IBM OMEGAMON for IMS on z/OS 5.5.0

Response Time Analysis Reference

Note

Before using this information and the product it supports, read the information in "Product legal notices" on page 47.

Notices

This edition applies to version 5, release 5, modification 0, of IBM® Tivoli® OMEGAMON® for IMS on z/OS® (product number 5698-T02) and to all subsequent releases and modifications until otherwise indicated in new editions.

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Chapter 1. Response Time Analysis overview

In IBM OMEGAMON for IMS on z/OS, response time is the time that it takes IMS to acknowledge an input message from the network and to initiate a response. The Response Time Analysis (RTA) component of OMEGAMON Classic captures detailed response time data from IMS and displays the response times of transactions in real time.

By using RTA, you can analyze transaction response times in real-time and use the information to understand the effects of your tuning measures, system modifications, and changing workloads. In addition, you can use the Response Time Monitor (RTM) feature to display the transactions and logical terminals with the worst response times.

Functions of the Response Time Analysis component

The Response Time Analysis (RTA) component of OMEGAMON Classic extends the capabilities of OMEGAMON Classic to include real-time tabular and graphic displays of transaction response times.

The RTA component receives input from IMS log records. To gain controlled access to these records, the RTA component dynamically alters the call address of the IMS physical logging routine. The RTA component scans the physical log buffers within the RTA address space in tandem with the IMS physical logging routine. If an error occurs, the RTA component recovers and restores the address of the IMS physical logging routine so that the RTA routine is not called again. After recovery, processing resumes within the IMS physical logging routine.

The RTA component analyzes the response time data that it captures from IMS and generates detailed response time data for all transactions, including fast path transactions. The component stores the detailed data in summary buckets and reports the data for user-specified groups. For information about these groups, see the *IBM OMEGAMON for IMS Realtime Commands Reference*. You can also analyze response times for transactions that are processed by message-driven BMP applications.

Stages of a typical IMS transaction

The Response Time Analysis (RTA) component is an event-driven collector that measures queuing and service times within IMS of transactions that are processed in a series of distinct stages.

A typical IMS transaction proceeds through the following stages:

1. The communications network receives the input message text from a node, such as a terminal.
2. The message queue stores the message for subsequent processing until all necessary resources are available to process the transaction.
3. Application programs can add other messages to the input message queue during the processing of transactions.
4. When resources are available, an application program is scheduled to process the messages for this transaction. The application program issues a DL/I message **Get Unique (GU)** call by using the I/O PCB to receive the input message text from the message queue.
5. During application processing, output messages are prepared for various system destinations. Some output messages are directed to other transactions within the system or go to the input message queue. The remaining messages go to communications destinations, for example, the terminals within the network. The message queue also stores these output messages.
6. After the application program completely processes the transaction, IMS takes the output messages from the message queues for delivery to final destinations. Output queue times can be lengthy if the network or the user is not immediately ready to receive the message.
7. Later, the user, a system device such as a printer, or another system receives these messages.
8. IMS purges the output message from the system.

Figure 1 on page 2 shows the components of response time for a typical IMS transaction. RTA also supports variations of these components.

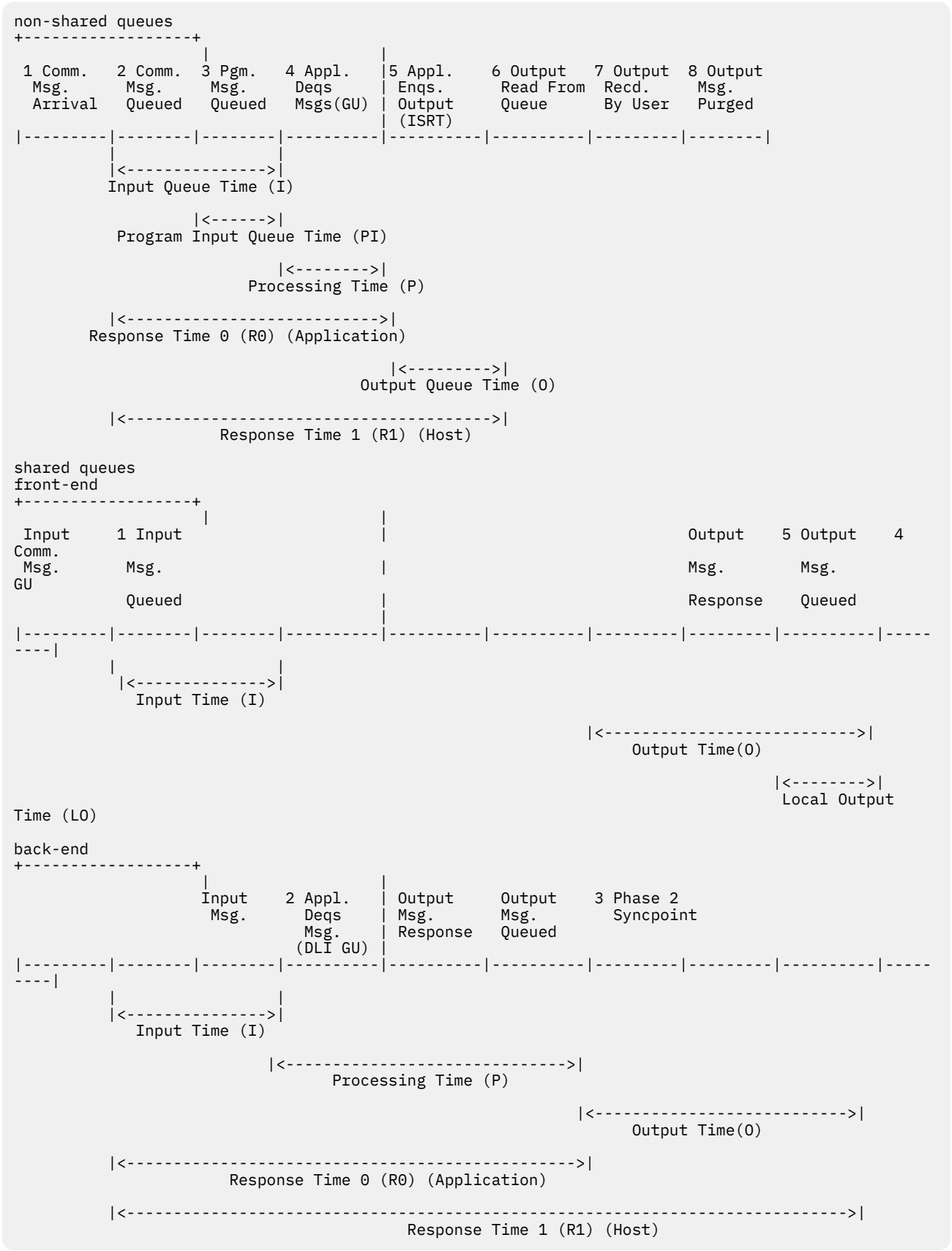

Figure 1. Components of IMS response time

Note: If you are running only in a Database Control (DBCTL) environment, RTA data is not available because DBCTL systems do not have Data Communications (DC) support. Therefore, neither transactions nor message queues exist. However, the RTA component can measure transaction response time in an IMS DB/DC system that serves as a DBCTL system.

RTA response time components

RTA response time consists of different time components such as input time, processing time, and output time, which are shown in Figure 1 on page 2 and are described in the following list. The abbreviations in parentheses (I, PI, P, R0, O, R1, and LO) are used to select the type of response time component for analysis by the IRSP, SRSP, GRSP, and ISET commands.

Input Queue Time (I)
For input messages that are sent by a communications input device, for example a terminal, the time that the message spends on the input queue before it is delivered to an application program (from stage 2 - 4). This time includes queue time, scheduling, program load, and program initialization.

Program Input Queue Time (PI)
For input messages that do not initiate from a terminal, for example a program-to-program switch or MSC link, the time that the message spends on the input queue before it is delivered to an application program (from stage 3 - 4). The time includes queue time, scheduling, program load, and program initialization. PI is not a subset of I.

Processing Time (P)
The time during which an application program processes the message. The time begins with the program message `Get Unique`, and ends with another `Get Unique` message, program termination, sync point, application program abend, or cancellation of the message.

Response Time 0 (R0)
The internal systems application response time for the transaction, which is the sum of I, or PI, and P, from stage 2 - 5.

Output Queue Time (O)
The amount of time that an output message spends waiting on the output message queue. This time begins with output message insert and ends with a communications `Get Unique` program message.

Response Time 1 (R1)
The total host response time for the transaction, which is the sum of I or PI, P, and O. R1 response time is greater than R0 response time. However, R1 response times are not recorded for a transaction if the transaction does not have an Output Queue Time component. Transactions with express output messages, that is, messages that are issued before sync point, can have an R1 value that is less than the R0 value because such transactions issue a response before transaction completion. R1 times are not produced for inquiry transactions that cannot be recovered because the LTERM ID of the originating terminal is not available. These times are defined as INQUIRY= (YES, NORECOV) on the TRANSACT macro from stage 2 - 6.

The RTA component does not produce R1 times for transactions that are returning a message to a terminal other than the originator.

LOT (LO)
Local output time. The amount of time that a transaction output spends on the local output queue. The time starts when the transaction output is fetched from the shared queue, and stops when the transaction output is fetched from the local terminal queue and delivered to the terminal by using the communications `Get Unique` - log record type 35.

Types of response time analysis performed by RTA

The Response Time Analysis (RTA) component tracks response times and analyzes the response time data by time intervals, time slots, and moving time slots. You can also use the RTA component to view the transactions and terminals with the poorest response time.

The following table lists the types of response time analysis that RTA provides.

Table 1. Types of RTA data	
RTA type	**Description**
Time interval analysis (IRSP)	Displays response time information for 3 user-defined intervals.
Selected time slot analysis (SRSP)	Displays response time data for a specified period, for example, 9 a.m. to 10 a.m.
Moving time slot analysis (GRSP)	Provides a graphical display of response time data for the last 10 minutes.
Response time monitor	Displays transactions or terminals with the worst response time.

Time interval analysis (IRSP)

The conventional way to analyze response time is to use a background reporting method, which reports issues with response time hours after the problems occur. In contrast, time interval analysis (IRSP) reports issues with short-term response time as the problems happen.

You can use time interval analysis to identify the IMS resources that are associated with poor response time and correct the problems in real time so that the response time continues to improve. You can further investigate the problems by using the real-time performance (OMEGAMON) and bottleneck analysis (DEXAN) components of OMEGAMON Classic to determine possible causes for the poor response time. Then, when you determine the cause, you can use OMEGAMON Classic features to correct the problem immediately.

Note: Because RTA is an event-driven collector and bottleneck analysis (DEXAN) is a sample-driven collector, do not compare the response time data values directly to the degradation data values.

The RTA component displays response times over three short-term intervals. For example, you can display the response time for 5, 10, and 30-minute intervals. You can vary the intervals, but the second interval must be a multiple of the first, and the third interval must be a multiple of the second. RTA presents time interval analysis results in a table.

See "Time interval analysis (IRSP) displays" on page 19 for information about how to display the response time data.

Time slot analysis (SRSP)

You use time slot analysis (SRSP) to monitor response time from a long-term perspective. The RTA component retains response time data for selected time slots during the day and displays the data upon request.

The RTA component can monitor up to 48 different time slots during the day. For example, to display the response time of a transaction between 6 a.m. and 9 a.m., you set up a time slot to cover this period. Then, later in the day, you can use the SRSP command to view the response time data that was captured for the 6 a.m. – 9 a.m. slot. Time slots cannot overlap, but you can leave gaps during the day for low-volume periods. The RTA component presents time slot analysis results in a table.

See "Time slot analysis (SRSP) displays" on page 24 for information about how to display the response time data.

Moving time slot analysis (GRSP)

Moving time slot analysis (GRSP) presents a graphic display of short-term response time data, that is, for the previous 10 minutes. Moving time slot analysis displays the following items

- *Fixed* items, which are the critical groups or group items that you want to monitor continually
- *Dynamic* items, which are monitored only when the items exceed their response time thresholds

You can also use moving time slot analysis to display the short-term response times for all response time components to identify the principal cause for response time delay.

The data display shows response time data for the current minute and the previous 9 minutes. Each minute before the current minute results in a shift to the left of the displayed response in the graph. At the top of each graphical partition, the RTA component shows the response time numerically for the past minute. Asterisks (*) are automatically displayed after any item that exceeds the thresholds that you define.

See "Moving time slot analysis (GRSP) displays" on page 30 for information about how to display the response time data.

The Response Time Monitor

The Response Time Monitor (RTM) analyzes transactions and logical terminals with the poorest response time during short-term intervals, and displays the information in a table. You can adjust several parameters to change the number of transactions that you want to display on a screen, the time interval, and the type of monitoring that you want, such as a fixed or moving window. For example, you can instruct the RTA component to display the 20 transactions with the poorest response time within a continually moving 10-minute interval.

The RTM monitors all transactions and logical terminals. It runs independent of group definitions; however, the transactions and terminals that the RTM identifies might be ones that you want to include in groups that you monitor.

See "Response Time Monitor data displays" on page 36 for more information about RTM.

Response Time Analysis monitoring by groups

While you can track response time dynamically, you can also assign specific transaction sets to groups. A transaction set might consist of critical transactions, PSBs, transaction classes, or logical terminals that must be monitored. By using groups, you can track response time by application, for example, or monitor transactions that encountered performance problems in the past.

A group is either a transaction, a logical terminal, or a node-related group. A transaction group contains only transactions and PSBs. A logical terminal group contains only logical terminals (LTERMs). A node group contains only nodes. You cannot mix group types. For example, you cannot define an LTERM in a group that already has transactions that are defined.

There are two special groups for RTA monitoring. SYSTEM is a composite of response times for all transactions. OTHER is a composite of response times for transactions that are not monitored within any specific group. SYSTEM and OTHER appear in certain RTA displays; however, they might be omitted from some of the examples in this reference guide.

The RTA component shares the group definition concept with the OMEGAMON and bottleneck analysis (DEXAN) components of OMEGAMON Classic. See the *IBM OMEGAMON for IMS on z/OS: Realtime Commands Reference* for information about defining groups.

Response Time Analysis exceptions

The purpose of the Automatic Response Time Threshold Monitoring Facility (ARSP) is to issue a warning to notify you when IMS average response time exceeds critical installation thresholds. Automatic, immediate notifications free you from the requirement to continually monitor a Response Time Analysis (RTA) display terminal.

ARSP integrates the OMEGAMON Classic exception analysis feature with the RTA component. The ARSP exception is part of the IM (IMS Internal) group of OMEGAMON Classic exceptions. You can also use ARSP with the exception logging facility (XLF) and the automatic screen facility (ASF) to automatically call screens that contain problem-solving IMS and z/OS commands.

The ARSP requires the following conditions to operate:

- RTA must be active and collecting data.
- Exception analysis must be active.

ARSP continually monitors response time components (I, PI, P, R0, O, R1, and LO) against a specified critical threshold, and generates a warning message to the terminal that indicates the problem. ARSP examines response time components of groups or group items, that is, transactions, logical terminals, PSBs, and classes, and analyzes average response time data within the first time interval established for Time Interval Analysis. To collect a significant amount of data, ARSP waits until the first minute of the interval has passed before it analyzes any data.

By default, the KIPGLB global definitions member that is in effect for the OMEGAMON Classic address space controls the group definitions, the critical thresholds, and the time interval. You use the EXCEPTION_THRESHOLD parameter in your KIPGLB member to define the ARSP critical exception thresholds for a group or for an item that is assigned to one or more groups. You can specify a threshold for each response time component or use the same threshold across all components. You specify the thresholds in tenths of a second or milliseconds, depending on the UNITS parameter. You use TIME_INTERVALS to define the intervals for time interval analysis. See the *IBM OMEGAMON for IMS on z/OS: Planning and Configuration Guide* for more information about KIPGLB.

You can also issue commands to dynamically define groups and change the settings. The last changes that are made remain in effect until the OMEGAMON Classic address space stops, the KIPGLB member is reloaded, or another KIPGLB member is loaded. Use the **ICTL** immediate command to dynamically change the time interval. RTA data collection must be stopped before you can change the interval. Use the **ISET** immediate command to dynamically set the exception thresholds for a group or an item. See the *IBM OMEGAMON for IMS on z/OS: Realtime Commands Reference* for information about defining groups.

ARSP can display a maximum of 25 exception messages per screen. Therefore, be selective about which response times you monitor.

ARSP sample display

Figure 2 on page 6 shows a sample of ARSP exceptions. In this example, the exception thresholds for the I, P, R0, O, R1, and LO response times for the group that is named CLASS 1 were exceeded. In addition, the O, R1, and LO exception thresholds for the PART transaction were exceeded.

```
 _____________ KOISYS   VTM     OI-II    V530.AL I81C 06/04/15 12:31:11    B
 Help PF1       Back PF3        Up PF7        Down PF8        Zoom PF11

 For an explanation of an exception, place the cursor on the exception
 name and press PF11.

 ================================================================================
                            Systemwide Exceptions

XIMS       OMEGAMON/IMS Exception Analysis
 ARSP Average   INPUT QUEUE TIME    for GROUP CLASS 1   is    2.8 m-secs
 ARSP Average   PROCESSING TIME     for GROUP CLASS 1   is  167.1 m-secs
 ARSP Average   OUTPUT QUEUE TIME   for GROUP CLASS 1   is  924.3 m-secs
 ARSP Average   RESPONSE TIME-0     for GROUP CLASS 1   is  169.9 m-secs
 ARSP Average   RESPONSE TIME-1     for GROUP CLASS 1   is  179.5 m-secs
 ARSP Average   LOCAL OUTPUT TIME   for GROUP CLASS 1   is   21.1 m-secs
 ARSP Average   OUTPUT QUEUE TIME   for TRANS PART      is  924.3 m-secs
 ARSP Average   RESPONSE TIME-1     for TRANS PART      is  179.5 m-secs
 ARSP Average   LOCAL OUTPUT TIME   for TRANS PART      is   21.1 m-secs
  ================================================================================
```

Figure 2. ARSP sample display

Chapter 2. Response Time Analysis data collection

To view response time data, configure the IMS Log Write user exit and ensure this user exit is active. In addition, ensure that the Response Time Analysis (RTA) data collector is active within the OMEGAMON address space.

For the RTA data collector, a standard installation typically configures the automatic start of the RTA component and activates data collection at OMEGAMON startup.

By default, RTA data collection uses Coordinated Universal Time (UTC) values that are located within most of the IMS log records. For those IMS log records that do not contain UTC values, RTA uses STCK (Store Clock) that is located within the log record and converts these values to UTC format. Other IBM products such as IMS Performance Analyzer and Problem Investigator calculate response time metrics in the same way.

Because IMS log records represent very near term historical data, when the system time is changed, for example, daylight savings time, response time metrics might become skewed for inflight transactions. This is a short-term issue which will remedy itself when the reporting interval pops. If you find it bothersome, specify the following configuration option:

Member KOICFG*xx*, where *xx* is the MPREFIX specified in the OMEGAMON STC, in the RKANPARU data set specifies global configuration variables that OMEGAMON can read at runtime. At the bottom of Member KOICFG*xx*, update the user section to add the *KI5_RTA_USESTCK* configuration variable. When the *KI5_RTA_USESTCK* variable is set to YES, RTA uses only Store Clock (STCK) values within the IMS log records. The STCK values are immune to system time change and therefore don't have the same issues as UTC time values.

The following example shows that user section of Member KOICFG*xx* is updated to add the KI5_RTA_USESTCK configuration variable that is set to YES:

```
*****************************************************************
* USER SECTION: OVERRIDE FOR MEMBER %SYSSTEPNAME%(%SYSMEMBER%)
*****************************************************************
* -------------- BEGIN - USER SECTION: OVERRIDE -------------- *
KI5_RTA_USESTCK              YES
* -------------- END   - USER SECTION: OVERRIDE -------------- *
```

Figure 3. User section of Member KOICFGxx with the KI5_RTA_USESTCK configuration variable

Member KRIRTA*mp* in *rhilev*.RKANPARU contains the commands to start RTA. KRIRTA*mp* is created during the PARMGEN configuration process, and is run by the KOI*mp*P00 PARM file when you start the OMEGAMON Classic address space. When OMEGAMON Classic starts, it also loads the KIPGLB member, which is identified by the GLOBAL parameter in the startup procedure, from the RKIPGLBL DD data set. The KIPGLB member contains the global defaults for RTA, including the time intervals, time slots, and group definitions.

The RTA component displays response time data when you issue the associated major and minor commands. The values in the KIPGLB member that is in effect control RTA, however, you can dynamically change the parameters. To modify the RTA data collection parameters, you must deactivate the RTA component. Then, after you modify the collection parameters, reactivate RTA to start data collection with the changes.

When you first use the RTA component, start with the default data collection parameters. With experience, you can modify the default values to match your requirements. The default RTA parameters are listed in the following table. For more information about KIPGLB, see the *IBM OMEGAMON for IMS on z/OS: Planning and Configuration Guide*.

Table 2. RTA default parameters		
Parameter	**Default**	**Range**
Time Intervals	15, 30, 60	1-999 minutes
Moving Time Slots Scale	2 seconds	1-999 seconds
Moving Time Slots Window	10 minutes	1-10 minutes
Time Slots (up to 48 permitted)	0000-0800 0800-0900 0900-1000 1000-1030 1030-1100 1100-1130 1130-1200 1200-1300 1300-1400 1400-1430 1430-1500 1500-1530 1530-1600 1600-1700 1700-1800 1800-1900 1900-2000 2000-2400	0-2400

Accessing the Response Time Analysis component

You can access the Response Time Analysis (RTA) component from the OMEGAMON Classic menu interface. The RTA component in the OMEGAMON Classic menu interface consists of a set of commands and screens that operate RTA and provide access to response time analysis data. Using the RTA screens, you can start and stop RTA data collection, change the way that RTA collects data, and view response time data.

You access RTA features from the **Response Time Menu** (KRIRTI) panel, which is available by using option **R** on the **Main Menu** panel in the OMEGAMON Classic interface.

1. The **Main Menu** panel, which is shown in the following figure, is the entry into OMEGAMON Classic components.

```
 _________________ ZMENU    VTM     OI-II    V530.AL I81C 06/04/15 15:25:52    B
> Help/News PF1           Exit PF3          Keys PF5          Command Mode PF12
> Return to CUA PA2       Colors PF18
>                  Enter a selection letter on the top line.
================================================================================
>               OMEGAMON for IMS Performance Monitor Main Menu

_ E  EXCEPTIONS ....... Current and potential system problems, latch conflicts
_ R  RESPONSE TIME .... Transaction response times (RTA users)
_ B  BOTTLENECKS ...... Resource contention (bottleneck analysis) (DEXAN users)
_ H  APPLICATION HIST.. Application History

_ M  MONITOR .......... IMS status, graphs, and time controlled operations
_ W  WORKLOAD ......... PSBs, DMBs, transactions, regions, and classes
_ Y  OTMA ............. OTMA status, TMEMBERs, and TPIPEs
_ L  LINES ............ Terminals, nodes, and lines
_ A  ALL POOLS ........ Communication, database, and program pools
_ C  COMPONENTS ....... I/O, logging, storage, and control blocks/modules

_ F  FAST PATH ........ IMS Fast Path information
_ O  OTHER SYSTEMS .... External subsystems (DB2 and MQ) and XRF information

_ T  TOOLS ............ Operator tools
_ P  PROFILE .......... Profile maintenance and session settings
>
================================================================================
```

Figure 4. Main menu

2. Use option **R** on the **Main Menu** panel to proceed to the **Response Time Menu** (KRIRTI) panel, which is shown in the following figure.

```
 _________________ KRIRTI   VTM     OI-II    V530.AL I81C 06/04/15 15:28:54    B
> Help PF1                    Exit PF3
>                   Enter a selection letter on the top line.
================================================================================
>                              Response Time Menu

_ A  PROBLEMS ............ Transactions and LTERMs with longest response times
_ B  GRAPH ............... 10-minute historical graph
_ C  TIME OF DAY ........ Response time by time-of-day slots
_ D  INTERVALS .......... Response time by recent time intervals
_ E  CONTROL ............ Start/stop RTA and control data collection
_ F  OPTIONS ............ Display time slot and group definitions

================================================================================
```

*Figure 5. **Response Time Menu***

3. Use the options on the menu to display analysis data of the response time information, to start and stop the RTA component, and to specify data collection options.
   For example, select option **B GRAPH** to view a graphical display of response time data. Figure 6 on page 10 shows the **GRAPH** menu option screen.

```
 _________________ KRIGRAF  VTM     OI-II    V530.AL I81C 06/04/15 15:56:57    B
> Help PF1               Back PF3              Up PF7                Down PF8
================================================================================
>                     10-Minute Historical Graph

> The moving time slot analysis provides a graphic display for the selected
> IMS.

> To display response time information about a specific group, type the group
> number directly after GRSP below and press ENTER.

> To display information about all of the response time components, type AL
> directly after TIME and press ENTER.

 GRSP  >>  Transaction Group totals display  <<
 time    | CLASS 1  | GROUP 03 |          |>GROUP 05<|>CLASS 1 <|>SYSTEM  <|
+        |  0.00000 | 0.000000 |          | 0.017783 |  0.017783|  0.017783|
+        |==========+==========+==========+==========+==========+==========+
+ m  99.0| *        |          |          | **       | **       | **       |
+ i  89.1| *        |          |          | **     * | **     * | **     * |
+ l  79.2| *        |          |          | **     * | **     * | **     * |
+ l  69.3| *        |          |          | **     * | **     * | **     * |
+ i  59.4| *        |          |          | **     * | **     * | **     * |
+ s  49.5| *        |          |          |-+--++--+-| **     * | **     * |
+ e  39.6| *        |  *       |          | **  *  * | **  *  * | **  *  * |
+ c  29.7| *        |  *       |          | **  *  * | **  *  * | **  *  * |
+ s  19.8| *        |  *       |          | ** **  **| **  *  **| **  *  **|
+     9.9| *        |  **      |          | ** **  **| ** **  **| ** **  **|
+        +----------+----------+----------+----------+----------+----------+
+           *****      *****                *****       *****      *****
+     min -8-6-4-2-0 -8-6-4-2-0 -8-6-4-2-0 -8-6-4-2-0 -8-6-4-2-0 -8-6-4-2-0
================================================================================
```

Figure 6. GRAPH menu option screen

Starting and stopping Response Time Analysis data collection

Use the **IRTA** immediate command to start and stop RTA data collection.

Although your installation might automatically start the RTA component when OMEGAMON Classic initializes, you can use the **IRTA** immediate command to dynamically start and stop RTA. For example, to change data collection parameters, such as the time intervals, or load a different KIPGLB member, you must first stop RTA data collection. Then, you can make your change and restart RTA.

1. From the **Response Time Menu** (KRIRTI) panel, select option **E, CONTROL** to proceed to the **Start/Stop RTA and Control Data Collection** (KRIIRTA) panel, which is shown in the following figure.

```
 _________________ KRIIRTA  VTM     OI-II    V530.AL I81C 06/04/15 15:34:35    B
> Help PF1               Back PF3              Up PF7                Down PF8
================================================================================
>              Start/Stop RTA and Control Data Collection

> To control RTA data collection, select an action and remove the > preceding
> IRTA below the description of that action.

> Start RTA data collection:
>IRTA START

> Stop RTA collection and delete the RTA collector
> and buckets from the system:
>IRTA STOP

> Clear RTA data collection buckets:
>IRTA RESET

================================================================================
```

Figure 7. Start/Stop RTA panel

2. Remove the > character that precedes the action that you want to perform, that is, Start, Stop, or Reset RTA data collection, then press **Enter**.

For example, to stop RTA data collection, enter the following command:

```
IRTA STOP
```

Note: The **IRTA** command does not modify the **RMON** command. When you stop RTA, the Response Time Monitor does not stop. However, you cannot run **XMON** or **TMON** if RTA is not active.

IRTA START options

You can use the following options with the **IRTA START** command.

XCFGROUP=*cccccccc*
The XCF group name, maximum 8 characters long. The RTA component connects to this group in shared queue environments to collect RTA data for shared transactions. The default value is KI2RTASQ.

SLOUGH=

YES
Specify YES, the default, to delete incomplete RTA records every 30 minutes.

NO
Specify NO to never delete incomplete RTA records. Specify NO only if you want RTA data for very long running transactions.

IRTA RESET options

You can use the following options with the **IRTA RESET** command.

BMPXON
Exclude BMP data from generated reports. This is the default. BMPXON is equivalent to BMP=OFF.

BMPXOFF
Include all BMP data in generated reports. BMPXOFF is equivalent to BMP=ON.

BMP=

OFF
Exclude BMP data from generated reports. This is the default. BMP=OFF is equivalent to BMPXON.

ON
Include all BMP data in generated reports. BMP=ON is equivalent to BMPXOFF.

If more than one of the options is coded, the first option becomes active. The system ignores the others.

IRTA status

To see the status of RTA data collection, enter IRTA with no parameters or enter IRTA?.

Changing the time intervals

You can change the default time intervals interactively when the data collector is inactive. Use the **ICTL** immediate command to change the time intervals.

If the RTA component is active, you must stop it before you can change the time intervals. Run the **IRTA STOP** command to stop RTA.

The intervals define the short-term intervals that are used by time interval analysis (IRSP). The first time interval also controls the ARSP exception, which is described in "Response Time Analysis exceptions" on page 5. The values for TIME_INTERVALS in the KIPGLB member that is in effect are used as the default intervals, unless you override them by using the **ICTL** immediate command.

- The **ICTL** immediate command has the following format.

```
ICTLa x,y,z
```

Figure 8. ICTL command format

x,y,z
Specify the short-term intervals in minutes 0 - 999. If you omit an argument, **ICTL** uses the current value of the omitted argument. The second argument must be a multiple of the first, and the third argument must be a multiple of the second.

For example, you can change the time intervals by entering the following command.

```
 ICTL 10,20,60
```

When you press **Enter**, RTA responds.

```
>ICTL  010,020,060
+      >> processing complete <<
```

Note: RTA places a comment symbol (>) in column 1 to prevent re-execution of the command.

a
Specify a ? to display the current time intervals. You can run ICTL? regardless of whether RTA data collection is active.

For example, when you enter ICTL?, RTA displays the current intervals as shown in the following example.

```
 ICTL? 005,015,060
```

If RTA is not active, you can type over the values, delete the ?, and then press **Enter** to change the intervals.

If the intervals that you enter are not valid, the RTA component displays an error message as shown in the following examples. You can type over the error, then press **Enter** to reenter the command.

```
 ICTL  005,015,055
+      >> 055 is not multiple of 015 -- error <<

 ICTL 1,2,3000
+         *
+                >> input greater than 999 in column marked above <<

 ICTL
+                 >>  enter new time intervals above <<
```

If you try to change the intervals while the RTA data collector is active, the RTA component displays an error and ignores the command.

After you change the time intervals, restart RTA data collection. See “Starting and stopping Response Time Analysis data collection” on page 10.

Changing moving time slot settings for a group

You can interactively change the moving time slot settings for a group, even when the data collector is active. Use the **ISET** immediate command with the **GRP** keyword to change settings for the specified group.

The settings defined for a group control when the group appears in the moving time slot analysis (GRSP) graph. You can specify that the group always appears in the graph, or dynamically appears based on when response time thresholds are exceeded. The settings also define the critical exception thresholds that are used by ARSP, which is described in “Response Time Analysis exceptions” on page 5.

By default, the settings that control a group are defined in **<<GROUP>>** statements in the KIPGLB member that is in effect. In KIPGLB, the **RESPONSE_TIME_THRESHOLD** parameter sets the thresholds and the **FIX** parameter specifies whether the group always displays or dynamically displays. The

EXCEPTION_THRESHOLD parameter sets the exception thresholds for ARSP. You can override the defaults for a group by using the **ISET** immediate command with the **GRP** keyword and the keywords for the settings that you want to change.

- The **ISET** immediate command with the **GRP** keyword has the following format.

```
xISETyy GRP=xxxxxxxx NAME=cccccccc THRESH=nnnn FIX=YES|NO EXPTHR=mmmm
```

Figure 9. ISET command format for groups

x
Specify L to list current parameter values. For example, when you enter LISETAL GRP=01 to list the settings for all of the response time types for group 01, RTA displays the current settings as shown in the following example.

```
LISETAL GRP=01
+  Group name = CVTCLS01
+  Resp Type:  I     PI    P     O     R0    R1    LO
+  Thresholds: 0001  0001  0001  0001  0001  0001  0001
+  Fix yes/no: Yes   Yes   Yes   Yes   Yes   Yes   Yes
+  Exp thresh: 0001  0001  0001  0001  0001  0001  0001
```

Specify D to mark the group ineligible for display. This option sets FIX=NO and THRESH=0000.

yy
Specify one of the following response types:

I
Input Queue Time

LO
Local Output Time

O
Output Queue Time

P
Processing Time

PI
Program Input Queue Time

R0
Response Time 0

R1
Response Time 1

AL
All of the response time types

xxxxxxxx
Specify the number or name of the group that you want to change. If you specify a name that includes blanks, you must enclose the name in single quotation marks.

cccccccc
Specify the new name for a group. Use the **NAME** parameter only if you want to change the name of the group. The name can be 1 - 8 characters. It can include blanks, but must be enclosed in single quotation marks.

nnnn
Specify the threshold for dynamic display transactions as 0 - 9999 tenths of seconds. If nnnn=0, this group is not eligible for dynamic display.

Use the **THRESH** parameter only if you want to change the response time threshold, where *yy* identifies which threshold to change. When yy=AL, then all of the response time thresholds are set to *nnnn*.

YES|NO
Specify whether the group is fixed for display. Use the **FIX** parameter only if you want to change whether the group is fixed for display (YES) or not (NO). You can specify a different **FIX** value for each type of response time. When yy=AL, then the **FIX** setting is assigned to each type of response time.

mmmm
Specify the critical threshold for the average response time, where the ARSP exception displays 0 - 9999 tenths of a second. Use the **EXPTHR** parameter only if you want to change the critical threshold, where *yy* identifies which threshold to change. When yy=AL, then all of the critical thresholds are set to *mmmm*.

Changing moving time slot settings for a group item

You can interactively change the moving time slot settings for a group item, even when the data collector is active. Use the **ISET** immediate command with the **TRAN**, **TERM**, **PSB**, or **CLASS** keyword to change settings for the specified group item.

The settings defined for a group item control when the group item appears in the moving time slot analysis (GRSP) graph. You can specify that the group item always appears in the graph, or dynamically appears based on when response time thresholds are exceeded. The settings also define the critical exception thresholds that are used by ARSP, which is described in "Response Time Analysis exceptions" on page 5.

Often, there may be no moving time slot settings for a group item because the item is monitored within context of the group or groups in which it is contained. However, you can also track the response times of a group item. By default, you specify the settings that control a group item in **<<ID>>** statements in the KIPGLB member that is in effect. In KIPGLB, the **RESPONSE_TIME_THRESHOLD** parameter sets the thresholds and the **FIX** parameter specifies whether the group item always displays or dynamically displays. The **EXCEPTION_THRESHOLD** parameter sets the exception thresholds for ARSP. You can override or set the defaults for a group item by using the **ISET** immediate command with the **TRAN**, **TERM**, **PSB**, or **CLASS** keyword and the keywords for the settings that you want to change.

Note: When you change the settings for a group item, you affect the item in all groups that contain the item.

- The **ISET** immediate command with the **TRAN**, **TERM**, **PSB**, or **CLASS** keyword has the following format.

```
xISETyy item=xxxxxxxx THRESH=nnnn FIX=YES|NO EXPTHR=mmmm
```

Figure 10. ISET command format for group items

x
Specify L to list current parameter values.

Specify D to mark the group item ineligible for display. This option sets FIX=NO and THRESH=0000.

yy
Specify one of the following response types:

I
Input Queue Time

LO
Local Output Time

O
Output Queue Time

P
Processing Time

PI
Program Input Queue Time

R0
Response Time 0

R1
Response Time 1

AL
All of the response time types

item=xxxxxxxx
Specify the group item that you want to change. The item can be one of the following values:

TRAN=xxxxxxxx
xxxxxxxx indicates the transaction name

TERM=xxxxxxxx
xxxxxxxx indicates the LTERM name

PSB=xxxxxxxx
xxxxxxxx indicates the PSB name

CLASS=nnn
nnn indicates the transaction class

nnnn
Specify the threshold for dynamic display transactions as 0 - 9999 tenths of seconds. If nnnn=0, this group item is not eligible for dynamic display.

Use the **THRESH** parameter only if you want to change the response time threshold, where *yy* identifies which threshold to change. When yy=AL, then all of the response time thresholds are set to *nnnn*.

YES|NO
Specify whether the group item is fixed for display. Use the **FIX** parameter only if you want to change whether the item is fixed for display (YES) or not (NO). You can specify a different **FIX** value for each type of response time. When yy=AL, then the **FIX** setting is assigned to each type of response time.

mmmm
Specify the critical threshold for the average response time, where the ARSP exception displays 0 - 9999 tenths of a second. Use the **EXPTHR** parameter only if you want to change the critical threshold, where *yy* identifies which threshold to change. When yy=AL, then all of the critical thresholds are set to *mmmm*.

Changing the moving time slot scale

You can change the moving time slot scale interactively, even when the data collector is active. Use the **ISET** immediate command with the **SCALE** keyword to change the scale.

The scale controls the number of seconds of response time that are represented on the vertical axis of the moving time slot analysis (GRSP) graph. The RTA component divides the vertical axis into 10 points, each 1/10 of the scale height.

The values for **SCALE** in the KIPGLB member that is in effect are used as the defaults, unless you override them by using the **ISET** immediate command with the **SCALE** keyword. You can set the scale for all of the response time types to the same value or assign a unique value to each response time type.

- The **ISET** immediate command with the **SCALE** keyword has the following format.

```
xISETyy SCALE=nnn
```

Figure 11. ISET with SCALE command format

x

Specify L to list current scale values. For example, when you enter LISET SCALE, RTA displays the current scale values for all of the response types as shown in the following example.

```
LISET SCALE
+  Scale values:  I=002  PI=002   P=002   O=002  R0=002
+                R1=002  LO=002
```

yy

Specify one of the following response types:

I
Input Queue Time

LO
Local Output Time

O
Output Queue Time

P
Processing Time

PI
Program Input Queue Time

R0
Response Time 0

R1
Response Time 1

AL
All of the response time types

nnn

Specify the display scale as 1-999 seconds.

Note: The scale is seconds or milliseconds depending on the **UNITS** parameter in the KIPGLB member that is in effect.

Changing the moving time slot window setting

You can interactively change the number of previous minutes that are examined and displayed by moving time slot analysis (GRSP), even when the data collector is active. Use the **ISET** immediate command with the **WINDOW** keyword to change the value.

The **WINDOW** value controls the number of minutes, up to a maximum of 10, that are represented on the horizontal axis of the moving time slot analysis (GRSP) graphs. With a value of 10, you can display the transactions that exceed their response time thresholds during the current minute or any of the previous 9 minutes.

The value for **WINDOW**, if specified, in the KIPGLB member that is in effect is used as the default. If **WINDOW** is not specified in the KIPGLB member, the default is 10. You can override the default by using the **ISET** immediate command with the **WINDOW** keyword.

- The **ISET** immediate command with the **WINDOW** keyword has the following format.

```
xISET  WINDOW=nn
```

Figure 12. ISET with WINDOW command format

x

Specify L to list the current value for **WINDOW**. For example, when you enter `LISET WINDOW`, RTA displays the current value as shown in the following example.

```
LISET  WINDOW=10
```

nn

Specify the number of minutes in which the system can check that a transaction exceeded its threshold, where the *nn* value is the last 1 - 10 minutes that RTA uses to check whether the transaction exceeded its threshold. For example, **WINDOW=1** shows those dynamic transactions with response times that exceeded their threshold during the *current* minute (numbered zero on the display). **WINDOW=10** shows those dynamic transactions with response times that exceeded their threshold during any one of the last 10 minutes.

Chapter 3. Response Time Analysis displays

You use Response Time Analysis (RTA) commands to view the response time data that is collected by the RTA component. You can view an analysis of the data by time intervals, time slots, and moving time slots. You can also see the worst-performing transactions and logical terminals.

With time interval analysis, time slot analysis, and moving time slot analysis, the response time information is displayed by groups and group items. You can optionally select the groups or group items whose data you want to display. By default, group definitions and other RTA options are controlled by the KIPGLB member that is in effect, however you can dynamically change some of the settings. For more information, see Chapter 2, "Response Time Analysis data collection," on page 7.

The information about the worst-performing transactions and logical terminals is independent of the group definitions. This information is controlled by the Response Time Monitor (RTM).

Note: The RTA data collector must be active before you can view response time data. See "Starting and stopping Response Time Analysis data collection" on page 10.

Response time analysis information is available for the following categories.

Time interval analysis (IRSP) displays

You use time interval analysis displays to monitor response times over three short-term intervals.

Use the **IRSP** major command to select time interval analysis and the groups or group items that you want to monitor. By default, the time intervals, for example, 5, 10, and 30 minutes, and the groups and group items are defined by the KIPGLB global definitions member that is in effect. However, you can dynamically change the settings. See "Changing the time intervals" on page 11. Also, see the *IBM OMEGAMON for IMS on z/OS: Realtime Commands Reference* for information about defining groups and *IBM OMEGAMON for IMS on z/OS: Planning and Configuration Guide* for information about KIPGLB. If you vary the time intervals, the second interval must always be a multiple of the first, and the third must be a multiple of the second.

After you run the **IRSP** major command to select time interval analysis, you run the **TIME** or the **CNT** minor commands to display the data. Use **TIME** to display the response time information, and **CNT** to display transaction count information. You can display the data for all of the types of response times or a specific type of response time, for example, processing time. The RTA component displays the data in a table.

You can run the time interval analysis commands yourself, or you can select option **D, INTERVALS** from the **Response Time Menu** (KRIRTI) panel to proceed to the **Overview by Recent Time Intervals** (KRIINT) panel, which automatically runs the **IRSP** and **TIME** commands. You can add commands or modify the commands to, for example, select a group or group item or select certain response times, then press **Enter** to see the data that is associated with your choices.

Issuing IRSP to select time interval analysis

You can use the IRSP major command to select time interval analysis and the groups or group items that you want to monitor.

The RTA data collector must be active before you can run **IRSP**. See "Starting and stopping Response Time Analysis data collection" on page 10.

With IRSP, you can display totals for all groups, items within a specific group, or totals for a specific group item.

- The IRSP major command has the following format.

```
IRSPnn xxxxxxxx IMS=iiii
```

Figure 13. IRSP (time interval) command format

nn
nn is optional. To display items within a group, specify the number of the group in *nn* or specify the group by using the GRP= keyword.

xxxxxxxx
To select a specific group for display, either enter the group number in the command argument field *nn*, or use the GRP= keyword to specify the number or name of the group.

To select a group item for which data is to be displayed, specify the item as follows:

- TRAN=xxxxxxxx indicates the transaction name
- TERM=xxxxxxxx indicates the LTERM name
- PSB=xxxxxxxx indicates the PSB name
- CLASS=nnn indicates the transaction class

iiii
The IMS=*iiii* keyword is optional. By default, the system uses the ID of the monitored IMS. If you are in multiple systems coupling (MSC) and shared queues environments, you can see statistics specific to an IMS subsystem by specifying the name of the input IMS in the IMSplex in *iiii*.

If you do not select a group or a group item, the RTA component selects all groups.

Run the TIME and CNT minor commands to display time interval analysis data for the selected groups or group items.

Issuing TIME to display time interval analysis response time information

You can use the TIME minor command to display response time information for time interval analysis (IRSP). You can display the data for all of the types of response times or a specific type of response time, for example, processing time.

The TIME minor command must be preceded by the IRSP major command. See "Issuing IRSP to select time interval analysis" on page 19.

- The TIME minor command of the IRSP major command has the following format.

```
xTIMEyy
```

Figure 14. TIME minor command of IRSP format

x
Specify the scrolling and average selection values as follows:

blank
Display all groups/items and average.

A
Display averages only.

0 - 9, B - Z
Scrolling value

yy
Specify one of the following response types. If you do not specify a value for *yy*, the default is R1.

I
Input Queue Time

LO
Local Output Time

O
Output Queue Time

P
Processing Time

PI
Program Input Queue Time

R0
Response Time 0.

R1
Response Time 1. R1 is the default.

AL
All of the response time types.

Issuing CNT to display time interval analysis transaction count information

You can use the CNT minor command to display transaction count information for time interval analysis (IRSP). The CNT command displays the number of transactions that are recorded during each of the time intervals. The transaction rate for each interval also displays within parentheses. The rate is in transactions per minute.

The CNT minor command must be preceded by the IRSP major command. See "Issuing IRSP to select time interval analysis" on page 19.

- The CNT minor command of the IRSP major command has the following format.

```
xCNT yy
```

Figure 15. CNT minor command of IRSP format

x
Specify the scrolling and totals selection values as follows:

blank
Display all groups/items and totals.

A
Display totals only.

0 - 9, B - Z
Scrolling value.

yy
Specify one of the following response types. If you do not specify a value for *yy*, the default is R1.

I
Input Queue Time

LO
Local Output Time

O
Output Queue Time

P
Processing Time

PI
Program Input Queue Time

R0
Response Time 0.

R1
Response Time 1. R1 is the default.

AL
All of the response time types.

Time interval analysis examples

The following examples illustrate ways that you can use the IRSP major command, and the TIME and CNT minor commands to display group and group item response time data based on time intervals.

Display response times for all groups plus averages

The first example shows a basic display of time interval analysis data. In this example, the IRSP major command and TIME minor command are issued with no other options. Therefore, RTA displays the R1 (the default for TIME) totals and average for all groups.

```
 IRSP
+      |    ID    | (00:15)  00:05:28 | (00:30)  00:20:28 | (01:00)  00:50:28 |
 time  |G=CVTCLS01|           4,234µs |            0.0114s |            0.0143s |
+      |G=PARTTRAN|                   |            7,756µs |            6,936µs |
+      |G=DSPTRAN |                   |            7,547µs |            9,913µs |
+      |G=ADDTRAN |                   |            6,543µs |            0.0146s |
+      |G=DLETRAN |                   |                    |            0.0217s |
+      |G=CANDTRAN|           2,891µs |            7,367µs |            7,800µs |
+      |G=DFSPSB  |                   |            7,282µs |            0.0145s |
+      |  AVERAGES|           3,563µs |            9,544µs |            0.0127s |
+      |  OTHER   |                   |                    |                    |
+      |  SYSTEM  |           4,234µs |            0.0114s |            0.0143s |
```

Figure 16. IRSP and TIME example

The first line of the display includes the length of each interval in parentheses (for example, 15 minutes), and the current place in the interval (for example, 5 minutes and 28 seconds). Blanks in an interval mean that no response time components of the requested type in this group occurred.

IRSP also displays a column labeled ID. When groups or group items are listed in the column, RTA displays a key to identify what type of object is listed. For example, G= signifies that the listed object is a group. The object type is identified with one of the following keys.

C=
Transaction class

G=
Group

L=
Logical terminal (LTERM) name

P=
PSB name

T=
Transaction name

Also, in the example, the last three lines of the display show the following information.

AVERAGES
Average response time for all transactions that are contained in the groups previously listed.

OTHER
Average response time for transactions that are not defined in any transaction group.

SYSTEM
Average response time for all IMS transactions in the system.

The OTHER and SYSTEM totals are displayed because IRSP was issued without specifying a group or group item. Therefore *all* groups were selected. The AVERAGES row displays because totals and averages are the defaults for TIME in this scenario.

Display just average response time for a selected group

You can use the ATIME command to display average response times for a selected group.

The following example uses the *nn* argument on the IRSP command to select group 03. Response time 1 (R1) is measured because it is the default for the TIME command in this scenario. When you press **Enter**, the output displays as follows:

```
 IRSP03
+      |    ID    | (00:05)  00:04:50 | (00:15)  00:09:50 | (01:00)  00:24:50 |
Atime  |  AVERAGES|           0.2160s |           0.0129s |           0.0139s |
```

Figure 17. Time interval analysis average response time for a group

In this example, the average response time for group 03 during the last 4 minutes and 50 seconds was 0.2160 seconds. During the last 9 minutes and 50 seconds, the average response time was 0.0129 seconds. This indicates that the average R1 response time for group 03 is increasing.

Display response times for items in a group

You can use the TIMEP command to show processing response times for the individual items in a group.

The following example uses the *nn* argument on the IRSP command to select group 01 and the TIMEP command to show the processing times for the individual items in the group and averages.

```
 IRSP01
+      |    ID    | (00:15)  00:13:14 | (00:30)  00:28:14 | (01:00)  00:28:14 |
 timeP |C=Class  1|           0.0127s |           0.0131s |           0.0131s |
+      |  AVERAGES|           0.0127s |           0.0131s |           0.0131s |
```

Figure 18. Time interval analysis for all items in a group

Display average response times for all response types

You can use the TIMEAL command to display average response times for all response types.

Issue the following commands:

```
  IRSP
  TIMEAL
```

The command output displays as follows:

```
 IRSP
+      |    ID    | (00:05)  00:02:09 | (00:15)  00:07:09 | (01:00)  00:22:09 |
 timeAL|Inqueue   |            2,518µs |            5,310µs |            7,921µs |
+      |Pgm Inq   |                    |                    |                    |
+      |Processing|           0.0201s |           0.0418s |           0.0410s |
+      |Resptime 0|           0.0227s |           0.0471s |           0.0490s |
+      |Locl Outpt|           5,604µs |           7,210µs |           0.0112s |
+      |Outqueue  |           0.9062s |           0.9064s |           0.9080s |
+      |Resptime 1|           0.0338s |           0.0468s |           0.0594s |
```

Figure 19. Time interval analysis for all response types

Note: Resptime 1 is not time the sum of **Resptime 0** and **Outqueue**. These numbers are averages within each response time component type.

Display transaction counts for a group

You can use the CNT command to display transaction count information for a group. The following example uses the *nn* argument on the IRSP command to select group 02, and the CNT R1 and CNT AL commands to show the transaction counts for the Response Time 1 component and the transaction counts for all of the response time components. The TIME and TIMEAL commands were also run.

```
 IRSP02
+       |    ID     | (00:15)  00:03:01 | (00:30)  00:18:01 | (01:00)  00:18:01 |
 time   |P=DFS*     |           0.0168s |           0.0267s |           0.0267s |
+       |  AVERAGES|           0.0168s |           0.0267s |           0.0267s |
 timeAL|Inqueue    |           0.0212s |           0.0310s |           0.0310s |
+       |Pgm Inq    |                   |                   |                   |
+       |Processing|           4,285µs |           5,299µs |           5,299µs |
+       |Resptime 0|           0.0125s |           0.0190s |           0.0190s |
+       |Locl Outpt|              13µs |              10µs |              10µs |
+       |Outqueue   |           0.0105s |           0.0179s |           0.0179s |
+       |Resptime 1|           0.0168s |           0.0267s |           0.0267s |
 cnt R1|P=DFS*     |   (12.6)       38 |   (13.6)      246 |   (13.6)      246 |
+       |  TOTALS   |   (12.6)       38 |   (13.6)      246 |   (13.6)      246 |
 cnt AL|Inqueue    |   (32.4)       98 |   (33.6)      606 |   (33.6)      606 |
+       |Pgm Inq    |                   |                   |                   |
+       |Processing|   (12.6)       38 |   (13.6)      246 |   (13.6)      246 |
+       |Resptime 0|   (12.6)       38 |   (13.6)      246 |   (13.6)      246 |
+       |Locl Outpt|   (19.8)       60 |   (19.9)      358 |   (19.9)      358 |
+       |Outqueue   |   (32.4)       98 |   (33.5)      604 |   (33.5)      604 |
+       |Resptime 1|   (12.6)       38 |   (13.6)      246 |   (13.6)      246 |
```

Figure 20. IRSP and CNT example

Time slot analysis (SRSP) displays

You use time slot analysis displays to monitor response times during specific time periods throughout the day. The RTA component retains response time data for selected time slots during the day and displays the data upon request.

Use the **SRSP** major command to select time slot analysis and the groups or group items that you want to monitor. The time slots and the default groups and group items are defined by the KIPGLB global definitions member that is in effect. You cannot interactively change the time slots, but you can dynamically change groups. See the *IBM OMEGAMON for IMS on z/OS: Realtime Commands Reference* for information about defining groups and *IBM OMEGAMON for IMS on z/OS: Planning and Configuration Guide* for information about KIPGLB.

After you run the **SRSP** major command to select time slot analysis, you run the **TIME** or the **CNT** minor commands to display the data. Use **TIME** to display the response time information, and **CNT** to display transaction count information. You can display the data for all of the types of response times or a specific type of response time, for example, processing time. The RTA component displays the data in a table. You use the label field on the **SRSP** command to scroll through the sets of time slots.

You can run the time slot analysis commands yourself, or you can select option **C, TIME OF DAY** from the **Response Time Menu** (KRIRTI) panel to proceed to the **Overview by Time of Day** (KRITOD) panel, which automatically runs the **SRSP** and **TIME** commands. You can add commands or modify the commands to, for example, select a group or group item or scroll through the time slots, then press **Enter** to see the data that is associated with your choices.

Issuing SRSP to select time slot analysis

You can use the SRSP major command to select time slot analysis and the groups or group items that you want to monitor.

The RTA data collector must be active before you can run **SRSP**. See “Starting and stopping Response Time Analysis data collection” on page 10.

With SRSP, you can display totals for all groups, items within a specific group, or totals for a specific group item.

- The SRSP major command has the following format.

```
xSRSPnn xxxxxxxx IMS=iiii
```

Figure 21. SRSP (time slot) command format

x
Specify the time slot scrolling selection value:

- 0 - select time slots 1-4 (1-8 if 132-column terminal). 0 is the default.
- 1 - select time slots 5-8 (9-16 if 132-column terminal).
- 2 - select time slots 9-12 (17-24 if 132-column terminal).
- 3 - select time slots 13-16 (25-32 if 132-column terminal).
- 4 - select time slots 17-20 (33-40 if 132-column terminal).
- 5 - select time slots 21-24 (41-48 if 132-column terminal).
- 6 - select time slots 25-28.
- 7 - select time slots 29-32.
- 8 - select time slots 33-36.
- 9 - select time slots 37-40.
- A - select time slots 41-44.
- B - select time slots 45-48.

nn
nn is optional. To display items within a group, specify the number of the group in *nn* or specify the group by using the GRP= keyword.

xxxxxxxx
To select a specific group for display, either enter the group number in the command argument field *nn*, or use the GRP= keyword to specify the number or name of the group.

To select a group item for which data is to be displayed, specify the item as follows:

- TRAN=xxxxxxxx indicates the transaction name
- TERM=xxxxxxxx indicates the LTERM name
- PSB=xxxxxxxx indicates the PSB name
- CLASS=nnn indicates the transaction class

iiii
The IMS=*iiii* keyword is optional. By default, the system uses the ID of the monitored IMS. If you are in multiple systems coupling (MSC) and shared queues environments, you can see statistics specific to an IMS subsystem by specifying the name of the input IMS in the IMSplex in *iiii*.

If you do not select a group or a group item, the RTA component selects all groups.

Note: The RTA component can display a maximum of four time slots on one line of an 80-column terminal. On a 132-column terminal, the RTA component can display up to eight time slots on one line. You use the label field on the SRSP command to scroll to another set of time slots. If you do not specify a label, RTA displays the first set of time slots. Then, to see the next set of time slots, use 1SRSP. To see the fourth set of time slots, use 3SRSP.

Run the TIME and CNT minor commands to display time slot analysis data for the selected groups or group items.

Issuing TIME to display time slot analysis response time information

You can use the TIME minor command to display response time information for time slot analysis (SRSP). You can display the data for all of the types of response times or a specific type of response time, for example, processing time.

The TIME minor command must be preceded by the SRSP major command. See "Issuing SRSP to select time slot analysis" on page 24.

- The TIME minor command of the SRSP major command has the following format.

```
xTIMEyy
```

Figure 22. TIME minor command of SRSP format

x
Specify the scrolling and average selection values as follows:

blank
Display all groups/items and average.

A
Display averages only.

0 - 9, B - Z
Scrolling value

yy
Specify one of the following response types. If you do not specify a value for *yy*, the default is R1.

I
Input Queue Time

LO
Local Output Time

O
Output Queue Time

P
Processing Time

PI
Program Input Queue Time

R0
Response Time 0.

R1
Response Time 1. R1 is the default.

AL
All of the response time types.

Issuing CNT to display time slot analysis transaction count information

You can use the CNT minor command to display transaction count information for time slot analysis (SRSP). The CNT command displays the number of transactions that are recorded during each of the time slots.

The CNT minor command must be preceded by the SRSP major command. See "Issuing SRSP to select time slot analysis" on page 24.

- The CNT minor command of the SRSP major command has the following format.

```
xCNT yy
```

Figure 23. CNT minor command of SRSP format

x

Specify the scrolling and totals selection values as follows:

blank
Display all groups/items and totals.

A
Display totals only.

0 - 9, B - Z
Scrolling value.

yy

Specify one of the following response types. If you do not specify a value for *yy*, the default is R1.

I
Input Queue Time

LO
Local Output Time

O
Output Queue Time

P
Processing Time

PI
Program Input Queue Time

R0
Response Time 0.

R1
Response Time 1. R1 is the default.

AL
All of the response time types.

Time slot analysis examples

The following examples illustrate ways that you can use the SRSP major command, and the TIME and CNT minor commands to display group and group item response time data based on time slots during the day.

Display response times for all groups plus averages

The first example shows a basic display of time slot analysis data. In this example, the SRSP major command and TIME minor command are issued with no other options. Therefore, RTA displays the R1 (the default for TIME) totals and average for all groups within the first set of time slots.

```
 SRSP
+       |    ID    | 00:00-08:00 | 08:00-09:00 | 09:00-10:00 | 10:00-10:30 |
 time   |G=CVTCLS01|             |             |     0.1016s |     0.0164s |
+       |G=PARTTRAN|             |             |     0.0146s |     8,688µs |
+       |G=DSPTRAN |             |             |     0.0121s |     0.0120s |
+       |G=ADDTRAN |             |             |     0.0421s |     0.0295s |
+       |G=DLETRAN |             |             |     0.0154s |     0.0239s |
+       |G=CANDTRAN|             |             |     7,668µs |     4,483µs |
+       |G=B* TERM |     0.0103s |             |     0.1418s |     0.0130s |
+       |G=CANDPSB |             |             |     7,668µs |     4,483µs |
+       |G=DFSPSB  |     0.0112s |             |     0.0125s |     0.0197s |
+       |  AVERAGES|     0.0107s |             |     0.0537s |     0.0157s |
+       |  OTHER   |             |             |             |             |
+       |  SYSTEM  |     0.0112s |             |     0.0727s |     0.0177s |
```

Figure 24. SRSP and TIME example

The first line of the display includes the time slots. Blanks in a time slot mean that no response time components of the requested type in this group occurred. When a column is blank, that means that there was no activity during that time period.

SRSP also displays a column that is labeled ID. When groups or group items are listed in the column, RTA displays a key to identify what type of object is listed. For example, G= signifies that the listed object is a group. The object type is identified with one of the following keys.

C=
Transaction class

G=
Group

L=
Logical terminal (LTERM) name

P=
PSB name

T=
Transaction name

Also, in the example, the last three lines of the display show the following information.

AVERAGES
Average response time for all transactions that are contained in the groups previously listed.

OTHER
Average response time for transactions that are not defined in any transaction group.

SYSTEM
Average response time for all IMS transactions in the system.

The OTHER and SYSTEM totals are displayed because SRSP was issued without specifying a group or group item. Therefore, *all* groups were selected. The AVERAGES row displays because totals and averages are the defaults for TIME in this scenario.

To display the response time information for the second set of time slots, type the scrolling character 1 in front of SRSP and press **Enter**.

```
1SRSP
+      |    ID    | 10:30-11:00 | 11:00-11:30 | 11:30-12:00 | 12:00-13:00 |
 time  |G=CVTCLS01|     0.1558s |     1.6526s |     0.0139s |     0.0215s |
+      |G=PARTTRAN|     0.0157s |     0.0107s |     0.0103s |     0.0102s |
+      |G=DSPTRAN |     0.0140s |     9,718µs |     0.0109s |     7,841µs |
+      |G=ADDTRAN |     0.0531s |     0.0343s |     0.0272s |     0.0609s |
+      |G=DLETRAN |     0.0129s |     0.0214s |     0.0124s |     0.0107s |
+      |G=CANDTRAN|     0.0175s |     8,346µs |     7,930µs |     5,369µs |
+      |G=B* TERM |     0.2006s |     1.5855s |     0.0210s |     0.0159s |
+      |G=CANDPSB |     0.0175s |     8,346µs |     7,930µs |     5,369µs |
+      |G=DFSPSB  |     0.0147s |     0.0117s |     9,882µs |     0.0170s |
+      |  AVERAGES|     0.0794s |     0.6813s |     0.0125s |     0.0175s |
+      |  OTHER   |             |             |             |             |
+      |  SYSTEM  |     0.1169s |     1.1804s |     0.0109s |     0.0163s |
```

Display response times for items in a group

You can use the SRSP and TIME commands to display response times for the individual items in a group.

The following example uses the *nn* argument on the SRSP command to select group 01 and the TIMER1 command to show the response time 1 (R1) for the individual items in the group and averages.

```
 SRSP01
+      |    ID    | 00:00-08:00 | 08:00-09:00 | 09:00-10:00 | 10:00-10:30 |
 timeR1|T=ADDPART |             |     0.0116s |     0.0136s |     8,588µs |
+      |T=PART*   |             |     0.0136s |     0.0156s |     8,788µs |
+      |  AVERAGES|             |     0.0126s |     0.0146s |     8,688µs |
```

Figure 25. Time slot analysis for all items in a group

Display just average response time for a selected group

You can use the ATIME command to display average response times for a selected group.

The following example uses the *nn* argument on the SRSP command to select group 01. ATIME0 and ATIMER1 are entered to display the output queue time and response time 1.

```
 SRSP01
+      |    ID    | 00:00-08:00 | 08:00-09:00 | 09:00-10:00 | 10:00-10:30 |
AtimeO |  AVERAGES|             |       252µs |     6.0106s |     1.4196s |
AtimeR1|  AVERAGES|             |     0.0126s |     0.0146s |     8,688µs |
```

Figure 26. Time slot analysis average response time for a group

Display average response times for all response types

You can use the TIMEAL command to display average response times for all response types.

In this example, the average response times for all response types in the fourth set of time slots are displayed.

The command output displays as follows:

```
3SRSP
+      |    ID    | 15:30-16:00 | 16:00-17:00 | 17:00-18:00 | 18:00-19:00 |
 timeAL|Inqueue   |     3,899µs |     0.0273s |     0.0979s |     3,356µs |
+      |Pgm Inq   |             |             |             |             |
+      |Processing|     9,451µs |     0.0149s |     9,712µs |     0.0110s |
+      |Resptime 0|     0.0130s |     0.0258s |     0.0763s |     0.0143s |
+      |Locl Outpt|         7µs |         8µs |         8µs |         7µs |
+      |Outqueue  |     9,386µs |     0.3312s |     0.6780s |     2,151µs |
+      |Resptime 1|     0.0215s |     0.2526s |     0.1736s |     0.0161s |
```

Figure 27. Time slot analysis for all response types

Display transaction counts for a group

You can use the CNT command to display transaction count information for a group. The following example uses the *nn* argument on the SRSP command to select group 02, and the CNT R1 and CNT AL commands to show the transaction counts for the Response Time 1 component and the transaction counts for all of the response time components. The TIMER1 and TIMEAL commands were also run. The third set of time slots are displayed.

```
2SRSP02
+      |    ID    | 13:00-14:00 | 14:00-14:30 | 14:30-15:00 | 15:00-15:30 |
 timeR1|T=PART*   |     0.0153s |     0.0115s |     0.0160s |     0.0118s |
+      |  AVERAGES|     0.0153s |     0.0115s |     0.0160s |     0.0118s |
 timeAL|Inqueue   |     1,752µs |     2,430µs |     2,958µs |     2,294µs |
+      |Pgm Inq   |             |             |             |             |
+      |Processing|     0.0119s |     8,928µs |     0.0130s |     9,196µs |
+      |Resptime 0|     0.0137s |     0.0113s |     0.0160s |     0.0115s |
+      |Locl Outpt|             |             |             |        11µs |
+      |Outqueue  |       276µs |       206µs |        40µs |     4.1536s |
+      |Resptime 1|     0.0153s |     0.0115s |     0.0160s |     0.0118s |
 cnt R1|T=PART*   |          22 |          52 |          51 |          58 |
+      |  TOTALS  |          22 |          52 |          51 |          58 |
 cnt AL|Inqueue   |          28 |          55 |          52 |          59 |
+      |Pgm Inq   |             |             |             |             |
+      |Processing|          27 |          54 |          51 |          58 |
+      |Resptime 0|          27 |          54 |          51 |          58 |
+      |Locl Outpt|             |             |             |           3 |
+      |Outqueue  |          22 |          52 |          51 |          65 |
+      |Resptime 1|          22 |          52 |          51 |          58 |
```

Figure 28. SRSP and CNT example

Moving time slot analysis (GRSP) displays

You use moving time slot analysis to view a graphic display of short-term response time data, that is, for the previous 10 minutes. Groups or items are defined as eligible for display if they are either fixed or dynamic, and exceed specified thresholds during the window.

Use the **GRSP** major command to select moving time slot analysis and the groups or group items that you want to monitor. By default, the moving time slot scale, the size of the window (that is, 10 minutes), and the groups and group items are defined by the KIPGLB global definitions member that is in effect. However, you can dynamically change the settings using the **ISET** immediate command. To dynamically change the settings, see the topics in Chapter 2, "Response Time Analysis data collection," on page 7. Also, see the *IBM OMEGAMON for IMS on z/OS: Realtime Commands Reference* for information about defining groups and *IBM OMEGAMON for IMS on z/OS: Planning and Configuration Guide* for information about KIPGLB.

After you run the **GRSP** major command to select moving time slot analysis, you run the **TIME** to display the response time data. You can display the data for all of the types of response times or a specific type of response time, for example, processing time. The RTA component displays the data in a graph.

You can run the moving time slot analysis commands yourself, or you can select option **B, GRAPH** from the **Response Time Menu** (KRIRTI) panel to proceed to the **10-Minute Historical Graph** (KRIGRAF) panel, which automatically runs the **GRSP** and **TIME** commands. You can add commands or modify the commands to, for example, select a group or group item or select certain response times, then press **Enter** to see the data that is associated with your choices.

The following rules apply to the display of groups and items with **GRSP**:

- Fixed groups or items, which are those items that are marked with **>** and **<** surrounding the name, are prioritized for display. Dynamic groups or items are used for the remaining positions. A dynamic group is included only when the response time exceeds a specified threshold during any of the minutes in the window.
- Unless you use the scrolling capability, dynamic groups or items are not displayed if there are six or more fixed groups or items, or if there are 11 fixed groups or items when you use a 132-column terminal.
- Fixed groups or items fill the screen from the right side of the display, while dynamic groups fill the screen from the left.
- If you do not specify a group name, number, or the name of an individual group item, the Response Time Analysis (RTA) component selects group totals for display.

The asterisks (*****) in the display show response times for the group or item for the previous 10 minutes. If the time is 12:31:24, the RTA component calculates the current minute from 12:31:00 through 12:31:24. At 12:32, the 12:31-minute display shifts to the slot for the previous minute.

The default display shows groups in the boxes. However, you can display group *items* in the boxes instead. To display group items, enter the group number or name after the **GRSP** command.

The response of the group or item during the previous minute shows numerically on the line that follows the group/item ID. The response value displays as MM:SS.T, or as HH:MM:SS if the response is greater than or equal to one hour.

The RTA component displays the threshold line, when it exists and falls within the scale, as a series of minus signs (**-**) or as plus signs (**+**) where the threshold intercepts the response graph.

To get millisecond precision for the GRSP display and the ARSP exception, set the `UNITS` parameter in the KIPGLB source member to `MILLIS`, which is the default. The alternative is `UNITS=SECONDS`. No change is required to the GRSP and ARSP milliseconds precision values.

Issuing GRSP to select moving time slot analysis

You can use the GRSP major command to select moving time slot analysis. You can control the parameters that affect the display for a group or item, including the parameters that set the scaling type and window type to be displayed.

The RTA data collector must be active before you can run **GRSP**. See "Starting and stopping Response Time Analysis data collection" on page 10.

With GRSP, you can display response time graphs for all groups, items within a specific group, or graphs for a specific group item.

- The GRSP major command has the following format.

```
GRSPnn xxxxxxxx IMS=iiii
```

Figure 29. GRSP (moving time slot) command format

nn
nn is optional. To display items within a group, specify the number of the group in *nn* or specify the group by using the GRP= keyword.

xxxxxxxx
To select a specific group for display, either enter the group number in the command argument field *nn*, or use the GRP= keyword to specify the number or name of the group.

To select a group item for which data is to be displayed, specify the item as follows:

- TRAN=xxxxxxxx indicates the transaction name
- TERM=xxxxxxxx indicates the LTERM name
- PSB=xxxxxxxx indicates the PSB name
- CLASS=nnn indicates the transaction class

The parameters for an *item* are independent of the groups that contain it. An item might be in several groups, but it has only one set of controlling parameters.

iiii
The IMS=*iiii* keyword is optional. By default, the system uses the ID of the monitored IMS. If you are in multiple systems coupling (MSC) and shared queues environments, you can see statistics specific to an IMS subsystem by specifying the name of the input IMS in the IMSplex in *iiii*.

If you do not select a group or a group item, the RTA component selects all groups.

Run the TIME minor command to display moving time slot analysis data for the selected groups or group items.

Issuing TIME to display moving time slot analysis response time information

You can use the TIME minor command to display response time information for moving time slot analysis (GRSP). You can display the data for all of the types of response times or a specific type of response time, for example, processing time.

The TIME minor command must be preceded by the GRSP major command. See "Issuing GRSP to select moving time slot analysis" on page 31.

The RTA component displays groups or group items in two ways:

fixed
Always displays.

dynamic
Displays only when the response time exceeds a specified threshold during the last 1 - 10 minute window.

- The TIME minor command of the GRSP major command has the following format.

```
xTIMEyy
```

Figure 30. TIME minor command of GRSP format

x
Specify the scrolling values as follows:

blank
Display all groups/items.

0 - 9, A - Z
Scrolling value

yy
Specify one of the following response types. If you do not specify a value for *yy*, the default is R1.

I
Input Queue Time

LO
Local Output Time

O
Output Queue Time

P
Processing Time

PI
Program Input Queue Time

R0
Response Time 0.

R1
Response Time 1. R1 is the default.

AL
All of the response time types.

Note: When you use the AL argument on the TIME command in the OMEGAMON for IMS Classic interface, the L label is reserved for IBM-use only.

Moving time slot analysis examples

The following examples illustrate ways that you can use the GRSP major command, and the TIME minor command to display a graphical view of group and group item response time data for the last 10 minutes.

This example shows three dynamic groups (PART, MAIL, and GROUP 05) and two fixed groups (INVOICE and SHIPPING). You can see that the Response Time Analysis (RTA) component displays the dynamic groups because these groups exceed their threshold within the eligible window.

In Figure 31 on page 33, the special SYSTEM group, which displays the response time for all transactions in the system, is also defined as a fixed display group. The RTA component displays the dynamic groups because these groups exceed their threshold within the eligible window. This window for threshold checking spans at least the previous 8 minutes because the RTA component does not display the dynamic group MAIL in less time. The dynamic group MAIL does not exceed its threshold during the previous 7 minutes.

A string of asterisks is displayed beneath the box of any group or item that exceeds its response time threshold, which highlights transactions that are experiencing response time problems.

```
 GRSP  >>  Transaction Group totals display  <<
 timeR1  | PART     | MAIL     | GROUP 05 |>INVOICE <|>SHIPPING<|>SYSTEM  <|
+        |       0µs|       0µs|       0µs|       0µs|       0µs|       0µs|
+        |==========+==========+==========+==========+==========+==========+
+ m 100.0|          |          |*         |*         |*         |*         |
+ i  90.0|*         |          |*         |*         |*         |*         |
+ l  80.0|*         |          |*         |*         |*         |*         |
+ l  70.0|*         |          |*         |*         |*         |*         |
+ i  60.0|*         |          |*         |*         |*         |*         |
+ s  50.0|*         |          |*  *      |*  *      |*  *      |*  *      |
+ e  40.0|*         |          |* **      |* **      |* **      |* **      |
+ c  30.0|*    *    | *        |* ** *    |**** *    |**** *    |**** *    |
+ s  20.0|*    *  * | *        |* ** *    |**** *  * |**** *  * |**** *  * |
+    10.0|*    *  * | *        |++++-+----|++++-+--+-|++++-+--+-|++++-+--+-|
+        +----------+----------+----------+----------+----------+----------+
+          *****      *****      *****      *****      *****      *****
+     min -8-6-4-2-0 -8-6-4-2-0 -8-6-4-2-0 -8-6-4-2-0 -8-6-4-2-0 -8-6-4-2-0
```

Figure 31. Moving time slot display

Use the ISET command to modify the display parameters.

```
ISETR1 SCALE=50
ISET  WINDOW=10
```

The command output displays as shown in Figure 32 on page 33:

```
 GRSP  >>  Transaction Group totals display  <<
 timeR1  | PART     | GROUP 05 |          |>INVOICE <|>SHIPPING<|>SYSTEM  <|
+        |       0µs|       0µs|       0µs|       0µs|       0µs|       0µs|
+        |==========+==========+==========+==========+==========+==========+
+ m  50.0|*         |*  *      |          |*  *      |*  *      |*  *      |
+ i  45.0|*         |*  *      |          |*  *      |*  *      |*  *      |
+ l  40.0|*         |*  *      |          |*  *      |*  *      |*  *      |
+ l  35.0|*    *    |* **      |          |* ** *    |* ** *    |* ** *    |
+ i  30.0|*    *    |* ** *    |          |**** *    |**** *    |**** *    |
+ s  25.0|*    *    |* ** *    |          |**** *    |**** *    |**** *    |
+ e  20.0|*    *    |* ** *    |          |**** *    |**** *    |**** *    |
+ c  15.0|*    *  * |* ** *    |          |**** *  * |**** *  * |**** *  * |
+ s  10.0|*    *  * |++++-+----|          |++++-+--+-|++++-+--+-|++++-+--+-|
+     5.0|+----+--+-|**** *    |          |**** *  * |**** *  * |**** *  * |
+        +----------+----------+----------+----------+----------+----------+
+          *****      *****                *****      *****      *****
+     min -8-6-4-2-0 -8-6-4-2-0 -8-6-4-2-0 -8-6-4-2-0 -8-6-4-2-0 -8-6-4-2-0
```

Figure 32. GRSP after ISET changes

Notice that MAIL disappears because a few minutes have passed, and now the 10-minute window has no responses that are over the threshold. To ensure a constant display of MAIL, you can set it as a fixed transaction.

The following example shows that MAIL is set as a fixed transaction:

```
ISETR1 GRP=3 FIX=YES
```

In Figure 33 on page 33, the display shows four fixed groups/items, including MAIL, and two dynamic groups/items.

Figure 33. Moving time slot display with 4 fixed groups

```
 GRSP  >>  Transaction Group totals display  <<
 timeR1  | PART     | GROUP 05 |>MAIL    <|>INVOICE <|>SHIPPING<|>SYSTEM  <|
+        |       0µs|       0µs|       0µs|       0µs|       0µs|       0µs|
+        |==========+==========+==========+==========+==========+==========+
+ m  50.0|*         |*  *      |          |*  *      |*  *      |*  *      |
+ i  45.0|*         |*  *      |          |*  *      |*  *      |*  *      |
+ l  40.0|*         |*  *      |          |*  *      |*  *      |*  *      |
+ l  35.0|*    *    |* **      |          |* ** *    |* ** *    |* ** *    |
+ i  30.0|*    *    |* ** *    |          |**** *    |**** *    |**** *    |
+ s  25.0|*    *    |* ** *    |          |**** *    |**** *    |**** *    |
+ e  20.0|*    *    |* ** *    |          |**** *    |**** *    |**** *    |
+ c  15.0|*    *  * |* ** *    |        * |**** *  * |**** *  * |**** *  * |
+ s  10.0|*    *  * |++++-+----|       ** |++++-+--+-|++++-+--+-|++++-+--+-|
+     5.0|+----+--+-|**** *    |       ***|**** *  * |**** *  * |**** *  * |
+        +----------+----------+----------+----------+----------+----------+
+          *****      *****                *****      *****      *****
+     min -8-6-4-2-0 -8-6-4-2-0 -8-6-4-2-0 -8-6-4-2-0 -8-6-4-2-0 -8-6-4-2-0
```

If all six windows are full, and you want to add another group for display, use the scrolling feature capability with the TIME command. The following example shows how you can add one more fixed group to the display even though it had no activity in the last 10 minutes. It also resets the scale to 1 second.

```
ISETR1 GRP=OTHER FIX=YES
ISETR1 SCALE=100
```

The output from the GRSP command is similar to the display in Figure 34 on page 34.

```
 GRSP  >>  Transaction Group totals display  <<
 timeR1  | PART     |>INVOICE <|>SHIPPING<|>MAIL    <|>OTHER   <|>SYSTEM  <|
+        |       0µs|       0µs|       0µs|       0µs|       0µs|       0µs|
+        |==========+==========+==========+==========+==========+==========+
+ m 100.0|          |          |          |          |          |          |
+ i  90.0|          |          |          |          |          |          |
+ l  80.0|          |          |          |          |          |          |
+ l  70.0|          |          |          |          |          |          |
+ i  60.0|          |          |          |          |          |          |
+ s  50.0|          |          |          |          |          |          |
+ e  40.0|          |**      * |**      * |          |          |**      * |
+ c  30.0|  *       |**      * |**      * | *        |          |**      * |
+ s  20.0|  *       |***    ** |***    ** |**        |          |***    ** |
+    10.0|  *       |+++----++-|+++----++-|***    *  |----------|+++----++-|
+        +----------+----------+----------+----------+----------+----------+
+          *****      *****      *****                          *****
+     min -8-6-4-2-0 -8-6-4-2-0 -8-6-4-2-0 -8-6-4-2-0 -8-6-4-2-0 -8-6-4-2-0
```

Figure 34. Moving time slot display with 5 fixed groups

GRSP replaces the dynamic group, GROUP 05, with the fixed group OTHER.

To scroll the display, enter an alphanumeric character in column one of the TIME minor command. **0** means do not scroll, **1** means scroll past the first six groups or items eligible for display, and so forth.

Even though you do not have room on one display for all eligible groups, you can use the scrolling capability to see more than six groups as shown in Figure 35 on page 35. Only the dynamic group, GROUP 05, is displayed in this example. The TIME command scrolled past the other groups.

```
 GRSP  >>  Transaction Group totals display  <<
1timeR1  | GROUP 05 |          |          |          |          |          |
+        |       0µs|          |          |          |          |          |
+        |==========+==========+==========+==========+==========+==========+
+ m 100.0|*         |          |          |          |          |          |
+ i  90.0|*         |          |          |          |          |          |
+ l  80.0|*         |          |          |          |          |          |
+ l  70.0|*         |          |          |          |          |          |
+ i  60.0|*         |          |          |          |          |          |
+ s  50.0|*         |          |          |          |          |          |
+ e  40.0|*      *  |          |          |          |          |          |
+ c  30.0|*     **  |          |          |          |          |          |
+ s  20.0|*     **  |          |          |          |          |          |
+    10.0|+-----++--|          |          |          |          |          |
+        +----------+----------+----------+----------+----------+----------+
+           *****
+     min -8-6-4-2-0 -8-6-4-2-0 -8-6-4-2-0 -8-6-4-2-0 -8-6-4-2-0 -8-6-4-2-0
```

Figure 35. Moving time slot response display with scrolling

Issuing the GRSP TIMEAL command to display average response times for all response types

You can use the TIMEAL command to display average response times for all response types. Issue the following commands:

```
GRSP
TIMEAL
```

The command output displays as follows:

```
 GRSP  >>  Transaction Group totals display  <<
1timeAL  |Inqueue   |Pgm Inq   |Processing|Resptime 0|Locl Outpt|Outqueue  |
+        |   0.0310s|       0µs|   0.0134s|   0.0444s|   6,294µs|       0µs|
+        |==========+==========+==========+==========+==========+==========+
+ m 100.0|          |          |          |          |          |          |
+ i  90.0|          |          |          |          |          |          |
+ l  80.0|          |          |          |          |          |          |
+ l  70.0|          |          |          |          |          |          |
+ i  60.0|          |          |          |          |          |          |
+ s  50.0|          |          |          |          |          |          |
+ e  40.0|          |          |          |         *|          |          |
+ c  30.0|         *|          |          |         *|          |          |
+ s  20.0|         *|          |         *|         *|          |         *|
+    10.0|--------++|----------|--------++|--------++|--------++|----------|
+        +----------+----------+----------+----------+----------+----------+
+           *****                *****      *****
+     min -8-6-4-2-0 -8-6-4-2-0  -8-6-4-2-0 -8-6-4-2-0
+        |Resptime 1|
+        |   0.0444s|
+        |==========+
+ m 100.0|          |
+ i  90.0|          |
+ l  80.0|          |
+ l  70.0|          |
+ i  60.0|          |
+ s  50.0|          |
+ e  40.0|         *|
+ c  30.0|         *|
+ s  20.0|         *|
+    10.0|--------++|
+        +----------+
+           *****
+     min -8-6-4-2-0 -8-6-4-2-0 -8-6-4-2-0
```

Figure 36. Graphical display that shows all response types

If the GRSP command selects a single group item, such as TRAN=PART, AL is the only valid option for the TIME command.

To identify the cause of a response time delay, enter any other response type, such as R0. The TIME command issues a warning message and dynamically changes the response type to AL. For example, if you enter the following commands:

```
GRSP TRAN=PART
timer0
```

The command output is similar to the following display:

```
GRSP TRAN=PART
 timeAL >> OI322: Response type ALL forced for single item <<
+        |Inqueue   |Pgm Inq   |Processing|Resptime 0|Locl Outpt|Outqueue  |
+        |   5,326µs|       0µs|   6,925µs|   0.0123s|   2,227µs|   0.9054s|
+        |==========+==========+==========+==========+==========+==========+
+ m 100.0|          |          |          |          |          |  *    ***|
+ i  90.0|          |          |          |          |          |  *    ***|
+ l  80.0|          |          |          |          |          |  *    ***|
+ l  70.0|          |          |          |          |          |  *    ***|
+ i  60.0|          |          |          |  *       |          |  *    ***|
+ s  50.0|          |          |          |  *       |          |  *    ***|
+ e  40.0|          |          |  *       |  *       |          |  *    ***|
+ c  30.0|  *       |          |  *       |  *       |          |  *    ***|
+ s  20.0|  *       |          |  *       |  *       |  *       |  *    ***|
+    10.0|--+----+-+|----------|--+----+++|--+----+++|--+----+--|--+----+++|
+        +----------+----------+----------+----------+----------+----------+
+           *****                *****      *****      *****      *****
+     min -8-6-4-2-0 -8-6-4-2-0  -8-6-4-2-0 -8-6-4-2-0
+        |Resptime 1|
+        |   8,242µs|
+        |==========+
+ m 100.0|          |
+ i  90.0|          |
+ l  80.0|  *       |
+ l  70.0|  *       |
+ i  60.0|  *       |
+ s  50.0|  *       |
+ e  40.0|  *       |
+ c  30.0|  *       |
+ s  20.0|  *    *  |
+    10.0|--+----+++|
+        +----------+
+           *****
```

Figure 37. Single group item display

This display shows that input queuing and processing time are contributing almost equally to push response time over target thresholds.

Response Time Monitor data displays

With Response Time Monitor (RTM) data displays, you can quickly identify poorly performing transactions and terminals.

RTM monitors *all* transactions in IMS, independent of group definitions, to report on the transactions and logical terminals with the longest response times. The **RMON** immediate command activates the data analysis function of the RTM. The **XMON** immediate command activates the data display function for transactions. The **TMON** immediate command activates it for terminals. The RTA data collector and the Response Time Monitor must both be active before you can run **XMON** or **TMON**.

Issuing RMON to start and stop RTM data analysis

You use the RMON immediate command to start and stop the data analysis function of the Response Time Monitor (RTM). The RMON parameters control the duration of the sampling interval and the size of your RTM displays. These RMON values are effective until the time interval elapses or you stop RTM.

- The **RMON** immediate command has the following format.

```
RMON ccc SIZE=nn INTRV=nnn FIXED|NFIXED UNIQ|NUNIQ
```

Figure 38. RMON command format

ccc
Specify whether you want to turn on RTM, turn off RTM, or display the status.

ON
Turn on the RTM data collector.

OFF
Turn off the RTM data collector.

? or blank
Display the status. Specify a ? or specify a blank with no other parameters.

nn
Specify the maximum number, 1 - 99, of transactions and terminals with the longest response time that the XMON and TMON commands can display. The default is 10.

nnn
Specify the sampling interval in 1 - 999 minutes. The default is 15 minutes.

FIXED|NFIXED
The FIXED and NFIXED parameters control how RTM deletes data from its displays. Assume an interval (INTRV) of 15 minutes. With a FIXED window, RTM samples data for 15 minutes and then clears the displays before it samples more data. FIXED window interval displays are more characteristic of the environment later in the interval, when the collected data represents a larger sample.

With an NFIXED or *moving window*, RTM deletes each piece of response time data from its display individually after another one occurs with a higher response time or after 15 minutes, whichever comes first.

The default is FIXED.

Note: You do not have to stop RTM to change the FIXED|NFIXED setting. You can change the setting when RTM is active by entering, for example, RMON FIXED.

UNIQ|NUNIQ
The UNIQ and NUNIQ parameters control whether RTM can display one or multiple items of the same type. For example, assume that there is one type of transaction, ADDINV, that always takes longer than all the other types within the IMS environment. NUNIQ (*non-unique*) allows more than one ADDINV transaction among those transactions with the highest response time to display on RTM displays, which might leave no space for any other type of transaction. If you do not want the same type of transaction to appear multiple times in the display, specify UNIQ.

With UNIQ (as in *unique*), you allow only the ADDINV transaction with the highest response time to appear on RTM displays, leaving space for other transaction codes.

The default is UNIQ.

Note: You do not have to stop RTM to change the UNIQ|NUNIQ setting. You can change the setting when RTM is active by entering, for example, RMON UNIQ.

In this example, you enter the **RMON** command to start the RTM data analysis function, with a display size of 15 and an interval of 20 minutes.

```
RMON ON SIZE=15 INTRV=20
```

RTM displays the following reply.

```
>RMON ON SIZE=15 INTRV=20 >> OI336: RTM is activated <<
```

When you enter RMON to list the status of the RTM, RTM displays the status and settings as shown in the following example.

```
RMON  >> OI342: RDC is active; SIZE=15 INTRV= 20 FIXED UNIQ <<
```

Issuing XMON to display transactions with the highest response time

You can use the XMON immediate command to display transactions with the highest response time.

The RTA data collector and the Response Time Monitor (RTM) must both be active before you can run **XMON**. Parameters on the **RMON** command also control the XMON output that is shown, including the number of transactions that appear and the sampling interval. See "Starting and stopping Response Time Analysis data collection" on page 10 and "Issuing RMON to start and stop RTM data analysis" on page 36.

The **XMON** immediate command displays transactions with the highest response time based on **RMON** settings. You can run the **XMON** command yourself, or you can select option **A, PROBLEMS** from the **Response Time Menu** (KRIRTI) panel to proceed to the **Transactions and LTERMs with the Longest Response Times** (KRIPROB) panel, which automatically runs the **XMON** command.

- The **XMON** immediate command has the following format.

```
XMONxx
```

Figure 39. XMON command format

xx
Specify one of the following response types. If you do not specify a value for *xx*, the default is R0.

I
Input Queue Time

LO
Local Output Time

O
Output Queue Time

P
Processing Time

PI
Program Input Queue Time

R0
Response Time 0. R0 is the default.

R1
Response Time 1

RTM samples each response time component independently. Therefore, the transactions with, for example, the highest output queue times (**O**) are not necessarily the same as those transactions with the highest processing times (**P**).

Note: The **R0** display also shows the response times of the components that comprise Response Time 0: **Input Queue Time (I)** and **Processing Time (P)**.

In the following example, the **XMON** command is run for each type of response time. The RTM data collection characteristics are FIXED and UNIQ. The sampling interval is 15 minutes, so the RTM component displays those transactions with the highest response times from the start of the interval until the current time. In this example, the data has been collected for 13 minutes and 39 seconds.

The SIZE that is specified is 10, which causes a maximum of 10 transactions with the highest response times for each response time component to display. Up to this point in the interval, only eight transactions were active in the local output queue (XMONLO), and none were in the program input queue (XMONPI).

Response times are represented in seconds or microseconds.

```
 XMONI   Transactions with longest I  time     (00:15)  00:13:39
+         ID       I     |    ID       I     |    ID       I
+      GKRA0012 0.0538s  | CAND11   0.0281s  | GKRA0008 0.0251s
+      GKRA0013 0.0219s  | DLETINV  0.0209s  | IVTFM    0.0204s
+      ADDPART  0.0186s  | DSPINV   0.0184s  | DLETPART 0.0162s
+      GKRA0006 0.0153s  |
 XMONPI  Transactions with longest PI time     (00:15)  00:13:39
+         ID       PI    |    ID       PI    |    ID       PI
 XMONP   Transactions with longest P  time     (00:15)  00:13:39
+         ID       P     |    ID       P     |    ID       P
+      GKRA0009 0.0578s  | DSPALLI  0.0526s  | DLETPART 0.0262s
+      DLETINV  0.0236s  | ADDPART  0.0225s  | GKRA0011 0.0200s
+      GKRA0006 0.0182s  | PARTRESP 0.0180s  | GKRA0007 0.0172s
+      GKRA0008 0.0163s  |
 XMONR0  Transactions with longest R0 time     (00:15)  00:13:39
+         ID       I       P       R0   |    ID       I       P       R0
+      DSPALLI  0.0128s 0.0526s 0.0655s | GKRA0009 0.0131s 0.0481s 0.0613s
+      GKRA0012 0.0538s   731µs 0.0545s | DLETINV  0.0209s 0.0108s 0.0318s
+      CAND11   0.0281s 1,855µs 0.0299s | GKRA0008 0.0251s 2,961µs 0.0281s
+      DLETPART 1,630µs 0.0262s 0.0278s | GKRA0013 0.0219s 3,269µs 0.0252s
+      ADDPART    819µs 0.0225s 0.0234s | DSPINV   0.0184s 4,401µs 0.0228s
 XMONLO  Transactions with longest LO time     (00:15)  00:13:39
+         ID       LO    |    ID       LO    |    ID       LO
+      DLETINV     39µs  | PART        18µs  | GKRA0008    10µs
+      GKRA0006    10µs  | ADDPART      7µs  | DSPINV       7µs
+      DSPALLI      7µs  | DLETPART     6µs  |
 XMONO   Transactions with longest O  time     (00:15)  00:13:39
+         ID       O     |    ID       O     |    ID       O
+      PART     0.9547s  | CAND11   0.2233s  | GKRA0013 0.1244s
+      DSPINV   0.0261s  | GKRA0008 7,378µs  | ADDPART  6,080µs
+      DSPALLI  3,642µs  | DLETPART 3,639µs  | GKRA0011 2,531µs
+      IVTFM    2,048µs  |
 XMONR1  Transactions with longest R1 time     (00:15)  00:13:39
+         ID       R1    |    ID       R1    |    ID       R1
+      CAND11   0.2262s  | GKRA0013 0.1296s  | DSPALLI  0.0655s
+      GKRA0009 0.0613s  | DSPINV   0.0343s  | DLETINV  0.0318s
+      GKRA0008 0.0281s  | DLETPART 0.0278s  | ADDPART  0.0234s
+      GKRA0011 0.0215s  |
```

Figure 40. Typical XMON display

When NUNIQ (*non-unique*) is enabled, more than one of the same type of items can display on the screen at the same time. When NFIXED (*moving window*) is enabled, then, at any moment, the RTM component displays those transactions with the highest response times over the previous number of minutes as defined by the sampling interval. For example, if the sampling interval (INTRV) is 15 minutes and the current time is 09:21:36, the RTM component displays the transactions with the highest response times from 09:06:36 until 09:21:36. At 10:05:47, the RTM component displays the transactions with the highest response times from 09:50:47 until 10:05:47.

Issuing TMON to display logical terminals with the highest response time

You can use the TMON immediate command to display logical terminals with the highest response time.

The RTA data collector and the Response Time Monitor (RTM) must both be active before you can run **TMON**. Parameters on the **RMON** command also control the TMON output that is shown, including the number of logical terminals that appear and the sampling interval. See “Starting and stopping Response Time Analysis data collection” on page 10 and “Issuing RMON to start and stop RTM data analysis” on page 36.

The **TMON** immediate command displays logical terminals with the highest response time based on **RMON** settings. You can run the **TMON** command yourself, or you can select option **A, PROBLEMS** from the **Response Time Menu** (KRIRTI) panel to proceed to the **Transactions and LTERMs with the Longest Response Times** (KRIPROB) panel, which automatically runs the **TMON** command.

- The **TMON** immediate command has the following format.

```
TMONxx
```

Figure 41. TMON command format

xx

Specify one of the following response types. If you do not specify a value for *xx*, the default is R1.

I

Input Queue Time

LO

Local Output Time

O

Output Queue Time

P

Processing Time

PI

Program Input Queue Time

R0

Response Time 0.

R1

Response Time 1. R1 is the default.

RTM samples each response time component independently. Therefore, the terminals with, for example, the highest output queue times (**O**) are not necessarily the same as those logical terminals with the highest processing times (**P**).

Note: The **R0** display also shows the response times of the components that comprise Response Time 0: **Input Queue Time (I)** and **Processing Time (P)**.

In the following example, the **TMON** command is run for each type of response time. The RTM data collection characteristics are FIXED and UNIQ. The sampling interval is 15 minutes, so the RTM component displays those logical terminals with the highest response times from the start of the interval until the current time. In this example, the data has been collected for 12 minutes and 51 seconds.

The SIZE that is specified is 10, which causes a maximum of 10 logical terminals with the highest response times for each response time component to display. Up to this point in the interval, only two logical terminals were active in the local output queue (TMONLO), 8 were active in the output queue (TMONO), and none were in the program input queue (TMONPI).

Response times are represented in seconds or microseconds.

```
 TMONI   Logical terminals with longest I  time     (00:15)  00:12:51
+         ID       I     |    ID       I     |    ID       I
+      CLOR0046 0.0538s  | CLOR0044 0.0281s  | CLOR0045 0.0251s
+      CLOR0043 0.0186s  | CLOR0042 0.0162s  | BLOR0040 8,694µs
+      BLOR0037 7,217µs  | BLOR0038 6,008µs  | BLOR0039 1,042µs
+      ALOR0031 1,012µs  |
 TMONPI  Logical terminals with longest PI time     (00:15)  00:12:51
+         ID       PI    |    ID       PI    |    ID       PI
 TMONP   Logical terminals with longest P  time     (00:15)  00:12:51
+         ID       P     |    ID       P     |    ID       P
+      CLOR0043 0.0578s  | CLOR0046 0.0526s  | BLOR0038 0.0497s
+      CLOR0042 0.0481s  | CLOR0044 0.0305s  | CLOR0045 0.0299s
+      BLOR0040 0.0182s  | BLOR0039 0.0182s  | ALOR0031 0.0180s
+      ALOR0032 4,782µs  |
 TMONR0  Logical terminals with longest R0 time     (00:15)  00:12:51
+         ID       I       P       R0   |    ID       I       P       R0
+      CLOR0046 0.0128s 0.0526s 0.0655s | CLOR0042 0.0131s 0.0481s 0.0613s
+      CLOR0043   726µs 0.0578s 0.0585s | BLOR0038   423µs 0.0497s 0.0501s
+      CLOR0045 3,659µs 0.0299s 0.0335s | CLOR0044 1,237µs 0.0305s 0.0318s
+      BLOR0040 2,774µs 0.0172s 0.0200s | BLOR0039   899µs 0.0182s 0.0191s
+      ALOR0031 1,012µs 0.0180s 0.0190s | BLOR0037 7,217µs 4,267µs 0.0114s
 TMONLO  Logical terminals with longest LO time     (00:15)  00:12:51
+         ID       LO    |    ID       LO    |    ID       LO
+      CLOR0043    18µs  | CLOR0042     7µs  |
 TMONO   Logical terminals with longest O  time     (00:15)  00:12:51
+         ID       O     |    ID       O     |    ID       O
+      CLOR0043 0.9547s  | CLOR0045 0.1244s  | CLOR0042 0.0153s
+      CLOR0044 0.0109s  | CLOR0046 6,109µs  | BLOR0040   464µs
+      BLOR0037   285µs  | ALOR0031    63µs  |
 TMONR1  Logical terminals with longest R1 time     (00:15)  00:12:51
+         ID       R1    |    ID       R1    |    ID       R1
+      CLOR0043 0.2262s  | CLOR0045 0.1296s  | CLOR0046 0.0655s
+      CLOR0042 0.0613s  | BLOR0038 0.0501s  | CLOR0044 0.0320s
+      BLOR0040 0.0200s  | ALOR0031 0.0191s  | BLOR0039 0.0191s
+      BLOR0037 0.0117s  |
```

Figure 42. Typical TMON display

When NUNIQ (*non-unique*) is enabled, more than one of the same type of items can display on the screen at the same time. When NFIXED (*moving window*) is enabled, then, at any moment, the RTM component displays those logical terminals with the highest response times over the previous number of minutes as defined by the sampling interval. For example, if the sampling interval (INTRV) is 15 minutes and the current time is 09:21:36, the RTM component displays the logical terminals with the highest response times from 09:06:36 until 09:21:36. At 10:05:47, the RTM component displays the logical terminals with the highest response times from 09:50:47 until 10:05:47.

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Accessibility features help users with physical disabilities, such as restricted mobility or limited vision, to use software products successfully.OMEGAMON monitoring products support several user interfaces. Product functionality and accessibility features vary according to the interface.

The major accessibility features in this product enable users in the following ways:

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- Operate specific or equivalent features using only the keyboard.
- Magnify what is displayed on the screen.

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