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Performance from Experience

IMS TECHNICAL CONFERENCE

Customer Experience: MQSeries and IMS

Session E92

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Acknowledgements

- Special thanks to:
  - Jack Yuan and his team from IBM IMS OTMA development for all the enhancements in PQ32402 and all of the other enhancements in OTMA
  - John Jones and Bill Millar and their team at IBM Hursley Labs for their work on the MQSeries IMS Bridge and sharing their knowledge of how it really works

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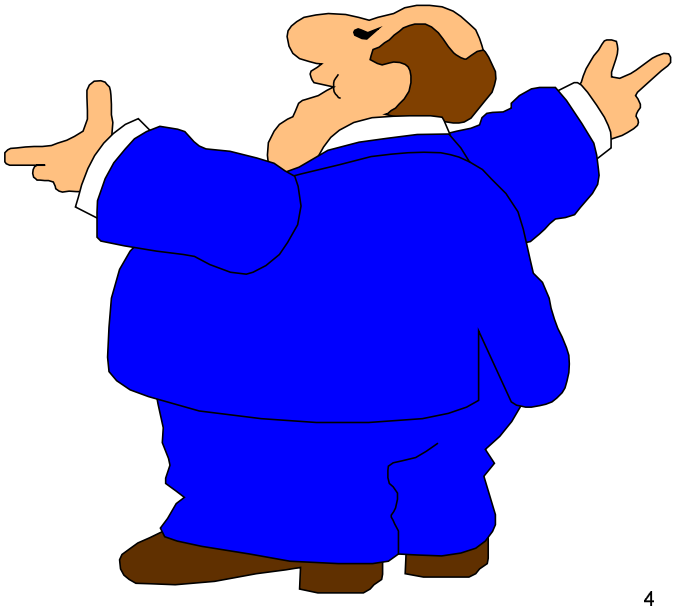
Presentation Outline

- Introduction
- IMS Application Access to MQSeries Messages
- Connecting MQSeries and IMS via ESS
- Using MQSeries API with IMS Applications
- MQSeries IMS Trigger Monitor
- IMS BMP Monitor
- IMS OTMA Interface
- MQSeries IMS Bridge
- IMS OTMA Security
- Telcordia Experience with the MQSeries IMS Bridge
- Sources of Documentation



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Introduction

- Telcordia has given several presentations about its experiences using IMS and MQSeries
- There have been many changes and enhancements in the last year
- We have learned a great deal about this topic in the last year
- This presentation will concentrate on what is new and what we have learned about IMS and MQSeries

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IMS Application Access to MQSeries Messages

- IMS applications can access MQSeries messages in 2 ways
  1. The IMS application uses the MQSeries API to Get and Put messages with syncpoint coordination with IMS
     - Requires connecting MQSeries to IMS via ESS
     - IMS Batch or BMP
       - Could be MQSeries triggered
     - IMS MPP
       - MQSeries message inserted to the IMS Message Queue by BMP
         - Trigger message
         - Real Message
  2. MQSeries IMS Bridge puts message on the IMS Message Queue via OTMA
     - Does not require connecting MQSeries to IMS via ESS
     - Requires OTMA configuration in CSQZPARM

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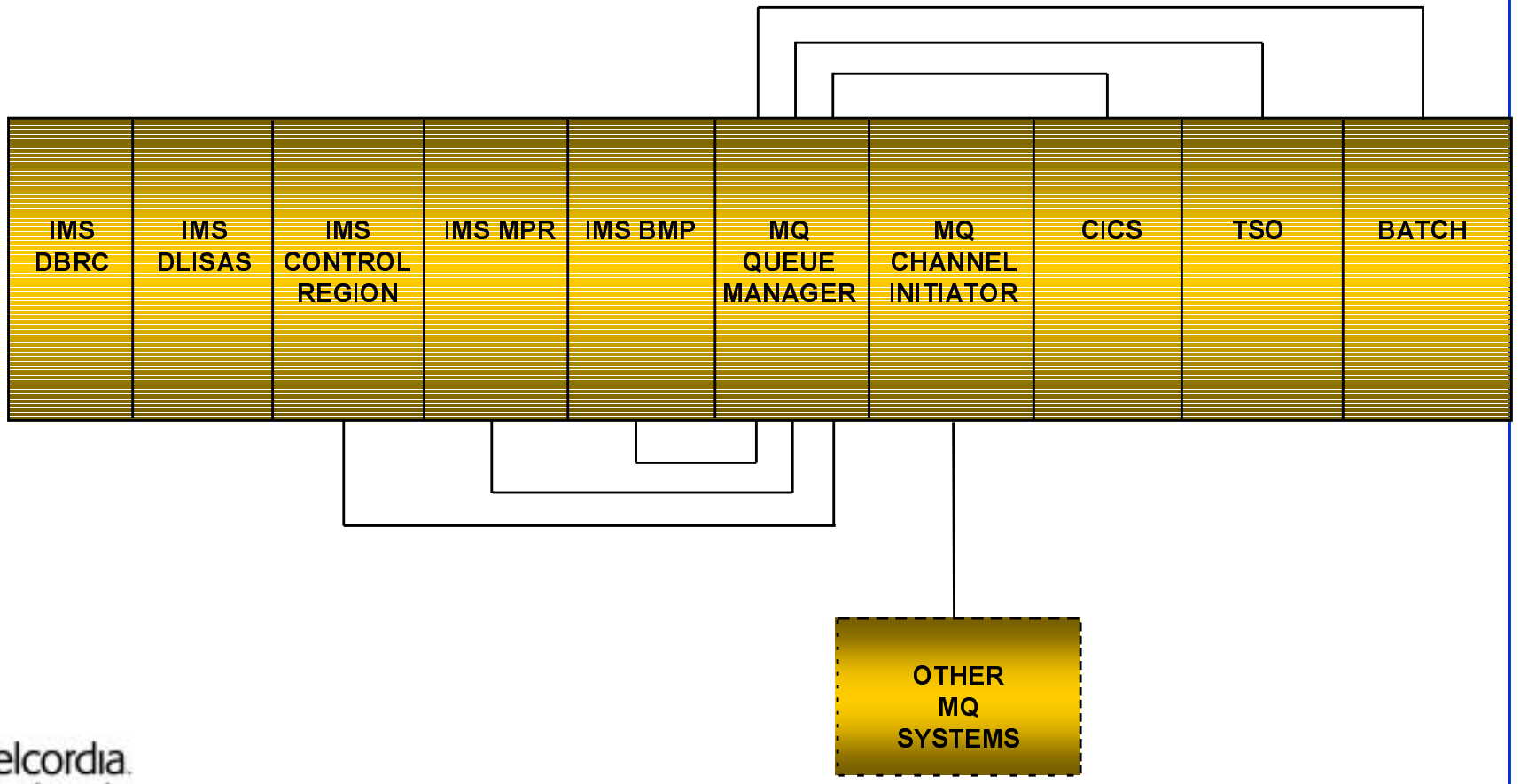
Connecting MQSeries and IMS via ESS

- MQSeries for OS/390 attaches to IMS just like DB2 using the external subsystem (ESS) interface



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Connecting MQSeries and IMS via ESS

- Define MQSeries to IMS by adding ESS information to the IMS PROCLIB

  FORMAT: SST=,SSN=,LIT=,ESMT=,RTT=,REO=,CRC=
  - SST: Subsystem Type - “MQS”
  - SSN: Subsystem Name - MQSeries for MVS/ESA subsystem
  - LIT: Language Interface Token - See CSQQDEFV
  - ESMT: External Subsystem Module Table - “CSQQESMT”
  - RTT: Resource Translation Table -Not Used by MQSeries
  - REO: Region Error Option - “R”, “Q”, or “A”
  - CRC: Subsystem Recognition Character - Not Used by MQSeries
    - The /SSR command is not supported

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Connecting MQSeries and IMS via ESS

- Place the MQSeries authorized library (HLQ.SCSQAUTH) in the IMS control region and dependent region DFSESL concatenations
- Copy module CSQQDEFV from HLQ.SCSQASMS to be customized, assembled, and linked into an authorized library in the IMS control region STEPLIB concatenation

```
CSQQDEFV CSECT
         CSQQDEFX NAME=CSQ1,LIT=LIT1,TYPE=DEFAULT
         CSQQDEFX NAME=CSQ3,LIT=LIT2
         CSQQDEFX TYPE=END
```

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Connecting MQSeries and IMS via ESS

- Subsystem Connection

```
/DIS SUBSYS ALL

SUBSYS   CRC  REGID  PROGRAM  LTERM     STATUS
CSQ3     !                              CONN
CSQ1     <                              CONN
DB2R     =                              CONN
                  1                     CONN
                  5                     CONN
```

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Using MQSeries API with IMS Applications

- Calls to MQSeries, IMS and DB2 can be made within the same unit of work (UOW)
  - MQSeries API calls
  - IMS IOPCB calls
  - IMS alternate output PCB calls
  - IMS database calls
  - DB2 calls
- An IMS commit is also an MQSeries and DB2 commit
  - SYNC, CHKP, GU to IOPCB (MODE=SNGL), normal program termination
- An IMS backout (ROLB) is also an MQSeries and DB2 backout
- Any IMS abend is also an MQSeries and DB2 backout
  - ROLL, miscellaneous abends

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Using MQSeries API with IMS Applications

- At normal syncpoint....
  - IMS input message is dequeued
  - MQSeries input messages marked with SYNCPOINT, NO_SYNCPOINT, and MARK_SKIP BACKOUT are dequeued
  - IMS EXPRESS and NON-EXPRESS output messages are sent
  - MQSeries output messages marked with SYNCPOINT and NO_SYNCPOINT are sent
  - IMS database updates are committed
  - DB2 updates are committed
  - If the IMS application is message driven the MQSeries connection handle is closed
    - For security reasons
      - Connection security is by userid
      - Each message can be from a different userid

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Using MQSeries API with IMS Applications

- At abnormal termination or ROLx....
  - IMS input message is dequeued
    - IMS 6.1 has Non-Discardable Message Exit
  - MQSeries input messages marked with SYNCPOINT are re-queued
  - MQSeries input messages marked with NO_SYNCPOINT are dequeued
  - MQSeries input messages marked with MARK_SKIP_BACKOUT are
    - Passed to the next UOW if this was the first UOW
    - Re-queued if this was the second UOW
  - IMS NON-EXPRESS messages are discarded
  - IMS EXPRESS output messages are sent
  - MQSeries output messages marked with SYNCPOINT are discarded
  - MQSeries NO_SYNCPOINT output messages are sent
  - IMS database updates are backed out
  - DB2 updates are backed out

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Using MQSeries API with IMS Applications

- Getting the default queue manager name is not straightforward...
  - MQCONN using default name (blank)
  - MQOPEN the Queue Manager
    - MQOD Objectype = MQOD_Q_MGR
    - MQOD Objectname = blanks
    - MQOO_INQUIRE
  - MQINQ for object name

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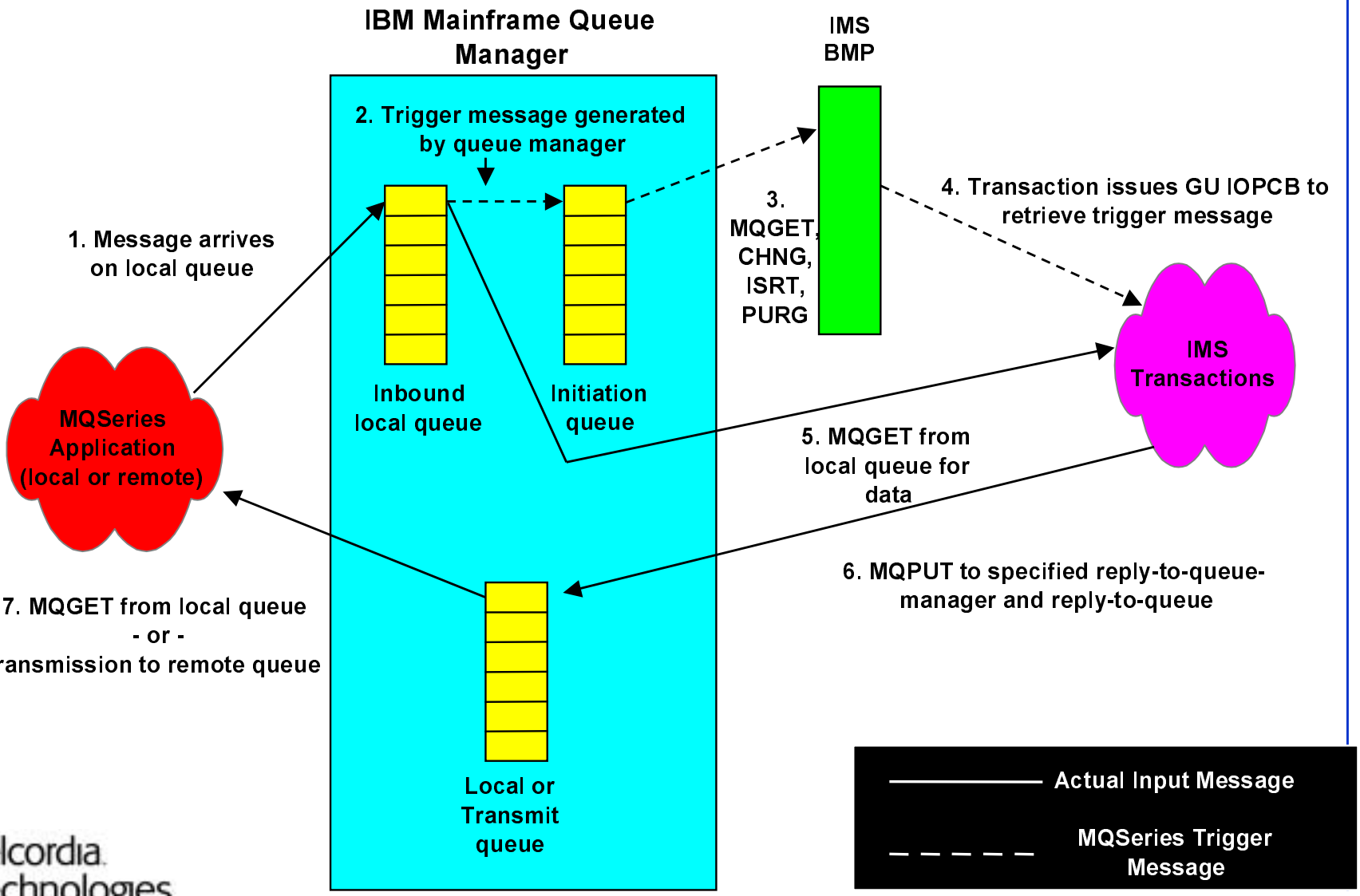
MQSeries IMS Trigger Monitor



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MQSeries IMS Trigger Monitor

- IMS triggering flow - MQSeries
  - ❶A message arrives on an MQSeries local queue
  - ❷A “trigger message” is sent to an MQSeries initiation queue
  - ❸A long-running non-message driven BMP waiting on the initiation queue reads the trigger message and inserts it to the IMS trancode named in the MQSeries process definition
    - This is an IBM supplied trigger monitor application (CSQQTRMN)

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MQSeries IMS Trigger Monitor

- IMS triggering flow - IMS

❹The IMS transaction is scheduled and does a GU to the IOPCB, retrieving the trigger message

- The trigger message identifies the MQSeries queue manager and local queue which caused the trigger to be pulled

❺The IMS transaction connects to the queue manager and reads the message from the MQSeries local queue via MQGET

❻The IMS transaction responds by inserting a message to an MQSeries queue via MQPUT

- The MQSeries message descriptor identifies a reply-to queue manager and queue

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IMS BMP Monitor

- User written IMS BMP monitor program
  - It is easy to write your own IMS BMP monitor
  - Telcordia developed one before the MQSeries IMS Trigger Monitor program was available
  - One enhancement could be to have one BMP wait on multiple queues using the MQGMO_SET_SIGNAL option (ECB)
  - Here's how to do it:
    - Write IMS BMP with MQI calls and an alternate output modifiable PCB (ALTPCB)
    - Wait on MQSeries initiation queue(s) or local queue(s)
      - Initiation queues hold trigger messages; local queues hold "real" messages
    - Insert messages to IMS ALTPCB

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MQSeries - Telcordia Web IMS Application

- Telcordia had an IMS application that generated customer reports
- The customer would phone Telcordia with a request for a report
- Telcordia would generate the report and mail it to the customer

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MQSeries - Telcordia Web IMS Application

- A new customer Web interface was built
  - Customer requests report via HTML
  - Request is sent to MQSeries queue on MVS
  - Long running BMP reads MQSeries queue for request
  - BMP reads data from IMS and formats report
  - BMP sends report via MQSeries to server
  - CGI-BIN program on server puts report in customer mailbox

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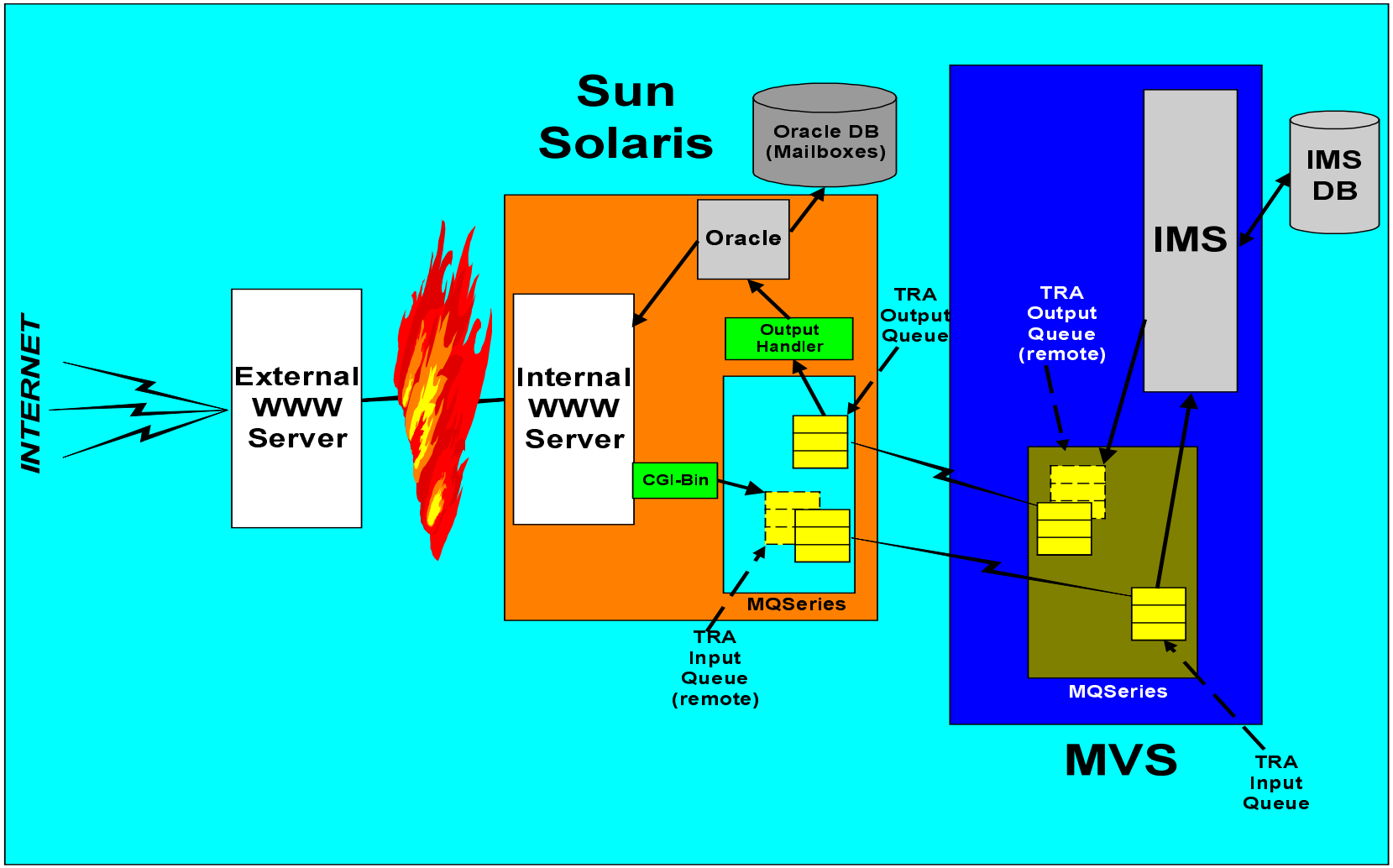
MQSeries - Telcordia Web IMS Application



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IMS OTMA Interface

- IMS/ESA 5.1 introduced the OTMA (Open Transaction Manager Access) feature
- This feature uses the MVS cross-coupling facility (XCF) to send data to IMS from other MVS applications (OTMA clients)
  - No VTAM or TCP/IP is involved

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IMS OTMA Interface

- IMS Connect is an IBM provided OTMA client for TCP/IP
  - This was the IMS TCP/IP OTMA Connection (ITOC)
  - See Session E93
- MQSeries includes an IMS OTMA client
  - "MQSeries-IMS Bridge"
- You can write your own OTMA client using the OTMA Callable Interface
  - See Session E93

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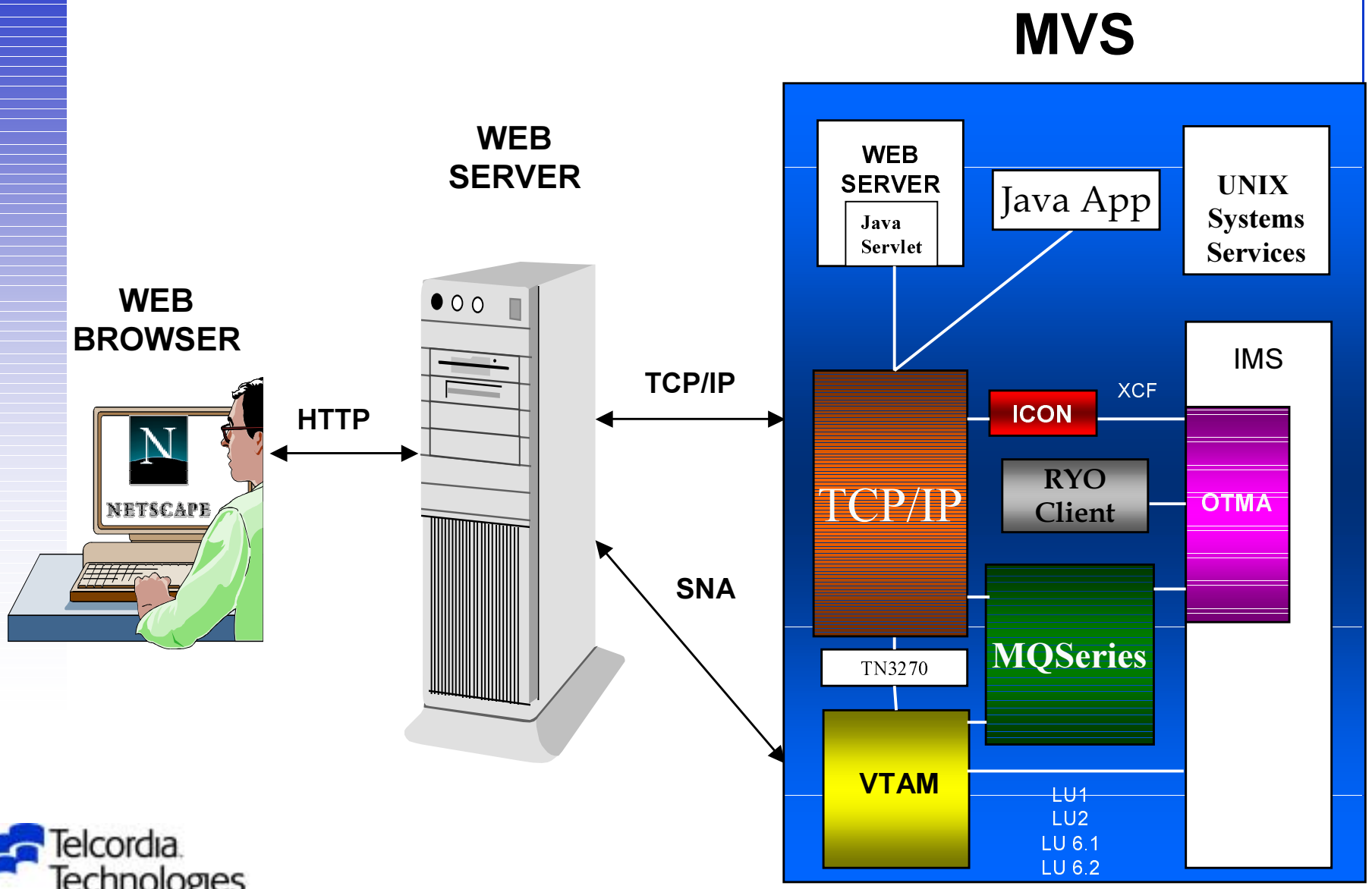
IMS OTMA Interface



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IMS OTMA Interface

- Tpipes (Transaction Pipes)
  - OTMA equivalent of LTERMs
  - Input Tpipe names are specified by the client
  - Asynchronous output Tpipe names
    - The destination in the CHNG call for modifiable ALTPCB's
    - The destination name in static ALTPCB's
    - Can be overridden by the DFSYDRU0 exit
  - Control blocks are dynamically created by IMS
  - Tpipe name must be unique only within a client (multiple clients can use the same Tpipe name)
    - IMS recognizes Tpipes as **XCFmember**.**Tpipename**
  - A Tpipe name cannot be the same name as an IMS transaction
  - Client manages the use of Tpipes (number, routing, etc.)

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IMS OTMA Interface

- Tpipes
  - There are two kind of TPIPES: SYNChronized and Non-SYNChronized
    - SYNChronized Tpipes exchange sequence numbers and can be resynchronized across failures
    - SYNChronized Tpipes will survive an IMS warm start but will be deleted during an IMS cold start
    - Non-SYNChronized Tpipes will be deleted during an IMS warm start

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IMS OTMA Interface

- OTMA Commit Mode
  - Specified by OTMA client for each message
  - Similar to APPC-IMS Commit Mode
  - Commit Mode 0 - Commit-then-send
    - IMS sends output after syncpoint is complete
    - OTMA requires ACK to dequeue message
  - Commit Mode 1 - Send-then-commit
    - IMS sends output and waits for ACK before syncpoint is complete
    - Increases region occupancy
    - Messages are not queued

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IMS OTMA Interface

- The maximum OTMA input segment size is 32767
  - LLZZ + 32763 bytes of user data
  - IMS will break up the segment into pieces that fit into the LGMSG and chain them together
- The maximum OTMA total message length to input to MQSeries is the MQ Max Message Length
  - This is usually 4MB
  - MQSeries long message support increases this to 100MB
    - This has not been tested with OTMA
- Thanks to Bob Millar of IBM Hursley for this information

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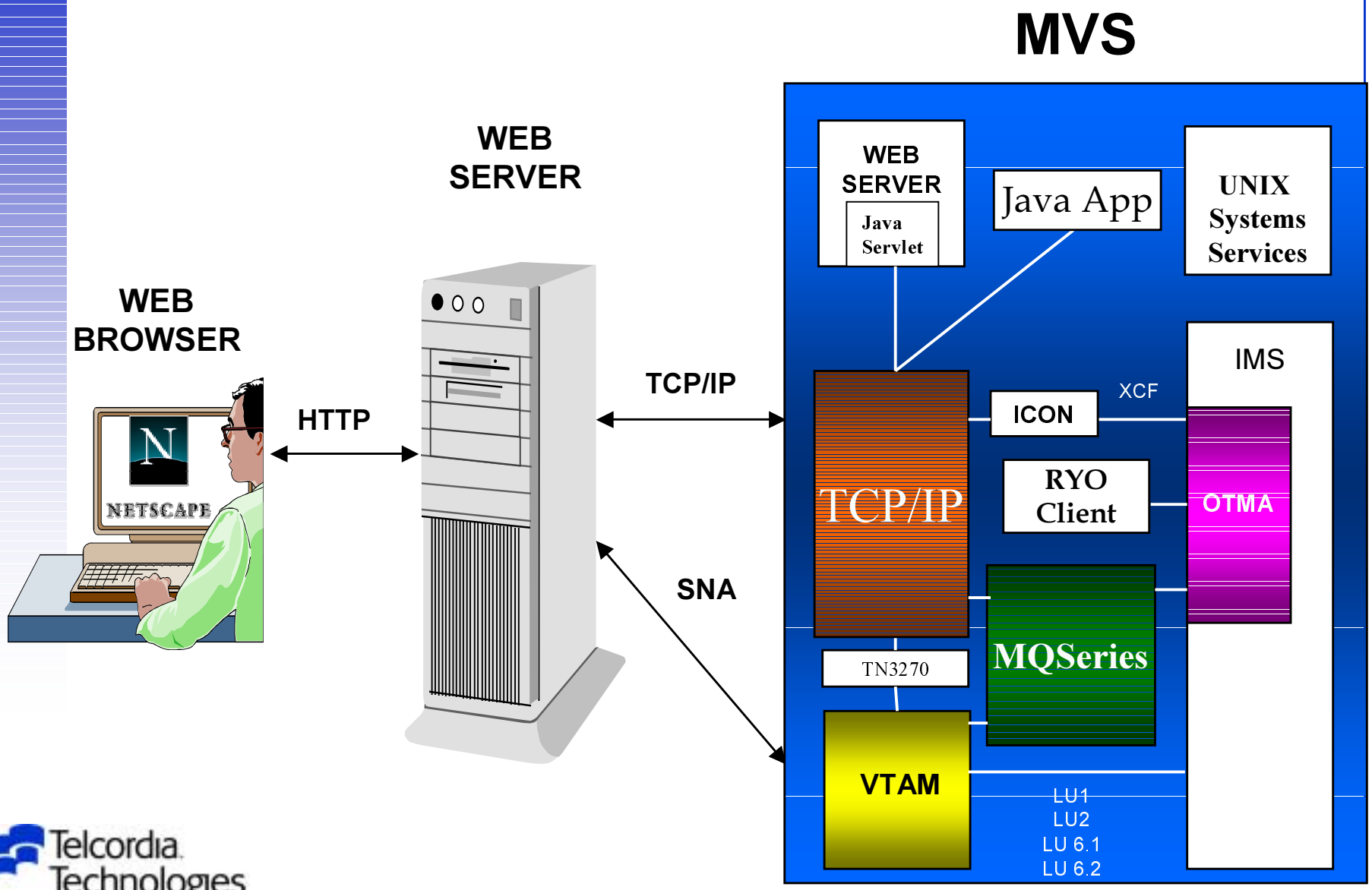
IMS OTMA Interface



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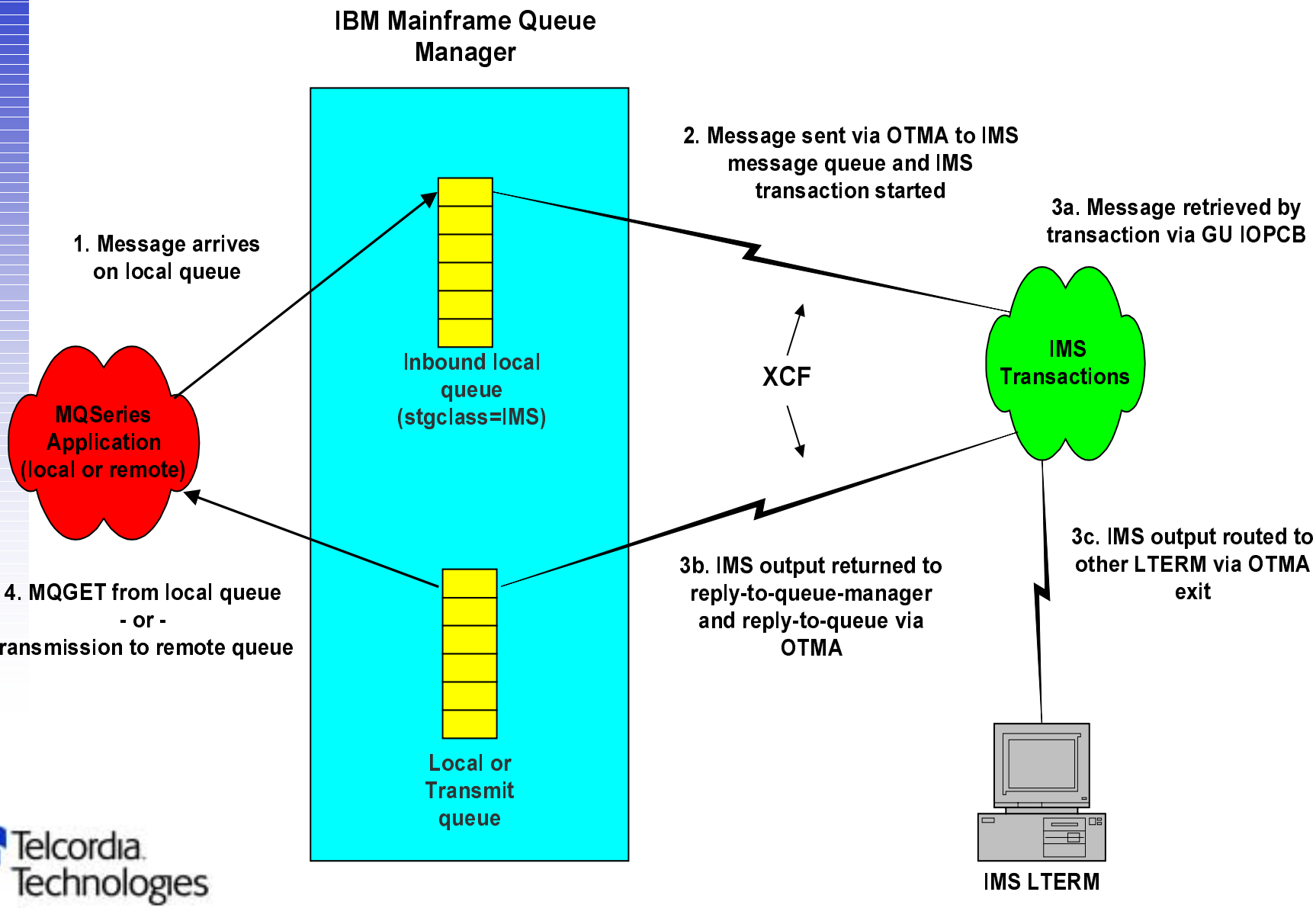
MQSeries IMS Bridge



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MQSeries IMS Bridge

- When the message arrives in MQSeries it will be sent via XCF to the IMS OTMA interface.
- Message may be:
  - an IMS transaction
  - an IMS command
  - NOT a message to an IMS LTERM
- IMS will put it on the IMS message queue
- The application will do a GU to the IOPCB to retrieve the message
- Output to the IOPCB returns to MQSeries which sends it to the ReplyToQueue
- This is very similar to the implicit LU6.2 process
- A remote queue manager can send a message to a local queue destined for IMS via OTMA

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MQSeries IMS Bridge

- One MQSeries queue manager can connect to multiple IMS control regions
- One IMS control region can connect to multiple MQSeries queue managers
- MQSeries and all IMS control regions must be in the same XCF group
  - I am hoping to get this fixed
- MQSeries and IMS can be on different MVS copies in the same Sysplex
- MQSeries IMS Bridge start and stop events are sent to the SYSTEM.ADMIN.CHANNEL.EVENT.QUEUE

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MQSeries IMS Bridge

- Define MQSeries to XCF in CSQZPARM
  - OTMACON keyword on CSQ6SYSP macro
    - OTMACON(Group,Member,Druexit,Age,TpipePrefix)
      - Group=XCF group
      - Member=XCF member
      - Druexit=IMS exit to route output (overrides DFSYDTx)
      - Age=how long a userid from MQSeries is considered previously verified in IMS
      - TpipePrefix=three character prefix for Tpipe name
        - To avoid collision with IMS transaction code names
  - Member CSQ4ZPRM in data set hlq.SCSQPROC has default CSQZPARM members you can use to build your members

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MQSeries IMS Bridge

- Define one or more storage classes with the XCFGNAME and XCFMNAME parameters of the IMS systems to which you will connect
  - DEFINE STGCLASS(IMSA) -
    PSID(02) –
    XCFGNAME(XCFGROUP)
    XCFNAME(XCFIMSA)
- Define local queue(s) referencing the storage classes
  - DEFINE QLOCAL(MQID_TO_IMSA) –
    STGCLASS(IMSA)
- Define reply-to-queue(s)
  - DEFINE QLOCAL(MQID_FROM_IMSA)

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MQSeries IMS Bridge

- Confirm On Arrival (COA) is provided when the message reaches the IMS queue
- Confirm On Delivery (COD) is not available
  - The message is rejected if this option is specified
- Expiry
  - A message can expire before reaching the IMS Bridge
  - It can not expire once it has reached the IMS Message Queue

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MQSeries IMS Bridge

- The sending application can optionally provide an IMS sub-header (MQIIH)
  - Several reserved fields...
  - IMS LTERM name to put in IOPCB
  - MFS Format name to put in IOPCB (no MFS formatting is actually done)
  - Reply To Format (MQSeries format name)
  - Authenticator (RACF password or PassTicket)
  - Transaction Instance ID (if IMS conversational)
  - Transaction State (conversational or not, architected command)
  - Commit Mode (commit-then-send or send-then-commit)
  - Security Scope (ACEE in control region or in control region and dependent region)
    - Only honored if /SEC OTMA PROFILE used

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MQSeries IMS Bridge

- Specify the presence of the MQIIH sub-header by using the MQMD.Format=MQFMT_IMS (“MQIMS”)
  - WARNING: MQIIH must be fullword aligned
- If no MQIIH is presented to the bridge (MQMD.Format=MQFMT_IMS_VAR_STRING) (“MQIMSVS”) default values are assumed:
  - LTERM=TpipeName
  - MODNAME=MQMD.Format
    - Default is “MQIMSVS”
  - MQMD.Format is used as the MFSMapName
  - Non-conversational
  - Commit-then-send (commit mode 0)
  - Security mode is MQISS_CHECK (ACEE only in CR)
- Data is passed to IMS in the OTMA prefix

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MQSeries IMS Bridge

- MQSeries creates two TPIPE control blocks per local queue defined as using the IMS bridge
  - One for “asynchronous” messages
    - Commit mode 0 - commit-then-send
    - Output is “asynchronous” to transaction completion
    - Default if no IIH
    - This is a SYNChronized Tpipe
  - One for “synchronous” messages
    - Commit mode 1 - send-then-commit
    - Output is “synchronous” with transaction completion
    - This is a non-SYNChronized Tpipe
  - See MQSeries Support Pack MP14 for TPIPE performance tuning
- The TPIPE control blocks in IMS are created when the first message for the type (sync, async) arrives on the queue

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MQSeries IMS Bridge

- There are special requirements for Commit Mode 0 input messages to IMS
  - If the IMS transaction is defined as RECOVER then the MQSeries message must be persistent
  - If the IMS transaction is NORECOV then the MQSeries message must be non-persistent
  - If this is not the case IMS will reject the message with sense code 00230000

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MQSeries IMS Bridge

- Commit Mode 0 input messages (continued)
  - How does IMS know whether a message is persistent or nonpersistent?
    - All CM0 messages arrive on SYNChronized TPIPES
    - There are no flags in the OTMA headers for this
  - The answer is that IMS and MQSeries “cheat”
    - If the message is persistent it is sent on the SYNChronized TPIPE with a valid sequence number
    - If the message is non-persistent it is sent on the SYNChronized TPIPE with the sequence number set to zero

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MQSeries IMS Bridge

- The data stream passed to MQSeries by the application MQPUT is in LLZZTrancodeDataLLZZData... format
  - This allows for multi-segment input messages via OTMA to IMS
- The sending message is always treated by MQSeries as “in syncpoint”
  - If the message is “not in syncpoint” it is treated as “in syncpoint” followed by an immediate commit

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MQSeries IMS Bridge

- If the input message cannot be put to the IMS queue because:
  - Invalid message - input message goes on DLQ and warning sent to system console
  - IMS rejected message (sense 001A) - DFS message from IMS is put into MQSeries reply message and put on reply-to queue
    - If reply message cannot be PUT, it is placed on the DLQ
    - Input message now goes to DLQ (PQ05963)
  - IMS rejected message (message error) - input message goes on DLQ and warning sent to system console
  - IMS rejected message (other) - messages go back to their original queue, the bridge is stopped, and warning sent to system console
- If any return messages cannot be PUT to the DLQ, messages go back to their original queue, the bridge is stopped, and warning sent to system console

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MQSeries IMS Bridge

- IMS Output Messages
  - Reply messages are placed on the MQSeries reply-to-queue specified in the original message header
  - All IMS message segments are assembled into a single MQSeries message which must not exceed the MAXMSGLEN parameter of the queue manager
  - If PUT to reply-to queue fails, the message goes on the DLQ
  - If PUT to DLQ fails, a NAK is sent to IMS and the message remains in IMS

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MQSeries IMS Bridge

- Building the MQMD in the OTMA user data for asynchronous OTMA output messages in the DFSYDRU0 exit is not straightforward
- The format is LL | | MQMD | | Reply-to-Format
- The LL must be exactly 2 (LL) + L'MQMD + 8 (Reply-to-Format) or MQSeries will ignore the entire MQMD and use default values
- The MQSeries sample exit in Appendix B of the *MQSeries for OS/390 System Management Guide* is very useful
  - Follow this code VERY carefully

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MQSeries IMS Bridge

- What you are building is actually an INPUT MQMD as if the message had come from MQSeries originally
  - The Replyto Queue and Replyto Queue Manager are the message destination
  - The MSGID and CORRELID are the INPUT MSGID and CORRELID - not what will be presented to the MQSeries application
    - Use the MQMD_REPORT field to specify that the input MSGID and CORRELID be moved to the corresponding output MQMD
      - The default is that the input MSGID is moved to the output CORRELID and a new MSGID is created

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MQSeries IMS Bridge

- Setting the format name for MQSeries to use for asynchronous OTMA output messages is not straightforward
- If you are sending back LLZZdataLLZZData as is probably the case you need to set the format name to MQFMT_IMS_VAR_STRING (“MQIMSVS”)
- The “Reply-to-Format” name in the OTMA User Data is the obvious choice
- But - the “Reply-to-Format” in the OTMA User Data is ignored unless the OTMA User Data is valid and the message was input with an MQIIH IMS prefix and the Reply-to-Format is not blanks

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MQSeries IMS Bridge

- But - there was no input message – how do you tell MQSeries there was an MQIIH
  - Remember you are building an INPUT MQMD in the OTMA User Data
    - Lie – set the MQMD_FORMAT to MQFMT-IMS (“MQIMS”)
- This tells MQSeries the “input message” had an MQIIH
- Then set the Reply-to-Format name in the OTMA User Data to “MQIMSVS”

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MQSeries IMS Bridge

- If after all that you:
  - set the Reply-to-Format to blanks (MQFMT_NONE)
  - or if the MQMD_FORMAT is not MQFMT_IMS
  - or if there is not valid OTMA User Data
  - **THEN** field TMAMHMAP in the OTMA State Prefix is used as the MQSeries Format Name
- This is set by the MODNAME parameter in the IMS ISRT call, if present
  - CALL “CBLTDLI” USING ISRT ALTPCB MSGIO MODNAME

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MQSeries IMS Bridge

- The TMAMHMAP field can be overridden in the OTMA Input/Output Edit Routine (DFSYIOE0)
- This lets your application be output independent
  - It can set a valid MODNAME in case the message is going to a terminal
  - The DFSYIOE0 exit can override it to “MQIMSVS”
- If TMAMHMAP is blanks or nulls the MQSeries Format name is set to MQFMT_NONE (blanks)

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MQSeries IMS Bridge

- The MQSeries application that MQGET's the reply message must be able to process the LLZZ's
  - If the application is written in C you must "cast" the LL field as MQ_BYTE or very bad things will happen
- You can also consider using MQSeries channel exits to remove the LLZZ's and set the Format Name to MQFMT_NONE

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MQSeries IMS Bridge

- Determining the MQSeries Persistence for output messages from OTMA to MQSeries is complicated and is affected by commit mode
- The determination takes place in two phases…

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MQSeries IMS Bridge

- Persistence Determination – Phase 1
  - If the output is on a TPIPE created by MQSeries
    - If the commit mode is 1 (send-then-commit) then the output message is persistent
    - If the commit mode is 0 (commit-then-send) then persistence is determined by message recoverability
      - If the message is recoverable then the output message is persistent
      - If the message is not recoverable then the output message is nonpersistent
    - A message is recoverable if there is a valid sequence number in the TMAMCRSQ field in the OTMA State Header
      - More later

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MQSeries IMS Bridge

- Persistence Determination – Phase 1
  - If the output is on a TPIPE not created by MQSeries
    - If the commit mode is 1 and flag TMAMCASY in not set in the OTMA State Header then the output message is persistent
    - If the commit mode is 0 or the TMAMCASY flag is set then persistence is determined by message recoverability
      - If the message is recoverable then the output message is persistent
      - If the message is not recoverable then the output message is nonpersistent
    - TMAMCASY indicates “asynchronous/unsolicited queued messages”
      - It may be set on for some IMS DFS messages
      - These messages must be treated as CM0 even if the input was CM1

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- Persistence Determination – Phase 1
  - You can control the presence of valid sequence numbers in the TMAMCRSQ field in the OTMA State Header for asynchronous output messages from IMS
  - Tell IMS to make the TPIPE SYNChronized when it is created
  - This can be set explicitly in the DFSYDRU0 exit
  - The OTMASP parameter in DFSPBxxx can be used to default newly created Tpipes to Synchronized
    - This parameter was created for MQSeries customers who wanted persistent output messages but did not want to write DFSYDRU0 exits

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- Persistence Determination – Phase 2
  - If there is a valid OTMA User Data Prefix
    - If the output is on a TPIPE created by MQSeries
      - If the message is Commit Mode 1
        - Then the output message persistence is the persistence of the input message as reflected in the MQMD_PERSISTENCE field in the OTMA User Data

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IMS OTMA Security

- Requires RACF 1.9.2 (or equivalent)
- Three levels of security
  1. Connections from MQSeries to IMS (during client bid)
     - Uses the RACF Facility class
     - IMS checks ***IMSXCF.XCFgroupname.MQ-member-name***
       - MQSeries must have read access to this class
     - MQSeries checks ***IMSXCF.XCFgroupname.IMS-member-name***
       - The MQSeries subsystem userid access to this class determines userid validation for each message that crosses the bridge

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IMS OTMA Security

- Three levels of security (continued)
  2. Userid Validation in MQSeries
     - MQMD.UserIdentifier field is used
     - Based on MQSeries Subsystem userid access to ***IMSXCF.XCFgroupname.IMS-member-name***
       - CONTROL/ALTER: Userids trusted, no checks
       - UPDATE: Userid validated by RACF prior to passing to IMS
       - READ: Userid/password validated by RACF prior to passing to IMS. Result of this check is cached and used on subsequent calls.
       - NONE (or no profile): Userid/password validated by RACF prior to passing to IMS. No cache is performed.
     - Once validated, the userid is passed to IMS and can be used for normal IMS security

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IMS OTMA Security

- Three levels of security (continued)
  3. OTMA Security (set by /SECURE OTMA)
     - CHECK
       - Existing RACF calls are made
       - IMS commands are checked against the CIMS class
       - IMS transactions are checked against the TIMS class
     - FULL
       - Same as CHECK, but the ACEEs are built in the dependent regions as well as the control region
     - NONE
       - No calls to RACF are made
     - PROFILE
       - Each message defines the level of security checking to be done
       - MQIIH.SecurityScope field allows for FULL or CHECK to be specified

IMS OTMA Security

- MQSeries security profiles
  - If ***subsysid.NO.SUBSYS.SECURITY*** is defined...
    - MQSeries does not pass userid to IMS
    - Client bid only succeeds when /SEC OTMA NONE is in effect (no userid is passed to the IMS transaction)
    - Good for early testing
  - If ***subsysid.NO.SUBSYS.SECURITY*** is not defined...
    - Define the ***subsysid.NO.xxxx.CHECKS*** profiles
    - Give MQSeries Subsystem userid at least UPDATE access in the ***IMSXCF.XCFgroupname.IMS-member-name*** profile
    - Client bid will succeed and userids will be passed to the IMS transactions

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Telcordia Experience with the MQSeries IMS Bridge

- Two Telcordia applications are currently using the MQSeries IMS bridge in production
- A client had been sending data to one of our applications via tape
- Regulators dictated that the turnaround be reduced from 3 days to 3 hours
- The client already had experience using MQSeries and had a general purpose MQSeries client on a UNIX platform
- The UNIX client sends the messages to MQSeries on MVS which sends them to IMS
- Replies are sent back to the client asynchronously using the OTMA routing exits

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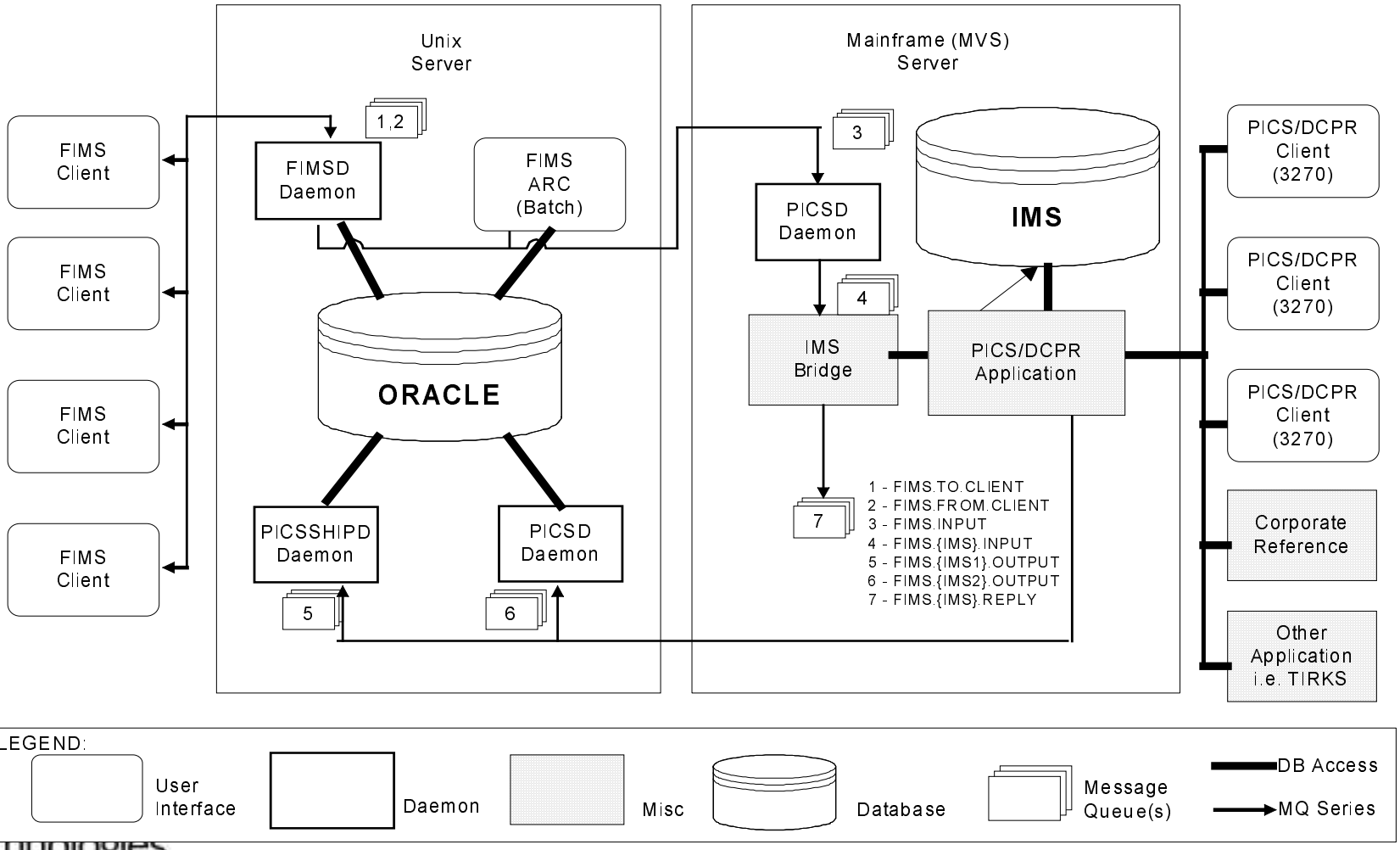
Telcordia Experience with the MQSeries IMS Bridge

Telcordia FIMS Architecture (Production)



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Information on the Web

- http://www.software.ibm.com/ts/mqseries/
- http://www.software.ibm.com/data/ims
- http://www.redbooks.ibm.com/

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IMS OTMA Documentation

- IMS/ESA V6 OTMA Guide and Reference - SC26-8743
- IMS/ESA Application Programming : Transaction Manager - SC26-8729
- IMS/ESA Customization Guide - SC26-8732

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MQSeries IMS Bridge Documentation

- MQSeries for MVS/ESA System Management Guide - SC33-0806
  - Chapter 2.3 - Customizing the MQSeries-IMS Bridge
  - Chapter 3.5 - The MQSeries-IMS Bridge
  - Chapter 3.6 - Controlling the MQSeries-IMS Bridge
  - Appendix B - Using OTMA exits in IMS
  - Appendix C - Mapping MQ messages to IMS transactions (will move to APG)
  - Appendix C - Resetting TPIPES (will move to Command Reference)
  - Appendix C - Messages and Codes (will move to Messages and Codes)

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MQSeries IMS Bridge Documentation

- MQSeries Application Programming Guide - SC33-0807
  - Chapter 15 - Writing MQSeries-IMS bridge applications
- MQSeries Application Programming Reference - SC33-1673
  - Chapters 2 and 6 - MQIIH structure and constants
- SupportPac MP14: MQSeries for MVS/ESA - IMS Bridge Performance Report #2
  - www.software.ibm.com/ts/mqseries/txppacs/txpsumm.html

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Questions?

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