Rule WLM608: Transport class did not have a signalling path assigned

Finding: The transport class did not have a signalling path assigned. There may be an error in the path definitions (for example, you may have a typographical error). Alternatively, the path(s) assigned to the transport class might have failed or have been deleted by an operator.

Impact: This finding can have a MEDIUM IMPACT or HIGH IMPACT on the signalling performance of the sysplex. The level of impact depends upon (1) the number of messages sent in the transport class, (2) the message characteristics of the transport class having no path assigned, and (3) the transport classes to which XCF routes messages.

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.

XCF group members communicate with each other using the XCF *signalling* mechanism. The communication is done via signalling paths consisting of ESCON channels operating in channel-to-channel (CTC) mode, a coupling facility list structure (beginning with MVS/ESA Version 5), or 3088 Multisystem Channel Communication Unit. Messages are sent over the signalling paths, and the paths have one or more buffers associated with them to hold the messages as they are sent or received.

Outbound paths are assigned to transport classes by using the CLASS parameter on the PATHOUT statement (or by using the SETXCF PATH command after IPL). At least one outbound signalling path should be assigned to each transport class[1]. If there is high message traffic in the transport class, you may wish to assign **more** than one signalling path to the transport class. Additionally, you may wish to assign more signalling paths for redundancy.

[1]You are not required to assign a signalling path to a transport class. If no signalling path is assigned to a transport class, the XCF groups in the transport class compete for signalling resources of other transport classes. This situation can degrade signalling performance.

XCF usually uses sends messages only on the signalling paths associated with a transport class. However, if there are no paths available to the transport class, XCF will route messages to other paths. Routing messages to other paths generates additional overhead for XCF to send the outbound message.

Additionally, using other paths may cause conflicts with the normal message traffic on these paths. As described in Rule WLM601, some messages are long and some are short; some messages have critical timing for system performance and some are less critical. If non-critical messages are routed to paths associated with a transport class with critical traffic, any resulting delays to the critical traffic could cause overall system performance problems.

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, and how many paths were assigned to the transport class.

CPExpert analyzes this information to determine whether at least one path was assigned to the transport class. CPExpert produces Rule WLM608 when there were no paths assigned to a transport class. Before firing Rule WLM608, CPExpert applies a "reality check" to make sure that a reasonable amount of traffic was sent in the transport class.

The following example illustrates the output from Rule WLM608:

RULE WLM608: TRANSPORT CLASS DID NOT HAVE SIGNALLING PATH ASSIGNED

The DEFAULT Transport Class did not have a signalling path assigned, yet there was activity on the transport class. Performance is degraded when a transport class does not have a signalling path assigned, since the groups compete for the signalling resources of transport classes assigned to other XCF groups. This finding applies to the following RMF measurement intervals:

MEASUREMENT INTERVAL	SENT TO	TOTAL REQUESTS	MESSAGE LENGTH
13:00-13:30,26MAR1996	J90	2,160	16,316
13:00-13:30,26MAR1996	JA0	587	16,316
13:00-13:30,26MAR1996	JB0	2,263	16,316
13:00-13:30,26MAR1996	JC0	1,492	16,316
13:00-13:30,26MAR1996	JD0	1,336	16,316
13:00-13:30,26MAR1996	JE0	898	16,316
13:00-13:30,26MAR1996	JF0	840	16,316
13:00-13:30,26MAR1996	Z0	1,086	16,316
13:00-13:30,26MAR1996	Z1	203	16,316

Suggestion: If Rule WLM608 is produced, CPExpert suggests that you consider the following alternatives[2]:

- A likely cause of no paths being assigned to a transport class is that you may have an error in the path definitions (for example, you may have a typographical error) in the DEVICE parameter list of the PATHOUT statement associated with the transport class. Please verify that the list is correct.

- You should determine whether an assigned path failed, or whether an operator deleted a path (using the SETXCF STOP, PATHOUT,DEVICE=outdevnum) command.

- If no outbound paths were assigned to the transport class, you normally should assign at least one path.

- If Rule WLM608 occurs frequently and there is no action you wish take, you can to exclude the transport class from CPExpert's analysis, using the **EXCLASSn** guidance variables. The EXCLASSn guidance 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)

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.

[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!

