

E12

Using ODBA to Access you IMS Databases

Ken Blackman



St. Louis, MO

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kblackm@us.ibm.com

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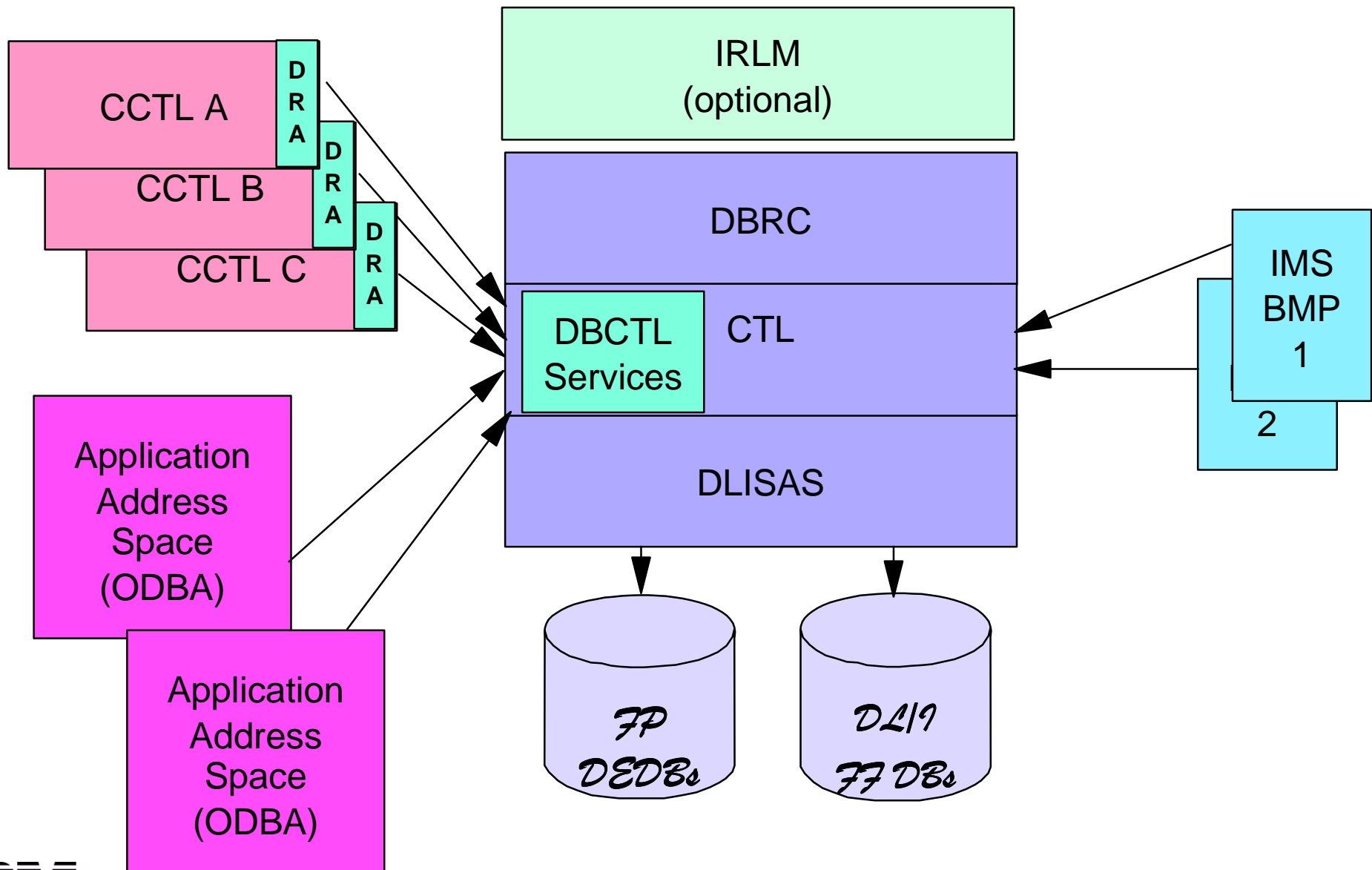
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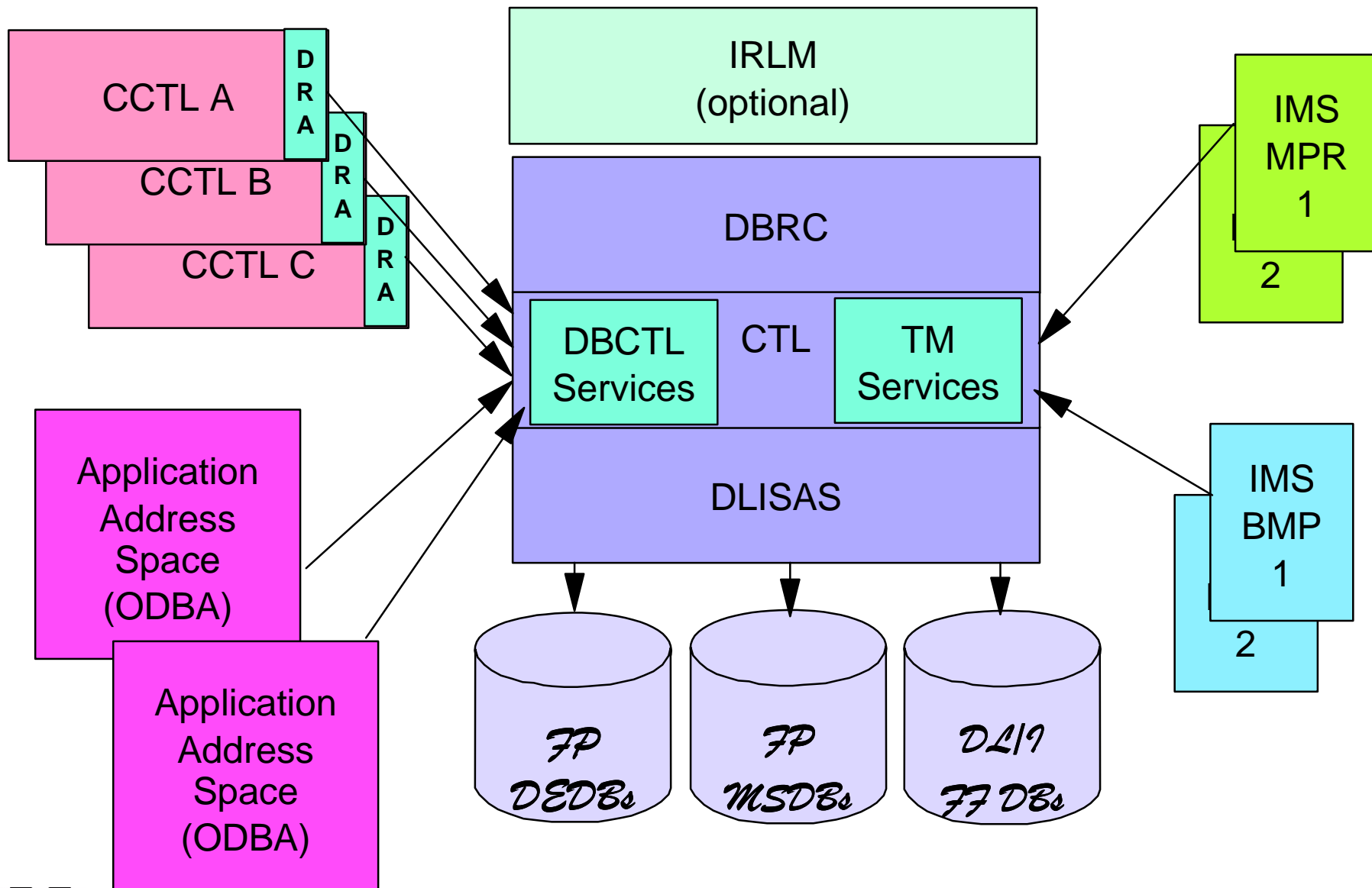
Agenda

- DBCTL Overview
- What is Open Database Access(ODBA)
- Setup Process
- ODBA Callable Interface connection to IMS DB
- New and Enhanced calls for ODBA
- Resource Recovery Services Basic Concepts
- Connection security
 - ▶ PSB security
- Examples
- Summary

IMS DBCTL Subsystem Structure



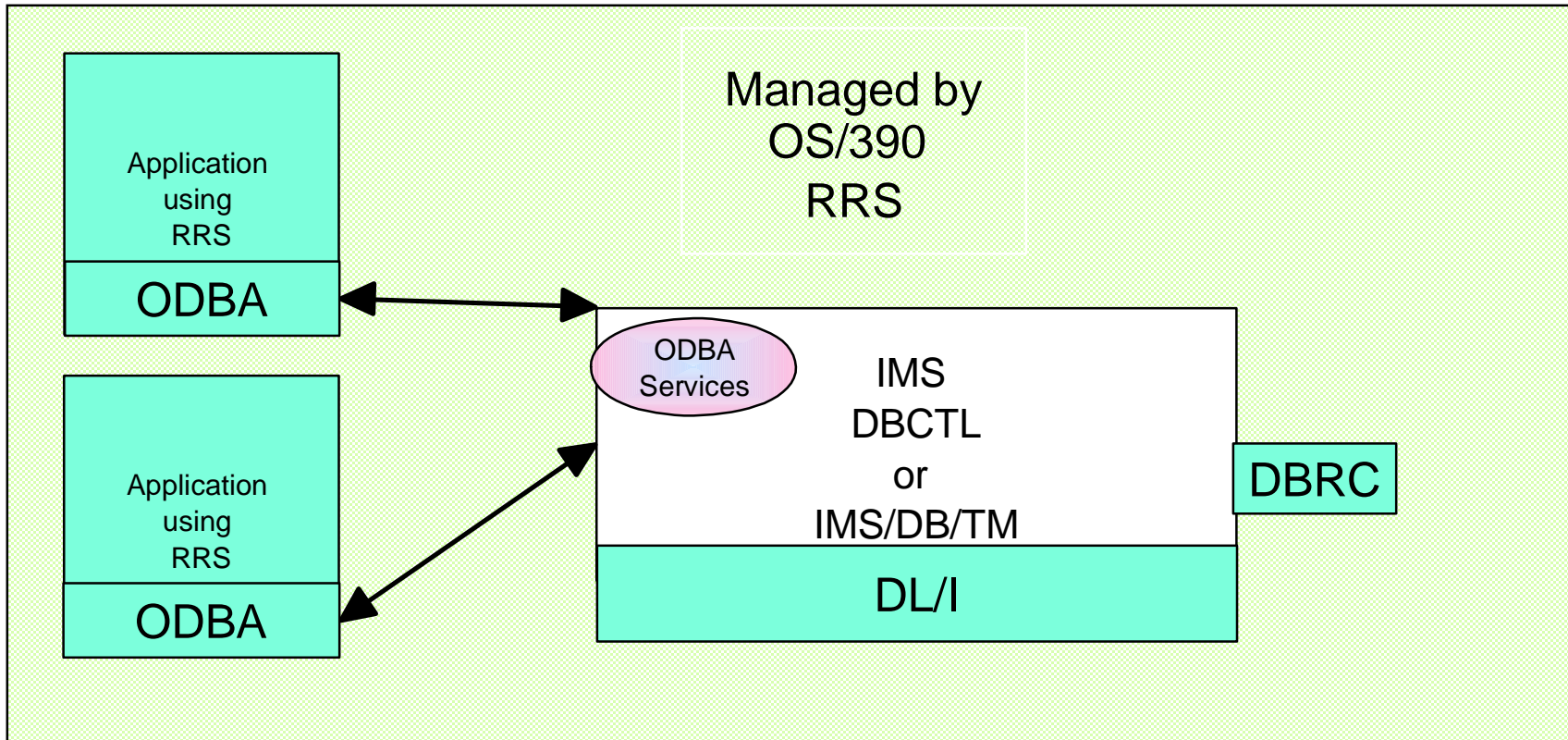
IMS TM/DB Subsystem Structure



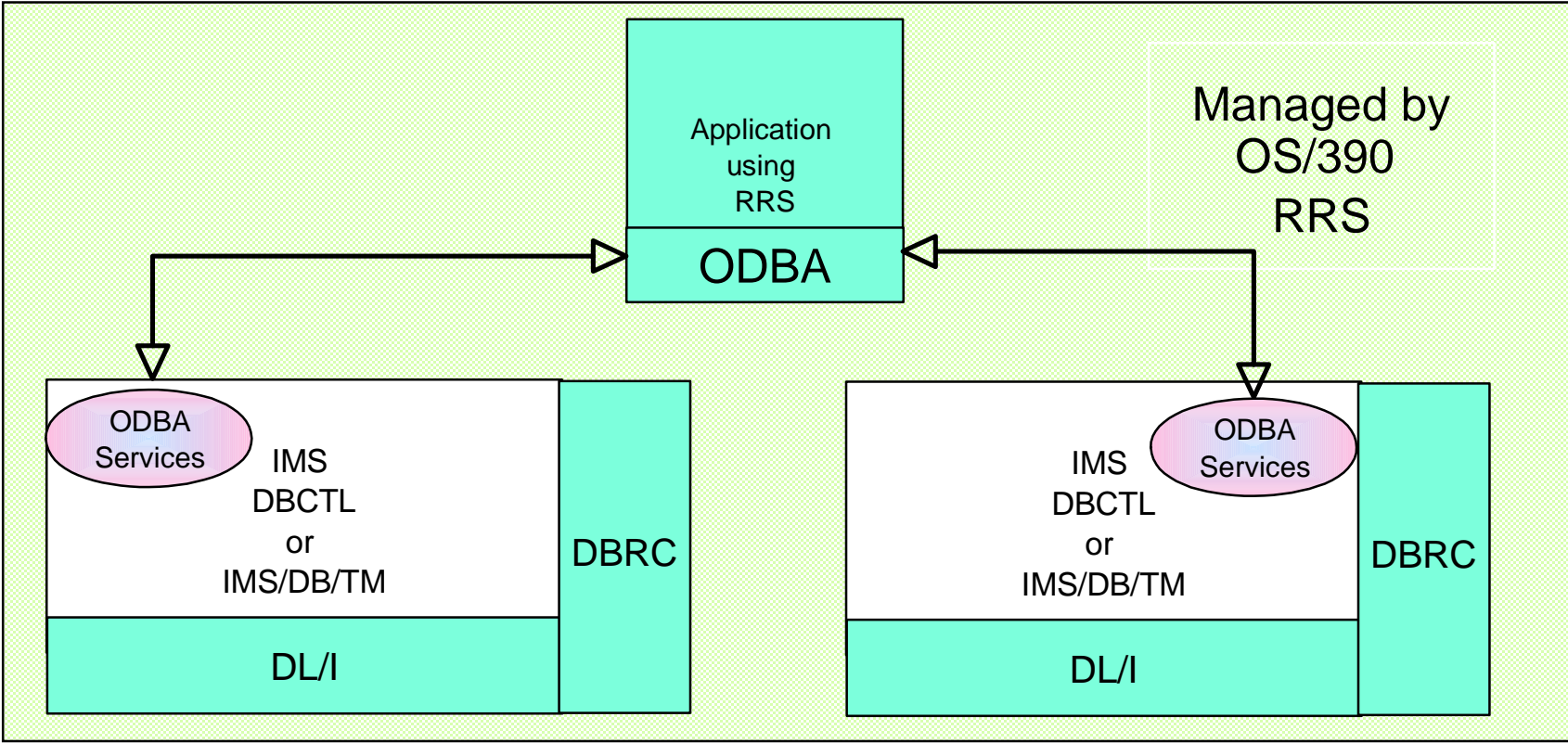
What is Open Database Access(ODBA)

- ODBA is a callable interface to databases managed by the IMS DB
- ODBA does not require an independent DBCTL subsystem
- ODBA allows IMS DB and OS/390 application programs to be developed, installed, and maintained independently of each other
- ODBA provides for failure isolation and independent resource recoverability
- ODBA requires RRS/MVS for syncpoint management

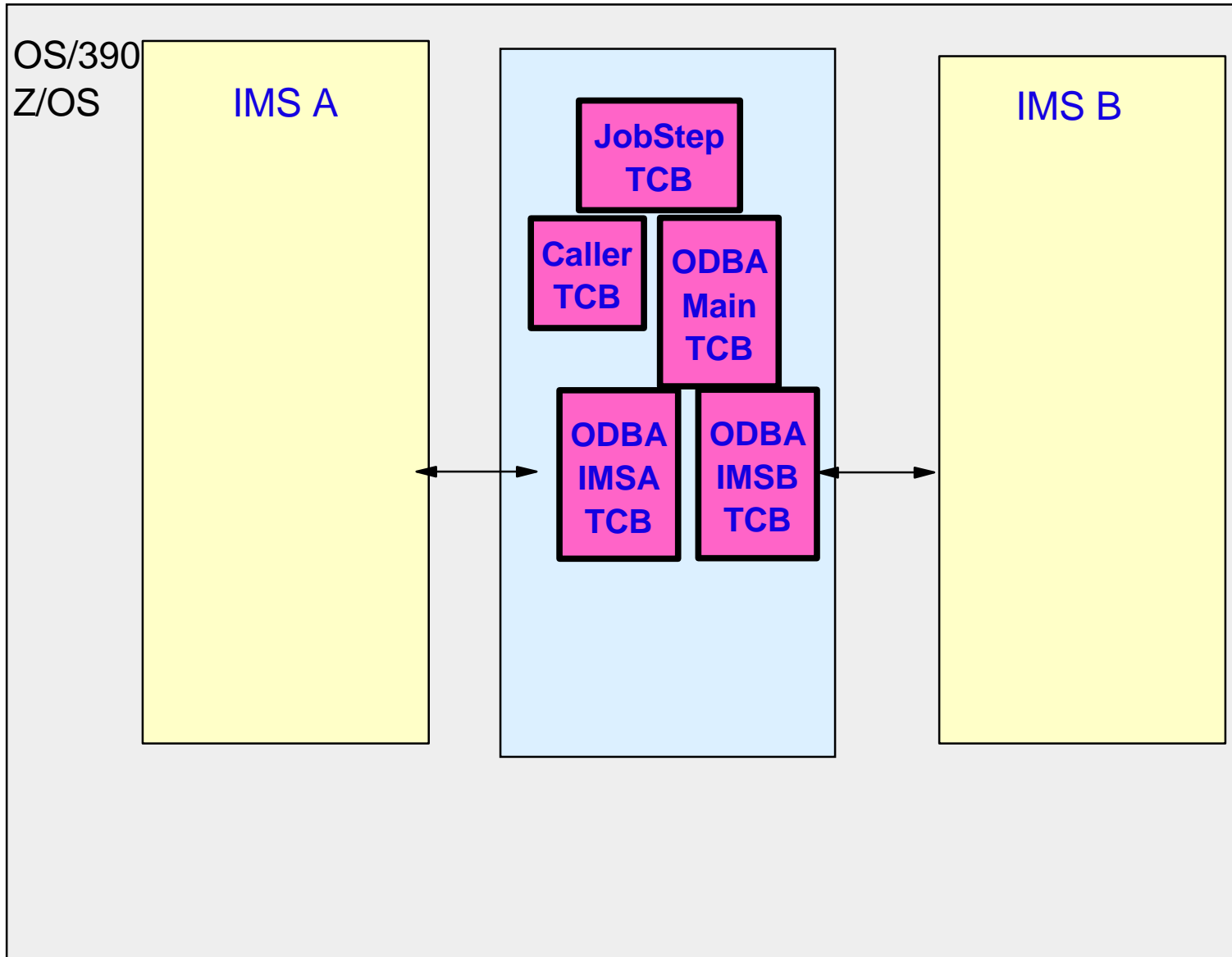
Multiple Applications to one IMS system



One Application to multiple IMS systems



ODBA TCBs



Setup Process

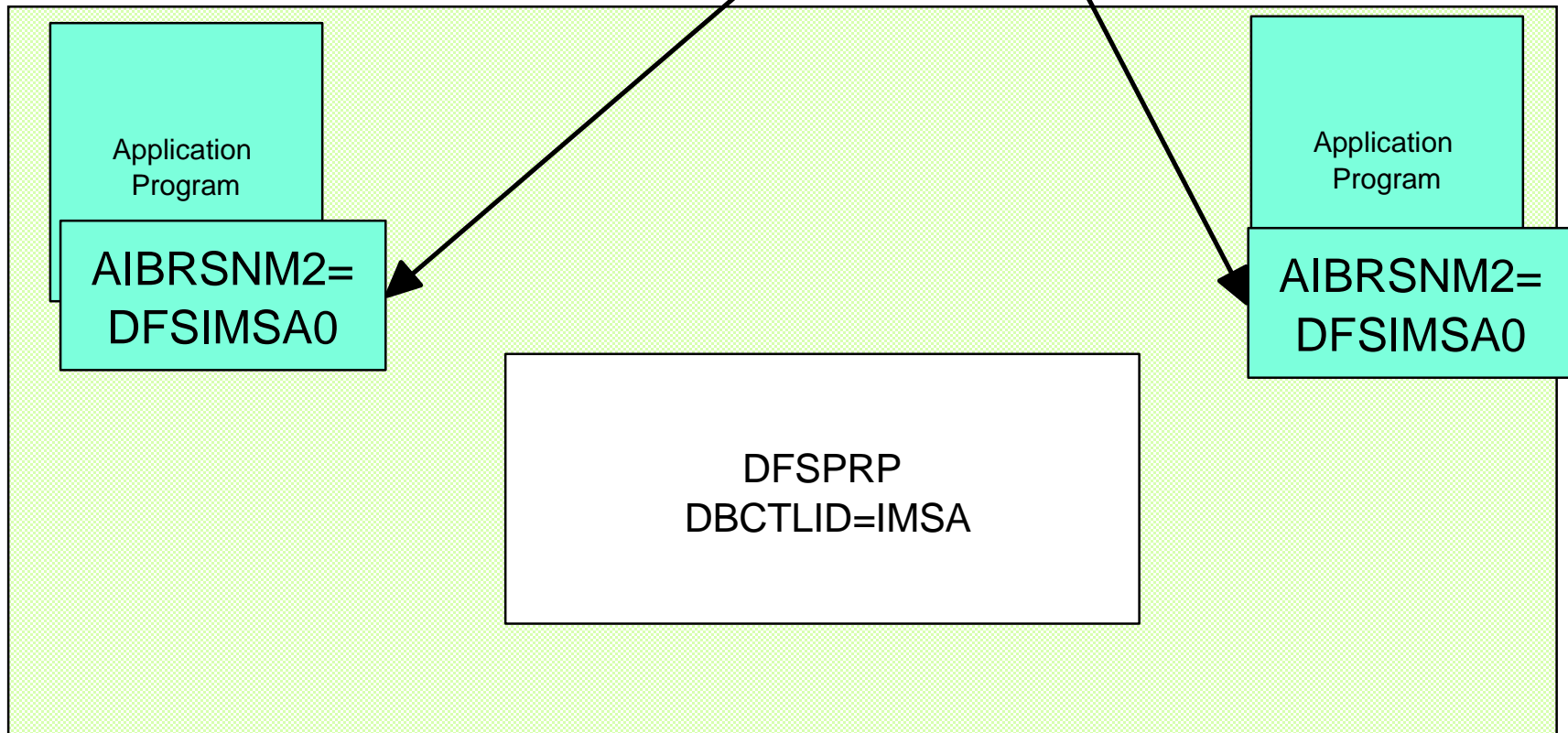
- Defining the Connection
 - ▶ DFSPRP macro defines DRA Startup parms
 - ▶ Assemble DFSnnnn0
 - nnnn = Any 1-4 alphanumeric characters
 - ▶ Put in PDS accessible by ODBA application address space
 - ▶ Where can you find the Parm Descriptions
 - DFSPRP DSECT=YES
 - IMS Install Volume 2

Setup Process...

- DFSPRP parms
 - ▶ DBCTLID
 - 1-4 IMSID value
 - ▶ CNBA
 - Total number of FastPath buffers
 - $FPBUF \times MAXTHRD \leq CNBA$
 - Needed for FP DEDB access
 - ▶ MINTHRD & MAXTHRD
 - $1 \leq MINTHRD \Rightarrow 999$
 - $1 \leq MAXTHRD \Rightarrow 999$
 - If $MAXTHRD < MINTHRD$ then $MAXTHRD = MINTHRD$

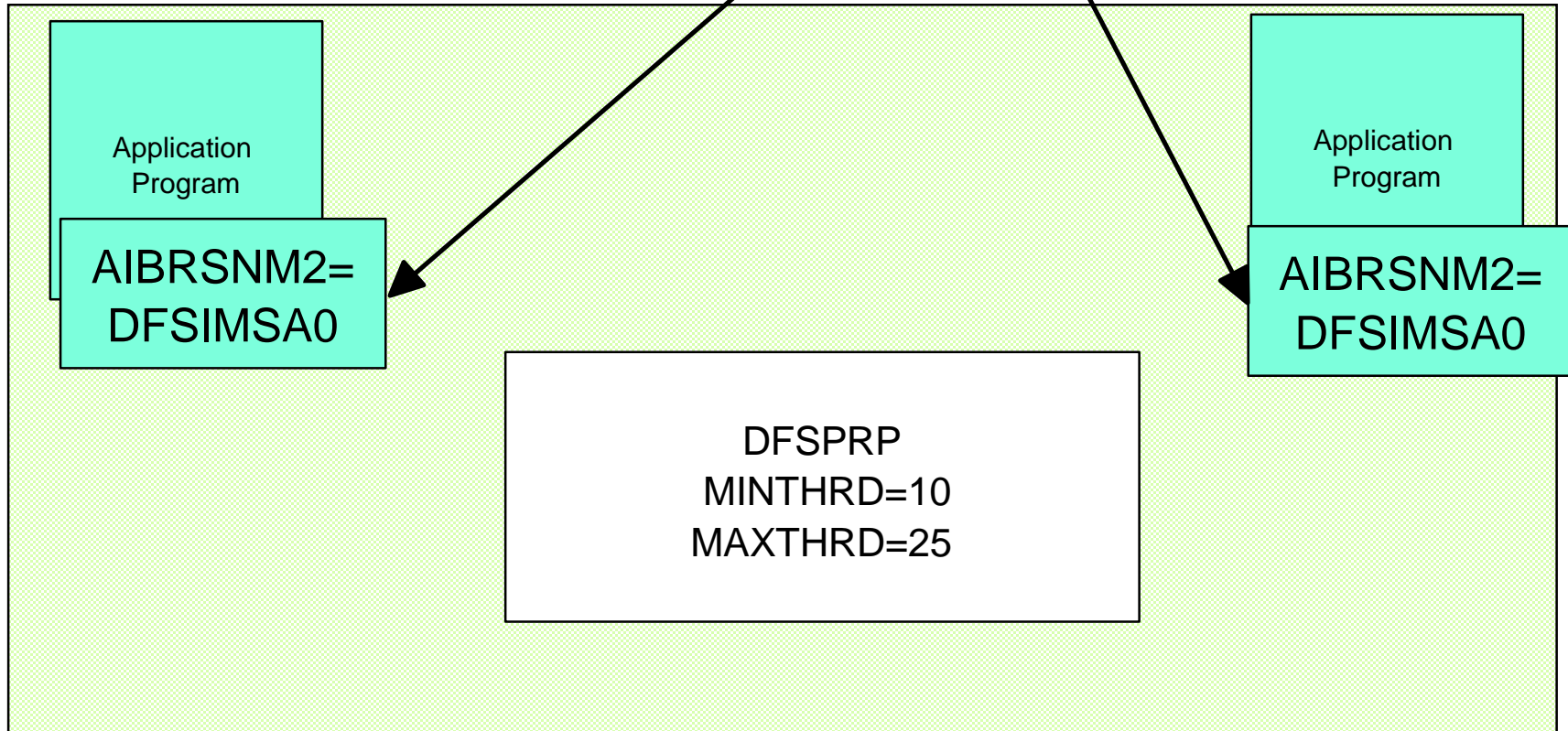
ODBA connection to IMS

```
//ODBA DD DSN=IMS.SDFSRESL(DFSIMSA0)
```

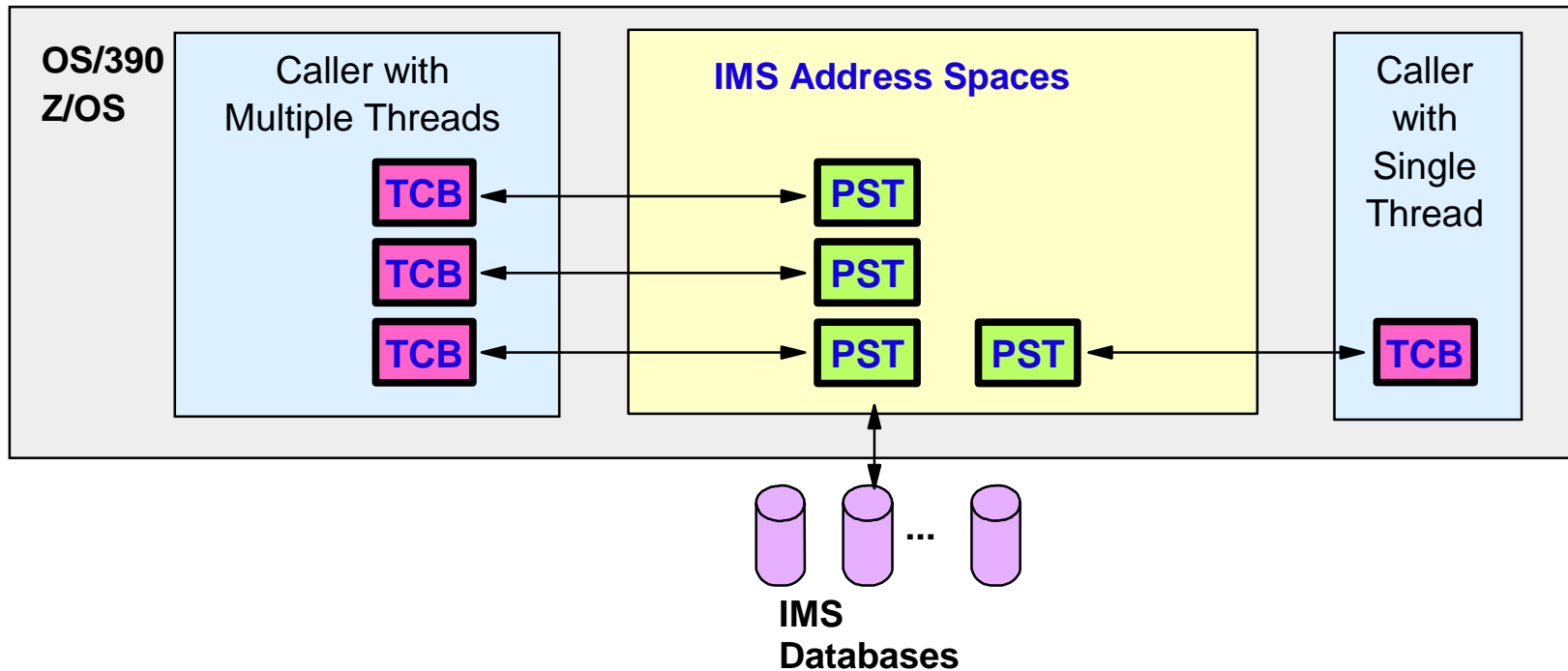


ODBA connection to IMS

```
//ODBA DD DSN=IMS.SDFSRESL(DFSIMSA0)
```



Caller TCB/PST



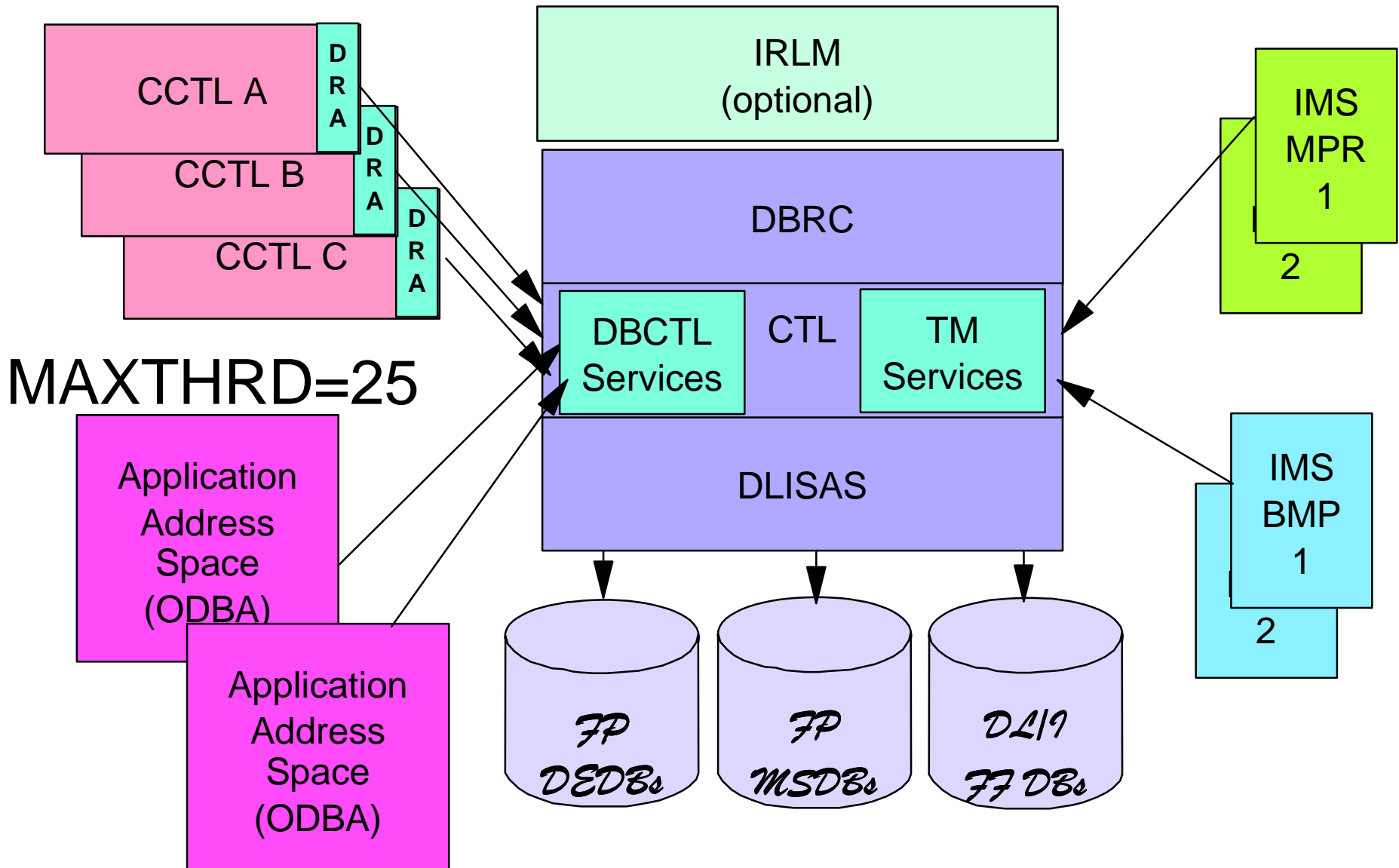
- **Multiple concurrent connections**

- Connectors may have multiple threads

- Each thread requires a TCB in caller environment
 - Each thread uses a PST in the control region

MAXTHRD=50

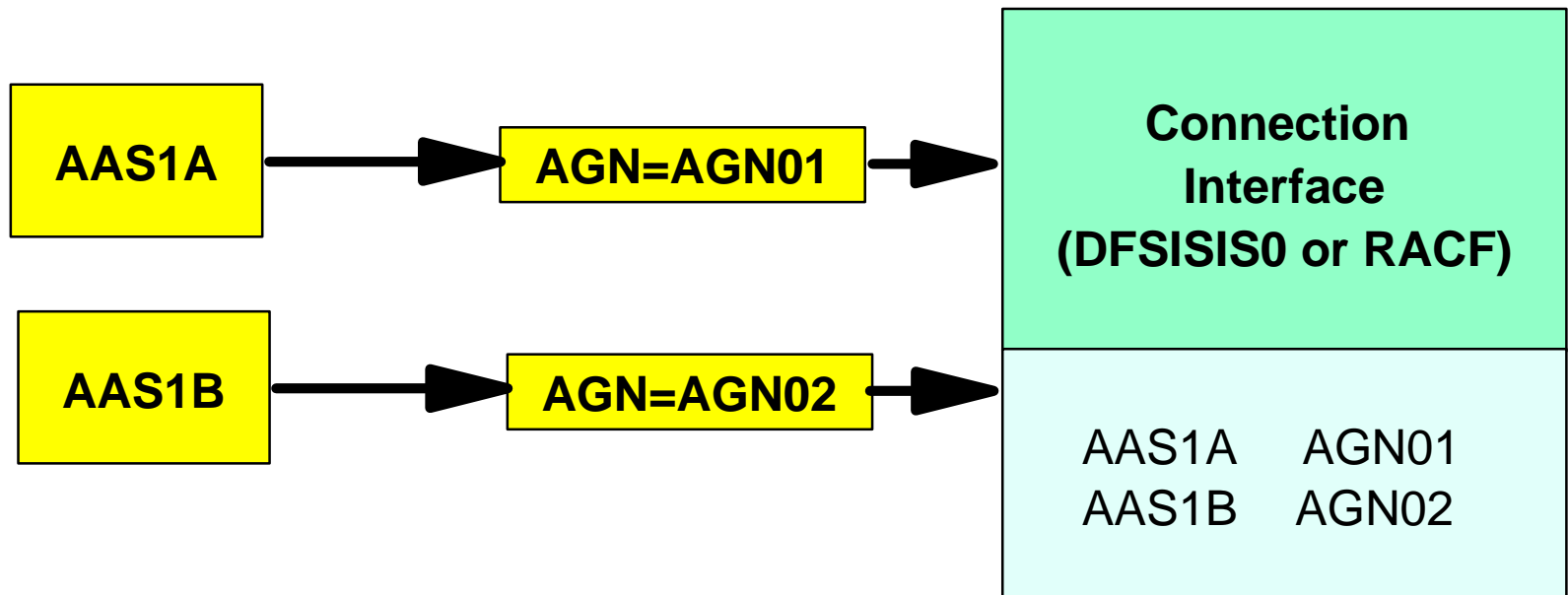
MPP/BMP=50



Connection Security

USERID from JOBCARD

AGN from DRA Startup Table



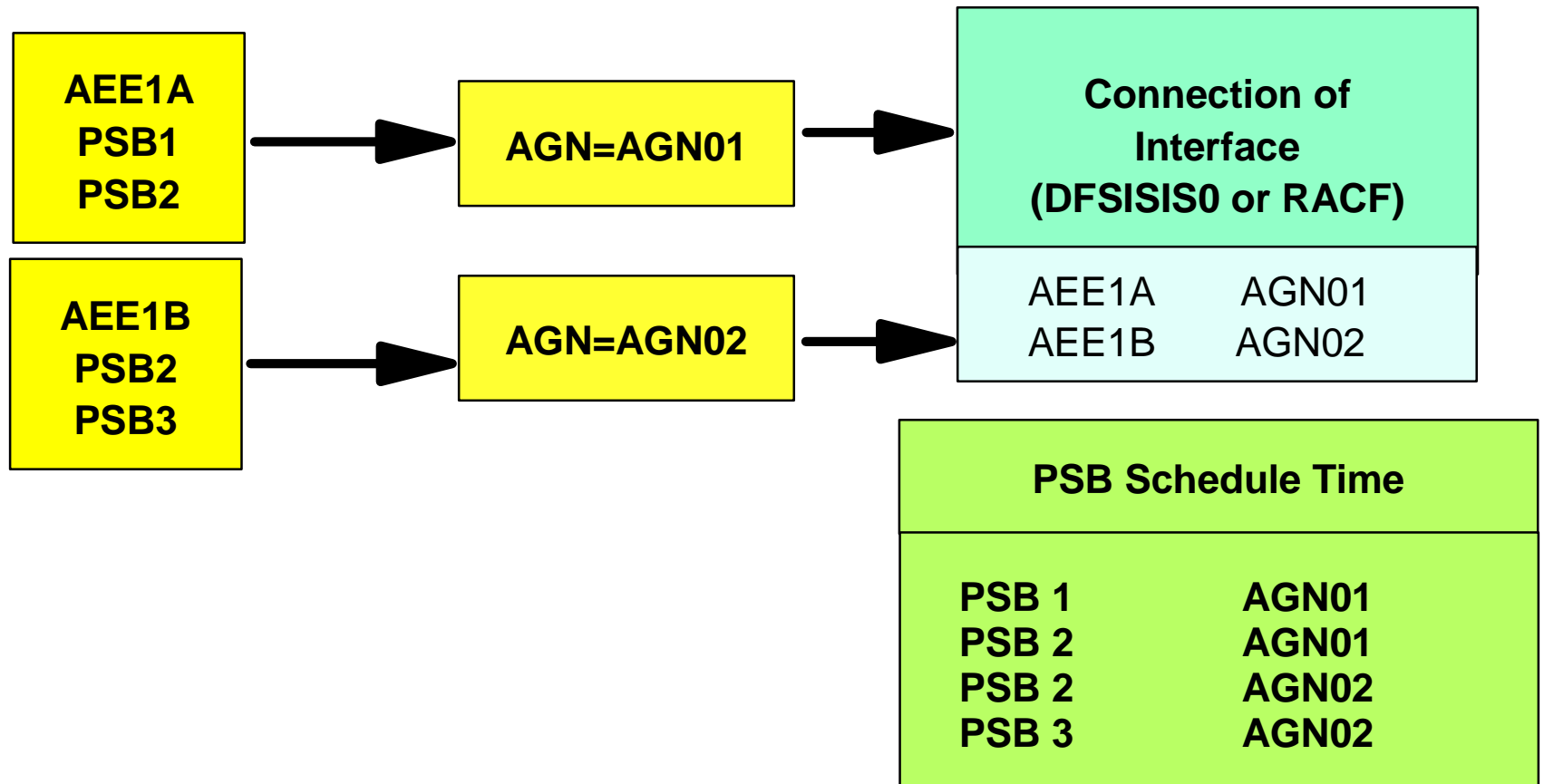
ISIS Parameter

Select ISIS= 1 - RACF

Select ISIS= 2 - DFSISIS0

AGN PSB Security

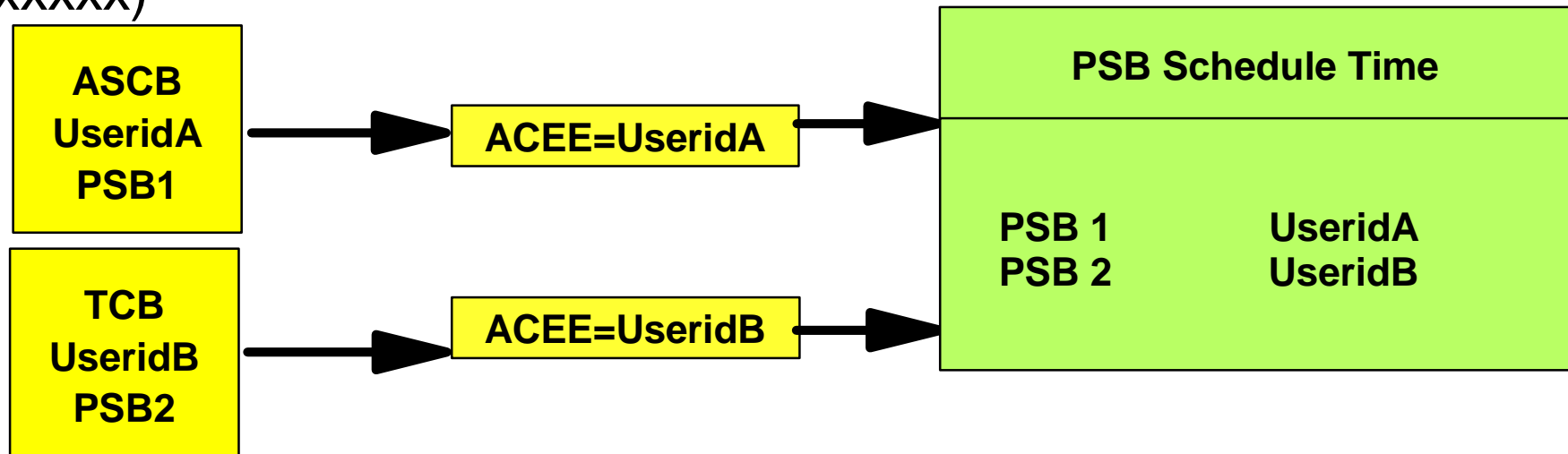
ISIS=1 or 2



ACEE PSB Security

IMS V7 - PQ50230 IMS V8 - PQ61889

- ODBASE=Y/N
 - ACEE - Authenticated USERID
 - The IMS application group resource class (AIMS or Axxxxxxx)



USERID from JOBCARD = ASCB

USERID from THREAD = TCB

DFS2855A APSB SECURITY CHECK FAILED...

and

ABENDU0438

ODBA Callable Interface connection to IMS DB

- **Application program must be linked with DFSCDLI0 or load it**
 - Language interface module for ODBA
 - Provides AERTDLI alias name
 - Invokes DRA interface
- **IMS modules must be available to address space**
 - May be in STEPLIB or JOBLIB
 - DFSAERG0
 - DFSAERM0
 - DFSAERA0
 - DRA Startup Table (DFSnnnn0)

ODBA Calls

- **IMS Calls must use AIB interface with AERTDLI**
 - CIMS
 - Establishes and terminates the connection
 - APSB
 - Allocates a PSB
 - DPSB
 - Deallocates a PSB when changes committed
 - DLI calls
 - Usual access to databases (GU, GN, ISRT, ...)
- **Synchronization via Resource Recovery Services**

CIMS Function=INIT

Call AERTDLI parmcount, CIMS, AIB

parmcount = set to n (optional)

AIB = Address of AIB

- AIBSFUNC=INIT(required)
- AIBRSNM2 = 1-4 character DRA ID (optional)
 - example IMSA
 - load DFSIMSA0 DRA Startup Table

//ODBA DD DSN=IMS.SDFSRESL(DFSIMSA0)



APSB call

Call AERTDLI parmcount, APSB, AIB

parmcount = set to 2 (optional)

AIB = Address of AIB (required)

- AIBRSNM1 = 8 character PSB name (required)

– example IMSAPSB1

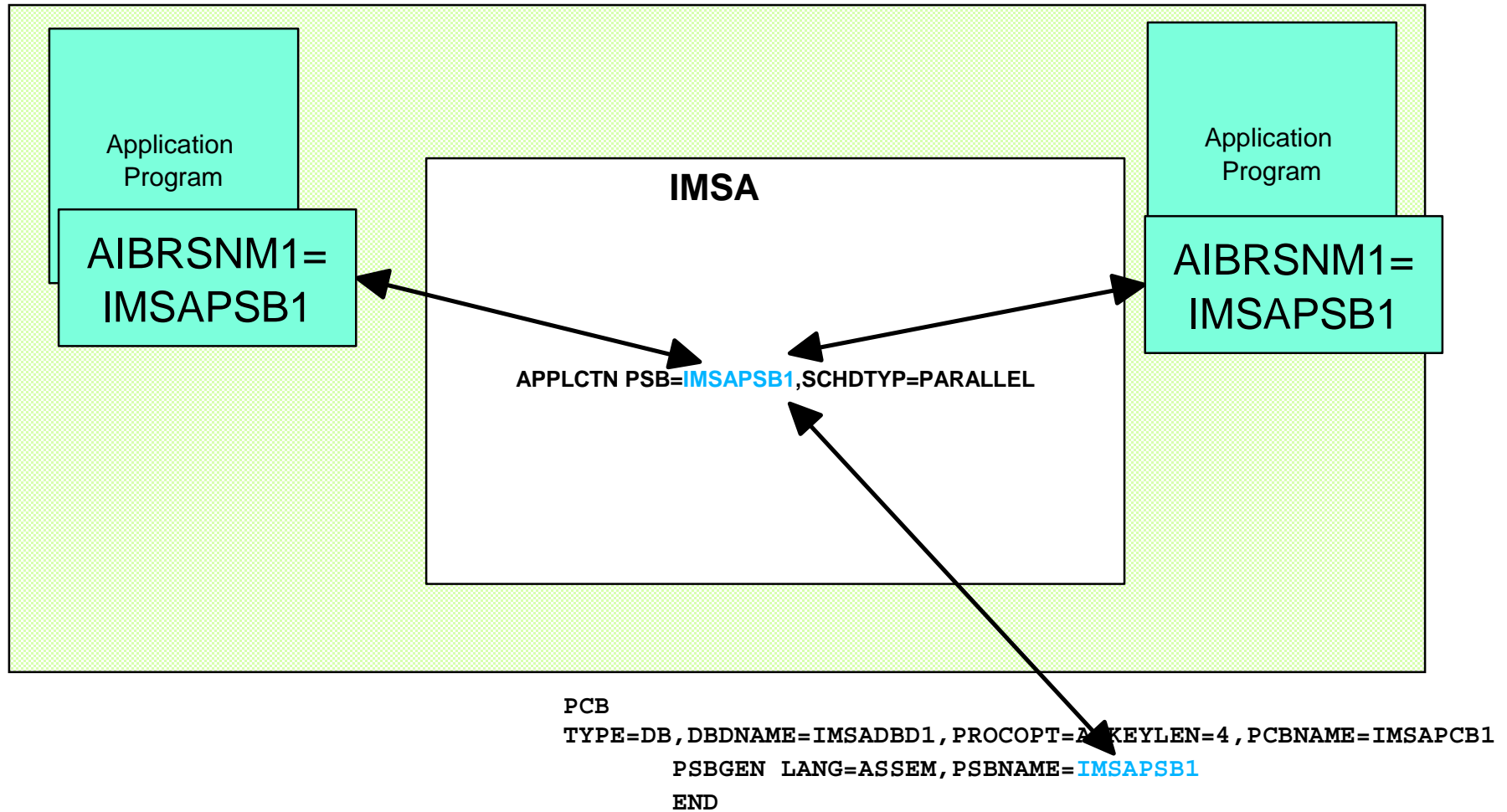
APPLCTN PSB=IMSAPSB1 ...

- AIBRSNM2 = 1-4 character startup table identifier (required)

– example IMSA

//ODBA DD DSN=IMS.SDFSRESL(DFSIMSA0)

ODBA connection to IMS



DL/I call

Call AERTDLI parmcount, xxxx, AIB, ...

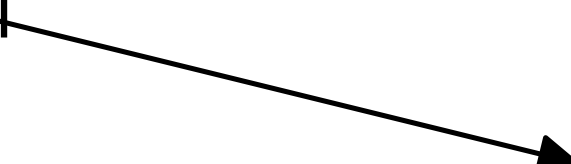
parmcount = set to n (optional)

xxxx = Call function (required)

AIB = Address of AIB

- (required-must be same as APSB AIB)
- AIBRSNM1 = 8 character PCB name (required)
 - example IMSAPCB1

```
PCB
TYPE=DB, DBDNAME=IMSADBD1, PROCOPT=A, KEYLEN=4, PCBNAME=IMSAPCB1
PSBGEN LANG=ASSEM, PSBNAME=IMSAPSB1
END
```



DPSB call

Does not initiate sync point processing

Call AERTDLI parmcount,DPSB, AIB

parmcount = set to 2 (optional)

AIB = Address of AIB (required)

- AIBRSNM1 = 8 character PSB name (required)
 - example IMSAPSB1
- AIBSFUNC = PREP (optional)
 - Used to perform Phase One of syncpoint
 - Database changes In-Doubt

CIMS Function=TERM

Call AERTDLI parmcount, CIMS, AIB

parmcount = set to n (optional)

AIB = Address of AIB

- AIBSFUNC=TERM(required)
- AIBRSNM2 = 1-4 character DRA ID (required)
 - example IMSA
 - uses DFSIMSA0 DRA Startup Table

CIMS Function=TALL

Call AERTDLI parmcount, CIMS, AIB

parmcount = set to n (optional)

AIB = Address of AIB

- AIBSFUNC=TALL(required)

Resource Recovery Services(RRS)

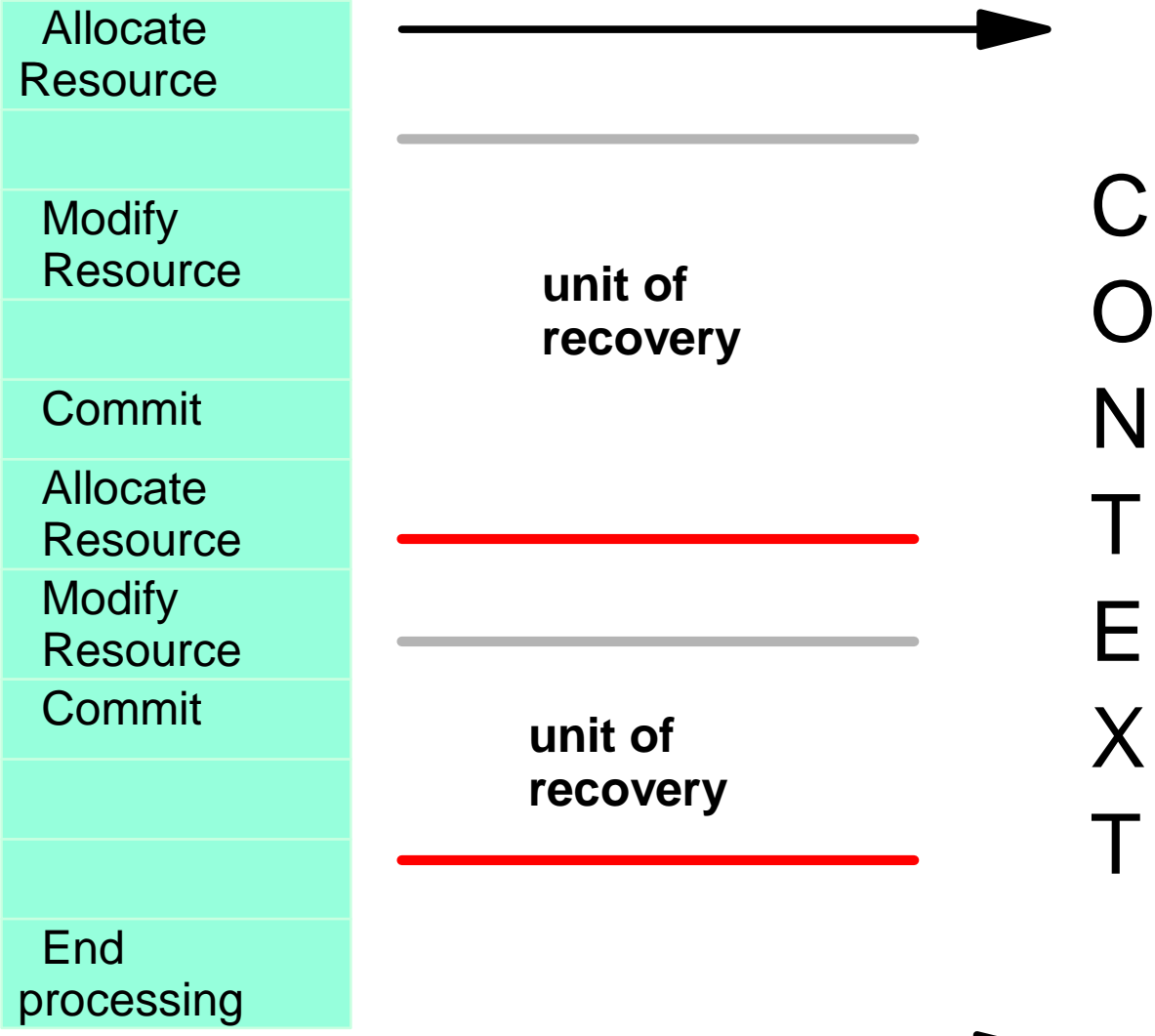
- A sync-point manager to coordinate the two-phase commit process
- Commit and Backout callable services for application programs
- A mechanism to associate resources with an application instance
- Manages Unit of Recovery(UR)

RRS Commit & Backout Stubs

- ATRCMIT or SRRCMIT
 - ▶ Commit unit of work
 - CALL SRRCMIT(RETCODE)
 - CALL ATRCMIT(RETCODE)
- ATRBACK or SRRBACK
 - ▶ Backout unit of work
 - CALL SRRBACK(RETCODE)
 - CALL ATRBACK(RETCODE)
- RRS stub code module used to access RRS
 - ▶ ATRRCSS from SYS1.CSSLIB

Context Example

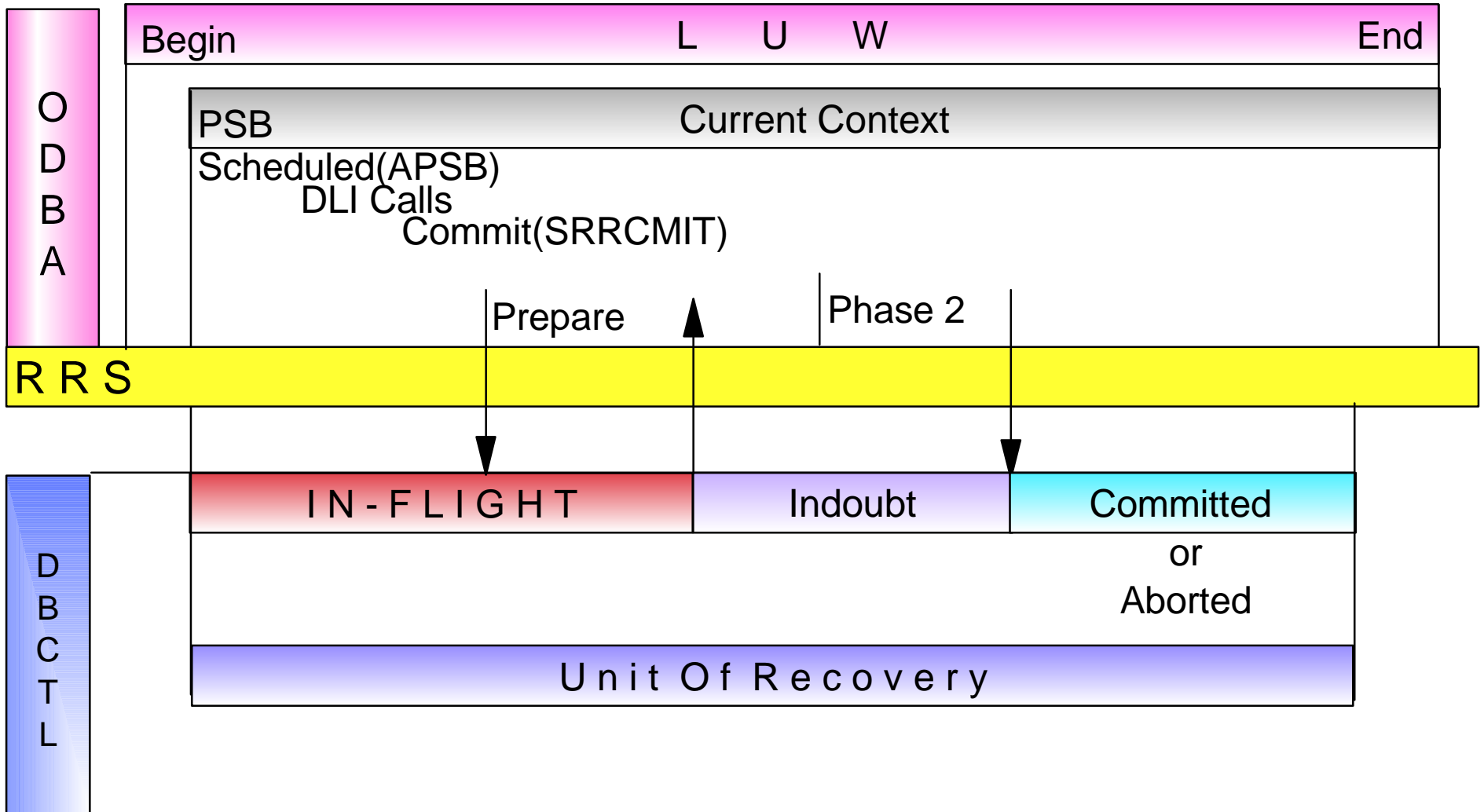
TCB - private start



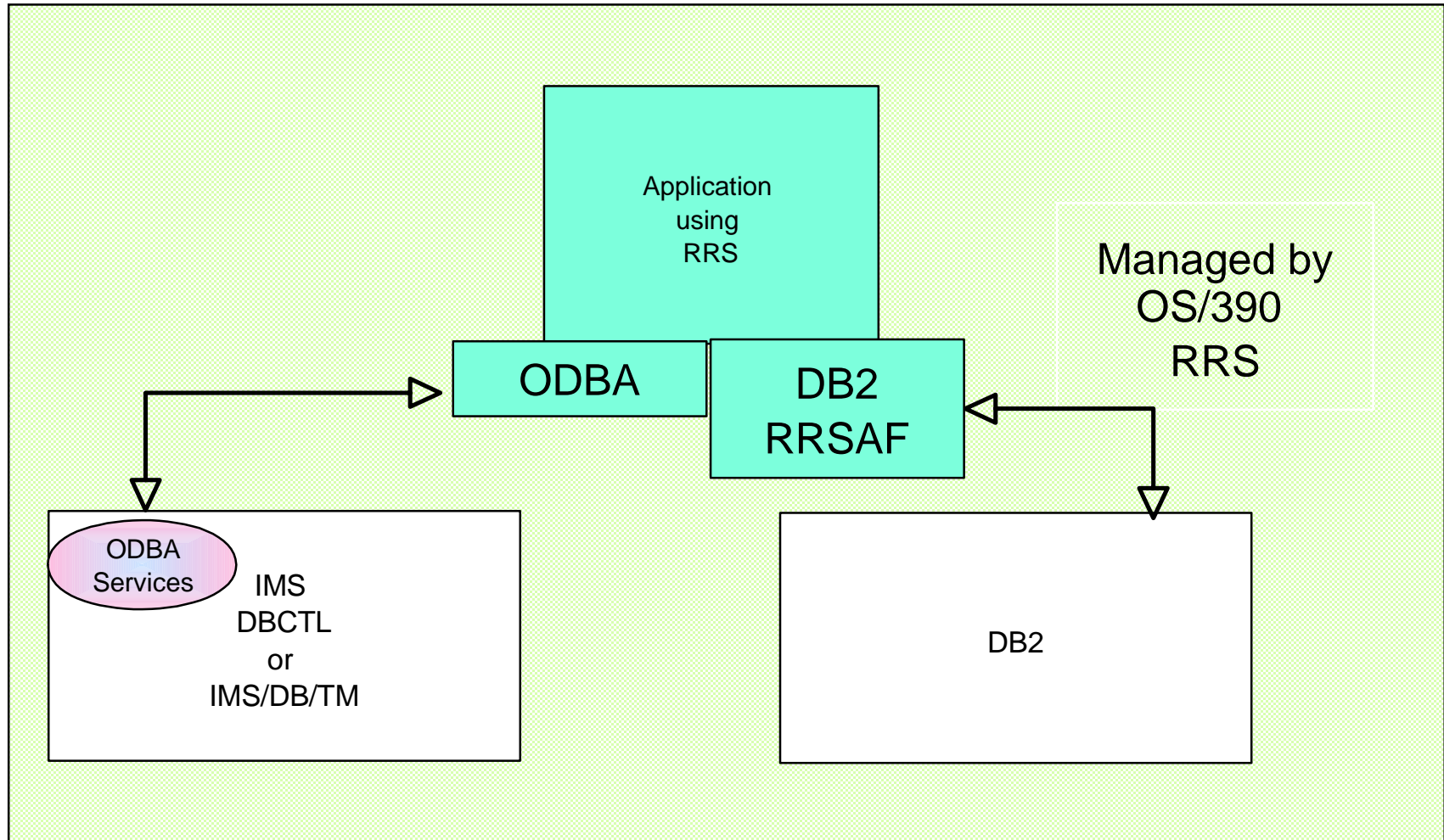
TCB - private end



Two Phase Commit



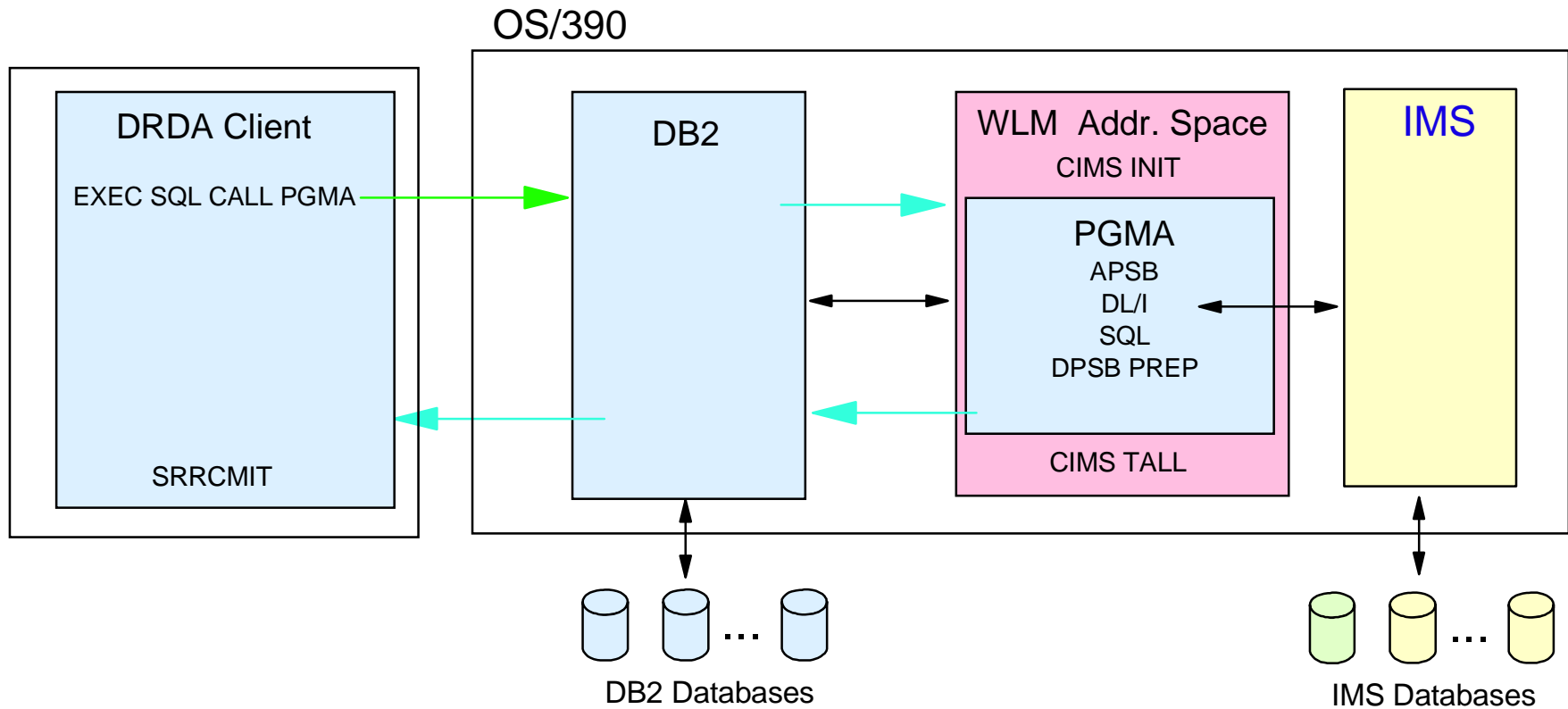
RRS Global Transaction



RRS Logging

- ARCHIVE - archive log (optional)
 - ▶ completed UR information
- RM.DATA - resource manager data log
 - ▶ Registered Resource Managers information
- MAIN.UR - main UR state log
 - ▶ current state of active URs
- DELAYED.UR - delayed UR state log
 - ▶ current state of active URs that have been delayed
- RESTART - restart log
 - ▶ incomplete URs information needed for restart

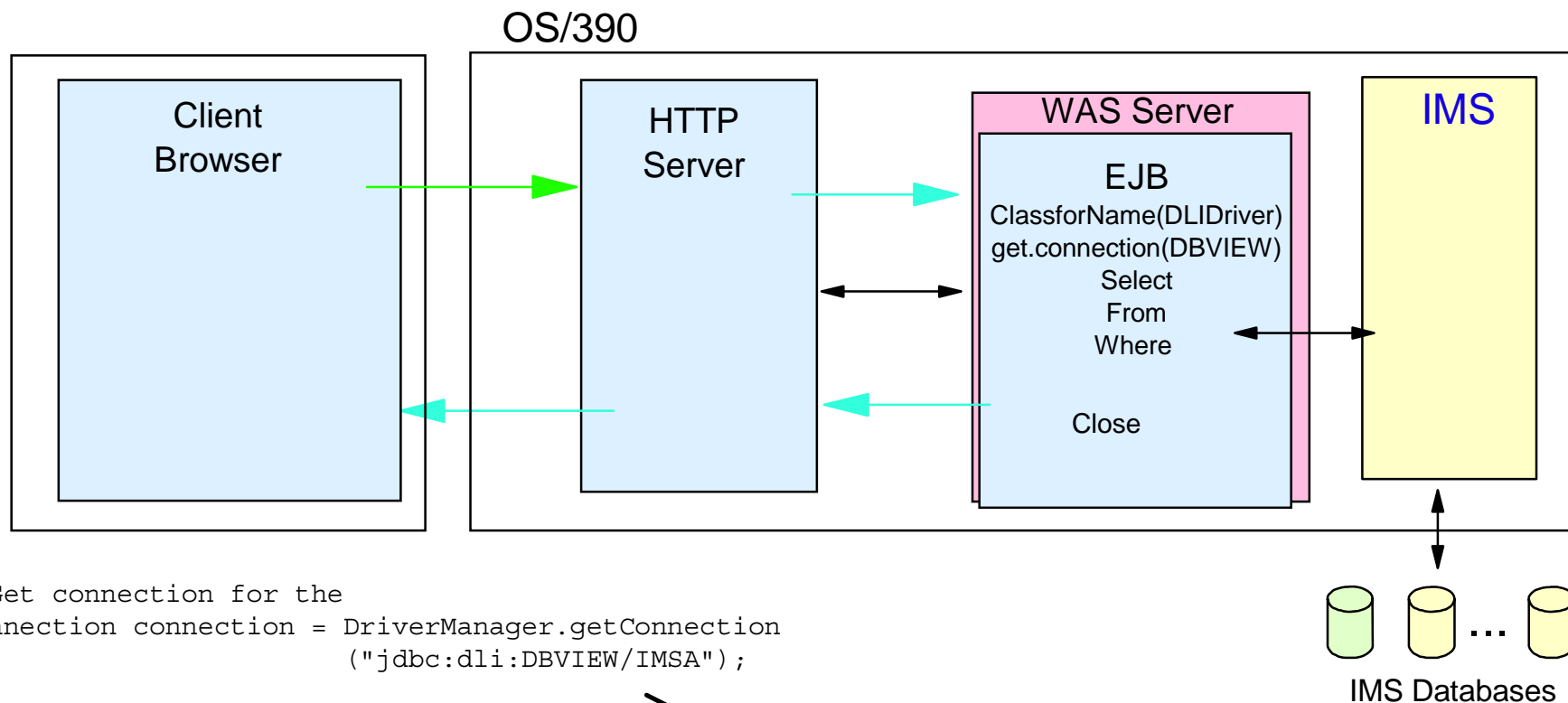
ODBA DB2 Stored Procedure Example



- DB2 stored procedure example

- Requires DB2 Version 5 or later and WLM managed stored procedures address spaces
- DRDA Client issues SQL for stored procedure
- DB2 invokes stored procedure
- Stored procedure does SQL and DL/I calls
- Client program does commit when stored procedure returns
 - or DB2 can issue SRRRCMIT

OS/390 WebSphere Application Server Example using IMS Java Classes



`//ODBA DD DSN=IMS.SDFSRESL(DFSIMSA0)`

Summary

- ODBA Callable Interface to IMS DB.
- AIB only interface.
- RRS is required.