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## Rule WLM362: Non-paging DASD I/O activity caused significant response delays

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**Finding:** Non-paging DASD I/O activity by the service class was a significant cause of the service class missing its response performance goal.

This finding applies only to service classes with response goals. I/O delays are a part of the computation of execution velocity only with OS/390 Release 3. Rule WLM361 applies to service classes with execution velocity goals.

**Impact:** This finding can have a LOW IMPACT, MEDIUM IMPACT, or HIGH IMPACT, depending upon the amount of DASD I/O activity and the delay to the service class caused by the DASD I/O activity.

**Logic flow:** The following rules cause this rule to be invoked:  
Rule WLM101: Service Class did not achieve average response goal  
Rule WLM102: Service Class did not achieve percentile response goal

**Discussion:** When CPExpert detects that a service class did not achieve its response goal, CPExpert analyzes the basic causes (see the discussion in the above predecessor rules). One of the possible causes of delay is that the service class was delayed because of non-paging DASD I/O activity.

The SRM collects I/O using and delay information beginning with OS/390 Release 3. Prior to OS/390 Release, any I/O delay is reflected in the UNKNOWN category of delay, and CPExpert will analyze the I/O delay as discussed in Rule WLM350.

The non-paging DASD I/O using and delay information is reported in SMF Type 72 records for each service class period. CPExpert analyzes the non-paging DASD I/O delay (field R723CIOD) for service classes missing their performance goal. CPExpert produces Rule WLM362 when the percent delay caused by non-paging DASD I/O is greater than the **WLM SIG** guidance variable in USOURCE(WLMGUIDE), and a response performance goal has been specified.

After producing Rule WLM362, CPExpert analyzes several possible causes of non-paging DASD I/O delay and reports the result in subsequent rules.

The following example illustrates the output from Rule WLM362:

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RULE WLM362: NON-PAGING DASD I/O ACTIVITY CAUSED SIGNIFICANT DELAYS

TSO (Period 1): A significant part of the delay to the service class can be attributed to non-paging DASD I/O delay. The below data shows intervals when non-paging DASD delay caused TSO to miss its performance goal:

MEASUREMENT INTERVAL	AVERAGE		---AVERAGE DASD I/O TIMES---			
	DASD I/O PER TRANS	TOTAL DASD TIME/TRANS	RESP	DISC	CONN	PEND
10:45-11:00,06MAR1997	64	0.773	0.012	0.005	0.002	0.005

**Suggestion:** From a high-level view, there are four key measures of DASD performance: IOS Queue (IOSQ) time, pending (PEND) time, disconnect (DISC) time, and connect (CONN) time. The last three of these measures are reported in SMF Type 72 records (fields R723CIWT, R723CIDT, and R723CICT, respectively) for environments prior to OS/390 V2R4. IOSQ time is reported in SMF Type 72 (field R723CIOT) beginning with OS/390 V2R4.

Please refer to the suggestions associated with Rule WLM361 for a discussion of these measures and how to reduce delay in each category.