



E63

INTRODUCTION TO IMS CONNECT

Gerald Hughes



Anaheim, California

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IMS CONNECT DEFINITION

IMS CONNECT
is IMS TOC base Code with
new functions and is
SMP/E installable and
SMP/E maintainable, and is a
priced and
Licensed IBM Program Product



IMS CONNECT DISCUSSION ITEMS

- ★ WHAT IS IMS CONNECT
- ★ BENEFITS OF IMS CONNECT
- ★ IMS CONNECT INTERNAL STRUCTURE
- ★ IMS CONNECT CONNECTION
- ★ IMS CONNECT BASE FUNCTIONS SUPPORTED
- ★ IMS CONNECT ADDITIONAL FUNCTIONS SUPPORTED
- ★ IMS COMMANDS
- ★ SOCKET TYPES
- ★ IMS CONNECT EXITS
- ★ STRUCTURES
- ★ CONFIGURING IMS CONNECT
- ★ DEFINING IMS CONNECT TO MVS
- ★ DEFINING IMS CONNECT TO IMS OTMA
- ★ DEFINING IMS CONNECT TRACE
- ★ DEFINING IMS CONNECT SECURITY
- ★ STARTING IMS CONNECT
- ★ IMS CONNECT PREREQUISITES
- ★ IMS CONNECT CONNECTION DIAGRAM TO IMS 5.1, 6.1 and 7.1
- ★ IMS CONNECT - SMP/E





★ WHAT IS IMS CONNECT

- **IMS CONNECT supports communications between one or more TCP/IP clients and one or more IMS systems. IMS CONNECT uses TCP/IP for communications with the clients, and XCF for communications to IMS OTMA.**
- **If a single IMS TM system cannot handle the work received from a single IMS Connect system, you can balance the workloads across multiple IMS systems.**
- **If a single IMS Connect cannot handle the work received from the clients, you can configure multiple IMS CONNECT to trigger access to a single/multiple IMS systems to balance the workload of TCP/IP client requests.**
- **It also provides a mechanism to manage the TCP/IP clients or DATASTORE through the use of commands.**
- **Provides E-Business Access to IMS Applications**

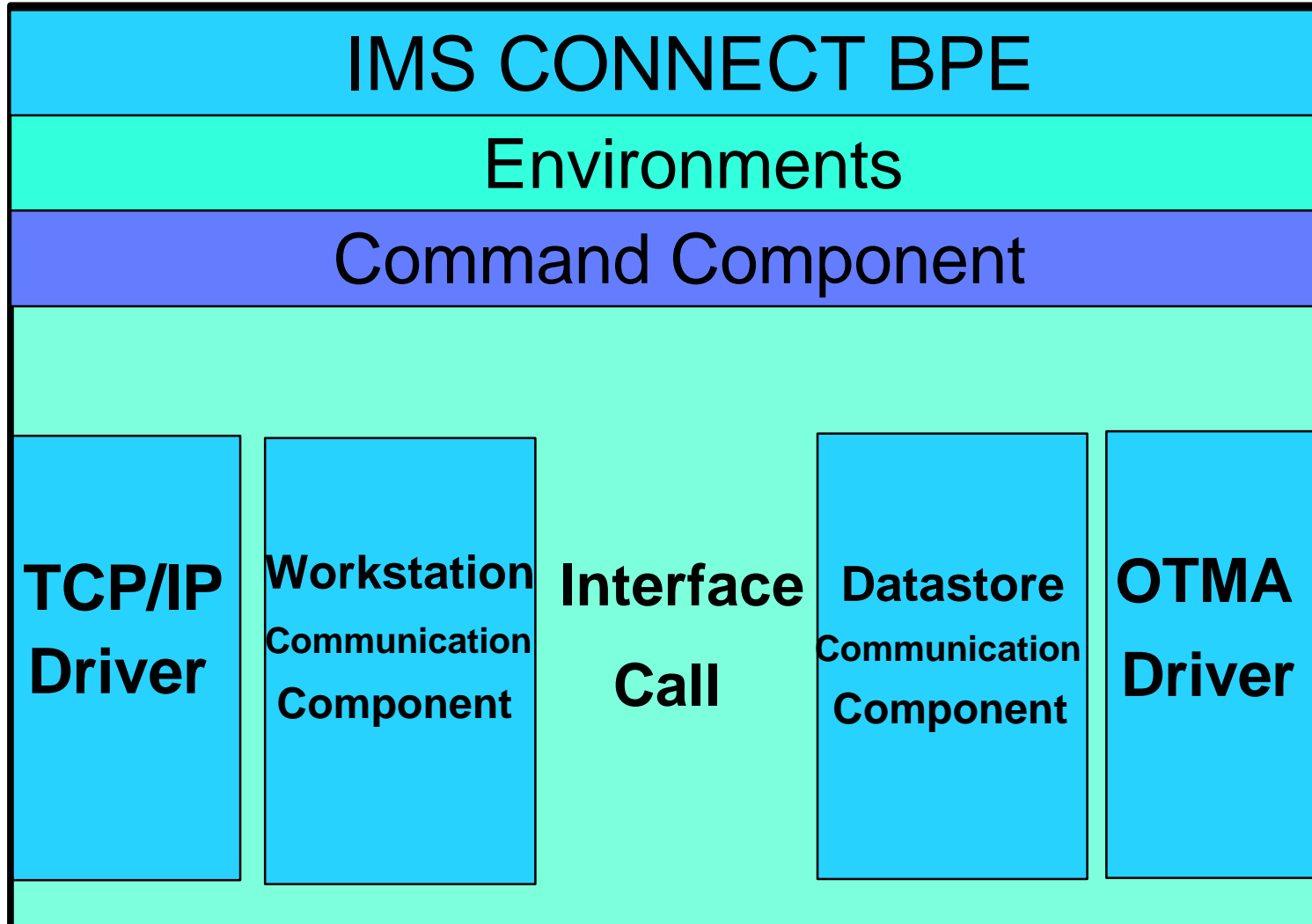


★ **BENEFITS OF IMS CONNECT**

- **Allows the customer to have access to existing and new IMS transaction and Databases via the intranet/internet**
- **Allows fast deployment of IMS transactions in the Network Computing Environment**
 - **Without modifying the IMS transaction**
 - **Without heavy workstation development effort when used with IMS Connector for JAVA**
 - **Can also be used in a non World Wide Web environment**
 - **Allows the customer to write their own TCP/IP client applications**
- **SMP/E installable/maintainable**
- **User Message Exit and Init Exit provides extreme power and flexibility**

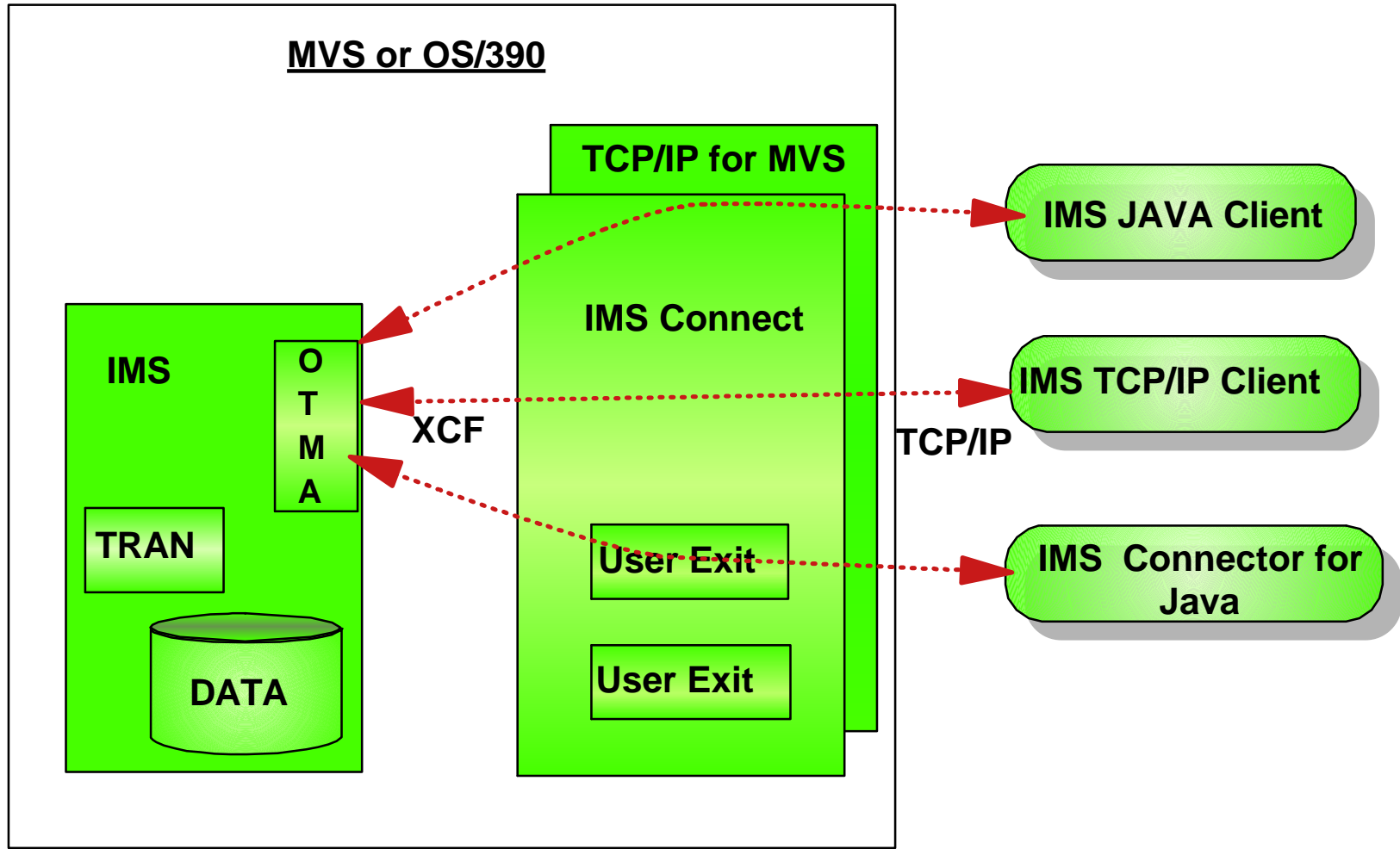


★ IMS CONNECT INTERNAL STRUCTURE





★ IMS CONNECT CONNECTION





★ **IMS CONNECT BASE FUNCTIONS**

- **CONNECT**
- **SEND**
 - **DATA**
 - **RESUME TPIPE COMMAND FUNCTION**
 - **SENDONLY COMMAND FUNCTION**
 - **ACK**
 - **NAK**
 - **DEALLOCATE COMMAND FUNCTION**
- **READ**
 - **DATA**
 - **RESPONSE**
- **DISCONNECT**



● SEND

- SEND IS USED TO SEND DATA TO IMS CONNECT
- SEND IS USED TO SEND COMMAND FUNCTION TO IMS CONNECT
 - RESUME TPIPE (IRM_F4 = IRM_F4_RESUMET)
 - SEND ONLY (IRM_F4 = IRM_F4_SENDOONLY)
- SEND
 - ACK (IRM_F4 = IRM_F4_ACK)
 - NAK (IRM_F4 = IRM_F4_NAK)
 - DEALLOCATE (IRM_F4 = IRM_F4_DEALLOC)
- EACH SEND MUST SEND AN **"IRM"** STRUCTURE
- THE SEND CAN REQUEST IN THE **"IRM"**
 - COMMIT MODE
 - ▶ SEND COMMIT (COMMIT MODE 1) (IRM_F2 = IRM_F2_CMODE1)
 - ▶ COMMIT SENT (COMMIT MODE 0) (IRM_F2 = IRM_F2_CMODE0)
 - SYNCH LEVEL
 - ▶ CONFIRM (IRM_F3 = IRM_F3_CONFIRM)
 - ▶ NONE (IRM_F3 = IRM_F3_NONE)
 - SOCKET TYPE
 - ▶ TRANSACTION SOCKET (IRM_SOCT = IRM_SOCT_TRAN)
 - ▶ PERSISTENT SOCKET (IRM_SOCT = IRM_SOCT_PER)
 - ▶ NON-PERSISTENT SOCKET (IRM_SOCT = IRM_SOCT_NPER)
 - OTHER AND USER REQUIREMENTS



— RESUME TPIPE

- RESUME TPIPE **"VIA A SEND"** IS USED TO NOTIFY IMS CONNECT **"HOLD ASYNCH OUTPUT"** IS TO BE RETRIEVED.
The IRM and/or exit can be used to control the number of messages that are to be received from IMS Connect.
 - Auto (designed for dedicated output device only)
 - No Auto
 - Single
 - No option
- A RECEIVE FROM THE CLIENT MUST FOLLOW THE RESUME TPIPE CALL
- THE IRM FOR RESUME TPIPE MUST HAVE SET;
 - COMMIT MODE ZERO (COMMIT SEND)
 - TRANSACTION SOCKET
- TO SUPPORT THE RETRIEVAL OF QUEUED OUTPUT MESSAGES THAT WERE:
 - INSERT'd TO AN ALTERNATE PCB
 - DATA RETRIEVED THAT WAS NAK'd
 - ◆ TCP/IP NETWORK FAILURE
 - ◆ NAK SENT BY CLIENT CODE
 - ◆ NAK SENT BY IMS CONNECT
- ASYNCHRONOUS OUTPUT RETRIEVAL OPTIONS
 - ◆ NO OPTION (IRM_F5 = X'00') DEFAULT, OLD PROCESSING, (=NOAUTO)
 - ◆ AUTO (IRM_F5 = IRM_F5_AUTO)
 - ◆ NOAUTO (IRM_F5 = IRM_F5_NOAUTO)
 - ◆ SINGLE (IRM_F5 = IRM_F5_SINGLE)



— SENDONLY

- SEND ONLY IS TO SUPPORT NON-RESPONSE TRANSACTIONS
- NO IMS ERROR MESSAGE OF *"DFS2082 Transaction Terminated Without sending Output"*



— ACK

- ACK IS USED TO PROVIDE **POSITIVE ACKNOWLEDGMENT** TO MESSAGE
- "SYNCHLEVEL=CONFIRM" SPECIFIED IN THE SEND OF THE TRAN CODE AND DATA OR DATA



— NAK

- NAK IS USED TO PROVIDE **NEGATIVE ACKNOWLEDGMENT** TO MESSAGE
- "SYNCHLEVEL=CONFIRM" SPECIFIED IN THE SEND OF TRAN CODE AND DATA OR DATA.



— DEALLOCATE

- **DEALLOCATE IS USED TO FORCE IMS CONNECT**
 - **TO TERMINATE THE IMS APPL**
 - **ISSUE A DISCONNECT REQUEST FROM THE CLIENT TO THE HOST**
 - **DISCONNECT ISSUED BY IMS CONNECT**



● READ

- READ IS USED TO RECEIVE DATA FROM IMS CONNECT
- READ IS USED TO RECEIVE RESPONSES FROM IMS CONNECT
- READ MUST FOLLOW THE RESUME TPIPE CALL
"WHICH IS A SEND FUNCTION"



● DISCONNECT

- **DISCONNECT IS USED TO DISCONNECT FROM IMS CONNECT**
- **DISCONNECT MUST BE ISSUED TO DISCONNECT FROM IMS CONNECT**



★ **IMS CONNECT ADDITIONAL FUNCTIONS SUPPORTED**

- **COMMIT MODE 0 (COMMIT SEND)**
- **COMMIT MODE 1 (SEND COMMIT)**
- **SYNCH LEVEL NONE**
- **SYNCH LEVEL CONFIRM**
- **ASYNCHRONOUS/UNSOLICIATED OUTPUT**
- **EXIT OPTIONS**
 - NO OPTION
 - AUTO
 - NOAUTO
 - SINGLE



● COMMIT MODE 1

- **SEND THEN COMMIT**
 - non-conversational trans. supported
 - conversational trans. supported
 - not supported for ASYNCH Output
- **OUTPUT MESSAGE SEGMENTS PACKAGED TOGETHER**
- **INPUT MESSAGE IS DELETED AND NOT RE-PRESENTED TO IMS ON FAILURE**
- **OUTPUT NOT QUEUED**
- **SYNCHLEVEL OPTIONS**
 - CONFIRM
 - NONE
- **OUTPUT MSG TOSSED IF NAK'd**
- **DB BACKED OUT IF MSG NAK'd**



● COMMIT MODE 0

- COMMIT THEN SEND
 - non-conversational trans. supported
 - conversational trans. not supported
 - required for ASYNCH Output Retrieval
- MESSAGE SEGMENTS SENT SEPARATELY
- OUTPUT QUEUED
- SYNCH LEVEL FORCED TO **"CONFIRM"**
- NAK'd MSG's REMAIN ON THE IMS QUEUE
- DB CHANGES COMMITTED
- IF OUTPUT MSG NAK'd, OUTPUT RE-Q'd AND A RESUME TPIPE AND READ REQUIRED TO RETRIEVE THE OUTPUT MESSAGE



● **SYNCH LEVEL = NONE**

- **NO ACKNOWLEDGMENT REQUIRED FROM CLIENT**
- **APPLIES TO COMMIT LEVEL 1 ONLY**



● **SYNCH LEVEL = CONFIRM**

- **ACKNOWLEDGMENT REQUIRED FROM
IMS CONNECT CLIENT**
 - **ACK**
 - **NAK**

- **APPLIES TO COMMIT MODE 1**

- **APPLIES TO COMMIT MODE 0**



★ **IMS CONNECT COMANDS**

- **CLOSEHWS**
- **OPENDS**
- **OPENPORT**
- **RECORDER**
- **SETRACF**
- **STOPCLNT**
- **STOPDS**
- **VIEWDS**
- **VIEWPORT**
- **VIEWHWS**



● CLOSEHWS

- **CLOSEHWS QUIESCE/FORCE**

TERMINATES IMS CONNECT

- QUIESCE**

Controlled shutdown of IMS Connect

- FORCE**

Emergency shutdown of IMS Connect

- **VALID SEQUENCES:**

- CLOSEHWS QUIESCE**

- CLOSEHWS FORCE**

- CLOSEHWS QUIESCE
FOLLOWED BY
CLOSEHWS FORCE**



● OPENDS

- **OPENDS *datastore_id***

**STARTS COMMUNICATION BETWEEN IMS CONNECT
AND A DATA STORE**

— *datastore_id*

Identifies the datastore that you want to stop.



● OPENPORT

- OPENPORT *portid*

REESTABLISHES IMS CONNECT COMMUNICATION WITH TCP/IP TO ALLOW LISTENING ON THE TCP/IP PORT SPECIFIED.

— *portid*

Identifies the port that the client is using for the TCP/IP connection with IMS Connect.



● RECORDER

- **RECORDER *OPEN/CLOSE***

OPENS AND CLOSSES THE LINE TRACE DATA SET

- *OPEN***

Open the line recorder trace for input and output messages to and from the user message exit.

- *CLOSE***

Close the line recorder trace for input and output messages to and from the user message exit.



● SETRACF

- **SETRACF *ON/OFF***

SET THE IMS CONNECT RACF REQUEST ON AND OFF

- *ON***

Enable the RACF user identification and verification

- *OFF***

Disable the RACF user identification and verification



● STOPCLNT

- **STOPCLNT *portid clientid***

IMMEDIATELY TERMINATES COMMUNICATION WITH A CLIENT USING A SPICIFIC TCP/IP PORT.

- *portid*

Identifies the port that the client is using for the TCP/IP connection with IMS Connect.

- *clientid*

Specifies the name of the client.



● STOPDS

- **STOPDS *datastore_id***

**IMMEDIATELY TERMINATES COMMUNICATION
BETWEEN IMS CONNECT AND A DATASTORE**

— *datastore_id*

Identifies the datastore that you want to stop.



● STOPPORT

- **STOPPORT *portid***

IMMEDIATELY TERMINATES LISTENING ON A TCP/IP PORT

portid

Identifies the port that the client is using for the TCP/IP connection with IMS Connect.



● VIEWDS

- VIEWDS *datastore_id/ALL*

DISPLAYS THE CURRENT ACTIVITY OF A DATASTORE

— *datastore_id*

Identifies the datastore that you want to view.

— *ALL*

Will display datastore information for all datastores currently active.

DATA THAT IS DISPLAYED IS:

- ▶ DATASTORE NAME
- ▶ DATASTORE STATUS
- ▶ XCF GROUP NAME
- ▶ IMS CONNECT XCF MEMBER NAME
- ▶ IMS OTMA XCF MEMBER NAME



● VIEWHWS

■ VIEWHWS

DISPLAY THE CURRENT ACTIVITY OF IMS CONNECT.

DATA THAT IS DISPLAYED IS:

- HWS ID
- DATASTORE NAME
- DATASTORE STATUS
- XCF GROUP NAME
- IMS CONNECT XCF MEMBER NAME
- IMS OTMA XCF MEMBER NAME
- PORT ADDRESS
- PORT STATUS
- CLIENTID
- USERID
- TRAN CODE
- CLIENT STSTUS
- SECOND CLIENT IN SPECIFIED STATUS
- IP ADDRESS
- CLIENT PORT NUMBER



● VIEWPORT

■ VIEWPORT *portid*

DISPLAY THE CURRENT ACTIVITY OF SELECTED PORT NUMBER

— *portid*

Identifies the port that the client is using for the TCP/IP connection with IMS Connect.

DATA THAT IS DISPLAYED IS:

- ▶ **PORT ADDRESS**
- ▶ **PORT STATUS**
- ▶ **CLIENTID**
- ▶ **USERID**
- ▶ **TRAN CODE**
- ▶ **CLIENT STSTUS**
- ▶ **SECOND CLIENT IN SPECIFIED STATUS**
- ▶ **IP ADDRESS**
- ▶ **CLIENT PORT NUMBER**



★ SOCKET TYPES

- PERSISTENT SOCKET
- TRANSACTION SOCKET
- NON PERSISTENT SOCKET



★ **IMS CONNECT EXITS**

- **USER INITIALIZATION EXIT**
- **USER MESSAGE EXITS**
- **OTMA DRU EXIT**



★ STRUCTURES

- **IRM**
- **CSM**
- **RSM**
- **RMM**



★ CONFIGURING IMS CONNECT

- HWS STATEMENT
- TCP/IP STATEMENT
- DATASTORE STATEMENT
- EXAMPLES OF CONFIGURATION



★ DEFINING IMS CONNECT TO MVS

- APF Authorization
- Updating the MVS PPT



● APF Authorization

- Authorize to APF the resident library (HWS.RESLIB) in which the IMS CONNECT modules reside



● Updating the MVS PPT

Because IMS CONNECT executes in supervisor state and key 7, you need to add an entry for it in the MVS Program Properties Table (PPT), as follows:

- Edit the SCHEDxx member of the SYS1.PARMLIB data set.
- Add the following entry in the MVS PPT:

```
PPT PGMNAME(HWSHWS00) /* PROGRAM NAME=HWSHWS00
CANCEL                /* PROGRAM CAN BE CANCELED
KEY(7)                /* PROTECT KEY ASSIGNED IS 7
SWAP                  /* PROGRAM IS SWAPPABLE
NOPRIV                /* PROGRAM IS NOT PRIVILEGED
DSI                   /* REQUIRES DATA SET INTEGRITY
PASS                  /* PASSWORD PROTECTION
SYST                  /* PROGRAM IS A SYSTEM TASK
AFF(NONE)             /* NO CPU AFFINITY
NOPREF                /* NO PREFERRED STORAGE
NOPREF                /* FRAMES
```




★ **Defining IMS Connect to IMS OTMA**

- **To access IMS OTMA, the DATASTORE definition statement in the "IMS Connect" configuration file is all that is required.**
- **The groupname in the IMS Connect defines the name that both IMS and IMS CONNECT are to join as a member.**
- **The tmembername defines to IMS CONNECT the IMS with which IMS CONNECT is to communicate.**
- **The membername defines to IMS the IMS CONNECT with which IMS is to communicate.**



★ DEFINING IMS CONNECT TRACE

The IMS Connect address space is built on top of BPE. Generally, you do not need to work with BPE. However, you IBM service representative could request that you change the default setting for certain BPE functions, such as storage management, internal tracing, dispatching, and other system-service functions. IMS Connect supplies a configuration data set member for BPE system service functions that you can modify.

```
#  
#DEFINITIONS FOR HWS TRACE  
#  
TRCLEV=(CMDT,HIGH,HWS)      /*IMS CONNECT COMMAND TRACE  
  
TRCLEV=(ENVT,HIGH,HWS)      /*IMS CONNECT ENVIRONMENT TRACE  
  
TRCLEV=(HWSW,HIGH,HWS)      /*IMS CONNECT SERVER TO TRACE  
  
TRCLEV=(OTMA,HIGH,HWS)      /*IMS CONNECT OTMA DRIVER TRACE  
  
TRCLEV=(HWSI,HIGH,HWS)      /*IMS CONNECT TO IMS TRACE  
  
TRCLEV=(TCPI,HIGH,HWS)      /*IMS CONNECT TCP/IP DRIVER TRACE
```





★ DEFINING IMS CONNECT SECURITY

- You can start IMS Connect as a job or procedure.
- If the Datastore (IMS), is RACF protected,
 - The **USERID=userid** parameter specified in the JOB card of the IMS Connect JCL is used as security vehicle to ensure IMS Connect access to IMS.
 - The Userid must have **READ** access to **IMSXCF.group.member**.
- **IMS OTMA provides security for IMS XCF connection by defining IMSXCF.group.member RACF facility class. (see IMS/ESA Open transaction Manager Access Reference for details).**



★ Starting IMS CONNECT

IMS CONNECT component can be invoked by an MVS procedure or using JCL. The following example shows the JCL statements required to define the MVS environment for IMS Connect.

```
//HWS PROC RGN=4096,SOUT=A,SYS1=,BPECFG=BPECFGHT,  
//HWSCFG=HWSCFG00  
//BRING UP AN ITOC SYSTEM  
//STEP1 EXEC PGM=HWSHWS00,REGION=&RGN,TIME=1440,  
//PARM='BPECFG=&BPECFG,HWSCFG=&HWSCFG'  
//STEPLIB DD DSN=HWS.&SYS1RESLIB,DISP=SHR  
//DD DSN=BPE.&SYS1.RESLIB,DISP=SHR  
//PROCLIB DD DSN=USER.PROCLIB,DISP=SHR  
//SYSPRINT DD SYSOUT=&SOUT  
//SYSUDUMP DD SYSOUT=&SOUT
```

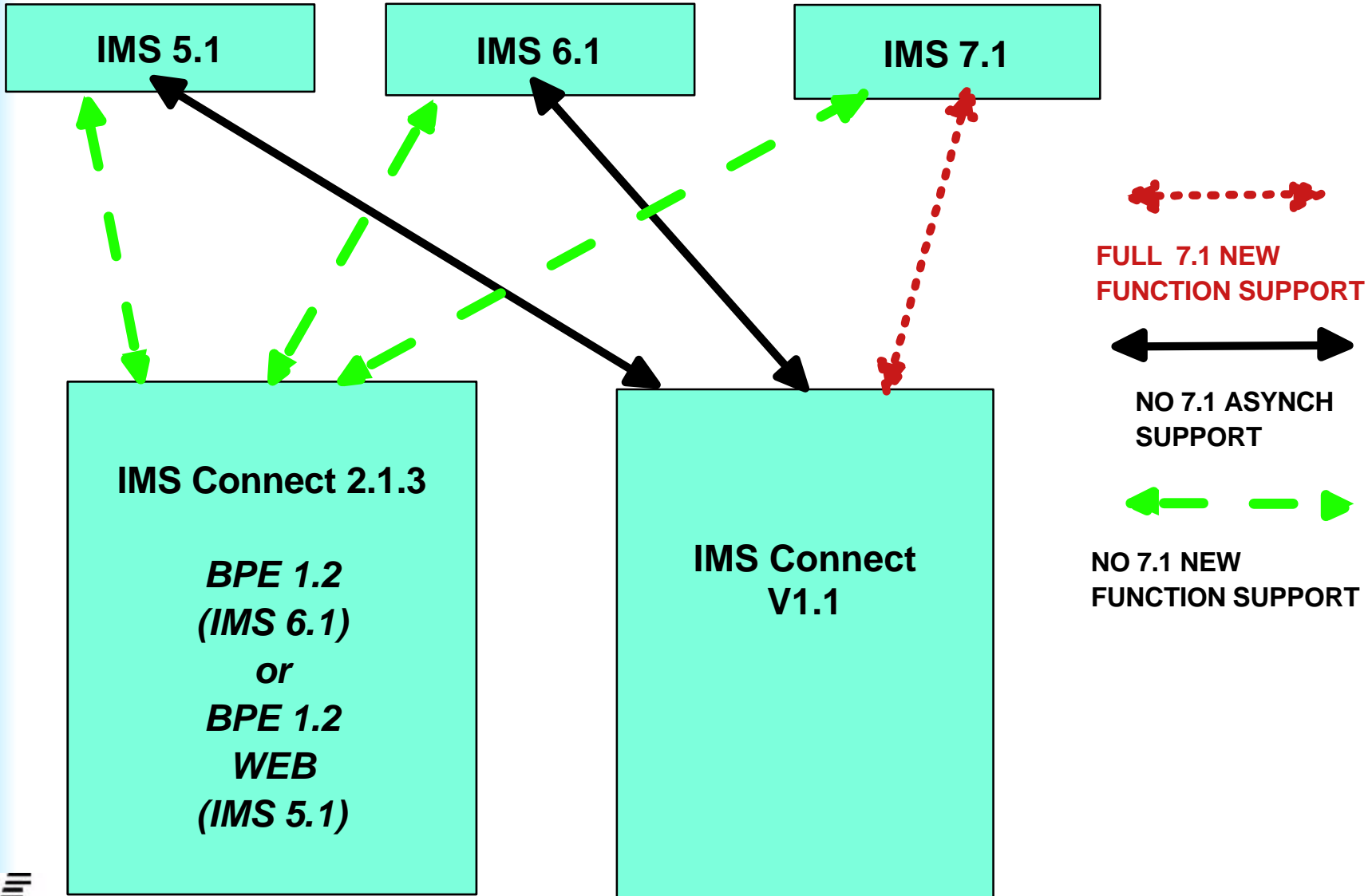


★ **IMS CONNECT PREREQUISITES**

- **HARDWARE REQUIREMENTS**
 - **Host processor capable of running IMS/ESA Version 5.1, 6.1, 7.1 or later.**
- **SOFTWARE REQUIREMENTS**
 - **MVS/System Product Version 4.3, or later.**
 - **IMS/ESA Version 5.1, 6.1, 7.1 or later.**
 - **TCP/IP Version 3.2, 3.4 or later**
 - **IMS APARS**
 - **PQ34229**
 - **PQ34542**
 - **PQ33929**
 - **PQ33996**



★ IMS CONNECT CONNECTIONS TO IMS 5.1, 6.1 and 7.1 B





★ **IMS CONNECT - SMP/E**

- **SMP/E INSTALLATION**
- **SMP/E MAINTENANCE**



● SMP/E INSTALLATION

- No IVP installation
- **INSTALL** will automatically delete all previous releases from the selected SMP/E zones
- You can select a new zone, use IMS zone.....
- SMP/E dialogs can be used to perform the SMP/E install
- Program Directory GI10-8275-00
- Sample code will be shipped as source code only, and will require compile and link-edit by customer
 - HWSSMPL0
 - HWSJAVA0
 - HWSUINIT
 - HWSYDRU0



● **SMP/E SERVICE**

- **STANDARD SMP/E maintenance**
- **RECEIVE/ACCEPT/APPLY**
- **Samples will be replaced with source code only**
- **Samples will have to be compiled and link-edited by customer when service is applied**
 - **HWSSMPL0**
 - **HWSJAVA0**
 - **HWSUINIT**
 - **HWSYDRU0**