
Rule CIC150: VTAM reached the maximum RAPOOL value too often

Finding: CPExpert has determined that VTAM reached the maximum Receive-Any Pool (RAPOOL) too often.

Impact: This finding should normally have a LOW IMPACT or MEDIUM IMPACT on the performance of the CICS region.

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

Discussion: Task input from a terminal is received by the VTAM access method and is passed to CICS, if CICS has a receive-any request outstanding. CICS receives data from VTAM in the receive-any input area (RAIA). The RAMAX operand in the SIT specifies the size in bytes of the I/O area that is allocated for each VTAM receive-any operation.

The RAMAX value should generally be set as large as the normal CICS system input message. For example, if the normal CICS system input is a screen, the RAMAX should be set to the size of the screen (plus 23 bytes to hold storage accounting information added by CICS).

The RAPOOL operand in the System Initialization Table (SIT) specifies the number of concurrent receive-any requests that CICS is to process from VTAM. The value of the RAPOOL operand determines how many receive-any buffers are created at any time. The number of buffers determines how many simultaneous VTAM inputs will be handled directly by CICS buffers, rather than by VTAM buffers.

If the number of simultaneous VTAM inputs is larger than the RAPOOL value, VTAM will store the inputs into its own buffers (acquired from subpool 229) and transfer them to CICS when CICS buffers are available.

If RAPOOL is set too low, not all terminal messages may be processed during one dispatch of the terminal control program. This will cause transactions to be delayed and performance to suffer. If RAPOOL is set too high (and RAMAX is a large value), then storage is wasted.

For each receive-any request, a VTAM request parameter list (RPL), a receive-any control element (RACE), and a receive-any input area are reserved. The total area reserved for a VTAM receive-any operation is:

$$(\text{RAMAX value} + \text{RACE size} + \text{RPL size}) * \text{RAPOOL value}$$

If virtual storage is not constrained, it is wise to have RAPOOL high enough to accommodate all receive-any requests. However, if storage is constrained, there are tradeoffs involved.

There are three basic considerations in selecting the values for RAMAX and RAPOOL: (1) the amount of storage required to handle the inputs, (2) the amount of processor time required to reissue the receive-any requests if inputs cannot be completely transferred to CICS, and (3) the delays to CICS tasks because their input cannot be serviced when available to VTAM.

CPEXpert evaluates the "number of times reached maximum" in the VTAM statistics portion of the CICS statistics. Rule CIC160 is produced if this value is greater than the RAPOOL guidance variable and storage was not constrained. (The default for the RAPOOL guidance variable is zero.)

Suggestion: CPEXpert suggests that you consider the following alternatives:

- Increase the RAPOOL value in the SIT. This will allow more concurrent inputs to be processed by VTAM in the CICS buffers. The RAPOOL value generally should be increased by 2 or 3 over its present setting.
- Assess the CICS workload executing during the interval being analyzed by CPEXpert. If the workload is unusual (e.g., end of month processing or some other relatively infrequent processing) then you may wish to ignore this rule. It may be better to allow VTAM to store the peak of messages in its own areas acquired from subpool 229, than to allocate more space to CICS which would normally be unused.
- Assess the CICS application systems - there may be unique situations in which CICS reissues a receive-in as soon as it finds one satisfied. In this situation, CICS would use the same RAIA repeatedly, and additional areas would be of no advantage. If the RAMAX size is relatively small, it is not worth spending much time trying to determine whether this situation occurs since having a RAPOOL value larger than necessary would "waste" only a small amount of storage.

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*: pages 59-60 and pages 209-213.

CICS/MVS Version 2.1.2 Performance Guide: pages 131-133 and pages 387-388.

CICS/ESA Version 3.1.1 Performance Guide: pages 144-146 and pages 209-213.

CICS/ESA Version 3.2.1 Performance Guide: pages 127-131 and pages 354-355.

CICS/ESA Version 3.3.1 Performance Guide: pages 137-141 and pages 372-373.

CICS/ESA Version 4.1.1 Performance Guide: Section 4.3.2, Section 4.3.3, and Appendix A.1.35.

CICS/TS Release 1.1 Performance Guide: Section 4.3.2, Section 4.3.3, and Appendix 1.1.31.

CICS/TS Release 1.2 Performance Guide: Section 2.2.14, and Appendix 1.1.32.

CICS/TS Release 1.3 Performance Guide: Section 2.2.14, and Appendix 1.1.35.

CICS/TS for z/OS Release 2.1 Performance Guide: Chapter 5 (VTAM statistics) and Appendix A (Table 148).

CICS/TS for z/OS Release 2.2 Performance Guide: Section 4.3.3 Setting the size of the receive-any pool (RAPOOL). |