B63

IMS High Performance Fast Path Utilities for z/OS

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- Overview – IMS High Performance Fast Path Utilities
- High Performance Fast Path Reorganization Tool
- Fast Path Basic Tools – Enhancements
- Fast Path Online Tools – Enhancements
- Summary
- Q&A

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IMS Fast Path Tools from IBM

- **Several general DB tools include support for Fast Path DB**

IMS Data Base Repair Facility	*5655-E03*
IMS Library Integrity Utilities	*5655-142*
IMS Sequential Randomizer Generator	*5655-E11*
IMS Hardware Data Compression - Extended	*5655-E02*
IMS Data Base Control Suite	*5655-L08*
IMS High Performance Image Copy	*5655-K96*
Application Recover tool for IMS and DB2	*5697-F56*
Online Recovery Service (ORS)	*5655-E50*
IMS Performance Analyzer	*5655-E15*
IMS DEDB Fast Recovery	*5655-E32*
IMS High Performance Fast Path Utilities for z/OS	***5655-K94***

IMS High Performance Fast Path Utilities for z/OS

- **Version 2 Release 1, 5655-K94**
- **General Availability : September, 2004**
  - *User's Guide :*
    - **Volume 1 High Performance Fast Path Reorganization Tool: SC18-7615-00**
    - **Volume 2 Fast Path Basic Tools: SC18-9238-00**
    - **Volume 3 Fast Path Online Tools: SC18-9239-00**
- **Follow-on of :**
  - *IMS Fast Path Basic Tools V1R2 (5655-E30)*
  - *IMS Fast Path Online Tools V2 (5655-F78)*
- **Supporting IMS**
  - *IMS Version 7*
  - *IMS Version 8*
  - *IMS Version 9*
- **Prerequisite Operating System**
  - *z/OS Version 1 Release 4 or higher*

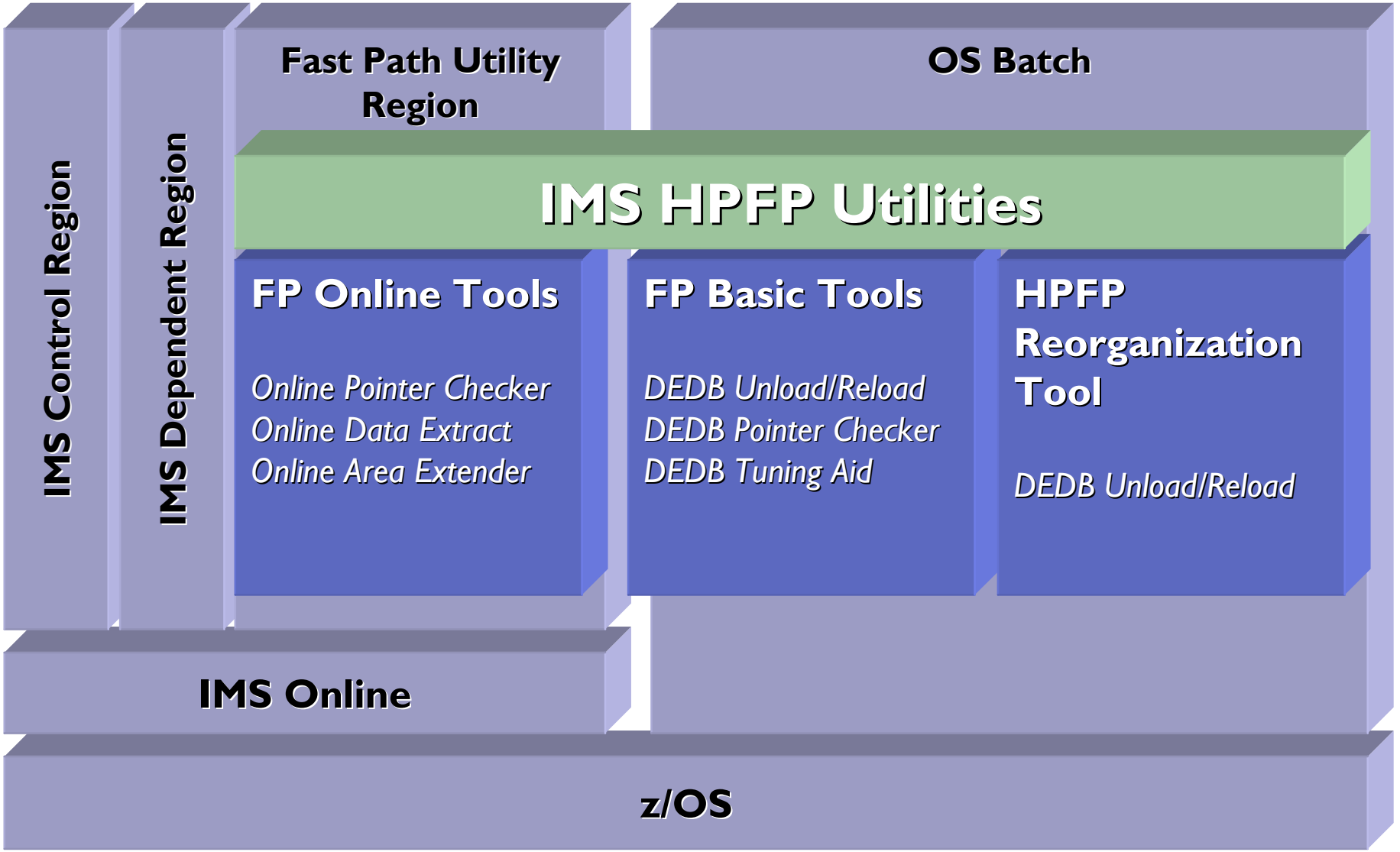
IMS High Performance Fast Path Utilities for z/OS

- **High Performance Fast Path Reorganization Tool** — New !!
  - *DEDB Unload/Reload*

- **Fast Path Basic Tools** — Repackaged
  - *DEDB Unload/Reload*
  - *DEDB Pointer Checker*
  - *DEDB Tuning Aid*

- **Fast Path Online Tools** — Repackaged
  - *Online Pointer Checker*
  - *Online Data Extract*
  - *Online Area Extender*

IMS High Performance Fast Path Utilities for z/OS



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- Overview – IMS High Performance Fast Path Utilities
- **High Performance Fast Path Reorganization Tool**
- Fast Path Basic Tools – Enhancements
- Fast Path Online Tools – Enhancements
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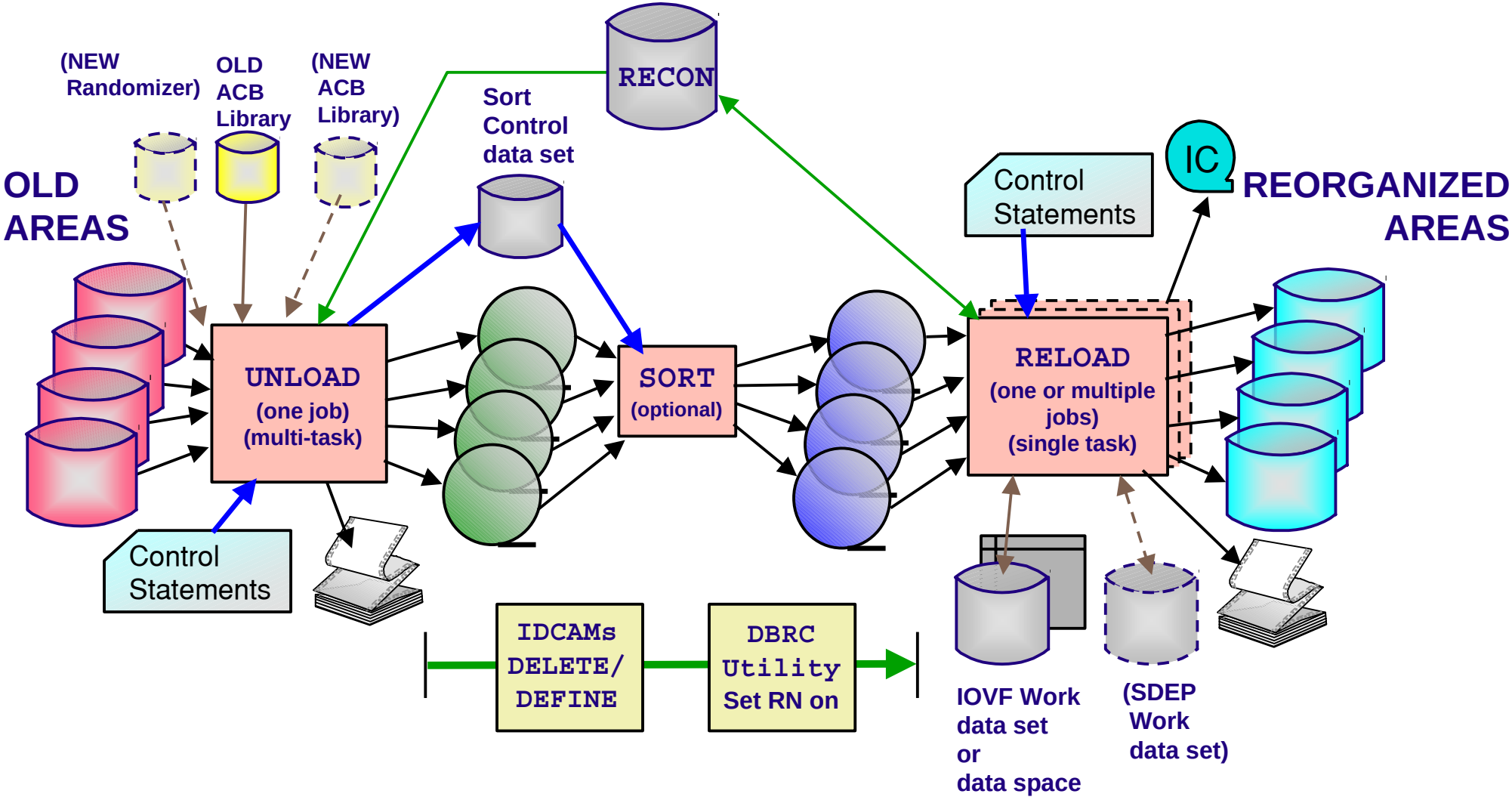
Highlights of HPFP Reorganization Tool

- **JCL Ease of Use**
  - *Increase the productivity of database support personnel*
    - Minimize steps for completing database Unload/Reload
    - Minimize DD statements
    - Single driver program with command language
- **Improved Reports**
  - *Generate more reports and information (than FP Basic Tools)*
- **Integrity with IMS**
  - *Increase the application availability*
  - *Multiple area data sets (ADSs) support*
- **High Performance**
  - *Save maintenance and database conversion costs*
  - *Reduce the consuming time for Unload/Reload traditionally required for :*
    - DEDB space reclaim
    - DEDB structure change

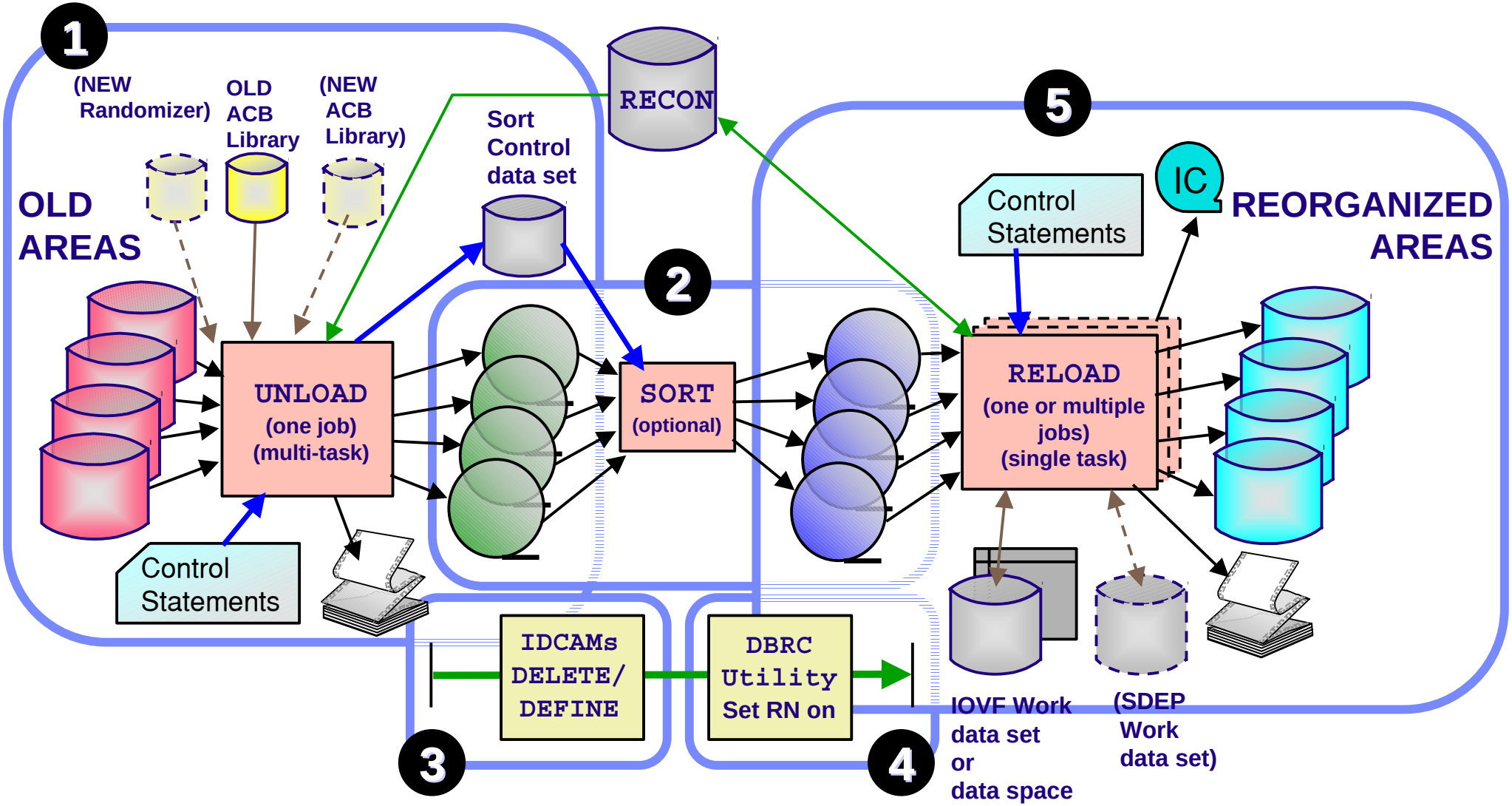
JCL Ease of Use : Minimize Manual Steps

(Today) Fast Path Basic Tools Unload/Reload Process Flow



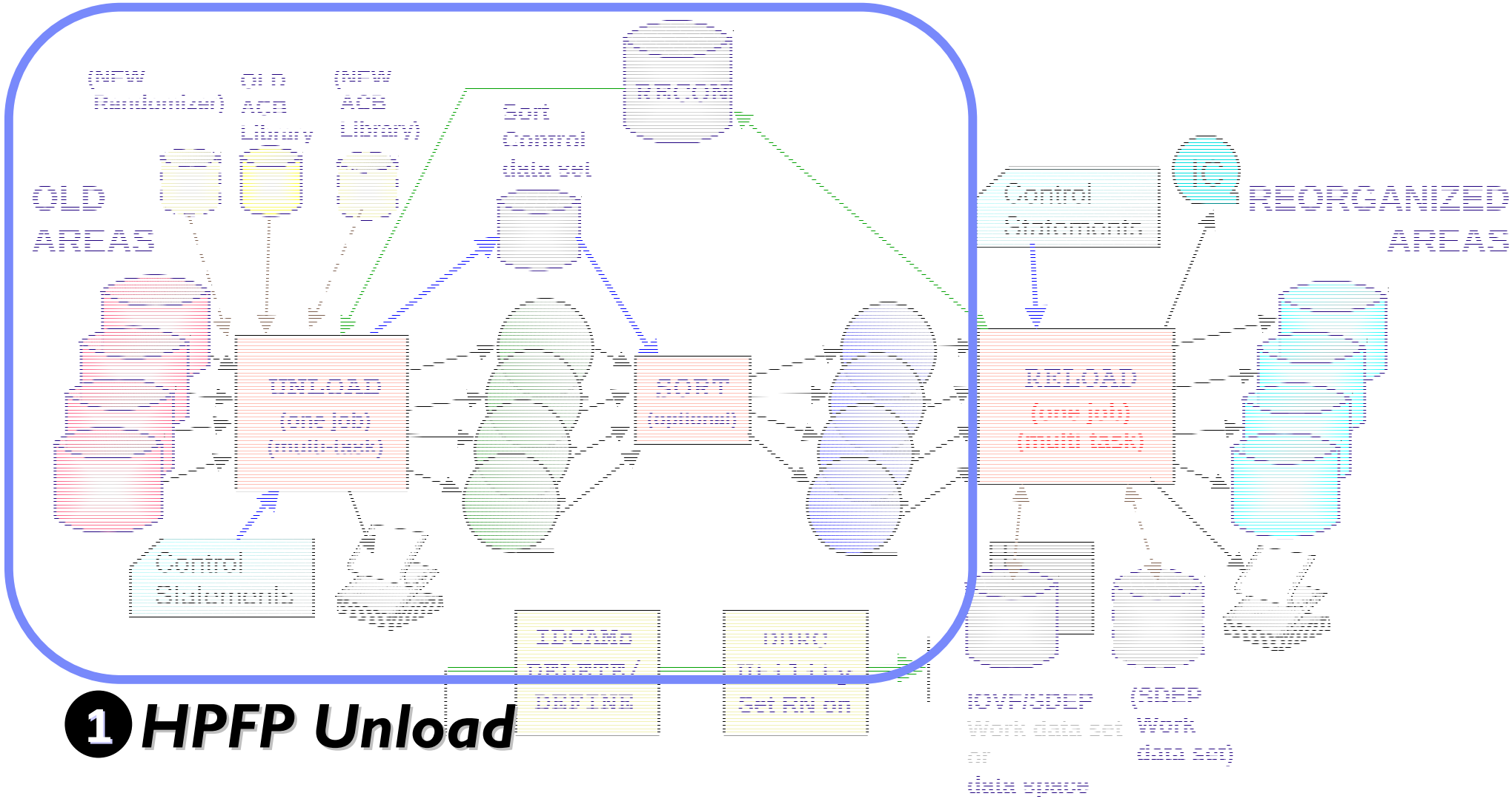
JCL Ease of Use : Minimize Manual Steps

(Today) Fast Path Basic Tools Unload/Reload EXEC Steps



JCL Ease of Use : Minimize Manual Steps

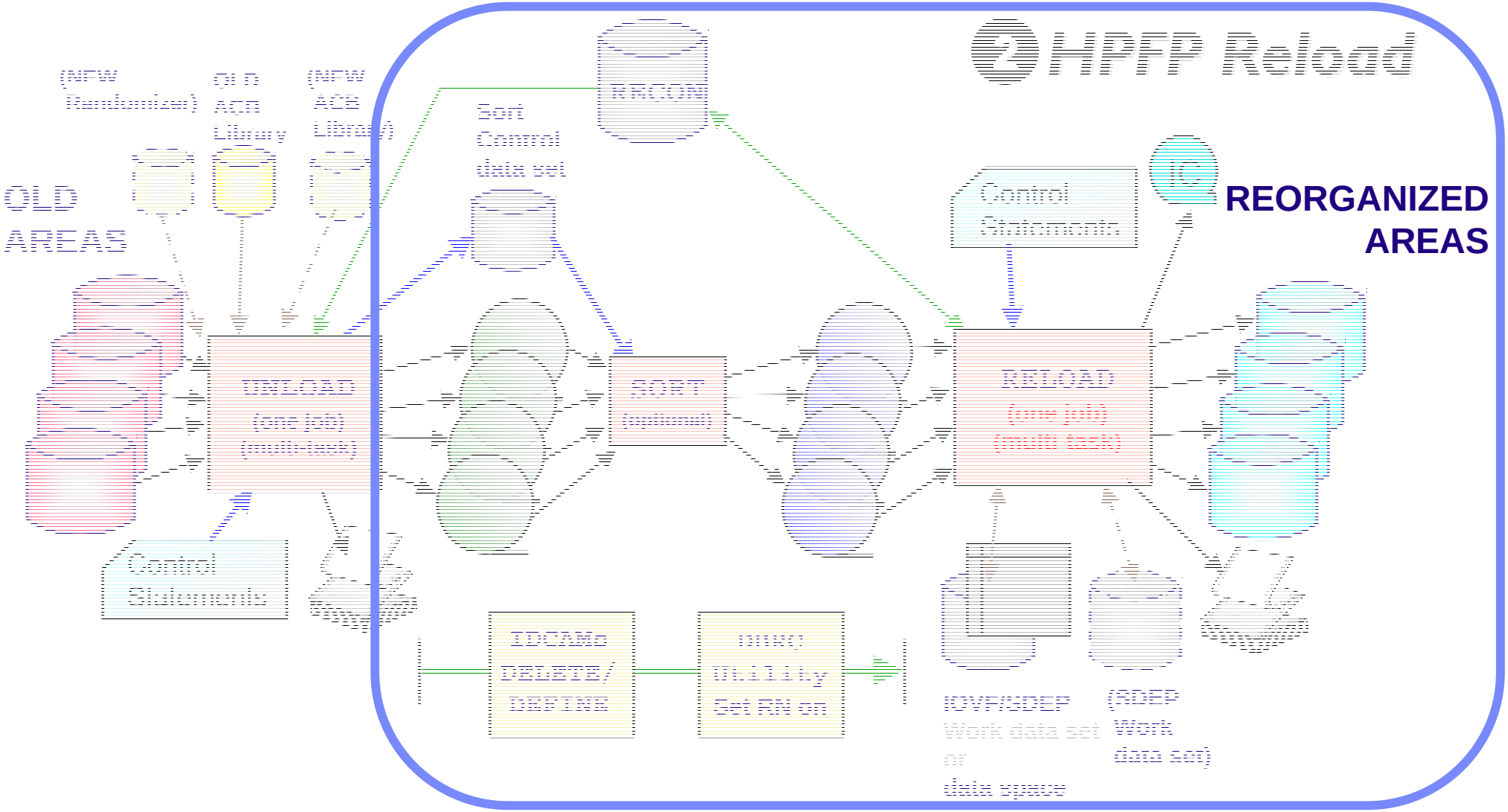
HPFP Reorganization Tool Unload/Reload EXEC Steps



1 HPFP Unload

JCL Ease of Use : Minimize Manual Steps

HPFP Reorganization Tool Unload/Reload EXEC Steps



JCL Ease of Use : Minimize Manual Steps

- **High Performance Fast Path Reorganization Tool provides :**
  - ***Standardized JCL***
    - **Single driver for unloading/reloading IMS data entry databases (DEDBs)**
    - **Controlled by unified command language**
  - ***Two steps to reorganize or restructure a DEDB***
    - **Unloading and reloading**
    - **Sort step is not required in JCL; it is run internally**
      - If necessary, it can be optionally included

JCL Ease of Use : Minimize JCL DD Statements

- **HPFP Reorganization Tool dynamically allocates :**
  - *DEDB area data sets for*
    - Input of the unload process
    - Output of the reload process (with space allocation)
  - *ACB libraries*
  - *DBRC RECON data sets*
  - *Data sets of unloaded segment records for*
    - Output of the unload process
    - Input of the reload process
  - *HFPPRINT data set*
  - *HFPRPTS data set*
  - *SORT work data sets*

- **Above DD statements are no longer required in JCL!**
- **Operator needs not care about these data set allocations !**

JCL Ease of Use : Command Language

- **Command Language for Control Statement**
  - *Unified (common) to both unload and reload*
  - *Controls the behavior of single driver*
  - *Simplified JCL structure*

```
//HFP       EXEC PGM=HFPMAIN0
//HFPSYSIN  DD *
 GLOBAL
  DBRC=YES
 UNLOAD
  …
/*
```

JCL Ease of Use : Command Language

- **Simple Language Structure**
  - *Command*
    - GLOBAL
    - RELOAD
    - UNLOAD
    - END
  - *Subcommands*
    - ALLOCATE for RELOAD
    - FILECTL for UNLOAD
  - *Keywords*
    - many…

JCL Ease of Use : Command Language

- **Nice Features**
  - *Advanced Data Set Name Specification*
    - Masks can be used for data set names
    - Generate data set groups (GDG)
  - *Command Syntax Check without run*
    - GLOBAL SCAN=YES

Improved Reports

7 kinds of report

	Unload	Reload
Audit report	o	o
Processing report	o	o
DBD definition report	o	o
Unloaded report	o	-
Reloaded report	o	o
Output file report	o	-
Input file report	-	o

Points of Improvement (vs. FP Basic Unload/Reload)

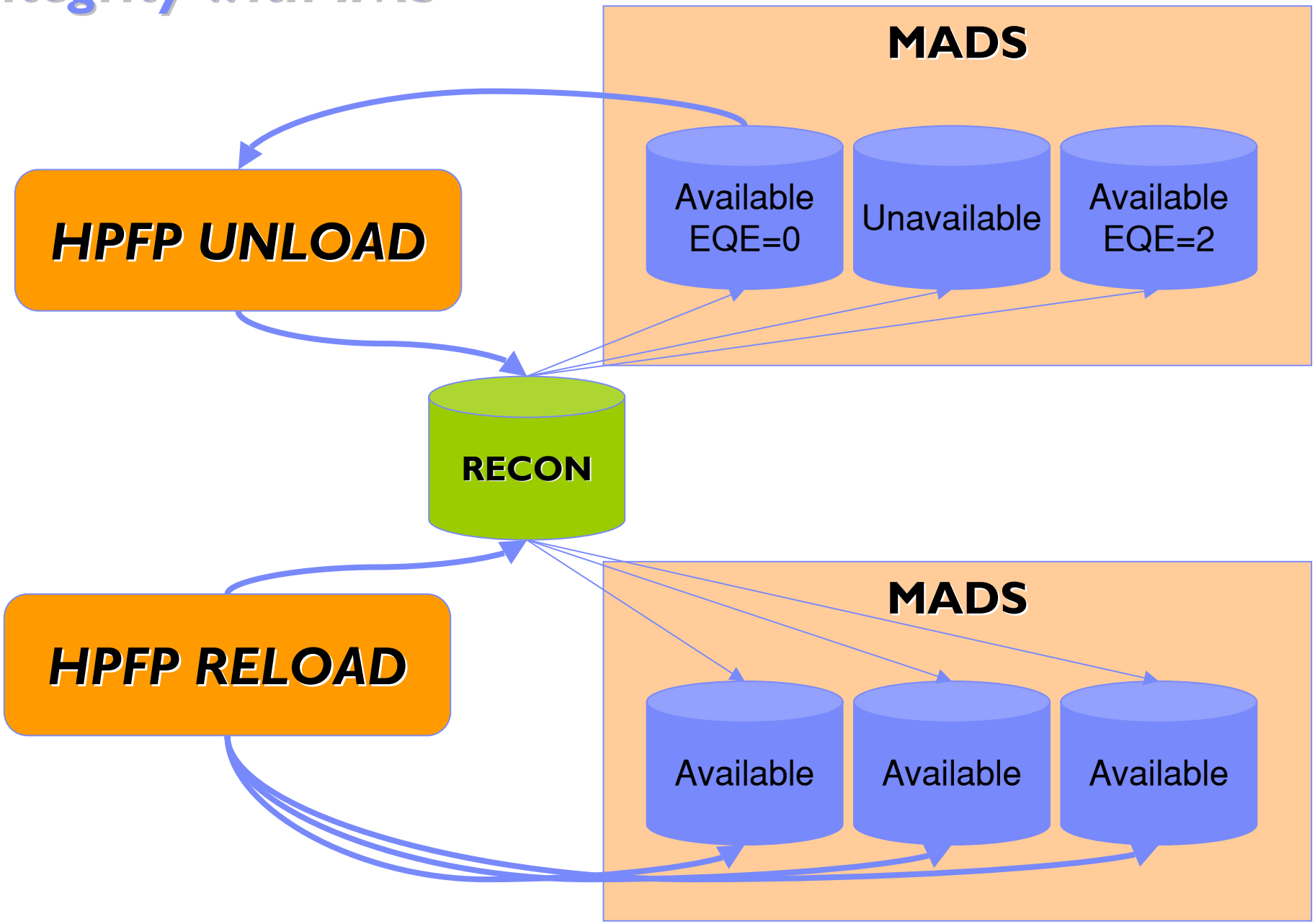
- *Generate DBD definition report*
- *Generate Input file report*
- *More information becomes available*
  - Differences of new and old ACBLIB
  - Pointer checking
  - Key sequence field checking

Integrity with IMS

- **DBRC environment support**
  - *As same as in IMS standard utilities*
  - *Obtain the area authorization from DBRC to keep the integrity of the area before unload/reload process*
  - *Application can run immediately after HPFP reload without any operator's interventions*

- **Multiple DEDB Area Data Sets (MADS) support**
  - *Select one of the error-free available ADSs registered with DBRC for unloading*
  - *All or the specified ADSs registered in DBRC can be made available after reloading*

Integrity with IMS



High Performance : Technical Topics

- **Reduce I/O and CPU**
  - *Internal Sort*
    - **No SORTIN and SORTOUT I/O for sorting**
  - *MMcall*
    - **Asynchronous I/O**
    - **Concurrent processing of multiple UOWs**
  - *Data Space*
    - **For IOVF and SDEP**
- **Multi-tasking**
  - *Parallel processing for multiple DEDB areas*
    - **Multiple subtasks for both unload and reload**
      - The number of concurrent processes can be specified by control statement

Sample JCLs

- **You can see :**
  - *How easy JCL looks like*
  - *Examples of control statements*
- **4 sample JCLs**
  - *Unload an area registered with DBRC*
  - *Reload an area registered with DBRC*
  - *Unload multiple areas into one output data set*
  - *Reload multiple areas from one input data set*

Unloading an Area Registered with DBRC

```
//HFPUNL   EXEC PGM=HFPMAIN0
//STEPLIB  DD DISP=SHR,DSN=HFP210.SHFPMOD0
//         DD DISP=SHR,DSN=IMSVS.SDFSRESL
//         DD DISP=SHR,DSN=IMSVS.PGMLIB
//IMSACB   DD DISP=SHR,DSN=IMSVS.ACBLIB
//IMSDALIB DD DISP=SHR,DSN=IMSVS.MDALIB
//HFPRPTS  DD SYSOUT=*
//HFPPRINT DD SYSOUT=*
//HFPSYSIN DD *
 GLOBAL
   DBRC=YES
 UNLOAD
   DBD=DEDBJN22,
   IAREA=(DB22AR0),
   OAREA=(DB22AR0),
   ODSNMASK='IMSVS.USRFILE.&AREA'
/*
```

Hints

- **RECON data sets are allocated dynamically by using DFSMDA members in the IMSDALIB DD data set.**
- **The input ADS to be unloaded is dynamically allocated.**
  - *The allocation information (DD name and DS name of the ADS) is obtained from DBRC.*
- **Output unloaded segment records data set for the area is IMSVS.USRFILE.DB22AR0 specified by the ODSNMASK='IMSVS.USRFILE.&AREA' parameter and it is allocated dynamically.**
  - *The data set must be pre-allocated and be cataloged.*

Reloading an Area Registered in DBRC

```
//HFP       EXEC PGM=HFPMAIN0
//STEPLIB   DD DISP=SHR,DSN=HFP210.SHFPMOD0
//          DD DISP=SHR,DSN=IMSVS.SDFSRESL
//          DD DISP=SHR,DSN=IMSVS.PGMLIB
//IMSACB    DD DISP=SHR,DSN=IMSVS.ACBLIB
//IMSDALIB DD DISP=SHR,DSN=IMSVS.MDALIB
//HFPRPTS   DD SYSOUT=*
//HFPPRINT DD SYSOUT=*
//HFPSYSIN DD *
 GLOBAL
   DBRC=YES
 RELOAD
   DBD=DEDBJN22,
   IAREA=(DB22AR0),
   IDSNMASK='IMSVS.USRFILE.&AREA',
   OAREA=(DB22AR0)
/*
```

Hints

- The input unloaded segment records data set for the area is IMSVS.USRFILE1.DB22AR0 specified by the IDSNMASK='IMSVS.USRFILE.&AREA' parameter and it is allocated dynamically.
- The output ADSs to be unloaded are dynamically allocated. The allocation information (DD name and DS name of the ADS) is obtained from DBRC.
- After reloading, the 'RECOV NEEDED' status of area DB22AR0 is changed to OFF and all three ADSs of the area are made AVAILABLE with DBRC.

Unloading multiple areas into one output data set

```
//HFPUNL      EXEC PGM=HFPMAIN0
//STEPLIB  DD DISP=SHR,DSN=HFP210.SHFPMOD0
//           DD DISP=SHR,DSN=IMSVS.SDFSRESL
//           DD DISP=SHR,DSN=IMSVS.PGMLIB
//IMSACB   DD DISP=SHR,DSN=IMSVS.ACBLIB
//USRFILE1 DD DISP=(NEW,CATLG),DSN=IMSVS.USRFILE1,SPACE=(CYL,(5,1)),
//              UNIT=SYSDA,VOL=SER=VOL001
//SYSOUT   DD SYSOUT=*
//HFPRPTS  DD SYSOUT=*
//HFPPRINT DD SYSOUT=*
//HFPSYSIN DD *
 GLOBAL
   DBRC=NO
 UNLOAD
   DBD=DEDBJN22,
   IAREA=(DB22AR0,DB22AR1,DB22AR2,DB22AR3),
   IDSNMASK='IMSVS.&AREA.ADS1',
   SORT=YES
  FILECTL
   OAREA=(DB22AR0,DB22AR1),
   DDNAME=USRFILE1
  FILECTL
   OAREA=(DB22AR2,DB22AR3),
   DSNAME='IMSVS.USRFILE2',
   DISP=(NEW,CATLG)
/*
```

Hints

- The DBRC=NO option does not check the area status in DBRC, so RECON data sets are not needed.
- The input ADSs to be unloaded for specified areas are dynamically allocated by using the IDSNMASK parameter.
- Following ADSs are allocated:
  - *IMSVS.DB22AR0.ADS1 for area DB22AR0*
  - *IMSVS.DB22AR1.ADS1 for area DB22AR1*
  - *IMSVS.DB22AR2.ADS1 for area DB22AR2*
  - *IMSVS.DB22AR3.ADS1 for area DB22AR3*
- The output unloaded segment records data set for area DB22AR0 and DB22AR1 is IMSVS.USRFILE1 specified by the DDNAME=USRFILE1 parameter in the FILECTL subcommand.
- The output unloaded segment records data set for area DB22AR2 and DB22AR3 is IMSVS.USRFILE2 specified by DSNAME='IMSVS.USRFILE2' in the FILECTL subcommand and it is allocated dynamically.
- By the SORT=YES parameter, the two output unloaded segment records data sets are sorted internally by the area number, RAP RBA, and the root key value.

Reloading multiple areas from one input data set

```
//HFP       EXEC PGM=HFPMAIN0
//STEPLIB   DD DISP=SHR,DSN=HFP210.SHFPMOD0
//          DD DISP=SHR,DSN=IMSVS.SDFSRESL
//          DD DISP=SHR,DSN=IMSVS.PGMLIB
//IMSACB    DD DISP=SHR,DSN=IMSVS.ACBLIB
//IMSDALIB DD DISP=SHR,DSN=IMSVS.MDALIB
//IAREA001 DD DISP=SHR,DSN=IMSVS.USRFILE1
//IAREA002 DD DISP=SHR,DSN=IMSVS.USRFILE2
//HFPRPTS   DD SYSOUT=*
//HFPPRINT DD SYSOUT=*
//HFPSYSIN DD *
 GLOBAL
   DBRC=YES
 RELOAD
   DBD=DEDBJN22,
   IAREA=(DB22AR0,DB22AR1),
   OAREA=(DB22AR0,DB22AR1,DB22AR2,DB22AR3),
   ODSNMASK='IMSVS.&AREA.NEW'
/*
```

Hints

- RECON data sets are allocated dynamically by using DFSMDA members in the IMSDALIB DD data set.
- The input unloaded segment records data set for area DB22AR0 and DB22AR1 is IMSVS.USRFILE1 specified by the IAREA001 DD.
- The input unloaded segment records data set for area DB22AR2 and DB22AR3 is IMSVS.USRFILE2 specified by the IAREA002 DD.
- Because the two input unloaded segment records data sets are already sorted during the unload process, it is not necessary to specify the SORT=YES parameter. SORT=YES must be specified if these data set are not sorted during the unload process.
- The output ADSs to be reloaded for specified areas are dynamically allocated by specified the ODSNMASK='IMSVS.&AREA.NEW' parameter.
- After reloading, areas DB22AR0, DB22AR1, the 'RECOV NEEDED' status of the areas is changed to OFF and all ADSs of these area are made AVAILABLE with DBRC.

Sample Reports

- 7 reports
  - *Audit report*
  - *Processing report*
  - *DBD definition report*
  - *Unloaded report*
  - *Reloaded report*
  - *Output file report*
  - *Input file report*

Audit Report

HFPSYSIN and JCL EXEC statement report

```
IMS HIGH PERFORMANCE FAST PATH UTILITIES                    "Audit report"
5655-K94  V2R1                                  DATE: 08/01/2004  TIME:  8.32.35


  HFPSYSIN
                0.......1.........2.........3.........4.........5.........6.........7.........8
                12345678901234567890123456789012345678901234567890123456789012345678901234567890

           -  1: GLOBAL
           -  2:    DBRC=NO,
           -  3:    SCAN=NO
           -  4: UNLOAD DBD=DEDBJN21,
           -  5:    IAREA=ALL,
           -  6:    OAREA=ALL,
           -  7:    ICACHE=YES,
           -  8:    ITASKCTL=1


  PROCESSING INFORMATION

      EXEC
            - IMSPLEX     :

      GLOBAL
            - DBRC        : NO
            - SCAN        : NO
```

Processing Report

- **Values that the unload or the reload command processing uses**
  - ***Values shown are determined from HFPSYSIN and the system defaults***

```
IMS HIGH PERFORMANCE FAST PATH UTILITIES - UNLOAD        "Processing report"
5655-K94  V2R1                                  DATE: 08/01/2004  TIME:  8.17.35

  UNLOAD   STARTED DATE: 08/01/2004  TIME:  8.17.35    ENDED DATE: 08/01/2004  TIME:  8.22.26

  UNLOAD   PROCESSING OPTION
            - COMPRESS     : NO
            - DBD          : DEDBJN21
            - EXITRTN      :
            - FORMAT       : DBT
            - IAREA        : ALL
            - ICACHE       : YES
            - IDSNMASK     :
            - ITASKCTL     : 1
            - KEYSEQCHK    : NOCHECK
            - OAREA        : ALL
            - ODSNMASK     :
            - PAD          : X'00'
            - PTRCHK       : ABEND
            - SDEP         : LOGICAL
            - SORT         : NO
            - SSP          : YES
            - IMSACB       : IMSVS.ACBLIB
            - NEWACB       : IMSVS.ACBLIB   (DYNAMIC ALLOCATION)

           PROCESSING INFORMATION
            - RANDOMIZER IS NOT CALLED FOR UNLOAD PROCESS.
            - DBRC=NO IS SPECIFIED. - EEQE DETECTION IS NOT PERFORMED.
```

DBD Definition Report

- **Information of ACBLIB for Unload/Reload command processing**
- **Report differences between new and old ACBLIBs**
  - *"*" means non-severe difference*
  - *"&" means severe difference and stops processing*

DBD Definition Report

```
IMS HIGH PERFORMANCE FAST PATH UTILITIES - UNLOAD        "DBD definition report"
5655-K94  V2R1                                  DATE: 07/01/2004  TIME: 17.17.47

    - ACBLIB     : IMSACB
    - ACB DSNAME : IMSVS.ACBLIB
    - DBD NAME   : DEDBJN22
    - RANDOMIZER : DBFHDC40
    - IMS LEVEL  : VERSION 7  RELEASE 1

DEDB DEFINITION DIFFERENCE DETECTED.                *: DIFFERENCE    &: SEVERE DIFFERENCE

DB LARGEST INFO:  CI-SIZE   UOW-1  NO(RAP'S/UOW)   UOW-2  SEG-LEN
                  -------  ------  -------------  ------  -------
                    2,048      13             10       3      900
AREA:
                                                                                SDEP START
     AREA    AREA     CI-SIZE  UOW=           ROOT=             BASE   DOVF   IOVF    ----------------
      NO.    NAME                                               CI'S   CI'S   CI'S    BLOCK#   RBA(HEX)
     -----  --------  -------  -------------  ---------------  ------ ------ ------  ----------------
         1  DB22AR0     1,024  (5,1)          (5,1)                 4      1      5       -           -
         2  DB22AR1     2,048  (5,1)          (5,1)                 4      1      5       -           -
         3  DB22AR2     1,024  (13,3)         (15,3)               10      3     39       -           -
==>      4* DB22AR3     1,024  (10,2)         (10,2)                8      2     20       -           -
==>      5* DB22AR4     2,048  (10,2)         (10,2)                8      2     20       -           -

SEGMENT:
                                                          PARENT       LENGTH         KEY        COMP-RTN
    SEG.      SEG.    HIER   PARENT  TYPE  FIX|VAR       -------  --------------  --------  --------------
    CODE      NAME    LVL    S.CODE                       PCL SSP     MAX     MIN  OFF  LEN    NAME     INIT
    -----  --------  -----  ------  ----  -------       --- ---  ------  ------  ---  ---  --------  ----
       1   ROOTSEG1      1       -     R       V         -   -     900      20    2    6         -     -
       2   SDSEGNM1      2       1     S       V         -   -     900      20    -    -         -     -
       3   DD1           2       1     D       V         -   -     900      20    2    7         -     -
       4   DD2           2       1     D       V         -   -     900      20    2    7         -     -
       5   DD3           2       1     D       V         -   -     900      20    -    -         -     -
       6   DD4           2       1     D       V         -   -     900      20    2    7         -     -
```

Legend : R: Root Segment, D: DDEP Segment, S: SDEP Segment, F: Fixed Length, V: Variable Length, I: Comp Init, Y:PCL Defined

Unloaded Report

- A count of the number of segments (by segment name and segment code) that were unloaded from each area of the database

```
IMS HIGH PERFORMANCE FAST PATH UTILITIES - UNLOAD        "Unloaded report"
5655-K94   V2R1                                  DATE: 08/01/2004   TIME:   7.08.47

 SEGMENTS UNLOADED FROM DATABASE: DEDBJN21

   - AREA NO:      1   AREANAME: DB21AR0    DDNAME: DB21AR0    DSNAME: IMSVS.MDB21AR0.ADSFP
                                            (JCL DD ALLOCATION)
        STARTED DATE: 08/01/2004   TIME:   7.08.47     ENDED DATE: 08/01/2004   TIME:   7.13.38

        IOVF
           - TOTAL CI'S        :       19833
           - UNUSED CI'S       :       19827
           - UNUSED CI RATIO   :         100 (%)

        SDEP
           - TOTAL CI'S        :       93978
           - UNUSED CI'S       :       86730
           - UNUSED CI RATIO   :          96 (%)
           - RANGE             : X'35B76000' TO X'65130000'
           - LOGICAL BEGIN     : CYCLE COUNT X'00000001' RBA X'35B76000'
           - LOGICAL END       : CYCLE COUNT X'00000001' RBA X'377C5004'
           - LOGICAL BEGIN TS  : X'BB94FE79F21F3341'
```

(continue…)

Unloaded Report

(continued…)

```
SUMMARY OF KEY SEQUENCE ERRORS
 - NUMBER OF RELATED DB RECORDS                                          :            0
 - NUMBER OF THE SEGMENTS DETECTED AS KEY SEQUENCE ERROR                 :            0
 - ERROR SEGMENTS SUM TOTAL INCLUDING CHILD SEGMENTS                     :            0

 SEGMENT   SEGMENT    SEGMENT           SEGMENTS     SEGMENTS     SKIPPED BY  SKIPPED BY
 CODE      NAME       HIERARCHY         READ         UNLOADED     KEY ERROR   USER EXIT
 -------   --------   ---------------- ----------- ----------- ----------- -----------
       1   ROOTSEG1   1                    250,000     250,000           0           0
       2   SDEPSEG1    2                   500,000     500,000           0           0   (SDEP=LOGICAL)
       3   DD102       2                  250,000     250,000           0           0
       4   DD202       2                  750,000     750,000           0           0
       5   DD302       2                  500,000     500,000           0           0
       6   DD303        3                 500,000     500,000           0           0

 ------------------------------------------------------------------------------------
 **  TOTAL  **                          2,750,000   2,750,000           0           0
```

Reloaded Report

- **A count of the number of segments that are to be reloaded to each area of the new database, and the count of the total number of segments in the database.**

```
IMS HIGH PERFORMANCE FAST PATH UTILITIES - RELOAD        "Reloaded report"
5655-K94   V2R1                                  DATE: 08/01/2004   TIME:   7.22.09


 SEGMENTS RELOADED FROM DATABASE: DEDBJN21

   - AREA NO:      1   AREANAME: DB21AR0    DDNAME: DB21AR0    DSNAME: IMSVS.MDB21AR0.ADSFP
                                                    DB21AR1            IMSVS.MDB21AR1.ADSFP
                                                    DB21AR2            IMSVS.MDB21AR2.ADSFP
                                           (JCL DD ALLOCATION)
        STARTED DATE: 08/01/2004   TIME:   7.22.10     ENDED DATE: 08/01/2004   TIME:   7.35.05

        IOVF
           - TOTAL CI'S        :       19833
           - UNUSED CI'S       :       19827
           - UNUSED CI RATIO   :         100 (%)

        SDEP
           - TOTAL CI'S        :       93978
           - UNUSED CI'S       :       86834
           - UNUSED CI RATIO   :          96 (%)
           - RANGE             : X'35B76000' TO X'65130000'
           - LOGICAL BEGIN     : CYCLE COUNT X'00000001' RBA X'35B76000'
           - LOGICAL END       : CYCLE COUNT X'00000001' RBA X'3775D000'
           - LOGICAL BEGIN TS  : X'BB94FE79F21F3341'
```

(continue…)

Reloaded Report

(continued…)

```
SUMMARY OF KEY SEQUENCE ERRORS
          - NUMBER OF RELATED DB RECORDS                                    :            0
          - NUMBER OF THE SEGMENTS DETECTED AS KEY SEQUENCE ERROR           :            0
          - ERROR SEGMENTS SUM TOTAL INCLUDING CHILD SEGMENTS               :            0

          SEGMENT   SEGMENT    SEGMENT           SEGMENTS
          CODE      NAME       HIERARCHY         RELOADED
          -------   --------   ---------------- -----------
                1   ROOTSEG1   1                    250,000
                2   SDEPSEG1    2                   500,000   (SDEP=LOGICAL)
                3   DD102       2                   250,000
                4   DD202       2                   750,000
                5   DD302       2                   500,000
                6   DD303        3                  500,000

          ---------------------------------------------------
          **  TOTAL  **                          2,750,000

  - DATABASE: DEDBJN21 TOTAL

          SEGMENT   SEGMENT    SEGMENT           SEGMENTS
          CODE      NAME       HIERARCHY         RELOADED
          -------   --------   ---------------- -----------
                1   ROOTSEG1   1                    250,000
                2   SDEPSEG1    2                   500,000   (SDEP=LOGICAL)
                3   DD102       2                   250,000
                4   DD202       2                   750,000
                5   DD302       2                   500,000
                6   DD303        3                  500,000

          ---------------------------------------------------
          **  TOTAL  **                          2,750,000
```

Output File Report

- **Segment counts and area totals by the output file ddname**
  - ***File totals and a database total are also provided***
  - ***The area totals should match the area totals in the Reloaded report***

```
IMS HIGH PERFORMANCE FAST PATH UTILITIES - UNLOAD        "Output file report"
5655-K94   V2R1                                  DATE: 08/01/2004   TIME:   7.08.47

 SEGMENT TOTALS BY OUTPUT FILE:

   - FILE DDNAME: OAREA001   DSNAME: IMSVS.HFPUSR.DB21AR0
          (JCL DD ALLOCATION)
   - AREA NO:      1   AREANAME: DB21AR0

            SEGMENT   SEGMENT    SEGMENT           SEGMENTS
            CODE      NAME       HIERARCHY         WRITTEN
            -------   --------   ---------------- -----------
                  1   ROOTSEG1   1                    250,000
                  2   SDEPSEG1    2                   500,000   (SDEP=LOGICAL)
                  3   DD102       2                   250,000
                  4   DD202       2                   750,000
                  5   DD302       2                   500,000
                  6   DD303        3                  500,000

            ---------------------------------------------------
             **   TOTAL   **                          2,750,000
```

(continue…)

Output File Report

(continued…)

```
 - FILE DDNAME: OAREA001 TOTAL

          SEGMENT   SEGMENT    SEGMENT           SEGMENTS
          CODE      NAME       HIERARCHY         WRITTEN
          -------   --------   ---------------- -----------
                1   ROOTSEG1   1                    250,000
                2   SDEPSEG1    2                   500,000   (SDEP=LOGICAL)
                3   DD102       2                   250,000
                4   DD202       2                   750,000
                5   DD302       2                   500,000
                6   DD303        3                  500,000

          ------------------------------------------------------
          **  TOTAL  **                          2,750,000

          ------------------------------------------------------
          *** FILE TOTAL ***                     2,750,000
```

Input File Report

- **Segment counts and area totals by the input file ddname**

```
IMS HIGH PERFORMANCE FAST PATH UTILITIES - RELOAD        "Input file report"
5655-K94   V2R1                                  DATE: 08/01/2004   TIME:   7.22.09


 SEGMENT TOTALS BY INPUT FILE :

   - FILE DDNAME: IAREA001   DSNAME: IMSVS.HFPUSR.DB21AR0
          (JCL DD ALLOCATION)
   - AREA NO:      1   AREANAME: DB21AR0

            SEGMENT   SEGMENT    SEGMENT          SEGMENTS     SEGMENTS     SKIPPED BY
            CODE      NAME       HIERARCHY        READ         RELOADED     KEY ERROR
            -------   --------   ---------------- ------------ ------------ ------------
                  1   ROOTSEG1   1                    250,000      250,000            0
                  2   SDEPSEG1    2                   500,000      500,000            0 (SDEP=LOGICAL)
                  3   DD102       2                   250,000      250,000            0
                  4   DD202       2                   750,000      750,000            0
                  5   DD302       2                   500,000      500,000            0
                  6   DD303        3                  500,000      500,000            0

            ------------------------------------------------------------------------
            **   TOTAL   **                          2,750,000    2,750,000            0

(continue…)
```

Input File Report

(continued…)

```
 - FILE DDNAME: IAREA001 TOTAL

          SEGMENT   SEGMENT    SEGMENT           SEGMENTS     SEGMENTS     SKIPPED BY
          CODE      NAME       HIERARCHY         READ         RELOADED     KEY ERROR
          -------   --------   ---------------- ----------- ----------- -----------
                1   ROOTSEG1   1                    250,000     250,000           0
                2   SDEPSEG1    2                   500,000     500,000           0 (SDEP=LOGICAL)
                3   DD102       2                   250,000     250,000           0
                4   DD202       2                   750,000     750,000           0
                5   DD302       2                   500,000     500,000           0
                6   DD303        3                  500,000     500,000           0

          ------------------------------------------------------------------------
          **  TOTAL  **                          2,750,000   2,750,000           0

          ------------------------------------------------------------------------
          *** FILE TOTAL ***                     2,750,000   2,750,000           0
```

Agenda

- Overview – IMS High Performance Fast Path Utilities
- High Performance Fast Path Reorganization Tool
- **Fast Path Basic Tools – Enhancements**
- Fast Path Online Tools – Enhancements
- Summary
- Q&A

Fast Path Basic Tools

- **DEDB Unload/Reload**
  - *DB AREA dynamically allocated*
  - *Full DBRC interface*
  - *Concurrent initialization and reload of Multiple DEDB Area Data Sets (MADS)*
  - *Includes support for SDEPs*
  - *Allows migration to/from HDAM, HALDB*
  - *Provides an API for reading/writing unload data set*
  - *Image copy data set after reloading*
- **DEDB Pointer Checker**
  - *Includes support for Image Copy data set*
    - Standard Image Copy
    - Image Copy Enhancement
    - IC2
  - *DBRC interaction and Dynamic Allocation*
- **DEDB Tuning Aid**
  - *For predicting effects of a DB change*

Fast Path Basic Tools – DEDB Unload/Reload Aids

- **High performance offline Unload and Reload utilities**
  - *Single or multiple areas concurrently*
- **DEDB Reload Segment Data Set Create utility**
  - *Enables a user application program to create a DEDB reload segment data set*
- **DEDB Unload Segment Data Set Retrieve utility**
  - *Enables a user application program to retrieve unloaded DEDB database segments from the DEDB reload segment data set in hierarchical order*
- **DEDB Unload Conversion utility**
  - *Inserts data from various formats of unload files onto an IMS Full Function or a Fast Path DEDB database*
- **Database Definition Record Create utility**
  - *In case you lose the DB Definition Record (built by unload, needed by reload)*
- **DEDB Randomizing module (FABARMIF)**
  - *Enables an application program to invoke a DEDB randomizer*
    - **Application specifies DBD name and Rootkey**
    - **FABARMIF returns AREA number and RAP CI address (and UOW number)**

Enhancements from FPB V1R2 GA

- **Produce LARGEST DATABASE RECORDS REPORT** (PQ58683)
- **Produce UOW range records in History2 DD by DEDB PC** (PQ80775)
- **Return code enhancement support** (PQ83614)
- **Site Default support for DEDB PC (FABADA1) and DEDB UR (Unload/Reload)** (PQ65931, PQ66084)
- **Provide IMSDALIB DD for DEDB PC and DEDB UR** (PQ89848)
- **Ignore pointer and key sequence errors, and continue with the unload/reload process** (PQ61155, PQ69196,PQ71615,PQ71985)
- **SDEP enhancements**
  - ***Relocate SDEP to make the expanded SDEP space immediately usable when SDEP=PHYSICAL*** (PQ78601)
  - ***UNLOAD/RELOAD with SDEP=PHYSICAL accompanied by DBD change*** (PQ79080)
- **Place certain segments into overflow CIs including IOVF** (PQ91752)
- **Support HD UNLDREC for HALDB by FABCUR9** (PQ81259)

Largest Database Records Report for DEDB PC

- **Largest database records report provides a description of each large database record, beginning with the largest.**

```
IMS HPFP UTILITIES - DEDBPC                          "LARGEST DATABASE RECORDS"              PAGE:     1
5655-K94                                           DATE: 08/03/2004  TIME: 11.47.22       FABADA5  - V2.R1
DBDNAME: DEDBJN22   KEY LENGTH:   6

RECORD SIZE # OF SEG'S AREANAME AREA# ROOT RBA  RAP#   RAP RBA  ROOT SEGMENT SEQUENCE FIELD (HEX) (CHARACTER)

----------- ---------- -------- ----- -------- -----  --------  --------------------------------- *----------------*

        112          1 DB22AR1      2 00000808     0  00000800  10220100 0000                     *                *
        112          1 DB22AR1      2 00000878     0  00000800  10220100 0100                     *                *
        112          1 DB22AR1      2 000008E8     0  00000800  10220100 0200                     *                *
        112          1 DB22AR1      2 00000958     0  00000800  10220100 0300                     *                *
        112          1 DB22AR1      2 000009C8     0  00000800  10220100 0400                     *                *
        112          1 DB22AR1      2 00000A38     0  00000800  10220100 0500                     *                *
        112          1 DB22AR1      2 00000AA8     0  00000800  10220100 0600                     *                *
        112          1 DB22AR1      2 00000B18     0  00000800  10220100 0700                     *                *
        112          1 DB22AR1      2 00001808     0  00000800  10220100 0800                     *                *
        112          1 DB22AR1      2 00001878     0  00000800  10220100 0900                     *                *
        112          1 DB22AR1      2 000018E8     0  00000800  10220100 0A00                     *                *
        112          1 DB22AR1      2 00001958     0  00000800  10220100 0B00                     *                *
        112          1 DB22AR1      2 000019C8     0  00000800  10220100 0C00                     *                *
        112          1 DB22AR1      2 00001A38     0  00000800  10220100 0D00                     *                *
        112          1 DB22AR1      2 00001AA8     0  00000800  10220100 0E00                     *                *
```

UOW Range Records in History2 DD for DEDB PC

- **Provides the History2 records that is totaled by UOW range.**
- **Enables you to do statistical and trend analysis**

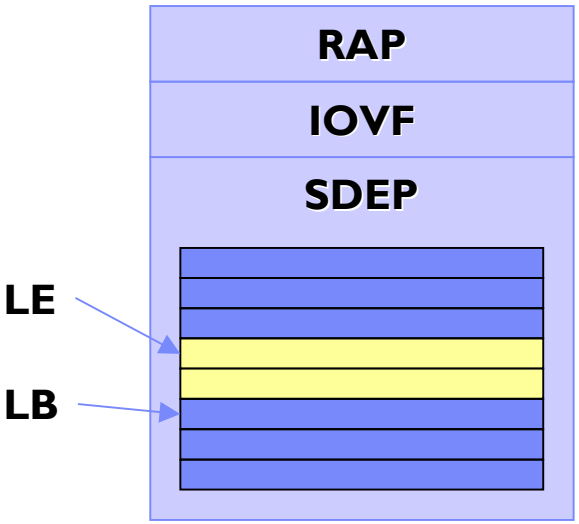
Site Default for DEDB PC and DEDB UR

- **Support Tools**
  - *DEDB PC: FABADA1*
  - *DEDB Unload: FABCUR1*
  - *DEDB Reload: FABCUR3*
- **Change some or all keyword without specifying the keywords in the JCL**
- **Sample assemble JCL SYSIN**

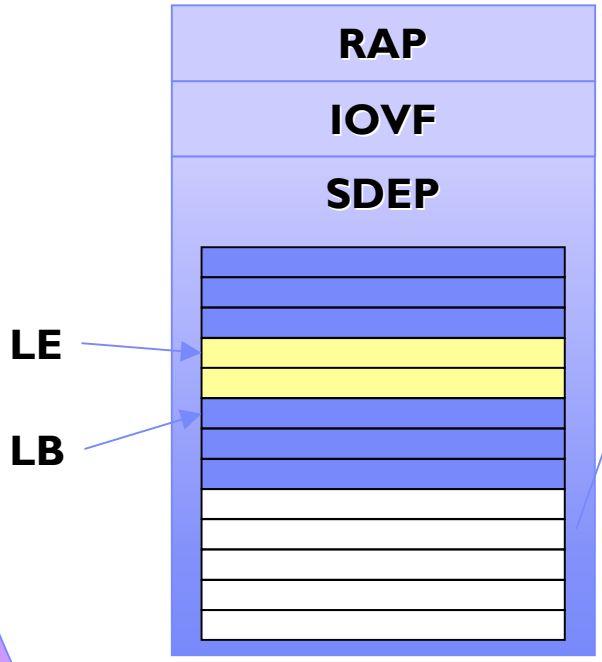
```
//ASM.SYSIN     DD *
          FABCOP1M  TYPERUN=REORG,DBRC=YES,STATS=YES,COMPRESS=YES,       X
                SDEP=LOGICAL,ACCESS=VSAM,PAD=X'40',FORMAT=TFMT,          X
                PTRERROR=BYPASS
          END
/*
```

SDEP Enhancements

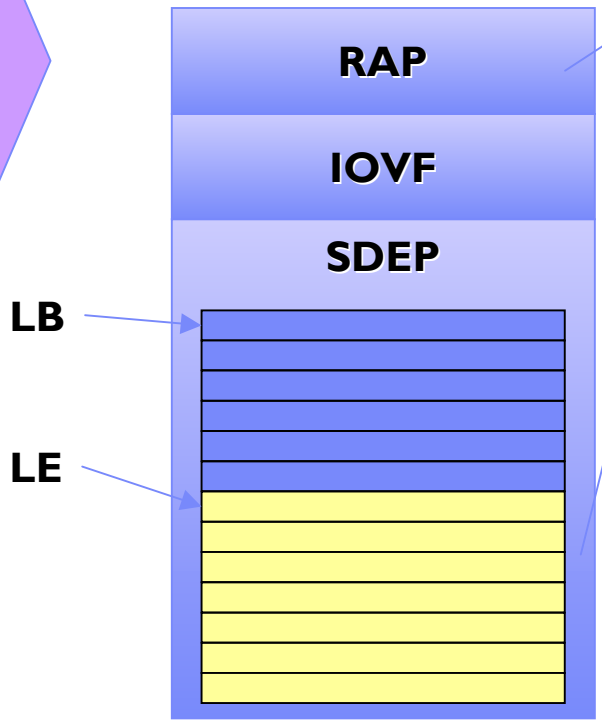
SDEP = PHYSICAL



Unload/Reload with expanding SDEP size



Before enhancement : expanded CI's are not available



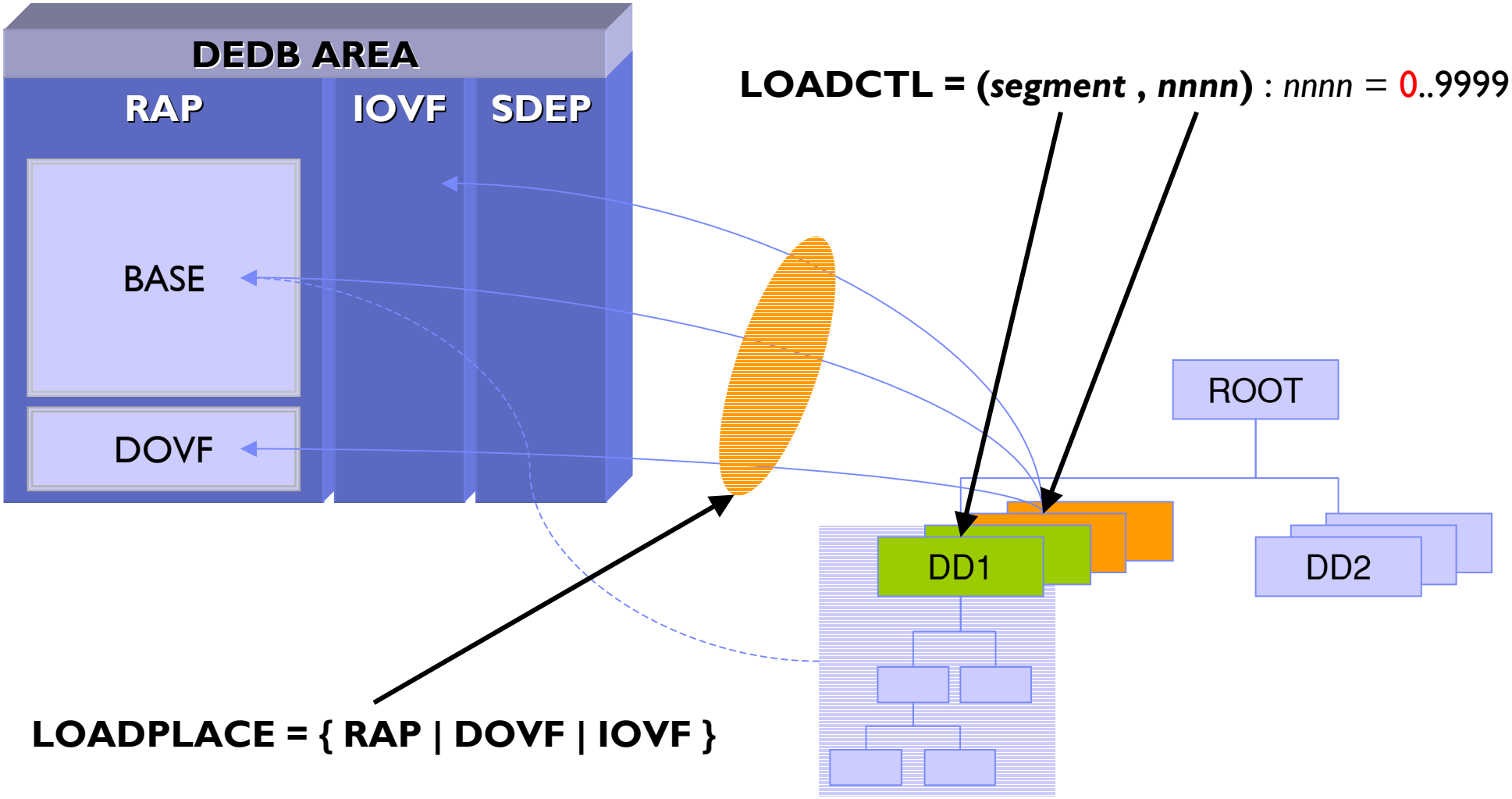
With enhancement : RAP/IOVF sizes can be changed

With enhancement : expanded CI's become available

SDEPRELOCATE = { YES | NO }

Place Certain Segments into Overflow CIs including IOVF

- The LOADCTL=(segment,nnnn) supports nnnn=0 which specifies that all specified segments are placed "far" from their root.



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Fast Path Online Tools

- Allows key functions to be performed without having to take DEDB AREAs offline
- Used in conjunction with the Fast Path Basic Tools

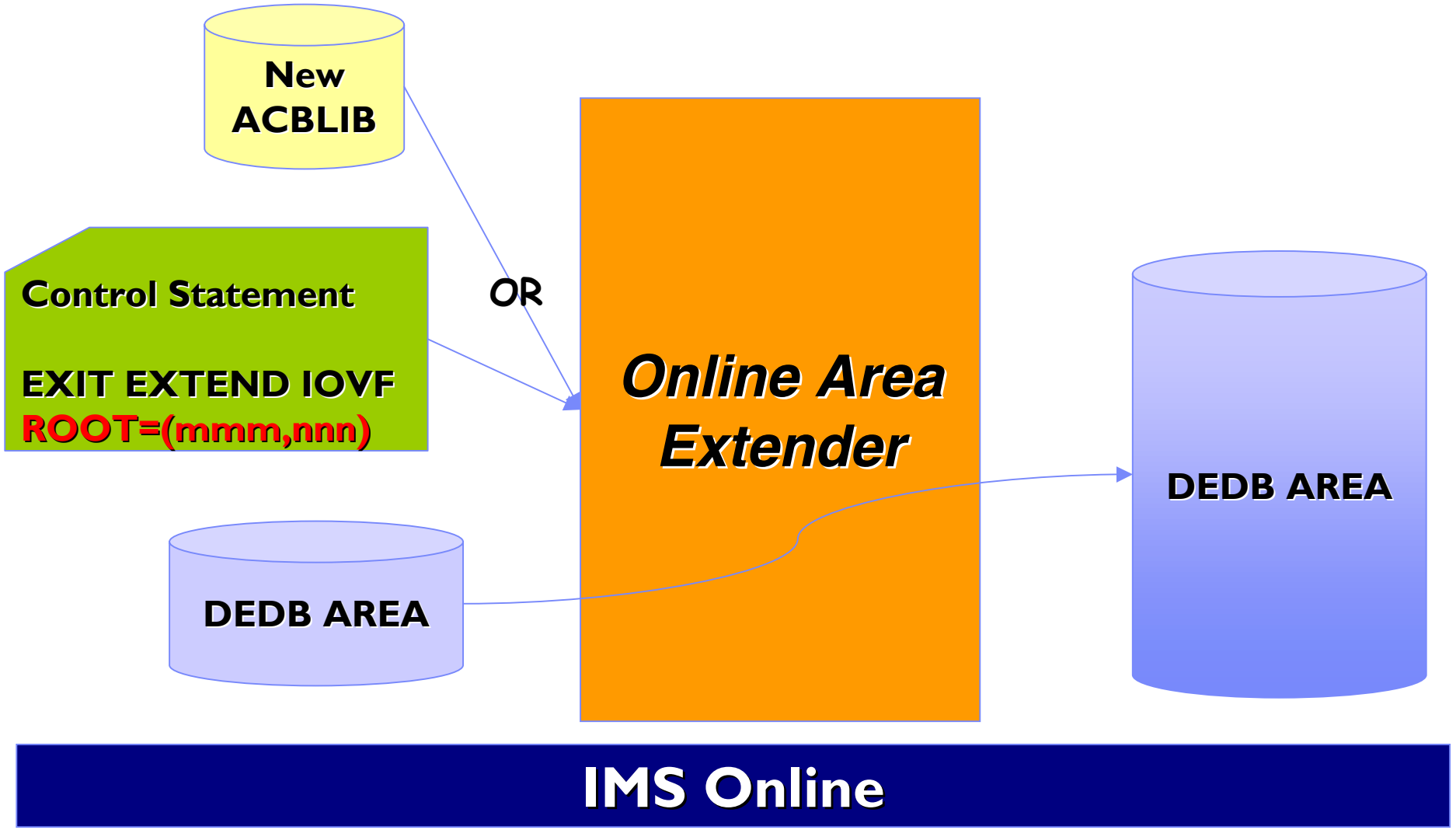
Fast Path Online Tools

- **Online Pointer Checker**
  - *Runs in a Fast Path Utility dependent region*
  - *Produces report of pointer errors (choice of fast scan or in-depth analysis)*
  - *Optionally creates set of sequential files which are input to DEDB Pointer Checker (or DEDB Tuning Aid) for space usage analysis, etc*
  - *Optionally creates a Concurrent Image Copy*
- **Online Data Extract**
  - *Easy-to-use, flexible tool for extracting data for data reporting and populating test databases*
  - *Runs in a Fast Path Utility dependent region*
  - *Extraction criteria allows one or more tests of segment data at multiple locations*
  - *Can write to file in DEDB Unload/Reload Utility format*
- **Online Area Extender**
  - *Enables increasing size of the SDEP part or IOVF (if no SDEP part) while the area is online*

Enhancements from FPO V2 GA

- **OPC: Return code enhancement support** (PQ82062)
- **ODE: New parameter to extract segments and its associated OUTPUT SEG=(SEG_NAME,PARM)** (PQ63823)
- **ODE: Provide feature to extract SDEP segments hierarchically** (PQ80001)
- **OAE: Expand the area with the control card that is not ACBLIB** (PQ90898)

OAE: Expand the area with the control card not ACBLIB



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Summary

- **High Performance Fast Path Utilities for z/OS**
  - *New Utilities for Fast Path Database from IBM*
  - *GA in September, 2004*
  - *High Performance Fast Path Reorganization Tool*
    - **Enhanced DEDB Unload/Reload**
  - *Fast Path Basic Tools*
    - **DEDB Unload/Reload and related batch utilities**
    - **Pointer Checking and space reporting**
    - **Tuning Aid to evaluate effects of potential DEDB changes**
  - *Fast Path Online Tools*
    - **Online pointer checking and space monitoring**
    - **Online data extraction for application use or creation of test databases**
    - **Online extension of areas**

Product Information

DB2 and IMS Tools

http://www.ibm.com/software/data/db2imstools/

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Thank You !

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