



→ Monitor your
CICS Transaction Gateway
in real time

Practical scenarios with
Tivoli OMEGAMON

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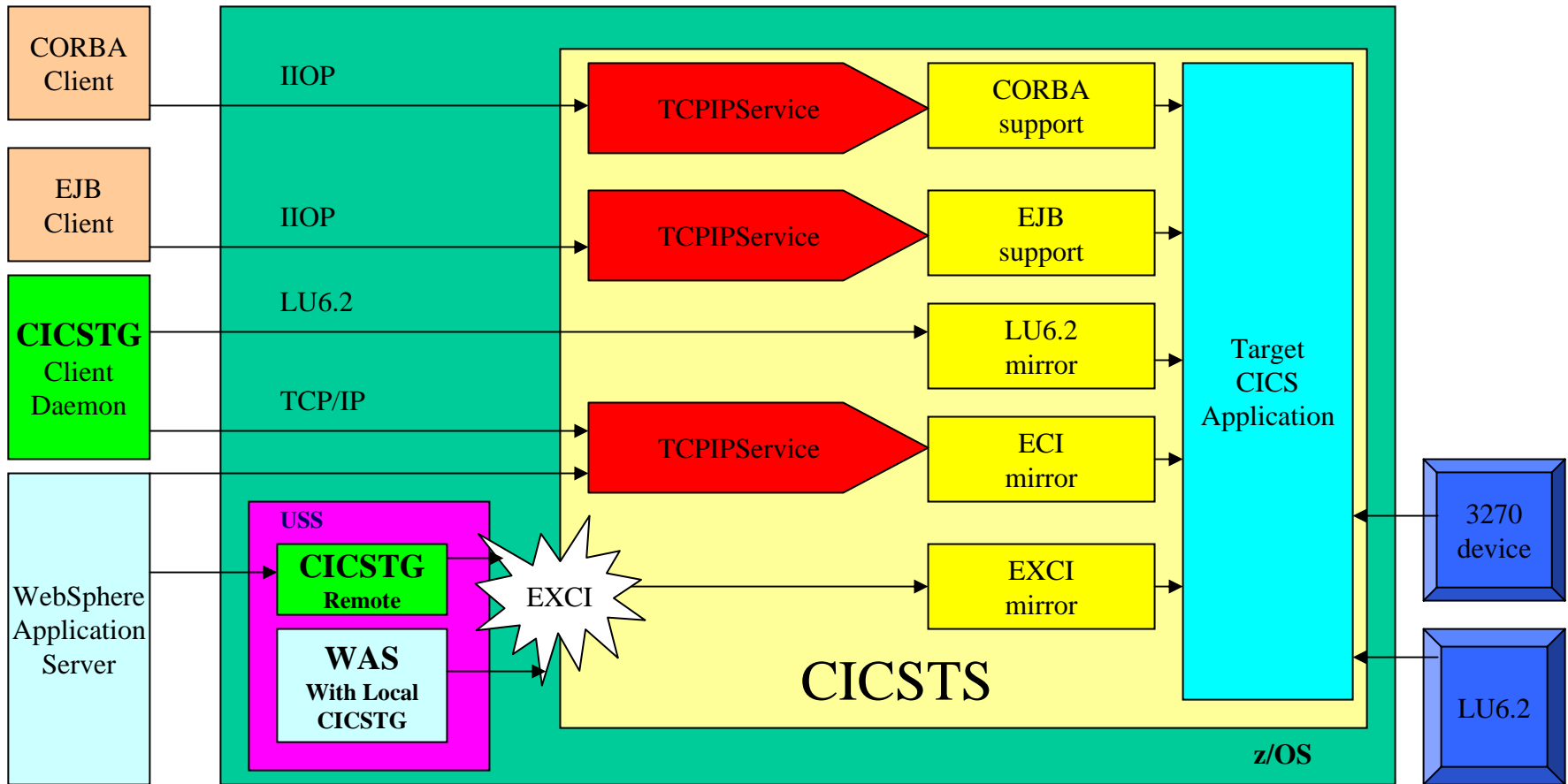
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- IBM Tivoli OMEGAMON XE for CICS TG on z/OS v410
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What is CICS Transaction Gateway?

- CICS Transaction Gateway (CICS TG) provides Java programmers secure, easy access from their Java client applications to CICS transactions using these standard Internet protocols:
 - ▶ TCP/IP sockets
 - ▶ Secure Sockets Layer (SSL)
- The CICS TG product suite runs on a wide variety of operating systems and connects to various products in the CICS family. When running on z/OS, CICS Transaction Gateway can access only CICS Transaction Server (CICS TS) for z/OS.
- On operating systems other than z/OS, CICS TG uses a client daemon to route requests to a CICS TS region using the following methods:
 - ▶ External Call Interface (ECI)
 - ▶ External Presentation Interface (EPI)
 - ▶ External Security Interface (ESI)
- On z/OS, CICS TG can route only ECI requests and has no client daemon. The CICS Transaction Gateway on z/OS actually uses the External CICS Interface, EXCI, to pass requests to CICS Transaction Server(s); however, to your Java client application, these appear to be ECI requests.
- CICS Transaction Gateway can manage many concurrent links to connected Web browsers and the Java applications running in them. The multithreaded architecture of the CICS TG daemon enables a single Gateway to support multiple concurrently connected users of your site's Web applications.
- On z/OS, CICS TG can also be employed as a Shared Object from within a WebSphere Application Server. This form of CICS TG is referred as the LOCAL mode. The CICS Transaction Gateway Daemon (separate address space or region on z/OS) is referred as the REMOTE mode.

CICS Transaction Gateway on the map



What is IBM Tivoli OMEGAMON XE for CICS TG on z/OS v410?

- IBM Tivoli OMEGAMON XE for CICS TG on z/OS offers a central point of management for CICS Transaction Gateway (CICS TG) running on z/OS and provides a comprehensive means for gathering the information you need to detect and prevent problems within your CICS TG applications.
- You can view data that Tivoli Enterprise Portal gathers from the CICS TG monitor in tables and charts that show you the status of your managed CICS TG address spaces (that is, instances of the CICS TG daemon), as well as their connectivity to CICS Transaction Server. This information enables you to:
 - ▶ Collect and analyze reliable, up-to-the-minute data that allows you to make faster, better informed operating decisions
 - ▶ Manage all CICS TG applications from a single point to identify problems at any time
 - ▶ Track performance against goals
 - ▶ Collect CICS TG statistics, which you can use to view thread activity, report CICS TS communication failures, examine resource waits and EXCI (External CICS Interface) pipe usage, and check for excessive transaction rollbacks, among other monitoring activities With OMEGAMON XE for CICS TG on z/OS, systems administrators can set threshold levels and flags to alert them when system conditions reach these thresholds.
- You can use advanced monitoring facilities that include:
 - ▶ User-defined and predefined situations based on thresholds to raise different types of alerts
 - ▶ At-a-glance status of all CICS TG regions
 - ▶ The capability to monitor multiple CICS TG regions simultaneously from one or more centralized workstations

Gateway Daemon Overview

Online performance analysis and statistics which weren't possible prior to CICS TG 7.0 and these workspaces

Graphs to display visually the correlation between CPU usage and requests executed by each CICS TG

The screenshot shows the 'Gateway Daemon Overview' window. On the left is a tree view of system components. In the center are two bar charts: 'CPU Utilization' and 'Requests per Minute', both comparing four CICS TGs (OMEGCTG1, OMEGCTG2, OMEGCTG4, OMEGCTG). At the bottom is a table with columns for System ID, Gateway Daemon Name, Start Date And Time, Total CPU Time, I/O Count, SSL Port Number, TCP Port Number, Health, Number of Requests Processed, Requests Per Minute, Userid, Region Type, and CPU Utilization.

System ID	Gateway Daemon Name	Start Date And Time	Total CPU Time	I/O Count	SSL Port Number	TCP Port Number	Health	Number of Requests Processed	Requests Per Minute	Userid	Region Type	CPU Utilization
MV2C	OMEGCTG1	05/03/07 13:40:12	00:48:58.13	663197	N/A	5114	98	1575430	443	OMEGTASK	STC	
MV2C	OMEGCTG2	05/03/07 15:35:01	00:25:21.12	12377	N/A	5124	0	18185	1501	OMEGTASK	STC	
MV2C	OMEGCTG4	05/03/07 15:35:16	00:24:00.82	13417	N/A	5144	100	9475	887	OMEGTASK	STC	
MV2C	OMEGCTG	05/04/07 01:00:15	00:25:02.24	13107	N/A	5104	100	0	0	SRUKS	Batch	

Initial overview to ascertain the availability, health and current workload of each of your CICS TGs running within that sysplex

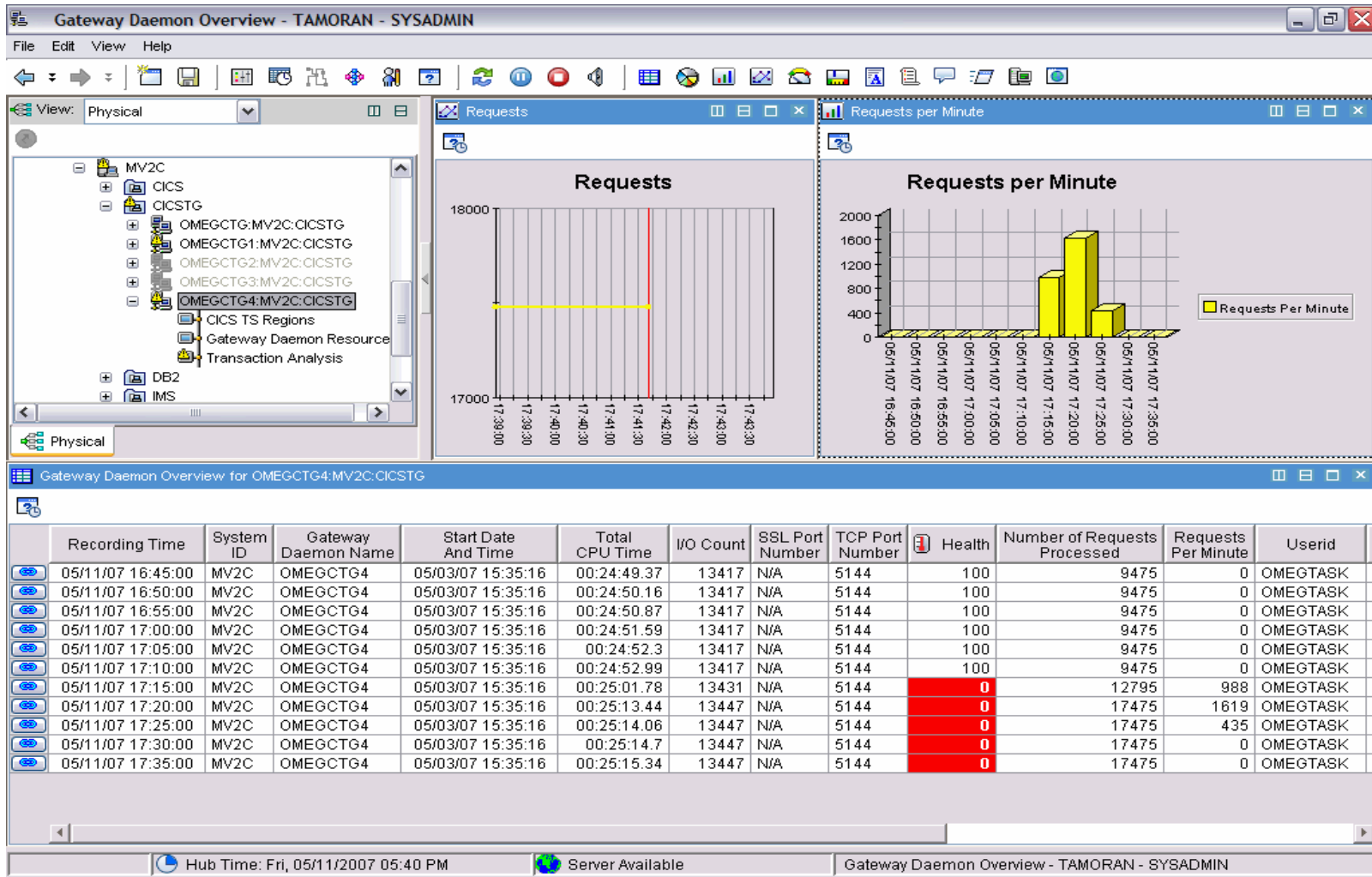
Low Health score is an early-warning of communication issues between CICS TG and CICS TS

Product-provided situations cover aspects of CICS TG Health and Gateway Status

Scenarios

- Transactions arrive but not processed!
 - ▶ The graphs display an imbalance between the CPU usage and the workload being executed in OMEGCTG2. Current percent of time this address space is using the CPU is much less than needed to process such high volume of transactions arriving per minute. As if the client requests are received but not processed!
 - ▶ The detail information in the lower table shows that Health of this Gateway Daemon has reached zero. This indicates there is currently no communication between this CICS TG and CICS TS region(s). Client requests are received but cannot be sent to the Transaction Server(s).
- Is my workload (Number of requests processed) equally balanced over CICS TG regions which share the same TCP or SSL port?
 - ▶ TCP or SSL port number assigned to each CICS TG region is displayed in the Gateway Daemon Overview table next to the total number of transactions or client requests processed.
- Number of I/O (EXCP) operations in each CICS TG address space may be deemed excessive. A High I/O count may be a concern when no Logging activities or Tracing events has occurred. The I/O operations related to the HFS file access (specific to each Gateway Daemon Process within UNIX System Services) may be viewed using the Dynamic Workspace Linking feature of the OMEGAMON XE for z/OS product.

History of workload activity in CICS TG regions



Scenarios

- Collecting History data via the Tivoli Data Warehouse repository allows you to:
 - ▶ Plan for workload growth
 - ▶ Perform trend analysis
 - ▶ Identify performance bottlenecks
 - ▶ Diagnose historical problems
 - ▶ Detect system anomalies
 - ▶ Manage system changes

- The CICS TG region OMEGCTG4, in the scenario above, displays an unusually high volume of activity in the span of 10 minutes from 17:15:00 to 17:25:00.

CICS TS Regions summary

Analysis of any communication between an individual CICS TG and the CICS TS regions during it's lifetime

Graph to display visually the correlation between % of Pipe Allocation and % of Requests Executed

Stats are provided both in 'raw' form and calculated over an interval period to allow for situations to be created if high numbers occur over short period of time

Product provided situations to cover high number of CICS communication failures and high rates of EXCI pipe allocation failures

CICS TS Regions - TAMORAN - SYSADMIN

Individual CICS TS Regions

System ID	Gateway Daemon Name	EXCI Pipes Allocated	CICS TS Region Count	Requests Executed	EXCI Pipe Limit	EXCI Pipe Reallocations	EXCI Pipe Allocation Failures	Communication Failures	Free Pipes	EXCI NETNAME
MV2C	OMEGCTG4	12	3	6356	100	0	0	129	88	

Individual CICS TS Region Summaries

System ID	CICS TS Region Jobname	CICS TS Region Applid	EXCI Pipes Allocated	Requests Executed	Requests Executed Per Minute	EXCI Pipe Allocate Failures	EXCI Pipe Allocation Failures Per Minute
MV2C	CICSCWA1	IYK2ZCW1	6	2356	0	0	0
MV2C	CICSCWA3	IYK2ZCW3	6	4000	795	0	0
MV2C	CTGHI1	IYK2ZHI1	0	0	0	0	0

11:43 AM Server Available CICS TS Regions - TAMORAN - SYSADMIN

Scenarios

- Is my workload balanced across all Transaction Server regions?
 - ▶ In the scenario above, the CICS TG region OMEGCTG4 is sending majority of the requests to CICS TS region IYK2ZCW3 to execute while Transaction Server IYK2ZHI1 is not being used!
 - ▶ There were 129 Communication Failures which may explain why no work has been sent to the CICS TS region IYK2ZHI1.
 - ▶ Although considerably more transactions are being sent to the CICS TS region IYK2ZCW3 than to IYK2ZCW1, pipe allocation is split equally between the two!

- Have I correctly specified the NETNAME of the EXCI connection in CICS TG environment variables file (via the DFHJVPIPE)?
 - ▶ In the scenario above, the EXCI NETNAME is blank. This means no specific pipe is used by the CICS TG region for EXCI calls. Hence, generic pipe is used. Note, any eligible Transaction Server region may then process requests from this CICS TG. Is that the intention?
 - ▶ You can manage and ensure the availability of specific pipes while benefit from a better reporting of resource usage within the intended Transaction Server regions.
 - ▶ In a failover scenario, one EXCI NETNAME applies to all mirror Transaction Server regions. Hence, there is no need to change the DFHJVPIPE variable dynamically.

- Are my CICS Transaction Server region(s) connected to my CICS TG region?
 - ▶ If a particular Transaction Server has never connected to the CICS TG region then the Applid column will be shaded with red and the CICS TS jobname will be left blank.
 - ▶ Use the Dynamic Workspace Linking feature to determine whether a particular Transaction Server region is currently available or active.

CICS TS Region details

CICS TS Region Details - IBM-4012B6C8BD2 - SYSADMIN

File Edit View Help

View: Physical

Transaction Manager Statistics

- More...
- CICSTG
 - OMEGCTG: MV2C: CICSTG
 - OMEGCTG1: MV2C: CICSTG
 - CICS TS Regions
 - Gateway Daemon Resource
 - Transaction Analysis
 - OMEGCTG2: MV2C: CICSTG
 - OMEGCTG3: MV2C: CICSTG
 - OMEGCTG4: MV2C: CICSTG
 - CICS TS Regions
 - Gateway Daemon Resource

Physical

Percentage of Requests Executed and Pipes Allocated for IYK2ZCW2

n	Gateway Daemon Name	CICS TS Region Jobname	CICS TS Region Applid	Requests Executed	Percentage Of Requests Executed	Requests Executed Per Minute	EXCI Pipes Allocated	Percentage Of Pipes Allocated	EXCI Pipe Allocate Failures	EXCI Pipe Allocation Failures Per Minute
1	OMEGCTG1	CICSCWA2	IYK2ZCW2	925450	74	0	10	34	0	0

Pipe Allocation Failures and Request Executions per Minute

Is the number of times the Gateway daemon has tried and failed to allocate a pipe to this CICS TS region over the most recent sampling interval, divided by the duration of the interval (from 60 to 120 seconds) to give the average over the past minute.

Hub Time: Fri, 05/11/2007 06:39 AM Server Available CICS TS Region Details - IBM-4012B6C8BD2 - SYSADMIN

Gateway Daemon Resources

The screenshot displays the 'Gateway Daemon Resources' interface. It features a tree view on the left showing the hierarchy of resources, including 'Gateway Daemon Resource'. Two charts are visible: 'Connection Manager Threads Allocated' and 'Worker Threads Allocated', both showing a single yellow bar representing the current number of threads. Below the charts are two summary tables. The first table, 'Connection Manager Threads Summary', shows 10 threads allocated out of a limit of 10, with 204 connection timeout limit hits. The second table, 'Worker Threads Summary', shows 10 threads allocated out of a limit of 10, with 0 worker timeout limit hits. A tooltip explains that the number of times the Gateway daemon failed to allocate a Connection Manager thread is 204.

System ID	Gateway Daemon Name	Initial Number	Thread Limit	Current Number Created	Current Number Allocated	Number Of Times Connecttimeout Limit Hit	Number Waiting
MV2C	OMEGCTG1	5	10	10	0	204	0

System ID	Gateway Daemon Name	Initial Number	Thread Limit	Current Number Created	Current Number Allocated	Number Of Times Workertimeout Limit Hit
MV2C	OMEGCTG1	5	10	10	0	0

Provides details on the thread resources within the Gateway Daemon, their current utilisation levels and timeout counts

This is a key area for performance and tuning. It allows you to easily determine whether or not your CICS TG has bottleneck problems (not enough capacity for workload)

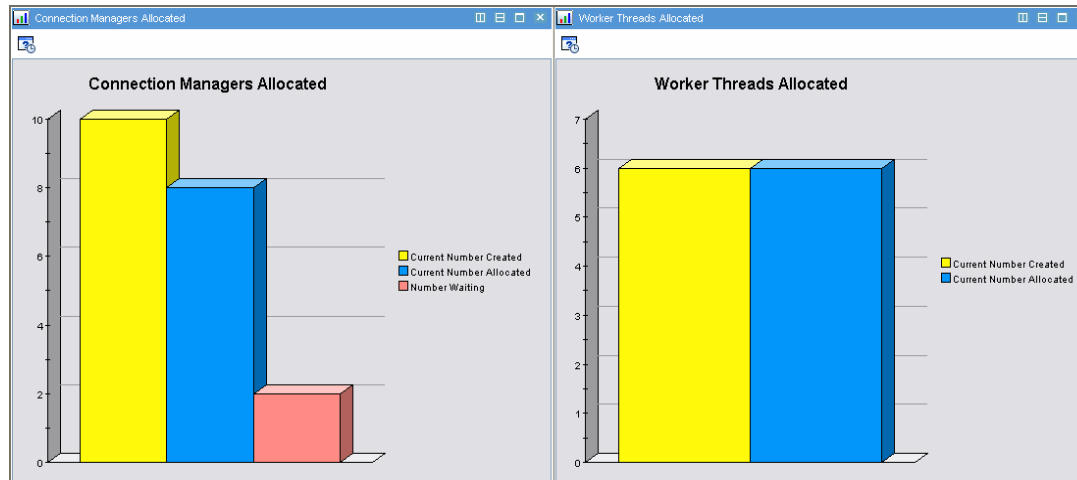
Previously you could analyse the performance of the CICS TS regions and the client apps but no idea if there was enough resources allocated in the CICS TG for the workload flowing through

Product-provided situations supplied to show high numbers of waiting threads and so performance bottlenecks are quickly found whilst the system is online:

- High number of waiting Connection Manager threads
- High rate of connection timeouts

Scenarios

- Do I have enough Gateway Daemon resources available to satisfy the throughput I expect?
 - In the scenario above, there are currently an equal number of Connection Manager threads as the Worker threads. However, this Gateway Daemon failed 204 times to allocate a Connection Manager thread to a Java client application within the specified timeout limit! Note, the Thread Limit has been reached according to the summary table. You may want to increase the value of *maxconnect* paramter in the CICS TG configuration file *.ini*
- Waiting for Worker threads?
 - In the scenario below, the graph to the left displays a surplus of available Connection Manager threads while some are waiting for a free Worker thread! The graph to the right shows that all created Worker threads are currently allocated hence, bottleneck is observed. You may want to increase the value of *maxworker*.



Transaction Analysis

Situations are provided to alert users about failing transactions and can be adjusted to suit your policies

Top graph shows the different types of transactions that can run in CICS TG:
 - SyncOnReturn
 - Extended LUW
 - XA (2-phase commit)

The screenshot displays the Transaction Analysis interface for TAMORAN - SYSADMIN. It includes a tree view on the left, a 'Ratio of Transaction Types' 3D stacked bar chart, a 'Gateway Daemon Summary' table, and two horizontal bar charts at the bottom: 'Extended LUW Transactions Ratio' and 'XA Transactions Ratio'.

System ID	Gateway Daemon Name	Number Of Requests Processed	Successful SYNCONRETURN Transactions	Extended LUW Transactions Committed	Extended LUW Transactions Rolled Back	XA Transactions Committed	XA Transactions Rolled Back
MV2C	OMEGCTG4	9475	1981	714	497	857	143

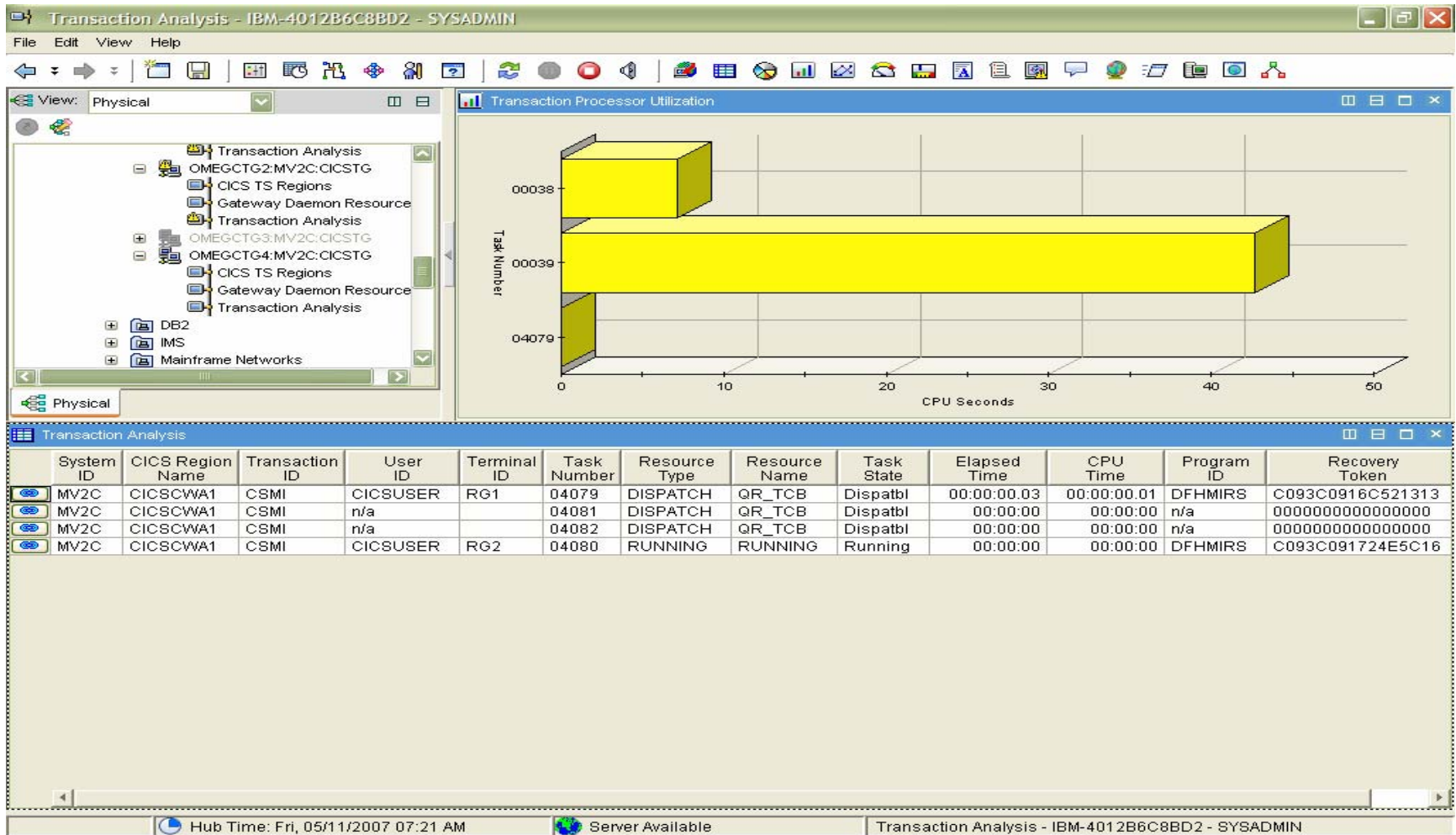
Bottom graphs show ratio of committed to rolled back Extended LUW and XA transactions

A high ratio of rolled back transactions in these lower two panes is an indication of a potential problem

Scenarios

- High number of rolled back transactions will fire Situations
 - ▶ In the scenario above, a very high number of Extended LUW transactions have been rolled back! The graph only shows the manifestation of a problem.
 - Client application provided inaccurate data?
 - Trouble in the CICS TS region?
 - Dynamically link to the Transaction Server region(s) to determine the cause
- XA rollbacks may be indicating problems with other systems (e.g. DB2 or IMS) that are participating within these 2-phase commit transactions.
 - ▶ In the scenario above, approximately 15% of our transactions are being rolled back. This could have an affect across all applications participating in these types of transactions.
- In a mixed application environment, the ratio of transaction types graphically displays the percentage of each type.

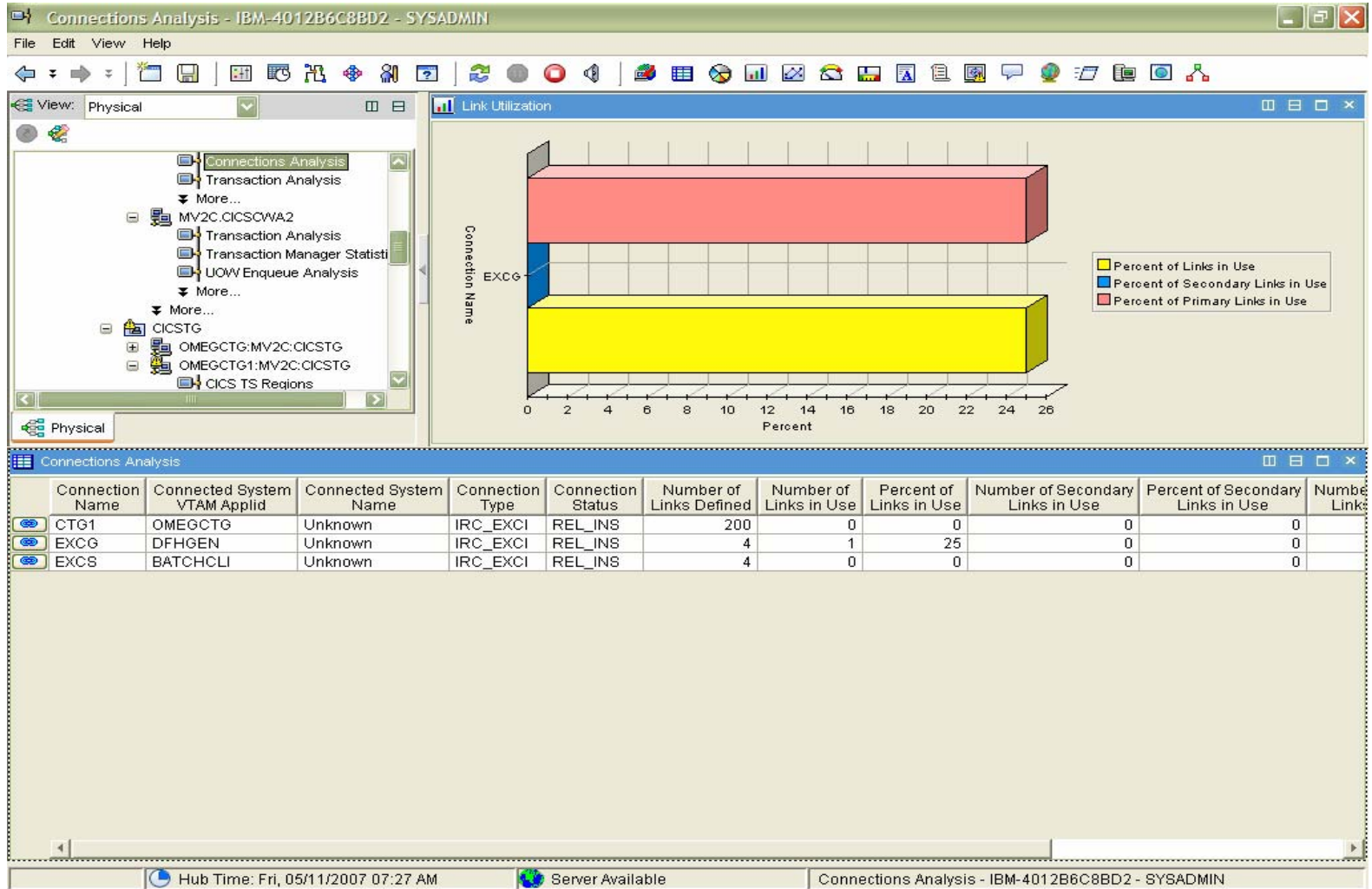
DWL - CICS TS transactions started for CICS TG



Scenarios

- Transactions are waiting! Determine where and why?
 - ▶ Determine if transactions are waiting for resources in the CICS TG region. Ensure that proper amount of Gateway Daemon resources are available - the current number of created equals the number of currently allocated threads and there is no waiting for resources in the CICS TG region.
 - ▶ Determine if transactions are waiting for resources in the CICS TS region. Use the DWL feature to dive into the Transaction Analysis workspace and view all mirror tasks initiated from the CICS TG region in question.
 - Examine the Task State and if waiting then Resource Name and Type should provide a good clue.
 - Examine the Terminal Id and ensure proper RECEIVEPfx and RECEIVECount was specified in the RDO Session definition.
 - You can perform an action against this task if desired.

DWL – CICS TS analysis of CICS TG connections



Problem determination - Sample transaction error condition

- SNEZA3:/TDCICST/ctg700/classes #>java EciD1 9.42.46.25 2006
- CICS Transaction Gateway Basic ECI Sample 1
- Usage: java com.ibm.ctg.samples.eci.EciD1 [Gateway URL]
[Gateway Port Number]
[SSL Keyring]
[SSL Password]
- To enable client tracing, run the sample with the following Java option:
-Dgateway.T.trace=on
- The address of the Gateway has been set to 9.42.46.25 Port:2006
- CICS Servers Defined:
 1. CICS R88A -CICS Transaction Server 3.1
 2. CICS R23 -CICS Transaction Server 3.1
 3. CICS R37 -CICS Transaction Server 2.3
 4. CICS MFG2 -CICS Transaction Server 2.2
 5. CICS MFG3 -CICS Transaction Server 2.3
 6. CICS MFG4 -CICS Transaction Server 3.1
 7. CICS XX64 -CICS Transaction Server 3.1
- Choose Server to connect to, or q to quit:
7
- ECI returned: **ECI_ERR_NO_CICS**
- Abend code was null

JNI trace – ECI_ERR_NO_CICS

- 13:41:45.472 Y040200f5,129718000000000a,Worker-0 " : Y0" CTG6810I First request on TCB address = 7c1b58.
- 13:41:45.486 Y040200f5,129718000000000a,Worker-0 " : Y19" CTG9251I Entering function 'initEXCIUser'
- 13:41:45.503 Y040200f5,129718000000000a,Worker-0 " : Y34" CTG9252I Exiting function 'initEXCIUser' (return code '0')
- 13:41:45.510 Y040200f5,129718000000000a,Worker-0 " : Y20" CTG9251I Entering function 'allocateEXCIPipe'
- 13:41:45.516 Y040200f5,129718000000000a,Worker-0 " : Y35" CTG9252I Exiting function 'allocateEXCIPipe' (return code '0')
- 13:41:45.522 Y040200f5,129718000000000a,Worker-0 " : Y21" CTG9251I Entering function 'baseEXCIPipeOperation'
- 13:41:45.530 Y040200f5,129718000000000a,Worker-0 " : Y0" CTG9276I Variable 'call_type' = '3'
- 13:41:45.538 Y040200f5,129718000000000a,Worker-0 " : Y36" CTG9252I Exiting function 'baseEXCIPipeOperation' (return code '0')
- 13:41:45.545 Y040200f5,129718000000000a,Worker-0 " : Y0" CTG6822E EXCI function error. Function Call = 3, Response = 8, Reason = 203, **Subreason field-1 = 0x68**, subreason field-2 = 0x00, **Cics_Rc = -3**.
- 13:41:45.553 Y040200f5,129718000000000a,Worker-0 " : Y21" CTG9251I Entering function 'baseEXCIPipeOperation'
- 13:41:45.562 Y040200f5,129718000000000a,Worker-0 " : Y0" CTG9276I Variable 'call_type' = '5'
- 13:41:45.570 Y040200f5,129718000000000a,Worker-0 " : Y36" CTG9252I Exiting function 'baseEXCIPipeOperation' (return code '0')
- 13:41:45.579 Y040200f5,129718000000000a,Worker-0 " : Y0" CTG6870I EXCI Open pipe gave a Retryable Response. Allocate,open will be retried a further 5 times.

Determine root cause of the error

- ECI_ERR_NO_CICS is raised as a result of a communication problem between the CICS TG and CICS TS regions. Use the DWL feature to view the status of required resources in the Transaction Server. Slide number 19 above, displays the connection name, type and status.
 - ▶ Ensure that Inter Region Communication (IRC) connection type is available.
 - ▶ Ensure that IRC connections are in service (IRC Opened)
 - ▶ Ensure that enough Primary Links are available (Number of Links in Use is less than the Number of Links Defined)

Problem determination - Sample transaction abend condition

- SNEZA3:/TDCICST/ctg700/classes #>java EciD1 9.42.46.25 2006
- CICS Transaction Gateway Basic ECI Sample 1
- Usage: java com.ibm.ctg.samples.eci.EciD1 [Gateway URL]
[Gateway Port Number]
[SSL Keyring]
[SSL Password]
- To enable client tracing, run the sample with the following Java option:
-Dgateway.T.trace=on
- The address of the Gateway has been set to 9.42.46.25 Port:2006
- CICS Servers Defined:
 1. CICS R88A -CICS Transaction Server 3.1
 2. CICS R23 -CICS Transaction Server 3.1
 3. CICS R37 -CICS Transaction Server 2.3
 4. CICS MFG2 -CICS Transaction Server 2.2
 5. CICS MFG3 -CICS Transaction Server 2.3
 6. CICS MFG4 -CICS Transaction Server 3.1
 7. CICS XX64 -CICS Transaction Server 3.1
- Choose Server to connect to, or q to quit:
7
- You are not authorised to run this transaction.
- ECI returned: **ECI_ERR_TRANSACTION_ABEND**
Abend code was AEI0

JNI trace – ECI_ERR_TRANSACTION_ABEND

- 13:25:00.649 Y0202008a,129718000000000a,Worker-0 :: Y0" CTG6810I First request on TCB address = 7c19c0.
- 13:25:00.656 Y0202008a,129718000000000a,Worker-0 :: Y19" CTG9251I Entering function 'initEXCIUser'
- 13:25:00.668 Y0202008a,129718000000000a,Worker-0 :: Y34" CTG9252I Exiting function 'initEXCIUser' (return code '0')
- 13:25:00.673 Y0202008a,129718000000000a,Worker-0 :: Y20" CTG9251I Entering function 'allocateEXCIPipe'
- 13:25:00.680 Y0202008a,129718000000000a,Worker-0 :: Y35" CTG9252I Exiting function 'allocateEXCIPipe' (return code '0')
- 13:25:00.685 Y0202008a,129718000000000a,Worker-0 :: Y21" CTG9251I Entering function 'baseEXCIPipeOperation'
- 13:25:00.690 Y0202008a,129718000000000a,Worker-0 :: Y0" CTG9276I Variable 'call_type' = '3'
- 13:25:00.697 Y0202008a,129718000000000a,Worker-0 :: Y36" CTG9252I Exiting function 'baseEXCIPipeOperation' (return code '0')
- 13:25:00.703 Y0202008a,129718000000000a,Worker-0 :: Y0" CTG6886I About to issue EXCI DPL call. Pipe token =0x12e375f8 ,
eci system name =CICSXX64, **program name =EC03**
- 13:25:00.708 Y0202008a,129718000000000a,Worker-0 :: Y22" CTG9251I Entering function 'EXCIDPLRequest'
- 13:25:00.811 Y0202008a,129718000000000a,Worker-0 :: Y37" CTG9252I Exiting function 'EXCIDPLRequest' (return code '0')
- 13:25:00.821 Y0202008a,129718000000000a,Worker-0 :: Y0" CTG6887I EXCI DPL call returned.
- 13:25:00.835 Y0202008a,129718000000000a,Worker-0 :: Y1" CTG6823E EXCI DPL_REQUEST specific error. RESP value =
0x1b, RESP2 value = 0x00, **Abend Code = AEI0, Cics_Rc = -7.**
- 13:25:00.841 Y0202008a,129718000000000a,Worker-0 :: Y21" CTG9251I Entering function 'baseEXCIPipeOperation'
- 13:25:00.845 Y0202008a,129718000000000a,Worker-0 :: Y0" CTG9276I Variable 'call_type' = '4'
- 13:25:00.850 Y0202008a,129718000000000a,Worker-0 :: Y36" CTG9252I Exiting function 'baseEXCIPipeOperation' (return code '0')
- 13:25:00.855 Y0202008a,129718000000000a,Worker-0 :: Y0" CTG6805I ECI parameters on exit. Call_Type = 1, Extend_Mode =
0, Luw-Token = 0, Commarea_Length = 18, Cics_Rc = -7, AV = 0.
- 13:25:00.860 Y0202008a,129718000000000a,Worker-0 :: Y15" CTG8602I JNI Method zos_ResetContext entry
- 13:25:00.866 Y0202008a,129718000000000a,Worker-0 :: Y1" CTG8632I No XID present on ECI Request.
- 13:25:00.873 Y0202008a,129718000000000a,Worker-0 :: Y16" CTG8604I JNI Method zos_ResetContext exit (rc = 0).

Determine root cause of the abend

- ECI_ERR_TRANSACTION_ABEND is raised because the CICS TS task was abnormally terminated with code AEI0. This abend code indicates that the required Server program was not available. Use the DWL feature to dive into the OMEGAMON XE for CICS product and search for the required program name.
 - ▶ Ensure the required program has been previously defined and RDO installed in the CICS TS region in question.
 - ▶ You should be able to use the Online Historical feature of the OMEGAMON XE for CICS product to view all abended transactions initiated from your CICS TG region(s).

DWL – Transaction Manager Stats in CICS TS

Transaction Manager Statistics - IBM-4012B6C8BD2 - SYSADMIN

File Edit View Help

View: Physical

- Service Task Details
- Storage Analysis
- Subpool Details
- System Initialization Table
- Task Class Analysis
- TCPIP Statistics
- Temporary Storage Queues
- Temporary Storage Summary
- Terminal Storage Violations
- Transaction Analysis
- Transaction Storage Violations
- Transient Data Queues
- Transient Data Summary

Physical

CICS Backlog Monitor

Number of Transactions

Time of Day

- Current MAXTASK
- Active user transactions
- Queued user transactions
- Peak active user transactions

System ID	CICS Region Name	Current MAXTASK	Active user transactions	Queued user transactions	MAXTASK count	Peak active user transactions	Peak queued user transactions	Total active user transactions	Total queued user transactions	Dispatchable transaction count	Running transaction count
MV2C	CICSCWA1	100	3	0	0	7	0	1484	0	1	

Hub Time: Fri, 05/11/2007 07:47 AM Server Available Transaction Manager Statistics - IBM-4012B6C8BD2 - SYSADMIN

DWL – z/OS address space overview of CICS TG

Address Space Overview - IBM-4012B6C8BD2 - SYSADMIN

File Edit View Help

View: Physical

- CICS
 - CICSTG
 - CTGMF01:SYS:CICSTG
 - CTGMF02:SYS:CICSTG
 - CTGMF03:SYS:CICSTG
 - Mainframe Networks
 - MVS Operating System
 - WLAG:SYS:MVSSYS
 - Address Space Overview
 - Channel Path Activity
 - Common Storage
 - Cryptographic Coprocessors
 - DASD MVS

Physical

CPU Usage

Page: 3 of 4

Where usage greater than 0%

Selected Execution States

Page: 3 of 4

Greater than 5%

Address Space Counts

Address Space Count	Started Task Count	Batch Job Count	TSO Count
312	269	21	

Address Space CPU Utilization Summary

Page: 3 of 4

Job Name	Step Name	Proc Step	Type
CTGMF01	CTGMF01	CTG700MF	STC
CTGMF02	CTGMF02	CTGMF02	STC
CTGMF03	CTGMF03	CTGMF03	STC
CTGMF04	CTGMF04	CTGMF04A	STC
CTGMF05	CTGMF05	CTGMF05A	STC
CTGRRMS	CTGRRMS		STC
D2D2058	D2D2058	D2CUA	STC
D2DB016	D2DB016	02CI	STC

Central Storage Frame Count

Page: 1 of 4

Where frame counts are greater than 0

Fixed Storage

Page: 1 of 4

274.0 (CICSTG05)

Hub Time: Fri, 05/11/2007 12:16 AM

Server Available

Address Space Overview - IBM-4012B6C8BD2 - SYSADMIN

DWL – Real and Virtual storage in CICS TG

Address Space Storage for Job - IBM-4012B6C8BD2 - SYSADMIN

File Edit View Help

View: Physical

Transaction Analysis

- OMEGCTG2: MV2C: CICTG
- OMEGCTG3: MV2C: CICTG
- OMEGCTG4: MV2C: CICTG
- CICS TS Regions
- Gateway Daemon Resource
- Transaction Analysis

DB2

IMS

Mainframe Networks

MVS Operating System

MVS2C: MV2C: MVSSYS

Address Space Overview

Physical

Central Storage Frame Counts

Page: 3 of 4

Fixed Storage

Page: 3 of 4

Address Space Real Storage

Page: 3 of 4

Address Space Name	Swap Status	Management Status	Central Frame Count	Fixed Frame Count	Expanded Frame Count	Hiperspace Frame Count	Non-virtual I/O Slot Count	User Key Dataspace
OMEGCTG	InNSW	NonSwap	35931	341	0	0	43035	0
OMEGCTG1	InNSW	NonSwap	35474	300	0	0	42256	0
OMEGCTG2	InNSW	NonSwap	35389	331	0	0	41996	0
OMEGCTG4	InNSW	NonSwap	35173	264	0	0	41580	0
OMEGDF	InNSW	NonSwap	513	186	0	0	5501	0
OMEGG58	InNSW	NonSwap	1730	158	0	0	9934	0
OMEGITMS	InNSW	Monitored	85686	766	0	0	1	490

Address Space Virtual Storage

Address Space Name	Low Fixed(Mb)	Low Virtual(Mb)	Extended Fixed(Mb)	Extended Virtual(Mb)	Large Fixed(Mb)	Large Virtual(Mb)	Total Fixed(Mb)	Total Virtual(Mb)	Large Max	Large Inuse Percent
OMEGCTG1	0.0	0.4	0.2	351.8	1.0	0.0	1.2	352.2	16.0G	0.0

The amount of allocated virtual storage, in Megabytes, below the 16 MB line, for this address space.

For System MV2C

Hub Time: Fri, 05/11/2007 06:33 AM Server Available Address Space Storage for Job - IBM-4012B6C8BD2 - SYSADMIN

DWL – Common address space storage in CICS TG

Address Space Common Storage - Orphaned Elements - IBM-4012B6C8BD2 - SYSADMIN

File Edit View Help

View: Physical

CSA Orphaned Storage Elements

Job Name	ASID	Start Address	End Address	Size	Age	Age Units	Fixed	Subpool	Storage Key	Requestor Return Address
CICSTGM2	0X01DE	0X00C32DE0	0X00C32FFF	544	002:08	Days	No	241	0	0X000090F8
CPC5316A	0X008F	0X00BF8000	0X00BF83F7	1016	004:09	Days	No			
CPC541AL	0X008F	0X00BEC000	0X00BEC3F7	1016	001:23	Days	No			
CPC541AL	0X00CC	0X00BFA000	0X00BFA3F7	1016	004:10	Days	No			
CP0C030L	0X00CC	0X00BF9000	0X00BF9457	1112	004:09	Days	No	241	0	0X12942E9E

The return address of the GETMAIN request, which is the next instruction following the GETMAIN.

ECSA Orphaned Storage Elements

Job Name	ASID	Start Address	End Address	Size	Age	Age Units	Fixed	Subpool	Storage Key	Requestor Return Address
CICSTG04	0X003E	0X0A7C0020	0X0A7D1FFF	73696	002:08	Days	No	241	0	0X037577EA
CICSTG04	0X003E	0X10112118	0X101121EF	216	002:08	Days	No	241	0	0X03757A78
CICSXX64	0X00F2	0X12299E00	0X12299FFF	512	002:05	Days	No	241	0	0X06CF1624
CICSXX64	0X00F2	0X0FED0060	0X0FED025F	512	002:06	Days	No	241	0	0X06CF1624
CICSXX64	0X00F2	0X0F27A000	0X0F27AFFF	4096	004:04	Days	No	241	0	0X12BFA738

SQA Orphaned Storage Elements

Job Name	ASID	Start Address	End Address	Size	Age	Age Units	Fixed	Subpool	Storage Key	Requestor Return Address
\$AFOPG	0X0018	0X00F835B8	0X00F83FFF	2632	004:17	Days				
\$DFHSMG	0X008E	0X00F8A010	0X00F8A07F	112	004:17	Days				
\$DFHSMG	0X008E	0X00F88978	0X00F88C27	688	004:17	Days				
\$DFHSMG	0X008E	0X00FACC08	0X00FACD2F	296	004:17	Days				
\$DFHSMG	0X008E	0X00FBA018	0X00FBA0FF	232	004:17	Days				
\$GNSDSST	0X00A9	0X00FA8010	0X00FA803F	48	004:17	Days				
\$GNSDSST	0X00A9	0X00FBAD40	0X00FBAD6F	48	004:17	Days				
\$GNSETE	0X00A5	0X00FAD350	0X00FAD47F	304	004:17	Days				
\$GNSETE	0X00A5	0X00FBAD00	0X00FBAD2F	48	004:17	Days				
\$GNSETE	0X00A5	0X00FC0A08	0X00FC0A37	48	004:17	Days				
CATALOG	0X000F	0X00FA6098	0X00FA6117	128	004:17	Days				
IMS910CC	0X0112	0X034D5000	0X034D507F	24	003:18	Days	Yes			

ESQA Orphaned Storage Elements

Job Name	ASID	Start Address	End Address	Size	Age	Age Units	Fixed	Subpool	Storage Key	Requestor Return Address
CICSTGM2	0X01DE	0X02FDA788	0X02FDA7DF	88	002:08	Days	Yes			
D5D5002	0X013C	0X01FDF008	0X01FDF19F	408	002:07	Days	Yes			
D5D5002	0X013C	0X01FD9008	0X01FD919F	408	002:07	Days	Yes			
D71DDBM1	0X00D8	0X02927400	0X029277FF	1024	003:14	Days	No			
FEFREUTC	0X003B	0X02F1AF00	0X02F2AFFE	65792	003:21	Days	No			
GMMFT20L	0X01E7	0X01F7CE80	0X01F7CEFF	128	07:38	Hours	Yes			
HZHOUH01	0X0036	0X030B2298	0X030B22FF	96	004:07	Days	Yes			
HZHOUV8C	0X003B	0X02A2B6A0	0X02A2B6FF	96	12:05	Hours	Yes			
IMS910CC	0X009A	0X03505000	0X0350507F	128	003:18	Days	Yes			
IMS910CC	0X009A	0X01A92EA8	0X01A92EFF	88	004:15	Days	Yes			
IMS910CC	0X011F	0X030E6110	0X030E618F	128	003:14	Days	Yes			
IMS910CC	0X012A	0X034D5000	0X034D507F	128	003:18	Days	Yes			

For System SYS

Hub Time: Fri, 05/11/2007 12:24 AM Server Available

Address Space Common Storage - Orphaned Elements - IBM-4012B6C8BD2 - SYSADMIN

DWL – UNIX System Services view of CICS TG

z/OS UNIX System Services Overview - IBM-4012B6C8BD2 - SYSADMIN

File Edit View Help

View: Physical

- Enclave Information
- Enqueue and Reserve Summ
- LPAR Clusters
- Operator Alerts
- Page Dataset Activity
- Real Storage
- System CPU Utilization
- System Paging Activity
- Tape Drives
- User Response Time
- WLM Service Class Resourc
- z/OS UNIX System Services

DB2plex

Physical

Dubbed Address S... Page: 1 of 2

ASID	A/S Name	CPU Time%
0X0041	OMEGCTG	0.00
0X002A	OMEGCTG1	0.00
0X006E	OMEGDF	0.00
0X0079	OMEGG58	0.00
0X00DD	OMPROUTE	0.00
0X0010	OMVS	0.00
0X0053	PECSYSJ	0.05
0X0076	PEWUIJ	0.00
0X00DE	PORTMAP	0.00
0X003C	PRADCICS	0.03
0X00CB	QG2CCHIN	0.02
0X0035	RACF	0.03

(Selected Attributes)

UNIX Processes Page: 2 of 5

Command Name	Jobname	UNIX Run Time%	Process Status
KGWSPIC4	OMEGC52	0.00	More Than One Process In Addr Space
sh	OMEGCTG1	0.00	Percent of CPU execution for UNIX work.
java	OMEGCTG1	0.15	
sh	OMEGCTG4	0.00	More Than One Process In Addr Space
java	OMEGCTG4	0.14	56
CTGBATCH	OMEGCTG4	0.00	More Than One Process In Addr Space
KGWSPIC4	OMEGG58	0.00	More Than One Process In Addr Space
KLV	OMEGITMS	0.00	More Than One Open Task In Process
DFHKETCB	PECMASJ	0.00	More Than One Process In Addr Space
DFHSIP	PEWUIJ	0.00	More Than One Process In Addr Space
CSQXTNSV	RQ02CHIN	0.00	More Than One Process In Addr Space
CSQXDISP	RQ02CHIN	0.00	More Than One Process In Addr Space

(Selected Attributes)

UNIX Kernel

Syscall Rate	CPU%	I/Os Rate	Number of Processes	Max Processes	Pt
0.000	0.00	0.000	481	1024	

(Selected Attributes)

UNIX Logged-on Users

Login Name	Name	Login
CNTEST3	CLIFTON, ANDREW D (A)	05/11/07
TURNM	TURNBULL, M (MATT)	05/02/07
P9COOPR	COOPER, P (PAUL)	05/09/07

(Selected Attributes)

UNIX Mounted File Systems Page: 1 of 11

Mount Point	File
/MV2C/cicstg/tg0i53	OMVSBLD.MV2C.TG
/MV2C/shiraz5	OMVS.MV2C.SHIRAZ
/MV2G/cicstg/tg0i53	OMVSBLD.MV2G.TG
/MV2H/cicstg/tg0i53	OMVSBLD.MV2H.TG
/MV2H/cicsts/ceri60	OMVSBLD.MV2H.CE
/MV2H/cicsts/ceri68	OMVSBLD.MV2H.CE
/MV2H/cicsts/ceri69	OMVSBLD.MV2H.CE
/MV2H/cicsts/ceri70	OMVSBLD.MV2H.CE
/MV2H/cicsts/ceri71	OMVSBLD.MV2H.CE
/MV2H/cicsts/ceri72	OMVSBLD.MV2H.CE
/MV2H/cicsts/ceri74	OMVSBLD.MV2H.CE
/MV2H/cicsts/ceri75	OMVSBLD.MV2H.CE
/MV2H/cicsts/ceri76	OMVSBLD.MV2H.CE
/MV2H/cicsts/ceri77	OMVSBLD.MV2H.CE
/MV2H/cicsts/ceriCF	OMVSBLD.MV2H.CE
/infomounts	*AMD/infomounts

(Selected Attributes)

Process Utilization

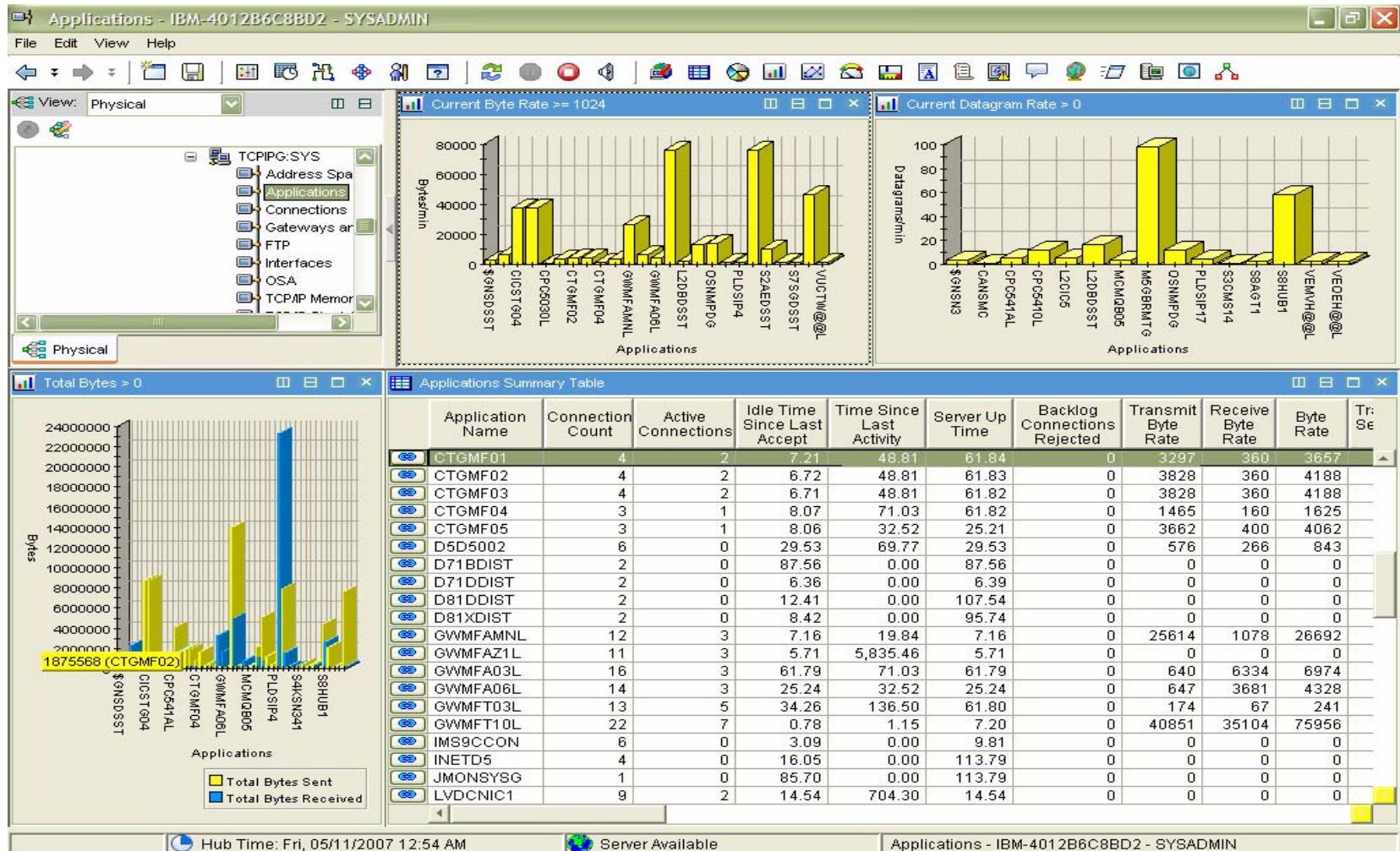
Process Utilization

Used%: 46.97

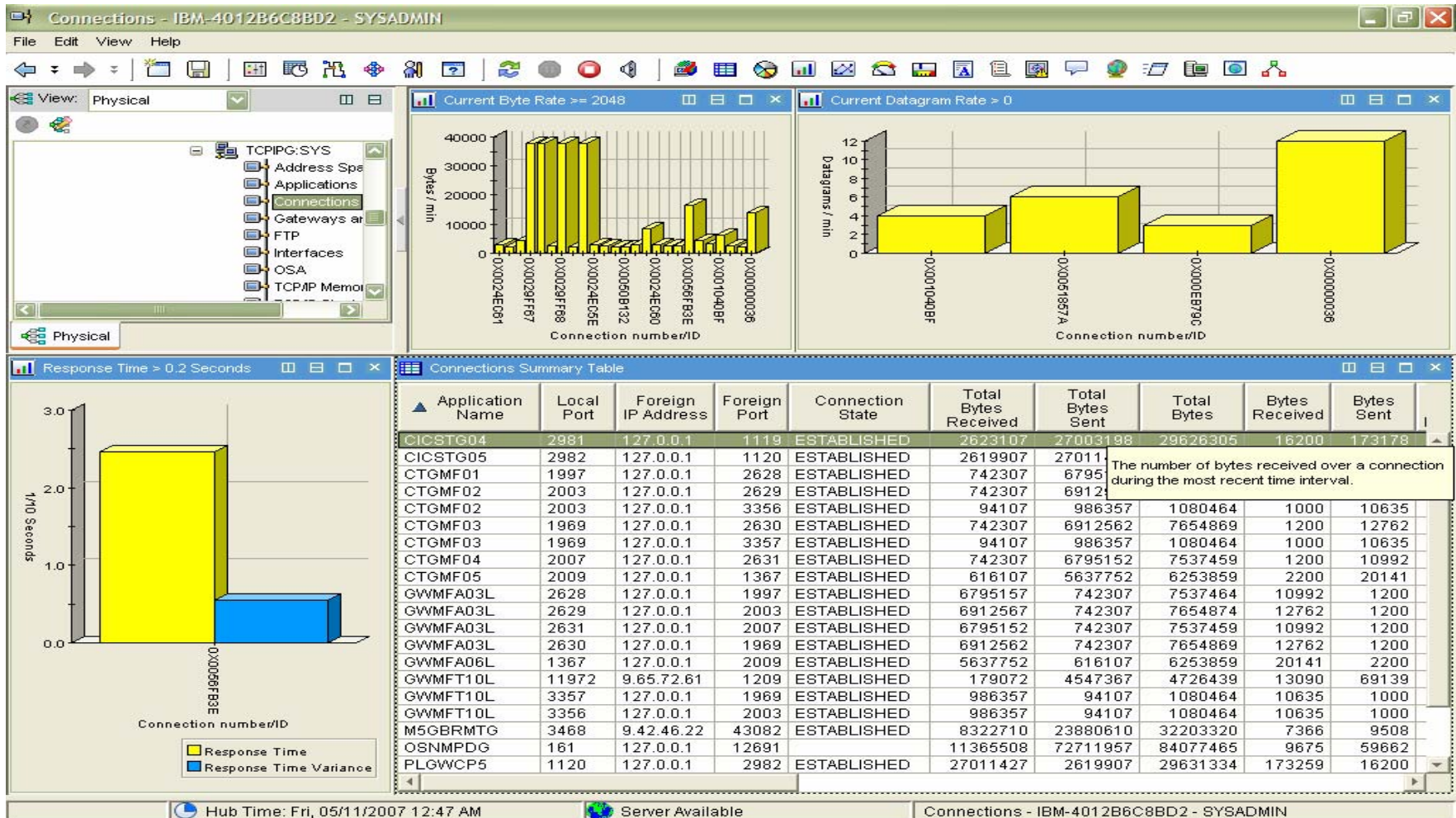
Legend: Max Processes (Red), Used Processes% (Yellow)

Hub Time: Fri, 05/11/2007 06:17 AM Server Available z/OS UNIX System Services Overview - IBM-4012B6C8BD2 - SYSADMIN

DWL – Mainframe Networks view of the CICS TG application activities



DWL – Network connection activities in CICS TG



Product provided situations - I

- Gateway Daemon Overview related situations

- ▶ **CICSTG_Health_Warning**

- Predicate: (*IF *VALUE Gateway_Daemon.Health *LT 100)
- Table: GDS
- Advise: The Health of this Gateway daemon has dropped below 100 percent. Intermittent connectivity problems between the Gateway daemon and CICS TS can cause the Health to drop, and if TCP/IP load balancing is in use the number of new connections being established with the affected Gateway daemon will be reduced. Investigate the connectivity to CICS TS.

- ▶ **CICSTG_Health_Critical** (Note: this is the only product provided situation which is auto-started)

- Predicate: (*IF *VALUE Gateway_Daemon.Health *EQ 0)
- Table: GDS
- Advise: The Health of this Gateway daemon has dropped to 0. Connectivity problems between the Gateway daemon and CICS TS mean that no requests being sent to this Gateway daemon have been successful. If TCP/IP load balancing is in use no more connections will be established to the Gateway daemon until the Health recovers or is reset.

- ▶ **CICSTG_Status_Warning**

- Predicate: (*IF *VALUE Gateway_Daemon.Gateway_Daemon_Status *EQ 3)
- Table: GDS
- Advise: The Gateway Daemon is shutting down and this takes longer than expected you may have transactions which are not completing and are preventing the Gateway daemon from shutting down. Investigate if any transaction is suspended.

Product provided situations - II

- CICS TS Regions related Situations

- ▶ **CICSTG_CommFailure_Warning**

- Predicate: (*IF *VALUE CICS_TS_Servers.CICS_Communication_Failures_Per_Minute *GT 100)
- Table: CSS
- Advise: More than 100 communication failures have occurred in the last minute. This suggests that CICS TS is not available.

- ▶ **CICSTG_PipeAlloc_Warning**

- Predicate: (*IF *VALUE CICS_TS_Server_Details.EXCI_Pipe_Allocation_Failures_Per_Minute *GT 100)
- Table: CSS and CSD
- Advise: More than 100 pipe allocation failures have occurred in the last minute. This may indicate a lack of pipes. You may need to allocate more pipes or change your pipe reuse model to avoid pipe allocation failures.

- ▶ **CICSTG_Freepipe Warning**

- Predicate: (*IF *VALUE CICS_TS_Servers.Free_Pipes *LT 10)
- Table: CSS
- Advise: The number of free pipes is less than 10. If you are not expecting to use all of your pipes, you may need to allocate more pipes or change your pipe reuse model to avoid pipe allocation failures.

Product provided situations - III

- Gateway Daemon Resources related Situations
 - ▶ **CICSTG_ConnTimeout_Warning**
 - Predicate: (*IF *VALUE Connection_Manager_Threads.Times_Connecttimeout_Limit_Hit_Per_Minute *GT 100)
 - Table: CMS
 - Advise: More than 100 client applications have been refused connections within the past minute due to a lack of Connection Manager threads. If this number is large for your configuration, consider increasing the number of Connection Manager threads or increasing the Connection Manager timeout.
 - ▶ **CICSTG_WorkerTimeout_Warning**
 - Predicate: (*IF *VALUE Worker_Threads.Number_Of_Times_Workertimeout_Limit_Hit_Per_Minute *GT 100)
 - Table: WTS
 - Advise: More than 100 Connection Managers have been unable to obtain a Worker thread within the past minute due to a lack of Worker threads. If this number is large for your configuration, consider increasing the number of Worker threads, increasing the Worker thread timeout or reducing the number of Connection Managers.
 - ▶ **CICSTG_ConnAlloc_Warning or Critical**
 - Predicate: (*IF *VALUE Connection_Manager_Threads.Ratio_Of_Current_To_Maximum_Number *GT 90)
 - Table: CMS
 - Advise: The number of Connection Manager threads in use is approaching the maximum. If this is higher than expected you may need to reconfigure your thread allocation. If the maximum is reached, the number of threads waiting and timed out are likely to increase.
 - ▶ **CICSTG_WorkerAlloc_Warning or Critical**
 - Predicate: (*IF *VALUE Worker_Threads.Ratio_Of_Current_To_Maximum_Number *GT 90)
 - Table: WTS
 - Advise: The number of Worker threads in use is approaching the maximum. If this is higher than expected you may need to reconfigure your thread allocation. If the maximum is reached, the number of threads waiting and timed out are likely to increase.
 - ▶ **CICSTG_ConnWait_Warning**
 - Predicate: (*IF *VALUE Worker_Threads.Ratio_Of_Current_To_Maximum_Number *GT 90)
 - Table: CMS and WTS
 - Advise: 90% of the Connection Managers threads are waiting for a Worker thread. Consider allocating more Worker threads or reducing the number of Connection Manager threads.

Product provided situations - IV

Transaction Analysis related Situations

▶ **CICSTG_RollbackXA_Critical**

- Predicate: (*IF *VALUE Gateway_Daemon.XA_Transactions_Rolled_Back_Percentage *GT 50)
- Table:
- Advise: More than half of the XA transactions being sent through this Gateway daemon are being rolled back. If this is higher than expected it may suggest a problem in CICS, with your application, or with other resource managers involved in this transaction.

▶ **CICSTG_RollbackXA_Warning**

- Predicate: (*IF *VALUE Gateway_Daemon.XA_Transactions_Rolled_Back_Percentage *GT 25)
- Table:
- Advise: More than a quarter of the XA transactions being sent through this Gateway daemon are being rolled back. If this is higher than expected it may suggest a problem in CICS, with your application, or with other resource managers involved in this transaction.

▶ **CICSTG_RollbackLUW_Critical**

- Predicate: (*IF *VALUE Gateway_Daemon.Extended_LUW_Transactions_Rolled_Back_Percentage *GT 50)
- Table:
- Advise: More than half of the Extended LUW transactions being sent through this Gateway daemon are being rolled back. If this is higher than expected it suggests a CICS TS or application problem.

▶ **CICSTG_RollbackLUW_Warning**

- Predicate: (*IF *VALUE Gateway_Daemon.Extended_LUW_Transactions_Rolled_Back_Percentage *GT 25)
- Table:
- Advise: More than quarter of the Extended LUW transactions being sent through this Gateway daemon are being rolled back. If this is higher than expected it suggests a CICS TS or application problem.

Software and hardware prerequisites

■ Supported software

- ▶ OMEGAMON XE for CICS Transaction Gateway on z/OS V4.1.0 operates in the following CICS Transaction Gateway, CICS® Transaction Server, and MVS™ environments.
 - CICS Transaction Gateway V7.0 or higher
 - CICS Transaction Servers V2.2, V2.3, V3.1, and V3.2
 - All supported releases of z/OS, V1R6 and higher.

■ Supported hardware

- ▶ Most of the hardware required to run OMEGAMON XE for CICS Transaction Gateway is determined by operating system considerations. For most hardware prerequisites consult the OMEGAMON documentation.
 - OMEGAMON XE for CICS Transaction Gateway can be deployed on any z/OS system that is capable of running z/OS version 1 Release 6 or higher. You must also ensure that you have adequate disk space to accommodate the products that you are installing.

Product packaging and installation

- If you are installing OMEGAMON XE for CICS Transaction Gateway and Tivoli Management Services for the first time, you will find familiar IBM packaging types (such as Passport Advantage), installation tools (such as SMP/E or InstallShield), and installation documentation, including a Program Directory.
- You will also find a z/OS-based Configuration Tool that streamlines the transition between the SMP/E installation and a running system. This tool works with SMP/E to save files that will be used in later steps to configure the products.
- System Modification Program/Extended (SMP/E) is the basic tool for installing and maintaining software in z/OS and OS/390 systems and subsystems. The guidance for doing an SMP/E installation is in the Program Directory. Every OMEGAMON XE monitoring agent product is accompanied by a program directory.
- IBM Tivoli OMEGAMON XE for CICS TG on z/OS v4.1.0 consists of the following functional modification identifiers (FMIDs) and component identifiers (COMPIDs):

▶ FMID	COMPID	Component Name	RETAIN Release
▶ HKGW410	5698A9300	OMEGAMON XE for CICS TG on z/OS	410
▶ HKCI310	5608A41CC	Configuration Assistance Tool	310
▶ HKDS610	5608A2800	Tivoli Enterprise Monitoring Server on z/OS	610
▶ HKLV610	5608A41CE	ITMS:Engine	610

Publications

- IBM Tivoli OMEGAMON XE for CICS TG on z/OS Library:

- IBM Tivoli OMEGAMON XE for CICS TG on z/OS: Planning and Configuration Guide, SC23-5962
 - ▶ Provides planning information for installing OMEGAMON XE for CICS Transaction Gateway and information about the OMEGAMON XE zSeries® products.

- IBM Tivoli OMEGAMON XE for CICS TG on z/OS: Problem Determination Guide, GI11-7962
 - ▶ Provides problem determination and resolution information for the issues most commonly encountered with OMEGAMON XE for CICS Transaction Gateway and IBM Tivoli Monitoring.

- IBM Tivoli OMEGAMON XE for CICS TG on z/OS: User's Guide, SC23-5963
 - ▶ Introduces the features, workspaces, attributes, and predefined situations for the OMEGAMON XE for CICS Transaction Gateway product and supplements the user assistance provided with this product. This document is written for system operators.