IMS 11

Easier than ever!

Information Management software

IMS 11: Easier than Ever

- **Availability and Prerequisites**

- **IMS 11 Overview**
  - System
    - ACBLIB Dynamic Allocation
    - 64-bit ACB Storage Pool
    - Mixed case passwords with RACF
  - Transaction Manager
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    - OTMA Commit Mode 0 ACK Timeout
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    - Port Input/Output Edit Exit
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  - Open Database and Universal Drivers
  - Database
    - Database Quiesce
    - Fast Path Dynamic 64-bit Buffer Manager
    - Open option for DEDB UPD commands
    - HALDB OLR performance
  - DBRC
    - BPE Based DBRC Region
    - Clean up command for RECONs

- **Migration**

- **IMS Enterprise Suite**

Availability and Prerequisites

- **IMS Version 11 - 5635-A02**

  - Announced on September 16, 2008

  - General availability on October 30, 2009

- **Prerequisites:**

  - z/OS V1R9 (5694-A01)

    - High Level Assembler Toolkit Release 5 (5696-234)

  - IRLM 2.2, if IRLM is used

  - Java Universal Drivers in JMP and JBP regions require JDK 6.0

    - JDK 5.0 is sufficient for other Java environments

  - See *IMS 11 Release Planning* (GC19-2442) for details

IMS System Enhancements

ACBLIB Dynamic Allocation

- **DFSMDA members are allowed for IMSACBA and IMSACBB**

  - DFSMDA members are used if DD statements are not present

    - Active ACBLIB allocated

    - Inactive ACBLIB is not allocated until needed

    - After online change inactive ACBLIB is deallocated

- **Benefits**

  - Restart of IMS is not required for:

    - Increasing the size of an ACBLIB

    - Correcting errors in the inactive ACBLIB

    - Adding data sets to the ACBLIB concatenation

64-bit ACB Storage Pool

- **Optional storage pool to cache ACB members in 64-bit storage**

  - Size specified in gigabytes on ACBIN64= parameter in DFSDFxxx member

  - Non-resident DMBs and PSBs are placed in storage pool when first read into 31-bit pools

  - Later requests for these DMBs and PSBs are satisfied from the storage pool

    - Eliminates reads from DASD

  - Resident DMBs and PSBs and Fast Path DEDBs do not use the 64-bit pool

- **Benefits**

  - Improved performance for users currently doing ACBLIB I/Os

    - Reduced I/Os to ACBLIB

    - Improved performance from managing smaller PSB pool

      - Smaller pool may be used without causing more I/Os

Mixed-case Password Support Enhancement

- **IMS 10 added support for mixed-case passwords**
  - IMS and IMS Connect
    - Parameters specified whether or not mixed-case was used by RACF

- **IMS 11 has new parameter values for IMS and IMS Connect**
  - New values say to use mixed-case if RACF is using mixed-case
  - New values are the defaults

- **Benefits**
  - Users do not have to change IMS and IMS Connect parameters when RACF implements mixed-case passwords
    - IMS and IMS Connect automatically use correct setting
  - IMS restart and IMS Connect command are not required when RACF changes to mixed-case passwords

Transaction Manager Enhancements

QUERY Commands for TM Resources

- **QUERY commands added for**

  > - IMS 8, 9, and 10 have QUERY TRAN command
  > - IMS 10 has QUERY command for MSC resources

  - LTERMs
    - Includes support for filtering by message age and queue counts
  - NODEs
  - USERs
    - ETO Users and ISC Subpools
  - USERIDs
    - Security User IDs
  - Includes support for wildcards

- **Benefits**

  - Improved ease of use in managing resources
  - Consolidation of output of several type-1 commands into one type-2 command response

TM Transaction Expiration

- **Transaction Expiration (Input Message Timeout)**
  - Input messages expire and are deleted prior to processing
    - Value checked at application program GU for input message
      - If time exceeded, the message is not returned
        - U0243 abend and information message is sent to terminal

  - Specified with EXPRTIME attribute for transactions
    - TRANSACT macro
    - CREATE and UPDATE commands for TRAN and TRANDESC
    - DFSINSX0 - Output Creation Exit

- **Benefit**
  - Reduces unnecessary processing when unexpected delays in the network or IMS result in remote client timeout before the input message is processed
    - Response no longer required

Message Level Transaction Expiration

- **Enhanced support only for OTMA**

  - Available with IMS 10 and IMS 11

    PK74017 (IMS 10) PK74024 (IMS Connect)

  - Expiration times may be specified for each message

    - Overrides transaction timeout specification
      - Message timeout may be
        - Elapsed time
        - Timestamp (STCK time)

- **Benefits**

  - Reduces unnecessary processing when unexpected delays in the network or IMS result in remote client timeout before the input message is processed

    - Response no longer required

OTMA Commit-then-Send (CM0) ACK Timeout

- **OTMA CM0 message ACK timeout**
  - Without timeout, TPIPE is hung until ACK occurs
  - Enhancement moves message to timeout message queue
    - Other messages on output message queue may be sent
  - Timeout value
    - Set by OTMA descriptor, IMS command, or OTMA member

- **Benefit**
  - Allows delivery of other messages when problem occurs with a message

OTMA Resource Monitoring

- Client-server protocol that allows early detection and warning of possible OTMA problems

    - OTMA:
        - Monitors resources - control blocks associated with unprocessed messages
            - Possible flood condition and incomplete Send-then-Commit CM1 messages
        - Detects possible degraded levels
        - Sends messages to clients (OTMA members) about the resources

    - OTMA members, such as IMS Connect
        - Stay informed of the status of OTMA resources and problem conditions
        - Support corrective actions such as rerouting the request to another IMS

OTMA Resource Monitoring

- **Benefits**

  - Allows OTMA member clients to take advantage of early flood detection and failure notification

    - Detect and address a problem when it is starting
      - Reject remote clients from sending in new messages
      - Reroute the messages to another IMS that can process the transactions

    - Each member can choose how to take advantage of the capability
      - IMS Connect provides the information to user message exits and vendor products

OTMA QUERY Commands

- ## QUERY OTMATI command

  - Used to monitor the OTMA workload and diagnose potential problems

  - Displays OTMA "transaction instance" information including:

    - Count of queued messages for each TPIPE
    - Number of messages older than specified age in seconds
    - And other data

```
QUERY OTMATI MSGAGE(5) SHOW(TRAN)


TSO SPOC output:


        MbrName    Tmember    TpipeName CC      MsgCnt      MessageAge      Transaction
        IMSA       MQ         CSQ81234   0         2            5           ACCTINQ
        IMSA       MQ         CSQ81234   0         1            7           NEWACCT
        IMSB       ICONN1     APPLB      0         2            8           INVQRY
        IMSB       ICONN1     APPLB      0         9            6           CHKSTAT
        IMSB       WAS        APPLC      0         4            9           SRCHPART
```

OTMA Type-2 Commands for Descriptors

- CREATE|UPDATE|DELETE|QUERY OTMADESC

  – Dynamically create, modify, and query OTMA descriptors

```
CREATE OTMADESC NAME(OTMACL9) TYPE(IMSCON) TMEMBER(HWS1)

TSO SPOC output:

MbrName    OTMADESC     Type       TMember      SMember      CC
IMSA       OTMACL9      IMSCON     HWS1         N             0
```

OTMA Type-2 Commands

- Benefits

  - Ability to monitor OTMA activity

  - Ability to add and change OTMA descriptors to adjust workload balancing

  - Automated operations benefits of type-2 commands

IMS Connect Enhancements

IMS Connect TCP/IP Auto Reconnect

- **Automatic reconnection to TCP/IP when network becomes available after a failure**
  - IMS Connect internally issues OPENPORT with loop and timer logic

- **Benefit**
  - Eliminates need for operator intervention (OPENPORT command)
  - Minimizes recovery time for connections after network outage

IMS Connect Port Message Edit Exit

- **New Port Message Edit exit routine**

  – Specified on HWSCFGx PORT statement

  – Allows modification of

    - Input message received from TCP/IP before IMS Connect processing
      – For example, IRM header may be added
    - Output message after IMS Connect formatting before being sent to TCP/IP
      – For example, IRM header may be deleted

  – Similar to IMS's physical terminal edit exit routine functionality

- **Benefit**

  – Allows IMS Connect to work with remote programs which cannot conform to IMS Connect standard message requirements (e.g. IRM header)

IMS Connect Recorder Trace Enhancements

- **IMS Connect Recorder Trace written to BPE External Trace**

  - Optional, but highly recommended

  - Eliminates trace data set full conditions

  - Provides greater flexibility in the amount of data recorded

- **Benefits**

  - Improved reliability of trace data

  - Improved efficiency of trace writing
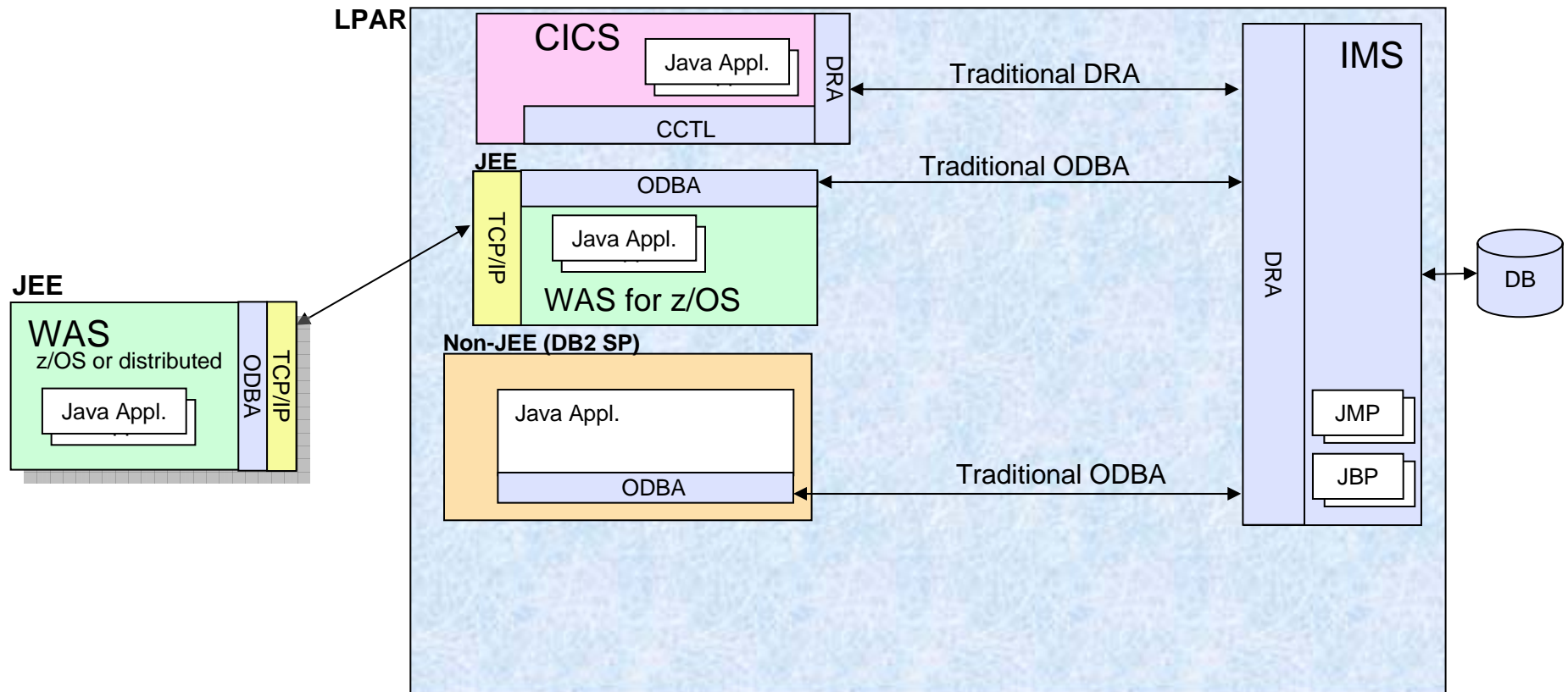
Open Database and Universal Drivers

October 13, 2009 Teleconference
IMS 11 Open Database: Modernizing IMS Database Access
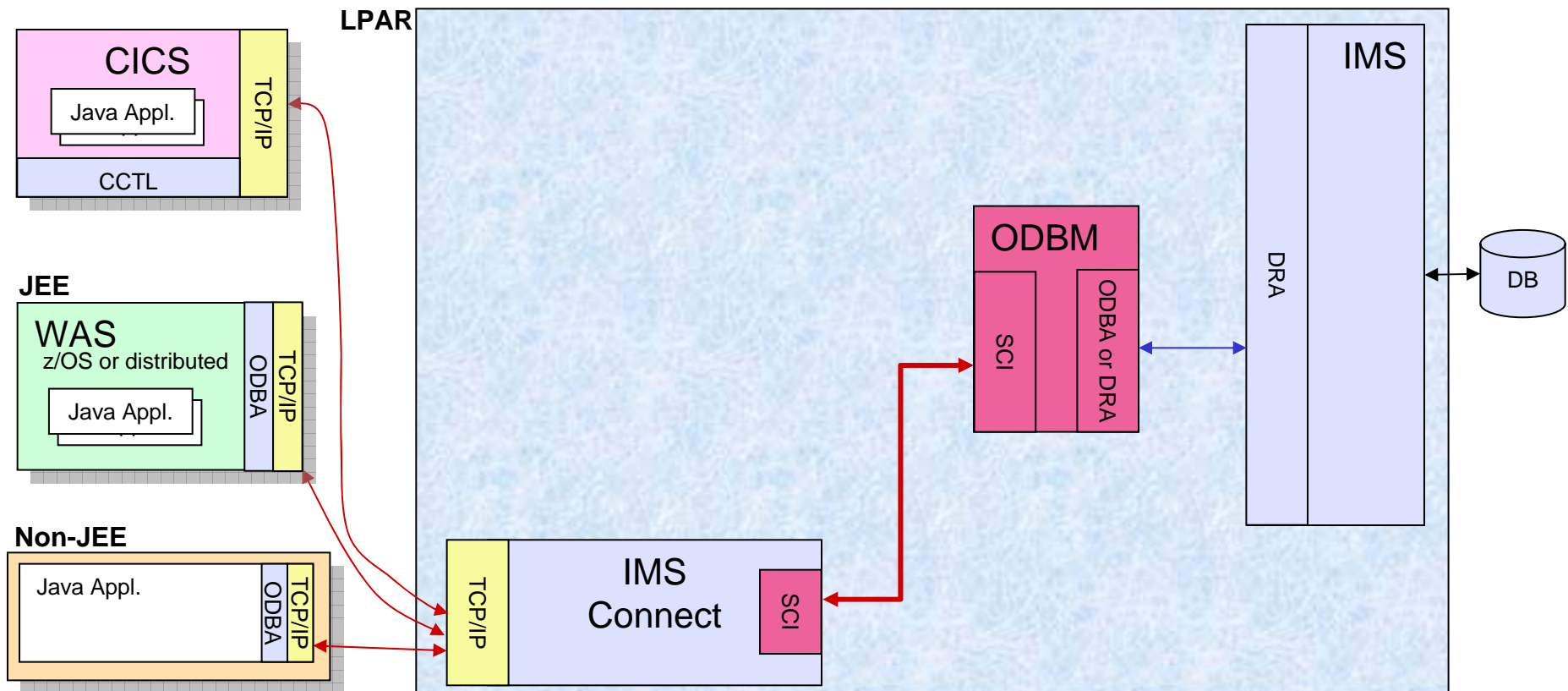*Available for replay*

Open Database

- **Open Database**
  - Direct access to IMS databases from Java programs on any platform
    - z/OS
    - Distributed
  - Extends IMS Connect
    - Serves as gateway from other platforms and systems for direct access to IMS databases
  - Provides standards based universal drivers for different APIs
    - JEE and non-JEE environments
  - Includes Open Database Manager (ODBM)
    - New Common Service Layer address space
    - Manages connections to ODBA
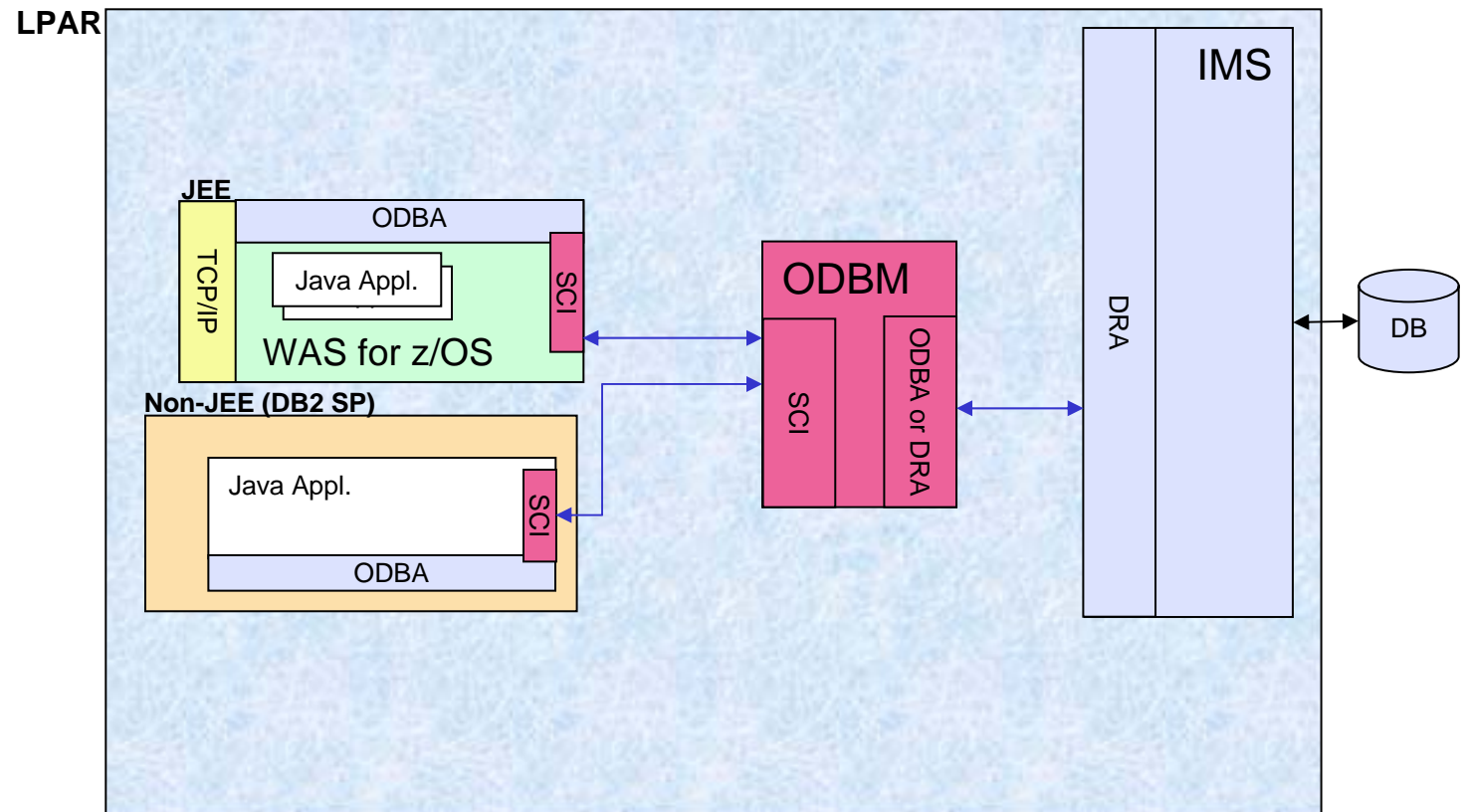
IMS 10 and IMS 9 Environment

LPAR

CICS

Java Appl.

DRA

CCTL

Traditional DRA

JEE

ODBA

TCP/IP

Java Appl.

WAS for z/OS

Traditional ODBA

Non-JEE (DB2 SP)

Java Appl.

ODBA

Traditional ODBA

JEE

WAS

z/OS or distributed

Java Appl.

ODBA

TCP/IP

IMS

DRA

DB

JMP

JBP

– Java application program access to IMS databases

Open Database

– Access from other LPARs and other platforms

- TCP/IP interface through IMS Connect
- Open Database Manager (ODBM) address space

Open Database

LPAR

JEE

TCP/IP

ODBA

Java Appl.

SCI

WAS for z/OS

Non-JEE (DB2 SP)

Java Appl.

SCI

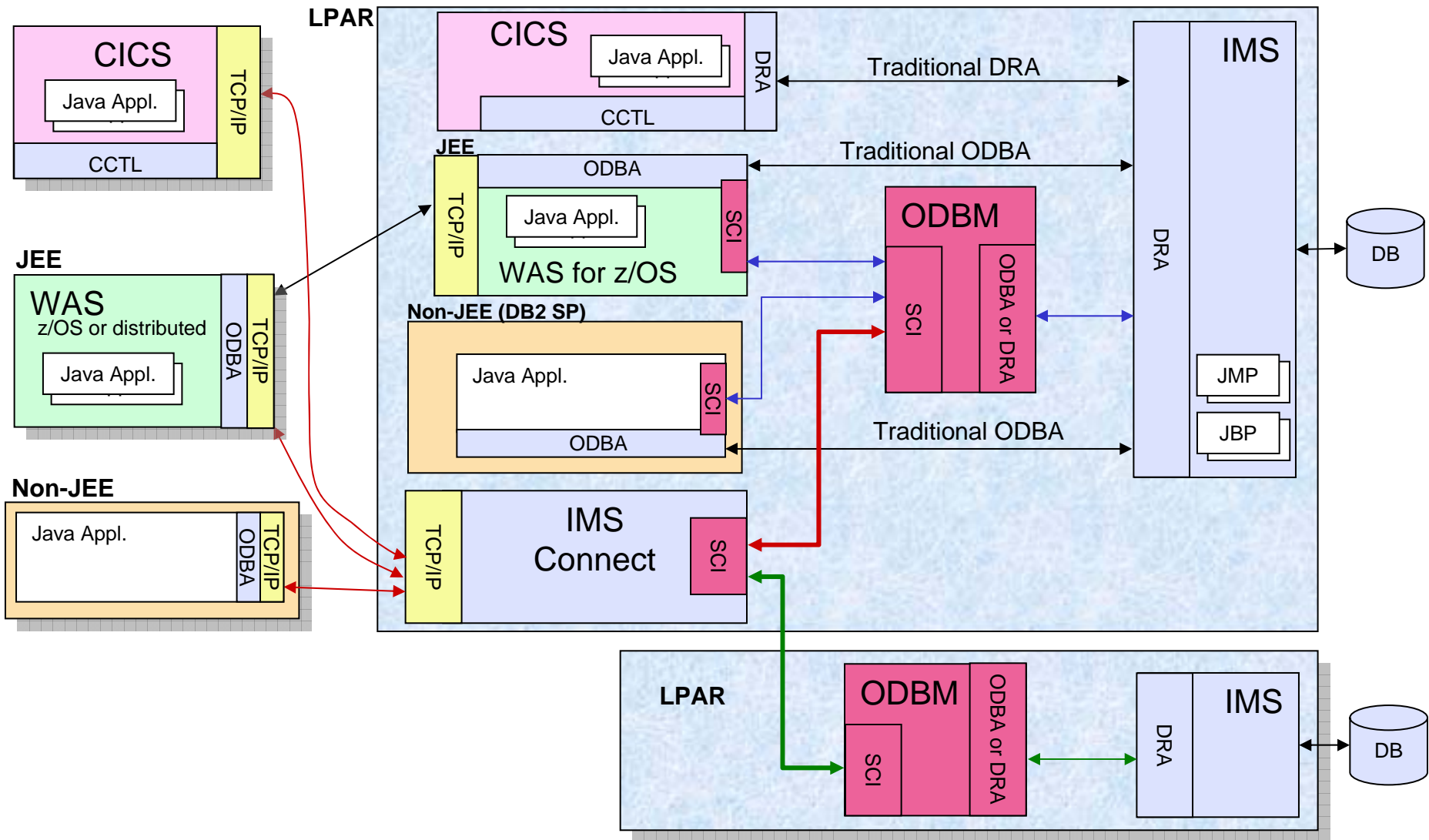ODBA

ODBM

SCI

ODBA or DRA

IMS

DRA

DB

- ODBM may be used with ODBA users on the same LPAR
  - Protect IMS from U0113 abends

Open Database
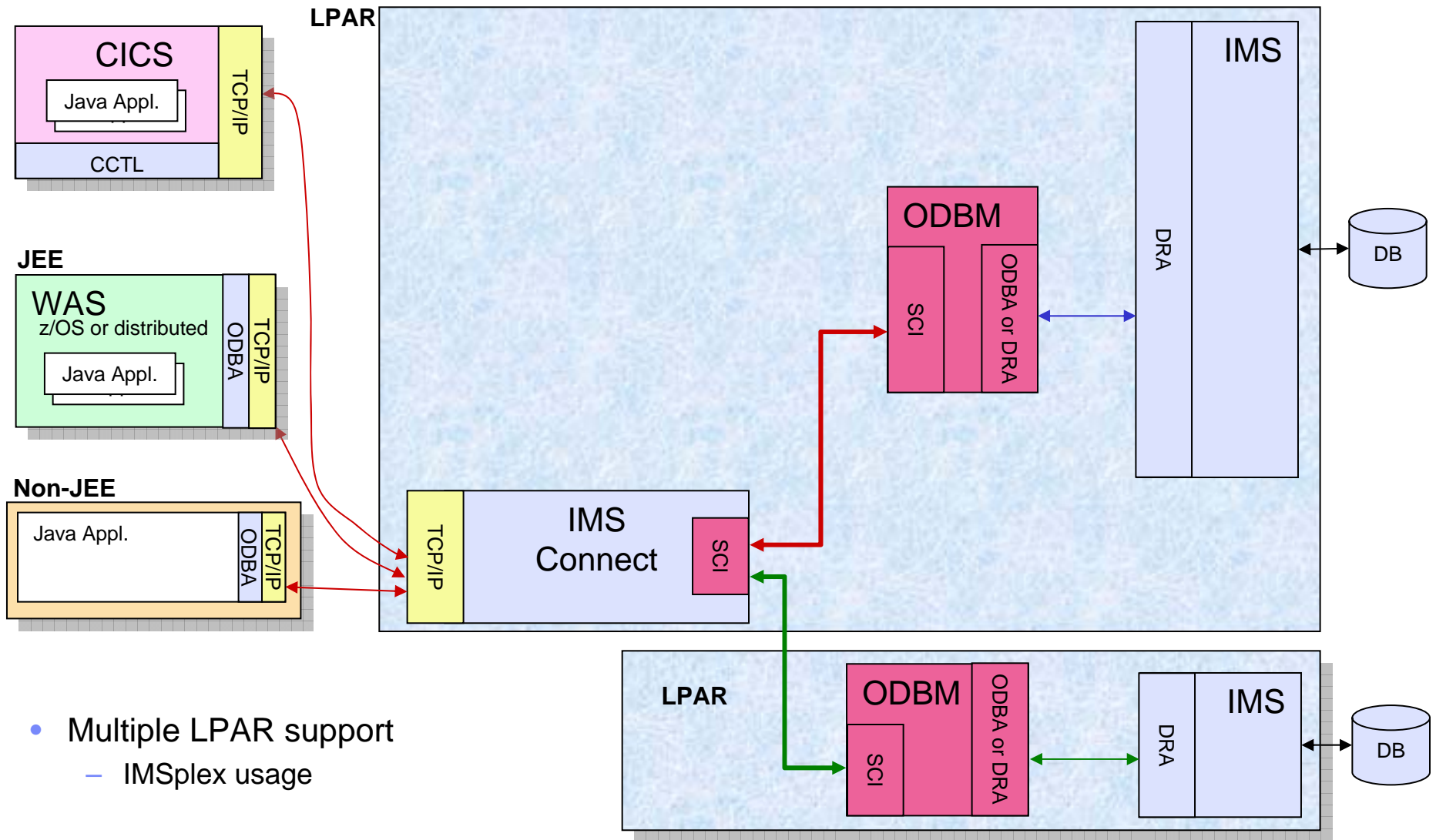
- Multiple LPAR support
  - IMSplex usage

Open Database - Many ways for access to IMS DBs

Universal Drivers

- **Universal drivers concept**
  - Single driver supports both type-4 (cross platform) and type-2 (same platform) connectivity
    - DRDA communications with IMS Connect for type-4 connectivity
    - Standard SQL including "virtual foreign keys" for hierarchy support

- **Universal drivers**
  - **Universal DB Resource Adapter**
    - JEE environments (e.g. WebSphere Appl. Server)
      - JCA 1.5
  - **Universal JDBC driver**
    - JDBC
  - **Universal DLI driver**
    - DL/I call interface
      - DL/I call concepts (SSAs, command codes, …)

Open Database and Universal Drivers

- Benefits

  - Access to IMS databases from any platform

    - z/OS and distributed
    - Java JEE and non-JEE

  - Distributed two phase commit support (optional)

    - Uses XA and RRS on z/OS

  - Universal drivers

    - Type-2 and type-4 connectivity
    - Standards based

  - Protection from Control Region U0113 abends

Database Enhancements

Database Quiesce

- **DB Quiesce**

  - Provides UPDATE command to create a Recovery Point

    - Command specifies databases, partitions or areas
    - Recovery point is recorded in RECONs
    - OLDS is switched
    - May be used for timestamp recoveries

  - Databases are <u>not</u> taken offline

    - Database data sets are <u>not</u> closed

  - Transaction programs and BMPs are <u>not</u> terminated

    - Internally quiesced at their next sync point
      - Database updates are quiesced

  - Recovery point is coordinated across IMSplex

  - Updates resume after all applications have reached a sync point

Database Quiesce

- Benefits

  - Minimal disruption to create recovery points
    - Databases data sets not deallocated or closed
    - Transactions and BMPs are not terminated

  - Coordinated across the IMSplex

  - May be used to eliminated regular (daily) /DBRs of databases

Fast Path Dynamic 64-bit Buffer Manager

- **Fast Path buffers above the bar in control region address space**
  - Optional
    - Specified in DFSDFxxx PROCLIB member
  - Autonomically allocates and manages buffers
    - Multiple subpools with different buffer sizes
    - User does not specify buffers
  - I/O is done directly to and from the 64-bit buffers
  - OBA is not serialized
    - Multiple dependent regions and threads may have OBA buffers at the same time

Fast Path Dynamic 64-bit Buffer Manager

- Benefits
  - ECSA constraint relief
    - Eliminates U1011 abends due to ECSA fragmentation

  - Supports multiple buffer sizes
    - Better use of buffers for areas with different CI sizes

  - Self tuning
    - User does not specify number of buffers
    - System dynamically adds buffers on demand

  - Eliminates need for IMS restart to add more Fast Path buffers
    - New dependent regions or threads may be added

OPEN Option for UPD DB and UPD AREA command

- **OPEN Option on UPD DB|AREA START(ACCESS) for DEDBs**

  - Opens all areas of specified DEDB or the specified AREA

  - Examples:

    `UPD DB NAME(DEDB001) START(ACCESS) OPTION(OPEN)`
      - Opens all areas for DEDB001

    `UPD AREA NAME(AREA0102) START(ACCESS) OPTION(OPEN)`
      - Opens area AREA0102

- **Benefit**

  - Operations may open areas before their first use by applications

HALDB OLR Performance Enhancements

- **HALDB Online Reorganization Performance Enhancements**
  - One log record written for all updates to a block
  - Sequential access for VSAM KSDS get processing
  - GNP calls eliminated for root-only databases
  - Reduced lock requests
    - Reduced use of the data set (ZID) busy lock
      - PHIDAM index inserts are batched at end of each unit of reorganization
    - Block locks eliminated for ILDS updates
    - IRLM lock look-aside
      - Avoids requesting locks already held

- **Benefits**
  - Reduced logging, reduced CPU consumption, shorten elapsed times

DBRC Enhancements

BPE Based DBRC Region

- **BPE for online system DBRC region**

  – Only applies to online DBRC region

- **Optional**

- **BPE provides improved tracing**

  – Four DBRC traces

    • Errors, requests, module flow, and group services and notifications

  – BPE external trace may be used

- **BPE provides improved user exit management**

  – RECON I/O, Security (command authorization), and Statistics exits

  – Multiple exits of each type

  – Refreshable exits without terminating IMS

- **LSR buffers defined in PROCLIB member**

BPE Based DBRC Region

- Benefits
  - Improved tracing capabilities
  - Improved user exit management
    - New statistics exit
  - Simplified definition of LSR buffers for the RECONs

Unconditional Deletion of RECON Information

- CLEANUP.RECON command

  - Used to delete old information in RECONs
    - Either time interval or time stamp is specified
      - Determines the time before which information is deleted
    - Deletes PRILOG, IC, ALLOC, REORG, and RECOV information

  - Information deleted even though IC requirements are not met
    - GENMAX and RECOVPD are ignored

  - Logs are deleted if closed before the specified time
    - Other logs are compressed in the PRILOG records

Unconditional Deletion of RECON Information

- Benefits

    - Simplifies maintenance of RECONs

    - Useful when data sets are deleted by expiration policy
        - Data sets older than a specified age are automatically deleted

    - May be used to identify data sets which are no longer in use
        - Command may be issued for a copy of the production RECONs

Migration

Migration

- Migration for IMS 9 and IMS 10 is supported

  - RECON upgrades directly from IMS 9 and IMS 10

  - DB recovery utilities accept IMS 9, IMS 10, and IMS 11 image copies, logs, and change accum data sets

- Applications and databases are compatible

  - Program recompiles and relinks are <u>not</u> required

- Coexistence support

  - Data sharing, shared queues, ISC, and MSC are supported with IMS 9 and IMS 10

  - Connectivity with CICS and DB2 supported with all supported releases of CICS and DB2

Coexistence Maintenance

- Coexistence APARs

Function	IMS 9 APAR	IMS 10 APAR
RECONs	PK61582	PK61583
IMS Connect	PK24912 PK29938 PK00895 PK87088	None
IMSplex	PK23402 PK32970 PK27280 PK30189	None
Global Online Change	PK23402 PK32970	None
ODBA	PK66020	PK66022
OTMA	PK47172	None
System Management	PK30189	None

More Information on IMS 11

- IMS 11 Release Planning, GC19-2442

- IMS 11 Publications
  - All the IMS Version 11 publications are available from the Information Management Software for z/OS® Solutions Information Center
    - publib.boulder.ibm.com/infocenter/imzic
      - Look under IMS Version 11

- IMS Family Web site:
  - www.ibm.com/ims

IMS Enterprise Suite

- A new no-charge product (5655-T60)
  - Packages several independent components
  - SMP support provided

- Components
  - IMS Connect API for Java and C
  - SOAP Gateway WS-Security and Business Events support
  - Java Message Server (JMS) API for Callout function
  - DLIModel utility Eclipse plug-in
    - GUI interface and database virtualization tool
  - …

- Teleconferences on the IMS Enterprise Suite
  - Nov. 24 and Dec. 8

IMS 11 Highlights

- **Open Database**
  - *Easier* distributed access to IMS databases

- **Database Quiesce**
  - *Easier* creation of recovery points with greater database availability

- **OTMA Resource Monitoring**
  - *Easier* management of remote transactions through IMS Connect

- **Fast Path 64-Bit Buffer Manager and 64-Bit ACB Storage Pool**
  - *Easier* performance management

- **ACBLIB Dynamic Allocation**
  - *Easier* management of ACBLIB data sets

Easier than Ever!