

# STROBE MVS

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## STROBE MQSeries Feature

Release 3.0



**COMPUWARE®**

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## Summary of Changes

This section lists the changes to the MQSeries Feature for STROBE MVS for Sysplex Release 3.0.

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### Changes to the STROBE MQSeries Feature

The MQSeries Feature for STROBE MVS for Sysplex 3.0 supports MQSeries Release 5.3.

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### Changes to this Manual

The MQSeries Feature contents did not change for STROBE MVS for Sysplex Release 3.0.



## Introduction

The STROBE Application Performance Measurement System and the STROBE MQSeries Feature are products designed for IBM OS/390 systems. The STROBE MQSeries Feature currently supports the following MQSeries releases:

- Version 1.1.4 (program number 5695-137)
- Version 1.2 (program number 5695-137)
- Version 2.1 (program number 5655-A95)
- Version 5.2 (program number 5655-F10)
- Version 5.3 (program number 5655-F10)

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## How This Manual Is Organized

Chapter 1, “Overview” presents an overview of the STROBE MQSeries Feature and the MQSeries environment.

Chapter 2, “Using the STROBE MQSeries Feature” describes how to use STROBE with the STROBE MQSeries Feature to measure an application that uses MQSeries.

Chapter 3, “Analyzing the Performance Profile” explains how to interpret the STROBE Performance Profile reports from the measurement of an application using MQSeries.

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## How to Use This Manual

Read Chapter 1, “Overview” and Chapter 2, “Using the STROBE MQSeries Feature” before submitting a measurement request. To interpret a Performance Profile for an application using MQSeries, read Chapter 3, “Analyzing the Performance Profile”.

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## The STROBE Library

The STROBE base product manuals include:

- *STROBE MVS Concepts and Facilities*, document number CWSTGX3A  
*STROBE MVS Concepts and Facilities* explains how to decide which programs and online regions to measure, when to measure them, and how to interpret the reports in the STROBE Performance Profile.
- *STROBE MVS Messages*, document number CWSTXM3A  
*STROBE MVS Messages* lists all messages and abnormal termination (ABEND) codes, describes how to interpret them, and in many cases suggests a corrective action.
- *STROBE MVS System Programmer's Guide*, document number CWSTXI3A  
The *STROBE MVS System Programmer's Guide* explains how to install and maintain STROBE.
- *STROBE MVS User's Guide*, document number CWSTUX3A and the *STROBE MVS User's Guide with Advanced Session Management*, document number CWSTUA3A

The *STROBE MVS User's Guide* explains how to use STROBE to measure application performance. The *STROBE MVS User's Guide with Advanced Session Management* explains how to use STROBE with the STROBE Advanced Session Management Feature to measure application performance. Users who have the STROBE Advanced Session Management Feature will use this manual rather than the *STROBE MVS User's Guide*.

- *STROBE MVS Application Performance Measurement System Quick Reference*

The *STROBE MVS Application Performance Measurement System Quick Reference* is a convenient reference for how to use STROBE and for interpreting the STROBE Performance Profile.

## STROBE Feature Manuals

These manuals describe the optional features of the STROBE MVS Application Performance Measurement System. Each manual describes measurement concepts applicable to and specific data made available by the feature.

- *STROBE MVS User's Guide with Advanced Session Management*, document number CWSTUA3A
- *STROBE ADABAS/NATURAL Feature*, document number CWSTUN3A
- *STROBE CA-IDMS Feature*, document number CWSTUR3A
- *STROBE CICS Feature*, document number CWSTUC3A
- *STROBE COOL:Gen Feature*, document number CWSTUG3A
- *STROBE CSP Feature*, document number CWSTUP3A
- *STROBE DB2 Feature*, document number CWSTUD3A
- *STROBE IMS Feature*, document number CWSTUI3A
- *STROBE Interface Feature*, document number CWSTUF3A
- *STROBE Java Feature*, document number CWSTUJ3A
- *STROBE MQSeries Feature*, document number CWSTUM3A
- *STROBE UNIX System Services Feature*, document number CWSTUU3A

## Online Documentation

STROBE manuals are available in HTML, Adobe Acrobat PDF format, and IBM BookManager format, on CD-ROM and at Compuware's technical support Web site at <http://frontline.compuware.com>.

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## Online Help

STROBE products provide the following online information:

- STROBE/ISPF Online Tutorials, Option T from the STROBE/ISPF STROBE OPTIONS menu
- STROBE/ISPF Online Message Facility, Option M from the STROBE/ISPF STROBE OPTIONS menu

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## Other Compuware Application Performance Management Products

The following products and features work in conjunction with STROBE MVS Application Performance Measurement System. These tools extend the benefits of application performance management (APM).

### iSTROBE

iSTROBE enables you to view and analyze STROBE Performance Profile data on a workstation using a standard Web browser. Easy to install and easy to use, iSTROBE guides you through the performance analysis process and offers recommendations for improving performance. iSTROBE simplifies the performance analysis of applications that you measure with STROBE. For more information on iSTROBE, see the *iSTROBE Getting Started Guide*.

### SQL Analysis Feature

The SQL Analysis Feature works in conjunction with STROBE and iSTROBE or APMpower to supply access path analyses and database and SQL coding recommendations for DB2 applications measured by STROBE. The SQL Analysis Feature pinpoints the most resource-consumptive static or dynamic SQL statements, explains why these statements might be inefficient, and provides recommendations to improve the performance of the DB2 application. For more information on the SQL Analysis Feature, see the *STROBE MVS User's Guide* or the *STROBE MVS User's Guide with Advanced Session Management*.

### APMpower

The APMpower Application Performance Analysis System extends the benefits of STROBE to application developers who use workstations to develop, test, and maintain MVS applications. Developers employ the APMpower graphical user interface and advanced analytical aids to navigate the Performance Profile, analyze and improve application performance, and share performance knowledge across the IS organization. For more information about APMpower, see the APMpower documentation.

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## Compuware APM Technical Support

For North American customers, for technical support, please contact the Technical Support department by telephone at (800) 585-2802 or (617) 661-3020, by fax at (617) 498-4010, or by e-mail at [strobe-sup@compuware.com](mailto:strobe-sup@compuware.com).

To access online technical support, visit Compuware's FrontLine page on the World Wide Web at <http://frontline.compuware.com> and select the product "STROBE and APMpower."

For other international customers, please contact your local Compuware office or STROBE supplier.

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## Compuware APM Training

Compuware's Education Resources Group offers a range of training options for organizations that use STROBE, iSTROBE, and APMpower. To arrange Application Performance Management training, please contact Compuware at 1-800-835-3190 or visit Compuware's Education Resources Group at <http://www.compuware.com/training>

For other international customers, please contact your local Compuware office or STROBE supplier for a complete list of APM Training offerings.

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## Compuware APM Service Offerings

For North American customers, for information about current service offerings, please contact your local Compuware sales office or call Compuware Corporate Headquarters at 1-800-COMPUWARE (266-7892) or visit Compuware's APM Product page on the World Wide Web at <http://www.compuware.com/products/strobe>.

For other international customers, please contact your local Compuware office or STROBE supplier for a complete list of Services offerings.

### APM Installation Assurance

The APM Installation Assurance service assists you in planning for, installing, customizing and using APM products. The service will help you maximize the value and benefits derived from the APM product family.

Consulting engineers work closely with your IT personnel to understand your operating environment and your organization's APM goals. The engineer will assist you in developing a customization and installation plan for STROBE, iSTROBE, and APMpower. The engineer will oversee the installation process and verify product readiness. The engineer will also help set up measurement request schedules, request groups, history records, AutoSTROBE measurement requests, and will verify the installation of the SQL Analysis Feature.

With APM Installation Assurance services, your organization can immediately maximize the value received from your investment in the APM product family. You will also benefit from a fully customized installation that will enhance the product functionality and increase the automation aspects of your APM initiatives.

### Application Performance Management Consulting

The Application Performance Management (APM) Consulting services assist you in identifying and resolving specific performance problems in your OS/390 business-critical applications.

Using STROBE, iSTROBE, and APMpower, consulting engineers work closely with your IT personnel to measure an application's performance, identify performance improvement opportunities and make recommendations for implementing solutions.

With APM Consulting services, your organization cannot only resolve problems quickly and effectively, but also gain the skills necessary to prevent application performance degradation in the future.

### Application Performance Assessment

The Application Performance Assessment (APA) service assists you in achieving a higher level of performance for your OS/390 business-critical applications.

Using STROBE, iSTROBE, and APMpower, consulting engineers work closely with your IT personnel to evaluate the efficiency of business-critical applications, identify opportunities for improving performance and document the potential savings that can result from implementing recommended solutions.

With APA services, you cannot only improve application performance quickly and effectively, but also gain the knowledge and skills necessary to implement and sustain a process-oriented application performance management (APM) program.

# Chapter 1.

## Overview

The STROBE MVS Application Performance Measurement System is a product that determines where and how application time is spent in online regions and batch processing programs and how system resources are used. STROBE collects several types of data as it tracks activity within an OS/390 environment and produces a collection of reports that helps you determine where to revise applications to improve their performance.

The STROBE MQSeries Feature supports measurement and analysis of CICS and batch applications that utilize the IBM MQSeries OS/390 product. The STROBE MQSeries Feature provides:

- CPU time and wait time caused by MQSeries calls
- Summary information on MQSeries call options and message attributes
- Attribution of CPU time and wait time within MQSeries system services (prefixed by CSQ) to invoking application code
- Function descriptors for MQSeries system services.

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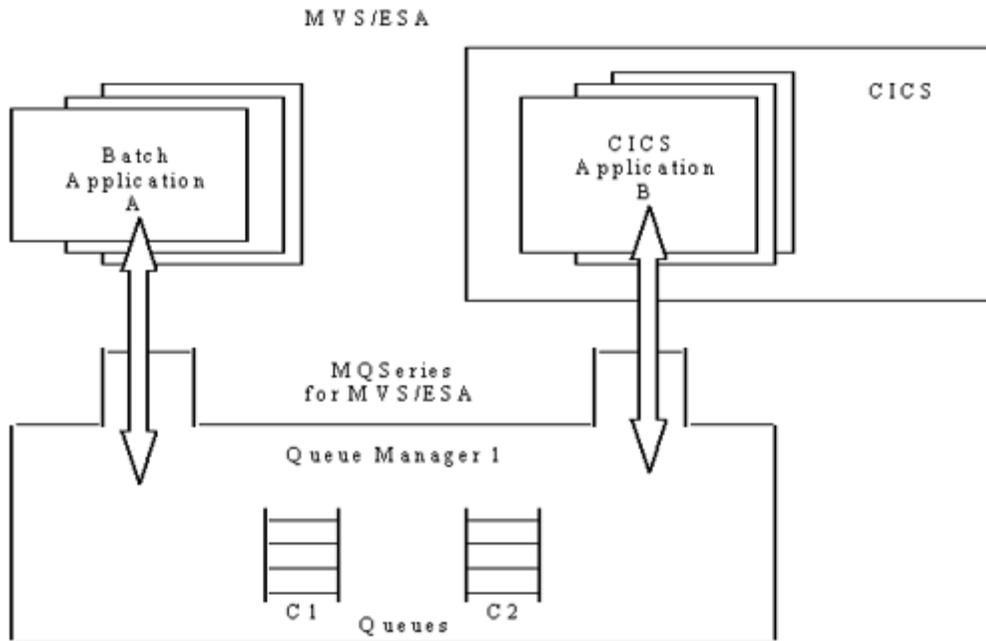
## MQSeries Overview

The IBM MQSeries message queueing product provides an information infrastructure that allows applications to communicate across different platforms and environments. Some concepts behind this infrastructure are described through the following IBM terminology:

- Messages - Data structures that contain control information and the data to be transferred between applications via MQSeries queues.
- Queues - Data structures used to store messages until they are retrieved by an application program.
- Queue Manager - Program that provides services by which user applications can read or write messages on MQSeries queues. In OS/390, the MQSeries queue manager is a separate address space.
- Channel - Agent that allows messages to be moved between queues defined to different queue managers. The processing associated with transmitting messages between different queue managers is sometimes referred to as Distributed Queue Management (DQM).
- Message Queueing Interface (MQI) - A set of Application Programming Interfaces (API) by which programs connect to individual queue managers, gain access to individual queues, and store and retrieve messages from queues.

Figure 1-1 on page 1-2 shows a simple MQSeries environment. The STROBE MQSeries Feature reports whether batch application A or CICS application B incur CPU or wait time during attempts to access the MQSeries queues C1 or C2.

Figure 1-1. MQSeries Overview




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## Benefits of the STROBE MQSeries Feature

The STROBE MQSeries Feature collects application performance information as the application executes. When measurement completes, STROBE organizes this information into the STROBE *Performance Profile*, a series of reports that show where and how time is spent during application execution, pinpointing possible areas for performance improvement. Measuring your application at successive stages of the development cycle helps you to evaluate and improve your code before moving the applications into production.

Measuring your production applications with the STROBE MQSeries Feature enables you to identify areas of the application to evaluate for improvement. You can then evaluate these performance improvement opportunities, determine the changes to make, implement the changes, and measure again to verify the effects of your changes.

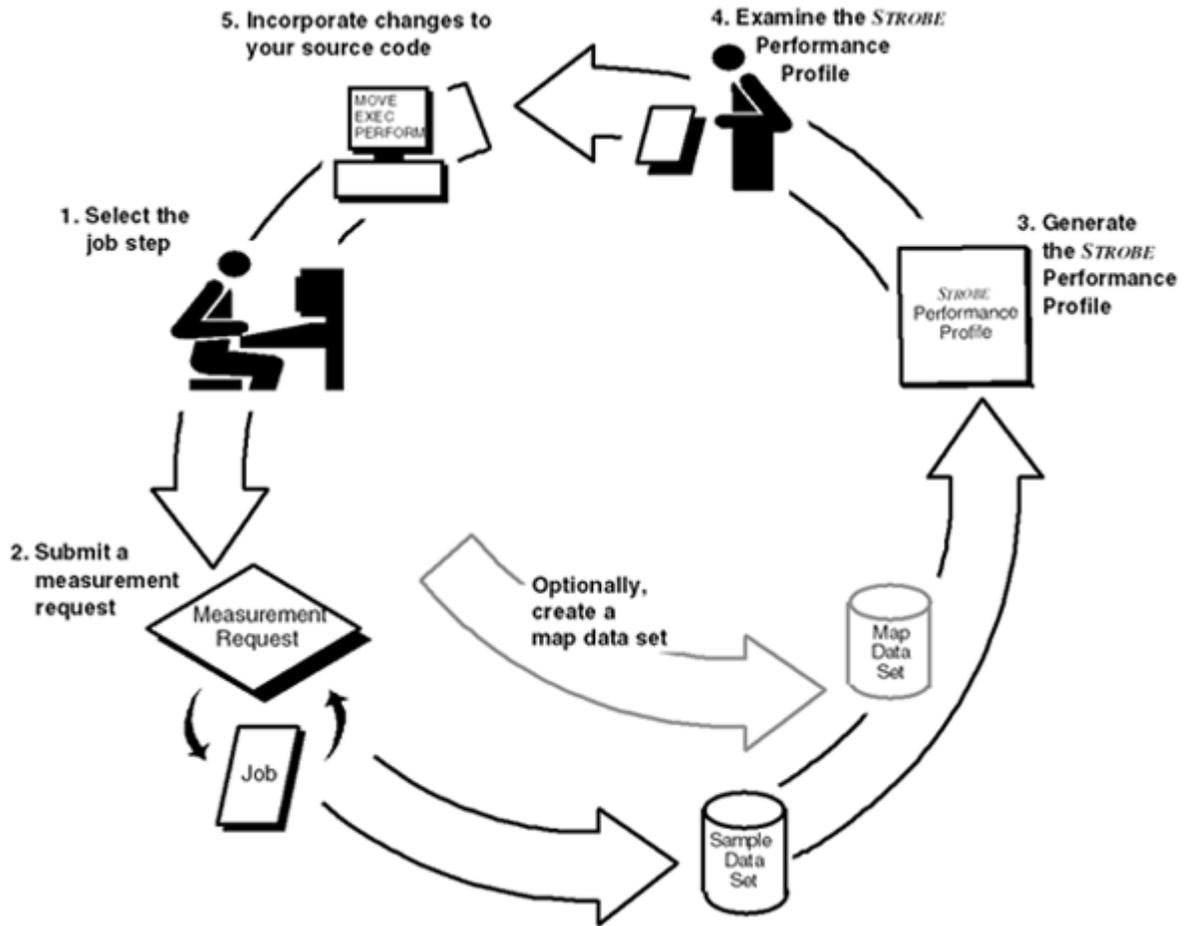
The next section discusses the key concepts and terms that are central to the use of the STROBE MQSeries Feature.

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## Concepts and Terminology

Prior to using the STROBE MQSeries Feature, you need to become familiar with the basic concepts and terminology specific to STROBE. Figure 1-2 on page 1-3 and the table following it introduce you to these concepts and terms.

Figure 1-2. Overview of STROBE Tasks



**Performance Profile** After STROBE closes the sample data set, you can use it to create the *Performance Profile*, a hierarchical series of reports that present the performance data collected during a measurement session. These reports show where and how the application spends the time during execution.

**measurement request** A *measurement request* specifies the parameters for measuring the performance of an application. As soon as the application is active, STROBE begins a *measurement session*, an interval during which STROBE collects performance data about the application while it is executing. STROBE stores measurement data in a *sample data set*, a file that contains the information collected during a single measurement session. Each measurement session corresponds to one sample data set.

**Attribution**

*Attribution* identifies the sites of invocation of system service routines, relating activity or wait to the modules that called these routines. Examine two Performance Profile reports to get a complete picture of the overall performance of your application.

- Attribution of CPU Wait Time report
- Attribution of CPU Execution Time report

Examine these reports when system services are responsible for significant CPU use or wait time.

---

## Overview of the Target Environment

The STROBE MQSeries Feature can be used to identify performance improvement opportunities for both batch applications and online CICS applications. The STROBE MQSeries Feature target environment is a batch, on-line IMS, CICS, or CICS address space which uses the MQSeries API.

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## Measuring Batch Jobs

Measurement of batch application service calls to MQSeries is one function of the MQSeries Feature. The STROBE Performance Profile contains reports of activity that takes place during the course of the execution of a batch job's steps that involves MQSeries access. The Performance Profile includes a series of CPU and wait time reports that provide comprehensive information about a batch job and its use of MQSeries. See "MQSeries Reports that Show CPU Time" on page 3-3 and "MQSeries Reports that Show Wait Time" on page 3-10 for more information about the STROBE MQSeries Feature batch job reporting.

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## Measuring On-line IMS transactions

To measure service calls that an on-line IMS transaction makes for MQSeries API services, you must have the STROBE MQSeries Feature and the STROBE IMS Feature installed at your site. If you set the appropriate IMS Data Collector options as explained in "IMS Transaction Level Reporting" on page 2-6, the MQSeries Feature will report information about on-line IMS transactions that access MQSeries. One set of transaction summary reports and one set of individual IMS transaction calls to MQSeries are produced by STROBE. See "MQSeries IMS Transaction Summary Reports" on page 3-15, "MQSeries Reports that Show CPU Time" on page 3-3 and "MQSeries Reports that Show Wait Time" on page 3-10 for more information about IMS and MQSeries measurement reporting.

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## Measuring CICS Jobs

To measure service calls that a CICS application makes for MQSeries API services, you must have the STROBE MQSeries Feature and the STROBE CICS Feature installed at your site. If you set the appropriate CICS Data Collector options, the STROBE MQSeries Feature will report information about CICS transactions that access MQSeries. A special Performance Profile report provides transaction-specific information about CICS service calls to MQSeries. See "MQSeries Reports for CICS Transactions" on page 3-16 for more information about CICS and MQSeries Feature measurement reporting.

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## Where to Find More Information

You can find detailed instructions for submitting and managing measurement requests and creating Performance Profiles in the STROBE/ISPF Online Tutorials and in Chapter 2 of the *STROBE MVS User's Guide* or in Chapter 2 of the *STROBE MVS User's Guide with Advanced Session Management*. For more information on interpreting Performance Profiles, see *STROBE MVS Concepts and Facilities*.



## Chapter 2.

# Using the STROBE MQSeries Feature

This chapter explains how to configure and use STROBE to measure a batch or CICS application that is using MQSeries. It also describes how to set reporting parameters to define what information appears in the STROBE MQSeries Performance Profile reports.

To enable STROBE to correctly attribute MQSeries measurement activity to application modules other than the one that invoked MQSeries, you must provide a special STROBE - DATA COLLECTORS panel parameter. It is the name of the common MQSeries user module that invokes MQSeries on behalf of other applications. For more information, see “Measuring Applications that Call MQSeries” on page 2-3.

---

## About the Application

The STROBE MQSeries Feature enables you to measure batch and CICS applications that use IBM's MQSeries product. While the application code is making a service call to MQSeries, STROBE collects data on the code activity. STROBE collects the following types of MQSeries information:

- MQSeries function (API) called
- application module (and its offset) that called the MQSeries function
- MQSeries queue holding data requested by function
- characteristics (size, priority) of message data being processed

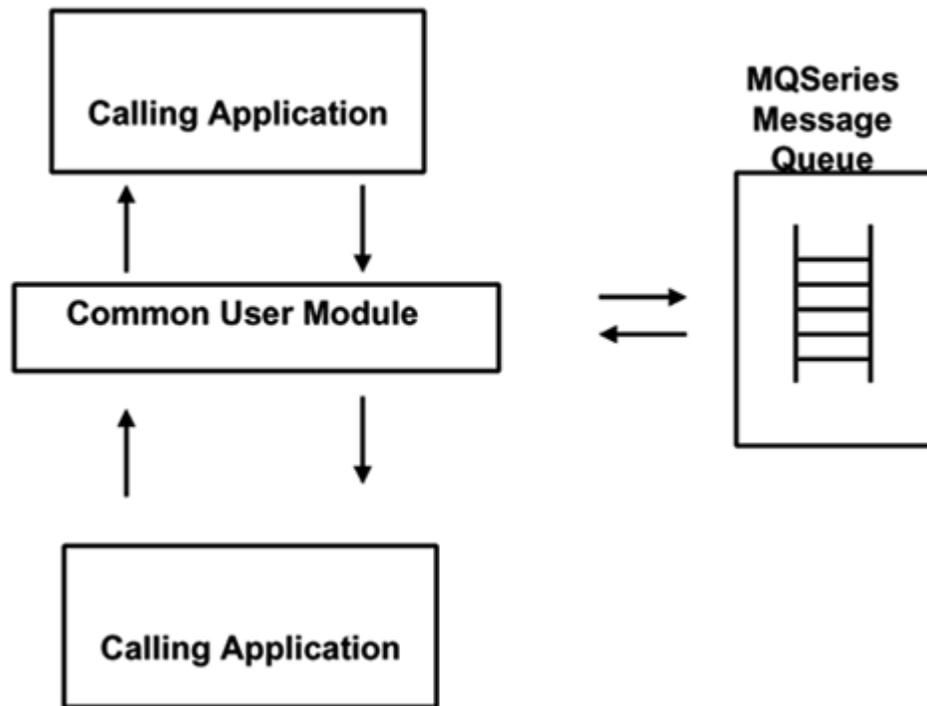
## Common MQSeries User Module

Some users provide a common MQSeries user module that all program modules use to invoke MQSeries API calls. When STROBE detects a call to the MQSeries address space, it attributes the measurement data to the calling module. If the call is made directly from the application being measured to MQSeries, STROBE correctly attributes the measurement data to the calling application module.

If a common user module invokes a MQSeries service call for the application being measured, STROBE is able to correlate the application module requesting MQSeries to the MQSeries activity it detects. The STROBE MQSeries Feature identifies the common user module that directly called MQSeries and then finds the application module that actually requested MQSeries data, attributing the resource consumption to that module.

Figure 2-1 on page 2-2 shows an example of an MVS environment where STROBE is measuring an application that uses a common user module to call MQSeries.

Figure 2-1. Common MQSeries User Module



To enable STROBE to provide MQSeries information about the application you are measuring instead of the common user module it detects, you have to identify the name of the user module when you add a measurement request. Then the STROBE MQSeries Feature can correctly attribute measurement data it collected to the calling application module instead of the common user module. The user module name will not typically appear in MQSeries reports.

MVS programming standards must be followed for STROBE and the STROBE MQSeries Feature to trace application activity through common MQSeries user modules. The common user module must be either:

- a separate load module from the load module(s) that invoke it.
- a separate CSECT in the program being measured
- a CSECT in one of the load modules that is mapped for measurement

The common user module must comply with standard MVS linkage conventions as follows:

- during its entire operation, register 13 of the common user module must point to its own save area
- offset 4 (i.e. the second word) of that save area must point to a save area of the caller of the user module.
- offset 12 (i.e. the fourth word) of the caller's save area must contain the return address to the calling routine.

If the MQSeries common user module is being called by a CICS transaction, the following rules apply:

- if the common user module is called dynamically, you should follow the batch application linking conventions

- the common user module should be invoked through the CICS application programming interface using either a LINK or XCTL command. However, for a XCTL command, no offset in the calling program can be provided.

---

## Starting STROBE

You have two options when starting STROBE:

- STROBE/ISPF — a menu-driven interface to the STROBE system
- STROBE command language — a set of procedural operators and parameters that you can invoke through Time Sharing Option (TSO) commands or batch jobs

If necessary, consult your systems programmer for specific information on how to start STROBE in your environment.

**Note:** If you are not measuring a batch or CICS application that is dependent upon a common MQSeries user module, and you have the MQSeries Feature installed, the Feature starts automatically and you can proceed with the measurement request without setting any of the STROBE - DATA COLLECTOR panel parameters described in the next section.

---

## Measuring the Application

With STROBE you can measure applications that run as batch jobs, use TSO, or execute in online regions. This section describes the steps you should take to measure a particular application with STROBE.

**Note:** To obtain STROBE measurement data on MQSeries service calls made by an application, the STROBE MQSeries Feature must be installed on the same MVS system or image where the MQSeries product is installed.

### Measuring Applications that Call MQSeries

To measure an application that is accessing MQSeries, you have to set parameters on the STROBE - DATA COLLECTORS panel. One value can be designated as a default so you only have to set the parameter name once.

1. Select either Option 1 ADD ACTIVE or Option 2 ADD QUEUED REQUEST depending on the type of job you are measuring.
2. Specify the target job name in the JOBNAME field.
3. If this is a queued request, specify the target job step in the PROGRAM or STEP fields.
4. Specify the target system in the SYSTEM field or clear this field to select from a list of systems.
5. Configure the measurement session by specifying:
  - how long you want to measure the job in the SESSION DURATION field
  - how many performance samples you want STROBE to take in the TARGET SAMPLE SIZE field
  - the TSO user ID for STROBE to notify when the request is complete in the TSO USER ID TO NOTIFY field
6. Specify the sample data set information in the SAMPLE DATA SET INFORMATION fields.

7. Select the DATA COLLECTORS panel shown in Figure 2-2 by entering “Y” in the DATA COLLECTORS field.
8. If you want to suppress MQSeries data collection, enter “N” in the MQSERIES field.
9. If applications accessing MQSeries call a common user module, enter the name of the user module that the measured application uses to access MQSeries in the “Common MQ User Module” field. This name must comply with MVS naming conventions. (If using the command language, enter the “MQROUTINE=user module name” parameter with the ADD command.)
10. If you are using an MQSeries common user module for all STROBE MQSeries Feature measurements, enter “Y” in the “Always Use as Default” field. This will provide attribution back to the calling application during subsequent MQSeries measurements.
11. To generate the MQSeries Service Time by Queue report, enter “Y” in the CICS Options “Collect Region Data” field or specify a transaction name(s) in the “Detail Transaction:” field. See the *STROBE CICS Feature* for more information about CICS data collection and reporting.
12. Press **Enter**.

**Figure 2-2.** STROBE - DATA COLLECTORS Panel

```

----- STROBE - DATA COLLECTORS -----
COMMAND ==>

OVERRIDE DATA COLLECTOR DEFAULTS FOR JOBNAME: WPAFXC
DATA COLLECTORS: (Y or N; Y adds to and N removes from your system defaults)
  ADABAS      ==>  ADA3GL      ==>  C      ==>
  CICS        ==>  COBOL      ==>  CSP      ==>
  DB2         ==>  IDMS       ==>  IDMS BATCH DML ==>
  IEF         ==>  IMS        ==>  MQSERIES ==>
  NATURAL     ==>  PL/I       ==>  SVC       ==>

CICS Options:
  Collect Region Data ==>      OR      Produce Performance Supplement ==>
  Detail Transaction: (TRAN or TR*):      Collect Terminal Activity ==>
  =>      =>      =>      =>      =>

CAPTURE Options:(Y or N; default is Y)
  DB2 ==>      IMS      ==>

Common MQ User Module ==>      Always use as default (Y/N) ==>

OTHER DATA COLLECTORS:
  PROGRAM NAME ==>      ==>      ==>      ==>

```

## Viewing the Status of Your Measurement Request

Once you have submitted an MQSeries measurement request, you can view the status of the request, regardless of the system on which it is executing.

To view the status of a measurement request, follow these steps:

1. Select Option 3 (STATUS) from the STROBE OPTIONS menu. STROBE/ISPF displays the STROBE - STATUS panel, which shows the status (active, suspended, queued, or completed) of each measurement request on a given system.

The STROBE - STATUS panel displays the status of each measurement request on a given system, as well as specific information about the measurement request.

2. Enter the system name in the SYSTEM field to view the status of measurement requests on a particular system. Alternately, clear this field using the space bar, and press **Enter** to view a list of all active systems in the sysplex. STROBE displays the STROBE - SYSTEM SELECTION LIST panel, which lists the active systems in the

Sysplex. Select one or more of these systems by entering S to the left of the system name.

3. Press the F3 key to exit from the STROBE - STATUS panel.

---

## Creating the Performance Profile

After the measurement is complete, (the sample data set and, optionally, the map data sets are created) you can create a Performance Profile for your application.

You have three options for creating a Performance Profile with STROBE/ISPF:

- Create a Performance Profile automatically when submitting a measurement request for an active or queued request.

Enter “Y” in the AUTO PROFILE CREATION field on the STROBE - ADD ACTIVE REQUEST panel or the STROBE - ADD QUEUED REQUEST panel.

- Create a Performance Profile from the STROBE OPTIONS menu.

Select Option 4 (PROFILE) from the STROBE OPTIONS menu. STROBE displays the STROBE - PRODUCE A PERFORMANCE PROFILE panel, where you can specify options for the Performance Profile.

- Create a Performance Profile from the STROBE - STATUS panel.

Enter “P” to the left of a completed measurement request number on the STROBE - STATUS panel. STROBE displays the STROBE - PRODUCE A PERFORMANCE PROFILE panel, where you can specify options for the Performance Profile.

## Tailoring MQSeries Reports

When you are creating a Performance Profile, you can limit the amount of reporting of MQSeries measurement data that is contained in the Profile. The STROBE - TAILOR REPORTS panel, (Figure 2-4 on page 2-7), provides two fields that pertain to MQSeries Feature reporting.

The MQSERIES CALLS field allows you to specify a percentage value that controls what MQSeries service calls are included in the Performance Profile. These reports are the CPU Usage by Module by MQSeries Call and the Wait by Module by MQSeries Call. The percentage represents the threshold for which you do not require measurement information about an MQSeries statement. For example, you can specify a percentage value of 10 in the MQSERIES CALL field. A value of 10 causes STROBE not to report on any MQSeries statement that did not execute enough times during a measurement session to represent 10% of the CPU or run time spent in wait that is recorded by the MQSeries Feature. All MQSeries statements that exceed 10% of the total CPU or run time spent in wait, are shown in the Performance Profile reports.

By default, STROBE will report on MQSeries service calls that show any amount of CPU or run time spent in wait activity.

To set these parameters with STROBE/ISPF or the STROBE command language:

1. Enter “Y” in the Tailor Reports field of the STROBE - PRODUCE A PERFORMANCE PROFILE panel.
2. On the STROBE - TAILOR REPORTS panel, specify a baseline percentage between 0 and 99.9 in the “Compress below%” portion of the MQSERIES CALLS field (Figure 2-4 on page 2-7).

When you submit a batch job using the STROE or STROXE procedure, specify MQCALL=*nn.n*. where *nn.n* is the baseline percentage you want to specify.

## IMS Transaction Level Reporting

For IMS, the MQSeries Feature provides you with the option of reporting on either a module or transaction level for the CPU Usage by Module by MQSeries Call and Wait by Module by MQSeries Call reports. To choose transaction level reporting, you specify the MQTRAN parameter as follows and shown in Figure 2-3:

1. On the STROBE - PRODUCE A PERFORMANCE PROFILE panel, specify **Y** in the Detail Reports field.
2. Press **Enter** to display the STROBE - DETAIL FOR A PERFORMANCE PROFILE panel.
3. Enter MQTRAN in the OTHER PARAMETERS field as shown below.

**Figure 2-3.** STROBE - DETAIL FOR A PERFORMANCE PROFILE Panel

```

----- STROBE - DETAIL FOR A PERFORMANCE PROFILE -----
COMMAND ==>
SAMPLE DATA SET: 'WPANAC.WPAJPS.S001D001'
REPORT OPTIONS:
TITLE      ==>
COMPRESS  ==> AAA      =.AAAA      ==>      =.      ==>      =.
          ==>          =.          ==>      =.      ==>      =.
          ==>          =.          ==>      =.      ==>      =.
          ==>          =.          ==>      =.      ==>      =.
DETAIL    ==>          ==>          ==>          ==>
          ==>          ==>          ==>          ==>
          ==>          ==>          ==>          ==>
RESOLUTION ==> 32      SORT SIZE ==>          LINES/PAGE ==>
OTHER PARAMETERS ==> MQTRAN
    
```

With the STROE or STROXE procedure, specify the MQTRAN parameter.

## Suppressing Attribution Reports

You can suppress all STROBE MQSeries Feature Attribution reports.

To set these parameters with STROBE/ISPF:

1. Enter **“Y”** in the Tailor Reports field of the STROBE - PRODUCE A PERFORMANCE PROFILE panel.
2. On the STROBE - TAILOR REPORTS panel, enter **“Y”** in the **“Suppress reports for MQSERIES”** portion of the ATTRIBUTION REPORTS field.

With the STROE or STROXE procedure, specify the NOATTR=MQSERIES parameter.

Figure 2-4. STROBE - TAILOR REPORTS Panel

```

----- STROBE - TAILOR REPORTS -----
COMMAND ==>

WAIT TIME BY MODULE -- Show location of wait ==> (Specify Y)
----- Report ----- Compress below OR Suppress (Specify Y)
PROGRAM USAGE BY PROCEDURE ==> % ==>
DASD USAGE BY CYLINDER ==> % ==>

TRANSACTION USAGE BY CONTROL SECTION ==> % ==>

CICS TRANSACTION PROFILE ==> sec ==>
CICS REGION LEVEL ==> sec ==>
MQSERIES CALLS ==> % ==>
ATTRIBUTION Reports ==> % ==>
  Suppress reports for:
    C ==> CICS ==> COBOL ==>
    CSP ==> DB2 ==> DL/I ==>
    IDMS ==> IEF ==> MQSERIES ==>
    PL/I ==> SVC ==>

PROGRAM SECTION USAGE SUMMARY Display inactive ==>
TIME and RESOURCE DEMAND DISTRIBUTION Combine tasks ==>
Combine tasks ==> Display all tasks ==> Display all DDs ==>

CICS TRANSACTION PROFILING FILTERS ==> ==> ==> ==> ==>
  Suppress non-CICS TRANSACTION REPORTS ==> (Specify Y)
USE DATE AND TIME FORMAT FROM PARMLIB ==>

```



## Chapter 3.

# Analyzing the Performance Profile

This chapter presents and explains the types of STROBE reports produced by the MQSeries Feature. The following briefly describes the types of reports:

- A set of four reports provides data showing CPU usage for batch and CICS applications resulting from MQSeries service calls. You can set a reporter parameter to cause STROBE to report on IMS transaction level instead of module level.
- A set of four comparable reports shows data reflecting wait time experienced by the batch application due to MQSeries. You can set a reporter parameter to cause STROBE to report on IMS transaction level instead of module level.
- A set of two reports each showing a summary of IMS transaction time resulting from calls to MQSeries resources. One report shows IMS transaction CPU usage time and the other report shows IMS transaction wait time.
- One special report shows the service time spent by CICS transactions accessing MQSeries in an on-line MVS environment.

---

## Verifying the Measurement Session Information

Start analyzing the Performance Profile by examining the Measurement Session Data report shown in Figure 3-1 on page 3-2. This report describes the environment during a measurement session and provides some overall measurement statistics. The COMMON MQ USER MODULE field in the MEASUREMENT PARAMETERS column section shows the common user module you designated as described in “Measuring Applications that Call MQSeries” on page 2-3. The REPORT PARAMETERS column section will show the MQSeries reporting threshold if you specified one.

In the JOB ENVIRONMENT column, two fields show MQSeries data. The SUBSYSTEM field indicates if the MQSeries Feature was active. The QMGR field shows the name and version of the queue manager that STROBE sampled most often.

Figure 3-1. Measurement Session Data Report for a Batch Job

** MEASUREMENT SESSION DATA **		
----- JOB ENVIRONMENT -----	----- MEASUREMENT PARAMETERS -----	----- MEASUREMENT STATISTICS-----
PROGRAM MEASURED - IKJEFT01	ESTIMATED SESSION TIME - 10 MIN	CPS TIME PERCENT - 4.46
JOB NAME - WPALXMA3	TARGET SAMPLE SIZE - 10,000	WAIT TIME PERCENT - 95.54
JOB NUMBER - JOB32090	REQUEST NUMBER (Q) - 79	RUN MARGIN OF ERROR PCT - .98
STEP NAME - PH02CS04		CPU MARGIN OF ERROR PCT - .98
DATE OF SESSION - 05/12/01	SYS REQ - SCS01	TOTAL SAMPLES TAKEN - 1,497
TIME OF SESSION - 15.19.45		TOTAL SAMPLES PROCESSED - 1,497
	OPTIONS - MQSERIES	INITIAL SAMPLING RATE - 16.67/SEC
	COMMON MQ USER MODULE - MQCONN	FINAL SAMPLING RATE - 16.67/SEC
SYSTEM - ESA SP4.3.0	----- REPORT PARAMETERS -----	SESSION TIME - 4 MIN 50.98 SEC
DFSMS - 1.1.0		CPU TIME - 0 MIN 32.04 SEC
CPU MODEL - 3090-600S	REPORT RESOLUTION - 32 BYTES	WAIT TIME - 0 MIN 1.60 SEC
SMF/SYSTEMID - SESA/SCS01	SORTSIZE - 999,999	STRETCH TIME - 4 MIN 17.34 SEC
	LINES/PAGE - 60	
SUBSYSTEM - MQSERIES		SRB TIME - 0 MIN 0.43 SEC
QMGR:ABC1. 1.2.0		SERVICE UNITS- 30951
REGION SIZE BELOW 16M - 1,088K	DASD= 2.0% DASDGAP= 5 ATTR= 0.0%	PAGES IN- 0 OUT- 0
REGION SIZE ABOVE - 32,768K	SQL=CPUTEXT=25	PAGING RATE - 0.00/SEC
PTF LVL- 2.4.0.FS000000/FS000000		EXCPS - 95 0.33/SEC
SAMPLE DATA SET - ZZ.WPALXMA3.S002D001		

To verify that the Performance Profile is valid, examine the following fields:

- In the JOB ENVIRONMENT column, ensure that the PROGRAM MEASURED, DATE OF SESSION, and TIME OF SESSION are what you expect.
- In the MEASUREMENT PARAMETERS column, ensure that the appropriate version of your application appears in the SUBSYSTEM field.
- In the MEASUREMENT STATISTICS column, examine the RUN MARGIN OF ERROR PCT and the CPU MARGIN OF ERROR PCT fields. A run-time margin of error of less than 2% usually reflects a reliable measurement. A high CPU margin of error does not mean that the Performance Profile is invalid. Rather, it indicates that you should focus your analysis on the reports that detail run time.
- If you are measuring CICS transactions making MQSeries service calls, ensure that the region level reporting is active (RLI appears in the MEASUREMENT PARAMETERS column).

## Choosing Between Execution and Wait Reports

Usually, a performance improvement opportunity exists in reducing wait time or curbing CPU consumption. To determine whether to examine the CPU execution or wait reports in the Performance Profile, look under the MEASUREMENT STATISTICS column at the values reported for the CPS TIME PERCENT (the percentage of time that one or more of the CPUs were active) and WAIT TIME PERCENT fields.

CPS time is the run time during which the central processing subsystem (consisting of one or more CPUs) was in use by application tasks that execute within the measured job steps. If the value for CPS TIME PERCENT is high, examine the following execution reports to determine opportunities for improvement in CPS time:

- MQSeries CPU Usage Summary report
- CPU Usage by Module by MQSeries Call report
- MQSeries Total CPU Activity by Queue report
- MQSeries Message - CPU Activity by Queue by Module report



**MODULE NAME**

The name of the module making the MQSeries service call. If you specified the name of the common user module on the STROBE - DATA COLLECTORS panel, it will not be listed in this report.

**SECTION NAME**

The name of the control section making the MQSeries service call.

**CPU TIME PERCENT**

The percentage of CPU time spent executing MQSeries service calls. The percentage reflects CPU time used by programs executing for the measured application. There are two measures of CPU time:

- SOLO shows MQSeries activity without any concurrent I/O or CPU activity being performed under control of programs executed for the measured job step.
- TOTAL shows MQSeries activity with or without any such concurrent activity.

## CPU Usage by Module by MQSeries Call

The CPU Usage by Module by MQSeries Call report (Figure 3-3 on page 3-5) breaks out and shows how the MQSeries activity for measured modules and their associated control sections and offsets is distributed over queue managers. For each queue manager, the storage location and service call appears. For each queue, the cumulative CPU usage for a service call is identified.

If you set the MQTRAN reporter parameter, this report will contain data showing IMS transaction level activity. See “CPU Usage by IMS Transaction Reporting” on page 3-6 for an example of the report format when the MQTRAN parameter is set.

This report example covers module ABCRED. The first section shown is ALPHA1. STROBE reported that MQGET calls from location 00001A3E to queue QUEUE\_RED\_33 consumed 1.05% of CPU time.

From location 0000846A, STROBE found that MQGET calls accessed four different MQSeries queues. The CPU consumption of these calls accounted for a total of 11.62% of the CPU time reported during the measurement session. Combined, these MQGET calls totaled 12.67% of the CPU time.

From module ABCRED and section ALPHA1, MQPUT1 calls were made from location 000022AA to two different queues under MQSeries queue manager QNM2. These calls accounted for 7.63% of CPU time.

**Note:** If you set a threshold value in the MQSERIES call field of the STROBE TAILOR REPORTS panel as explained in “Tailoring MQSeries Reports” on page 2-5, the TOTAL value may not match the sum of the values reported for each call. STROBE does not report detail lines for calls that show less CPU time than the threshold value you specified.

Figure 3-3. CPU Usage by Module by MQSeries Call Report

```

** CPU USAGE BY MODULE BY MQSERIES CALL **
MODULE ABCRED
SECTION ALPHA1
)
QUEUE MANAGER NAME - QNM1

REQUEST      MQSERIES      QUEUE NAME      CPU TIME      PERCENT
LOCATION      CALL              CPU SOLO      TOTAL

00001A3E    MQGET            QUEUE_RED_33    1.05          1.05
0000846A    MQGET            QUEUE_WHITE_14  2.61          2.61
                                QUEUE_WHITE_15  .56           .56
                                QUEUE_WHITE_16  8.09          8.12
                                QUEUE_WHITE_17  .32           .32
                                -----
TOTAL                                11.58         11.62

QMN1 ACTIVITY                                12.63         12.67

QUEUE MANAGER NAME - QNM2

REQUEST      MQSERIES      QUEUE NAME      CPU TIME      PERCENT
LOCATION      CALL              CPU SOLO      TOTAL

000022AA    MQPUT1          QUEUE_BLUE_22   4.61          4.61
                                QUEUE_BLUE_25   3.02          3.02
                                -----
TOTAL                                7.63          7.63

QMN2 ACTIVITY                                7.63          7.63

ALPHA1 ACTIVITY                                20.26         20.30

MODULE - ABCGREEN
SECTION - THETA3

QUEUE MANAGER NAME - QMN1

REQUEST      MQSERIES      QUEUE NAME      CPU TIME      PERCENT
LOCATION      CALL              CPU SOLO      TOTAL

0000553E    MQPUT            QUEUE_GREEN_9   .03           .03

DELTA ACTIVITY                                .03           .03

ABCGREEN ACTIVITY                                20.29         20.33

TOTAL CPU ACTIVITY                                59.43         59.58

```

**MODULE**

The name of the module making the MQSeries service call. If you specified the name of the common user module on the STROBE - DATA COLLECTORS panel, it will not be listed in this report.

**Note:** If a CICS transaction program or an IMS on-line transaction is terminating during the measurement session and STROBE is unable to identify it, this column will list a pseudo module name beginning with a ".". (For example, .MQSRIES.) See Chapter 3 of the *STROBE CICS Feature* and Chapters 4 and 5 of the *STROBE IMS Feature* for more information about pseudo module names that can appear in this report.

**SECTION**

The name of the control section making the MQSeries service call.

**QUEUE MANAGER NAME**

Name of the queue manager of the queue that was the target of the MQSeries service calls.

**REQUEST LOCATION**

Storage location of individual service call in the control section.

**MQSERIES CALL**

The type of service call made by the control section.

**QUEUE NAME**

Name of the MQSeries queue holding the data that was the object of the service call. In most cases, this name is the name of the local queue. For a MQPUT1 call, however, this name is either the local queue name, or the alias name (if an alias was used for the queue).

**Note:** The message 'UNABLE TO IDENTIFY QUEUE' may appear in the queue name field if certain control blocks are not available to STROBE. MQSeries control blocks may not be available at OPEN and CLOSE time.

The message 'NO QUEUE APPLICABLE FOR THIS API' may appear in the queue name field when STROBE is processing either internal APIs or MQCMIT and MQBACK APIs.

**CPU TIME PERCENT**

The percentage of CPU time spent executing MQSeries service calls. The percentage reflects CPU time used by programs executing for the measured application. There are two measures of CPU time:

- SOLO shows MQSeries activity without any concurrent I/O activity being performed under control of programs executed for the measured job step.
- TOTAL shows MQSeries activity with or without any such concurrent I/O activity.

**TOTAL CPU ACTIVITY**

The total CPU time percentage attributed to the service calls to the queue manager.

**CPU Usage by IMS Transaction Reporting**

The MQSeries Feature also reports on IMS transactions that execute in an on-line environment. As explained in "IMS Transaction Level Reporting" on page 2-6, you can set the MQTRAN parameter to enable STROBE to report measurement information for IMS transactions. This information includes the transaction name, the module(s) from which the MQSeries call was made, the location of the transaction and which queue manager was called by the transaction. Figure 3-4 shows the format of the CPU Usage by Module by MQSeries Call report if you specify the MQTRAN parameter.

If you have identified an IMS transaction with high CPU time usage on the Summary of CPU Usage by Transaction report as described in the section "MQSeries IMS Transaction Summary Reports" on page 3-15, you can use this report to see the MQSeries service calls being made by the transaction that used the most CPU time.

STROBE reports total CPU usage time on a queue manager, module and a transaction level as shown in the report field descriptions following Figure 3-4.

As shown on the CPU Usage by Transaction Summary report shown in Figure 3-12, the transaction named IMSTRAN2 had a total CPU usage of 6.62 percent. You can see each MQSeries service call that transaction IMSTRAN2 made during the measurement session.

**Figure 3-4.** CPU Usage by Module by MQSeries Call Report (Transaction Level)

```

** CPU USAGE BY MODULE BY MQSERIES CALL **
TRANSACTION NAME - IMSTRAN2
MODULE NAME      - STRIC123
) SECTION NAME   -
QUEUE MANAGER NAME - QM03

REQUEST          MQSERIES      QUEUE NAME          CPU TIME PERCENT
LOCATION          CALL              TOTAL              SOLO      TOTAL

0002AE48        MQPUT          MQ.BATCH.NO.TRIGGER1 .05       .05
MODULE STRIC123 TOTAL                      .05       .05

TRANSACTION NAME - IMSTRAN2
MODULE NAME      - STRIP111
) SECTION NAME   - STRIC123
QUEUE MANAGER NAME - QM01

REQUEST          MQSERIES      QUEUE NAME          CPU TIME PERCENT
LOCATION          CALL              TOTAL              SOLO      TOTAL

0000026A        MQPUT          MQ.BATCH.NO.TRIGGER1 .10       .10
QUEUE MANAGER QM01 TOTAL                      .10       .10

TRANSACTION NAME - IMSTRAN2
MODULE NAME      - STRIP111
SECTION NAME     - STRIC123
QUEUE MANAGER NAME - QM02

REQUEST          MQSERIES      QUEUE NAME          CPU TIME PERCENT
LOCATION          CALL              TOTAL              SOLO      TOTAL

0000026A        MQPUT          MQ.BATCH.NO.TRIGGER1 .05       .05
QUEUE MANAGER QM02 TOTAL                      .05       .05

TRANSACTION NAME - IMSTRAN2
MODULE NAME      - STRIP111
SECTION NAME     - STRIC123
QUEUE MANAGER NAME - QM03

REQUEST          MQSERIES      QUEUE NAME          CPU TIME PERCENT
LOCATION          CALL              TOTAL              SOLO      TOTAL

0000026A        MQPUT          MQ.BATCH.NO.TRIGGER1 6.42      6.42
QUEUE MANAGER QM03 TOTAL                      6.42     6.42

MODULESTRIP111  TOTAL                      6.57     6.57
-----
TRANSACTION IMSTRAN2  TOTAL                      6.62     6.62
    
```

**Queue Manager “Name” Total**

The total CPU usage time reported by STROBE for the queue manager called by the on-line IMS transaction module.

**Module “Name” Total**

The total CPU usage time reported by STROBE for the on-line IMS transaction module.

**Transaction “Name” Total**

The total CPU usage time reported by STROBE for the on-line IMS transaction.

---

## MQSeries Total CPU Activity by Queue Report

For each MQSeries queue manager, the MQSeries Total CPU Activity by Queue report (Figure 3-5) provides a summary of the messages received on a MQSeries queue and includes information about the characteristics of the messages. In this measurement session, the queue manager QMN1 was handling two queues. The first queue accounted for a total of 15.12% of CPU activity and the second queue’s activity correlated to 14.34% of the CPU time attributed to the queue. The remaining report fields provide different types of information about the messages received on each queue and are described in the

following section. These fields just report information about messages that were observed by STROBE. A message not observed could have one of the noted characteristics, but was not sampled by STROBE.

Figure 3-5. MQSeries Total CPU Activity by Queue Report

```

** MQSERIES - TOTAL CPU ACTIVITY BY QUEUE **

QUEUE MANAGER NAME - QMN1
) QUEUE NAME - QUEUE_WHITE_33

          CPU TIME PERCENT  --OBSERVED CHARACTERISTICS OF MESSAGES ON THIS QUEUE--
          SOLO   TOTAL    COA   COD   BROWSE  DATA  WAIT  CORL  SYNC
                                CONV  ID  POINT

MQGETS      9.34    9.37                Y                Y    Y
MQPUTS      5.64    5.68            Y                Y
MQPUTS1     .06     .06              Y
OTHER MQSERIES CALLS .01    .01
-----
TOTAL MQSERIES CALLS 15.05   15.12

QUEUE NAME - QUEUE_NAME_OF_UP_TO_48_CHARACTERS_C

          CPU TIME PERCENT  --OBSERVED CHARACTERISTICS OF MESSAGES ON THIS QUEUE--
          SOLO   TOTAL    COA   COD   BROWSE  DATA  WAIT  CORL  SYNC
                                CONV  ID  POINT

MQGETS      3.48    3.43                Y                Y    Y
MQPUTS      9.67    9.69            Y                Y
MQPUTS1     1.22    1.22              Y
OTHER MQSERIES CALLS -        -
-----
TOTAL MQSERIES CALLS 14.32   14.34
    
```

**COA (Confirmed on Arrival)**

This column denotes whether a message that was written specified that a confirmation of arrival (COA) should be generated when the message has been put on its final destination queue.

**COD (Confirmed on Delivery)**

This column denotes whether a message that was written specified that a confirmation of a delivery (COD) should be generated when the message has been retrieved from its final destination queue.

**BROWSE**

On a MQGET call, the message was copied, but not removed, from the queue.

**DATA CONV**

One or more MQGET service calls specified that the application data in the message should be converted to conform to the values in the message descriptor.

**WAIT**

An MQGET call was issued with a specification of a maximum time that MQSeries is to wait for the specified message to arrive on the queue.

**CORL ID**

One or more service calls specified a correlation ID.

**SYNC POINT**

One or more messages were read or written with a synchronization point specified.

## CPU Activity by Queue by Module

The CPU Activity by Queue by Module report (Figure 3-6) shows the activity caused by application modules that access MQSeries and provides a list of characteristics of the messages associated with the application activity.

Figure 3-6. MQSeries Messages CPU Activity by Queue Module

```

** MQSERIES MESSAGES CPU ACTIVIITY BY QUEUE BY MODULE**
)
QUEUE MANAGER NAME - QMN1
) QUEUE NAME - QUEUE_SYS039

MODULE      SECTION      CPU TIME PERCENT      PRIORITY      SMALLEST      LARGEST      AVER
              SOLO      TOTAL      RANGE      MESSAGE      MESSAGE      SIZE
ABCJONES     GAMMA          9.14      9.17      2 - 3         4,700        12,800      7,700
ABCJONES     THETA           .03       .03       7 - 7         1,600         1,600      1,600
XYZGRANT     EPSILON        2.89      2.89      3 - 5         2,300         5,100      3,500
CCCBLUE      SIGMA          2.99      3.03      1 - 5         2,300         7,800      4,600
-----
TOTAL FOR QUEUE          15.05      15.12

QUEUE NAME - QUEUE_SYS255

MODULE      SECTION      CPU TIME PERCENT      PRIORITY      SMALLEST      LARGEST      AVER
              SOLO      TOTAL      RANGE      MESSAGE      MESSAGE      SIZE
ABCJONES     GAMMA          2.61      2.62      3 - 5         1,600        12,800      4,900
ABCBLUE      BETA           .03       .03       2 - 2         1,000         1,800      1,100
ABCGOLD      GAMMA4        16.73     16.73     1 - 9         2,900        10,300      5,600
-----
TOTAL FOR QUEUE          19.37      19.38

QUEUE MANAGER NAME - QMN2
) QUEUE NAME - QUEUE_SYS364

MODULE      SECTION      CPU TIME PERCENT      PRIORITY      SMALLEST      LARGEST      AVER
              SOLO      TOTAL      RANGE      MESSAGE      MESSAGE      SIZE
ABCJONES     GAMMA          4.61      4.61      1 - 4          800          2,800      1,600
XYZGRANT     EPSILON        1.21      1.21      2 - 3         1,100        11,000      4,100
CCCBLUE      SIGMA          1.87      1.88      3 - 7         3,600         9,800      5,500
-----
TOTAL FOR QUEUE          7.69      7.70
    
```

### PRIORITY RANGE

This field identifies the range of priorities for the MQSeries messages observed by the STROBE MQSeries Feature during measurement.

### SMALLEST MESSAGE

This field indicates the size of the smallest message sent to or received by the module section. If the value is 1- 999,999 bytes, the number of bytes is listed without any notation. If the value is one megabyte or more, an "M" appears after the number. In the case of MQPUT and MQPUT1 calls, this value is the size of the message specified in the service call. For MQGET calls, this value indicates the buffer length specified in the service call.

### LARGEST MESSAGE

This field indicates the size of the largest message sent to or received by the module section. If the value is 1- 999,999 bytes, the number of bytes is listed without any notation. If the value is one megabyte or more, an "M" appears after the number. In the case of MQPUT and MQPUT1 calls, this value is the size of the message specified in the service call. For MQGET calls, this value indicates the buffer length specified in the service call.

### AVER SIZE

This field indicates the average size of the messages sent to or received by the module section.

## MQSeries Reports that Show Wait Time

The STROBE MQSeries Feature Performance Profile also includes a set of reports that identify the wait time that application modules spent when making service calls to MQSeries. Four reports are produced for batch and CICS jobs that are similar in format to the reports produced for CPU usage.

### MQSeries Wait Summary

The MQSeries Wait Summary report (Figure 3-7 on page 3-10) shows a summary of the wait time experienced by application modules due to making MQSeries service calls. During this measurement session, service calls to queue manager QMN1 from section GAMMA4 of module ABCGREEN accounted for 15.48% of the run time spent in wait. Service calls to queue manager QMN2 accounted for 4.48% of the run time spent in wait.

### RUN TIME PERCENT

The percentage of time during the measurement session that the address space was in the wait state. There are two measures of run time:

- PAGE shows wait time that results from retrieving a page from the page data set. A high value in this column indicates that there is not enough physical memory assigned to the address space. If you noticed a high paging rate on the Measurement Session Data report, the Wait Time by Module report enables you to see which module was experiencing delay because of paging.
- TOTAL measures all causes of wait time, including page retrieval, programmed I/O operations, and timer requests.

For a description of the other fields in this time report's fields, see "MQSeries CPU Usage Summary Report" on page 3-3.

Figure 3-7. MQSeries Wait Summary Report

```

** MQSERIES - WAIT SUMMARY **

QUEUE MANAGER NAME - QMN1
)
MODULE      SECTION  RUN TIME  PERCENT   RUN TIME HISTOGRAM  MARGIN OF ERROR: 2.01%
NAME        NAME       PAGE     TOTAL    .00    4.00    8.00    12.00    16.00
ABCGREEN    MEGA2      .24      .24
ABCGREEN    GAMMA4     15.45    15.48    .*****.
-----
QMN1 ACTIVITY      15.69    15.72

QUEUE MANAGER NAME - QMN2
MODULE      SECTION  RUN TIME  PERCENT   RUN TIME HISTOGRAM  MARGIN OF ERROR: 3.50%
NAME        NAME       PAGE     TOTAL    .00    1.50    3.00    4.50    6.00
ABCGREEN    GAMMA4     4.45     4.48    .*****.
-----
QMN2 ACTIVITY      4.45     4.48

TOTAL WAIT ACTIVITY      20.14    20.20
    
```

## Wait by Module by MQSeries Call Report

The Wait by Module by MQSeries Call report (Figure 3-8 on page 3-12) breaks out and shows the percentage of run time spent in wait caused by MQSeries activity for measured modules and their sections and how it is distributed over queue managers. For each queue manager, the storage location and service call is displayed. The cumulative percentage of run time spent in wait by a service call is provided for each queue manager.

If you set the MQTRAN reporter parameter, this report will contain data showing on-line IMS transaction level activity. See “IMS Transaction Level Wait Time Reporting” on page 3-12 for an example of the report format when the MQTRAN parameter is set.

In this report example, the MQSeries calls issued from sections GAMMA4 and MEGA2 of module ABCGREEN are identified. The MQGET calls from location 00001A3E in section GAMMA4 to the queues managed by QMN1 took 11.13% of the run time spent in wait. The MQPUT calls from location 00002468 consumed 4.35% of the run time spent in wait. The MQGET calls to the queue manager QMN2 from section GAMMA4 took 4.48% of the run time spent in wait. A total of 19.96% of run time spent was reported for section GAMMA4.

For section MEGA2, the total percentage of run time spent in wait for MQPUT calls made from location 0000111E to the QMN1-managed queues shows the same percentage as the WAIT SUMMARY report, 0.24%. The sum of the run time spent in wait for these two sections matches the total shown in the last report: 20.20% of the measurement run time was spent in wait.

**Note:** If you set the threshold value in the MQSERIES CALLS field of the STROBE TAILOR REPORTS panel as explained in “Tailoring MQSeries Reports” on page 2-5, the TOTAL value may not match the sum of the values reported for each call. STROBE does not report detail lines for calls that show less wait time than the threshold value that you specified.

For a description of this report’s fields, see “CPU Usage by Module by MQSeries Call” on page 3-4.

Figure 3-8. Wait by Module by MQSeries Call Report

```

** WAIT BY MODULE BY MQSERIES CALL **
  QUEUE MANAGER NAME - QMN1
  MODULE - ABCGREEN
  SECTION - GAMMA4
  REQUEST  MQSERIES  QUEUE NAME
  LOCATION  CALL
  00001A3E  MQGET    QUEUE_1
                                     .35      .35
                                     QUEUE_2
                                     6.76     6.76
                                     QUEUE_3
                                     .31      .31
                                     QUEUE_4
                                     .10      .10
                                     QUEUE_5
                                     .07      .07
                                     QUEUE_6
                                     .19      .19
                                     QUEUE_7
                                     2.76     2.78
                                     QUEUE_8
                                     .12      .12
                                     QUEUE_9
                                     .23      .23
                                     QUEUE_A
                                     .23      .23
      TOTAL                                     11.11    11.13
  00002468  MQPUT    QUEUE_3
                                     .68      .68
                                     QUEUE_B
                                     3.66     3.67
      TOTAL                                     4.34     4.35
  QNM1 WAIT ACTIVITY                                     15.45    15.48
  QUEUE MANAGER NAME - QMN2
  REQUEST  MQSERIES  QUEUE NAME
  LOCATION  CALL
  00002340  MQGET    QUEUE_1
                                     4.45     4.48
  GAMMA4 WAIT ACTIVITY                                     19.90    19.96
  MODULE ABCGREEN
  SECTION MEGA2
  QUEUE MANAGER NAME - QMN1
  REQUEST  MQSERIES  QUEUE NAME
  LOCATION  CALL
  0000111E  MQPUT    QUEUE_SYS_2
                                     .24      .24
  MEGA2 WAIT ACTIVITY                                     .24      .24
  ABCGREEN WAIT ACTIVITY                                     20.14    20.20
  TOTAL WAIT                                     20.14    20.20
  
```

### IMS Transaction Level Wait Time Reporting

The MQSeries Feature also reports wait time for IMS transactions that execute in an on-line environment. As explained in “IMS Transaction Level Reporting” on page 2-6, you can set the MQTRAN parameter to enable STROBE to report measurement information for IMS transactions. This information includes the transaction name, the module(s) from which the MQSeries call was made, and the location of the transaction. Figure 3-9 on page 3-13 shows the format of the Wait by Module by MQSeries Call report if you specify the MQTRAN parameter.

If you have identified an on-line IMS transaction with high wait time on the Summary of Wait Time by Transaction report as described in the section “MQSeries IMS Transaction Summary Reports” on page 3-15, you can use this report to find the MQSeries service calls causing the most wait time. STROBE reported that transaction IMSTRANS3 took 2.31 percent of the wait time. By looking up IMSTRAN3 here, you can see the MQSeries service calls that caused the wait time.

**Figure 3-9.** Wait by Module by MQSeries Call Report (Transaction Level)

```

** WAIT BY MODULE BY MQSERIES CALL **
TRANSACTION NAME - IMSTRAN1
MODULE NAME      - STRIC123
SECTION NAME     - STRIC123

QUEUE MANAGER NAME - QM01

  REQUEST      MQSERIES      QUEUE NAME      RUN TIME PERCENT
  LOCATION     CALL          PAGE           TOTAL
0002AE48      MQPUT          MQ.BATCH.NO.TRIGGER      .00      .02
-----
MODULE STRIC123 TOTAL                .00      .02

TRANSACTION NAME - IMSTRAN1
MODULE NAME      - STRIC124
SECTION NAME     - STRIC124

QUEUE MANAGER NAME - QM01

  REQUEST      MQSERIES      QUEUE NAME      RUN TIME PERCENT
  LOCATION     CALL          PAGE           TOTAL
0002AE48      INTCALL11     NO QUEUE APPLICABLE FOR THIS API      .00      .37
0002AE48      INTCALL11     NO QUEUE APPLICABLE FOR THIS API      .00      .05
-----
MODULE STRIC124      TOTAL                .00      .42
TRANSACTION IMSTRAN1  TOTAL                .00      44

TRANSACTION NAME - IMSTRAN3
MODULE NAME      - STRIP110
SECTION NAME     - STRIP110

QUEUE MANAGER NAME - QMXA1

  REQUEST      MQSERIES      QUEUE NAME      RUN TIME PERCENT
  LOCATION     CALL          PAGE           TOTAL
0002AE48      MQCMIT        NO QUEUE APPLICABLE FOR THIS API      .00      1.87
0002AE48      MQCMIT        NO QUEUE APPLICABLE FOR THIS API      .00      .43
-----
MODULE STRIP110      TOTAL                .00      2.31
TRANSACTION IMSTRAN3  TOTAL                .00      2.31

```

**Queue Manager "Name" Total**

The total wait time reported by STROBE for the on-line IMS transaction resulting from making calls the queue manager

**Module "Name" Total**

The total wait time reported by STROBE for the on-line IMS transaction module.

**Transaction "Name" Total**

The total wait time reported by STROBE for the on-line IMS transaction.

**MQSeries Total Wait by Queue Report**

The Total Wait by Queue report (Figure 3-10 on page 3-14) provides a summary of messages received on a MQSeries queue and includes information about the characteristics of the messages. In this measurement session, the queue manager QMN1 was handling two MQSeries queues. The first queue accounted for a total of 7.00% of run time spent in wait time and the second queue's activity correlated to 14.34% of the run time spent in wait attributed for the measurement session.

**Note:** Refer to "MQSeries Total CPU Activity by Queue Report" on page 3-7 for a description of this report's fields.

Figure 3-10. MQSeries Total Wait by Queue Report

```

** MQSERIES - TOTAL WAIT BY QUEUE **

QUEUE MANAGER NAME - QMN1
) QUEUE NAME - QUEUE_B

--OBSERVED CHARACTERISTICS OF MESSAGES ON THIS QUEUE--
      RUN TIME  PERCENT  COA  COD  BROWSE  DATA  WAIT  CORL  SYNC
      PAGE     TOTAL                CONV  ID  POINT

MQGETS      6.76     6.76                Y      Y      Y
MQPUTS      .24      .24      Y
MQPUT1S     -         -
OTHER MQSERIES CALLS  -         -
-----
TOTAL MQSERIES CALLS  7.00     7.00

QUEUE NAME - QUEUE_C

--OBSERVED CHARACTERISTICS OF MESSAGES ON THIS QUEUE--
      RUN TIME  PERCENT  COA  COD  BROWSE  DATA  WAIT  CORL  SYNC
      PAGE     TOTAL                CONV  ID  POINT

MQGETS      3.48     3.43                Y      Y
MQPUTS      9.67     9.69      Y      Y
MQPUTS1     1.22     1.22      Y
OTHER MQSERIES CALLS  -         -
-----
TOTAL MQSERIES CALLS  14.32    14.34
    
```

### MQSeries Messages Wait by Queue by Module Report

The Messages Wait by Queue by Module report (Figure 3-10) shows the wait time experienced by application modules that make service calls to an MQSeries queue and provides a list of characteristics of the messages associated with the application activity.

**Note:** See “CPU Activity by Queue by Module” on page 3-9 for a description of the report fields.

Figure 3-11. MQSeries Messages Wait by Queue By Module

```

** MQSERIES MESSAGES WAIT BY QUEUE BY MODULE**

QUEUE MANAGER NAME - QMN1
QUEUE NAME - QUEUE_15

MODULE      SECTION      RUN TIME PERCENT      PRIORITY  SMALLEST  LARGEST  AVER
           PAGE     TOTAL      RANGE     MESSAGE   MESSAGE   SIZE
ABCGREEN   GAMMA4      .35      .35      2 - 7     1,600    12,800   4,700
-----
TOTAL FOR QUEUE      .35      .35

QUEUE NAME - QUEUE_B

MODULE      SECTION      RUN TIME PERCENT      PRIORITY  SMALLEST  LARGEST  AVER
           PAGE     TOTAL      RANGE     MESSAGE   MESSAGE   SIZE
ABGREEN    GAMMA4      6.76    6.76     2 - 7     1,600    12,800   4,700
ABCMICHAEL MEGA2      .24     .24      2 - 3     1,600     1,800   1,700
-----
TOTAL FOR QUEUE      7.00    7.00

QUEUE MANAGER NAME - QMN2
QUEUE NAME - QUEUE_3

MODULE      SECTION      RUN TIME PERCENT      PRIORITY  SMALLEST  LARGEST  AVER
           PAGE     TOTAL      RANGE     MESSAGE   MESSAGE   SIZE
ABCGREEN   GAMMA4      4.45    4.48     3 - 9     1,200    10,800   1,600
XYZBLUE    ALPHA3      1.21    1.21     2 - 3      700     32,100   4,100
XYZRED     SIGMA8      1.87    1.88     1 - 1      800     2,800   1,600
-----
TOTAL FOR QUEUE      5.28    5.31
    
```

## MQSeries IMS Transaction Summary Reports

The STROBE *STROBE MQSeries Feature* generates two reports that provide measurement information about on-line IMS transactions. One report contains a summary of CPU usage by IMS transaction and the other report contains a summary of wait time by IMS transaction.

### Summary of CPU Usage for IMS Transactions

Figure 3-12 shows the MQSeries Summary of CPU Usage by Transaction report. For each on-line IMS transaction that occurs during the measurement session, STROBE provides both solo and total percentages for CPU usage. You can use this report information to augment the report data provided by the STROBE *STROBE IMS Feature*.

A transaction named IMSTRAN2 caused a high 6.62 percent usage of the CPU time during the STROBE measurement session. Setting the MQTRAN parameter as explained in “IMS Transaction Level Reporting” on page 2-6 causes STROBE to obtain individual IMS transaction report data. Then by referring to the section “CPU Usage by Module by MQSeries Call” on page 3-4, you can identify what calls to MQSeries are causing the most of the IMSTRAN2 transaction CPU usage.

**Figure 3-12.** Summary of CPU Usage by Transaction Report

** MQSERIES - SUMMARY OF CPU USAGE BY TRANSACTION **								
) TRANSACTION NAME	% CPU TIME		MARGIN OF ERROR: 4.25%	.00	3.50	7.00	10.50	14.00
	SOLO	TOTAL						
IMSTRANS1	.25	.25	.					
IMSTRANS2	6.62	6.62	.***					
IMSTRANS3	2.34	2.34	.*					
IMSTRANS4	3.97	3.97	.*					
TOTALS	39.67	39.75						

#### TRANSACTION NAME

The name of the IMS transaction causing CPU usage resulting from making a MQSeries service call.

For a description of the other fields show on the Summary of CPU Time report, see “MQSeries Reports that Show CPU Time” on page 3-3.

### Summary of Wait Time for IMS Transactions

Figure 3-13 shows the Summary of Wait Time by Transaction. For each on-line IMS transaction that occurs during the measurement session, STROBE provides both solo and total percentages for wait time. You can use this report information to augment the report data provided by the STROBE *IMS Feature*.

A transaction named IMSTRAN3 caused 2.31 percent of the wait time during the STROBE measurement session. Setting the MQTRAN parameter as explained in “IMS Transaction Level Reporting” on page 2-6 causes STROBE to obtain individual IMS transaction report data. Then by referring to the section “Wait by Module by MQSeries Call Report” on page 3-11, you can identify what calls to MQSeries are causing the most of the IMSTRAN3 transaction wait time.

**Figure 3-13.** Summary of Wait Time by Transaction Report

```

** MQSERIES - SUMMARY OF WAIT TIME BY TRANSACTION **

)
TRANSACTION          % RUN TIME          MARGIN OF ERROR:  2.45%
NAME                PAGE      TOTAL          .00      2.0      4.0

IMSTRANS1           .00      .10      .
IMSTRANS2           .00      .43      .+
IMSTRANS3           .00      2.31      .+++++++
IMSTRANS4           .00      .71      .++

-----
TOTALS              .00      3.55

```

**TRANSACTION NAME**

The name of the IMS transaction causing wait time resulting from making the MQSeries service call.

For a description of the other fields show on the Summary of Wait Time By Transaction reports, see "MQSeries Reports that Show Wait Time" on page 3-10.

---

## MQSeries Reports for CICS Transactions

The STROBE *STROBE MQSeries Feature* generates one report that provides measurement information about CICS transactions. You should also check the STROBE CICS Feature transaction profiling CICS API service time reports to obtain more detailed information about the performance of the CICS transactions you are measuring.

### MQSeries Service Time by Queue Report

The MQSeries Service Time by Queue report (Figure 3-14 on page 3-17) contains wait execution and dispatch delay times for CICS transactions that make service calls to MQSeries. The report is divided into two sets of values:

- The Mean Service Time section values are totals for the transaction's entire measurement session.
- The Queue Service Time section values are a subset of the Mean Service Times that indicate how much of the Mean Service Time was spent making MQSeries service calls.

Figure 3-14 on page 3-17 shows an example of this report. The time unit value for all fields is seconds.

**Note:** If you designate a transaction name(s) in the "Detail Transaction:" field of the STROBE DATA COLLECTORS panel, the "Collect Region Data" field is set to Y by default. To collect just region level MQSeries data in a CICS environment, the "Collect Region Data" field must be set to Y. Also you must have set region level reporting active on the STROBE TAILOR REPORTS panel. See Chapter 2, "Using the STROBE MQSeries Feature" for more information.

Figure 3-14. MQSeries Service Time by Queue Report

```

** MQSERIES SERVICE TIME BY QUEUE**

QUEUE MANAGER NAME - QMN1
QUEUE NAME - QUEUE_NAME_OF_SATURN
-----MEAN SERVICE TIME (SECS.)-----
DISPATCH
TRANSACTION   COUNT   DELAY   SUSPEND   EXEC   TOTAL
TXN1          42,500   2.24    1.20     1.04   4.48
TXN2           9,225   3.33    2.20     1.00   6.53
TXN3          15,001   1.40     .55     .80    2.75
-----
TOTAL         66,726   2.20    1.19     .98    4.76
DISPATCH     DELAY     SUSPEND     EXEC
1.31       .65       .55

QUEUE NAME - QUEUE_NAME_OF_CICSTXP2
-----MEAN SERVICE TIME (SECS.)-----
DISPATCH
TRANSACTION   COUNT   DELAY   SUSPEND   EXEC   TOTAL
TXN1          42,500   2.24    1.20     1.04   4.48
TXN3          15,001   1.40     .55     .80    2.75
-----
TOTAL         57,501   3.64    1.19     1.84   7.23
DISPATCH     DELAY     SUSPEND     EXEC
.40       .20       .29
.40       .20       .40
.40       .20       .34
    
```

**TRANSACTION**

The name of the transaction that made a service call to the listed MQSeries queue.

**COUNT**

The number of times the transaction executed during the measurement session.

**MEAN SERVICE TIME Section**

The values shown under this header indicate the average amount of time that the transaction was active in the address space.

**DISPATCH DELAY**

The average time that the transaction was in a dispatchable state. The transaction was marked as dispatchable and will be dispatched when a TCB becomes available.

**SUSPEND**

The average time that the transaction was in a suspended state. A transaction is in a suspended state when MVS reports it has been suspended by one of these functions: SUSPEND, WAIT\_MVS, WAIT\_OLDC, or WAIT\_OLDW.

**EXEC**

The average time that the transaction was in executable state. A transaction is executing when both OS/390 and CICS report that a transaction is running.

**TOTAL**

The total mean service time for the transaction.

**TOTAL Section**

This section in the first column provides the sum of the total number of transaction recorded for a queue manager during a measurement session. The remaining columns indicate the average dispatch delay, suspend, execution or total time found for the total of the transactions accessing that queue.

**QUEUE SERVICE TIME SECS. Section**

**QUEUE SERVICE TIME**

The amount of service time that the application was active with an MQSeries queue.

#### **DISPATCH DELAY**

CICS has marked the transaction as suspended, but it is actually waiting to be dispatched onto a MQSeries TCB. The average amount of time that the transaction is in this state.

#### **SUSPEND**

The CICS adapter has suspended the transaction with a resource name of either GETWAIT or TSKSWCH for MQSeries. OS/390 reports the same data. The average amount of time that the transaction is in this state.

#### **EXEC**

Both OS/390 and CICS report that the transaction is executing and STROBE finds the transaction is executing on a MQSeries TCB. The average amount of time that the transaction is in this state.

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