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CICS TS V4.R2 Planning Your CICS Upgrade

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- Thanks to Steve Zemblowski for the initial version of the Upgrade planning charts at CICS TS V4.2 general availability

Session Agenda

- Software prerequisites
- General external changes
 - Resource definition
 - Application and systems programming interfaces
 - Global user exits
 - Monitoring and statistics
- Functional changes
 - Obsolete function removal
- Documentation
- Summary

Use the Information Center

- Release-specific guidance
 - Upgrading from Version 3 Release 1
 - Upgrading from Version 3 Release 2
 - Upgrading from Version 4 Release 1

- This presentation will draw from the V4.1 → V4.2 requirements

CICS Transaction Server V4.2 Elements

- CICS Transaction Server V4.2
 - CICS 0670
 - Service Flow Runtime now shipped with CICS TS V4.2
- CICSplex SM V4.2
- REXX
 - Development System
 - Runtime Facility
 - REXX Common for z/OS
- CICS Information Center V4.2
 - Download to install on your own workstation or server
 - Use real-time from ibm.com
- CICS Explorer
 - Available via download site

Software Prerequisites

- CICS TS V4.2 requires z/OS V1.11 or later
 - The product will not initialize with a lower level of operating system
- The IBM XML Toolkit V1.10 for z/OS
 - Required at runtime if WS-Security is used
 - If not present at runtime DFHPI0119 will be issued
 - Not required for installation
- IBM 64-bit SDK for z/OS, Java Technology Edition, V6.0.1
 - 31-bit SDK is no longer supported
- IBM XML Toolkit and Java SDK not shipped with CICS

Software Prerequisites...

- CICS Tools
 - Performance Analyzer Version 3.2 with PM30692
 - Interdependency Analyzer Version 3.1 with PM34054
 - Configuration Manager Version 2.1 with PM32874
 - Deployment Assistant Version 1.1 with PM34068
 - CICS VSAM Recovery Version 4.2 or 4.3 with PM34799
- CICS Transaction Gateway Version 7.1 or later
- IMS™
 - Version 10 with PM31730
 - Version 11 with PM31729
 - Version 12 with PM31420 for threadsafe support
 - At GA of CICS TS 4.2, IMS Version 12 is available through a Quality Partnership Program
- DB2® Version 8.1 or later
- WebSphere MQ Version 6.0 or later
- WebSphere Application Server for z/OS Version 6.1 or later
- Current® prerequisite levels are maintained at:
 - <http://www.ibm.com/support/docview.wss?uid=swg27020857>

Operating System Setup

- CICS uses z/OS conversion services
 - aka z/OS Unicode support
 - Conversion facility must be enabled
 - Documented in “z/OS Support for Unicode: Using Conversion Services”
- SDFHLINK modules are downward compatible
 - e.g. SVC, DFHIRP
- SEYULINK modules are not downward compatible
- For 64 bit exploitation MEMLIMIT needs to be set equal to or greater than 4GB
 - DFHSM0602 message issued if MEMLIMIT is less than 4GB

64-bit storage usage -- MEMLIMIT

- CICS TS 4.2 requires a minimum of 4 GB
- DFHSM0602 message is issued and CICS terminates
 - if MEMLIMIT is less than 4 GB
- Possible above-bar storage usage
 - Main temporary storage
 - Minimum 1 MB
 - Limited to 25% of MEMLIMIT
 - Channels and containers
 - Limited to 5% of MEMLIMIT
 - Internal trace table
 - Minimum 16 KB
 - Maximum 1 GB
 - Transaction dump table (TRTRANSZ parameter)
 - Minimum 16 KB
 - Maximum 1 GB

MEMLIMIT calculation

- MEMLIMIT possible above-bar storage usage
 - Association data control blocks (1 KB per active task)
 - Message tables (3 MB for English + 3 MB for each additional language)
 - Event processing capture queues
 - I/O buffers for z/OS system services parser
 - CICSplex SM API results sets
 - CMCI retained results
 - Pooled JVMs
 - $-Xmx + \text{HEAP64} + \text{LIBHEAP64} + (\text{STACK64} * 5)$
 - + JVMCCSIZE if using shared class cache
 - DFHJVMRO contains HEAP64, LIBHEAP64 and STACK64
 - JVM servers
 - $Xmx + \text{HEAP64} + \text{LIBHEAP64} + (\text{STACK64} * (\text{THREADLIMIT} + \text{Xgthreads}))$

Installation Process

- Default installation process
 - Common IBM install procedures
 - SMP/E RECEIVE, APPLY, ACCEPT commands
 - Described in the CICS Installation Guide
- DFHISTAR process
 - CICS generated installation job stream
 - Described in the CICS Installation Guide

Installation Process...

- CICSplex SM integrated into the standard install process
 - Same as in V4.1
 - CICS will not initialize if you omit the CICSplex install
 - No separate installation job stream

- New CPSM Installation Verification Programs

CICS Local and Global Catalog Changes

- Define new local and global catalogs
 - Initialize the Catalogs
 - Perform an INITIAL start
 - Documentation in the CICS Information Center
 - Sample jobstreams in XDFHINST

Systems Initialization Table: New Parameter

- $TSMMAINLIMIT=\{64M|nnnnnnM|nnG\}$
 - Limit for main temporary storage
 - Cannot be greater than 25% of MEMLIMIT

Systems Initialization Table: Changed Parameters

- CSDLRNO = {1|number|NONE|NO}
 - The LSR pool number can now range from 1 to 255
- EDSALIM = {48M|number}
 - The default and minimum value changed from 10M to 48M
- FCQRONLY = {YES|NO}
 - Specify YES for MRO and ISC connections
 - Specify NO for IPIC-only connections
- TRTABSZ = {4096|number-of-kilobytes}
 - 64-bit storage can be acquired
- TRTRANSZ = {16 |number-of-kilobytes}
 - 64-bit storage is acquired

New Supplied Transactions

- CESL transaction
 - New transaction to sign on to CICS using a password or a password phrase
 - Supports both 3270, Sequential and Console devices
 - Does not support 40x12 size screens
 - CESN will remain unchanged
- CEPF
 - Event processing deferred filtering task
 - Category one transaction

Changed supplied transactions

- CEDF transaction
 - Changed to hide passwords or password phrases
 - CHANGE PASSWORD
 - CHANGE PHRASE
 - SIGNON
 - VERIFY PASSWORD
 - VERIFY PHRASE
- DFHMIRS is now threadsafe
 - Supplied definition is CONCURRENCY(THREADSAFE)
 - Switch to L8 made before TS and FC requests
 - Only requests function shipped over IPIC will run on an Open TCB
 - Review your DFHSIT specification
 - FCQRONLY

CICS Supplied Transactions: CEMT...

- New commands
 - INQUIRE EPADAPTER
 - Retrieve information about an EP adapter
 - INQUIRE TEMPSTORAGE
 - Retrieve information about storage used by TS queues
 - SET EPADAPTER
 - Enable or disable an EP adapter
 - SET TEMPSTORAGE
 - Set the amount of storage that is available to TS queues

CICS Supplied Transactions: CEMT...

- Changed commands
 - INQUIRE ATOMSERVICE
 - URIMAP, XMLTRANSFORM
 - INQUIRE CLASSCACHE
 - STARTTIME (replaces DATESTARTED and TIMESTARTED)
 - INQUIRE EVENTBINDING
 - EPADAPTER
 - INQUIRE EVENTPROCESS
 - SCHEMALEVEL
 - INQUIRE IPCONN
 - MIRRORLIFE
 - INQUIRE MQCONN
 - New value GROUPTRESYNC is added to the RESYNCMEMBER
 - INQUIRE PROGRAM
 - JVMSERVER
 - The CONCURRENCY option has a new value of REQUIRED

CICS Supplied Transactions: CEMT...

- Changed commands
 - INQUIRE TCPIPSERVICE
 - MAXPERSIST
 - INQUIRE TSMODEL
 - EXPIRYINT
 - INQUIRE TSQUEUE/TSQNAME
 - EXPIRYINT
 - INQUIRE URIMAP
 - SOCKETCLOSE, SOCKPOOLSIZE
 - INQUIRE WEBSERVICE
 - ARCHIVEFILE
 - SET MQCONN
 - New value GROUPRESYNC is added to the RESYNCMEMBER

The CSD

- Define a new CSD
 - Initialize
 - Copy groups from earlier level of CICS

- OR ---

- Upgrade an existing CSD

- Research user-modified CICS-supplied resource definitions
- Research copies of CICS-supplied resource definitions
- Sharing the CSD
 - CICS TS V4.2 CSD can be shared with prior releases
 - Check for the appropriate compatibility groups

Resource Definition

- Obsolete attribute LSRPOOLID in LSRPOOL
 - Replaced by LSRPOOLNUM attribute
- Changed PROGRAM resource definition
 - CONCURRENCY attribute has new option of REQUIRED

New attributes on resource definitions

- FILE
 - LSRPOOLNUM replaces LSRPOOLID
- LSRPOOL
 - LSRPOOLNUM replaces LSRPOOLID
- PROGRAM
 - JVMSERVER
 - Specifies the JVMSERVER to use to run this Java program
- TCPIPService
 - MAXPERSIST
 - Specifies max number of persistent connections from web clients
- TSPMODEL
 - EXPIRYINT
 - Specifies the expiration time for an unreferenced TS queue (main or auxiliary)
- URIMAP
 - SOCKETCLOSE
 - Specifies for how long, CICS keeps a client HTTP connection open for reuse
- WEBSERVICE
 - ARCHIVEFILE
 - Specifies the archive file that contains the WSDL

EXEC CICS API

- Modified commands
 - QUERY SECURITY
 - New EPADAPTER resource type
 - SIGNON
 - Added options for password phrases
 - WRITEQ TS
 - MAIN and AUX setting honored for IPIC function shipping
- New commands
 - CHANGE PHRASE
 - Change the password phrase
 - VERIFY PHRASE
 - Verify the password phrase is valid

Upgrade for Java applications

- All JVMs run in 64-bit
 - Review your MEMLIMIT specification
- JCICS packaging has changed
 - Now uses OSGi bundles for JVMSERVER
 - Review PM36832 and PM36838 for DB2 JDBC drivers
- New JVM profile options
 - JAVA_PIPELINE
 - OSGI_BUNDLES
 - OSGI_STARTUP_TIMEOUT
 - &JVMSERVER
 - Name of the JVMSERVER is substituted at run time
- Obsolete JVM profile options
 - CICS_HOME used if USSHOME=NONE

Systems Programming Interface (SPI)

- New commands
 - INQUIRE CAPDATAPRED
 - Retrieve information about an application data predicate
 - INQUIRE CAPINFOSRCE
 - Retrieve information about an information source
 - INQUIRE CAPOPTPRED
 - Retrieve information about an application command option predicate
 - INQUIRE EPADAPTER
 - Retrieve information about a specified event processing adapter
 - INQUIRE OSGIBUNDLE
 - Retrieve information about an OSGi bundle installed in a JVM server
 - INQUIRE OSGISERVICE
 - Retrieve information about OSGi services that are registered
 - INQUIRE TEMPSTORAGE
 - Retrieve information about storage used by TS queues
 - SET EPADAPTER
 - Set the status of an EP adapter to enabled or disabled
 - SET TEMPSTORAGE
 - Set the amount of storage that is available to TS queues

Obsolete SPI options

- LSRPOOLID is replaced by LSRPOOLNUM on:
 - CREATE LSRPOOL
 - CREATE FILE
 - INQUIRE FILE
 - SET FILE
- For compatibility
 - The LSRPOOLID value is transferred to LSRPOOLNUM

New SPI options

- FILE – LSRPOOLNUM
 - CREATE, INQUIRE, SET
- LSRPOOL – LSRPOOL
 - CREATE
- MQCONN -- New value GROUPRESYNC added to the RESYNCMEMBER
 - CREATE, INQUIRE, SET
- PROGRAM – JVMSERVER
 - CREATE, INQUIRE
- PROGRAM -- New value REQUIRED is added to CONCURRENCY option
 - CREATE, INQUIRE
- TCPIPSERVICE – MAXPERSIST
 - CREATE, INQUIRE
- TSMODEL – EXPIRYINT
 - CREATE, INQUIRE
- URIMAP – SOCKETCLOSE
 - CREATE, INQUIRE

New SPI options

- INQUIRE ASSOCIATION
 - ODADPTRID, ODADPTRDATA1, ODADPTRDATA2, ODADPTRDATA3, PHAPPLID, PHCOUNT, PHNETWORKID, PHSTARTTIME, PHTASKID, PHTRANSID
- INQUIRE ATOMSERVICE -- URIMAP, XMLTRANSFORM
- INQUIRE CAPTURESPEC
 - CURRPGM, CURRPGMOP, CURRTRANID, CURRTRANIDOP, CURRUSERID, CURRUSERIDOP, NUMDATAPRED, NUMINFOSRCE, NUMOPTPRED, PRIMPRED, PRIMPREDOP
- INQUIRE DB2CONN -- REUSELIMIT
- INQUIRE IPCONN -- MIRRORLIFE
- INQUIRE EVENTBINDING -- EPADAPER
- INQUIRE JVMPOOL -- PROFILEDIR
- INQUIRE JVMSERVER
 - CURRENTHEAP, GCMODEL, INITHEAP, MAXHEAP, OCCUPANCY, PID
- INQUIRE URIMAP -- SOCKETCLOSE SOCKPOOLSIZE
- INQUIRE WEBSERVICE -- ARCHIVEFILE

Global User Exits

- It is ***HIGHLY recommended*** that ALL global user exits be analyzed to ensure that they are ***THREADSAFE*** and that their ***PROGRAM definitions changed to specify CONCURRENCY(THREADSAFE)***
- All exits using XPI calls MUST be reassembled !!

Global User Exits...

- New exits
 - XEPCAP
 - Event capture exit
 - Invoked just before an event is captured by CICS
- Changed exits
 - UEPTERM (zero) affected by IPIC function shipping
 - XTSQRIN, XTSQROUT, XTSPTIN, and XTSPTOUT
 - XFCFRIN and XFCFROUT
 - Exits that must be threadsafe
 - XTSQRIN, XTSQROUT, XTSPTIN, and XTSPTOUT
 - XFCFRIN and XFCFROUT, XISQUE
 - XDLIPRE, XDLIPOST
 - XRSINDI installation and discard exit
 - UEPIDTYP parameter
 - *UEIDEPAD: An EPADAPTER resource*
 - *UEIDOSGB: An OSGi bundle*

Changes to task related user exits

- New context management parameters
 - Exit invoked a non-terminal-related EXEC CICS START command
 - Not invoked for terminal-related EXEC CICS START commands
- Allows origin data to be added to the task
- For details of the new fields:
 - http://publib.boulder.ibm.com/infocenter/cicsts/v4r2/topic/com.ibm.cics.ts.doc/dfha3/topics/dfha3_ewlm_parms.html

Changes to User Replaceable Modules

- Custom EP adapters
 - Must honor EPAP_RECOVER setting
- DFHDSRP
 - New settings for UOW affinity
- DFHDYP
 - Should be coded to threadsafe standards
- DFHJVMAT
 - Only called for pooled JVMs
- DFHJVMRO
 - New 64-bit parameters for pooled JVMs
- EYU9WRAM
 - New settings for UOW affinity
- EYU9XLOP
 - New settings for UOW affinity

Monitoring and Statistics

- Monitoring
 - Record size increases to 2960 bytes
- New monitoring data
 - Origin data
 - Previous hop data
 - Event data
- DFH\$MOLS
 - Support for new monitoring data fields
 - UNLOAD function only supported for CICS TS 3.2 and Version 4
- Statistics
 - Support for new EP adapter statistics
 - New Storage Manager reports for 64-bit

CICSPIlex Systems Manager

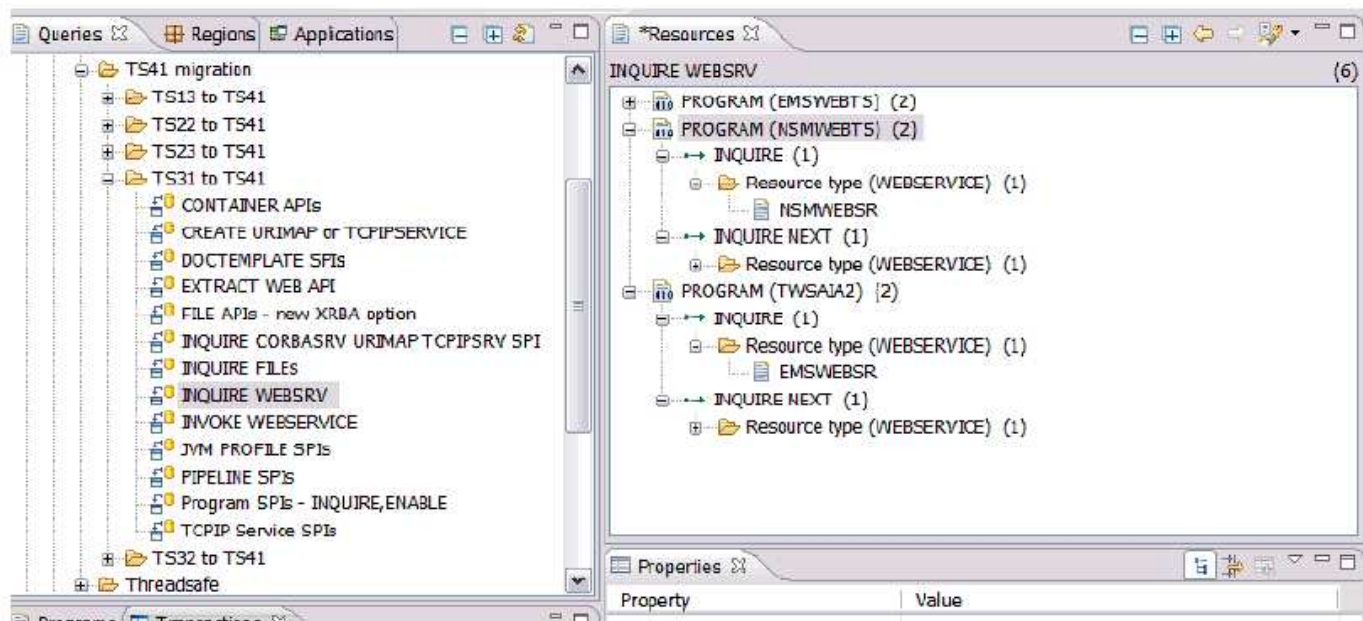
- CICSPIlex upgrade similar to previous releases
 - Maintenance point CMAS must be upgraded first
 - CMAS and MAS agent code must all be at V4.2 level
 - WUI Server and its connected CMAS must be at V4.2 level
 - Migrate contents of WUI Server repository
 - Views and resource tables added to reflect the new resource types

Miscellaneous changes

- New DSAs
 - GCDSA: above bar CICS dynamic storage
 - ETDSA: extended trusted dynamic storage
- Release Sensitive XPI call RELENSCALL
 - Support is stabilized in CICS TS V4.2
 - Intend to remove support in a future release
- CICS Messages and Codes file (CMAC)
 - IBM will no longer provide updates using PTFs

CICS Interdependency Analyzer

- Upgrade analysis
 - Can help identify changes related to CICS upgrade
 - Query results can help target testing



Summary

- Installation
 - Similar to previous releases
 - Standard installation procedure or DFHISTAR
- Upgrading
 - Application Programmers
 - Review Java programs and procedures
 - Systems Programmers
 - “Normal” release process
 - Review ALL GLUEs, TRUEs and URM
 - Review resource definitions