
Rule WLM604: XCF outbound message buffer space may be too small

Finding: CPExpert has determined that a large percent of the cross system coupling facility (XCF) outbound messages were rejected because of constraints on the amount of outbound message buffer space.

Impact: This finding can have a MEDIUM IMPACT or HIGH IMPACT on the signalling performance of the sysplex.

Logic flow: This a basic finding. There are no predecessor rules.

Discussion: The XCF component of MVS/ESA allows authorized programs on one MVS system in a sysplex to communicate with programs on the same system or on other systems. A typical example of this communication is between CICS regions; CICS regions often communicate with other CICS regions in the same system or with CICS regions on other systems in the sysplex.

Please refer to the discussion associated with Rule WLM601 for additional information about XCF buffers.

Message buffer space for outbound traffic is assigned to transport classes¹ in two ways: (1) the basic assignment to the transport class via the MAXMSG parameters on the CLASSDEF statement and (2) the MAXMSG parameter on the PATHOUT statement.

The MAXMSG parameter defines the amount of message buffer space allocated for outbound messages sent in the transport class. The MAXMSG parameter can be specified on the PATHOUT statements, or on the CLASSDEF statement. The message buffer space available to outbound messages in a transport class is the sum of the message buffer space specified for the transport class on the CLASSDEF statement, plus the message buffer space specified for each outbound signalling path assigned to the transport class.

If no MAXMSG value is specified for the paths associated with a transport class or for the CLASSDEF statement, MVS uses the value of the MAXMSG parameter specified on the COUPLE statement (with a default of 750K bytes of buffer space).

¹Message buffers are assigned to transport classes only for **outbound** traffic since only outbound traffic can be separated into transport classes. Inbound traffic cannot be separated by transport classes; buffers are assigned to inbound traffic based on the total buffer space defined on the PATHIN statement.

Message buffer space for **outbound** messages is separated by transport class, so a sudden high volume of traffic in one transport class will not cause performance problems for another transport class. If the message buffer space required to support messages in a particular transport class is exhausted, MVS will reject additional messages until outbound message buffer space becomes available in the transport class.

SMF Type 74 (Subtype 2) provides statistics about the number of messages sent by XCF groups in a transport class, where the messages are sent, how many messages were rejected because there was insufficient message buffer space, and how much message buffer space was allocated to the transport class.

CPEXpert analyzes this information to determine whether sufficient message buffer space has been defined. CPEXpert computes the total outbound message traffic for a transport class. CPEXpert concludes that the message buffer space is too small for the transport class when more than the value specified for the **PCTREJ** guidance variable of the outbound messages were rejected because of no buffer space. The default specification for the PCTREJ guidance variable is **%LET PCTREJ = 0.1**; indicating that Rule WLM604 will be produced when more than one-tenth of a percent of the outbound traffic is rejected for insufficient buffer space.

CPEXpert produces Rule WLM604 to alert you that a significant percent of messages have been rejected because of insufficient buffer space.

The following example illustrates the output from Rule WLM604:

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RULE WLM604: THE XCF MESSAGE BUFFER SPACE MAY BE TOO SMALL

The message buffer space may be too small for the DEFAULT transport
class. CPEXpert noticed that XCF requests were rejected because of
constraints on the amount of message buffer space. You should consider
increasing the amount of XCF message buffer space for the DEFAULT
transport class. An asterisk beside the buffer space means that the
buffer space DECREASED during the reported measurement interval, from
the preceding measurement interval. This finding applies to the
following measurement intervals:
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MEASUREMENT INTERVAL	SENT TO	TOTAL REQUESTS	REJECTED REQUESTS	PCT REJECTED	BUFFER SPACE
13:00-13:30,26MAR1996	J90	2,160	196	9.1	1,536K
13:00-13:30,26MAR1996	JAO	587	49	8.3	1,536K
13:00-13:30,26MAR1996	JB0	2,263	174	7.7	1,536K
13:00-13:30,26MAR1996	JC0	1,492	107	7.1	1,536K
13:00-13:30,26MAR1996	Z0	1,086	60	5.6	1,536K
13:00-13:30,26MAR1996	Z1	203	11	5.3	1,536K

Suggestion: The available outbound buffer space for a transport class can be too small because (1) the amount initially specified was too low, (2) a system operator could have decreased the amount of message buffer space for the transport class, or (3) there could have been a loss of one or more paths assigned to the transport class.

If Rule WLM604 is produced, CPExpert suggests that you consider the following alternatives²:

- You should assess whether a system operator changed the amount of message buffer space assigned to the transport class or to paths assigned to the transport class. CPExpert will notify you (by placing '***' beside the buffer space value) if the amount of allocated message buffer space assigned to the transport class **decreased** from the previous RMF measurement interval.

If the system operator did make a change resulting in less outbound message buffer space for the transport class, you should verify that there was a sound rationale for the action.

- You should evaluate the amount of message space specified for the transport class on the CLASSDEF statement and the amount of message buffer space specified for each path assigned to the transport class. You should consider using the MAXMSG parameter of the CLASSDEF statement or the PATHOUT statement to increase the message buffer space for the transport class.
- You should assess whether there has been a decrease in the number of paths assigned to the transport class. Since the available message buffer space for transport classes is partly a function of the message buffer space assigned to paths associated with the transport class (for output messages), a decrease in the number of paths would cause a decrease in the message buffer space. A system operator could have issued the SETXCF STOP command to delete a signalling path, or a path could have failed.
- If Rule WLM604 occurs frequently and there is no action you wish take, you should change the guidance to CPExpert by altering the PCTREJ guidance variable in USOURCE(WLMGUIDE).

Alternatively, you can use the **EXCLASSn** guidance variables to exclude the transport class from CPExpert's analysis. The EXCLASSn guidance

²**WARNING:** There exists little practical experience with analyzing coupling facility data and with selecting proper values for the controlling parameters. The CPExpert analysis and suggestions are based on (1) the information contained in the referenced documents and (2) our analysis of data provided by IBM or CPExpert users. Please keep this paucity of knowledge in mind when considering the alternatives. Additionally, **please** provide Computer Management Sciences with feedback!

variables allow you to exclude one or more transport classes from analysis.

- Reference:** MVS/ESA: Setting Up a Sysplex (GC28-1449)
Section 5: Planning Signalling Services in a Sysplex
- MVS/ESA: Initialization and Tuning Reference (GC28-1452)
COUPLExx (Cross-System Coupling Facility Parameters)
- OS/390: Setting Up a Sysplex (GC28-1779)
Section 5: Planning Signalling Services in a Sysplex
- OS/390: Initialization and Tuning Reference (GC28-1752)
COUPLExx (Cross-System Coupling Facility Parameters) Parameters)
- z/OS: Setting Up a Sysplex (SA22-7625)
Section 5: Planning Signalling Services in a Sysplex
- z/OS: Initialization and Tuning Reference (SA22-7592)
COUPLExx (Cross-System Coupling Facility Parameters)
- "Parallel Sysplex Performance: tuning tips and techniques,"
Kelley, Joan (IBM, Poughkeepsie, NY), SHARE 86, February 1996.
- z/OS V1R2: MVS System Messages, Volume 10 (IXP-IZP), SA22-7640
- z/OS V1R3: MVS System Messages, Volume 10 (IXP-IZP), SA22-7640
- z/OS V1R4: MVS System Messages, Volume 10 (IXP-IZP), SA22-7640 |