IBM Software Group

IMS08

IMS V8 Overview
Part I: Base Enhancements (non-CSL)

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ON DEMAND BUSINESS™

Agenda

- Base Enhancements
  - DBRC
  - Image Copy 2
  - Syntax Checker
  - DEDB
  - And more ...
- Parallel Sysplex enhancements
  - System-managed processes
  - Shared queues

Some Key Dates

Product	Date	Announcement Letter
IMS V9 (5655-J38)	**October 29, 2004**	**ZP04-0409 IMS V9 GA**
IMS V8 (5655-C56)	**October 25, 2002**	**ZP02-0447 IMS V8 GA**
IMS V7 (5655-B01)	**September 8, 2004** *August 3, 2004*	 **ZP04-0249 IMS V7 Withdrawn from Marketing** *ZP04-0312 Withdrawal from Service announced for* ***November 8, 2005***
IMS V6 (5655-158)	**September 4, 2002** *September 30, 2003*	**ZP02-0255 IMS V6 Withdrawn from Marketing** *ZP02-0343 IMS V6 Withdrawn from Service*

DBRC - 16MB RECON Record Size

Large maximum record sizes may be needed to extend IMS continuous availability

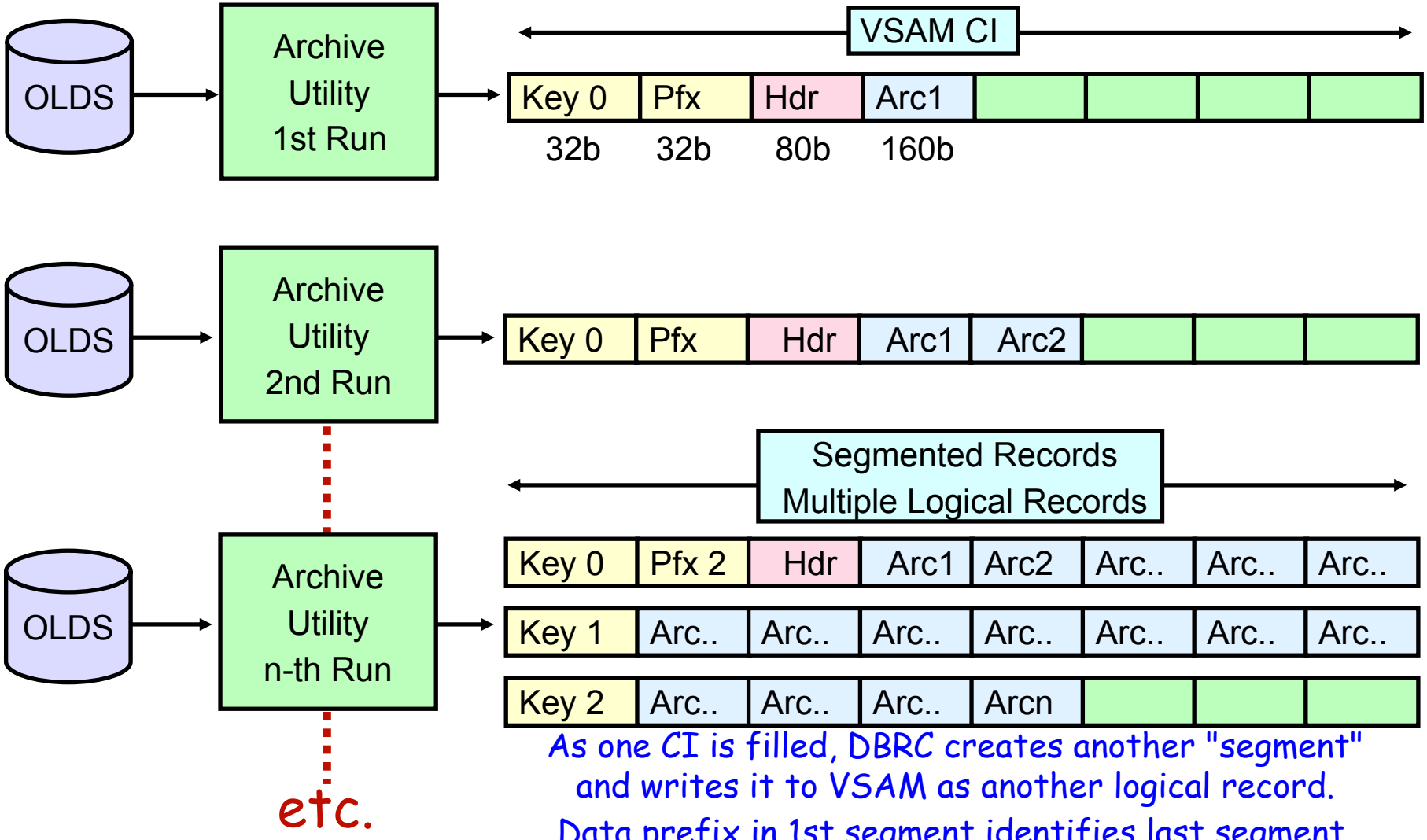
- Pre-V8 used VSAM *spanned* records
  - Maximum size limited to Control Area size
- Prevented RECON backup to tape if >32K
  - Now possible with BACKUP.RECON and tape blocksizes > 32K
- Warning message DSP0278W - then U0071 if not corrected
  - LOGALERT and SIZALERT provide warnings

IMS V8 uses *"segmented"* records instead of VSAM spanned records

- Controlled by IMS
  - Not limited by VSAM maximum record size or control area size
- Records are divided into multiple segments - 1/CI
  - Last two bytes of KEY is Segment #
  - First segment contains DATA PREFIX with last Segment #
- Maximum total size of all segments - 16MB
  - *Over 100,000 single volume archived data sets*

DBRC - 16MB RECON Record Size ...

RECONs may be defined to VSAM without spanned records



As one CI is filled, DBRC creates another "segment" and writes it to VSAM as another logical record.
Data prefix in 1st segment identifies last segment.

DBRC - 16MB RECON Record Size ...

Migration considerations

- IMS V8 supports RECONs with differing CI/record sizes
  - Can change one RECON at a time
  - Not recommended to be permanent
    - Requires additional overhead for segmenting
- RECON I/O Exit (DSPCEXT0)
  - Complete unsegmented record passed to exit
    - May be much larger than before (up to 16MB)
    - Length passed in standard parameter list
- *May want to adjust LOGALERT and SIZALERT*
  - Based on 16MB size - not VSAM maximum record size
- LIST.RECON displays current PRILOG record size
- SPEs available for V6 and V7
  - Will read and write segmented records, but ...
  - Still limited to maximum record size specified to VSAM
  - CI and logical record sizes must still be the same for all RECONs

DBRC - PRILOG Compression

In previous releases

- PRILOG Compression is attempted
  - When record reaches 50% of maximum record size
  - Again when record reaches 75% of maximum record size
  - When DELETE.LOG INACTIVE is issued

In IMS V8

- PRILOG compression is attempted *on every archive*,
  and when **DELETE.LOG INACTIVE** command entered
- If compression attempt removes no SLDS entries
  - **DSP1150I LOG RECORD(S) COULD NOT BE COMPRESSED,**
    RECORD TIME = timestamp
    reason type = timestamp
- Reason types: **EARLIEST ALLOC TIME,**
  EARLIEST CHECKPOINT, or
  LOG RETENTION TIME

New

New

DBRC - PRILOG Compression ...

Periodically, DBRC will attempt to remove unneeded logs from the PRILOG record, freeing up space.

DELETE.LOG INACTIVE

Key 0	Pfx 2	Arc1	Arc2	Arc3	Arc..	Arc..	Arc..
Key 1	Arc..	Arc..	Arc..	Arc..	Arc..	Arc..	Arc..
Key 2	Arc..	Arc..	Arc..	Arcn			

Key 0	Pfx 1	Arc7	Arc8	Arc9	Arc..	Arc..	Arc..
Key 1	Arc..	Arc..	Arc..	Arc..	Arcn		

Three conditions will prevent PRILOG compression

1. Log still needed for potential database recovery
   (oldest image copy older than log start time)
2. DBRC log retention time not expired
3. Log needed for /NRE BUILDQ
   (last SNAPQ or cold start on this log)

DBRC - Command Authorization

Security support for DBRC commands

- Commands can be authorized
  - At the *command verb* level
    - For example, the **CHANGE** command
  - At the *verb + resource type* level
    - For example, the **CHANGE.DB** command
  - At the *verb + resource type + resource name* level
    - For example, the **CHANGE.DB** DBD(**ACCTDB**) command

```
CHANGE.RECON CMDAUTH(SAF|EXIT|BOTH|NONE,safhlq)
```

- Security profiles may differ for different RECONs
  - **safhlq** saved in RECON header extension
- Security is invoked only for commands issued from DBRC Utility (DSPURX00) or HALDB Partition Definition Utility
  - Similar security for /RMx commands provided in IMS V9

DBRC - Command Authorization ...

RACF Definitions

- Uses FACILITY resource class
  - RDEFINE FACILITY *resource* UACC(NONE)
    - *resource* is *safhlq.command-verb.resource-type.resource-name*
- Users must be given READ access to command resource
  - PERMIT resource CLASS(FACILITY) ID(user_id) ACCESS(READ)

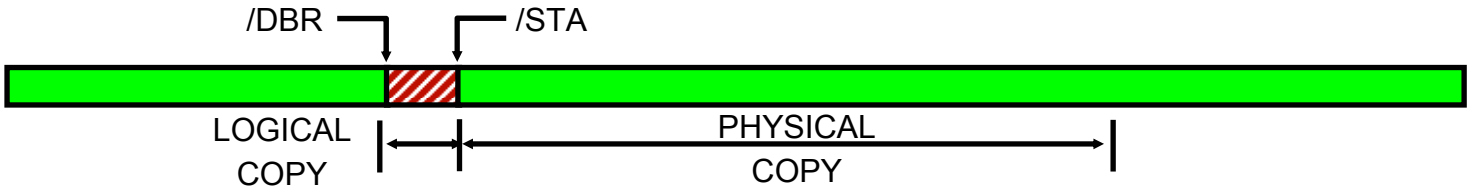
Example

```
RDEFINE FACILITY IMSP.DELETE UACC(NONE)
PERMIT IMSP.DELETE CLASS (FACILITY) ID(MAKENA) ACCESS(READ)

RDEFINE FACILITY IMSP.CHANGE.DB.ACCTDB UACC(NONE)
PERMIT IMSP.CHANGE.DB.ACCTDB CLASS(FACILITY) ID(DBAGRP) ACCESS(READ)

RDEFINE FACILITY IMST.CHANGE.DB.ACCTDB UACC(NONE)
PERMIT IMST.CHANGE.DB.ACCTDB CLASS(FACILITY) ID(APPLGRP) ACCESS(READ)
```

Image Copy 2 - V6

Introduced in IMS V6

- Invokes DFSMSdss to copy data set
  - Logical copy
    - Very fast (seconds)
    - DBR database prior to this phase
    - When logical copy complete, start database
  - Physical copy
    - Updates occurring after logical copy completes do not appear in image copy



- Advantage
  - Database is *offline very short time* to get clean copy
- Hardware requirement
  - Requires IBM ESS (Enterprise Storage System - Shark)

Image Copy 2 - V8

Enhanced in V8

- Can copy *multiple database data sets in one execution of IC2*
  - Logical and physical copies performed in parallel
- Can copy *groups of DBDSs* (e.g., a DBDSGRP)
  - All DBDSs in group are copied in parallel
  - Single message reports when all logical copies are complete

```
DFS3121A LOGICAL COPY COMPLETE FOR GROUP FNCLGRP;
          0 OF 5 DATA SETS FAILED
DFS3121I COPIED DB/AREA ACCT DDN ACCT1 DSN IMSPRD.DB.ACCT.ACCT1
DFS3121I COPIED DB/AREA ACCT DDN ACCT2 DSN IMSPRD.DB.ACCT.ACCT2
DFS3121I COPIED DB/AREA CUST DDN CUSTA DSN IMSPRD.DB.CUST.CUSTA
DFS3121I COPIED DB/AREA CUST DDN CUSTB DSN IMSPRD.DB.CUST.CUSTB
DFS3121I COPIED DB/AREA CUST DDN CUSTC DSN IMSPRD.DB.CUST.CUSTC
```

- Can write multiple image copies to one output data set
- Additional DFSMSdss "OPTIMIZE" performance options
- DBRC GENJCL.IC support

Syntax Checker

Syntax Checker is a new IMS ISPF application

Its primary functions are to

- *Define, verify, and validate* PROCLIB member DFSPBxxx parameters and value specifications prior to (re)starting IMS
  - Find errors before restarting IMS
- Identify *new and obsolete* parameters
  - Useful when migrating to new version of IMS
- Identify *all possible* parameters
- Provide *detailed online help* text at the parameter level

IMS V9 adds support for

- DFSDCxxx
- DFSSQxxx

Invalid Parameter

```
  File   Edit   View   Help
------------------------------------------------------------------------
                    IMS 7.1 Parameters for DB/DC
Command ===>
DFSI920 Parameter value invalid
Press enter to check the syntax.

Data Set Name  . . : IMS71.IMS1.PROCLIB(DFSPBIMS)
IMS Release  . . . : 7.1

  Sel Codes: C = Comment D = Delete / = Select

 Sel Keyword    Value            Description
  _  ________ = ________
  _  ALOT     = 9              ETO Auto Logon Off Time
  _  AOIS     = A              ICMD Security Option
  _  APPC     = Y              Activate APPC/IMS (Y|N)
  _  APPLID1  = IMS1           VTAM Applid of Active IMS System
  _  APPLID2  = IMS2           VTAM Applid of XRF Alternate System
  _  CHTS     = 1000           Number of CCB Hash Table Slots
  _  CMDMCS   = N              MCS/EMCS Command Option: N|Y|R|C|B
  _  DBBF     = 1000           Number of Database Buffers
```

Keyword ALOT Help

```
 File  Edit  View  Help
+-------------------------------------------------------------------------+
|                          ALOT Autologoff Time                           |
|                                                                         |
|                                                          More:     +  |
| KEYWORD: ALOT                                                           |
|                                                                         |
| Specifies the autologoff time in minutes. Valid values are 0 and from 10  |
| to 1440. If the ALOT value is not specified, the value from the JCL member |
| is used except for FINANCE, SLU P, and ISC. If ALOT is not specified on   |
| the logon descriptor or overridden by the logon exit (DFSLGNX0) for       |
| FINANCE, SLU P, and ISC, a value of 1440 is used (the value from the JCL  |
| member is ignored).                                                     |
| etc.                                                                    |
|                                                                         |
+-------------------------------------------------------------------------+
```

Not Valid in Release

```
 File  Edit  View  Help
-------------------------------------------------------------------------------
                    IMS 8.1 Parameters for DB/DC
Command ===>
DFSI926 Keyword CHTS not valid in Release 8.1
Press enter to check the syntax.

Data Set Name  . . : IMS71.IMS1.PROCLIB(DFSPBIMS)
IMS Release  . . . : 8.1

 Sel Codes: C = Comment D = Delete / = Select

 Sel Keyword    Value            Description                        More: -
  _  CHTS     =  1000             Number of CCB Hash Table Slots
  _  CMDMCS   =  N                MCS/EMCS Command Option: N|Y|R|C|B
  _  DBBF     =  1000             Number of Database Buffers
  _  DBFX     =  10               Num. DB Buffs available at FP Reg Start
  _  DBRCNM   =  DBCPROC          DBRC Problib Member Name
```

S/C - "DISPLAY NEW" Screen

```
 File  Edit  View  Help
------------------------------------------------------------------------
                    IMS 8.1 Parameters for DB/DC
Command ===>

Press enter (without other input) to check for errors.

Data Set Name  . . : IMS71.IMS1.PROCLIB(DFSPBX71)
IMS Release  . . . : 8.1

  Sel Codes: C = Comment D = Delete / = Select

 Sel Keyword    Value            Description
  _  CSLG     =  _______         CSL Global Member (DFSCGXXX)
  _  FPOPN    =  _______         Defer DEDB Area Preopen
  _  IOVFI    =  _______         Timer Interval: IOVF Control Intervals
  _  ODBASE   =  _______         Check security for APSB call (from ODBA)
  _  OTMAASY  =  _______         OTMA program switch for nonresponse tran
```

DEDB Enhancements

Data Entry Database

- Support for more than 240 Areas
  - DEDBs can now be defined with up to 2048 Areas
    - 2048 * 4GB = 8TB
  - No change to DEDB externals (application interface)
- Non-recoverable DEDBs
    - INIT.DB or CHANGE.DB DBD(dbdname) **NONRECOV** ...
  - Database changes not logged
    - Reduces log volumes
  - Especially useful for
    - Work databases, scratch pad databases, temporary databases
  - Supported for
    - VSO and Non-VSO, shared and non-shared
  - Not supported for
    - DEDBs with SDEPs
- FPOPN=D
  - Open is deferred for areas registered as PREOPEN or PRELOAD

Parallel DB Auth/Alloc/Open

During IMS V8 restart and termination

- For ***full function*** databases ....
  - DBRC database authorization processing
  - Data set allocation, open, close, and end-of-volume processing
- Similar support for DEDBs in IMS V9

Ten parallel TCBs for database processing during IMS warm or emergency restart, and during IMS shutdown

- Databases assigned to one of 10 TCBs for open/close/eov processing

- During warm or emergency restart
  - Single DBRC authorization request for all DBs assigned to that TCB
  - Parallel database data set ALLOCATION and OPEN processing

- During shutdown
  - Single DBRC unauthorization request
  - Parallel close and deallocation of database data sets

Parallel DB Auth/Alloc/Open ...

```
.....
DATABASE DBX
DATABASE DBY
DATABASE DBZ
.....
```

```
PSBXYZ
        PCB DBX
        PCB DBY
        PCB DBZ
```

IMS V6/V7

```
/NRE
/STA REGION
SCHEDULE PSBXYZ
        AUTH DBX
        ALLOCATE DBDSX
        AUTH DBY
        ALLOC DBDSY
        AUTH DBZ
        ALLOC DBDSZ
DLI CALL TO DBX
        OPEN DBDSX
DLI CALL TO DBY
        OPEN DBDSY
DLI CALL TO DBZ
        OPEN DBDSZ
```

Items in red and indented contribute to the response time of that first transaction.

This occurs for every database until all are authorized, allocated, and opened.

Parallel DB Auth/Alloc/Open ...

```
.....
DATABASE DBX (TCB1)
DATABASE DBY (TCB2)
DATABASE DBZ (TCB3)
.....
```

```
PSBXYZ
        PCB DBX
        PCB DBY
        PCB DBZ
```

IMS V8

/NRE

TCB1

```
AUTH DBX ...
ALLOCATE DBDSX
OPEN DBDSX
```

TCB2

```
AUTH DBY ...
ALLOCATE DBDSY
OPEN DBDSY
```

TCB3

```
AUTH DBZ ...
ALLOCATE DBDSZ
OPEN DBDSZ
```

```
/START REGION
SCHEDULE PSBXYZ
```

```
DLI CALL TO DBX
DLI CALL TO DBY
DLI CALL TO DBZ
```

Application response time
not impacted by authorization,
allocation, or open processing.

Parallel DB Close/Dealloc/Unauth

During shutdown

- New TCBs process shutdown for assigned databases
  - Single DBRC request (per TCB) to unauthorize databases
  - Parallel close and deallocation of database data sets

/CHE FREEZE

TCB1	TCB2	TCB3
CLOSE DBDSX	CLOSE DBDSY	CLOSE DBDSZ
DEALLOCATE DBDSX	DEALLOCATE DBDSY	DEALLOCATE DBDSZ
UNAUTH DBX ...	UNAUTH DBY ...	UNAUTH DBZ ...

IMS V8

IMS/DB2 Coordinated Disaster Recovery

IMS RSR came out with IMS V5

- ❑ requires small bandwidth to support shadow DBs (or DB recovery) at a remote site
- ❑ But only used by a very few customers
- major reason being the lack of DB2 support

IMS V8 RSR addresses the need for

- ❑ coordinated IMS and DB2 recovery
- ❑ with limited bandwidth to remote site

Uses RSR for IMS Log Data

with option of shadow DBs

Uses XRC for DB2 Log Data

can be used for DB2 rolling recoveries

IMS RSR communicates with DFSMS System Data Mover

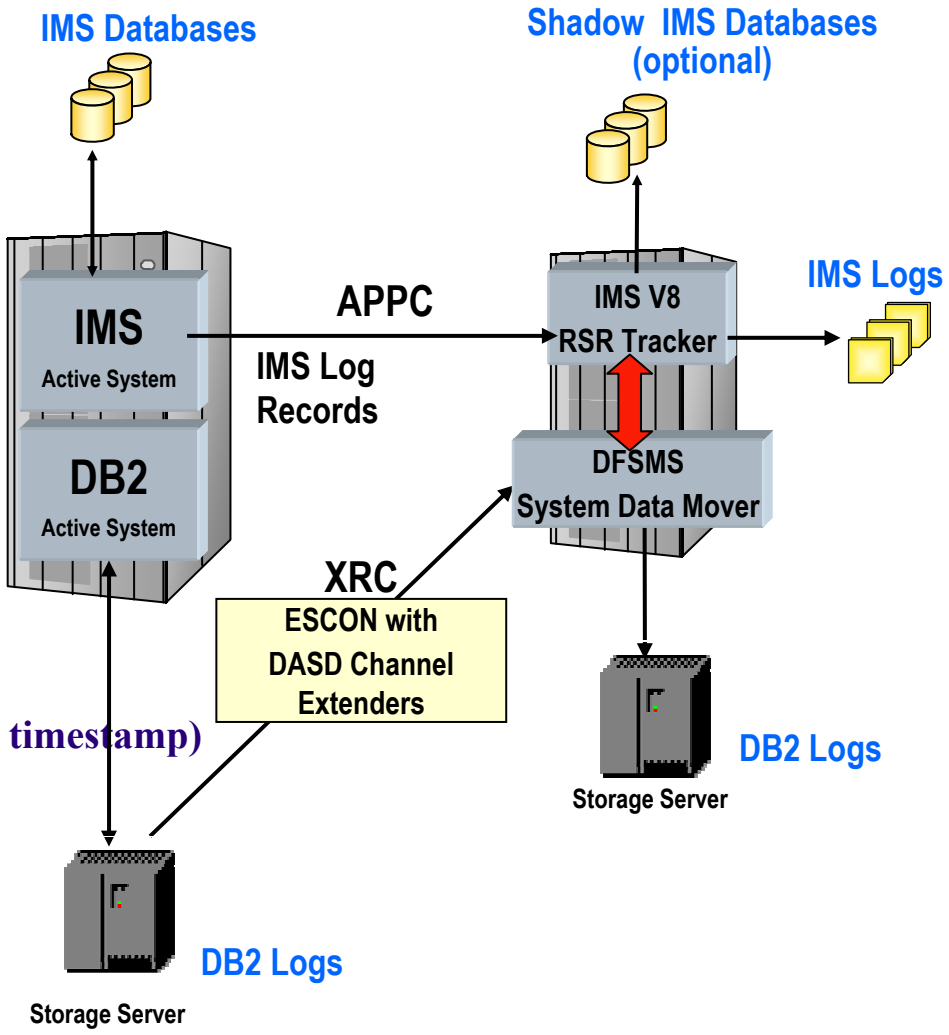
- ❑ ensures IMS does not get ahead of DB2

At a take-over, RSR supplies latest recovery time (log truncation timestamp)

- ❑ used to do a DB2 Conditional Restart

During shutdown

- ❑ New TCBs process shutdown for assigned databases
  - •Single DBRC request (per TCB) to unauthorize databases
  - •Parallel close and deallocation of database data sets



Dynamic Backout with SLDS

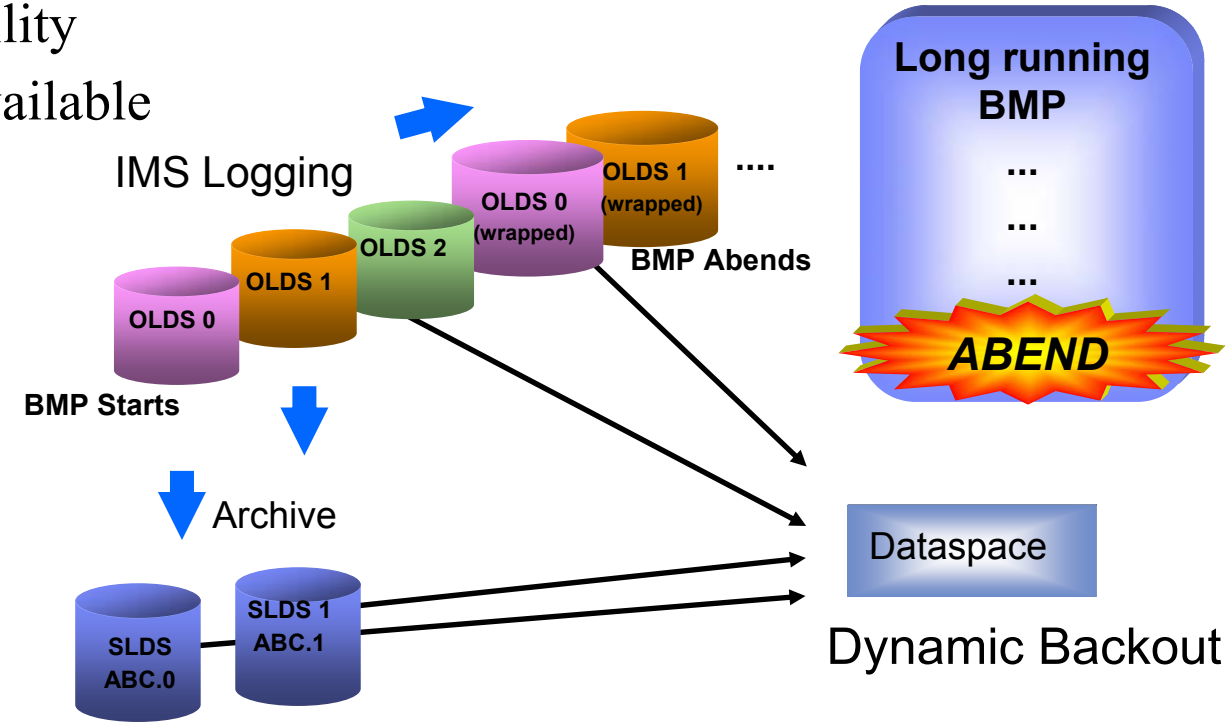
The IMS Logger is now able to read SLDSs for Dynamic Backout, avoiding the need for batch backout in some cases

- Example — A long running application requires uncommitted updates on the SLDS after the OLDS have wrapped

SLDS log records are read into a dataspace for use by dynamic backout ...

- Else must revert to Batch Backout Utility
- ... if operating system says space is available

Also applies in a Shared Queues environment.
In a Shared Message Queue environment SLDS will now be dynamically mounted when /CHE is issued and the messages are only available on SLDS (due to SQ being full)



What Else Is In Version 8?

APPC

- Add/delete descriptors dynamically
- CPU time limit for CPI-C driven transactions
- Enhanced "outbound LU" support
- DFSLUEE0 - Ability to change APPC synclevel
- DFSCMUX0 - Ability to reroute DFSxxxxx error messages

Invoke SAF security on APSB call

- ODBASE=Y|N

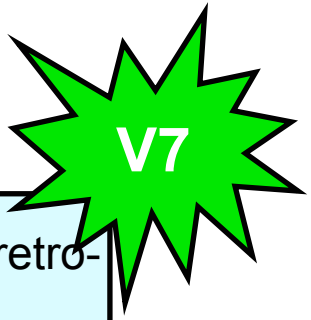
Virtual storage constraint relief

- From CSA and PVT
  - For example, 352 bytes per dual OLDS buffer moves to ECSA

What Else Is In Version 8?

HALDB enhancements

- Single partition access (Batch, BMP, JBP)
- HALDB Control Statement enhanced to allow 20 control statements
- Bypass secondary index load
- Batch DBRC registration commands



- Enhancement to allow Batch job to run without DBRC when using a PSB that references a HALDB (provided the HALDB is not referenced)
- HALDB Partition Selection Exit enhancement - no longer have to create own DSECTs for the partition selection exit parameters
- HD Unload (DFSURGU0) and HD Reload (DFSURGL0) enhanced to generate statistics on a partition basis

What Else Is In Version 8?

Timeout for IRLM lock requests

- LOCKTIME=nn (DFSVSMxx)
- U3310 abend if wait longer than locktime

OTMA

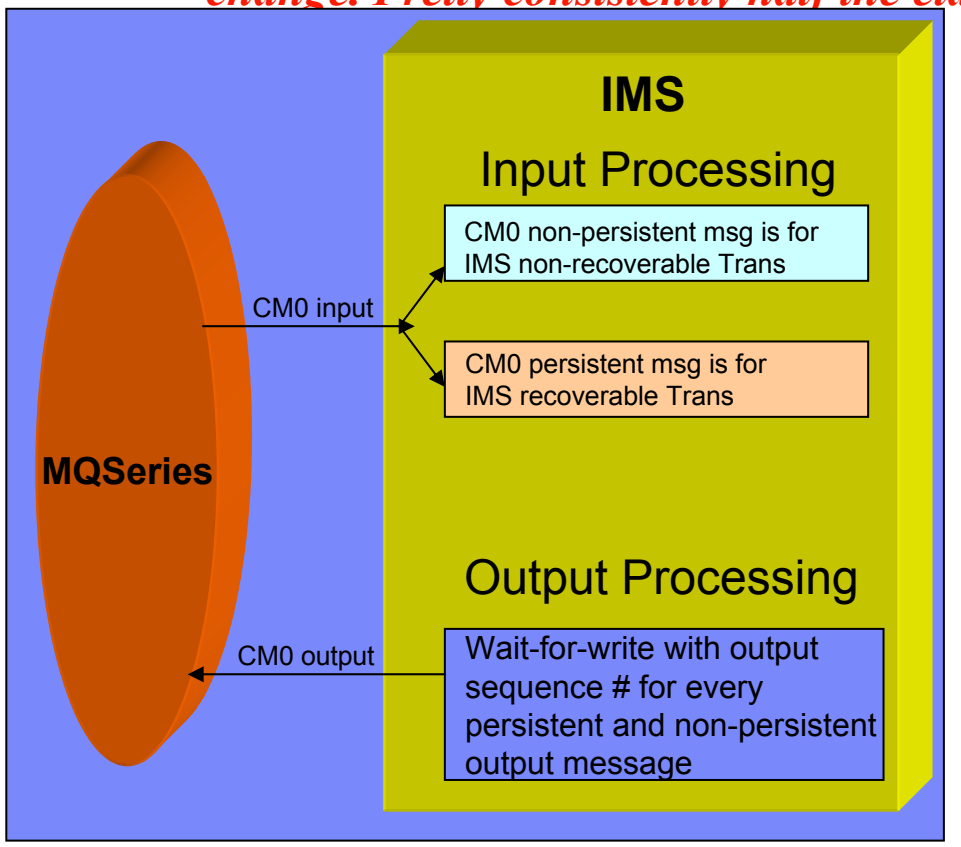
- Command to refresh ACEEs (/SECURE OTMA REFRESH)
- Dynamic expansion of OTMA ACEE pool (>5000 userids)
- New “Auto-One” option for OTMA Resume TPIPE protocol
  - After receiving the Resume TPIPE command from IMS Connect, if there are messages on the asynchronous hold queue, OTMA sends one message
  - If there are currently no messages, OTMA will send one message when it arrives
  - Once an message is delivered, the RESUME TPIPE option will be reset to "NO-AUTO”

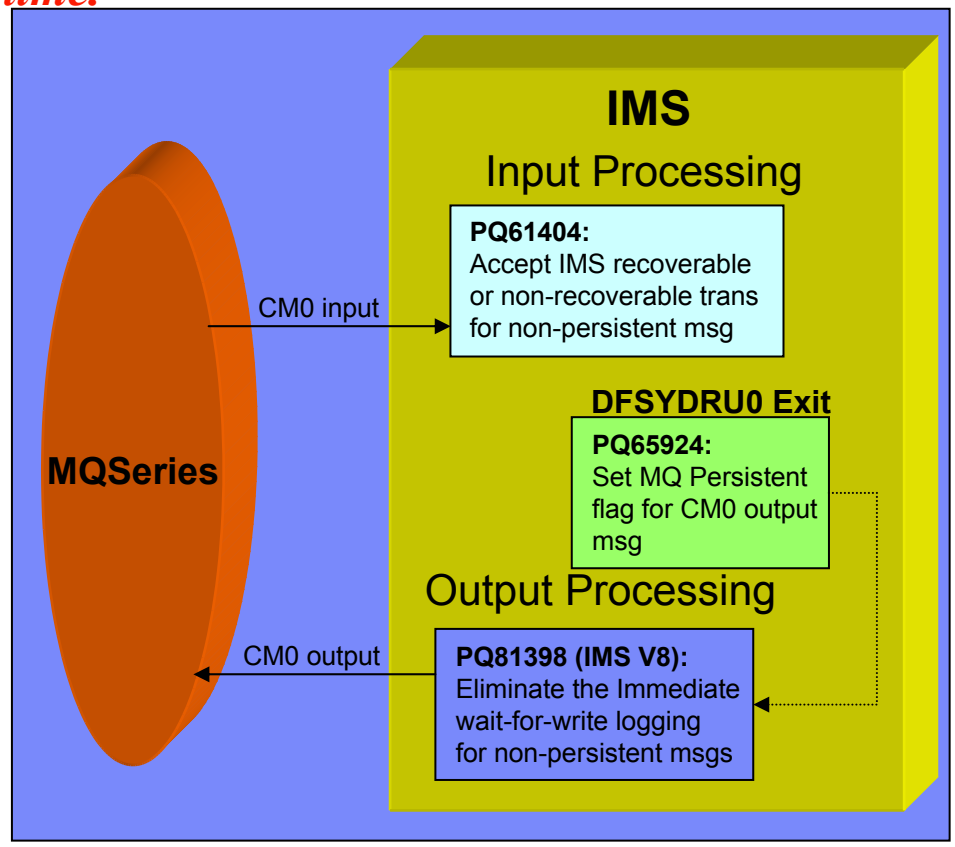
OTMA Enhancements

MQ/OTMA CM0 Non-Persistent Message Enhancements

- Removed unnecessary "OTMA sequence number" logic for processing CM0 non-persistent output messages
- Customer feedback on the reduced elapsed time:

"Wow - what a difference .... it goes down from 0.491 sec/trx before to 0.248 sec/trx with the change. Pretty consistently half the elapsed time."





What Else Is In Version 8?

OTMA…

- /DISPLAY TMEMBER TPIPE
  - Command is enhanced to show the wait status for an expected ACK or NAK for CM0 messages
- Ability to Delete Undeliverable CM0 Output
  - When IMS Connect is disconnected from the XCF group
    - IMS Connect applications have an option to inform OTMA to purge CM0 IOPCB output

See the IMS Newsletter, Winter 2004 edition, "IMS Connect, CM0 Persistent Sockets for IMS Connect" , pg 13, for more information on these enhancements (available from IMS Family homepage)

What Else Is In Version 8?

These line items also retrofitted to V7.

Parameter to disable IMS use of RRS

- RRS=Y | N (note the default!)

IMS Batch support for RRS

- Coordinated 2-phase commit with DB2 or WebSphere MQ
- Batch program requires connection to RRS
  - New JCL PROC parameter "RRS=Y"
- RRS uses System Logger for saving coordination data
- Batch program requires DASD logging and BKO=Y
- Utilized by IMS DataPropagator V3R1
  - uses MQ to give "asynchronous near real time" data propagation for Batch DL/1

Additional IMS V8 Java Enhancements

Java

- New Java IMS application and database class packages
- New dependent region types for Java applications

IMS-DB2 Interoperability

- Supports DB2 access from an IMS JMP or JBP region
  - IMS V8
    - PQ73326 (UQ80615)
    - Prereq PQ73897 (latest level of IMS Java)
    - Prereq PQ75284 (IMS code using DB2's attachment facility)
  - DB2
    - DB2 V8 (PQ74629)
    - DB2 V7 (PQ69861)
- Uses DB2 RRS attach facility
  - Requires SSM= and RRS=Y in the IMS startup definitions

Additional IMS V8 Java Enhancements…

IMS Java and Cobol Interoperability

- Requires Enterprise Cobol for z/OS V 3.2
  - Object oriented syntax
    - Cobol applications that run in a JBP or JMP must use the AIB interface
      - All PCBs in the PSB must be named

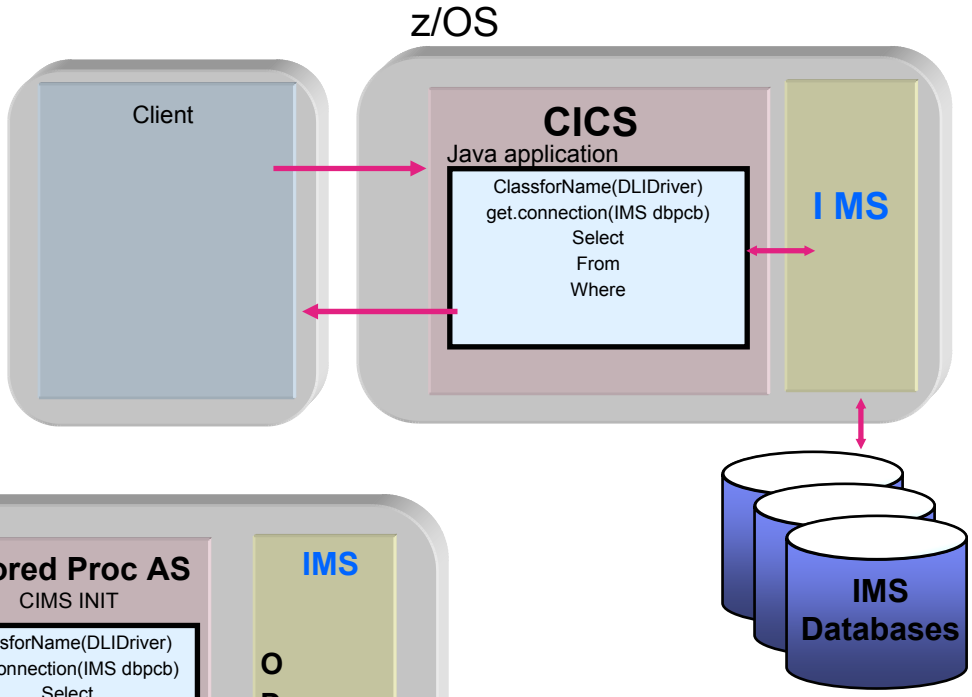
XPLINK Support with IBM SDK for z/OS V1.4.1

- JMP and JBP regions MUST specify XPLINK=Y
  - IBM LE Extra Performance Linkage runtime option

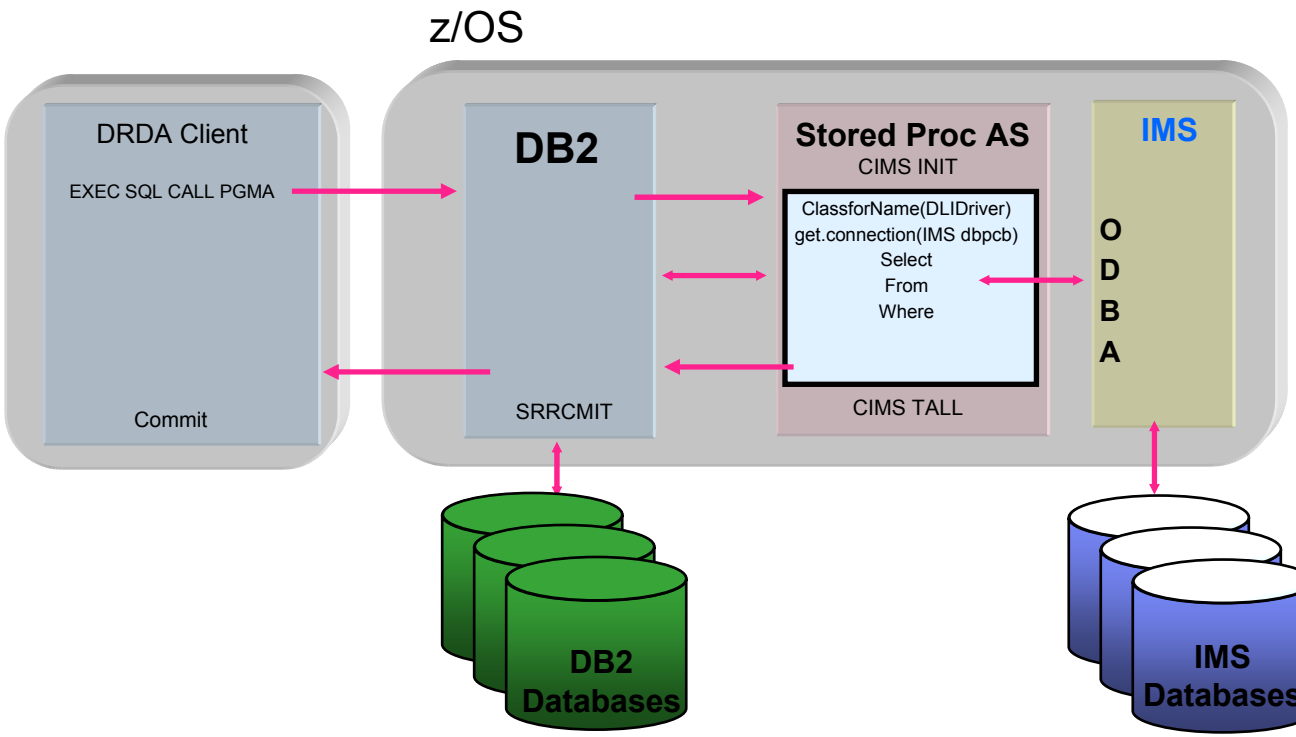
IMS DB Access from Other Java Environments

The IMS Java Classes can be used to create Java applications that run as

- CICS/DBCTL programs
- DB2 Stored Procedures using ODBA



Note: Retrofitted to IMS V7

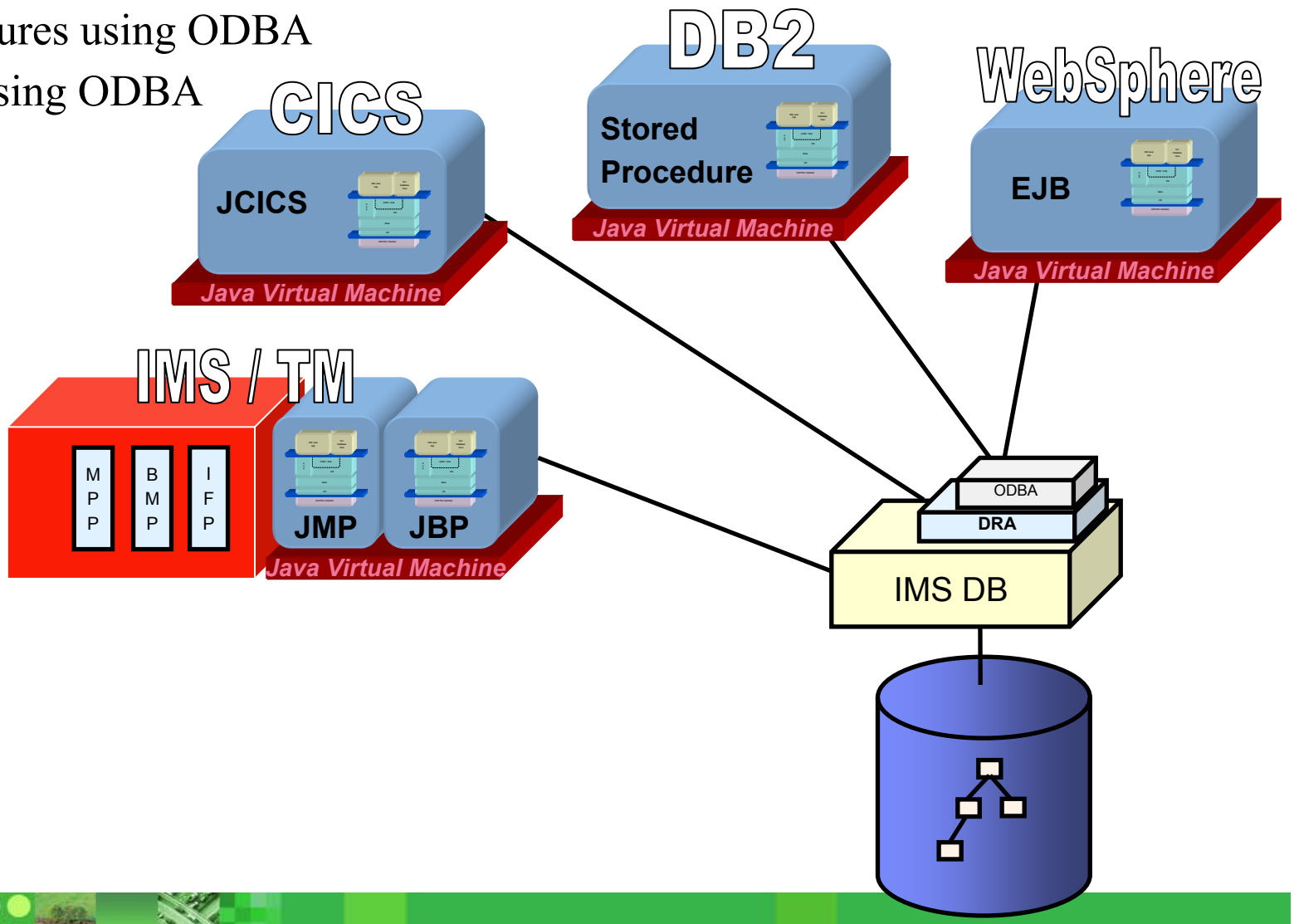


IMS DB Access from Other Java Environments

The IMS Java Classes can be used to create Java applications that run as

- CICS/DBCTL programs
- DB2 Stored Procedures using ODBA
- WebSphere EJBs using ODBA

Note: Retrofitted to IMS V7



Java Tooling

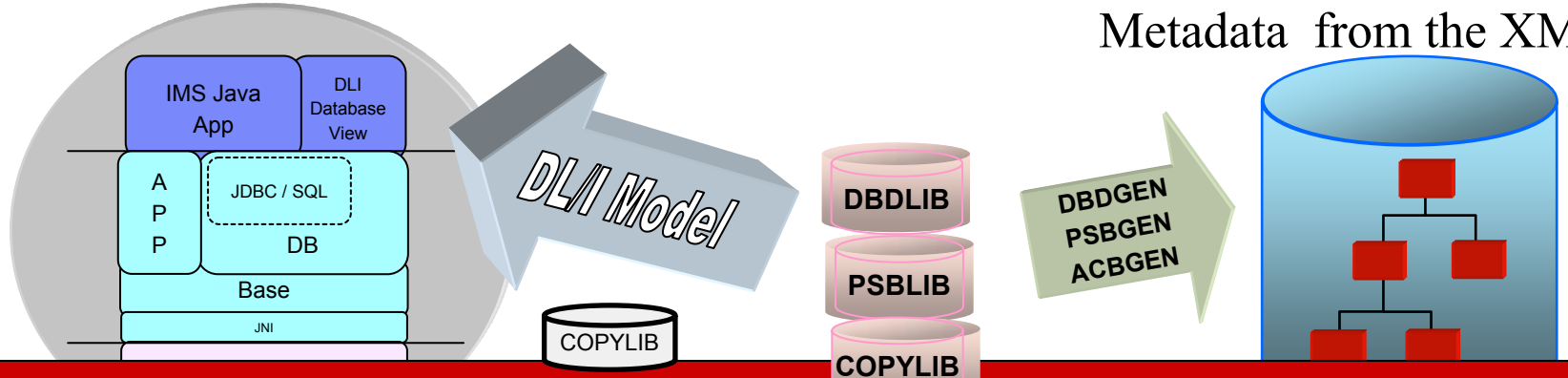
IMS Java programs require database descriptions to be coded in Java "metadata"

Problems:

- Confusion generating IMS Java Metadata (DLIDatabaseView)
- Time consuming
- Too prone to simple mistakes

Solution:

- DLIModel utility to:
  - Parse DBD and PSB
  - Produce XML to act as a standard form of IMS Metadata
  - Generate the IMS Java Metadata from the XML



The DLIModel Utility GUI plug-in technology preview is available from the IMS Family Home page or directly from: ***http://www-306.ibm.com/software/data/ims/toolkit/dlimodelutility/***

Agenda

- Base Enhancements
  - DBRC
  - Image Copy 2
  - Syntax Checker
  - DEDB
  - And more ...
- **Parallel Sysplex enhancements**
  - **CF Structure Management**
    - **Autoalter**
    - **System managed rebuild**
    - **System managed duplexing**
  - Shared queues
    - SQ support for synchronous APPC and OTMA transactions

Alter and Auto Alter Support

Alter changes a structure without rebuilding it

- Change is made to the existing structure
- Size may be changed by operator command or by connector
- Entry-to-element ratio may be changed only by connector
  - IMS (or CQS) does not change this ratio
- Initiated with operator command:

```
SETXCF START,ALTER,STRNM=<name>,SIZE=<new-size>
```

Autoalter allows an alter to be done by the system

- Dynamic adjustment
- Size and/or entry-to-element ratio may be changed by system
  - Reacts to needs of the structure
    - Reaching *fullthreshold* causes Auto Alter to increase size
  - Reacts to needs of the system
    - Unused space in structure makes it available for contraction

Alter and Autoalter ...

Autoalter hardware and software requirements

- OS/390 V2R10; CF Level 9

Autoalter enabling requirements

- Update and activate CFRM policy
  - Administrative Data Utility: IXCMIAPU

```
ALLOWAUTOALT(YES) - default is NO
FULLTHRESHOLD(percentage) - default is 80%
MINSIZE(nnnn) - default is 75% of INITSIZE
```

Supported for

- Shared VSO, Shared Queues, IRLM, OSAM, and VSAM
- Resource structure in V8

System-Managed Rebuild

System-managed rebuild

- Allows operator to move structure to another CF
  - *Does not require an active connector* to rebuild (copy) a structure
  - Operator initiates rebuild with a command
    - –If connector active, connector will rebuild
    - –If no connector active, system will rebuild
    - –To move one structure to another candidate CF

      SETXCF START,REBUILD,STRNM=<name>,LOC=OTHER
    - –To move all structures on named CF to other candidate CFs

      SETXCF START,REBUILD,CFNAME=<name>
- *Does not provide automatic rebuild of structure for failures*
  - This function is provided by system-managed duplexing

System-Managed Rebuild ...

Hardware and software requirements

- OS/390 V2R8; CF Level 9

Enabling requirements

- CFRM CDS must be formatted to support SMREBLD
  - CDS Format Utility: IXCL1DSU

```
DATA TYPE(CFRM)
ITEM NAME(SMREBLD) NUMBER(1)
```

- Update and activate CFRM policy
  - Administrative Data Utility: IXCMIAPU

```
PREFLIST(CF01 CF02)
```

Supported for

- Shared VSO, Shared Queues, IRLM
- Resource structure in V8

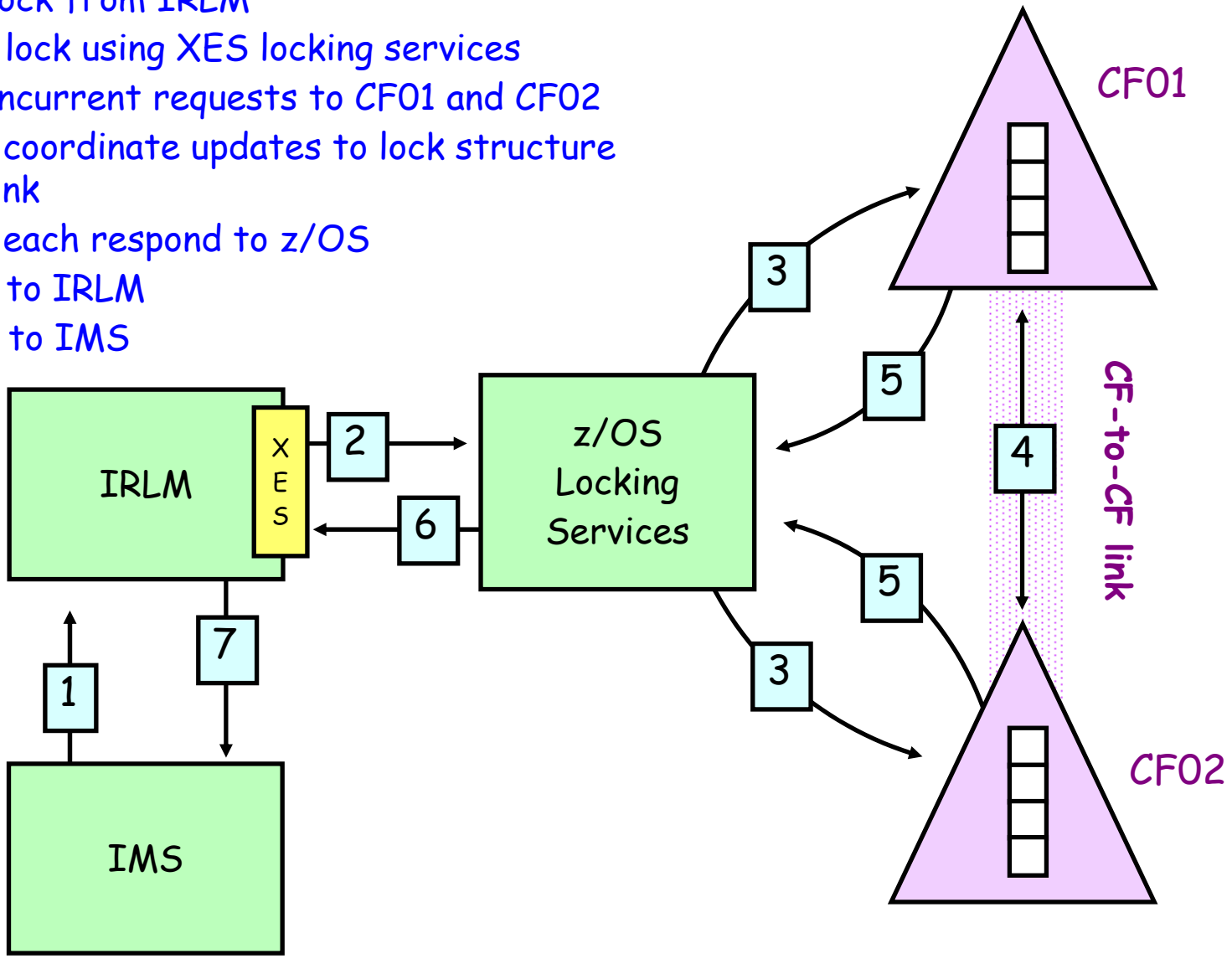
System-Managed Duplexing

System-managed duplexing

- Objective is to provide
  - Robust failure recovery of a structure with ...
  - Minimal participation by connectors
    - Compare to CQS recovery of shared queues structures
- Provides protection against
  - Structure failure
  - CF failure
  - Loss of CF connectivity
- System creates and maintains two copies of the structure
  - On two different Coupling Facilities
  - One structure name is used for the two structures

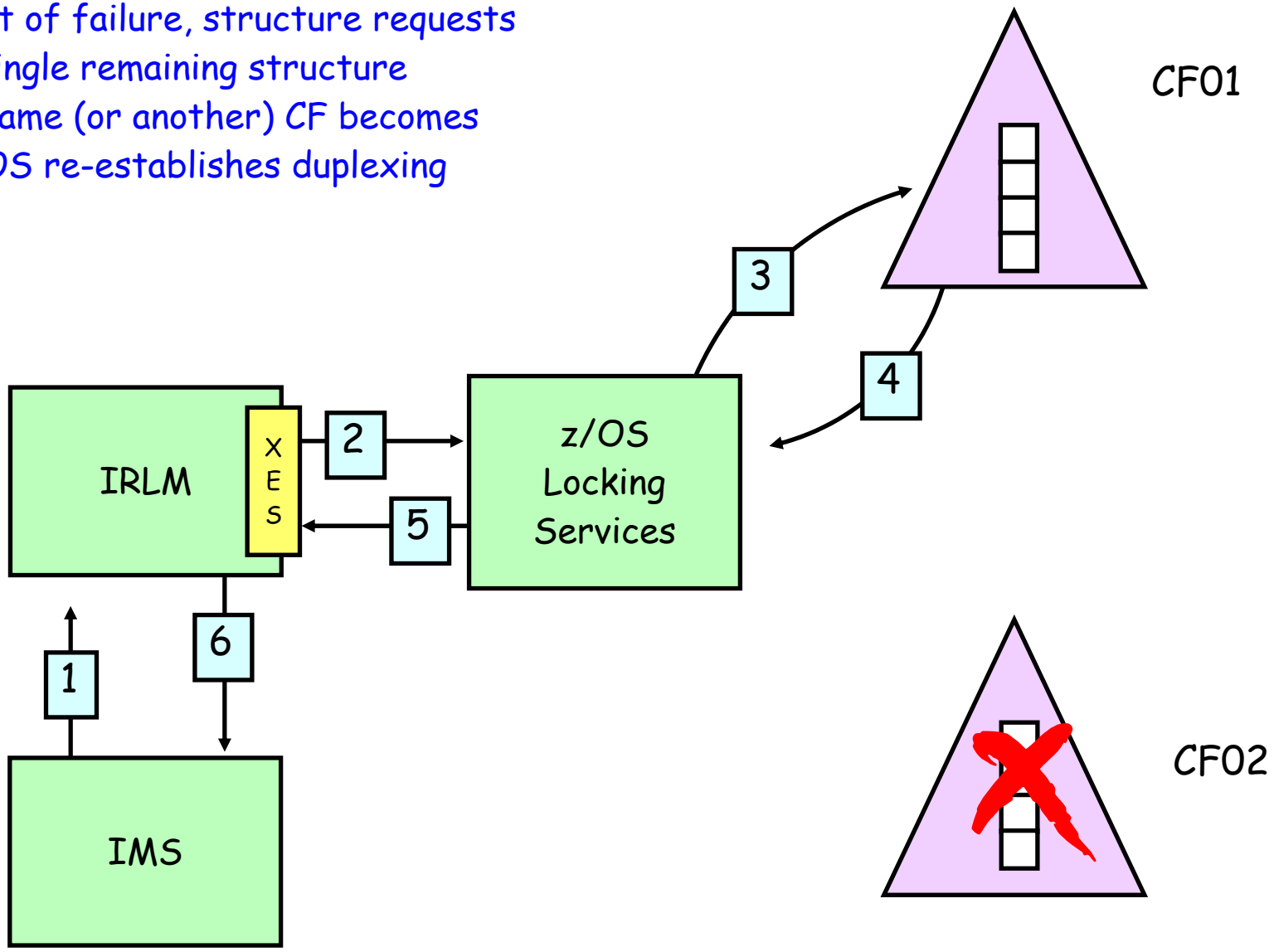
System-Managed Duplexing ...

1. IMS requests lock from IRLM
2. IRLM requests lock using XES locking services
3. z/OS makes concurrent requests to CF01 and CF02
4. CF01 and CF02 coordinate updates to lock structure using CF-to-CF link
5. CF01 and CF02 each respond to z/OS
6. z/OS responds to IRLM
7. IRLM responds to IMS



System-Managed Duplexing ...

- In the event of failure, structure requests continue to single remaining structure
- When the same (or another) CF becomes available, z/OS re-establishes duplexing automatically



System-Managed Duplexing ...

Enabling requirements:

- CFRM CDS must be initialized with SMDUPLEX specified
  - CDS Format Utility: IXCL1DSU

```
DATA TYPE(CFRM)
ITEM NAME(SMDUPLEX) NUMBER(1)
```

- CFRM policy definition for structure:
  - DUPLEX(ENABLED) - automatically activated

  - or -

  DUPLEX(ALLOWED) - activated by command

```
SETXCF START,DUPLEX,STRNM=name
```

Duplexing supported for

- Shared VSO, Shared Queues, IRLM
- Resource structure in V8

System-Managed Duplexing ...

Minimum Hardware and software requirements:

- z/OS V1.2 with APARs OW41617 and OW45976
- CF Level 11 (9672 CF) or CF Level 12 (zSeries CF)
- CF-to-CF links
- IMS V8
- IMS V7 with APAR
  - Call the support center to get the most current list of APARs

For more information on System Managed CF Structure Duplexing, see the following url: http://www-1.ibm.com/servers/eserver/zseries/library/techpapers/gm130103.html

Agenda

- Base Enhancements
  - DBRC
  - Image Copy 2
  - Syntax Checker
  - DEDB
  - And more ...
- Parallel Sysplex enhancements
  - CF Structure Management
    - Autoalter
    - System managed rebuild
    - System managed duplexing
  - **Shared queues**
    - **SQ support for synchronous APPC and OTMA transactions**

Sync APPC/OTMA SQ Support

Description

- Allows synchronous APPC/OTMA transactions to execute on any IMS in the shared queues group
  - APPC Synchronous inbound requests (Allocate - Send - Receive)
  - OTMA Send-then-Commit (Commit Mode 1)

- Enabled if all of the following are true
  - All environments are z/OS V1.2 or later with RRS enabled
  - Shared queues is enabled
  - All IMS systems in the SQ group are IMS V8
    - Update RECONs to reject V6/V7 signons

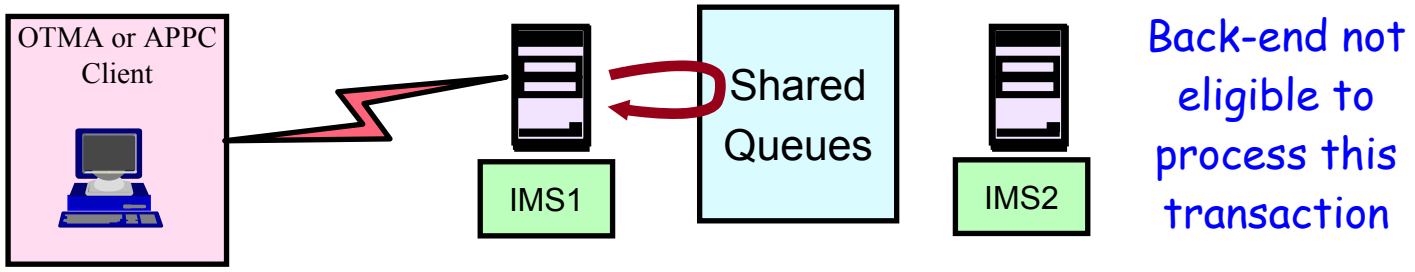
```
CHANGE.RECON MINVERS(81)
```

  - **AND** AOS=Y/F/**N**

Background

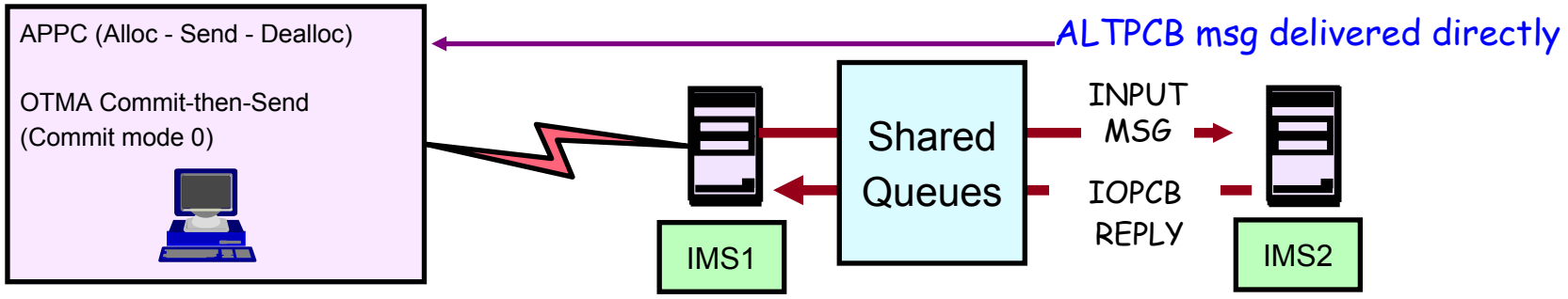
IMS V6 - Introduced Shared Queues support

- ***All*** APPC and OTMA messages processed on SQ "front-end"



IMS V7 - Enhanced Shared Queues support

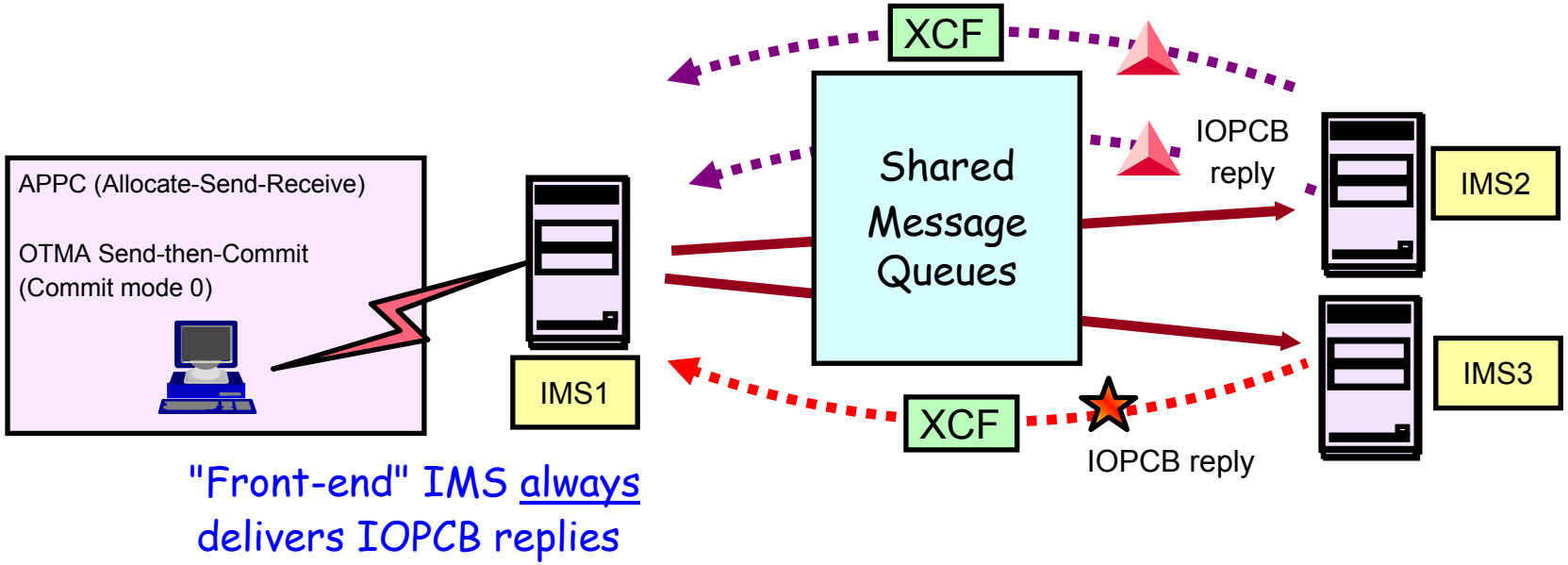
- ***Asynchronous*** APPC/OTMA messages could process on any system in the Shared Queues group ("front- or back-end")



Synchronous SQ Support ...

IMS V8 - Completes Shared Queues support

- Synchronous APPC/OTMA message support



Non-conversational IOPCB reply messages (less than 61K) are sent to the front-end using XCF services.

Conversational IOPCB reply messages or any messages greater than 61K are sent to the front-end using Shared Queues along with a special NOTIFY message that is sent using XCF.

Synchronous SQ Support ...

Support for ...

- Sync_levels: None, Confirm, Syncpoint
- All transaction types except APPC CPIC-Driven

Uses RRS (Resource Recovery Services) - z/OS V1.2

- Allows synchronization of message-processing and the associated commit across IMS systems


Thank
You