S 30

IMS Fastpath Tool Pack Enhancements

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Agenda

- IMS FastPath Basic Tools for OS/390
  - DBT V3 DEDB Unload/Reload enhancements
  - DBT V3 Pointer Checker enhancements
- IMS FastPath Online Tools for OS/390
  - Online Data Extract
  - Online Pointer Checker
  - Online Area Extender
- IMS DEDB Fast Recovery

IMS FastPath Basic Tools

- 5655-E30
- Package consists of:
  - DEDB Unload / Reload
  - DEDB Pointer Checker
  - DEDB Tuning Aid

Unload Reload Enhancements

- DBRC support
- ADS dynamic allocation support
- User Exit (compression/expansion) on Unload & Reload
- SDEP support
- FABCUR5
  - Create database definition record dataset (DURDBDFN)
- FABCUR6
  - Application API to create reload file
- FABCUR7
  - Application API to read unload file
- FABCRIMF enhanced
- FABCUR9
  - HDAM/HIDAM to DEDB, DEDB to HDAM/HIDAM conversion aid
  - also DEDB to DEDB, HDAM to HDAM, HIDAM to HIDAM
- Optional new unload file format

Unload Reload Enhancements

- DBRC support
  - Optional (DBRC=Y|N)
    - Default is N
  - Unload verifies:
    - Area not authorized for update
    - Area has no EEQEs
    - Area not RECOVERY NEEDED
    - Area has available ADS
    - If MADS in use, one ADS is selected for use in unload
  - Verification done twice
    - Start of Unload
    - End of Unload
  - MADS support: Reload can reload all registered ADSs
  - Reload verifies
    - Area is RECOVERY NEEDED
  - Reload Completion sets
    - ADS AVAIL
    - RECOVERY NEEDED OFF
    - IC RECOMMENDED ON

Unload Reload Enhancements

- Dynamic Allocation support
  - If DBRC=Y and Area registered
    - ADS DSN selected from DBRC
    - Can override via JCL (DSN must match DBRC)
  - If DBRC=Y and Area non registered
    - ADS DSN obtained from DFSMDA member
    - Can override in JCL
  - If DBRC=N
    - ADS DSN obtained from DFSMDA member
    - Can override in JCL
  - If DBRC=Y, RECONx can be dynamically allocated using DFSMDA members

Unload Reload Enhancements

- User Exit support on Unload & Reload
  - FABCUR1 (Unload)
    - EXITRTN=Exit-name
    - Loaded from EXITRTN DD statement
    - Invoked with EXPAND parameter
  - FABCUR3 (Reload)
    - EXITRTN=(Exit-name, function)
    - Loaded from EXITRTN DD statement
    - Function: EXP, CMP, EXC
      - EXP - Expand
      - CMP - Compress
      - Expand then Compress (call exit twice)
  - Note, this is not the same as the COMPRTN= specification on DBDGEN

Unload Reload Enhancementsb

- SDEP support
  - FABCUR1 (Unload)
    - SDEP = NO|LOGICAL|PHYSICAL
      - Default NO
    - LOGICAL
      - Unload via pointers
      - If root deleted SDEP segment not unloaded
      - segment timestamps reset on Reload
    - PHYSICAL
      - Unload in physical order between LB and LE
      - supports marker segment processing
      - segment timestamps preserved
      - segment unload even if parent root deleted
      - can't change CI Size on reload
      - Compressed SDEP segments not expanded
      - Can expand SDEP portion of the Area on reload

Unload Reload Enhancements

- SDEP support
  - FABCUR3 (Reload)
    - No control card, triggered by SDEP segments in unload file
    - CI format depends on DBD in ACBLIB (NEWACB, OLDACB)
      - Can unload V5 and reload V6 format, or vice versa
      - V6 and higher CI Prefix will show c'FPTOOL ' as subsystem.
    - LOGICAL Reload sets segment timestamps to Logical Begin Timestamp unloaded from DMAC
    - LOGICAL Unload requires SORT before Reload
      - FABCUR1 generates SORT control card
    - LOGICAL reload requires new DURSDWRK DD
      - work file, equal in size to total SDEP segments unloaded
    - PHYSICAL REORG mode only (NEWACB not allowed)
      - (no change to Area Structure)
  - FABCUR6, FABCUR7 (Application read/write UR file)
    - Support SDEP segment type

Unload Reload Enhancements

- FABCUR5
  - Can be used to create a DURDBDFN file from ACBLIB
  - Useful for moving DEDB area between systems
  - Useful for reloading from Online Data Extract file

Unload Reload Enhancements

- FABCUR6
  - Callable application API to create reload file(s)
  - Simple API: three calls
    - INIT
      - Input : DBDNAME
    - PUT
      - Input: SEGMENT NAME, SSP data, SEGMENT DATA
    - EOJ
  - Creates a reload file per Area in DB
  - API compatible with OEM APIs

Unload Reload Enhancements

- FABCUR7
  - Callable application API to read unload file(s)
  - Can read 1 or 2 unload files
  - Simple API: three calls
    - INIT | INID
      - Single or Dual mode
    - GET | GET1 | GET2
      - Single mode or GET from file1|2
      - Returns segment data, status code, segment information (type, rootkey, etc)
    - EOJ
  - API compatible with OEM APIs

Unload Reload Enhancements

- FABCUR9
  - Conversion or Migration Aid
    - BMP,DLIBATCH,DBDBATCH
      - BMP required if loading DEDB
    - Accepts both DBT UR formats or HDAM/HIDAM Unload as input
      - HD Unload to DEDB
      - HD Unload to HIDAM or HDAM
      - DEDB Unload to HDAM or HIDAM
      - DEDB Unload to DEDB
    - Remap Segment names, or change Segment RECFM (F|V)
    - Can REPL Segments in existing DB from data in unload file.
    - Can use any PSB with appropriate DB & sensitivity
      - Assembler PSB with COMPAT=N not required
      - Target DB can be anywhere in PSB

Unload Reload Enhancements

- FABCRMIF enhancement
  - API to invoke randomizer from application program
    - including outside of IMS
  - Useful to sequence files, DB2 tables, in RAP order
  - Simple API:
    - INIT call
      - Input DBD name
    - CALC call
      - Input key
      - Output Area# RAP#
  - Requires ACBLIB DD statement in invoking job
  - Enhanced to in DBT V3 to allow up to 16 different DBDs in same job

Unload Reload Enhancements

- New Unload File Format
  - FABCUR1 FMT=TFMT|DBT
  - FMT=TFMT
    - Prefix (SCSQ data) trimmed to minimum for segment level defined in DB.
    - Smaller output file.
    - Compatible with OEM for applications that read unload file natively.
      - Header record (Area Control Record) still present
  - Default is FMT=DBT
  - FABCUR3 detects reload file format automatically

Pointer Checker Enhancements

- DBRC support
- Dynamic Allocation support
- Compatibility change for AREA= keyword
- FABARMIF enhancement

Pointer Checker Enhancements

- DBRC support
  - DBRC=Y|N and FORCE=Y|N
    - Default DBRC=N
  - DBRC=Y Verifies Area:
    - Not authorized for update
    - No EEQEs
    - Not RECOVERY NEEDED
    - Registered DSN vs DARVSAM DD or <area> DD DSN
  - FORCE=Y and DBRC=Y
    - Continue processing if some or all of the above, after issueing an error message
- Dynamic Allocation support
  - Use DFSMDA member if provided
    - ADS and RECONs
  - Not obtained from DBRC

Pointer Checker Enhancements

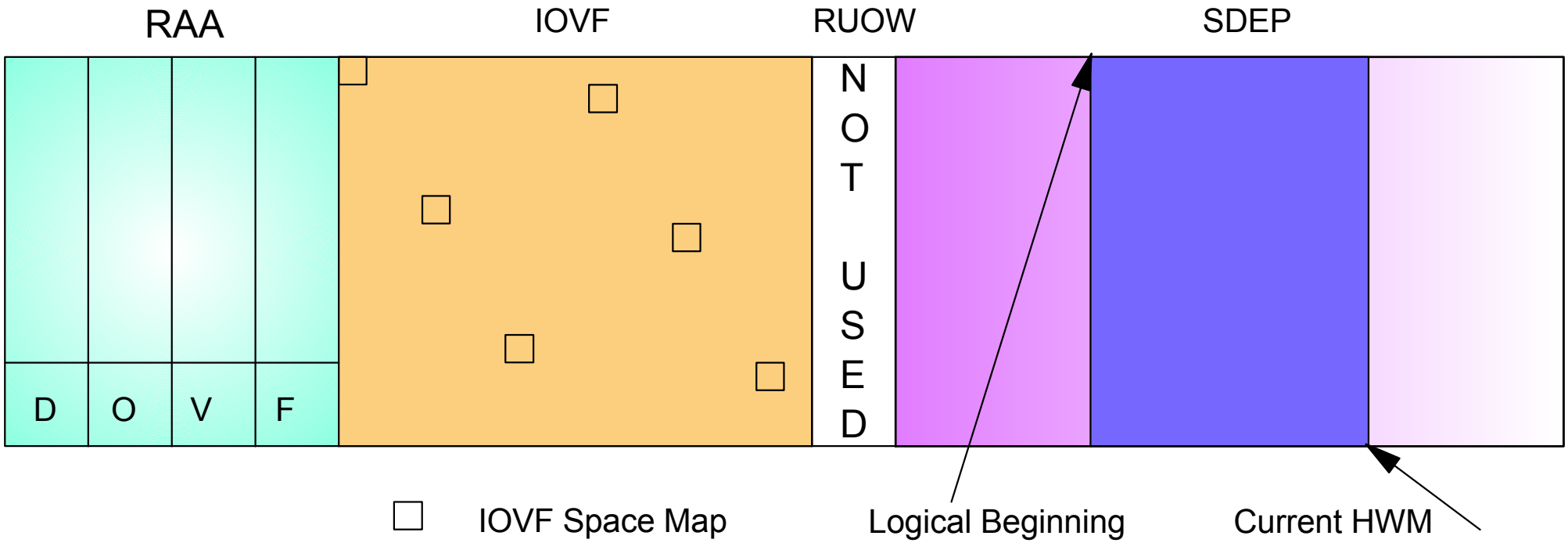
- AREA keyword change
  - VSAM not coded and AREA= coded
    - Image copy input, verified against AREA= value
  - VSAM and AREA= coded
    - ADS input, verified against AREA= value
  - VSAM coded, AREA= not coded
    - ADS input, using Area Name from DMAC of ADS input
  - Neither VSAM nor AREA= coded
    - If DARVSAM coded, ADS input
    - Otherwise, DFSUDUMP expected, Image Copy input
  - Change made for OEM compatibility

- FABARMIF enhancement
  - Support added for up to 16 different DBDs in single run
  - Same as FABCRMIF in Unload/Reload

IMS FastPath Online Tools

- 5655-E31
- IMS FastPath Basic Tools is a prerequiste.
- Package conists of:
  - Online Data Extract
  - Online Pointer Checker
  - Online Area Extender

Area Layout



Online Data Extract

- Select and extract data from online DEDB area
  - Selection by
    - Segment name
    - Segment name and offset, length, data comparator
    - Selection is hierarchical
      - If higher level segment qualifed, qualification must match for lower level segments to be considered
    - SDEP segment type is supported
  - Output
    - Entire segment
    - Segment fragments by offset, length
    - Mutiple output file formats
      - Standard
      - Both DBT Unload | Reload formats
      - Format suitable for sort on root key

Online Data Extract

- Runs as IFP Utility region
  - TYPE TOOL
  - EXITNAME EXTRACT
- Uses IMS Services to read and lock data
  - UOW mode locking
  - SHR locks only
  - Reads entire UOW in one operation
    - Locks held while pointer chains followed
    - IOVF CIs read individually as required
- Guarantees consistent view of data being updated concurrently by online work

Online Data Extract

- Multiple Area processing
  - Can process multiple areas serially in single utility run
    - Same as other IFP utilites (SCAN, DELETE, HSREORG)
  - Output can be combined into a single output file, or can be written to a unique file per Area processed.
  - Control statements (SELECT, OUTPUT) can be specified at the run level or at the area level.
    - Area level requires a separate input file per Area
    - Input file DDNAME = Area Name
  - Unload | Reload format output requires separate output file per area

Online Data Extract

- SDEP Processing
  - Similar to SDEP Scan
  - Pointer chains NOT used
    - Root does not have to match SELECT criteria
    - Root may not even exist (deleted).
  - Can select by timestamp
    - Can recover from SDEP processing errors by extracting logically deleted SDEPs (if not yet overwritten).
    - Default timestamp is Area Logical_Begin_Timestamp so normally deleted SDEPs not extracted.
  - Considerations:
    - SDEP segments written at end of extract file, not immediately following the root
    - Not supported for DBT UR output format

Online Data Extract

- Compression Exit support
  - EXPAND=Y|N
    - Y = Segment expanded prior to applying select criteria, and segment, or segment fragment, expanded in ouput file.
    - N = Segment not expanded. Can still select by compressed value if desired.
  - Exit must be loadable via STEPLIB
  - Exit can't use or depend on IMS Control Region services or control blocks.
  - Exit only required if a compressed segment is selected for evaluation and EXPAND=Y.
    - Don't require exit to navigate segment hierarchy

Online Data Extract

- Optimzed access via Randomizer
  - If root segment SELECT is qualified, and qualification is EQ compare on root key
  - Randomizer used to determine and limit UOWs read
  - Randomizer load module not required in STEPLIB.
    - IMS's copy of the randomizer is used.
    - Ensures same randomizer in effect.
    - Randomizer can't use IMS services or access IMS control blocks other than MMRB as documented in Customization Guide.

Online Data Extract

- Security
  - RACF validation
    - CLASS(IMSTODE)
    - ENTITY(imsid.dbname.areaname)
    - ATTR=READ

Online Data Extract

- Application I/O Interface Routine FPXGXDR0
  - Isolate application programs which read ODE output file from knowledge of ODE file format and future changes
  - Supports up to 9 ODE files
  - "DL/I like" interface
    - INIT | INIx
    - GET | GETx
    - EOJ | EOJx
  - API similar to existing OEM product
  - FPXGXDR0 is driver that actually invokes FPXGXDR1
    - No future need to relink if FPXGXDR1 changes

Online Data Extract

```
//IFP.SYSIN DD *
   TYPE  TOOL
   AREA  ACCOUNT1
   EXIT    EXTRACT
   GO
/*
//FPXCTL DD *
  FPXCTL OUTPUT=STD,EXPAND=YES,OFILE=FILE1
  SELECT SEG=ACCOUNT,FIELDS=(1,6,GT,X'000999')
  SELECT SEG=BALANCE,FIELDS=(1,3,GE,X'0010000C')
  OUTPUT SEG=NAME,FIELDS=(1,20,25,5)

//FILE1 DD DSN=EXTRACT.OUTPUT.FILE
```

Online Data Extract

```
//IFP.SYSIN DD *
   TYPE  TOOL
   AREA  ACCOUNT1
   EXIT   EXTRACT
   GO
   AREA  ACCOUNT2
   EXIT   EXTRACT
   GO
/*
//FPXCTL DD *
  FPXCTL OUTPUT=STD,EXPAND=YES,OFILE=FILE1
  SELECT SEG=ACCOUNT,FIELDS=(1,6,GT,X'000999')
  SELECT SEG=BALANCE,FIELDS=(1,3,GE,X'0010000C')
  OUTPUT SEG=NAME,FIELDS=(1,20,25,5)

//FILE1 DD DSN=EXTRACT.OUTPUT.FILE
```

Online Data Extract

```
//IFP.SYSIN DD *
   TYPE  TOOL
   AREA  ACCOUNT1
   EXIT   EXTRACT
   GO
   AREA  ACCOUNT2
   EXIT   EXTRACT
   GO
/*
//ACCOUNT1 DD *
  FPXCTL OUTPUT=STD,EXPAND=YES,OFILE=ACC1
  SELECT SEG=ACCOUNT,FIELDS=(1,6,GT,X'000999')
  SELECT SEG=BALANCE,FIELDS=(1,3,GE,X'0010000C')
  OUTPUT SEG=NAME,FIELDS=(1,20,25,5)
//ACCOUNT2 DD *
  FPXCTL OUTPUT=STD,EXPAND=YES,OFILE=ACC2..
  <etc>
//ACC1 DD DSN=EXTRACT.OUTPUT.ACCOUNT1.FILE
//ACC2 DD DSN=EXTRACT.OUTPUT.ACCOUNT2.FILE
```

Online Data Extract

```
SELECT SEG=*

SELECT SEG=MYSEG,FIELDS=(1,2,EQ,C'ME'),ANDFIELD,
  (10,1,EQ,C'Y'),ANDFIELD,(15,2,EQ,X'0000')

SELECT SEG=BALANCE

SELECT SEG=MYSEG,STOPAFT=5
SELECT SEG=MYSEG,SKIP=10,STOPAFT=5
SELECT SEG=MYSEG,EVERY=2

SELECT SEG=MYSDEP,FIELDS=(1,2,EQ,C'AA'),
   AFTERTIME=X'B4D7B2D3A37792B2'

   AFTERTIME=yyyy.ddd.hh.mm.ss.t
```

Online Data Extract

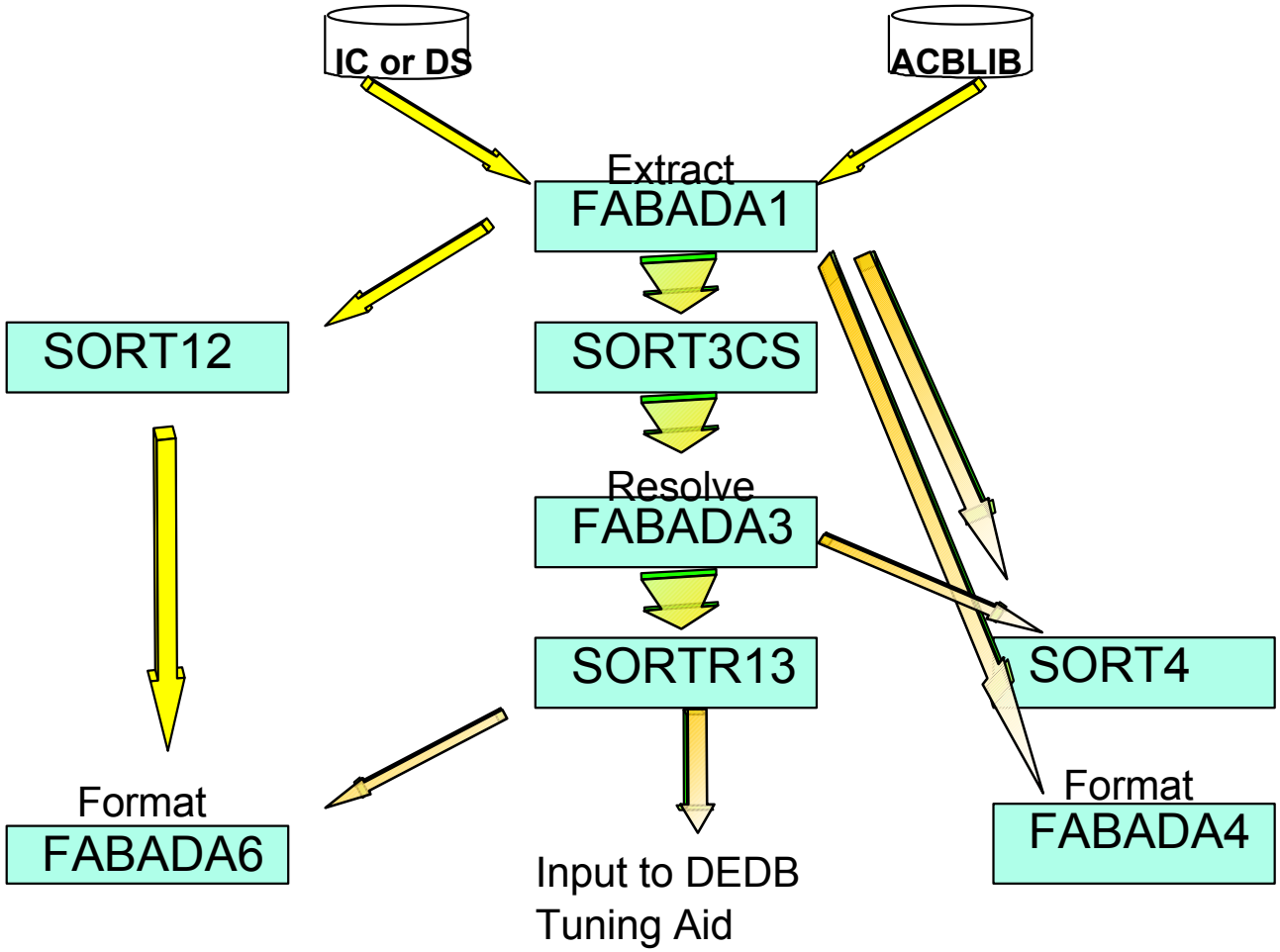
```
OUTPUT SEG=*

OUTPUT SEG=MYSEG,FIELDS=(1,2,10,5,20,2)

OUTPUT SEG=MYSEG
```

```
---------------------------------------------------------------------------------
 FPXCTL INDOUBT=YES   <extract InDoubt SDEP segments>
        IOVFPOOL=nn    <IOVF Pool size>
        OFILE=filename   <output file name, default FPXOFILE>
        OUTPUT = UR|STD|SORT
```

Online Data Extract

- DBT Reload considerations
  - DURDBDFN dataset required
    - can be created by FABCUR5 utility (FP Basic Tools)
  - No SDEP support

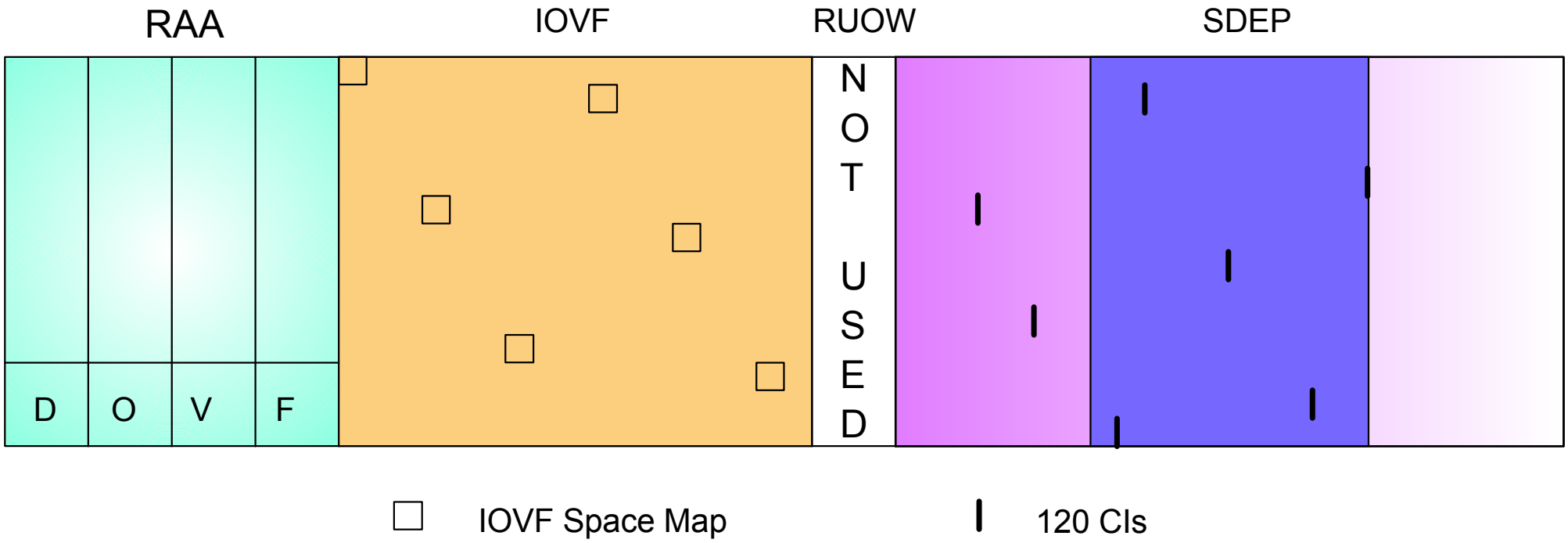
DBT Pointer Checker Suite Flow



Online Pointer Checker

- Extension of FP Basic Tools Pointer Checker and Tuning Aid
  - Collect data online for offline processing by FP Basic Tools Pointer Checker and|or Tuning Aid
- Quick verification of DB integrity
  - PTRSCAN option. No DBT records created.
- Create Image Copy while validating DB
  - DBRC registration optional
  - "fuzzy" (Concurrent) type Image Copy
- SNAP up to 10 error CIs to DD SNAPPIT
  - automatic if DD statement present

Area Layout



Online Pointer Checker

- PTRSCAN mode
  - Fast scan of Area Integrity
    - Checksum
    - Follows Pointer Chains
  - Can be combined with Image Copy
  - Processing logic
    - Reads all RAA UOWs and attempts to follow pointer chain, including reading IOVF CIs as required.
    - Reads all IOVF CIs in space map range blocks (120 CIs)
      - Space map CI SHR lock allows validation of freespace chains in IOVF CIs. Lock held only during read of remaining 119 CIs.
    - SDEP CIs read in larger of UOW or 120 CI blocks
      - Only if SDEP keyword specified
      - Segments deblocked and analyzed
    - Additionally, all CIs read are validated for
      - CI type code, CIDF/RDF
      - Freespace to segment overlaps

PTRSCAN Output - Pt 1

```
FPX0039I Starting Online Fast Path utility processing:
 (cont)    AREA name = DB23AR1    AREA number = ******2
FPX0073I                                  Area Analysis Report
FPX0073I Run Date/Time       2000.278/16:40:03.13
FPX0073I DBD Name           DEDBJN23
FPX0073I Area Name          DB23AR1
FPX0073I Randomizer Name     RMOD4
FPX0073I Area ID                2
FPX0073I CI Size              2048 (x'0800')
FPX0073I CIs per UOW             3
FPX0073I RAPs per UOW            2
FPX0073I DOVF CIs per UOW        1
FPX0073I Number of UOWs          1
FPX0073I Total RAPs in Area      2
FPX0073I Total RAPs in DB      272
FPX0073I IOVF Space Map CIs      1
FPX0073I Total IOVF CIs          3
FPX0073I Free IOVF CIs           2
FPX0073I RAA RBA Range    x'00001000' to x'00002800'
FPX0073I IOVF RBA Range   x'00002800' to x'00004000'
FPX0073I REORG UOW Range  x'00004000' to x'00005800'
FPX0073I End of Area RBA  x'0000A800'
FPX0073I No SDEP Segment Defined.
FPX0073I Segments Defined      127
FPX0073I Hierarchial Levels    15
FPX0073I Maximum IOA Length    900
FPX0073I Area is not using VSO.
```

PTRSCAN Output - Pt 2

```
FPX0054I Area level statistics:
        Segment   Segment    Segment          Segments
        Code      Name       Hierarchy        Read
          1     ROOTSEG1   1                  10
          2     DD1        2                  3
          3     DD2        2                  3
          4     DD3        2                  3
          5     DD4        2                  3
          6     DD43       3                  0
          7     DD44       4                  0
    < ---------------------------------------------------------->
        125     DDA314              14         0
        126     DDA315              15         0
        127     DDA4       2                  0
                                    --------
                                      34
      PTRSCAN detected errors:        0
DFS2657I UTILITY EXECUTED AS REQUESTED
FPX0049I TYPRUN=PTRSCAN
FPX0049I  SDEP
FPX0049I  STAT
```

PTRSCAN Output - Pt 3

Example error sets

FPX0061E -> Severe Error:
FPX0061E Bad scrap bytes detected in CI.
FPX0061E RBA of error CI: 00002000
FPX0061E Hex offset in CI: 000007F2

FPX0061E -> Serious Error:
FPX0061E Sequence error in dependent segment twin chain.
FPX0061E Source SC 01 Name A1111111 RBA 0000106A
FPX0061E Target SC 01 Name A1111111 RBA 0000848E
FPX0061E Previous twin key value:
FPX0061E C1F0F6F0F0F0F0F5F1F1
FPX0061E Current twin key value:
FPX0061E C1F0F6F0F0F0F0F3F9F0

Online Pointer Checker

- PTRSCAN mode
  - Partial Analysis possible with STARTUOW STOPUOW
  - Errors written to report file
  - Condition Code 4 if any errors detected
  - MAXERROR option
    - STOP or ABEND after MAXERROR errors detected
    - Default 100.
  - ERRORACT option
    - STOP or ABEND when MAXERROR errors detected.
  - Image Copy
    - If any errors detected, DBRC registration of Image Copy will be bypassed.
    - For routine use, suggest MAXERROR=1 and ERRORACT ABEND
      - Ensures you will be aware of any pointer errors
    - Not valid with STARTUOW STOPUOW

Online Pointer Checker

- PTRSCAN errors detected:
  - Pointer RBA invalid (outside valid numeric ranges)
  - CI Type code invalid
  - Data at pointer RBA not expected segment type
  - Physical Child Last pointer not pointing at last child
  - Root to SDEP pointer outside SDEP RBA range
  - Twin key not ascending
  - Invalid subset pointer
  - Access to an IOVF CI from more than one UOW
  - V5 SDEP CI (warning)
  - SDEP CI full bit not set (warning)
  - InDoubt SDEP segment
  - SDEP CI FSEOF error (not pointing after last segment)
  - IOVF CI ownership error
  - Checksum error
  - CIDF or RDF error

Online Pointer Checker

- IMAGE COPY
  - Image Copy is treated as Concurrent Copy
    - Same file format
  - DBRC registration supported
    - Will not occur if any pointer errors detected.
    - DBRC=Y|N
    - Requires RECONx DD statements in JCL or DFSMDA members in STEPLIB
  - Dual Image Copy output supported

Online Pointer Checker

- SECURITY
  - RACF VALIDATION
    - CLASS(IMSTOPC)
    - ENTITY(imsid.dbname.areaname)
    - ATTR=READ

Online Pointer Checker

- Interface to FP Basic Tools Pointer Checker and Tuning Aid
  - OPC creates the same records as FABADA1
    - Detailed pointer analysis
    - Detailed freespace analysis
    - PTRSCAN function always performed
    - FABADAx invoked offline
    - Image Copy valid with any of these options
    - SDEP keyword if SDEP integrity is to be checked
  - TYPRUN=PTRALL
    - Produce records for detailed pointer checking
  - TYPRUN=FS
    - Produce records for freespace analysis
  - TYPRUN=RPT
    - Function of both PTRALL and FS
  - TYPRUN=MODEL
    - Same as RPT, but root key appended to all records for use by DBT DEDB Tuning Aid

Online Pointer Checker

- AREA REORG Considerations
  - FP Basic Tool Pack Tuning Aid can create Partial Reorg control cards for standard IMS DEDB Online Reorg
    - Based on OPC Input
  - STARTUOW STOPUOW cards

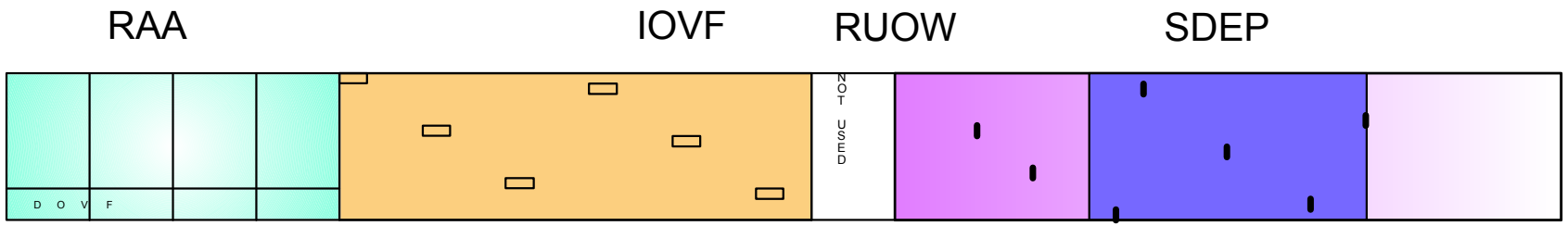
Online Area Extender

New function in FP Online Tools V2 R1

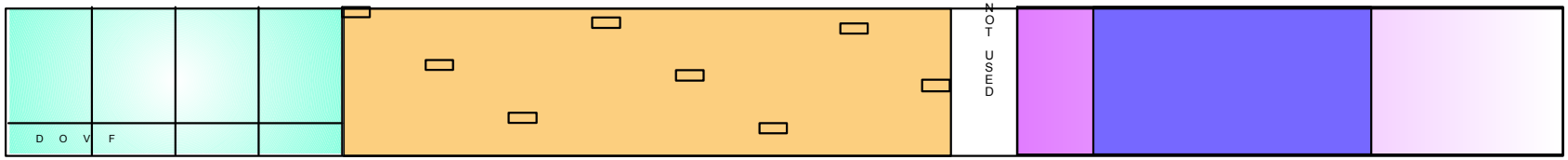
- Extend IOVF Space, SDep Space
  - or Both
- DBs must be DBRC Registered
  - Add new MADSs to Registration
- Concurrent with Online Activity
  - Enhances Availability
- Exploits MADS Functionality
  - 1 to 6 copies in, 6 to 1 copies out
  - max 7 copies at a time
- Must not Overlay "live" SDeps !
  - "Available" SDep CIs Cannibalised
  - RUOW Retained for Compatibility

Online Area Extender

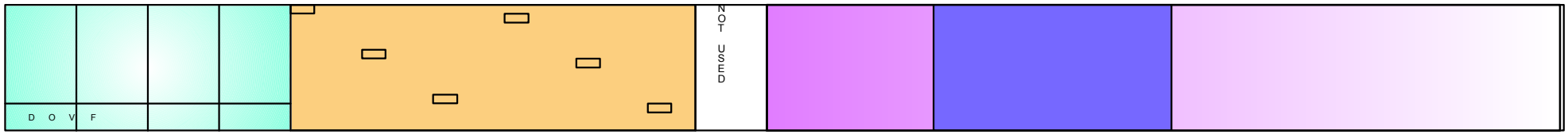
Area Layout



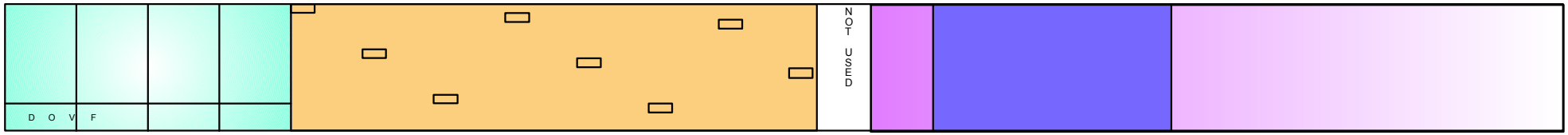
Base



IOVF Expansion

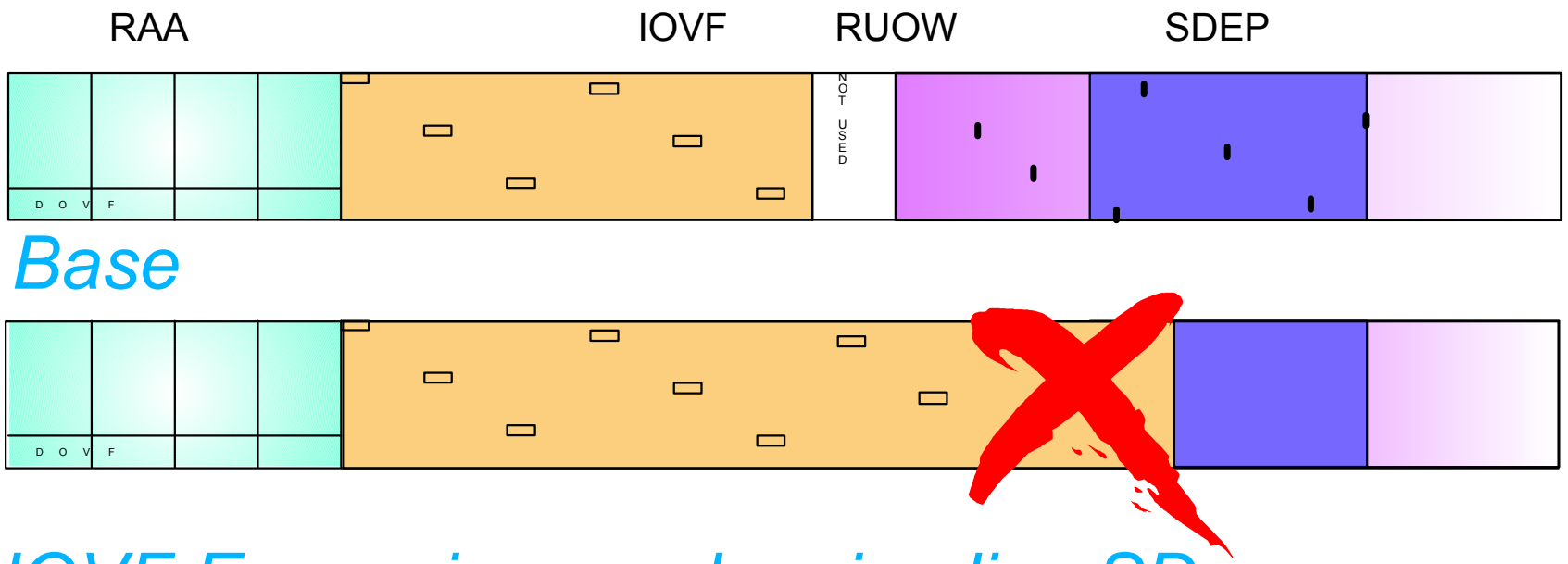


SDep Expansion



Both

Online Area Extender



Base

IOVF Expansion overlapping live SDeps

➡ *Use SCAN / DELETE to free up space*

Online Area Extender

Consistent with IMS functions

- Data Sharing
- MADS
- EQE
- EEQE

Not Supported with RSR Registered DBs

VSO Areas must Revert to DASD (/VUNLOAD)

Utility can be Restarted

Extension Cannot be Reversed

Online Area Extender - Steps

Allocate larger area data sets (ADS)

Register the new ADS as UNAVAIL with DBRC

For IOVF extension only:

- Change the ROOT parm in the DBDs

  AREA DD1=XX,SIZE=2048,UOW=(64,14),ROOT=(936,36)

  Increase number2 (936) and overflow2 (36) by the same amount
- Run DBDGEN and ACBGEN

Run the SDEP SCAN / DELETE utilities if necessary

Remove the area from VSO if applicable

Set up JCL and control statements to run Online Area Extender

Submit the JCL and control statements

Post-execution Steps

Switch to the ACBLIB containing the new DEDB member

- Required Before Second IOVF Extension
- IMS will function correctly with "discovered" DB characteristics

Reload the area into VSO if applicable

Online Area Extender

Control Statements

EXIT EXTEND - Utility function
- IOVF or SDEP - IOVF needs ACBLIB
- TEST - validate requested function
  - output statistics for "new" Area
- SDEPWARN - message and termination if SDep portion reduced
- RESTART - if appropriate

GO - execute the function

Online Area Extender

Statistics

FPX 99I Online Area Extender statistics:

Original Area Datasets

DDNames	Dataset Names
DB21AR11	DB21AR11
DB21AR12	DB21AR12

Extended Area Datasets

DDNames	Dataset Names
DB21AR13	DB21AR13
DB21AR14	DB21AR14

Online Area Extender

	Original Area Datasets	Extended Area Datasets
New RAP and IOVF Size	5,12	
Min.allocated Area Size	75,264	
First SDEP RBA (HEX)	00001800	
Oldest SDEP RBA (HEX)	00007200	
Next Aval.SDEP RBA (HEX)	00009200	
Area Dataset Size	50,176	75,264
CI Size	512	512
CIs/UOW	2	2
DOVF CIs/UOW	1	1
RAP Size (BLKS)	2	2
RAP Size (Bytes)	1,024	1,024
First IOVF CI #	4	4
#of Space Map CIs	1	1
IOVF Usable Size (BLKS)	1	5
IOVF Usable Size (BYTES)	512	2,560
IOVF Size Change (BLKS)		4
First Reorg CI #	6	10
First SDEP CI #	8	12
SDEP Size (BLKS)	90	135
SDEP Size (Bytes)	46,080	69,120
SDEP Size Change (BLKS)	INCREASE	45

Online Area Extender

- Security
  - RACF validation
    - CLASS(IMSTOAE)
    - ENTITY(imsid.dbname.areaname)
    - ATTR=UPDATE

DEDB Fast Recovery

- 5655-E32
- Separate Product
  - Handle /ERE or IMS FDBRfailures
  - Reapply DEDB updates from last checkpoint to log EOF
    - Same processing as Emergency Restart
  - Supports datasharing, VSO, SDEPs
  - Also recovers MSDBs
- Potentially, save large outage while Areas recovered offline

Software Prereqs

- IMS FastPath Basic Tools for OS/390
  - Supports IMS V5, IMS V6, IMS V7
- IMS FastPath Online Tools for OS/390
  - Supports IMS V6 and IMS V7
  - Enabling APAR required:
    - V6: PQ34416
    - V7: PQ34417

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