
Rule CIC328: High percent version check failed for an entry being updated

Finding: The CICS Shared Temporary Storage Queue Server statistics showed that a large percent of version check failed for an entry being updated, indicating that another task had updated the entry.

Impact: This finding has a LOW IMPACT, MEDIUM IMPACT, or HIGH IMPACT on the performance of the CICS region.

Logic flow: This is a basic finding, based on an analysis of the data. The finding applies beginning with CICS/Transaction Server for OS/390 or for z/OS.

Discussion: The CICS temporary storage control facility provides the application programmer with the ability to store data in temporary storage queues, either in main storage, in auxiliary storage on a direct-access storage device, or in a temporary storage data sharing pool. With shared temporary storage, applications can:

- Write data to a temporary storage queue (WRITEQ TS command)
- Update data in a temporary storage queue (WRITEQ TS REWRITE command)
- Read data from a temporary storage queue (READQ TS command)
- Read the next data from a temporary storage queue (READQ TS NEXT command)
- Delete a temporary storage queue (DELETEQ TS command)

The VERSCOMPARE keyword of the IXLLSTE or IXLLSTM macro specifies whether version number comparison is to be performed to determine whether the list entry should be processed. Version number comparison compares the version number of the designed list entry to a specified version number value. Version number comparison can request that the version number of the designated list entry be equal or less than or equal to a specified version number value. If the criterion is not met, the request is terminated.

Temporary storage control commands WRITEQ TS and DELETEQ TS invoke implicit enqueueing. However, CICS enqueueing is not invoked for READQ TS commands. This makes it possible for one task to read a temporary storage queue record while another is updating the same record.

After issuing the READQ TS command, if the application wishes to modify the information and then issue a WRITEQ TS command, it is possible that the temporary storage queue record would have been updated by another task. In this case, the WRITEQ TS command would fail because of a version check.

Shared temporary storage queue server statistics for the coupling facility are available in MXG file CICXQ1. CPExpert uses data in CICXQ1 to calculate the percent of requests that encountered a version check failed for an entry being updated condition, using the following algorithm:

$$\text{Percent version check failed} = \frac{S1RSP4CT}{S1RSP1CT + \text{Abnormal responses}}$$

where S1RSP1CT = Number of normal responses
Abnormal = S1RSP2CT + S1RSP3CT + S1RSP4CT +
S1RSP5CT+ S1RSP6CT + S1RSP7CT +
S1RSP8CT

S1RSP2CT = Requests timed out by CF
S1RSP3CT = Specified entry not found
S1RSP4CT = Version check failed for entry being updated
S1RSP5CT = List authority comparison failed
S1RSP6CT = Maximum list key reached
S1RSP7CT = List structure was out of space
S1RSP8CT = Other IXLLIST return code occurred

CPExpert produces Rule CIC328 when the percent requests that encountered a “version check failed for an entry being updated” condition is greater than the value specified by the **TSPCTVCF** guidance variable in USOURCE(CICGUIDE). The default value for the **TSPCTVCF** is 0.1 indicating that CPExpert should produce Rule CIC328 whenever more than one tenth percent of the requests encountered a “specified entry (queue or item) was not found” condition.

Suggestion: If this finding is produced, you should consider the following alternatives:

- Modify the task to use explicit enqueueing on temporary storage queues where concurrently executing tasks can read and change queue(s) with the same temporary storage identifier. CICS provides the following explicit enqueueing commands:
 - EXEC CICS ENQ RESOURCE

- EXEC CICS DEQ RESOURCE

These commands can be used to protect a temporary storage queue from being read and updated concurrently.

- Change the TSPCTVCF guidance variable in USOURCE(CICGUIDE) so Rule CIC328 is produced only when you wish to be aware of a larger percent of requests that experienced a version check failed for an entry being updated condition.
- You can specify **%LET TSPCTVCF = 100;** in USOURCE(CICGUIDE) to suppress this finding (the percent version check failed for an entry being updated cannot be greater than 100), or you can “turn off” the rule using the process described in Section 3 of this User Manual.

Reference: *CICS/TS for OS/390 Release 1.1*
CICS Recovery and Restart Guide:
Section 3.4.5.3 Implicit enqueueing on recoverable temporary storage queues
Section 3.4.5.5 Explicit enqueueing (by the application programmer)

CICS/TS for OS/390 Release 1.2
CICS Recovery and Restart Guide:
Section 3.4.4.3 Implicit enqueueing on recoverable temporary storage queues
Section 3.4.4.5 Explicit enqueueing (by the application programmer)

CICS/TS for OS/390 Release 1.3
CICS Recovery and Restart Guide:
Section 3.4.4.3 Implicit enqueueing on recoverable temporary storage queues
Section 3.4.4.5 Explicit enqueueing (by the application programmer)

CICS/TS for z/OS Release 2.1
CICS Recovery and Restart Guide: Chapter 13. Programming considerations
Implicit enqueueing on recoverable temporary storage queues
Explicit enqueueing (by the application programmer)

CICS/TS for z/OS Release 2.2
CICS Recovery and Restart Guide: Section 3.4 (Programming considerations)
Implicit enqueueing on recoverable temporary storage queues
Explicit enqueueing (by the application programmer)

CICS/TS for z/OS Release 2.3
CICS Recovery and Restart Guide: Section 3.4 (Programming considerations)
Implicit enqueueing on recoverable temporary storage queues
Explicit enqueueing (by the application programmer)

CICS/TS for z/OS Release 3.1

CICS Recovery and Restart Guide: Section 3.4 (Programming considerations)

- Implicit enqueueing on recoverable temporary storage queues
- Explicit enqueueing (by the application programmer)
- Explicit enqueueing (by the application programmer)

CICS/TS for z/OS Release 3.2 Recovery and Restart Guide:

Chapter 13. Programming considerations

- Locking (enqueueing on) resources in application programs
 - Implicit enqueueing on recoverable temporary storage queues
 - Explicit enqueueing (by the application programmer)

CICS/TS for z/OS Release 4.1 Recovery and Restart Guide:

Chapter 13. Programming for recovery

- Locking (enqueueing on) resources in application programs
 - Implicit enqueueing on recoverable temporary storage queues
 - Explicit enqueueing (by the application programmer)

CICS/TS for z/OS Release 4.2 Recovery and Restart Guide:

Chapter 13. Programming for recovery

- Locking (enqueueing on) resources in application programs
 - Implicit enqueueing on recoverable temporary storage queues
 - Explicit enqueueing (by the application programmer)

CICS/TS for z/OS Release 5.1 Recovery and Restart Guide:

Chapter 11. Programming for recovery

- Locking (enqueueing on) resources in application programs
 - Implicit enqueueing on recoverable temporary storage queues
 - Explicit enqueueing (by the application programmer)
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