Management Central Monitors: OS/400 Command Substitution Parameters

Management Central Monitors allow for OS/400 commands to be run based upon threshold or reset actions. When special keyword parameters are used in the commands, Management Central will substitute values for these keywords, enabling the user to construct more meaningful commands or messages. This document expands upon the information found in the online help text for these special OS/400 command keyword substitution parameters.

System Monitor support:

<table>
<thead>
<tr>
<th>Param. (1)</th>
<th>Passed Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>&amp;DATE</td>
<td>Date</td>
</tr>
<tr>
<td>&amp;INTVL</td>
<td>Collection interval</td>
</tr>
<tr>
<td>&amp;MON</td>
<td>Monitor name</td>
</tr>
<tr>
<td>&amp;RDUR</td>
<td>Reset duration</td>
</tr>
<tr>
<td>&amp;RVAL</td>
<td>Reset value</td>
</tr>
<tr>
<td>&amp;SEQ</td>
<td>Sequence number</td>
</tr>
<tr>
<td>&amp;TDUR</td>
<td>Trigger duration</td>
</tr>
<tr>
<td>&amp;TIME</td>
<td>Time</td>
</tr>
<tr>
<td>&amp;TVAL</td>
<td>Trigger value</td>
</tr>
<tr>
<td>&amp;VAL</td>
<td>Current value (2)</td>
</tr>
</tbody>
</table>

System Monitor substitution parameter Notes:

1. The dollar sign ($) that was available in previous releases is still supported, for example, $TIME.
2. Batch IO is shown as I/O operations rather than transactions per second. Transaction rates are shown as transactions rather than transactions per second. Interactive response times (both average and maximum) are shown in milliseconds rather than seconds.
3. Parameters must be upper case

Job Monitor support:

(first 4 below are common with System and Message Monitors)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Passed Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>&amp;DATE</td>
<td>Date</td>
</tr>
<tr>
<td>&amp;INTVL</td>
<td>Collection interval length in seconds</td>
</tr>
<tr>
<td>&amp;MON</td>
<td>Monitor name</td>
</tr>
<tr>
<td>&amp;TIME</td>
<td>Time</td>
</tr>
<tr>
<td>&amp;ENDPOINT</td>
<td>Endpoint system name</td>
</tr>
<tr>
<td>&amp;EVENTTYPE</td>
<td>Event type and defined as follows: (4)</td>
</tr>
<tr>
<td></td>
<td>Triggered Event = 1</td>
</tr>
<tr>
<td></td>
<td>Auto Reset Event = 2</td>
</tr>
<tr>
<td></td>
<td>Manual Reset Event = 3</td>
</tr>
<tr>
<td>&amp;JOBNAME</td>
<td>Job name of the job causing the trigger/reset</td>
</tr>
<tr>
<td>&amp;JOBNUMBER</td>
<td>Job number of the job causing the trigger/reset</td>
</tr>
<tr>
<td>&amp;JOBSTATUS</td>
<td>Job status causing a trigger/reset (7)</td>
</tr>
<tr>
<td>&amp;JOBTYPE</td>
<td>Job type of the job causing the trigger/reset</td>
</tr>
<tr>
<td>&amp;JOBUSER</td>
<td>Job user of the job causing the trigger/reset</td>
</tr>
<tr>
<td>&amp;METRICTYPE</td>
<td>Category of metric. For Job Monitor is defined as follows:</td>
</tr>
<tr>
<td></td>
<td>Status Metric = 10010</td>
</tr>
</tbody>
</table>
Message Metric = 10020
Numeric Metric = 10030

&METRIC Metric that has triggered/reset and defined as follows:
  Job Cpu Util = 1010
  Job Logical IO = 1020
  Job Disk IO = 1030
  Job Com IO = 1040
  Job Trans Rate = 1050
  Job Trans Time = 1060
  Job Thread Count = 1070
  Job Page Faults = 1080
  Sum Cpu Util = 2010
  Sum Logical IO = 2020
  Sum Disk IO = 2030
  Sum Com IO = 2040
  Sum Trans Rate = 2050
  Sum Trans Time = 2060
  Sum Thread Count = 2070
  Sum Page Faults = 2080
  Job Status = 3010
  Job Log Messages = 3020
  Sum Job Count = 4010

&NUMCURRENT Current numeric value (5, 6)
&NUMRESET Threshold value to cause auto-reset of numeric metric (1, 6)
&NUMTRIGGER Threshold value to cause trigger of a numeric metric (5, 6)
&OWNER Monitor owner
&RDUR Reset duration, in intervals, as set in the threshold (1)
&RESETTYPE Reset type and defined as follows: (3)
  manual reset = 1
  automatic reset = 2
&SBS Subsystem of the job causing the trigger/reset
&SERVER Server type of the job causing the trigger/reset.
  Not supported for summary metrics.
&THRESHOLD Trigger duration, in intervals, as set in the threshold (5)
&THRESHOLD Threshold number causing the trigger
&MSGID Message ID causing the trigger/reset (2)
&MSGSEV Message severity causing the trigger/reset (2)
&MSGTYPE Message type causing the trigger/reset (2)

Job Monitor substitution parameter notes:

(1) If a monitor is triggered and the user performs a manual reset (“Reset with Commands” or “Reset Only”), there is no substitution value for the Parm &NUMRESET, &RDUR. It will only have a value if the reset is automated.

(2) &MSGID, &MSGSEV, or &MSGTYPE you need to be monitoring the ‘Job Log Message’ metric - otherwise there is no substitution value for these. Additionally, these are only valid in the trigger and reset commands of Job Log Messages thresholds.

(3) &RESETTYPE only has a valid substitution value on an OS/400 reset command. Constant values are used to determine whether the reset type is manual or automated.

(4) &EVENTTYPE is valid for all substitution and has constant values that are used to determine the type of monitor event that occurred (automated trigger, automated reset, or manual reset). In an OS/400 trigger command, the value is always the trigger constant; in a reset command, it can either be the automated reset or manual reset constant.
Invalid combinations of Job Monitor metric with substitution parameters:

(A) Job Count metric not valid with: &JOBNAME, &JOBUSER, &JOBNUMBER, &JOBTYPE, &SBS, &SERER, &MSGID, &MSGSEV, &MSGTYPE, AND &JOBSTATUS

(B) Job Log Message metric not valid with: &RDUR, &NUMRESET, &TDUR, &NUMTRIGGER, &NUMCURRENT, and &JOBSTATUS

(C) Job Status metric not valid with: &NUMRESET, &NUMTRIGGER, &NUMCURRENT, &MSGID, &MSGSEV, AND &MSGTYPE

(D) The ‘Job Numeric Values’ metrics of CPU Percent Utilization, Logical I/O Rate, Disk I/O Rate, Communications I/O Rate, Transaction Rate, Transaction Time, Thread Count, and Page Fault Rate are not valid with: &MSGID, &MSGSEV, &MSGTYPE AND &JOBSTATUS

(E) The ‘Summary Numeric Values’ metrics of CPU Percent Utilization, Logical I/O Rate, Disk I/O Rate, Communications I/O Rate, Transaction Rate, Transaction Time, Thread Count, and Page Fault Rate are not valid with: &JOBNAME, &JOBUSER, &JOBNUMBER, &JOBTYPE, &SBS, &SERVER, &MSGID, &MSGSEV, &MSGTYPE AND &JOBSTATUS

Message Monitor support:

(first 4 below are common with System and Job Monitors)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Passed Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>&amp;DATE</td>
<td>Date</td>
</tr>
<tr>
<td>&amp;MON</td>
<td>Monitor name</td>
</tr>
<tr>
<td>&amp;INTVL</td>
<td>Collection interval length in seconds</td>
</tr>
<tr>
<td>&amp;TIME</td>
<td>Time</td>
</tr>
<tr>
<td>&amp;ENDPOINT</td>
<td>Endpoint system name</td>
</tr>
<tr>
<td>&amp;EVENTTYPE</td>
<td>Event type and defined as follows:</td>
</tr>
<tr>
<td></td>
<td>Triggered Event = 1</td>
</tr>
<tr>
<td></td>
<td>Manual Reset Event = 3</td>
</tr>
<tr>
<td>&amp;FRMJOBNUMBER</td>
<td>“From job number&quot; for the message causing the trigger</td>
</tr>
<tr>
<td>&amp;FRMJOBNAME</td>
<td>“From job name&quot; for the message causing the trigger</td>
</tr>
<tr>
<td>&amp;FRMPROGRAM</td>
<td>“From program&quot; for the message causing the trigger</td>
</tr>
<tr>
<td>&amp;FRMUSER</td>
<td>“From job user&quot; for the message causing the trigger</td>
</tr>
<tr>
<td>&amp;MSGKEY</td>
<td>4-byte message key for the message causing the trigger (as a hex string)</td>
</tr>
<tr>
<td>&amp;MSGID</td>
<td>Message ID causing the trigger</td>
</tr>
<tr>
<td>&amp;MSGSEV</td>
<td>Message severity causing the trigger</td>
</tr>
<tr>
<td>&amp;MSGTYPE</td>
<td>Message type causing the trigger</td>
</tr>
<tr>
<td>&amp;MSGCOUNT</td>
<td>Current message count (that caused the trigger)</td>
</tr>
<tr>
<td>&amp;OWNER</td>
<td>Monitor owner</td>
</tr>
</tbody>
</table>
&THRESHOLD   Threshold number causing the trigger
&TOLIB      Message queue's library to which this message was sent (the library of the queue being monitored)
&TOMSGQ     Message queue name to which this message was sent (the queue being monitored)

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**B2B Monitor Support:**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Passed Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>&amp;NAME</td>
<td>Name</td>
</tr>
<tr>
<td>&amp;OWNER</td>
<td>Owner (user id)</td>
</tr>
<tr>
<td>&amp;OPERATOR</td>
<td>User id</td>
</tr>
<tr>
<td>&amp;TYPE</td>
<td>Type of action of the threshold: NONE, TRIGGER, TRIGGER_RUNCMD, RESET, RESET_RUNCMD, MANUAL_RESET, or MANUAL_RESET_RUNCMD</td>
</tr>
<tr>
<td>&amp;TARGET_VALUE</td>
<td>Target value set by user to monitor</td>
</tr>
<tr>
<td>&amp;ACTUAL_VALUE</td>
<td>Actual value that occurred when trigger happened</td>
</tr>
</tbody>
</table>

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**Examples of Parameter Substitution for System Monitors**

1. The following command uses the &TIME and &TVAL parameters to pass to the program the time that the threshold was triggered and the trigger value:
   CALL LIB01/PROG02 PARM('&TIME' ' &TVAL').

2. The following command uses the &MON, &TVAL, &TDUR, and &VAL parameters on the Send Message command to send a message to the system operator when the threshold has been triggered:
   SNDMSG MSG('Monitor &MON exceeded threshold &TVAL for &TDUR interval(s); current value is &VAL.') TOUSR(*SYSOPR)

   The message displayed to the system operator is:
   Monitor MyMonitor exceeded threshold 50 for 1 interval(s); current value is 61.

   **Note:** Lengths subject to change across releases  last updated  8/14/2003
System Monitor Command Substitution Parameter Lengths

&DATE   Date (length 8) MMDDYYYY
&MON    Monitor name (length 1-64)
&TIME   Time (length 6) HHMMSS
&INTVL  Collection interval (length 1-4)
&RDUR   Reset duration (length 1-3)
&RVAL   Reset value (length 1-3)
&SEQ    Sequence number (length 10)
&TDUR   Trigger duration (length 1-3)
&TVAL   Trigger value (length 1-5)
&VAL    Current value (2) (length 1-5)

Message Monitor Command Substitution Parameter Lengths

&DATE   Date (length 8) one possible format: MMDDYYYY
&MON    Monitor name (length 1-64)
&TIME   Time (length 6) HHMMSS
&ENDPOINT Endpoint system name (length 1-256)
&EVTN    Event type and defined as follows: (length 1)
          Triggered Event = 1
          Manual Reset Event = 3
&FRMJOBNUMBER "From job number" for the message causing the trigger (length 6)
&FRMJOBNAME "From job name" for the message causing the trigger (length 1-10)
&FRMPROGRAM "From program" for the message causing the trigger (length 1-10)
&FRMUSER "From job user" for the message causing the trigger (length 1-10)
&INTVL  Collection interval length in seconds (length 1-4)
&MKEY   4-byte message key for the message causing the trigger as a hex string (length 11, format example x'000002A0' )
&MSGID   Message ID causing the trigger (length 7)
&MSGSEV  Message severity causing the trigger (length 1-2)
&MSGTYPE Message type causing the trigger (length 1)
&MSGCOUNT Current message count (that caused the trigger) (length 1-3)
&OWNER  Monitor owner (length 1-10)
&THRESHOLD Threshold number causing the trigger (length 1-3)
&TOLIB Message queue's library to which this message was sent (the library of the queue being monitored) (length 1-10)
&TOMSGQ Message queue name to which this message was sent (the queue being monitored) (length 1-10)

Job Monitor Command Substitution Parameter Lengths

&DATE   Date (length 8) one possible format: MMDDYYYY
&MON    Monitor name (length 1-64)
&TIME   Time (length 6) HHMMSS
&ENDPOINT Endpoint system name (length 1-256)
&EVTN    Event type and defined as follows: (4) (length 1)
          Triggered Event = 1
          Auto Reset Event = 2
          Manual Reset Event = 3
&INTVL  Collection interval length in seconds (length 0-4)
&JOBNAME  Job name of the job causing the trigger/reset (length 1-10)
&JOBNUMBER  Job number of the job causing the trigger/reset (length 6)
&JOBSTATUS  Job status causing a trigger/reset (7) (length 0-4)
&JOBTYPE  Job type of the job causing the trigger/reset (length 1)
&JOBUSER  Job user of the job causing the trigger/reset (length 1-10)
&METRICTYPE  Category of metric. For Job Monitor is defined as follows: (length 5)
                      Status Metric = 10010
                      Message Metric = 10020
                      Numeric Metric = 10030
&METRIC  Metric that has triggered/reset and defined as follows: (length 4)
                      Job Cpu Util      = 1010
                      Job Logical IO    = 1020
                      Job Disk IO       = 1030
                      Job Com IO        = 1040
                      Job Trans Rate    = 1050
                      Job Trans Time    = 1060
                      Job Thread Count  = 1070
                      Job Page Faults   = 1080
                      Sum Cpu Util      = 2010
                      Sum Logical IO    = 2020
                      Sum Disk IO       = 2030
                      Sum Com IO        = 2040
                      Sum Trans Rate    = 2050
                      Sum Trans Time    = 2060
                      Sum Thread Count  = 2070
                      Sum Page Faults   = 2080
                      Job Status        = 3010
                      Job Log Messages  = 3020
                      Sum Job Count     = 4010
&NUMCURRENT  Current numeric value (5, 6) (length 0-6)
&NUMRESET   Threshold value to cause auto-reset of numeric metric (1, 6) (length 0-4)
&NUMTRIGGER Threshold value to cause trigger of a numeric metric (5, 6) (length 0-6)
&OWNER  Monitor owner (length 1-10)
&RDR  Reset duration, in intervals, as set in the threshold (1) (length 0-3)
&RESETTYPE  Reset type and defined as follows: (3) (length 0-1)
                      manual reset = 1
                      automatic reset = 2
&SBS  Subsystem of the job causing the trigger/reset (length 1-10)
&SERVER  Server type of the job causing the trigger/reset (length 0-32) Not supported for summary metrics.
&TDUR  Trigger duration, in intervals, as set in the threshold (5) (length 0-3)
&THRESHOLD Threshold number causing the trigger (length 1-3)
&MSGID  Message ID causing the trigger/reset (2) (length 0-7)
&MSGSEV  Message severity causing the trigger/reset (2) (length 0-2)
&MSGTYPE  Message type causing the trigger/reset (2) (length 0-2)