
Rule CIC176: The VSAM LSR subpool buffers were seldom used

Finding: CPExpert has detected that VSAM Local Shared Resources (LSR) subpool buffers were seldom used.

Impact: This finding should normally have a LOW IMPACT or MEDIUM IMPACT on the performance of the CICS region. This should be ignored unless storage is a constraint to CICS performance.

Discussion: VSAM files assigned to a LSR pool share common buffers (and also share strings) assigned to the LSR pool. Since the buffers are shared, significantly fewer buffers normally are required to support I/O access operations. This is because not all files will be accessed at any particular time. Rather, file accesses will tend to be distributed across files at different times. Some files will have requirements for buffers at one time, while at another time they will not be accessed and will not require buffers. The demand for buffers therefore is the **peak collective demand** rather than the **sum** of the **peak individual** demands.

For example, 3 files might individually have a peak I/O access demand for 5 buffers. The sum of the individual buffers required to prevent buffer waits would be a total of 15 buffers (3 * 5). However, the peak collective demand would normally be less than 15 buffers. If there were no overlap of I/O access operations among the files, the peak collective demand would be only 5 buffers.

In practice, the peak collective demand for buffers is usually less than half of the sum of the peak individual demands. Assigning files to LSR pools therefore significantly decreases the storage requirements to support CICS VSAM buffers.

LSR pools are generated using the DEFINE LSRPOOL command of Resource Definition Online, or using the DFHFCT TYPE=SHRCTL macro. The BUFFERS operand of this macro is used to define the number and size of the buffers assigned to the pool. Buffers are normally specified with different sizes, with the different sizes corresponding to the size of the CI for data and index records of files assigned to the LSR pool. The pools with different buffer sizes are referred to as LSR subpools. There can be (and should be) different LSR subpools for data and index CI sizes¹

Please refer to Rule CIC165 for further discussion of the benefits of using LSR pools.

¹See Rule CIC166 for further discussion of this issue.

The discussion regarding benefits of using LSR pools assumes that VSAM files actually use the subpools. If VSAM files do not use the LSR subpools that are created, the storage dedicated to buffers for a particular subpool might be better used elsewhere in CICS.

The CICS statistics provide information about the number of times an I/O request was made to a LSR pool, and identify the subpool to which the request was made.

CPEXpert calculates the total I/O requests made to each LSR subpool that was defined. The resulting value is compared with the LSRUSE_n guidance variable (where “n” is the number of the LSR pool, ranging from 1 to 8). CPEXpert produces Rule CIC176 if the total number of I/O requests to the LSR subpool is lower than the LSRUSE_n guidance variable.

The default value for each LSRUSE_n guidance variable is based on the global LSRUSE guidance variable. The default values for the LSRUSE guidance variable is 100, meaning that CPEXpert will produce Rule CIC176 when less than 100 I/O requests are made to the LSR subpool. You can use the default value for the LSRUSE guidance variable, specify a different value for this global variable (and have the global value applied to each LSR pool), or specify a different value for one or more LSR pools.

CPEXpert will not produce Rule CIC176 unless the condition exists for more than 50% of the CICS statistics intervals being analyzed.

Suggestion: As mentioned above, if VSAM files do not use the LSR subpools that are created, the storage dedicated to a particular subpool might be better used elsewhere in CICS.

- If storage is a constraint to CICS performance, and Rule CIC176 is produced for a particular LSR subpool, you should consider (1) eliminating the LSR subpool so the storage can be used elsewhere in CICS, or (2) reducing the number of buffers assigned to the subpool. If you eliminate the LSR subpool, you should identify any VSAM files that have specified the LSR subpool and change their specification to a different LSR pool.
- You can alter CPEXpert’s analysis by specifying a different value for either the global LSRUSE guidance variable or use the LSRUSE_n guidance variable to alter CPEXpert’s analysis for specific LSR pools.

Reference: *CICS/OS/VS Version 1.7 Performance Guide*: pages 65-68, pages 232-238, and page 244.

CICS/MVS Version 2.1.2 Performance Guide: pages 158-162, page 170, and pages 394-397.

CICS/ESA Version 3.1.1 Performance Guide: pages 71-73, pages 93-106, and page 239.

CICS/ESA Version 3.2.1 Performance Guide: pages 147-152, page 155, and pages 310-321.

CICS/ESA Version 3.3.1 Performance Guide: pages 157-162, pages 165-166, and pages 329-339.

CICS/ESA Version 4.1.1 Performance Guide: Section 4.4.2, Section 4.4.4, and Appendix A.1.11.

CICS/TS Release 1.1 Performance Guide: Section 4.4.2, Section 4.4.4, and Appendix 1.1.9.

CICS/TS Release 1.2 Performance Guide: Section 4.4.2, Section 4.4.4, and Appendix 1.1.10.

CICS/TS Release 1.3 Performance Guide: Section 4.6.2, Section 4.6.4, and Appendix 1.1.11.

CICS/TS for z/OS Release 2.1 Performance Guide: Chapter 18 (VSAM resource usage (LSRPOOL)), Chapter 18 (VSAM buffer allocations for LSR), and Appendix A (Table 53).

CICS/TS for z/OS Release 2.2 Performance Guide: Section 4.5.2 Defining VSAM resource usage, Section 4.5.4 Defining VSAM buffer allocations for LSR, and Appendix 1.1.17.6. |

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