
Rule CIC186: The number of Temporary Storage buffers may be too low

Finding: CPExpert believes that the number of temporary storage buffers may be too low.

Impact: This finding should normally have a fairly LOW IMPACT on the performance of the CICS region. However, if the VSAM buffer wait occurs often, then this finding will have a MEDIUM IMPACT or HIGH IMPACT on performance of the CICS region.

Logic flow: This is a basic finding, based upon an analysis of the daily CICS statistics.

Discussion: VSAM multiple buffers allow multiple VSAM control intervals to be available in storage at the same time. When multiple buffers are available for temporary storage, the CICS temporary storage programs can use different buffers to respond to several concurrent requests for temporary storage.

Using multiple VSAM buffers also increases the probability that the control interval required by any particular request will already be available in a buffer. From this view, buffers can be viewed as a "in storage" caching device, and can result in substantially fewer physical I/O operations required of VSAM.

If no buffer is available when a task attempts to access temporary storage, the task must wait. This situation is called "wait on buffers" and tasks are queued serially by temporary storage queue name. However, VSAM can continue servicing requests for other temporary storage queue names by other tasks.

It is generally desirable to minimize the number of times tasks must wait for access to a VSAM buffer. When the tasks wait, they continue to hold system resources (e.g., real storage), and may cause additional performance problems because the resources are not available to service other tasks.

The CICS statistics analyzed by CPExpert indicated that the percent of temporary storage I/O operations waiting for VSAM buffers was higher than the TSIOWAIT guidance variable in USOURCE(CICGUIDE). The default value for the TSIOWAIT guidance variable causes this rule to be produced when **any** temporary storage I/O operations waited for buffers. This usually means that additional buffers should be allocated for temporary storage.

Note that IBM's CICS Performance Guides suggest that up to 5% of temporary storage I/O operations waiting for buffers may be tolerable. However, IBMLINK Document Q467834 suggests that the number of temporary storage buffers should be increased if **any** buffer waits occur. CPExpert agrees with the IBMLINK Document.

Suggestion: CPExpert suggests that you consider increasing the number of VSAM buffers allocated for temporary storage. The number of VSAM buffers that CICS allocates for temporary storage is specified by the second parameter of the TS operand in the System Initialization Table (SIT).

NOTE: The significance of this finding depends upon whether the finding is based upon analyzing daily information or based upon analyzing historical information.

- If this finding is based upon an analysis of daily information, the finding may be applicable only to the performance of CICS for this day. Unless you feel that the analysis is generally applicable (or unless the workload processed on this day is particularly critical), please wait until CPExpert performs an analysis of historical information before taking action.
- If this finding is based upon an analysis of historical data covering a prolonged period, the finding is more definite than a tentative finding based upon analysis of only a single day's data.

Reference: *CICS/OS/VS Version 1.7 Performance Guide*: page 79 and pages 264-268.

CICS/MVS Version 2.1.2 Performance Guide: pages 193-197 and page 408.

CICS/ESA Version 3.1.1 Performance Guide: page 125 and pages 259-263.

CICS/ESA Version 3.2.1 Performance Guide: pages 231-235 and page 339.

CICS/ESA Version 3.3.1 Performance Guide: pages 249-253 and page 357.

CICS/ESA Version 4.1.1 Performance Guide: Section 4.10.1 and Appendix A.1.26.

CICS/TS Release 1.1 Performance Guide: Section 4.10 and Appendix 1.1.25.

CICS/TS Release 1.2 Performance Guide: Section 4.10 and Appendix 1.1.26.

CICS/TS Release 1.3 Performance Guide: Section 4.14 and Appendix 1.1.29.

CICS/TS for z/OS Release 2.1 Performance Guide: Chapter 26 (CICS temporary storage) and Appendix A (Table 124).

CICS/TS for z/OS Release 2.1 Performance Guide: Section 4.13.1 Tuning the use of CICS temporary storage and Appendix 1.1.29. |

IBMLINK Document Q467834
TITLE: Questions about CICS Shutdown Statistics