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## Rule WLM114: BTE Phase had large number of Ready samples

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**Finding:** CPExpert has detected that a large percent of the begin\_to\_end (BTE) phase samples were in the Ready state. This finding applies only to service classes representing CICS/ESA Version 4 transactions.

**Impact:** This finding means that CICS transactions were waiting for dispatch in the Transaction Owning Region but were not dispatched by CICS.

**Logic flow:** The following rules cause this rule to be invoked:

- Rule WLM104: Subsystem Service Class did not achieve average response goal
- Rule WLM105: Subsystem Service Class did not achieve percentile response goal

**Discussion:** CICS/ESA Version 4.1 reports two separate views of the transactions: the *begin\_to\_end phase* and the *execution phase*<sup>1</sup>.

- **Begin\_to\_end phase.** The begin\_to\_end phase starts when CICS/ESA Version 4.1 has classified the transaction<sup>2</sup>. This action normally is done in a CICS Terminal Owning Region (TOR).
- **Execution phase.** The execution phase starts when either CICS/ESA Version 4.1 or IMS Version 5 has started an application task to process the transaction. For CICS, this normally is done in a CICS Application Owning Region (AOR).

CICS provides the System Resources Manager (SRM) with information about the phase (begin\_to\_end or execution) of transactions by executing the IWMMINIT ("Initialize the Monitoring Environment") macro. The DURATION parameter of the IWMMINIT macro tells the SRM whether the following information related to a transaction is associated with the begin\_to\_end phase or with the execution phase.

The IWMMINIT macro is issued immediately after CICS has issued the IWMCLSFY ("Assigning Incoming Work Requests to a Service Class") macro to establish a service class for a transaction. Thus, the SRM quickly

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<sup>1</sup>IMS Version 5 reports only *execution phase* samples.

<sup>2</sup>Classifying the transaction into a service class is actually done by the Workload Manager when CICS issues the IWMCLSFY macro. Please refer to Section 4 for a more complete discussion of the subsystem work manager (e.g., CICS) interaction with the Workload Manager.

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knows (1) the service class to which a transaction belongs and (2) whether the transaction is in its begin\_to\_end phase or in its execution phase.

CICS or IMS will provide the SRM with information about the state of the transaction (active state, ready state, waiting state, etc.) by issuing the IWMMCHST ("Change State of Work Request") macro. The SRM simply sets bits in a status word to indicate the state of a transaction.

The SRM periodically samples the status word associated with each transaction<sup>3</sup>, and updates counters representing the state of transactions executing in the service class. There is a status word for the begin\_to\_end phase and a status word for the execution phase, and separate sets of counters are maintained for the various begin\_to\_end states and execution states for each service class

Included in the state reported by CICS are the times the transaction is in a Ready state. The Ready state indicates that there was a program ready to execute on behalf of a work request in the "served" service class, but that the work manager has given priority to another work request. In the case of a CICS region, this means that there were more CICS tasks ready to execute in the "served" service class than were dispatched by CICS.

CICS transactions typically enter the system via a CICS TOR. The transactions receive some initial processing in the TOR and are routed to an AOR for actual application processing. CICS signals the beginning of the execution phase for the transaction when the transaction is received by the AOR.

Some transactions are not routed to an AOR, however. These transactions are completely processed in the TOR. Since the AOR signals the beginning of the execution phase, these transactions never enter the execution phase.

The service class being analyzed by CPExpert exceeded its performance objective (as reported by Rule WLM104 or Rule WLM105). Further, CPExpert had been directed to analyze response time based on the begin\_to\_end phase<sup>4</sup>.

CPExpert produces Rule WLM114 when the Ready samples account for more than 25% of the number of begin\_to\_end samples AND when you have directed CPExpert to analyze response delays based on the begin\_to\_end phase. CPExpert concludes that a large percentage of non-routed transactions are processed in the service class if more than 25% of

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<sup>3</sup>With MVS/ESA SP5.1, the SRM takes its samples every 250 milliseconds.

<sup>4</sup>That is, you had specified %LET PHASE=BEGIN\_TO\_END in USOURCE(WLMGUIDE).

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the transaction samples occurred in the Ready state of the begin\_to\_end phase.

This means that CICS tasks were waiting dispatch in the TOR, but could not be dispatched because (1) the CICS TOR was denied access to a CPU because its MVS dispatching priority was not high enough or (2) the CICS TOR was processing other CICS tasks.

The following example illustrates the output from Rule WLM114:

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RULE WLM114:  BTE PHASE HAD LARGE READY SAMPLES

CPEXpert has detected that a large number of BEGIN_TO_END PHASE Ready
samples were recorded for the CICS Service Class.  These Ready tasks
would be shown as "Dispatchable" by the CEMT INQUIRE TASK command.
This means that CICS tasks were waiting dispatch in the TOR, but could
not be dispatched because (1) the CICS TOR was denied access to a CPU
because its MVS dispatching priority was not high enough or (2) the CICS
TOR was processing other CICS tasks.  Please refer to Rule WLM114 in the
WLM Component User Manual for alternatives to correct the situation.  This
finding applies to the following RMF measurement intervals:
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MEASUREMENT INTERVAL	BEGIN TO END PHASE SAMPLES	READY SAMPLES	ACTIVE SAMPLES
10:00-10:30,26MAR1996	511,574	209,486	7,238
10:30-11:00,26MAR1996	513,461	289,929	6,895

**Suggestion:** CPEXpert suggests that you consider the following alternatives:

- **The CICS TOR was denied access to a CPU.** Please refer to Rule WLM250 for a discussion and alternatives when a service class is denied access to a CPU.
- **The CICS TOR was processing other CICS tasks.** Please refer to Rule WLM121 for a discussion and alternatives when the CICS TOR was processing other CICS tasks.

**Reference:** CICS/ESA Version 4.1 Performance Guide  
Section 2.6.3.1: Service Definitions

CICS/TS Release 1.1 Performance Guide  
Section 2.6.3.1: Service Definitions

CICS/TS Release 1.2 Performance Guide  
Section 2.6.3.1: Service Definitions

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CICS/TS Release 1.3 Performance Guide  
Section 2.5.7.1: Service Definitions

CICS/TS for z/OS Release 2.1 *Performance Guide*: Chapter 8 (Managing Workloads - Setting up service definitions).

CICS/TS for z/OS Release 2.2 *Performance Guide*: Chapter 8 (Managing Workloads - Setting up service definitions). |