary indexes. The DFSSRTnn dataset is for the sort control statements to be used for a corresponding DFSWRKnn.

Under Utility Control statements divide step 2 into two mutually exclusive parts:

1. MIGRATE=YES (leave the description as it is)

2. MIGRATX=YES

Eliminates the need to run multiple migration HDUNLOAD jobs for migration to PSINDEX by creating multiple work files from a single pass of the database for each index source segment. Corresponding sort control statements are generated for each work file. The sorted file is then usable as input to HDRELOAD to load the PSINDEX. DFSWRKnn and DFSSRTnn DD cards are required for each secondary index database referencing the primary database being unloaded.

In the Examples section add:

HDUNLOAD produces the following report to aid in identifying and sorting the work files.Reference this report to determine which DFSWRKnn is the unload of a given secondary index when MIGRATX is used.

W O R K F I L E S T A T I S T I C S

SINAME	WFNAME	SFNAME	RCDTOTAL	OFFSET	LENGTH
INDEX 1	DFSWRK01	DFSSRT01	00000075	0069	0018
INDEX 2	DFSWRK02	DFSSRT02	00000015	0069	0018
INDEX 3	DFSWRK03	DFSSRT03	00000300	0069	0018
INDEX 4	DFSWRK04	DFSSRT04	00000075	0069	0018

Here is some JCL to unload a primary database and its two secondary index data-bases:

```
//HDUNLOAD EXEC PGM=DFSRRC00,REGION=2048K,
// PARM=(ULU,DFSURGU0,DDPRIM01,9,0000,,0,,N,0,,,,N,N,,N)
//IMS DD DSN=DBDLIB,DISP=SHR
//STEPLIB DD DSN=LOADLIB,DISP=SHR
// DD DSN=IMSVS.I71STS27.CRESLIB,DISP=SHR
//SYSPRINT DD SYSOUT=*
//SYSUDUMP DD SYSOUT=*
//DFSRESLB DD DSN=IMSVS.I71STS27.CRESLIB,DISP=SHR
//DFSURGU1 DD DSN=HDAM2IX.UNLOAD,DISP=(SHR),
// UNIT=SYSDA,SPACE=(CYL,(5,3)),DCB=BUFNO=5
//DDPRIM01 DD DSN=DDPRIM01,DISP=SHR
//DFSWRK01 DD DSN=DFSWRK01,DISP=(NEW,KEEP),VOL=SER=000000,
```

```
// UNIT=SYSDA,SPACE=(CYL,(500,3)),DCB=BUFNO=5
//DFSSRT01 DD DSN=DFSSRT01,DISP=(NEW,KEEP),VOL=SER=000000,
// UNIT=SYSDA,SPACE=(TRK,(1,0)),DCB=BUFNO=5
//DFSWRK02 DD DSN=DFSWRK02,DISP=(NEW,KEEP),VOL=SER=000000,
// UNIT=SYSDA,SPACE=(CYL,(500,3)),DCB=BUFNO=5
//DFSSRT02 DD DSN=DFSSRT02,DISP=(NEW,KEEP),VOL=SER=000000,
// UNIT=SYSDA,SPACE=(TRK,(1,0)),DCB=BUFNO=5
//DFSVSAMP DD DSN=IMSVS.DFSVSAMP(DFSVSM01),DISP=SHR
//SYSIN DD *
MIGRATX=YES
```

Here is some JCL that sorts the work file DFSWRK01 of secondary index data-base INDEX01 using the sort control statements in DFSSRT01 from HD Unload with the MIGRATX=YES option. The sorted output is passed to the HD Reload job step to load HALDB PSINDEX database PSNDX001.

```
//SORT01 EXEC PGM=SORT,REGION=2048K,PARM='CORE=MAX'
//SORTLIB DD DSN=SYS1.SORTLIB,DISP=SHR
//SORTIN DD DSN=DFSWRK01,DISP=(OLD,PASS),VOL=SER=000000
//SORTWK01 DD UNIT=SYSDA,SPACE=(CYL,(100,5),,CONTIG)
//SORTWK02 DD UNIT=SYSDA,SPACE=(CYL,(100,5),,CONTIG)
//SORTWK03 DD UNIT=SYSDA,SPACE=(CYL,(100,5),,CONTIG)
//SYSIN DD DSN=DFSSRT01,DISP=(OLD),VOL=SER=000000
//SORTOUT DD DSN=INDEX001.SORTED.UNLOAD,DISP=(,PASS),
// UNIT=SYSDA,VOL=SER=000000,SPACE=(CYL,(500,3))
//HDRELOAD EXEC PGM=DFSRRC00,REGION=2048K,
// PARM=(ULU,DFSURGL0,PSNDX001,9,0000,,0,,N,0,,,,N,N,,N)
//IMS DD DSN=HALDB.DBDLIB,DISP=SHR
//STEPLIB DD DSN=IMSVS.I71STS27.CRESLIB,DISP=SHR
//DFSRESLB DD DSN=IMSVS.I71STS27.CRESLIB,DISP=SHR
//DFSUINPT DD DSN=INDEX001.SORTED.UNLOAD,DISP=(OLD)
//SYSPRINT DD SYSOUT=*
//DFSVSAMP DD DSN=IMSVS.DFSVSAMP(DFSVSM01),DISP=SHR
.**********************************************
```

PQ37127 - HALDB Migration Aid Utility

DOCUMENTATION CHANGES:

IMS V7 Messages and Codes: GC26-9433-00

The following messages will be removed:

DFS0480A -UNABLE TO LOCATE CURRENT SEGMENT TYPE
DFS4162 -KEYRANGE TOO SHORT ...
DFS4181 -KEYRANGE TOO LONG ...
DFS4186 -ANALYSIS CANCELLED,HALDB DB

IMS V7 Utilities Reference: Database and Transaction Manager

Please replace the entire Chapter 1:
HALDB Migration Aid Utility (DFSMAID0) with the following:

Chapter 1. HALDB Migration Aid Utility (DFSMAID0)

The HALDB Migration Aid utility will scan an existing database, collect data, perform analysis, and provide statistics and recommendations for HALDB partition boundaries for migrating a database to a HALDB.

Input and Output: The HALDB Migration Aid utility uses the following input:

- Key ranges per HALDB partition
- Maximum number of bytes per HALDB partition (leaving space for growth)
- Number of HALDB partitions desired

- Sample size, when estimation based on a random sample is desired

The HALDB Migration Aid utility produces the following output displayed in a generated report:

- Total bytes -- prefix + data lengths that exist for the currents database expressed in Kbytes
- Number of database records
- Number of segments by type
- Increase in prefix size (in bytes) that are created in a new HALDB
- Increase due to physical pairing (in bytes) that are created in a new HALDB

The total prefix size of the entire database increases because an EPS (Extended Pointer Set) is used to point to logical parents and because the addition of a physical logical child is provided to replace the virtual logical child.

JCL Requirements: The following are required:

- A JOB statement that you define
- An EXEC statement
- DD statements that specify the input and output

EXEC Statement The EXEC statement can be in the form:

PGM=DFSRRC00,PARM='ULU,DFSMAID0,dbname,,,,,,,,,,N,N'

DD Statements

STEPLIB DD Points to IMS.SDFSRESL, which contains the IMS nucleus and required action modules. If STEPLIB is unauthorized by having unauthorized libraries concatenated to IMS.SDFSRESL, a DFSRESLB DD statement must be included. DFSRESLIB DD Points to an authorized library that contains the IMS SVC modules.
IMS DD Defines the libraries containing the DBD and PSB that describe the database to be analyzed. These data sets must reside on a direct-access device. This statement is required and must always define the DBD library. The PSB library is only required when PARM=DLI is specified.

SYSIN DD Defines the input control data set for this program. The data set can reside on tape, on a direct-access device, or be routed through the input stream. SYSIN becomes the C standard input (stdin) to DFSMAID0.

SYSPRINT DD Defines the message output data set. The data set can reside on a printer, a tape, or a direct-access device, or be routed through the output stream. SYSPRINT receives the standard output (stdout) from DFSMAID0.

SYSUDUMP DD Define an optional dump dataset.

database DD References the database that is to be scanned as indicated by the Database Prereorganization utility. Without dynamic allocation preparation, these DD statements are necessary for each database. The DDnames must match the DDnames indicated in the DBD. The data set must reside on a direct-access device.

DFSVSAMP DD Describes the data set that contains the buffer information required by the DL/I Buffer Handler.

Utility Control Statement: Input statements are used to describe processing options for the HALDB Migration Aid utility. The format of the HALDB Migration Aid utility control statement is:

>>MAX=nnnnnnn NBR=nnnn KR=nnnn SAMPLE=nnnn <<

MAX Specifies the maximum number of bytes desired for each HALDB partition in the new database.

NBR Specifies the number of HALDB partitions desired in the new database.

KR Specifies the high key values desired for additional HALDB partitions, such as HALDB Partition 2 and above.

SAMPLE Specifies optionally the size of a random sample to partition.

Output Messages and Statistics: The HALDB Migration Aid utility provides output messages and statistics. Figure 1 is an example of the statistics obtained from this utility.

partition 1 :

minimum key =
+0000 d2c1c1f1 f1 |KAA11 |
maximum key =
+0000 d2f2f3f9 f9 |K2399 |

	Segments	bytes	pref-incr	pair-inc
1)'K1 '	263	14728	2104	0
2)'K2 '	37	1036	296	0
3)'K3 '	68	3808	2176	0
4)'K4 '	35	560	420	0
5)'K5 '	46	1656	368	0
6)'K6 '	40	640	480	0

Figure 1.DFSMAID0 output statistics

The above report is shown for each HALDB partition, followed by the overall totals.
Shown is the total increase in prefix size for the entire database. This total increase is due to:

- The use of an EPS to point to logical parents
- A total increase in bytes for the addition of a physical logical child to replace the virtual logical child

Return Codes: The following return codes are provided at program termination:

Code	Meaning
0	Successful completion
12	Utility terminated

Related Reading: See IMS Version 7 Messages and Codes for explanations of the messages accompanying all nonzero return codes.

Examples: **Example 1**

Sample JCL input parameters P one parameter set valid at a time:

```
//SYSIN DD
KR=C'1050'
KR=X'0123456789abcdef'
//SYSIN DD *
MAX=750
//SYSIN DD *
SAMPLE=10000
NBR=100
```

PQ38822 -RECON PARTITION LIST COMMAND SUPPORT - DBRC

The LIST command output for HALDB Partition (TYPE=PART) databases will now include information from the Partition record (DSPPTNRC).

Following is an example of the Partition record information now formatted in the LIST.DB output. The new information is marked with a "|". Randomizer information is only displayed for PHDAM DBs. OSAM block sizes, obviously, will only be displayed for OSAM DBs. Note: Data in this example has been truncated to fit in this report.

```
---------------------------------------------------------------
DB
DBD=PDHDOKA MASTER DB=DBHDOK01 CHANGE#=6 TYPE=
USID=0000000004 AUTHORIZED USID=0000000004 HARD USID=00000000
RECEIVE USID=0000000004 RECEIVE NEEDED USID=0000000000
DBRCVGRP=**NULL**

|RANDOMIZER:
| NAME=DFSHDC40 ANCHOR=3 HIGH BLOCK#=3 BYTES=25
|FREE SPACE:
| FREE BLOCK FREQ FACTOR=0 FREE SPACE PERCENTAGE=0
```

```
|
|PARTITION HIGH KEY/STRING (CHAR): (LENGTH=5 )
| K0200
|PARTITION HIGH KEY/STRING (HEX):
| D2F0F2F0F040404040404040404040404040404040404040404040404040404
|
|OSAM BLOCK SIZE:
| A = 2048
| B = 2048
| C = 4096
| D = 4096

FLAGS:                                  COUNTERS:
      BACKOUT NEEDED          =OFF      RECOVERY NEEDED COUNT        =0
      READ ONLY               =OFF      IMAGE COPY NEEDED COUNT      =0
      PROHIBIT AUTHORIZATION  =OFF      AUTHORIZED SUBSYSTEMS        =0
                                        HELD AUTHORIZATION STATE     =0
                                        EEQE COUNT                   =0
      TRACKING SUSPENDED      =NO       RECEIVE REQUIRED COUNT       =0
      OFR REQUIRED            =NO
      PARTITION INIT NEEDED   =NO
-----------------------------------------------------------------
```

Publications Changes

Appendix C of the *DBRC Guide and Reference* will need to be updated with a new sample listing of HALDB and PART records. Also, the section "Fields Present in a DB (PART) Record" will need the following information inserted:

Line 6:
RANDOMIZER:
Line 7:
NAME=randname ANCHOR=nnn HIGH BLOCK#=nnnnnnnn BYTES=nnnnnnnn

Lines 6 and 7 are only listed for PHDAM databases.

NAME -
Name of the randomizing module.

ANCHOR -
The number of root anchor points desired in each control interval or block in the root addressable area of a PHDAM DB.

HIGH BLOCK#-
The maximum relative block number value that the user wishes to allow a randomizing module to produce for this DB.

BYTES -
The maximum number of bytes of a DB record that can be stored into the root addressable area in a series of inserts unbroken by a call to another DB record.

Line 8:
FREE SPACE:
Line 9:
FREE BLOCK FREQ FACTOR=nnn FREE SPACE PERCENTAGE=nn

Lines 8 and 9:

FREE BLOCK FREQ FACTOR -
Specifies that every nth control interval or block in this data set group is left as free space during DB load or reorganization.

FREE SPACE PERCENTAGE -
Specifies the minimum percentage of each control interval or block that is to be left as free space.

Line 1 :
PARTITION HIGH KEY/STRING (CHAR):(LENGTH=nnn)

Line 11:
PARTITION HIGH KEY/STRING (HEX):

Lines 1 and 11::
Printable and hexadecimal formats of the partition high key/selection string.The key/string is padded with blanks, so the hexadecimal format may contain extra x'4 'characters beyond the length of the key/string (LENGTH=in line 1 lists the actual key/string length).

Line 12:
OSAM BLOCK SIZE:
Line 12a-j:
s =nnnnn
|
|
where s="A"->"J"

Line 12 is only listed for OSAM databases.
The OSAM block size is listed for each data set group member defined. s is the data set group identifier, A through J.