E32

HALDB Conversion Aid

Technical Introduction

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Agenda

- HALDB Overview

- Conversion to HALDB

- "IMS HALDB Conversion Aid"

- Future Directions

HALDB Overview

- Why should we go to HALDB
  - Keep more data online
    - No "purges"
    - Cheaper disks
  - More 24*7
    - Partitions are independent
  - Less online changes
    - Physical characteristics no longer in DBD
    - Add of new partitions

HALDB Overview

- /DBRs

  - Authorization on partition

  - Schedule on DBD

  - But: "BA" status code

- Utilities

  - Can take advantage of better /DBR capability

- Multiple DSG

  - Still available if required

HALDB Overview

- Things to consider
  - Index record size significantly larger
  - There is no WF1
    - Data maintenance during REORG
  - Prefix increases by 8 or 12 bytes
    - More if LP pointer (+24)

HALDB Overview

- Pointer Healing
  - Cost of pointer healing
    - Will be heavily discussed over the next 5 years
- ILK
  - HD Unload dataset format changes
    - ILK needed for RELOAD

Conversion to HALDB

- Locate all DBDs
  - All related DBDs must convert together
- Find "reasonable" partition boundaries
  - What are those for secondary indexes?
- Run conversion Unload
  - MIGRATE vs. MIGRATX

Conversion to HALDB

- What about "old" DBRC information

- Change the DBDs

- Define Partitions

- Allocate all files

- Run Reload (several)

- Do all required image copies

- ACBGENs, Online Change

IMS HALDB Conversion Aid

- HILITES
  - From Full Function to HALDB
    - HISAM to PHIDAM
    - Previous partitioning product
  - On "cruise control" if wanted
  - ISPF application
  - Who does the TEST databases?
  - Why not convert ALL databases?

IMS HALDB Conversion Aid

- Conceptual View
  - IMS Environment
    - Defines IMS datasets and setup parameter
    - Could be seen as a global IMS ID
  - Conversion Project
    - Is attached to an environment
    - Contains all databases to be converted together

IMS HALDB Conversion Aid

```
----------------------- IMS HALDB Conversion Aid   -----------------------
Command ===>


        Select Function                   Current Settings
                                          Environment: PECK-TEST
        Administration Functions          Project:     HDO2
    1   Add-Modify-Delete Environment
    2   Add-Delete Conversion Project
    3   Projects in Progress

        Utilities
    4   Disassemble DBD
    5   Show partition definition
    6   Generate JCL

        Project Handling
    7   Select an Environment
    8   Select a Project
    9   Start or Continue with the Current Project
```

IMS HALDB Conversion Aid

```
----------------------- IMS HALDB Conversion Aid   -----------------------
Command ===>


                 Datasets
 RESLIB   :   IMS710.SDFSRESL
          :


 MACLIB   :   IMS710.SDFSMAC


 LOADLIB  :   PECK.COMMON.LOAD


 DFSVSAMP :   PECK.COMMON.JCL
           Member name: VSAMP


 MDALIB  1:   PECK.COMMON.MDALIB
         2:


 RECON MDA located in:  1     1 RESLIB
                              2 MDALIB 1
                              3 MDALIB 2
                              4 Specify RECON datasets
```

IMS HALDB Conversion Aid

```
----------------------- IMS HALDB Conversion Aid  -----------------------

Command ===>


                  DBD Libraries
 DBDLIB  1:    PECK.COMMON.DBDLOAD
         2:
         3:
         4:
         5:
         6:
         7:
         8:
         9:
```

IMS HALDB Conversion Aid

- DBD Conversion
  - Change back to single DSG
    - Change was done because of space
  - From VSAM to OSAM
    - Now is a good opportunity
    - OSAM has many advantages

IMS HALDB Conversion Aid

```
----------------------- IMS HALDB Conversion Aid  -----------------------

Command ===>


                         DBD Conversion Rules


  Multi DSG:            1      1  To single DSG
                               2  Leave as is
                               3  Ask during Conversion


  Convert VSAM to OSAM: 2      1  Yes
                               2  No
                               3  Ask during Conversion


  Change DBD name:     1      1  Yes
                               2  No


  Selection Exit:      3      1  Yes
                               2  No
                               3  Ask during Conversion


  Heal Index Pointer:  1      1  Yes
                               2  No
                               3  Ask during Conversion
```

IMS HALDB Conversion Aid

```
----------------------- IMS HALDB Conversion Aid  -----------------------
Command ===>

                        Save Source Statements


  DBD Source:        2  1    No
                        2    Yes
      Source File:       PECK.COMMON.NEWDBD



  IDCAMS Source:     3  1    No
                        2    Yes
                        3    Yes, but no DELETE file


      Member Name:     2    1 DBD Name
                             2 Partition Name
                             3 DD Name
      Del File:          PECK.COMMON.DELETES
      Def File:          PECK.COMMON.DEFINES
```

IMS HALDB Conversion Aid

- How to partition
  - Specify number of partitions
  - Specify size of partitions
  - Specify key ranges

- What to do about Secondary Indexes

IMS HALDB Conversion Aid

```
----------------------- IMS HALDB Conversion Aid  -----------------------
Command ===>

                        Data Collection Rules

  Combine Database records:      5000   (number of database records)

  Main DB Partition:     3    1  Fixed Number of Partitions     2
                              2  Fixed Partition Size (MB)      0512
                              3  Ask during Conversion
                              4  Specify High Keys


  Index Partition:       1    1  Fixed Number of Partitions     1
                              2  Fixed Partition Size (MB)      1024


  PDB Conversion:        3    1  Use existing Keys or Partitions
                              2  Create new Partition boundaries
                              3  Ask during Conversion


  Additional Partitioning Layouts to be created?
                         2    1  Yes
                              2  No, use the one created during Collect
```

IMS HALDB Conversion Aid

```
----------------------- IMS HALDB Conversion Aid   -----------------------
Command ===>


                    Partition Naming Rules


 Partition Name:  4    1  DBD name (up to 6) and 0-9,A-Z
                       2  DBD name (up to 6) and A-Z
                       3  Ask for partition name during Conversion
                       4  Ask for constant (6 char) during Conversion
                       5  DBD pattern  **.**.** and 0-9,A-Z
                              like     ..***.**


 Partition DSN:   3    1  High qualifier and DBD name
                       2  High qualifier and Partition name
                       3  Ask during Conversion

                          High-level qualifier
                          PECK.IMSDB
```

IMS HALDB Conversion Aid

```
----------------------- IMS HALDB Conversion Aid  -----------------------
Command ===>


                      Space Allocation Rules
                      for PHDAM and PHIDAM


  HDAM RAA Size:        1     1  Clone from DBD
                              2  (1) and increase 10 percent
                              3  Ask during Conversion


  Overflow Size:        1     1  Clone from original dataset
                              2  (1) and increase 10 percent
                              3  Ask during Conversion


  Byte limit:           1     1  Same as old DBD
                              2  None
                              3  Ask during Conversion


  SMS Allocation:       2     1  Yes  Dataclass:
                              2  No, ask for Volume serial
                              3  Yes, no Dataclass
```

IMS HALDB Conversion Aid

```
----------------------- IMS HALDB Conversion Aid  -----------------------

Command ===>


                      Space Allocation Rules
                      for ILDS datasets


 Free Space per CI:    1     1  Do not specify
                             2  Set to  10 percent
                             3  Ask during Conversion


 Free Space per CA:    1     1  Do not specify
                             2  Set to  10 percent
                             3  Ask during Conversion


 Dataset Allocation:   1     1  Round to full Cylinder
                             2  Add  10 percent
                             3  Ask during Conversion


 SMS Allocation:       2     1  Yes  Dataclass:
                             2  No, ask for Volume serial
                             3  Yes, no Dataclass


 CI Size:              4     (1, 2, 4, 6, 8, 12) in Kbytes
```

Do the Conversion

```
----------------------- IMS HALDB Conversion Aid  -----------------------

Command ===>

          DBD CONVERSION SELECTION

          Select one of the provided DBD libraries
          or specify a DBD library
          1       PECK.COMMON.DBDLOAD
          2
          3
          4
          5
          6
          7
          8
          9


               Specify a DBDLIB dataset name
               PECK.COMMON.DBDLOAD


          DBD     *              "*" for list of DBDs

               Display mode    B     Browse (default)
                               V     View
```

Do the Conversion

```
| ----------------------- IMS HALDB Conversion Aid  --------- Row 1 of 60 |
| Command ===>                                              Scroll ===> CSR |
|                                                                           |
|           Select  DBD                                                     |
| ------------------------------------------------------------------------- |
|                  DEDB1                                                     |
|                  HDO1                                                      |
|         s        HDO2                                                      |
|                  HDO2TT                                                    |
|                  HDV1                                                      |
|                  HDV2                                                      |
|                  HDX2                                                      |
|                  HIDAM2                                                    |
|                  HIDO2                                                     |
|                  HIDV2                                                     |
|                  HISAM                                                     |
|                  HISAM1                                                    |
|                  HPI20                                                     |
|                  HPV20                                                     |
|                  LDBD1                                                     |
|                  PAIR1                                                     |
|                  PAIR2                                                     |
'--------------------------------------------------------------------------'
```

Do the Conversion

```
------------------------ IMS HALDB Conversion Aid   ------------- Row 1 of 5

Command ===>

                    DBD(s) in Project HDO2


 S  DBD        Type Prim DBD  Log. Current Level        Current Status
                             Rel.
--------------------------------------------------------------------------------
    HDO2       D                  Collect DBDs          Wait for User
    SIO21      X   HDO2           Collect DBDs          Wait for User
    SIO23      X   HDO2           Collect DBDs          Wait for User
    SIO22      X   HDO2           Collect DBDs          Wait for User
    SIO24      X   HDO2           Collect DBDs          Wait for User
****************************** Bottom of data ********************************
```

Conversion Phases

- Get all the data

- Prepare everything

- Unload the database

- Make all the changes and reload the database

- Post processing

What does the User need to do?

- Answer Questions
  - Presented as ISPF screens

- Submit JCL
  - Presented in an ISPF VIEW screen

- Check the Output
  - All processed should end with RC 0

Changes since GA

- New Functions
  - Save DBD source
  - Save IDCAMS source
  - Specification of key ranges
  - Support for non-unique indexes
  - Support for SHISAM
  - PDB settings can be copied

Changes since GA

- Partition Selection Exit
  - Utility to test the selection exit
    - based on HD unload file

- Generic Selection exit IHCPSEL0
  - Based on subset of the root key
  - Specification of offset and length
  - Uses data string in DBRC definition

Future Directions

- Next Versions
  - Status code "BA" handling
  - PROCOPT=L support
    - Allow logical related segments to be loaded
    - Solve PSINDEX performance issues
  - DEDB to HALDB
  - Maintain HALDB partitions

How to look at this

- Visit H05

  – Hands on: HALDB Conversion Aid

- Look at a DEMO

  – in the booth