C27

Migrating to CICS Transaction Server V2

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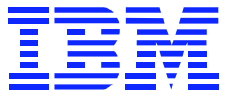- **The following are trademarks of Sun Microsystems**
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Session Agenda

- **Resource Definition**
- **Application Programming Interface**
- **System Programming Interface**
- **Database**
- **Exits and User Replaceable Modules**
- **Prerequisites**
- **Documentation**
- **Summary**

Session Objective

This presentation is intended to provide information on migration from CICS TS 1.3 to CICS TS V2.2.

Resource Definition

- **CICS System Definition (CSD)**
  - Define New CSD with changed attributes
    - ➤ RECORDSIZE (200 2000)
  - REPRO existing CSD to new dataset
  - Run DFHCSDUP UPGRADE
    - ➤ Use DFHCSDUP SCAN command to check for user changes

  - Sharing the CSD
    - ➤ CICS TS 2.2 CSD can be shared with prior releases
      - ■ *Use DFHCOMP groups*
    - ➤ REQUESTMODEL definition has significant changes
      - ■ *Create separate groups for 2.2 and 1.3 REQUESTMODELs*
      - ■ *Use 2.2 CEDA in compatibility mode (PF2 on ALTER) to update*

Resource Definition…

- **CEDA**
  - Watch upper and lower case fields on resource definitions
    - CORBASERVER
    - DJARDIR, JNDIPREFIX, SHELF
  - Multi-line fields
    - All the line entries must be available to edit the fields
      - *e.g. SHELF, HOST*

Resource Definition…

- **System Initialization Table**

  - New parameters

    - AIBRIDGE={AUTO | YES}
    - BRMAXKEEPTIME={86400 | seconds}
    - EJBROLPRF=ejbrole-prefix
    - IIOPLISTENER={YES | NO}
    - KEYRING=key-database-path-name
    - MAXHPTCBS={5 | number}
    - MAXJVMTCBS={5 | number}
    - MAXSOCKETS=number

Resource Definition…

- **System Initialization Table…**

  - New parameters
    - ➤ RSTSIGNOFF={NOFORCE|FORCE}
    - ➤ RSTSIGNTIME={500|hhmmss}
    - ➤ STATEOD={0|hhmmss}
    - ➤ STATINT={030000|hhmmss}
    - ➤ XEJB={YES|NO}

  - Obsolete parameters
    - ➤ DCT
    - ➤ KEYFILE
    - ➤ MNEVE
    - ➤ XRFSOFF
    - ➤ XRFSTIME

Resource Definition…

- **System Initialization Table…**

  - Changed parameters

    - ► LGDFINT={5 | number}   changed to 5 from 30
    - ► MNFREQ={0 | hhmmss}   minimum value 1 minute
    - ► MAXOPENTCBS={12 | number)   maximum value 2000
    - ► STNTRxx and SPCTRxx   new domains
      - *EJ, II, OT, PT, RZ, SJ*

Resource Definition…

- **DB2CONN**
  - DB2GROUPID
  - DB2ID
    - ► Will override the DB2GROUPID
  - RESYNCMEMBER={YES|NO}
  - TCBLIMIT={12|number}
    - ► DB2 V5 - DB2 creates TCB pool
    - ► DB2 V6 – CICS uses Open TCB pool
      - ■ *MAXOPENTCBS considerations*
  - ~~PRIORITY~~
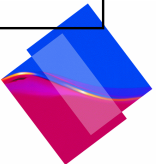   - ► ~~DB2 V6 – ignored, treated as EQUAL~~
- **DB2ENTRY**
  - ~~PRIORITY~~
    - ► ~~DB2 V6 – ignored, treated as EQUAL~~

> *PQ67351*
>
> *Honors Priority Specification*
> *Adds DFHD2PXT*

Resource Definition…

- **PROFILE**
  - DFHCICSI: new profile in group DFHISC for outbound IIOP
  - RTIMOUT
    - Now applies to IIOP request processors
- **PROGRAM**
  - CONCURRENCY={QUASIRENT|THREADSAFE}
    - DB2 V6 considerations
    - Run load module scanner with filter table: DFHEIDTH
      - *SPRM and APRM manuals document threadsafe commands*
  - JVM={NO|YES}
    - Debug option moved to JVMPROFILE member
  - JVMPROFILE: member with JVM initialization parameters
    - DFHJVMPR: sample for persistent, reusable JVM
    - DFHJVMPS: sample to execute JVM as in CICS TS 1.3

Resource Definition…

- **REQUESTMODEL**
  - *CICS TS V1.3 and V2 REQUESTMODEL definitions are incompatible and must be defined in different groups*

  - TYPE={GENERIC|CORBA|EJB}
    - ➤ GENERIC
      - ■ *BEANNAME, INTFACETYPE, MODULE, INTERFACE, OPERATION*
    - ➤ CORBA
      - ■ *MODULE, OPERATION, INTERFACE*
    - ➤ EJB
      - ■ *BEANNAME, INTFACETYPE, OPERATION*
        - BEANNAME: matches enterprise bean name in deployment descriptor
        - INTERFACE: matches IDL interface name
        - INTFACETYPE={BOTH|HOME|REMOTE}
        - MODULE: matches IDL module name
        - OPERATION: matches IDL operation or Java method name
  - Obsolete parameters
    - ➤ OMGINTERFACE, OMGMODULE, OMGOPERATION

Resource Definition…

- **TCPIPSERVICE**
  - PROTOCOL={ECI|HTTP|IIOP}
  - AUTHENTICATE
    - ► HTTP Protocol (NO, BASIC, CERTIFICATE, AUTOREGISTER, AUTOMATIC)
    - ► IIOP Protocol (NO, CERTIFICATE)
    - ► ECI Protocol (ATTACHSEC={VERIFY|LOCAL})
  - CERTIFICATE
  - DNSGROUP
  - GRPCRITICAL
  - TRANSACTION
    - ► ECI (CIEP), HTTP (CWXN), IIOP (CIRR)
  - URM
    - ► HTTP: Analyzer program
    - ► IIOP: Security URM for IIOP

Resource Definition…

- **TRANSACTION**
  - OTSTIMEOUT={NO|hhmmss}
- **TYPETERM**
  - RSTSIGNOFF={NOFORCE|FORCE}
    - ➤ XRFSIGNOFF available in compatibility mode

- **New and changed definitions to support Enterprise Beans**
  - CORBASERVER
    - ➤ Default limit of 41 CORBASERVERs per logical server
  - DJAR
  - TCPIPSERVICE
    - ➤ Must be defined in separate group from its related CORBASERVER and installed first

Application Programming Interface

- **RESP2 values**
  - *File Control*
    - ➤ RESP2 values always returned for local and remote files
  - *Program Control*
    - ➤ New RESP2 values for Java errors
- **EXEC CICS**
  - *ASSIGN NETNAME*
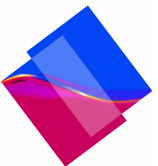   - ➤ Value returned could be a VTAM LU alias
  - *SIGNON / SIGNOFF*
    - ➤ Operation is terminal related only
    - ➤ Executing transaction security and userid set at task attach time
      - ▪ *XSNEX Global User Exit (temporary migration aid)*
- **Mapset Generation (DFHMSD)**
  - *Will add CSECT, AMODE 31 and RMODE ANY statements*
    - ➤ Only if the MAPSET does not include a CSECT statement

Application Programming Interface...

- **High Performance Java (HPJ) Programs**
  - IIOP applications
    - ➤ Stateless CORBA objects now acquire a JVM
      - *HPJ-compiled applications must be converted to JVM programs*
      - *Must use the idlj compiler from the SDK*
        - ➤ CICS no longer provides a dfjcldl.jar
      - *GenFacIOR utility no longer required*
        - ➤ PERFORM CORBASERVER PUBLISH will create stringified IOR on the shelf
  - Non-IIOP applications
    - ➤ Will continue to run in CICS TS 2.2
      - *Hot Pooling also supported*
    - ➤ CICS TS V2.2 provides no support for developing new HPJ programs or for modifying existing HPJ programs
      - *CICS TS 2.2 JCICS classes cannot be used to develop HPJ programs*

System Programming Interface

- **New commands**
  - CREATE
    - ➤ CORBASERVER, DJAR
  - DISCARD
    - ➤ CORBASERVER, DJAR
  - INQUIRE
    - ➤ BEAN, BRFACILITY, CORBASERVER, DISPATCHER, DJAR, JVMPOOL
  - PERFORM
    - ➤ CORBASERVER, DJAR
  - SET
    - ➤ BRFACILITY, CORBASERVER, DISPATCHER, JVMPOOL
- **Obsolete options on commands**
  - CREATE
    - ➤ TYPETERM XRFSIGNOFF (now RSTSIGNOFF)

System Programming Interface...

- **Changed commands**
  - COLLECT
    - ➤ STATISTICS
  - CREATE
    - ➤ DB2CONN, PROGRAM, REQUESTMODEL, TRANSACTION, TYPETERM
  - ENABLE PROGRAM
    - ➤ QUASIRENT, THREADSAFE, PURGEABLE
  - INQUIRE
    - ➤ AUTOINSTALL, CONNECTION, DB2CONN, MONITOR, NETNAME, PROGRAM, REQUESTMODEL, TASK, TCPIP, TCPIPSERVICE, TERMINAL, TRACEID, TRANSACTION, UOW, UOWLINK
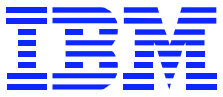 - PERFORM
    - ➤ STATISTICS
  - SET
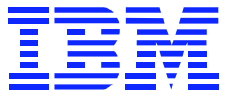   - ➤ DB2CONN, PROGRAM, MONITOR, TCPIP, TRACETYPE

Supplied Transactions

- **CEMT**
  - Changes related to INQ/SET enhancements
    - ➤ Note: INQ DISPATCHER versus INQ SYSTEM
- **CETR**
  - Changes to support new domains
- **CEOT**
  - Temporarily alter the uppercase translation for your terminal
    - ➤ UCTRAN, NOUCTRAN, TRANIDONLY
- **New transactions in support of Enterprise Beans**
  - CREA
    - ➤ Generate REQUESTMODEL definitions based on installed DJARs
  - CREC
    - ➤ Display of installed DJARs and their related transactions
- **New transaction from LE to support CICS**
  - CLER
    - ➤ Display LE runtime options

Global User Exits

- *It is HIGHLY recommended that ALL global user exits be analyzed to insure that they are THREADSAFE and that their PROGRAM definitions changed to specify CONCURRENCY(THREADSAFE)*

    - XRMIIN, XRMIOUT, XEIIN and XEIOUT are most important
        - DB2 V6 Considerations

- **DFHUEPAR changes**
    - UEPGIND extended to include new dispatch modes
        - QR, RO, CO, FO, SZ, RP, SL, SO, S8, H8, J8, L8, D2

Global User Exits…

- **XFAINTU**
  - Parameter list change to support new bridge enhancements
- **XRSINDI**
  - Parameter list change to support new resource types
    - ➤ CORBASERVER, DJAR, Enterprise Bean
- **XFCREQ**
  - Only invoked in AOR, may change or reject the request
- **XFCREQC**
  - Only invoked in AOR, may change the return code

Global User Exits…

- **XFCFRIN**
  - Invoked in AOR and FOR, may change SYSID or reject
- **XFCFROUT**
  - Invoked in AOR and FOR, may monitor return code
- **XSNON**
  - Parameter list change to support flag bytes
- **New Samples**
  - DFH$REQC for XFCSREQC
  - DFH$LGLS for XLGSTRM

User Replaceable Modules

- **DFHDSRP**
  - Changes to COMMAREA to support request streams
- **DFHDYP**
  - Changes to COMMAREA to support LINK 3270 Bridge
- **DFHEJDNX**
  - Provides a distinguished name when no client certificate
- **DFHEJEP**
  - Monitors EJB related events
    - ➤ CORBASERVER, DJAR, BEANS
- **DFHJVMAT**
  - Invoked only for JVMs defined with Xresettable=NO

User Replaceable Modules…

- **DFHPGADX**
  - Parameter changes to support JVMPROFILE
- **DFHSJJ8O**
  - Override LE enclave storage options for JVM
- **DFHXOPUS**
  - Provides a USERID for inbound IIOP requests
- **DFHZATDX**
  - Parameter changes for LINK 3270 Bridge support
  - Sample code to extract the NQN from the CINIT or Bind
- **Node Error Programs**
  - New action flag to print NQN

User Replaceable Modules…

- **DFHCNV macro**
  - Changes to the offset and length parameters passed to the DFHUCNV user-replaceable module
    - ➤ Length fields are now full word parameters
  - TYPE=ENTRY, USREXIT=YES|NO|program_name
    - ➤ Allows use of a different program name than DFHUCNV

- **DFHUCNV**
  - Existing DFHUCNV program must be changed for V2.2
    - ➤ Create new program for use with CICS V2.2
    - ➤ Specify USREXIT=program_name in the V2.2 conversion table

DB2

- **Constraint Relief**
  - Move DB2 PRH workarea above the 16MB line
    - ► DB2 APAR PQ55078
      - ▪ *Applicable to DB2 V6 and V7*
      - ▪ *VSCR of 4k per identified TCB*
- **Group Attach considerations**
  - Requires DB2 Version 7
    - ► ERLY code and PQ44614, PQ45691, and PQ45692
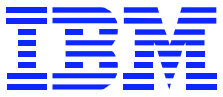   - ▪ *Requires an IPL*
- **DB2ID and DB2GROUP ID mutually exclusive**
  - DB2ID takes precedence
- **Resynchronization Considerations**
  - RESYNCMEMBER(YES|NO)
    - ► Wait until previous DB2 subsystem is available
  - RESYNCMEMBER(NO)
    - ► One attempt will be made to connect to previous DB2 subsystem
    - ► DB2 In-doubts will wait for original connection to be reestablished

DB2…

- **DB2 Performance Enhancements (OTE Exploitation)**
  - Requires DB2 Version 6
    - ➤ Including ERLY code
  - User Applications must be Threadsafe
    - ➤ CONCURRENCY specification on PROGRAM definitions
  - Global and Task Related User Exits used by the application
    - ➤ Must all be Threadsafe
      - *Concurrent specification on program definition for GLUES*
      - *OPENAPI on ENABLE PROGRAM for TRUES*
        - ➤ OPENAPI is set automatically for DB2 TRUE
- **Changes**
  - TCBLIMIT on DB2CONN is a subset of MAXOPENTCBS
  - ~~Open TCB dispatch priority may be different from DB2 definitions~~
    - ➤ Refer to documentation in PQ67351
  - DB2 CPU time will be included in CICS 110 records
    - ➤ May increase due to now accounting for CREATE Thread

CICSPlex System Manager

- **CPSM migration has not changed from prior release**
  - CAS, CMAS and MAS Agent code must all be at the same CPSM release level
    - ➤ Maintenance Point must be migrated first
    - ➤ Migrate the CPSM by MVS image to latest level
      - ■ *Migrate CICS regions to new releases after CPSM migration complete*
        - ➤ API considerations
- **CPSM WLM considerations**
  - LINK 3270 Bridge routing not supported in this CPSM release
  - Front-end routing program to CPSM and User DFHDYP
  - Separate "TORs" for 3270 and LINK Bridge work
- **CPSM discontinued functions**
  - RODM support
  - RMAS support for CICS/ESA and CICS TS
  - Tivoli GEM agent code

Startup JCL

- **DFHJVM – JVM Initialization Options**
  - PDS containing multiple members
    - ➤ Members contain a JVM profile
  - JVM profile specified on PROGRAM definition
    - ➤ JVMPROFILE(DFHJVMPR|name)
      - ▪ *Two profiles supplied in SDFHENV*
- **DFHCJVM**
  - DD statement no longer required
- **user.properties file**
  - CICS does not look for a user properties file
  - Reads the system properties file
    - ➤ Named on the JVMPROPS parameter in the JVM profile

Prerequisites for CICS TS V2.2

- **Operating System**
  - OS/390 2.10
    - ➤ Base CICS support
    - ➤ APAR PQ44884 (PTF UQ50735) is required
  - Coupling Facility Duplexing
    - ➤ Announcement Letter 102-327, December 17, 2002
      - ■ *System-Managed Coupling Facility Structure Duplexing, the expected availability of which was announced on June 25, 2002 (announcement letter 102-181), will not be available by the end of 2002. IBM still intends to deliver this function in the future, however, a new availability date has not been determined.*
        - ➤ IBM 9672 G5 or G6 server with CFCC Level 11
        - ➤ IBM 9672 R06 Coupling Facility with CFCC Level 11
        - ➤ IBM zSeries 800 or 900 server with CFCC Level 12
        - ➤ IBM z900 Model 100 Coupling Facility with CFCC level 12
        - ➤ IBM z800 Model 0CF Coupling Facility with CFCC Level 12
        - ➤ Bi-directional CF-to-CF connectivity via coupling links
        - ➤ Additional prerequisites in the technical paper GM13-0103-3, "System Managed CF Structure Duplexing"

- **UNIX System Services must be running in full function mode**
- **PDSE datasets are required for Java RELFILEs**
- ✓ *Review Program Directory for critical APARs*

Prerequisites for CICS TS 2.2...

- **Java**
  - IBM Developer Kit for OS/390, Java 2 Technology Edition, V1.3.1
- **Communication Server (VTAM and TCP/IP)**
  - Component of OS/390 or z/OS
- **Database**
  - IMS Database Manager 6.1
  - DB2 5.1
  - DB2 6.1 and ERLY code
    - ➤ Required for OTE exploitation
  - DB2 7.1 and ERLY code
    - ➤ Required for Group Attach

Prerequisites for CICS TS 2.2…

- **CICSPlex SM 2.2**
  - Included in CICS Transaction Server 2.2
  - Global Enterprise Manager (GEM agent) not shipped with CICS
    - ➤ Tivoli Business System Manager required
- **Security**
  - OS/390 2.10 RACF
- **Application Assembly Tool**
  - WebSphere Application Server
    Advanced Single Server Edition V4.01
    - ➤ Included in CICS Transaction Server 2.2

Prerequisites for CICS TS 2.2...

- **Translator support for the earlier (pre-Language Environment) compilers is withdrawn in this release**
  - OS/VS COBOL (5740-CB1, 5740-LM1, and 5734-CB4)
  - VS COBOL II (5668-958, also 5688-023)
  - OS PL/I Version 1 (5734-PL1)
  - SAA AD/Cycle C/370 (5688-216)

- *It is planned that run-time support for OS/VS COBOL programs, regardless of run-time library used, and for any other programs running under pre-Language Environment run-time libraries will be withdrawn in the next release.*
  - *Migrate to the LE runtime libraries*

Prerequisites for CICS TS 2.2...

- **Compilers**
  - Java
    - ➤ Visual Age for Java 3.5 or 4.0
    - ➤ WebSphere Studio Application Developer
  - COBOL
    - ➤ IBM COBOL for MVS and VM Version 1 (5688-197)
    - ➤ IBM COBOL for OS/390 and VM Version 2 (5648-A25)
      - ■ *Required for Integrated Translator support (PQ45462)*
    - ➤ IBM Enterprise COBOL for z/OS and OS/390 Version 3 (5655-G53)
  - PLI
    - ➤ OS PL/I V2.3 Compiler and Library (5668-910)
    - ➤ IBM PL/I for MVS & VM Version 1 (5688-235)
    - ➤ IBM VisualAge PL/I for OS/390 Version 2 (5655-B22)
      - ■ *Required for Integrated Translator support (PQ45562)*
    - ➤ IBM Enterprise PL/I for z/OS and OS/390 Version 3 (5655-H31)
  - Assembler
    - ➤ OS/390 Assembler H Version 2 (5668-962)

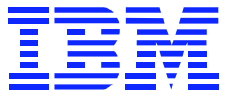# Documentation

- **CICS Information Center**
  - Primary source of CICS information
  - HTML representation of the CICS Library
    - Shipped on a CD
    - Accessed with a web browser
    - Extensive search capabilities
    - Bookmarks can be set
  - Existing CICS library available in both HTML and PDF formats
- **Hardcopy Publications (shipped with order)**
  - CICS TS for z/OS Release Guide   GC34-5983
  - CICS TS for z/OS Migration Guide   GC34-5984
  - CICS TS for z/OS Installation Guide   GC34-5985
  - CICS TS for z/OS Program Directory   GI10-2543
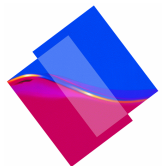
Other manuals available as separate priced feature

Summary

- **Review the CICS TS Migration Guide**

- **Review ALL GLUEs and TRUEs**
  - Threadsafe considerations
- **Watch the DB2 Release Levels**
  - DB2 Version 6
    - ► Will change the allocation of the TCB pool
    - ► MAXOPENTCBS must include DB2 TCBLIMIT
- **Changes to the Defaults**
  - LGDFINT now 5
  - MAXOPENTCBs now 12
  - New MAXJVMTCBS and MAXHPTCBS