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**Rule CIC254**The USRDELAY value might be too low

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**Finding:** CPExpert believes that the USRDELAY value specified in the System Initialization Table (SIT) might be too low.

**Impact:** This finding should normally have a MEDIUM IMPACT on the performance of the CICS region. The finding could have a significant impact on the CPU and I/O overhead associated with the CICS region.

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

**Discussion:** The USRDELAY parameter in the SIT specifies the maximum time, in the range 0 through 10080 minutes (up to 7 days), that an eligible userid and its associated attributes are to be retained in the user table if the userid is unused. A userid that is retained during the delay period can be reused. Reusing userids significantly reduces both CPU and I/O overhead, since

The userids eligible for reuse within the USRDELAY period are any that are:

C Received from remote systems.

C Specified on SECURITYNAME in CONNECTION definitions.

C Specified on USERID in SESSIONS definitions.

C Specified on USERID in the definition of an intrapartition transient data queue.

C Specified on USERID on START commands.

The default value for the USRDELAY parameter is 30 minutes, indicating that a user will be signed off and removed from the system<sup>1</sup> if there is no activity for 30 minutes. If a value of zero is specified, userid entries are deleted immediately after use. Once an entry is deleted, the user must sign on again to perform further activity. When the user signs on again, the external security manager (e.g., RACF) must be invoked.

The CICS user domain attempts to minimize the number of times it calls the security domain to create user security blocks. These calls generate *considerable* overhead in both processor time and input/output operations.

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<sup>1</sup>Message DFHUS0200 is issued if the user is removed from the system, but the message can be suppressed by an XMEOUT global user exit program.

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If possible, each unique representation of a user is shared between multiple transactions. A user-domain representation of a user can be shared if the following attributes are identical:

C The userid.

C The groupid.

C The applid. This is not necessarily the same for all the users in a region. The applid is shipped with the userid across MRO links.

C The port of entry. This can be the netname for users signed on at VTAM terminals, or the console name for users signed on at consoles. It is null for other terminal types and for users associated with non-terminal transactions.

Selecting an appropriate value for the USRDELAY parameter is a tradeoff between:

- Management desire for security.
- The overhead required for the external security manager and the potential inconvenience or annoyance to the user.

The CICS User Domain statistics provide information that can be used to select an appropriate value for the USRDELAY parameter from a system performance view. The User Domain statistics are available in the MXG CICDS file.

C When CICS adds a new user instance to the user domain, the domain attempts to locate that instance in its user directory. If the user instance already exists with the parameters described above, that instance is reused. The USGDRRC variable records how many times this is done. However, if the user instance does not already exist in the user directory, the instance must be added. Adding the user instance requires an invocation of the security domain and the external security manager. USGDRNFC records how many times this is necessary.

C When the count associated with the instance is reduced to zero, the user instance is not immediately deleted but is placed in a timeout queue controlled by the USRDELAY parameter. While it is in the timeout queue, the user instance is still eligible to be reused. If it is reused, it is removed from the timeout queue. USGTORC records how many times a user instance is reused while it was being timed out, and USGTOMRT records the average time that user instances remain on the timeout queue until they are removed.

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However, if a user instance remains on the timeout queue for a full USRDELAY interval without being reused, it is deleted. USGTOEC records how many times this happens.

IBM suggests that if USGTOEC is large compared to USGTORC, you should consider *increasing* the value of USRDELAY. However, if USGTOMRT is much smaller than USRDELAY, you may be able to *reduce* USRDELAY without significant performance effect.

Unfortunately, the USRDELAY value is not available in CICS statistics. Consequently, CPEXPERT can address only the issue of increasing the value of the USRDELAY parameter.

CPEXPERT compares the USGTOEC value (the number of user instances deleted from the timeout queue) with the USGTORC value (the times a user instance was reused while it was being timed out). As mentioned earlier, these variables are in MXG file CICDS. CPEXPERT produces Rule CIC254 when the USGTOEC value is more than **twice** the value of USGTORC. This indicates that the number of userids were deleted from the timeout queue was more than twice the number of userids that were reused.

**Suggestion:** If Rule CIC254 is produced regularly, CPEXPERT suggests that you consider the following alternatives:

**C Increase the USRDELAY value.** You should consider increasing the USRDELAY to the value provided by Rule CIC254. The value provided by Rule CIC254 is simply the average time that has elapsed before a userid was deleted, as obtained from the USGTOMRT (average time that a userid remained on the timeout queue before being removed).

Even though increasing the USRDELAY value can significantly reduce overhead, there is a potential problem with increasing the USRDELAY value

High values of USRDELAY may affect your security administrator's ability to change the authorities and attributes of CICS users. Changes to the authorities and attributes are not reflected in CICS immediately. These changes are not applied until the user instance is refreshed in CICS by being flushed from the timeout queue after the USRDELAY interval.

For example, if USRDELAY=30 were specified, but a userid continues to run transactions every 25 minutes, the USRDELAY value will never expire and any changes made to the userid will never come into effect.

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Some security administrators might require that `USRDELAY=0` be specified. With `USRDELAY=0`, remote users normally<sup>2</sup> are flushed out immediately after the transaction they are executing has terminated. Consequently, the user control blocks must be reconstructed frequently, with the resulting significant overhead and poor performance.

**C Turn off Rule CIC254.** You can “turn off” rule CIC254 if you decide that you should not alter the `USRDELAY` (see Section 3 for instructions on how to “turn off” rules).

**Reference:** *CICS/ESA Version 4.1 Performance Guide*: Section 2.2.12 (User domain statistics).

*CICS/TS Release 1.1 Performance Guide*: Section 2.2.12 (User domain statistics).

*CICS/TS Release 1.2 Performance Guide*: Section 2.2.13 (User domain statistics).

*CICS/TS Release 1.3 Performance Guide*: Section 2.2.13 (User domain statistics).

*CICS/TS for z/OS Release 2.1 Performance Guide*: Section 2.2.30 (Interpreting user domain statistics).

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<sup>2</sup>This specification could allow some sharing of user instances if the usage count is never reduced to zero.