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CICS Transaction Server for z/OS Core Foundations and Scalability

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Agenda

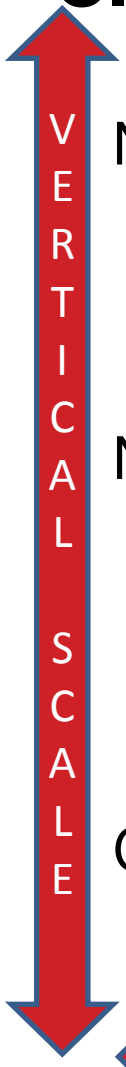
- CICS TS V4.2 Core Foundation and Scalability Overview
- CICS Transaction Server V5.1 Open Beta
  - Core Foundations
    - Security
    - Communications
    - Core features
  - Scalability
    - Open Transaction Environment
    - Virtual Storage Constraint Relief
    - Greater Use of 64-bit Storage
    - Instrumentation – Monitoring and Statistics
- Summary

Notes

CICS Transaction Server for z/OS provides a robust and scalable foundation on which business depends.

CICS Transaction Server for z/OS Version 4 provided a number of scalability enhancements, from Threadsafe exploitation to greater 64-bit infrastructure. During this session we will cover the details of these enhancements and also look at what the future holds to ensure CICS Transaction Server continues to provide the solid foundation and scalability on which your business depends.

CICS TS Core Foundations and Scalability



Need to scale horizontally

- High Availability, Failover, …
- Application and/or Data Separation, Security Considerations, …
- Larger workloads that are not threadsafe, …

Need to scale vertically

- Larger workloads that are threadsafe, have application affinities, …
- Larger payloads (e.g. webservices, …)
- Improve utilization on lightly loaded systems (reduce horizontal)
- Simplify management and maintenance (reduce horizontal)

Core Foundation

- Communications, Resource Managers, Operating System, Hardware, …

CICS TS V4.2 – Foundation and Scalability …

- CICS TS V4.2 delivered new and enhanced capabilities in the area of scalability …
  - New **concurrency** option for greater OTE exploitation
  - Threadsafe Mirrors for Function Shipping over IPIC connections
  - Threadsafe CICS-DBCTL interface when connected to IMS V12
  - More threadsafe EXEC CICS API and SPI commands
  - New 64-bit infrastructure and exploitation
  - More VSAM LSR Pools

Notes

The scalability enhancements provided by CICS Transaction Server for z/OS Version 4.2 provide, via the OTE enhancements, the ability for more workload to exploit the power of the mainframe. The 64-bit enhancements provide the ability to scale vertically, and therefore do more work in a single CICS region, as well as providing a foundation for even greater capacity in the future.

CICS TS V4.2 Core Foundations and Scalability …

- OTE Settings in CICS TS V4.1 …
  - Defining a program with attribute **api(openapi)**
    - Tells CICS the application will use non-CICS APIs
    - Has the side effect of running the application on an open TCB
    - Has the drawback of forcing CICS to match execution key and TCB key so that non-CICS APIs will work!
  - Means CICS has to use L9 open TCBs for user key programs
    - Not good for DB2, MQ, or CICS Sockets applications

Notes

In CICS Transaction Server V4.1 …

Defining a program with attribute API(OPENAPI) has the side effect of causing the program to run from the start on an open TCB. However, primarily it is telling CICS that the program will issue non CICS supported API commands (i.e. something other than EXEC CICS, EXEC SQL, WebSphere MQ commands, etc,) for example, an MVS command.

Unlike CICS commands, an MVS command, will only work correctly when the key of the TCB matches the execution key. So when running EXECKEY(USER) which is key 9, an OPENAPI program is given a key 9 TCB called an L9 TCB.

Contrast this with a program that only issues CICS supported commands. In this case CICS does not reference the key of the TCB, so a program can be running in User key or CICS key, and can run under a key 8 TCB such as the QR or an L8 TCB.

Users who define programs as OPENAPI get the advantage of starting on an open TCB, but suffer the disadvantage that an L9 will be used (assuming storage protection is active). This is a disadvantage because DB2 requires an L8 TCB and so we switch from L9 to L8 and back again for every DB2 request. This is why OPENAPI should not be used for DB2 programs or MQ programs.

CICS TS V4.2 Core Foundations and Scalability …

- OTE Settings in CICS TS V4.2 …
  - We have separated out whether an application must run on an open TCB from what type of APIs it uses
- CONCURRENCY(REQUIRED)
  - Application must be coded to threadsafe standards
  - States that the application MUST start and run on an open TCB
  - If a TCB switch to the QR TCB is made for an EXEC CICS command, a switch back to the open TCB will occur when returning to the application
- Existing API keyword defines what APIs are used
  - This defines what type of CICS TCB is used

CICS TS V4.2 Core Foundations and Scalability …

- **CONCURRENCY(REQUIRED)** and **API(CICSAPI)**
  - The application will run on an open TCB from the start
  - It only uses CICS supported APIs (including DB2, IMS, and MQ)
    - CICS will always use an L8 TCB in this instance irrespective of the execution key, as CICS APIs do not rely on the key of the TCB
  - Great for applications that are to use Resource Managers
    - Such as DB2 and MQ as the same L8 TCB is used!
- **CONCURRENCY(REQUIRED)** and **API(OPENAPI)**
  - The application will run on an open TCB from the start
  - As it will use non-CICS APIs …
    - It will run on an L8 or an L9 TCB depending on the execution key
      - *This is the same as with CICS TS V4.1*
  - Only use **OPENAPI** when non-CICS supported APIs are to be used!

Notes

In CICS Transaction Server V4.2 …

CICS TS V4.2 provides a new CONCURRENCY(REQUIRED) setting which specifies that the program requires to run on an open TCB. It will run on an open TCB from the start, and if CICS has to switch to the QR TCB to process a non-threadsafe CICS command, it will return to the open TCB when it returns to the application program. Now the user can define that the program must start on an open TCB, independently of defining what APIs it uses.

The API parameter determines what type of open TCB is used.

For CONCURRENCY(REQUIRED) programs the type of open TCB used depends on what APIs the program is to use:-

•If the program uses only CICS supported APIs (including access to external resource managers, such as DB2, IMS, and WebSphere MQ) then it should be defined with the program attribute API(CICSAPI). In this case CICS always uses an L8 open TCB, irrespective of the execution key of the program, because CICS commands do not rely on the key of the TCB.

•If the program is to use other non-CICS APIs then it must be defined with the program attribute API(OPENAPI). In this case CICS uses an L9 TCB or an L8 TCB depending on the execution key of the program. This is to allow the non-CICS APIs to operate correctly. This OPENAPI behaviour is the same as previous releases.

CICS TS V4.2 Core Foundations and Scalability …

- Open Transaction Environment – Threadsafe Mirror
  - DFHMIRS is now Threadsafe
  - IPIC transformers are now threadsafe
    - Non IPIC code remains non threadsafe!
  - Only requests Function Shipped over IPIC will run on open TCB
    - File Control (FC) and Temporary Storage (TS)
    - Distributed Program Link (DPL)
      - *If the target application program is defined as threadsafe and the Mirror is already on an open TCB*
  - Review your DFHSIT specification for FCQRONLY if using IPIC
    - Specify FCQRONLY=NO as there is no longer any need to turn off threadsafety in the FOR
- Remote FC and TS requests over IPIC are now threadsafe
  - No TCB switch to QR in the AOR
  - Transformers can run on open TCB in the AOR and ship the request

Notes

The CICS-supplied mirror program, DFHMIRS, which is used by all mirror transactions, is now defined as threadsafe. In addition, the IPIC transformers have been made threadsafe. For IPIC connections only, CICS runs the mirror program on an L8 open TCB whenever possible. For threadsafe applications that function ship commands to other CICS regions using IPIC, the resulting reduction in TCB switching improves the performance of the application compared to other intercommunication methods. To gain the performance improvement, you must specify the system initialization parameter FCQRONLY=NO in the file-owning region.

File Control requests that are Function Shipped using IPIC connectivity provide threadsafe file control with significant potential throughput improvements over LU6.2 in CICS regions with multiple processors available.

Temporary Storage requests that are Function Shipped using IPIC connectivity are threadsafe and no longer need to switch to the QR TCB before being Function Shipped.

For remote File Control (FC) or Temporary Storage (TS) requests Function Shipped over IPIC connections, CICS will no longer force a switch to the QR TCB if it is running currently on an open TCB. The requests will be Function Shipped running on the open TCB.

In the FOR or QOR, the mirror decides when to switch to an open TCB. It does so for the first File Control or Temporary Storage request received over an IPIC connection. The idea is for long running mirrors to keep the mirror transaction running on an open TCB.

CICS TS V4.2 Core Foundations and Scalability …

- CICS-DBCTL interface will use OTE when connected to IMS V12
  - At connect time …
    - CICS and IMS determine if each other can support OTE
  - With IMS V10 and V11
    - CICS-DBCTL TRUE enabled as QUASIRENT
    - Toleration APAR PM31730 (IMS V10), PM31729 (IMS V11)
  - With IMS V12
    - CICS-DBCTL TRUE enabled as OPENAPI
    - Exploitation APARs PM31420 + PM47327, PM45414 are required
- Syncpoint Commands now threadsafe
  - EXEC CICS SYNCPOINT, SYNCPOINT ROLLBACK, …
- Threadsafe EXEC CICS API Commands
  - QUERY SECURITY, SIGNON, SIGNOFF, …
  - EXTRACT TCPIP, EXTRACT CERTIFICATE, …

CICS TS V4.2 Core Foundations and Scalability …

- CICS and 64-bit Support …
  - CICS Transaction Server for z/OS V4.2 contains significant changes to the CICS domain architecture that exploits the underlying z/Architecture for 64-bit addressing and provides the infrastructure for CICS domains to utilize and exploit 64-bit addressing mode
  - Provides below the bar Virtual Storage Constraint Relief (VSCR) …
    - Single System Scaling …
      - *More concurrent tasks, larger applications, …*
    - Increasing pressure on storage usage above the 16MB line!
      - *Both in z/OS storage and in the CICS EDSA storage!*
  - The following CICS domains run AMODE(64)
    - Trace Domain, Message Domain, Temporary Storage Domain, …
    - Kernel Domain, Monitoring Domain, Storage Manage Domain, …
    - Lock Manager Domain, …

CICS TS V4.2 Core Foundations and Scalability …

- CICS and 64-bit Support – Exploiters …
  - CICS Java
    - Move to 64-bit JVM (Java 6) for pooled JVM and JVMServer
    - 31-bit Java not supported
  - CICS Trace
    - Internal Trace Table in 64-bit storage (above the bar)
    - Transaction Dump Trace Table in 64-bit storage
  - CICS Message Domain
    - CICS Message Tables in 64-bit storage
  - CICS Temporary Storage
    - Many Temporary Storage control blocks in 64-bit storage
    - TS Main storage in 64-bit storage

CICS Transaction Server V5.1 Open Beta

- *CICS TS V5.1 open beta delivers significant vertical and horizontal scaling capabilities that enable more efficient and robust handling of larger workloads, and provides opportunity to 'right size' and simplify CICS topologies.*
- Core Foundations
  - Security
  - Event Processing
  - Communications
  - Core features
- Scalability
  - Open Transaction Environment
  - Virtual Storage Constraint Relief
  - Greater Use of 64-bit Storage
  - Instrumentation – Monitoring and Statistics

Notes

CICS TS V5.1 open beta delivers significant vertical and horizontal scaling capabilities that enable more efficient and robust handling of larger workloads, and provides opportunity to 'right size' and simplify CICS topologies. This includes greater use of 64-bit storage, an increase in the maximum number of concurrent user tasks to 2000, and thread safe access to CICS Transient Data Queues (TDQs).

CICS TS V5.1 open beta offers a fast and lightweight Java web container, providing developers with the rich features of Java Servlet and JavaServer Pages (JSP) specifications, and fast local access to your existing CICS applications and data. Built on WebSphere Application Server Liberty profile technology, this web container runs in the CICS JVM server environment. A wide range of Java development tools can be used to develop web applications, such as WebSphere Application Server Developer Tools for Eclipse (WDT), and Rational® Developer for System z.

The JVM server makes use of the IBM 64-bit SDK for z/OS, Java Technology Edition, V7.0.0, that brings many enhancements to the Java language. When using JDBC to access DB2, Java programs will perform better due to reduced TCB switching.

CICS event processing is expanded to enable the filtering and capturing of WRITE OPERATOR commands, encompass the majority of CICS messages, and include predefined information specified in the capture specification. You can emit an event to several event consumers using the new event processing adapter sets.

The CICS-WebSphere MQ dynamic program link (DPL) bridge provides a convenient mechanism to automatically invoke a CICS program to process a WebSphere MQ message. Today this mechanism uses a COMMAREA interface that is restricted to 32KB in size. CICS TS V5.1 open beta introduces an alternate DPL bridge that uses a container that does not have a size restriction and therefore broadens the solutions in which the DPL bridge can be used.

CICS statistics and monitoring provide vital information about the health of the system and the workloads. CICS TS V5.1 open beta statistics now include more data about the load, capacity, and performance of the system. The data provided by monitoring can help you to assess performance more accurately, including potential bottlenecks. Together these enhancements enable you to make more informed decisions about hardware and software upgrades, and application deployments.

CICS TS V5.1 open beta introduces a number of enhancements to make operations easier and more transparent. For example, the default values for several CICS startup parameters are changed to adopt best practice, or are removed altogether where CICS is now able to automatically make adjustments at run time. Also, CICS can issue messages to audit configuration changes made by operational staff or automation procedures that use the SET, PERFORM, ENABLE, DISABLE and RESYNC SPI commands.

CICS support for Secure Sockets Layer (SSL) is enhanced, with a new PERFORM SSL REBUILD command to refresh certificates used for SSL handshakes without performing a restart, and SSL cipher codes negotiated at run time are now recorded in SMF 110 performance records. It is possible to specify that a full verification request takes place at least once a day when users log on to the system, to ensure that IDs are always ready for audit, recorded as being used, and retained.

Core Foundations – SPI Command Auditing

- SPI commands now audited to the CICS log for better accountability of configuration changes
  - DFHAP1900 *date time applid netname userid transid command* RESP(response) RESP2(n)
    - Issued after command completes
  - Commands audited …
    - SET, PERFORM, ENABLE, DISABLE, RESYNC
    - Except for PERFORM SHUTDOWN that already have audited messages DFHTM1715 / DFHTM1703
  - Sent to new TD queue CADS (indirect to CSSL by default)
  - Changes to some resources (e.g. TERMINAL, NETNAME) not audited

Core Foundations – Security …

- Logging on with VERIFY command can now use full RACF verification at least once a day
  - Ensures user IDs are always ready for audit, recorded as being used, and retained in your system

- Distributed identities are now propagated for START command
  - Auditors can use the distributed identity associated with started tasks to find the identity of the user

Core Foundations – Security – Notes …

CICS support for Secure Sockets Layer (SSL) is enhanced, with a new PERFORM SSL REBUILD command to refresh certificates used for SSL handshakes without performing a restart, and SSL cipher codes negotiated at run time are now recorded in SMF 110 performance records. It is possible to specify that a full verification request takes place at least once a day when users log on to the system, to ensure that IDs are always ready for audit, recorded as being used, and retained

Core Foundations – Security …

- SSL certificates and environment can be refreshed online for improve 24x7 operation
  - New PERFORM SSL REBUILD command
    - After updating key ring with new certificate
    - After LDAP server is restarted

- SSL ciphers used are now recorded in SMF 110 CMF performance class records for better performance analysis

Core Foundations – Event Processing …

- EXEC CICS WRITE OPERATOR command Event enabled
  - CICS event processing is expanded to enable the filtering and capturing of EXEC CICS WRITE OPERATOR commands, encompass the majority of CICS messages, and include predefined information specified in the capture specification.

- Multiple Event Processing Adaptors
  - You can emit an event to several event consumers using the new event processing adapter sets.

Core Foundations – Communications …

- CICS-WebSphere MQ DPL Bridge
  - Supports a Channel/Container based interface
    - Flexible, not restricted to 32 KB
  - Transaction CKBC, defined in group DFHMQ
  - Place request WMQ message into DFHREQUEST container
  - Link with channel DFHMQBR_CHANNEL
  - Target can return a response in DFHRESPONSE container

Core Foundations – Communications – Notes …

The CICS-WebSphere MQ dynamic program link (DPL) bridge provides a convenient mechanism to automatically invoke a CICS program to process a WebSphere MQ message. Today this mechanism uses a COMMAREA interface that is restricted to 32KB in size. CICS TS V5.1 open beta introduces an alternate DPL bridge that uses a container that does not have a size restriction and therefore broadens the solutions in which the DPL bridge can be used.

Core Foundations – Communications …

- Full support of execution diagnostic facility (CEDF and CEDX) with IPIC connections
  - Function Shipping, DPL, Transaction Routing
- New sample programs for autoinstall of IPIC connection resources for easier configuration

- EXCI Batch programs can now call CICS regions in different XCFGROUPs dynamically
  - EXCI URM DFHXCURM can change the value of XCFGROUP to be used
  - Enables moving CICS regions to their own XCFGROUP without re-coding batch programs

Core Foundations – Installation and Startup …

- CICS TS V5.1 open beta introduces a number of enhancements to make operations easier and more transparent
- For example …
  - the default values for several CICS startup parameters are changed to adopt best practice
    - PRTYAGE, TRTRANSZ, TCTUALOC, …
  - or are removed altogether where CICS is now able to automatically make adjustments at run time
    - MAXOPENTCBS, MAXXPTCBS, TDSUBTASK, …

Core Foundations – Installation and Startup …

- Dynamically install the CICS TYPE 3 supervisor call (SVC) using new utility DFHCSVCU
  - No need to IPL z/OS therefore more flexible and faster to install CICS
- New regular status messages are issued during startup if VSAM RLS data sets require lost locks recovery processing
- Local and Global Catalogs version verification is now performed during startup
  - Allows for better diagnostics if CICS brought up with an old dataset

Core Foundations – Installation and Startup …

- CICS System Initialization Parameters
  - Simplified Configuration
  - More optimum values – enabling best practices
- AKPFREQ
  - Minimum reduced from 200 to 50
- TRTRANSZ
  - Default increased from 16K to 1024K
  - Trace table is in 64-bit storage
  - Giving much better chance of tracing the error before a dump
- TCTUALOC
  - TCT User Area Location – Default now ANY

Core Foundations – OTE Enhancements

- Commands that access Transient Data (TD) are now threadsafe
  - EXEC CICS READQ TD, WRITEQ TD, and DELETEQ TD
- Global User Exits must be threadsafe
  - XTDEREQ, XTDEREQC
  - XTDIN, XTDOUT, and XTDREQ
- Function Shipping over IPIC will use an Open TCB
- CICS system parameter TDSUBTASK obsolete
- Existing SPI commands commonly used in some applications now threadsafe
  - EXEC CICS SET TASK
  - INQUIRE and SET TRACEDEST / TRACEFLAG / TRACETYPE

Core Foundations – OTE Enhancements …

- Removed TCB switch for Java applications accessing DB2
  - Java applications that use JDBC or SQLJ will not require a TCB switch to L8
  - Java programs will perform better due to reduced TCB switching
- Reduction in TCB switching requirements
  - The problem – T8/X8 applications switch TCBs to access DB2
    - T8 – Java applications in a JVM Server using JDBC or SQLJ
    - X8 – CICS-key XPLink programs (C/C++)
  - TCB switch to L8 no longer needed to access DB2
  - Supports inter-language program LINKs
  - Required PTFs for DB2 V9 (UK78500) and V10 (UK78499)

Core Foundations – Application Enablement …

- PUT CONTAINER command has new APPEND option
  - Enables containers to “grow” without having to delete/recreate
- GET CONTAINER command has new BYTEOFFSET option
  - Retrieve a section of container data beginning at offset
- Enhancements to XML data mappings
  - CICS XML and web services assistants now support mapping overrides to improve the readability of generated COBOL language structures.
    - New option to specify that any underscore in the XML is converted to a hyphen in the generated COBOL language structures.

Core Foundations – WAS Liberty Profile …

- Support for WebSphere Application Server Liberty Profile
  - Lightweight WAS – configuration defines which features to load
  - WAS V8.5, released in April 2012
  - Runs in a JVM Server in CICS
  - Supplied and installed with CICS at no charge, with the restriction that it only runs dynamic web applications
    - Java Server Pages (JSP) and Servlets
  - Access to CICS functionality via JCICS API
  - Application lifecycle controlled via CICS Bundle support
  - Sample dynamic web applications supplied

Core Foundations – WAS Liberty Profile – Notes …

CICS TS V5.1 open beta offers a fast and lightweight Java web container, providing developers with the rich features of Java Servlet and JavaServer Pages (JSP) specifications, and fast local access to your existing CICS applications and data. Built on WebSphere Application Server Liberty profile technology, this web container runs in the CICS JVM server environment. A wide range of Java development tools can be used to develop web applications, such as WebSphere Application Server Developer Tools for Eclipse (WDT), and Rational® Developer for System z.

Core Foundations – WAS Liberty Profile …

- Development requirements
  - Download and install Eclipse IDE
  - Download the Elcipse Web Tools Platform
    - **Help > Install New Software > Work with: All Available Sites**
    - Select Web, XML, Java EE and OSGi Enterprise Development and follow the wizard to install them
  - Download and install the CICS Explorer SDK
  - Build and test the Servlet examples

- SHARE Sessions …
  - *11374: WebSphere Application Server Liberty Profile – Rumours Dispelled*
  - *11373: WebSphere Application Server – What's New?*

Core Foundations – Java …

- The JVM server makes use of the IBM 64-bit SDK for z/OS, Java Technology Edition, V7.0.0
- Java 7 provides a range of benefits aiming to help developers with ease of writing and optimizing Java code.

Scalability

- CICS TS V5.1 open beta delivers significant vertical and horizontal scaling capabilities that enable more efficient and robust handling of larger workloads, and provides opportunity to 'right size' and simplify CICS topologies.
- This includes …
  - Virtual Storage Constraint Relief (VSCR)
  - Greater use of 64-bit Storage
  - Open Transaction Environment Enhancements
  - An increase to the maximum (MXT) number of user tasks
  - Instrumentation Enhancements

Scalability – Virtual Storage Constraint Relief …

- 24-bit Virtual Storage Constraint Relief
  - Reduce pressure on below the line storage
  - Provide for greater capacity for workload growth
  - Reduce below the line Short-on-storage conditions

- 24-bit Virtual Storage Constraint Relief …
  - Control blocks, Modules, and stack storage moved above the line
    - Syncpoint, Transient Data, Journal Control, …
  - Reduce below-the-line storage used by CICS supplied transactions
    - Redefined with TASKDATALOC(ANY)
    - CEDF and CECI processing
    - CWTO, CIEP, CSNC, and the Mirror transactions

Scalability – Virtual Storage Constraint Relief …

- 24-bit Virtual Storage Constraint Relief …
  - Mirror transactions …
    - Supplied mirror transaction defined with TASKDATALOC(ANY)
    - Will use 31-bit task storage
    - AEZA or AZEC abend will occur if you DPL to a AMODE(24) program
      - *Define your own mirror with TASKDATALOC(BELOW)*
      - *Change the application to be AMODE(31)*
  - Change to the COMMAREA location on XCTL
    - Copy to 24-bit or 31-bit storage depending on target program
    - Same behaviour as LINK
  - User Exit Global Work Area
    - New GALOCATION parameter on the ENABLE PROGRAM command

Scalability – VSCR – Notes

Several elements of the CICS infrastructure now use 31-bit (above the 16MB line but below 2GB) storage in the CICS region, in place of all, or some, of the 24-bit (below the 16MB line) storage. Lowering the demands on 24-bit storage helps avoid short-on-storage conditions and can reduce the need for additional CICS regions.

The CICS-supplied mirror transactions use 31-bit storage (above 16 MB but below 2 GB). If an EXEC CICS LINK command is issued over DPL for an AMODE(24) application, an AEZA or AEZC abend will occur. To avoid this situation, do one of the following:

1. Define your own mirror transaction that uses 24-bit storage. For example, you can copy a CICS-supplied mirror transaction, then specify the TASKDATALOC(BELOW) attribute.
2. Modify the application so that it is AMODE(31) and update the appropriate program definition.

When you enable a global user exit program or task-related user exit program, you can now select the location for the storage that CICS provides as a global work area for the exit. The global work area can be in 24-bit storage or in 31-bit storage.

Scalability – Greater Use of 64-bit Storage …

- 31-bit Virtual Storage Constraint Relief …
  - Reduce pressure on above the line storage
  - Provides for greater capacity for workload growth
  - Reduce above the line Short-on-storage situations

- Additional CICS domains exploiting 64-bit Storage …
  - Console Queue Domain
  - Storage Manager Domain
  - Loader Domain

Scalability – Open Transaction Environment …

- CICS program LOADs when running on an Open TCB
  - When running on an open TCB and a CICS program load is requested there is no longer a TCB switch to the RO TCB
    - EXEC CICS LINK, LOAD, XCTL, …
  - CICS RO TCB used for …
    - CICS program LOADs when NOT running on an Open TCB
    - DFHRPL and LIBRARY Dataset Management
- New statistics on RO TCB program load requests and load time

- Reduced contention for the single CICS RO TCB
- Increase the potential CICS program LOAD capacity

Scalability – System Parameters …

- MAXTASK
  - Maximum tasks limit increased from 999 to 2000
  - Single region capacity being constrained by CICS maxtask limit
  - Primarily for Terminal and File Owning Regions (TORs and FORs)
    - Single TOR routing to multiple Application Owning Regions (AORs)
    - Single FOR servicing multiple Application Owning Regions (AORs)
- Simplification (obsolete parameters)
  - MAXOPENTCBS
    - Now calculated as (2 * MXT Value) + 32
  - MAXXPTCBS
    - Now set equal to MXT Value
- PRTYAGE parameter – Default reduced from 32768ms to 1000ms
  - Produce a more even throughput for long-running transactions

Scalability – Instrumentation

- CICS statistics and monitoring provide vital information about the health of the system and the workloads.
- CICS TS V5.1 open beta statistics now include more data about the load, capacity, and performance of the system.
- The data provided by monitoring can help you to assess performance more accurately, including potential bottlenecks.
- Together these enhancements enable you to make more informed decisions about hardware and software upgrades, and application deployments.

Scalability – Instrumentation …

- Physical hardware environment
  - CEC Machine Type and Model ID
    - e.g. 2097-740
- Transaction performance related to CICS region load
  - Current active task count and maxtask setting
- Improved transaction wait (suspend) analysis – new metrics …
  - MRO/ISC Allocate Waits
  - IPIC Allocate Waits
  - RO and SO TCB Mode Delays
  - Intrapartition and Extrapartition TD Lock Waits
  - File Control Exclusive Control Waits
  - VSAM File String Waits

Scalability – Instrumentation …

- Monitoring RMI Data Collection Option
  - Default changed from RMI=NO to RMI=YES
  - Additional performance metrics on CICS Resource Manager usage
- Statistics Data Interval Collection Option
  - Default changed from STATINT=030000 to 010000 (hhmmss)
  - More timely statistics data collection – peak hour analysis
- Monitoring Global Statistics
  - z/OS WLM settings for the CICS region …
    - Transaction, Region, or Both Goals
  - Improved CICS Workload Management analysis

Summary

- CICS TS V5.1 open beta delivers significant vertical and horizontal scaling capabilities that enable more efficient and robust handling of larger workloads, and provides opportunity to 'right size' and simplify CICS topologies.
- Core Foundations
  - Security, Communications, Core Features, …
- Scalability
  - Virtual Storage Constraint Relief, Greater Use of 64-bit Storage, …
  - Open Transaction Environment, …
  - Instrumentation – Monitoring and Statistics
- Foundation for even greater capacity and throughput