

Changes

CPEXpert Release 13.2: The main changes to the CICS Component for CPEXpert Release 13.2 are:

- C Rule CIC101 (CICS region reached maximum tasks too often)* has been revised to show total active tasks (both system and users), peak user tasks, times MAXTASKS was reached, peak users at MAXTASKS, and total time suspended for MAXTASKS reason.
- C Rule CIC251 (Default value was specified for the MROBTCH parameter)* has been significantly revised. IBM provided detailed discussion of the reasons that the default value might not be appropriate, depending on installation environment and workload. This documentation from IBM includes methods for estimating the CPU savings that result from different values of the MROBTCH parameter, and recommendations for the maximum MROBTCH value. CPEXpert has incorporated this IBM guidance and discussion into Rule CIC251 logic and documentation.
- C Rule CIC254 (ISRDELAY value may be too low)* has been completely revised and retitled as *Rule CIC254 (USRDELAY value may be too low)*.

The following new rules have added to the CICS Component

- C Rule CIC275 (CICS-DB2 TCBs in use was approaching TCBLIMIT)* analyzes whether the peak number of Task Control Blocks (TCBs) in use for the CICS-DB2 connection was approaching the limit set by the TCBLIMIT attribute.
- C Rule CIC276 (High number of CICS-DB2 tasks on Pool Ready Queue)* analyzes whether the peak number of tasks on the Pool Ready Queue is high for the CICS-DB2 connection.
- C Rule CIC277 (Number of CICS-DB2 pool threads in use was approaching limit)* analyzes whether the number of pool threads in use was approaching the thread limit specified for the CICS-DB2 connection.
- C Rule CIC278 (CICS-DB2 tasks abended because pool thread was unavailable)* analyzes whether at least one CICS-DB2 task abended because a pool thread was unavailable, and the THREADWAIT attribute specified abend.
- C Rule CIC280 (High number of CICS-DB2 Entry tasks on Entry Ready Queue)* analyzes whether the peak number of tasks on an Entry Ready Queue is high for the CICS-DB2 connection.

- C *Rule CIC281 (CICS-DB2 Entry tasks abended because Entry thread was unavailable)* analyzes whether the peak number of tasks on an Entry Ready Queue is high for the CICS-DB2 connection.
- C *Rule CIC282 (CICS-DB2 Entry tasks overflowed to Thread Pool)* analyzes whether at least one CICS-DB2 Entry task overflowed to the thread pool because an Entry thread was unavailable, and the DB2ENTRY THREADWAIT attribute specified POOL.
- C *Rule CIC285 (Consider increasing protected threads for CICS-DB2 Entry tasks)* analyzes whether the average number of thread terminations for the CICS-DB2 Entry was sufficiently high that you should consider specifying (or increasing) the number of protected threads for the CICS-DB2 Entry.
- C *Rule CIC286 (Consider decreasing protected threads for CICS-DB2 Entry)* analyzes whether the average number of threads that were reused for the CICS-DB2 Entry was sufficiently low that you should consider decreasing the number of protected threads for the CICS-DB2 Entry.
- C *Rule CIC290 (Open (L8) TCBs reached MAXOPENTCBS limit)* analyzes whether the peak number of open (L8) Task Control Blocks (TCBs) in use for the CICS-DB2 connection reached the limit set by the MAXOPENTCBS parameter specified in the System Initialization Table (SIT).
- C *Rule CIC291 (Peak open TCBs in use was approaching MAXOPENTCBS)* analyzes whether the peak number of open (L8) Task Control Blocks (TCBs) in use was approaching the limit set by the MAXOPENTCBS parameter specified in the System Initialization Table (SIT).

CPExpert Release 13.1: The main changes to the CICS Component for CPExpert Release 13.1 are:

- C The CICS Component has been updated with new analysis in several areas:
 - C Rule CIC109: CICS region is approaching maximum capacity, provides analysis of the quasi-reentrant (QR) TCB approaching a limit that IBM indicates is maximum capacity.
 - C Rule CIC275: CICS-DB2 peak TCBs is approaching TCBLIMIT, provides initial analysis of CICS-DB2 Connect performance problems
 - C Rule CIC276: CICS-DB2 peak tasks on Pool Ready Queue is high, provides initial analysis of CICS-DB2 Connect performance problems
 - C Rule CIC277: CICS-DB2 pool threads in use is approaching limit, provides initial analysis of CICS-DB2 Connect performance problems

The analysis of CICS-DB2 Connect performance problems will be expanded significantly with Release 13.2, with enhanced documentation of the rules listed above and with new rules added to analyze CICS-DB2 Connection problems¹.

The following rules were added to analyze performance problems with CICS shared data tables:

- C Rule CIC401: Adds were rejected because shared data table was full
- C Rule CIC402: Records not found in CICS-maintained shared data table
- C *Rule CIC403: Records not found in user-maintained shared data table*
- C Rule CIC405: High data set activity for CICS-maintained shared data table
- C Rule CIC406: VSAM data set might not be good candidate for shared data table

The following rules were added to analyze performance problems with coupling facility data tables (CFDT)²:

- C Rule CIC420: High percent of structure entries were in use
- C Rule CIC421: High percent of structure elements were in use
- C Rule CIC422: High percent structure requests encountered length error
- C Rule CIC423: High percent entries (CFDT or item) not found
- C Rule CIC424: List full condition was reached for CFDT
- C Rule CIC425: The CFDT list structure was out of space
- C Rule CIC426: High percent version check failed for an entry being updated
- C Rule CIC440: LOC=ANY storage request initially failed and was retried
- C Rule CIC441: LOC=ANY requests were unable to obtain storage and failed
- C Rule CIC442: LOC=ANY low percent minimum free storage

¹The CICS-DB2 Connect rules listed above were suggested by **Rexaldo Avendano** (Kaiser Permanente). However, his suggestions were made as I began final testing of Release 13.1. These rules were added to Release 13.1, but the documentation is incomplete.

²Thanks to **Rexaldo Avendano** (Kaiser Permanente) for providing test data so I could develop the CFDT rules.

- C Rule CIC443: LOC=BELOW storage request initially failed and was retried
- C Rule CIC444: LOC=BELOW requests were unable to obtain storage and failed
- C Rule CIC445: LOC=BELOW low percent minimum free storage
- C Rule CIC446: CFDT pool server storage allocation was less than expected

The following rule was added to allow users of the CICS Component to be informed of CPU time used by CICS work represented by a WLM report class. This new logic allows the CICS Component to associate CICS work with WLM report class information in SMF Type 72 records (MXG file TYPE72GO). The CICS Component will produce findings when designated conditions exist.

- C Rule CIC700: CICS report class used more than specified percent CPU time

The initial rule relates only to percent CPU time used by specific CICS work, but future rules could relate to other information contained in the MXG TYPE72GO file.

- C Add the ability to select up to 10 systems individually for analysis. Until Release 131, a user had the options of analyzing data for all systems in the performance data based, analyzing data for a specific sysplex (in case the performance data base contained data for more than one sysplex), or analyzing data for a specific system in the performance data base. With Release 13.1, up to 10 systems can be individually selected for analysis.
- C Enhance the options provided with the SAS Output Delivery System (ODS). With Release 13.1, users who exercise the SAS ODS feature for creating CPEXpert output can optionally create the output as a PDF file, which can be emailed to other users. Additionally, users can optionally specify a STYLE feature for either HTML or PDF output, if they have a preferred STYLE for HTML or PDF output. The optional links that are available with the HTML have been revised; SAS at some user sites did not create the HTML output in the "standard" way, and the CPEXpert code that inserted links into the HTML output did not work properly. I have revised the code to place the links into the output as the output is created, rather than attempting to place the links into the final HTML output created by SAS.
- C CPEXpert now specifies `OPTIONS COMPRESS=N;` to override any site specification for file compression. Experiments have shown that CPEXpert code runs significantly faster (using much less CPU time) if compression has been turned off.

CPEXpert Release 12.2:

The main changes to the CICS Component for CPEXpert Release 12.2 are:

- C Add support for CICS/TS for z/OS Release 2.2.
- C Add code that allows non-standard CICS statistics interval data to be used with a SAS/ITSV (renamed SAS/ITRM) performance data base.
- C Add documentation to describe the implications when the number of GETMAINs is too high.

CPEXpert Release 12.1:

The main changes to the CICS Component for CPEXpert Release 12.1 are:

- C Add Shared Temporary Storage (TS) Server analysis. This new code includes 20 new rules to analyze:
 - C Shared TS Queue Server: coupling facility statistics
 - C Shared TS Queue Server: buffer pool statistics
 - C Shared TS Queue Server: storage statistics

This new analysis was suggested by **Paul Gordon** of Bank of America, who not only provided the suggestions, but also (in collaboration with **Bryant Osborn** of Bank of America) provided test data³ so the new code could be tested.

- C Remove the dependency of the CICS Component on the System Initialization Table (SIT) parameters. With this major revision of the CICS Component, all required SIT parameter information is automatically acquired from data available in standard CICS interval statistics (for example, the SIT MXT value is acquired from the XMCMXT value in the MXG CICXMC data set). This change has the effect of significantly reducing the user effort required to install and execute the CICS Component.
- C Improve the listing of rules that are suppressed. A rule is suppressed when (1) the required data variables do not exist in your performance data base, (2) the required data variables are not available for the specific CICS region being analyzed, (3) the rule

³It should be mentioned that the test data revealed that IBM's *CICS Performance Guides* have many errors with the descriptions of Shared TS Server variables in SMF Type 110 records. IBM Hursley has kindly agreed to correct these documentation errors.

applies to a CICS feature being evaluated, (4) the rule does not apply to the version of CICS being analyzed, or (5) the rule has been 'turned off' the rule in USOURCE(CICGUIDE). The new report lists each suppressed rule and describes why the rule was suppressed.

- C Enhance the output of many CICS rules, by providing a better description of the problems and providing variables to reveal the significance of the analysis.

CPExpert Release 11.2:

The main changes to the CICS Component for CPExpert Release 11.1 are:

- C Add support for CICS/Transaction Server for z/OS, Version 2.1.
- C Add support for the SAS Output Delivery System (ODS) feature, to enable optional web access of CPExpert reports (this new option was suggested by **Harald Seifert** of HUK, Coburg, Germany).
- C Add optional links in CPExpert reports (if the SAS ODS feature is invoked), that link rule output to CPExpert documentation for the rules produced.
- C Add an option to create summary output showing all rules that were produced, and listing the CICS regions for which the rules were produced (this new option was suggested by **Paul Gordon** of Bank of America).
- C Add an option to create summary output by **system**, to show all rules that were produced and list the CICS regions for which the rules were produced (this new option was suggested by **Paul Gordon** of Bank of America).
- C Added a new rule (CIC175) to analyze whether CICS LSR pools were seldom used (this rule was suggested by **Paul Gordon** of Bank of America).
- C Added a new rule (CIC176) to analyze whether CICS LSR subpools were seldom used (this rule was suggested by **Paul Gordon** of Bank of America).
- C Updated appropriate documentation references for z/OS Version 1 Release 2.

CPExpert Release 11.1:

The main changes to the CICS Component for CPExpert Release 11.1 are documentation corrections and updating references for z/OS Version 1 Release 1.

CPExpert Release 10.2:

The main changes to the CICS Component for CPExpert Release 10.2 are simply documentation corrections.

CPExpert Release 10.1:

The main changes to the CICS Component for CPExpert Release 10.1 are to add new rules to analyze the performance implications of system logger use by CICS. These rules were suggested by **Paul Gordon**, Bank of America.

- C Add a new rule to analyze whether CICS log stream structure offloads occurred because the structure was 90% full.
- C Add a new rule to analyze whether Interim storage was not efficiently used for CICS log streams.
- C Add a new rule to analyze whether local storage buffers not efficiently used for CICS DASD-only log streams.
- C Add a new rule to analyze whether the DASD staging data set high threshold was reached for CICS log streams.
- C Add a new rule to analyze whether frequent log stream DASD-shifts occurred for CICS log streams.
- C Add a new rule to analyze whether specific CICS log streams caused structure to reach high threshold
- C Add a new rule to analyze whether specific CICS log stream consumed most of structure resources

CPExpert Release 9.2:

The main changes to the CICS Component for CPExpert Release 9.2 are to:

- C Add a new rule to analyze whether the value of the DSHIPINT value in the System Initialization Table (SIT) might be too large.
- C Add a new rule to analyze whether more than one string was specified for VSAM ESDS files that have only write activity.

- C Add a new rule to analyze whether VSAM ESDS files have a mixture of read and write activity, but that are *primarily* write-only, and should have two file definitions specified.
- C Add a new rule to analyze whether SUBTSKS=1 was specified in the System Initialization Table (this rule was suggested by **Bryant Osborn** of Bank of America).
- C Add a new rule to analyze whether CICS waited for a logger “structure full” condition for log streams residing in a coupling facility.
- C Add a new rule to analyze whether CICS waited for a logger “staging data set full” condition for DASD-only log streams.

CPExpert Release 9.1:

The main changes to the CICS Component for CPExpert Release 9.1 are to:

- C Add an option to extract only CICS interval statistics files and variables that are required for analysis of CICS performance constraints. This option is suitable for sites with extremely large CICS performance data base.
- C Add an option to exclude listing of the SIT and rules that are “turned off” by the CICS Component. This option is suitable for sites that analyze a very large number of CICS regions and otherwise might have an undesirably large output from the CICS Component.
- C Add an option to suppress the analysis and findings of particular rules, or suppress the analysis and findings only for particular CICS regions. The desire for this feature typically is caused by (1) an overall disagreement with the finding, (2) an inability to make a suggested change, or (3) a decision that a particular finding is inapplicable to a particular CICS region.
- C Revise the process for specifying guidance for CPExpert to analyze the TCLASS times at MAXACTIVE.
- C Add options to analyze the tasks active in a CICS region, as controlled by the MXT keyword in the SIT.
- C Add an option to specify unique analysis guidance for individual CICS regions. This option applies to any user who analyzes multiple CICS regions during a single execution of the CICS Component. The various CICS regions typically provide service to different users, the regions often have different applications, and the regions may even be a mixture of test regions and production regions. One set of analysis guidance variables do not always apply to all regions being analyzed. Consequently, CPExpert now provides the capability to override the basic guidance on a region-by-region basis.

- C Add a new rule (suggested by **Paul Gordon** of NationsBank) to analyze whether the Maximum Task (MXT) specification may be too small.
- C Add a new rule (suggested by **Paul Gordon** of NationsBank) to analyze whether the Peak EDSA usage is approaching EDSALIM value.
- C Update the Component to support OS/390 Version 2 Release 7.
- C Correct documentation and code based on errors reported by users.

CPExpert Release 8.2:

The main changes to the CICS Component for CPExpert Release 8.2 are to:

- C Update the Component to support OS/390 Version 2 Release 6.
- C Correct code based on errors reported by users.

CPExpert Release 8.1:

The main changes to the CICS Component for CPExpert Release 8.1 are to update the Component to support CICS/Transaction Server, Release 1.2. Additionally, a new rule (suggested by **David Ehresman** of University of Louisville, KY) analyzes the value of the TRTABSZ keyword in the System Initialization Table (SIT).