MAINVIEW® for IMS Offline Transaction Accountant

Reference Manual

Version 3.3.30

November 2003

Restricted Rights Legend

Contacting BMC Software

You can access the BMC Software Web site at **http://www.bmc.com**. From this Web site, you can obtain information about the company, its products, corporate offices, special events, and career opportunities.

United States and Canada

Address BMC Software, Inc.
2101 CityWest Blvd.
Houston TX 77042-2827

Telephone 713 918 8800 or
800 841 2031

Fax 713 918 8000

Outside United States and Canada

Telephone (01) 713 918 8800

Fax (01) 713 918 8000

Customer Support

You can obtain technical support by using the Support page on the BMC Software Web site or by contacting Customer Support by telephone or e-mail. To expedite your inquiry, please see “Before Contacting BMC Software.”

Support Web Site

You can obtain technical support from BMC Software 24 hours a day, 7 days a week at **http://www.bmc.com/support.html**. From this Web site, you can

- read overviews about support services and programs that BMC Software offers
- find the most current information about BMC Software products
- search a database for problems similar to yours and possible solutions
- order or download product documentation
- report a problem or ask a question
- subscribe to receive e-mail notices when new product versions are released
- find worldwide BMC Software support center locations and contact information, including e-mail addresses, fax numbers, and telephone numbers

Support by Telephone or E-mail

In the United States and Canada, if you need technical support and do not have access to the Web, call 800 537 1813. Outside the United States and Canada, please contact your local support center for assistance. To find telephone and e-mail contact information for the BMC Software support center that services your location, refer to the Contact Customer Support section of the Support page on the BMC Software Web site at **http://www.bmc.com/support.html**.

Before Contacting BMC Software

Before you contact BMC Software, have the following information available so that Customer Support can begin working on your problem immediately:

- product information
  - — product name
  - — product version (release number)
  - — license number and password (trial or permanent)
- operating system and environment information
  - — machine type
  - — operating system type, version, and service pack or other maintenance level such as PUT or PTF
  - — system hardware configuration
  - — serial numbers
  - — related software (database, application, and communication) including type, version, and service pack or maintenance level
- sequence of events leading to the problem
- commands and options that you used
- messages received (and the time and date that you received them)
  - — product error messages
  - — messages from the operating system, such as `file system full`
  - — messages from related software

Contents

Figures

Tables

About This Book

This book describes how to use the Transaction Accountant, a MAINVIEW® for IMS Offline component.

This book is intended for

- IMS application analysts who need to know costs per user and application
- IMS system or database administrators who need to perform cost analyses
- data center managers who need to make hardware and resource acquisition decisions based on long-term trends
- data center accountants who need to produce billing reports for direct charge-back to groups of users

Before using the Transaction Accountant, you must be familiar with the MAINVIEW for IMS Offline environment (described in the *MAINVIEW for IMS Offline – Customization and Utilities Guide*), the IBM® OS/390 batch job execution, and the IBM IMS program product.

For information about new features in the current release of MAINVIEW for IMS Offline, see the product release notes, which are available on the BMC Software Support Web pages.

Note: Although MAINVIEW for IMS is often referred to as “MVIMS” in this book, the abbreviation is used for brevity only and does not represent a legal product name of BMC Software.

How This Book Is Organized

The organization of this book is described in the table below.

Chapter/Appendix	Description
Chapter 1, “Introduction”	describes how Transaction Accountant works
Chapter 2, “Event Collector Options”	describes the Event Collector parameters needed by Transaction Accountant to produce reports from the IRUF file
Chapter 3, “Charge-Out Analysis (TASCOSTR)”	describes the Transaction Accountant charge-out analysis program (TASCOSTR)
Chapter 4, “Financial Summary Analysis (TASFINSM)”	describes the Transaction Accountant financial summary analysis program (TASFINSM)
Appendix A, “How Product Libraries Should Be Used”	describes how to use distributed and customized parameter, sample, and profile libraries

MAINVIEW Product Documentation

MVIMS is integrated with the BMC Software MAINVIEW® architecture. MAINVIEW is a base architecture that allows authorized users to use a single terminal to interrogate any OS/390, CICS, IMS, DB2, or MQSeries subsystem in a sysplex.

This section lists the documents specific to MAINVIEW for IMS products and the documents that provide information common to many MAINVIEW products.

MVIMS Product Library

The MVIMS product library includes the following books.

MAINVIEW for IMS Offline

MAINVIEW for IMS Offline – Customization and Utilities Guide

MAINVIEW for IMS Offline – Performance Reporter Reference Manual

MAINVIEW for IMS Offline – Transaction Accountant Reference Manual

MAINVIEW for IMS Offline – Release Notes

MAINVIEW for IMS Online

MAINVIEW for IMS Online – Customization Guide

MAINVIEW for IMS Online – IPSM Reference Manual

MAINVIEW for IMS Online – Analyzers Reference Manual

MAINVIEW for IMS Online – Monitors and Traces Reference Manual

MAINVIEW for IMS Online – Release Notes

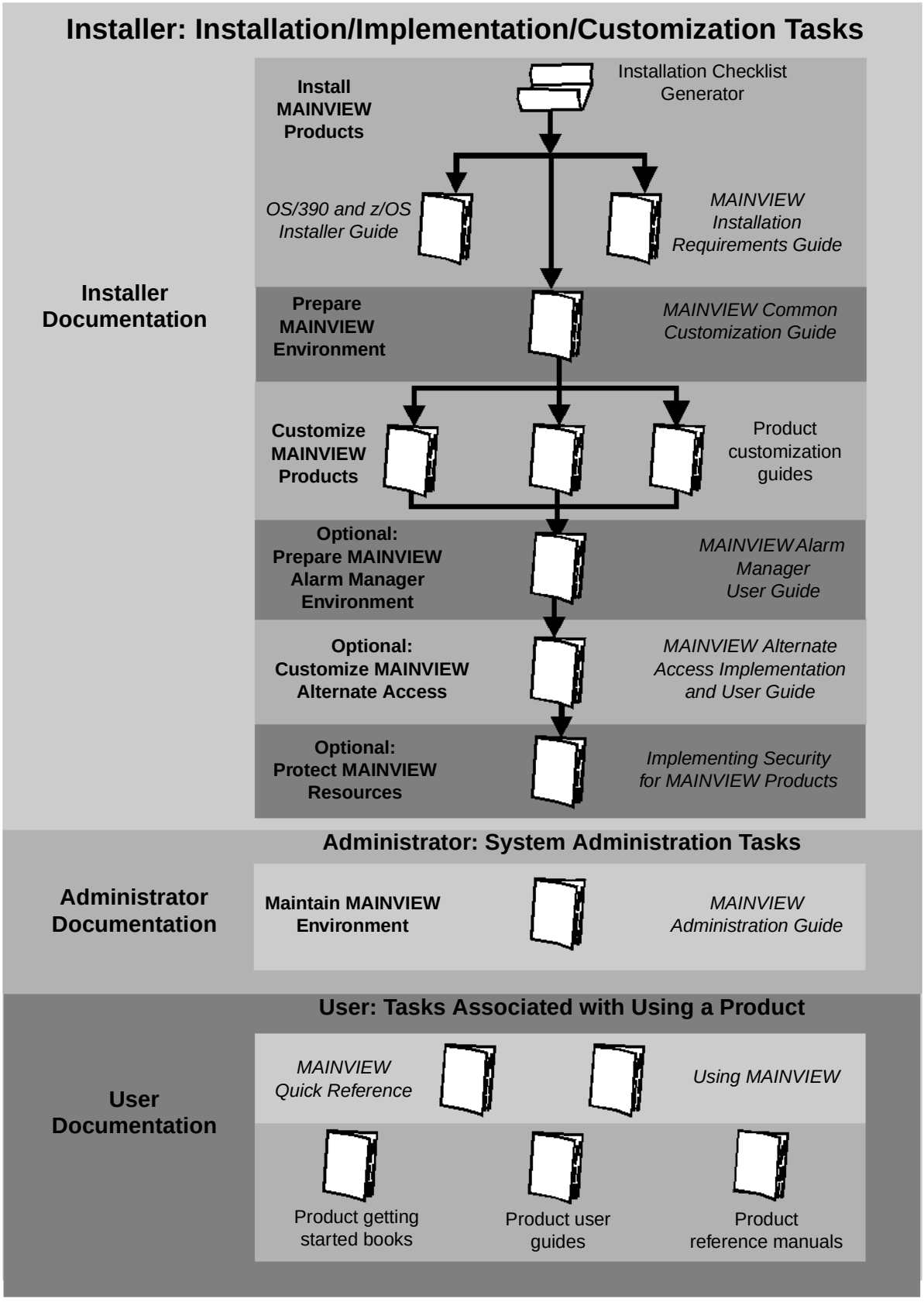
MAINVIEW Product Family Documentation

The books and quick references that provide general information common to many MAINVIEW products are listed and described in the following table.

OS/390 and z/OS Installer Guide	Provides information about the installation of BMC Software products on OS/390 and z/OS systems
MAINVIEW Installation Requirements Guide	Provides information about installation requirements such as software requirements, storage requirements, and system requirements
MAINVIEW Common Customization Guide	Provides instructions for manually customizing the MAINVIEW environment for your products
MAINVIEW Alarm Manager User Guide	Explains how to create and install alarm definitions that indicate when exceptions occur in a sysplex
MAINVIEW Alternate Access Implementation and User Guide	Explains how to configure, start, and stop VTAM and EXCP AutoLogon sessions to access MAINVIEW products without an active TSO subsystem
Implementing Security for MAINVIEW Products	Explains basic MAINVIEW security, enhanced security, and MAINVIEW Alternate Access security
MAINVIEW Administration Guide	Provides information about MAINVIEW operations, targets, single-system image contexts, MAINVIEW Alarm Manager, data sets, view customization, and diagnostic facilities
MAINVIEW Products General Information	Provides an overview of the MAINVIEW environment and the products it supports
MAINVIEW Quick Reference	Introduces the MAINVIEW family of products and lists the commands used to manage the MAINVIEW windows environment

Note: MAINVIEW messages are documented in the Messages and Codes online display, which you can access by typing MSG in the command line of any MAINVIEW display.

The figure on the next page lists the MAINVIEW product documents and shows how they should be used.


Installer: Installation/Implementation/Customization Tasks
Installer Documentation
Install MAINVIEW Products
Installation Checklist Generator
OS/390 and z/OS Installer Guide
MAINVIEW Installation Requirements Guide
Prepare MAINVIEW Environment
MAINVIEW Common Customization Guide
Customize MAINVIEW Products
Product customization guides
Optional: Prepare MAINVIEW Alarm Manager Environment
MAINVIEW Alarm Manager User Guide
Optional: Customize MAINVIEW Alternate Access
MAINVIEW Alternate Access Implementation and User Guide
Optional: Protect MAINVIEW Resources
Implementing Security for MAINVIEW Products
Administrator: System Administration Tasks
Administrator Documentation
Maintain MAINVIEW Environment
MAINVIEW Administration Guide
User: Tasks Associated with Using a Product
User Documentation
MAINVIEW Quick Reference
Using MAINVIEW
Product getting started books
Product user guides
Product reference manuals

Accessing Product Information

The books that accompany BMC Software products are available in online format and printed format. You can also access product information from product release notes and other product notices.

Online Books

Online books are formatted as Portable Document Format (PDF) files. You can view them, print them, or copy them to your computer using Acrobat Reader 3.0 or later. For information about downloading the free reader from the Web, go to the Adobe Systems site at **http://www.adobe.com**.

You can access online books from the documentation CD that accompanies your product or from the Web. To view online books, visit the support pages of the BMC Software Web site at **http://www.bmc.com/support_home**.

Printed Books

A set of printed books is provided with your product order. To request additional books, go to **http://www.bmc.com/support_home**.

Release Notes and Other Notices

Printed release notes accompany each BMC Software product. Release notes provide current information about new and changed product functions.

A product may also have related technical bulletins that are provided between releases. The latest versions of the release notes and technical bulletins are available on the Web at **http://www.bmc.com/support_home**.

Conventions

The following symbols are used to define command syntax, and they should not be included with a command.

- Brackets [ ] enclose optional parameters or keywords.
- Braces { } enclose a list of parameters, one of which must be chosen.
- A vertical line | separates alternative options, one of which can be chosen.
- An underlined parameter is the default.

The following command syntax conventions also apply:

- An ITEM IN CAPITAL LETTERS must be typed exactly as shown.
- Items in *italicized, lowercase* letters are values that you supply.
- When a command is shown in uppercase and lowercase letters, such as **HSplit**, the uppercase letters show the command abbreviation that you can use (**HS**, for example). The lowercase letters complete the command name. Typing the entire command name is an alternative way of entering the command.
- Commands that do not have an abbreviation (**END**, for example) are shown in all uppercase letters.

Chapter 1 Introduction

The Transaction Accountant is an MVIMS Offline component that is used for billing and cost control analysis by users of IMS resources. The IMS Resource Utilization File (described on page 1-4) provides input to the Transaction Accountant. Output from the Transaction Accountant consists of

- invoices or reports that provide a detailed breakdown of usage and rates to which an equivalent dollar value is assigned
- summaries of activity grouped by customer, customer/transaction, or transaction

The Transaction Accountant can produce bills for users directly. It can also be interfaced with the site's major accounting system by means of the charge-out version of the IMS Resource Utilization File.

The Transaction Accountant provides the IMS accounting administrator with many options pertinent to the charge-out requirements for an IMS system. It can function as a stand-alone component or as part of a combination of several MVIMS components.

Billing Facilities

The Transaction Accountant is a comprehensive and flexible charge-out component that helps a site understand the costs associated with transaction processing. It also provides for the distribution of these costs to the responsible users of the IMS system. Table 1-1 lists

- items that can be charged
- descriptions for each charge
- rate categories applied

Table 1-1 Charge-Out Options and Rates (Part 1 of 2)

Item to Charge	Type of Rate	Rate Categories
Basic resource	**Standard**. Charges a cost to the transaction for each resource consumed.	• Message region CPU time • DL/I CPU time • DB2 CPU time • Storage usage • Storage allocated **Note:** You can specify an option to bypass costing of BMP, JBP, NDP, and FPU activity (see page 3-34).
Database	**Standard**. Based on database requests (DL/I calls) and actual I/O.	• Get unique • Get next • Insert • Replace • Delete • Key I/O • Nonkey I/O • No I/O
	Special. Charges associated with specified databases.	Differential charge-out to be applied to specified databases. The same type of rates apply as for standard.
DB2	**Standard**. Based on DB2 requests (SQL calls)	SQL call types: • Reads • Updates • DDL • Dynamic • Control • Other
	Special. Charges associated with specified DB2 application plan names.	Differential charge-out to be applied to specified DB2 application plan names. The same type of rates apply as for standard.

Table 1-1 Charge-Out Options and Rates (Part 2 of 2)

Item to Charge	Type of Rate	Rate Categories
Terminal	**Standard**. Based on terminal requests (DL/I calls) and I/O.	• Message get uniques, nexts • Message inserts • Data transferred • Characters input, output, other • Connect time
	Special. Charges associated with specified logical terminals.	Differential pricing mechanism for the users of those terminals. The same rate categories apply as for standard.
Customer	**Special**. Charges associated with specified customers.	Discount or markup charge-out for specified customers.
Transaction	**Standard**. Minimum charge to process each transaction. This charge is added to the basic resource charge for each transaction.	Transactions normally costing $0.46 with a minimum transaction charge of $0.10 will cost $0.56.
	Special. Flat charge to execute a particular transaction.	Fixed unit charge (for example, $0.20 per execution), instead of using the resource rate method.

Note: To define rates for the categories in Table 1-1, see “Defining Charge-Out Rates” on page 3-32.

IMS Resource Utilization File (IRUF)

The IMS Resource Utilization File (IRUF) is the primary source of information used as input by the Transaction Accountant. IRUFs are first produced as detail files, which contain one record for each transaction or program activity and one record for each logical terminal generated in IMS.

Users have the option of creating terminal records for each terminal or for only those terminals that experienced activity. (For more information about this option, see the LTERMREC parameter in the Log Edit chapter of the *MAINVIEW for IMS Offline – Customization and Utilities Guide*.)

An IRUF contains data that has been collected and processed by MVIMS. The Event Collector captures data about IMS activity as it occurs and writes the information to the IMS system log as MVIMS transaction and program records. You can modify the amount of data collected and stored in the records by specifying different data collection options to the Event Collector. For more information about the options and the reporting differences that result, see Chapter 2, “Event Collector Options.”

The system log data is processed by the MVIMS batch program IMFLEDIT. IMFLEDIT extracts the MVIMS records, as well as some data from IMS log records, and stores the data in the detail IRUF format. During this process, you can add customer identification to the IRUF by means of a user exit routine, which results in the creation of terminal records.

Information in an IRUF can be summarized (through the TASCOSTR program) for a time period, such as one day. Data is grouped into the following three record types:

Terminal record	Summarized information for each logical terminal within a customer/user category per summarization period.
Program record	Summarized information for each program within the summarization period (for example, one program accounting record per program per day).
Transaction record	Summarized information for each transaction code within a customer/user category per summarization period (for example, one transaction accounting record per transaction code within a customer/user category).

The Transaction Accountant TASCOSTR program

- reads IRUF files
- costs the workload
- summarizes the input data
- stores the data in a summary IRUF

Input to the TASCOSTR program can be detail IRUFs, summary IRUFs, or a combination of detail and summary IRUFs. Output from the TASCOSTR program, when it is costed IRUFs, is the input used by another Transaction Accountant program, TASFINSM.

The Transaction Accountant uses the utilities PRSSELEC and PRSPRINT (which are documented in the *MAINVIEW for IMS Offline – Customization and Utilities Guide*). You can use the PRSSELEC utility to extract a subset of data to be processed by the Transaction Accountant. You can use the PRSPRINT utility to print IRUFs.

Transaction Accountant users can select the following types of reports:

- detail charge-out
- distribution charge-out
- total IMS resource usage
- financial summary

Note: IMFLEDIT is described in the *MAINVIEW for IMS Offline – Customization and Utilities Guide*. The TASCOSTR and TASFINSM programs are described in Chapters 3 and 4 of this book.

Chapter 2 Event Collector Options

The Event Collector collects IMS event data that is used by the Performance Reporter and the Transaction Accountant. The data is collected and stored in the IRUF for processing by these batch report programs.

You can specify the amount of data collected and stored in the IRUF by using data collection parameters specified to the Event Collector in BBPARM member IMFECP00.

This section describes the Event Collector parameters needed by the Transaction Accountant and the Performance Reporter to produce reports from the IRUF file. For more information about these parameters, see the *MAINVIEW for IMS Offline – Customization and Utilities Guide*.

Data Collection Parameters

The following parameters determine the amount of IMS event data collected in the IRUF file for batch report processing:

Dependent Region Overhead CPU

BILLOVHD=NO | YES | SCHEDDLI

The BILLOVHD parameter determines whether dependent region CPU time is treated as either

- overhead
- chargeable CPU time per user

when the CPU time is spent in

1. prior transaction termination
2. current transaction scheduling
3. program load, if any
4. schedule-to-first DL/I

If BILLOVHD=NO (the default), CPU time spent in items 1 through 4 is treated as overhead.

If BILLOVHD=YES, CPU time spent in items 1 through 4 is charged to the user.

If BILLOVHD=SCHEDDLI, CPU time spent in items 1 and 2 is treated as overhead and CPU time spent in items 3 and 4 is charged to the user.

DBCTL Threads

CICS=YES | ONLINE | OFFLINE | NO

The CICS parameter controls whether records are collected for DBCTL CICS and ODBA thread data. The CPU usage is the same for all options. Usage depends on the number and activity of CICS transaction programs.

BMP and JBP Data

BMP=YES | NO | NOCPU

The BMP parameter controls whether activity data for BMP and JBP transactions and programs is collected. The default is YES, to collect the data.

If BMP and JBP processing is causing bottlenecks in the IMS online system, you may want to avoid the extra overhead that MVIMS monitoring adds. However, this option is viable only if the MVIMS BMP and JBP data is not required for accounting or IMS performance analysis. In general, most sites will want to collect BMP and JBP data.

The effect of this parameter on MVIMS CPU usage depends on the number and activity of all BMPs and JBPs.

Buffer Handler Timing

BHTO=OFF | ON

BHTO controls whether IMS buffer handler activity is included with DL/I CPU or timed separately. The default is to include it with DL/I (BHTO=OFF).

The high ratio of buffer handler calls to application program DL/I calls in IMS makes separate collection of buffer handler CPU very CPU-intensive for MVIMS. The ratio can be as high as 20 to 1, so collecting separate CPU time data for each buffer handler request can become too expensive when compared with the value of the data. Depending on the number of database calls and the amount of buffer handler activity, BHTO=ON can increase MVIMS CPU usage by 20 to 40 percent.

BHTO=ON is provided for product compatibility, but it is not a recommended option.

CPU Data Collection Options

CPU=DEPPGM | DEPDB2 | DEP | ALL | NONE

The CPU parameter controls the level of CPU data collected by the Event Collector.

CPU=DEPPGM causes the Event Collector to time only the dependent region activities. The setting times the entire transaction as a single event and does not time individual DL/I or DB2 calls. The single resulting CPU time (representing all the chargeable time for the transaction) is attributed to application program CPU time. All other chargeable timings are zero. Overhead CPU time, however, is still kept separately.

CPU=DEPPGM offers the biggest overhead reduction, since it times the entire transaction as a single event instead of timing each DL/I and SQL call. However, the amount of overhead saved depends to a large extent on the current transaction processing profiles. For example, a BMP program issuing 10,000 DL/I calls saves more than an MPP program issuing only 10 DL/I calls. However, even when savings from each transaction are small, they add up quickly.

The difference between CPU=DEPDB2 and CPU=DEPPGM is that CPU=DEPDB2 causes the Event Collector to separate the dependent region DB2/SQL time from the application program CPU time.

CPU=DEPDB2 causes the Event Collector to time the DB2 events (SQL calls). As a result, the potential amount of overhead saved from this option is highly dependent on how many SQL calls the transaction/program issues. For example, if an MPP program issues only two DL/I calls and 100 SQL calls, the amount saved is minimal.

CPU=DEP causes the Event Collector to attribute chargeable CPU application program or DL/I processing CPU time to a specific transaction and user. When CPU=DEP is used, Event Collector CPU usage increases 25 to 35 percent, depending on the amount of DL/I activity, over CPU=NONE.

CPU=ALL adds collection of DL/I processing CPU in the control region and measurement of various overhead categories such as program scheduling activity. The setting can increase MVIMS CPU usage by 3 to 12 percent over the CPU=DEP option.

CPU=ALL is the best choice if the various overhead CPU categories are needed for performance analysis or if any of the following are true of the monitored IMS:

- IMS parameter LSO equals Y.
- BMPs and JBPs are run in nonparallel DL/I mode.
- Percentage of message queue DL/I calls compared to database calls is high. (On average, message queue calls are 5 to 15 percent of the total DL/I calls.)

All of these factors increase the amount of IMS CPU incurred in either the control regions or the DLISAS regions.

Database I/O Options

DBIO=IOWAITS | BFALTERS | NONE

DBIO controls the level of database I/O data to be collected by the Event Collector. The DBIO=BFALTERS option collects all database activity indicators at the database level for each transaction.

With the BFALTERS option, reporting can be made by transaction and user and by database, for extended performance analysis. NO I/O counts (the number of reads without I/Os), which show buffer handler activity, can also be collected when BFALTERS is selected. BFALTERS uses an IMS buffer handler interface, which is expensive because of the high ratio of requests to the buffer handler compared with DL/I calls and actual I/O.

DBIO=IOWAITS activates a more efficient method of data collection. DL/I calls are collected by database. I/Os are measured at actual occurrence (using the DC Monitor IWAIT interface) instead of in the buffer handler. With the IWAIT interface, reads and writes that occur during call processing are collected by database, but writes that occur at sync point (the majority) can be associated only with the transaction and user, not with the specific database. Most writes are collected at the transaction level and reported under the special database entry ALLDBS. NO I/O counts are not collected.

IOWAITS provides the same level of data as BFALTERS for accounting and for the transaction, program, and totals levels of I/O analysis. For performance analysis at the database level, DL/I calls, reads, and some writes are still available. The other writes are reported per program.

IOWAITS is the default and recommended option because Event Collector CPU usage is significantly less than with BFALTERS, which can increase MVIMS CPU usage by 30 to 40 percent over the IOWAITS option, depending on the amount of database activity. Using the IOWAITS option increases the MVIMS CPU usage by 5 to 10 percent over DBIO=NONE, depending on the number of database I/Os.

DBIO=NONE specifies that reads, writes, and NO I/O counts are not collected. DL/I calls are still available by database.

Note: The DBIO parameter does not affect Fast Path databases.

Extended Recovery

DEPREC=YES | NO

DEPREC controls whether recovery from additional abend conditions in dependent regions is enabled and performed as necessary.

MVIMS CPU usage may be increased 10 to 30 percent over the DEPREC=NO option, depending on the options chosen for other parameters (because the more work the Event Collector does, the more overhead is added by this option).

The default should remain set until MVIMS is thoroughly tested and stable in each environment. If CPU utilization is still a concern after the other options are chosen, you could then set this parameter to NO for additional savings.

CPU Timing

The Event Collector accumulates CPU times in various categories and maintains several CPU fields in the MVIMS log records and IRUF records. The values in these fields, or various combinations of the values, are reported.

Application Program CPU

Application program CPU, also called message region CPU, is collected unless CPU=NONE. This value is the time spent by the application program in the dependent region.

Note: This field includes user-attributable CPU time incurred in DB2 through the IMS Attach Facility if the parameter FEATURE=NODB2 is specified in PARMLIB member IMFSYS00 (see PARMLIB member IMFSYSBB for more information).

Application program CPU is included in chargeable CPU, which is CPU time that is directly attributable to the user who submitted the transaction.

The BILLOVHD parameter can affect this value by optionally adding some dependent region overhead.

Message DL/I CPU

Message DL/I CPU is the time spent in the dependent region processing DL/I requests. This time value usually includes most of the time involved in processing database calls.

This value is collected unless CPU=NONE. The time is included in chargeable CPU, which is CPU time that is directly attributable to the user who submitted the transaction.

LSO=Y and BMPs and JBPs in nonparallel DL/I mode reduce this value (moving time to control DL/I CPU).

Control DL/I CPU

Control DL/I CPU is the time spent in the control region (or in DLISAS if LSO=S) processing DL/I requests. The major portion of this time is for message queue calls.

If LSO=Y, most database DL/I work is done under the LSO subtasks in the control region. If LSO=S, the serialized database processing occurs in the DLISAS region but is accumulated with the control region CPU time.

The control DL/I CPU value is collected only if CPU=ALL. The value is included in chargeable CPU, which is CPU time that is directly attributable to the user who submitted the transaction.

If CPU=DEP, total DL/I CPU is generally 5 to 15 percent less than with the CPU=ALL option, because control DL/I CPU is not measured. If LSO=Y or BMP and JBP nonparallel processing is used, much more data is lost.

DB2 CPU

DB2 CPU is the amount of dependent region CPU time (in thousandths of a second) that is used by the transaction to make DB2 requests. The request generally runs in cross-memory mode under the IMS dependent region program controller task.

The DB2 CPU value is collected only if CPU=ALL, CPU=DEP, or CPU=DEPDB2. The value is included in chargeable CPU, which is CPU time that is directly attributable to the user who submitted the transaction.

Message Buffer CPU

Message buffer CPU is the time spent in the IMS database buffer handler routines during database DL/I call processing. Message buffer CPU is collected under the dependent region task.

The message buffer CPU value is collected if BHTO=ON and if CPU=ALL or CPU=DEP. BHTO is forced to OFF unless DBIO=BFALTERS.

If BHTO=OFF (the default), this time is zero and the CPU is included in message DL/I CPU. Message buffer CPU time can be timed separately to exclude it from chargeable CPU, because the time can be considered an overhead function within IMS.

LSO=Y and BMPs and JBPs in nonparallel DL/I mode reduce this value (moving time to control buffer CPU).

Control Buffer CPU

Control buffer CPU is the time spent in the IMS database buffer handler routines during database DL/I call processing. Control buffer CPU is collected in the control or DLISAS regions.

The control buffer CPU value is collected if BHTO=ON and CPU=ALL. BHTO is forced to OFF unless DBIO=BFALTERS.

If BHTO=OFF (the default), this time is zero and the CPU is included in control DL/I CPU. The time can be timed separately to exclude it from chargeable CPU, because the time can be considered an overhead function within IMS.

LSO=Y and BMPs and JBPs in nonparallel DL/I mode increase this value.

Message OPEN/CLOSE CPU

IMS DL/I CPU time spent in database OPEN/CLOSE activity under the dependent region TCB is for Fast Path databases only. Full function database OPEN/CLOSE activity is performed in the control region.

MVIMS treats DL/I CPU time as overhead CPU.

The DL/I CPU time value is collected unless CPU=NONE.

Control OPEN/CLOSE CPU

All full function database OPEN/CLOSE activity is performed in the control region under the control task TCB. This activity includes all processing done in the IMS OPEN/CLOSE module DFSDLOC0. If LSO=S, the processing occurs in the DLISAS address space but is accumulated in this field.

MVIMS treats control OPEN/CLOSE CPU time as overhead CPU.

This value is only collected if CPU=ALL.

Program Scheduling CPU

Program scheduling activity occurs in the control region and, if LSO=S, partially in the DLISAS region. The program scheduling activity in both regions are accumulated in this field.

MVIMS treats program scheduling CPU time as overhead CPU.

This value is only collected if CPU=ALL.

Message Region Overhead CPU

The message region overhead CPU value is always collected. This value is the amount of overhead CPU time (both TCB and SRB) that was spent in the dependent region and that was not directly attributable to a transaction. The value usually includes program initialization and termination.

- If the startup parameter BILLOVHD=NO (the default), the value includes the time between the end of scheduling and the first program DL/I call.

- If BILLOVHD=YES, this time is included in application program CPU (dependent region). Program load time is attributed to the first transaction processed and is chargeable.

- If CPU=NONE, the value includes all CPU time incurred in the dependent regions. For all the other CPU options, the value includes all dependent region CPU not identified as application program, DL/I, buffer, or OPEN/CLOSE CPU (for example, region startup).

Note: Use of the parameter CPUOVHD=REFCPU sets this value to zero.

Control Region Overhead

The control region overhead value is always collected.

- If CPU=ALL, this value includes all control/DLISAS CPU not identified as DL/I, buffer, program scheduling or OPEN/CLOSE CPU (control region initialization, for example).

- For all the other CPU options, the value includes all CPU time incurred in the control/DLISAS regions.

Note: Use of the parameter CPUOVHD=REFCPU sets this value to zero.

The control region overhead CPU time for a program includes the nonattributable control region overhead CPU time (both TCB and SRB) measured between the last program termination (in any IMS region) and the termination of this one. The program accounting record (PAR) has the following two control region overhead fields:

1. The first PAR field for control region overhead contains the nonattributable overhead field and several other overhead fields, accumulated for a program. This value includes scheduling CPU time from this program record and the three control region CPU times from the corresponding transaction records.

2. The second PAR field includes only the nonattributable overhead figure. If you are writing a program to accumulate total CPU time for any time period, use this field.

Tip: When you review CPU time, make comparisons carefully. If the comparisons are against address space statistics, be sure to include all the CPU times for that region and no others.

The job name of the dependent region (region ID) where processing took place is available in both the TAR and PAR records.

Database I/O Data

MVIMS collects all database activity indicators per transaction at the database level. A separate segment is appended to the MVIMS transaction record per accessed database to hold the counts (see the MVIMS transaction log record layout in the *MAINVIEW for IMS Offline – Customization and Utilities Guide*). This process allows later reporting by transaction, by user (for accounting), and by database, which is always true for the DL/I calls. Each call is counted by type (GU, ISRT, and so on) and per DBD.

These database segments also contain fields for several I/O-related counts. I/O activity is split into categories according to whether the I/O was a read or write, key or nonkey access. One additional count, called NO I/O, is unique to MVIMS. This count is a measure of IMS overhead and is the number of requests to the IMS buffer handler that do *not* result in I/O. These counts can be affected by the Event Collector parameters.

Note: If DBTNAME=DD is specified, database reads and writes and reads without I/O counts (NO I/O counts) are collected at the data set level, except for Fast Path DEDBs.

Database Reads

Reads are counted as key or nonkey reads. No database reads are collected if DBIO=NONE (except for DEDBs and MSDBs).

The database read counts are collected at the database level with both DBIO=BFALTERS and DBIO=IOWAITS.

Reads caused by access through a secondary index or logical database are counted with DBIO=BFALTERS and DBIO=IOWAITS, but are shown for the actual target DBD (DBPCB).

Note: This process may cause key I/O to appear for nonkey databases, such as HDAM.

Database Writes

Writes are counted as key and nonkey writes. No database writes are collected if DBIO=NONE (except for DEDBs).

If DBIO=BFALTERS:

- All writes are collected at the database level.
- Writes to maintain a secondary index or logical database are collected. Counts are maintained at the database level (DBPCB).

If DBIO=IOWAITS:

- Most writes are collected at the transaction level and reported under the database entry ALLDBS, including all writes occurring at sync point (the majority). These counts correspond closely to the DC Monitor IWAITS reported under the I/O PCB (Program I/O report).
- Database writes that occur during call processing (such as the deletion of a HISAM root) are accumulated by database.
- Writes to maintain a secondary index or logical database are collected under the DBD that is the actual target (DBPCB).
- VSAM-initiated writes for buffer steal and background write are not measured.
- OSAM buffer steal writes are accumulated in the (otherwise unused) NO I/O counter for the database/transaction whose read request forced the buffer steal.
- Chained VSAM or OSAM writes of multiple buffers count as one write.

NO I/O

NO I/O counts are collected only if DBIO=BFALTERS.

NO I/O measures the number of requests to the IMS buffer handler that do not result in I/O.

DB2 Subsystem Activity

MVIMS measures the number of DB2 calls made through the IMS Attach Facility. I/O is not measured. The call counts are recorded in an optional segment at the end of the MVIMS transaction record. The transaction record is described in the “Transaction Accounting Record (TAR) Layout” section of the “IRUF Record Layout Descriptions” appendix of the *MAINVIEW for IMS Offline – Customization and Utilities Guide*.

BMP and JBP Data

BMP and JBP data is always collected unless BMP=NO or BMP=NOCPU is specified. If BMP=NO, no BMP and JBP transaction and program records are produced, which affects all MVIMS reports. If BMP=NOCPU, all CPU timing fields in the BMP and JBP records are zero. DL/I calls and database I/O statistics are collected.

Chapter 3 Charge-Out Analysis (TASCOSTR)

The TASCOSTR report program can be used to

- provide the data center with a detailed audit of charges accrued to a specific user for the IMS services consumed and automated billing for its customers (Detail Charge-Out Analysis report)
- allow the system or database administrator to establish rates more easily and accurately, measure the impact of the rate structure, and identify the variance between special-charged transactions and actual processing costs (Distribution Charge-Out Analysis report)
- maintain an audit trail of the rates used for each charge-out process (Chargeable Rate Table report)
- determine the cost of IMS operation by generating total IMS resource usage reports (Total IMS Resource Usage Analysis report)
- summarize the IRUF file created by MVIMS Log Edit (IRUF Summarization)

Input and Output

The charge-out component of the Transaction Accountant (TASCOSTR) accepts any of the following input:

- a sorted IMS Resource Utilization File
- user-specified execution PARM options
- report control statements

TASCOSTR can produce any of the following processes.

Full Charge-Out

Full charge-out produces a summarized IRUF and the following accounting reports:

- Detail Charge-Out Analysis report
- Distribution Charge-Out Analysis report
- Chargeable Rate Table report
- Total IMS Resource Usage Analysis report

IRUF Summarization

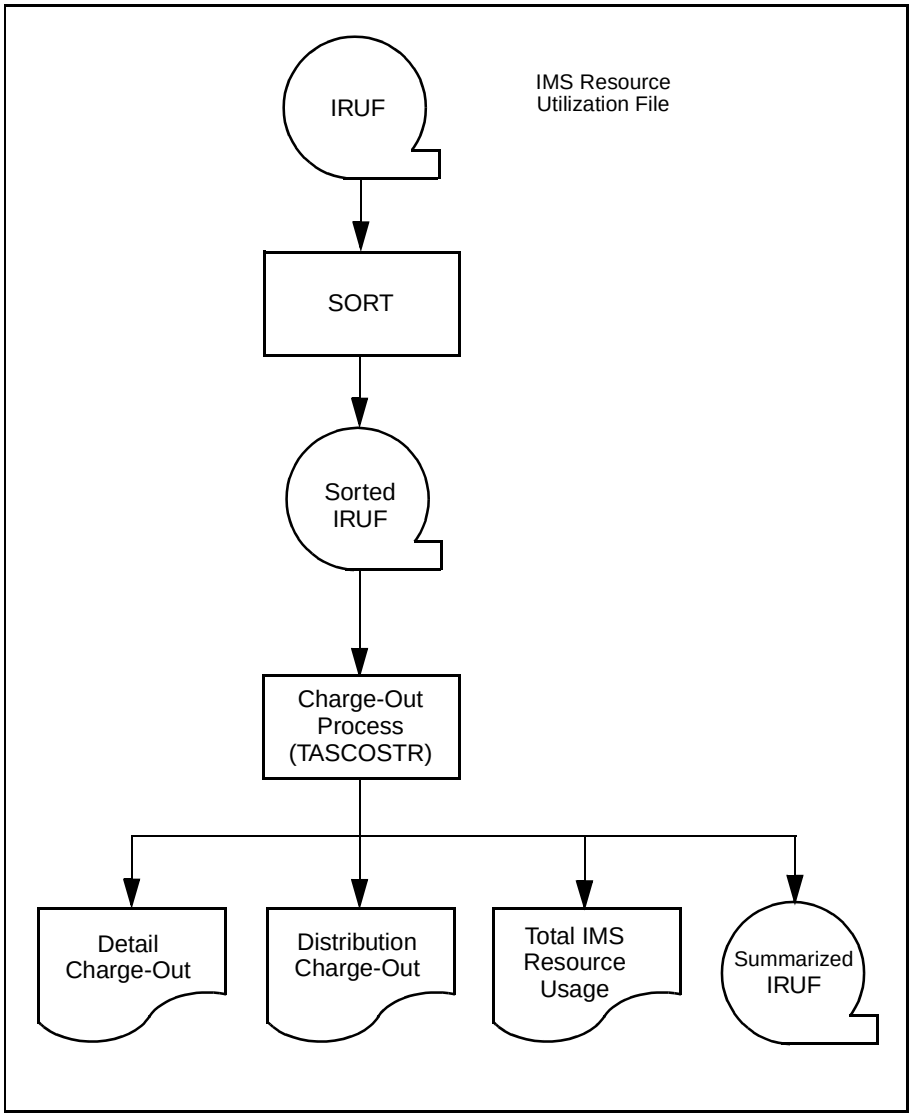
IRUF summarization produces a summarized IRUF and one report, the Total IMS Resource Usage Analysis report.

Resource Cost Analysis

Resource cost analysis produces the Distribution Charge-Out Analysis report and the Chargeable Rate Table report, but it does not summarize the IRUF.

Figure 3-1 figure shows system flow for TASCOSTR.

Figure 3-1 TASCOSTR System Flow



Report Element Description

This section describes the elements of each report produced by TASCOSTR.

DBCTL Threads

DBCTL CICS and ODBA thread activity can be reported by TASCOSTR if CICS=YES or CICS=OFFLINE is specified for the Event Collector in BBPARM member IMFECP00.

In the following report descriptions, DBCTL thread considerations are indicated for each applicable section. Any CPU time reported for DBCTL threads represents only the DL/I portion of the application CPU time.

Detail Charge-Out Analysis

The Detail Charge-Out Analysis report (shown in Figure 3-2 on page 3-5) provides a statement of all costs/charges for all transactions for each user-defined customer. The report provides a subtotal for each customer ID and can be used as a customer invoice. The customer ID is a user-defined data element that relates costing information in the IRUF to the responsible user.

DBCTL Threads

DBCTL CICS and ODBA thread activity can be reported by TASCOSTR. The following considerations apply:

- Processor charges are for the DBCTL CPU time. The charges do not include CPU time in CICS.
- Terminal charges, DB2 charges, and line connect charges are zero.
- If the LTERM is used in the customer ID field, it is the four-byte CICS terminal ID for DBCTL threads.

Figure 3-2 on page 3-5 provides an example of the Detail Charge-Out Analysis report.

Figure 3-2 Detail Charge-Out Analysis Report

```
**** IMF ****                                IMS TRANSACTION ACCOUNTANT                                                    **** IMF ****
CURRENT DATE - 03/22/yy <1>                  DETAIL CHARGE-OUT ANALYSIS                                                   PAGE NO -    2
*************************************************************************************************************************************
* COST CENTER CATEGORY *    NUMBER   *   PROCESSOR        TERMINAL       DATA BASE         DB2     *    SPECIAL   *     TOTAL     *
* COST CENTER ID       * TRANSACTIONS*    CHARGES         CHARGES         CHARGES         CHARGES   *    CHARGES   *    CHARGES    *
*************************************************************************************************************************************
* <2>                  *             *                                                               *              *               *
* LINE CONNECT CHARGE  *             *       0.000           0.000           0.000           0.000 *        0.000 *         0.000 *
*                      *             *                                                               *              *               *
*                      *             *                                                               *              *               *
*                      *             *                                                               *              *               *
* TOTAL BY LTERM       *           1 *       0.002           0.000           0.000           0.000 *        0.000 *         0.002 *
* M0771190 <3>         *             *                                                               *              *               *
*                      *             *                                                               *              *               *
*************************************************************************************************************************************
* <2>                  *             *                                                               *              *               *
* TRANSACTION TOTAL    *       <4> 1 *    <5> 0.003       <6> 0.000       <7> 0.000       <8> 0.000 *    <9> 0.000 *    <10> 0.003 *
* KNV5A3BS <3>         *             *                                                               *              *               *
*                      *             *                                                               *              *               *
* TRANSACTION TOTAL    *           2 *       0.007           0.000           0.000           0.000 *        0.000 *         0.007 *
* KUM5A380             *             *                                                               *              *               *
*                      *             *                                                               *              *               *
* LINE CONNECT CHARGE  *             *       0.000           0.000           0.000           0.000 *        0.000 *         0.000 *
*                      *             *                                                               *              *               *
*                      *             *                                                               *              *               *
*                      *             *                                                               *              *               *
* TOTAL BY LTERM       *           3 *       0.010           0.000           0.000           0.000 *        0.000 *         0.010 *
* O0760490             *             *                                                               *              *               *
*                      *             *                                                               *              *               *
*************************************************************************************************************************************
**** IMF ****                                IMS TRANSACTION ACCOUNTANT                                                    **** IMF ****
CURRENT DATE - 03/22/yy DETAIL CHARGE-OUT ANALYSIS                                                    PAGE NO -    3
*************************************************************************************************************************************
* COST CENTER CATEGORY *    NUMBER   *   PROCESSOR        TERMINAL       DATA BASE         DB2     *    SPECIAL   *     TOTAL     *
* COST CENTER ID       * TRANSACTIONS*    CHARGES         CHARGES         CHARGES         CHARGES   *    CHARGES   *    CHARGES    *
*************************************************************************************************************************************
*                      *             *                                                               *              *               *
*                      *             *                                                               *              *               *
* GRAND TOTALS <11>    *          12 *       0.037           0.000           0.000           0.000 *        0.000 *         0.037 *
*                      *             *                                                               *              *               *
*                      *             *                                                               *              *               *
*************************************************************************************************************************************
*  ACCOUNTING FOR PERIOD COVERING  03/22/yy (91152) 05.41  TO  03/22/yy (91152) 05.47  <12>                                          *
*************************************************************************************************************************************
```

Table 3-1 describes the elements of the Detail Charge-Out Analysis report. The reference numbers (with the **<n>** format) match the elements in the report example to the elements described in the table.

Table 3-1 Detail Charge-Out Analysis Report Elements (Part 1 of 2)

<1> CURRENT DATE Date this report was generated, expressed as mm/dd/yy.
<2> COST CENTER CATEGORY Type of costs incurred by the associated categories. The values printed per control break category may include the following: **TRANSACTION TOTAL**. A summarized charge-out for the transaction code shown in the cost center category ID field. **LINE CONNECT CHARGES**. Charge-out for terminal connect charges only. **USER-DEFINED COST CENTER**. A summary of charge-outs for each user-defined cost center category (1 to 5 maximum; see “Cost Center Category Control Statements” on page 3-28).
<3> COST CENTER ID User-defined ID of a cost center category (see “Defining the Cost Center Category and ID” on page 3-28).
<4> NUMBER TRANSACTIONS Number of transaction executions that resulted in the associated charge-outs.
<5> PROCESSOR CHARGES Total charges incurred for message region resources consumed, which include • message region CPU time charge • storage allocated charge • storage used charge For more information, see “Application Program CPU” on page 2-7.
<6> TERMINAL CHARGES Total charges incurred for terminal resources consumed, which include • terminal connect charge • message traffic charge – input character charge – output character charge – other character charge • terminal I/O charge – MESSAGE GET UNIQUE charge – MESSAGE GET NEXT charge – MESSAGE INSERT charge Insert charges are based on insert, purge, and other calls.

Table 3-1 Detail Charge-Out Analysis Report Elements (Part 2 of 2)

<7>	**DATABASE CHARGES** Total charges incurred for database resources consumed, which include • DL/I CPU time charge • DL/I I/O charge – KEY I/O charge – NONKEY I/O charge – NO I/O charge • DL/I requests – GET UNIQUE charge – GET NEXT charge – INSERT charge – DELETE charge – REPLACE charge For more information, see “Message DL/I CPU” on page 2-7, “Control DL/I CPU” on page 2-8, “Database Reads” on page 2-12, “Database Writes” on page 2-13, and “NO I/O” on page 2-13.
<8>	**DB2 CHARGES** Total charges incurred for DB2 requests, which include • DB2 CPU time • SQL call charges For more information, see “DB2 CPU” on page 2-8 and “DB2 Subsystem Activity” on page 2-14.
<9>	**SPECIAL CHARGES** Total charges applied for transaction charge-out options, which include • minimum transaction charge • special transaction charge • prorated customer charge
<10>	**TOTAL CHARGES** Sum of charges per cost center category.
<11>	**GRAND TOTALS** Total of all cost center charges for all IMS transactions.
<12>	**ACCOUNTING FOR PERIOD COVERING** Time span during which the transaction charges were incurred.

Distribution Charge-Out Analysis

The Distribution Charge-Out Analysis report is a tool you can use to evaluate the rate assigned to each resource and its effect on the overall charge-out process.

Figure 3-3 Distribution Charge-Out Analysis Report

```
**** IMF ****                                         IMS TRANSACTION ACCOUNTANT                                         **** IMF ****
CURRENT DATE - 03/22/yy                            DISTRIBUTION CHARGE-OUT ANALYSIS                                       PAGE NO -   2
NUMBER OF TRANSACTIONS PROCESSED IS <1>   12            ACCUMULATIVE CHARGE-OUT AMOUNT IN DOLLARS IS <2>           0.03
*********************************************************************************************************************************
*                                                             *                                        *                       *
*      RESOURCE IDENTIFICATION        RATE/UNIT OF COST       *           QUANTITY      TOTAL  PERCENT *                       *
*                                                             *           MEASURED      CHARGES OF TOTAL*                      *
*                                                             *                                        *                       *
*********************************************************************************************************************************
*                                                             *                                        *                       *
*  <3>                                                        *                                        *                       *
*  STANDARD DATA BASE RESOURCES                               *                                        *                       *
*                                     <4>                     *              <5>          <6>     <7>  *                       *
*      STANDARD GET UNIQUES           0.0000/100 GET UNIQUES  *              12.0        0.000    0.00 *                       *
*      STANDARD GET NEXTS             0.0000/100 GET NEXTS    *               0.0        0.000    0.00 *                       *
*      STANDARD INSERTS               0.0000/100 INSERTS      *               0.0        0.000    0.00 *                       *
*      STANDARD DELETES               0.0000/100 DELETES      *               0.0        0.000    0.00 *                       *
*      STANDARD REPLACES              0.0000/100 REPLACES     *               0.0        0.000    0.00 *                       *
*      STANDARD KEY I/OS              0.0000/100 KEY I/OS     *               0.0        0.000    0.00 *                       *
*      STANDARD NONKEY I/OS           0.0000/100 NONKEY I/OS  *               4.0        0.000    0.00 *                       *
*      STANDARD NO I/OS               0.0000/100 NO I/OS      *              23.0        0.000    0.00 *                       *
*                                                             *                                        *                       *
*********************************************************************************************************************************
*                                                             *                                        *                       *
*  STANDARD DB2 RESOURCES                                     *                                        *                       *
*                                                             *                                        *                       *
*      STANDARD READS                 0.0000/100 READS        *               0.0        0.000    0.00 *                       *
*      STANDARD UPDATES               0.0000/100 UPDATES      *               0.0        0.000    0.00 *                       *
*      STANDARD DDL CALLS             0.0000/100 DDL CALLS    *               0.0        0.000    0.00 *                       *
*      STANDARD DYNAMIC CALLS         0.0000/100 DYNAMIC CALL *               0.0        0.000    0.00 *                       *
*      STANDARD CONTROL CALLS         0.0000/100 CONTROL CALL *               0.0        0.000    0.00 *                       *
*      STANDARD OTHER CALLS           0.0000/100 OTHER CALLS  *               0.0        0.000    0.00 *                       *
*********************************************************************************************************************************
**** IMF ****                                          IMS TRANSACTION ACCOUNTANT                                        **** IMF ****
CURRENT DATE - 03/22/yy                             DISTRIBUTION CHARGE-OUT ANALYSIS                                      PAGE NO -   3
NUMBER OF TRANSACTIONS PROCESSED IS            12            ACCUMULATIVE CHARGE-OUT AMOUNT IN DOLLARS IS           1.22
*********************************************************************************************************************************
*                                                             *                                        *                       *
*      RESOURCE IDENTIFICATION        RATE/UNIT OF COST       *           QUANTITY      TOTAL  PERCENT *  PROCESSING    CHARGE *
*                                                             *           MEASURED      CHARGES OF TOTAL*   COSTS      VARIANCE *
*                                                             *                                        *                       *
*********************************************************************************************************************************
*                                                             *                                        *                       *
*                                                             *                                        *                       *
*  SPECIAL CHARGED TRANSACTIONS                               *                                        *                       *
*                                                             *                                        *     <8>         <9>   *
*             KUM9Z380                 30.00/100 EXECUTIONS   *               4.0        1.200   98.11 *     0.01        1.18  *
*                                                             *                                        *                       *
*********************************************************************************************************************************
```

Table 3-2 describes the elements of the Distribution Charge-Out Analysis report. The reference numbers (with the **<n>** format) match the elements in the report example to the elements described in the table.

Table 3-2 Distribution Charge-Out Analysis Report Elements

<1> NUMBER OF TRANSACTIONS PROCESSED Number of transactions processed during this accounting cycle.
<2> ACCUMULATIVE CHARGE-OUT AMOUNT IN DOLLARS Total number of dollars charged out in this accounting cycle.
<3> RESOURCE IDENTIFICATION Name of the chargeable resource. The resources are grouped as follows: • standard basic resources • standard terminal resources • special-charge terminal resources • standard database resources • special-charge database resources • standard DB2 resources • special-charge DB2 plan names • special-charge transactions • special-charge customers
<4> RATE/UNIT OF COST Charge for this resource, expressed in dollars and cents and qualified by a description of the chargeable unit (for example, CPU seconds).
<5> QUANTITY MEASURED Total amount of the billable resource measured for this accounting cycle. For more information, see Chapter 2, “Event Collector Options.”
<6> TOTAL CHARGES Total charges resulting from the specified rate.
<7> PERCENT OF TOTAL Percentage figure representing the portion of the accumulative charge-out amount that may be attributed to the rate.
<8> PROCESSING COSTS Actual costs calculated for this special-charge transaction code (reported for special-charge transactions only).
<9> CHARGE VARIANCE Difference between the total charges and processing costs (reported for special-charge transactions only).

Chargeable Rate Table Report

The Chargeable Rate Table report shows the accounting administrator the rates that are specified and accepted for this accounting charge-out process. The elements of this report are the user-specified rates defined as input to the RATEDIT DD JCL statement. These rate specifications are described in “Defining Charge-Out Rates” on page 3-32.

Figure 3-4 Chargeable Rate Table Report

```
**** IMF ****                                  IMS TRANSACTION ACCOUNTANT                                  **** IMF ****
                                                 CHARGEABLE RATE TABLE
CURRENT DATE - 03/22/yy              BMP COSTING - NO                    TERMINAL COSTING - YES            PAGE NO -   1
*****************************************************************************************************************************
*                                                                                                                           *
* - - - - - - - - - - - - - - - - - - - - - - - - - - - - B A S E   R A T E S - - - - - - - - - - - - - - - - - - - - - - - - - *
*                                                                                                                           *
*                              MSG REGION  ALLOCATED      USED        DL1     MINIMUM CHARGE      DB2                         *
*                               CPU TIME   KCORE MINS  KCORE MINS   CPU TIME     RATE/100        CPU TIME                    *
*                                                                                                                           *
*          STANDARD              0.2000      0.0000      0.0100      0.2000      0.0000          0.2000                      *
*                                                                                                                           *
*****************************************************************************************************************************
*                                                                                                                           *
* - - - - - - - - - - - - - - - - - - - - - - - - - - T E R M I N A L   R A T E S - - - - - - - - - - - - - - - - - - - - - - *
*                                                                                                                           *
*          TERMINAL        MESSAGE     MESSAGE    MESSAGE       INPUT      OUTPUT       OTHER      CONNECT                 *
*            NAME        GET UNIQUE   GET NEXT     INSERT    CHARACTERS  CHARACTERS  CHARACTERS      TIME                  *
*                         RATE/100    RATE/100    RATE/100    RATE/1000  RATE/1000    RATE/1000   RATE/HOUR                *
*                                                                                                                           *
*                           0.0000      0.0000      0.0000      0.0000      0.0000      0.0000      0.0000                  *
*                                                                                                                           *
*****************************************************************************************************************************
*                                                                                                                           *
* - - - - - - - - - - - - - - - - - - - - - - - - - D A T A   B A S E   R A T E S - - - - - - - - - - - - - - - - - - - - - - *
*                                                                                                                           *
*          DATA BASE      GET UNIQUE   GET NEXT     INSERT      DELETE      REPLACE      KEY IO    NONKEY IO     NO IO      *
*            NAME          RATE/100    RATE/100    RATE/100    RATE/100    RATE/100    RATE/100    RATE/100    RATE/100     *
*                                                                                                                           *
*                           0.0000      0.0000      0.0000      0.0000      0.0000      0.0000      0.0000      0.0000       *
*                                                                                                                           *
*****************************************************************************************************************************
*                                                                                                                           *
* - - - - - - - - - - - - - - - - - - - - - - - - - D A T A   B A S E   2  (D B 2)   R A T E S - - - - - - - - - - - - - - - - - *
*                                                                                                                           *
*          PLAN NAME           READ      UPDATE       DDL       DYNAMIC     CONTROL      OTHER                            *
*                             RATE/100    RATE/100    RATE/100    RATE/100    RATE/100    RATE/100                         *
*                                                                                                                           *
*                           0.0000      0.0000      0.0000      0.0000      0.0000      0.0000                           *
*                                                                                                                           *
*****************************************************************************************************************************
```

Total IMS Resource Usage Analysis

The Total IMS Resource Usage Analysis report (shown in Figures 3-5 through 3-8) summarizes resource usage data from the terminal, program, and transaction IRUF records. CPU usage is shown either as user-related (chargeable) or as overhead (not chargeable). The report also shows the total number of programs and transactions, DL/I requests, both terminal and database I/O, and DB2 calls.

This overview report does not contain costing information, and it is used primarily to track total resource consumption and to profile the IMS workload.

DBCTL Threads

DBCTL CICS and ODBA thread resources are included in the MPP workload column.

Figure 3-5 CPU Usage and System Availability

```
**** IMF ****                                IMS TRANSACTION ACCOUNTANT                                **** IMF ****
CURRENT DATE - 03/22/yy <1>                TOTAL IMS RESOURCE USAGE ANALYSIS                          PAGE NO -    1
IMSID - IMS1 <2> IMS LEVEL  - xx00 <4>                                  <6> EARLIEST START - yy.350 05:41:38
SMFID - A9E3 <3> LSO OPTION - S <5>                                     <7> LATEST STOP    - yy.350 05:47:32
*************************************************************************************************************************
*              <8>                 *            <9>           *            <10>           *              <11>          *
*      RESOURCE IDENTIFICATION     *         MPP WORKLOAD     *         BMP WORKLOAD      *             TOTAL          *
*                                  *       QUANTITY   % TOTAL *       QUANTITY   % TOTAL  *           WORKLOAD         *
*                                  *                  WORKLOAD *                  WORKLOAD *                            *
*************************************************************************************************************************
*                                  *                           *                           *                            *
*  IMS OVERHEAD CPU USAGE <12>     *                           *                           *                            *
*                                  *                           *                           *                            *
*      CONTROL REGION/DLISAS CPU TIME  *          2.53   100.0%  *          0.00     0.0%  *              2.53          *
*      BUFFER HANDLING CPU TIME    *          0.00     0.0%  *          0.00     0.0%  *              0.00          *
*      OPEN/CLOSE PROCESSING CPU TIME  *          0.00     0.0%  *          0.00     0.0%  *              0.00          *
*      PROGRAM SCHEDULING CPU TIME     *          0.06   100.0%  *          0.00     0.0%  *              0.06          *
*      MESSAGE REGION OVERHEAD CPU TIME *         0.24   100.0%  *          0.00     0.0%  *              0.24          *
*      *******  TOTAL OVERHEAD CPU     *          2.83   100.0%  *          0.00     0.0%  *              2.83          *
*      *******  AVG OVERHEAD CPU/TRAN  *       0.23617            *       0.00000            *           0.23617          *
*                                  *                           *                           *                            *
*  IMS CHARGEABLE CPU USAGE <13>   *                           *                           *                            *
*                                  *                           *                           *                            *
*      APPLICATION PROGRAM CPU TIME    *          0.18   100.0%  *          0.00     0.0%  *              0.18          *
*      DL/I CPU TIME               *          0.01   100.0%  *          0.00     0.0%  *              0.01          *
*      DB2 CPU TIME                *          0.00     0.0%  *          0.00     0.0%  *              0.00          *
*      *******  TOTAL CHARGEABLE CPU   *          0.19   100.0%  *          0.00     0.0%  *              0.19          *
*      *******  AVG CHARGEABLE CPU/TRAN *       0.01608            *       0.00000            *           0.01608          *
*      *******  AVG DL/I CPU / DB CALL  *       0.00092            *       0.00000            *           0.00092          *
*      *******  AVG DB2 CPU / DB2 CALL  *       0.00000            *       0.00000            *           0.00000          *
*                                  *                           *                           *                            *
*  IMS TOTAL CPU USAGE <14>        *                           *                           *                            *
*                                  *                           *                           *                            *
*      CONTROL REGION/DLISAS CPU TIME  *          2.59   100.0%  *          0.00     0.0%  *              2.59          *
*      DEPENDENT REGION CPU TIME   *          0.43   100.0%  *          0.00     0.0%  *              0.43          *
*      *******  TOTAL IMS CPU          *          3.03   100.0%  *          0.00     0.0%  *              3.03          *
*      *******  AVG CPU/TRAN           *       0.25225            *       0.00000            *           0.25225          *
*      *******  % DEP.REGION/TOTAL CPU  *         14.3%            *         0.0%             *             14.3%          *
*      *******  % CHARGEABLE/TOTAL CPU  *          6.3%            *         0.0%             *              6.3%          *
*                                  *                           *                           *                            *
*                                  *                           *                           *                            *
*  IMS SCHEDULING ACTIVITY <15>    *                           *                           *                            *
*                                  *                           *                           *                            *
*      NUMBER OF PROGRAMS          *            13   100.0%  *            0     0.0%  *              13            *
*      NUMBER OF PROGRAM ABENDS-SYSTEM  *        0     0.0%  *            0     0.0%  *               0            *
*      NUMBER OF PROGRAM ABENDS-USER    *        0     0.0%  *            0     0.0%  *               0            *
*      NUMBER OF TRANSACTIONS      *            12   100.0%  *            0     0.0%  *              12            *
*      NUMBER OF TRANS. ACCESSING DB2   *        0     0.0%  *            0     0.0%  *               0            *
*      *******  AVG TRANS/PROGRAM      *        0.923            *        0.000            *            0.923           *
```

```
*                                    *                          *                          *                          *
*****************************************************************************************************************************
```

Figure 3-6 Full Function Workload

```
**** IMF ****                                  IMS TRANSACTION ACCOUNTANT                                        **** IMF ****
CURRENT DATE - 03/22/yy                    TOTAL IMS RESOURCE USAGE ANALYSIS                                    PAGE NO -   2
IMSID - IMS1   IMS LEVEL  - xx00                  FULL FUNCTION WORKLOAD                 EARLIEST START - yy.350 05:41:38
SMFID - A9E3   LSO OPTION - S                                                            LATEST STOP    - yy.350 05:47:32
*****************************************************************************************************************************
*                                    *                          *                          *                          *
*      RESOURCE IDENTIFICATION       *          MPP WORKLOAD    *          BMP WORKLOAD    *           TOTAL          *
*                                    *       QUANTITY  % TOTAL  *       QUANTITY  % TOTAL  *         WORKLOAD         *
*                                    *                 WORKLOAD *                 WORKLOAD *                          *
*****************************************************************************************************************************
*                                    *                          *                          *                          *
*  IMS TERMINAL I/O <16>             *                          *                          *                          *
*                                    *                          *                          *                          *
*      FULL FUNCTION TRANS (MSG Q)   *            12   100.0%   *            0     0.0%   *              12          *
*                                    *                          *                          *                          *
*      INPUT CALLS - MGU/MGN         *            12   100.0%   *            0     0.0%   *              12          *
*      OUTPUT CALLS - MISRT/MPURG    *            12   100.0%   *            0     0.0%   *              12          *
*      *******  TOTAL TERMINAL I/O   *            24   100.0%   *            0     0.0%   *              24          *
*      *******  AVG TERMINAL I/O / TRAN *       2.000           *          0.000           *           2.000          *
*                                    *                          *                          *                          *
*  IMS FULL FUNCTION DATA BASE REQUESTS <17>                     *                          *                          *
*                                    *                          *                          *                          *
*      TRANS ACCESSING FF DBS        *             9   100.0%   *            0     0.0%   *               9          *
*                                    *                          *                          *                          *
*      DL/I GET UNIQUES              *            12   100.0%   *            0     0.0%   *              12          *
*      DL/I GET NEXT                 *             0     0.0%   *            0     0.0%   *               0          *
*      *******  TOTAL GET CALLS      *            12   100.0%   *            0     0.0%   *              12          *
*      *******  AVG GET CALLS / TRAN *       1.333           *          0.000           *           1.333          *
*                                    *                          *                          *                          *
*      DL/I DELETES                  *             0     0.0%   *            0     0.0%   *               0          *
*      DL/I REPLACES                 *             0     0.0%   *            0     0.0%   *               0          *
*      DL/I INSERTS                  *             0     0.0%   *            0     0.0%   *               0          *
*      *******  TOTAL UPDATE CALLS   *             0     0.0%   *            0     0.0%   *               0          *
*      *******  AVG UPDATE CALLS / TRAN *      0.000           *          0.000           *           0.000          *
*                                    *                          *                          *                          *
*      TOTAL DL/I DATA BASE CALLS    *            12   100.0%   *            0     0.0%   *              12          *
*      *******  AVG DL/I CALLS / TRAN *       1.333           *          0.000           *           1.333          *
*      *******  % UPDATE CALLS       *           0.0%           *              0.0%        *              0.0%        *
*                                    *                          *                          *                          *
*  IMS FULL FUNCTION DATA BASE I/O <18> *                       *                          *                          *
*                                    *                          *                          *                          *
*      KEY READS                     *             0     0.0%   *            0     0.0%   *               0          *
*      NONKEY READS                  *             4   100.0%   *            0     0.0%   *               4          *
*      *******  TOTAL READ I/O       *             4   100.0%   *            0     0.0%   *               4          *
*      *******  AVG READ I/O / TRAN  *       0.444           *          0.000           *           0.444          *
*                                    *                          *                          *                          *
*      KEY WRITES                    *             0     0.0%   *            0     0.0%   *               0          *
*      NONKEY WRITES                 *             0     0.0%   *            0     0.0%   *               0          *
*      *******  TOTAL WRITE I/O      *             0     0.0%   *            0     0.0%   *               0          *
*      *******  AVG WRITE I/O / TRAN *       0.000           *          0.000           *           0.000          *
*                                    *                          *                          *                          *
*      TOTAL DATA BASE I/O           *             4   100.0%   *            0     0.0%   *               4          *
*      *******  AVG I/O / TRAN       *       0.444           *          0.000           *           0.444          *
*      *******  % KEY I/O            *           0.0%           *              0.0%        *              0.0%        *
*      *******  % WRITE I/O          *           0.0%           *              0.0%        *              0.0%        *
*                                    *                          *                          *                          *
*****************************************************************************************************************************
```

Figure 3-7 Fast Path Workload

```
**** IMF ****                                IMS TRANSACTION ACCOUNTANT                                  **** IMF ****
CURRENT DATE - 03/22/yy                  TOTAL IMS RESOURCE USAGE ANALYSIS                               PAGE NO -   3
IMSID - IMSP   IMS LEVEL  - xx00                FAST PATH WORKLOAD                  EARLIEST START - yy.350 12:54:47
SMFID - TPON   LSO OPTION - S                                                       LATEST STOP    - yy.350 13:12:35
*************************************************************************************************************************
*                                  *                        *                        *                        *
*      RESOURCE IDENTIFICATION     *          MPP WORKLOAD  *          BMP WORKLOAD  *          TOTAL         *
*                                  *        QUANTITY  % TOTAL *        QUANTITY  % TOTAL *        WORKLOAD      *
*                                  *                  WORKLOAD *                  WORKLOAD *                      *
*************************************************************************************************************************
*                                  *                        *                        *                        *
*  IMS TERMINAL I/O <19>           *                        *                        *                        *
*                                  *                        *                        *                        *
*      FAST PATH TRANSACTIONS (EMH)*              0    0.0% *              0    0.0% *                 0      *
*                                  *                        *                        *                        *
*      INPUT CALLS - MGU           *              0    0.0% *              0    0.0% *                 0      *
*      OUTPUT CALLS - MISRT/MPURG  *              0    0.0% *              0    0.0% *                 0      *
*      *******  TOTAL TERMINAL I/O *              0    0.0% *              0    0.0% *                 0      *
*      *******  AVG TERMINAL I/O / TRAN *      0.000         *        0.000         *             0.000      *
*                                  *                        *                        *                        *
*                                  *                        *                        *                        *
*  IMS FAST PATH DATA BASE REQUESTS <20>*                   *                        *                        *
*                                  *                        *                        *                        *
*      TRANS ACCESSING FP DBS      *             93  100.0% *              0    0.0% *                93      *
*                                  *                        *                        *                        *
*      DL/I GET UNIQUES            *            186  100.0% *              0    0.0% *               186      *
*      DL/I GET NEXT               *              0    0.0% *              0    0.0% *                 0      *
*      *******  TOTAL GET CALLS    *            186  100.0% *              0    0.0% *               186      *
*      *******  % MSDB GET CALLS   *           0.0%         *           0.0%         *               0.0%     *
*                                  *                        *                        *                        *
*      DL/I DELETES                *              0    0.0% *              0    0.0% *                 0      *
*      DL/I REPLACES               *              0    0.0% *              0    0.0% *                 0      *
*      DL/I INSERTS                *              0    0.0% *              0    0.0% *                 0      *
*      *******  TOTAL UPDATE CALLS *              0    0.0% *              0    0.0% *                 0      *
*      *******  % MSDB UPDATE CALLS*           0.0%         *           0.0%         *               0.0%     *
*                                  *                        *                        *                        *
*      TOTAL DL/I DATA BASE CALLS  *            186  100.0% *              0    0.0% *               186      *
*      *******  AVG DL/I CALLS / TRAN *        2.000         *        0.000         *             2.000      *
*      *******  % MSDB CALLS       *           0.0%         *           0.0%         *               0.0%     *
*                                  *                        *                        *                        *
*  IMS FAST PATH DATA BASE I/O <21>*                        *                        *                        *
*                                  *                        *                        *                        *
*      DEDB READS                  *            217  100.0% *              0    0.0% *               217      *
*      *******  AVG READ I/O / TRAN *        2.333         *        0.000         *             2.333      *
*                                  *                        *                        *                        *
*      DEDB WRITES                 *              0    0.0% *              0    0.0% *                 0      *
*      *******  AVG WRITE I/O / TRAN *       0.000         *        0.000         *             0.000      *
*                                  *                        *                        *                        *
*      TOTAL DATA BASE I/O         *            217  100.0% *              0    0.0% *               217      *
*      *******  AVG I/O / TRAN     *        2.333         *        0.000         *             2.333      *
*      *******  % WRITE I/O        *           0.0%         *           0.0%         *               0.0%     *
*                                  *                        *                        *                        *
*************************************************************************************************************************
```

Note: If there is no Fast Path activity, the Fast Path workload page is not produced.

Figure 3-8 DB2 Workload

```
**** IMF ****                                IMS TRANSACTION ACCOUNTANT                                  **** IMF ****
CURRENT DATE - 03/22/yy                  TOTAL IMS RESOURCE USAGE ANALYSIS                             PAGE NO -   3
IMSID - X15H   IMS LEVEL  - 2200                    DB2 WORKLOAD                  EARLIEST START - yy.350 08:15:12
SMFID - SYSB   LSO OPTION - S                                                     LATEST STOP    - yy.350 08:36:14
*****************************************************************************************************************
*                                    *                          *                          *                       *
*      RESOURCE IDENTIFICATION       *          MPP WORKLOAD    *          BMP WORKLOAD    *          TOTAL        *
*                                    *        QUANTITY  % TOTAL *        QUANTITY  % TOTAL *        WORKLOAD     *
*                                    *                  WORKLOAD*                  WORKLOAD*                     *
*****************************************************************************************************************
*                                    *                          *                          *                       *
*  DB2 REQUESTS      SSID - DB2D <22>*                          *                          *                       *
*                                    *                          *                          *                       *
*      NUMBER OF TRANS. ACCESSING DB2*              30  100.0%  *              0     0.0%  *              30       *
*                                    *                          *                          *                       *
*      DB2 SELECTS/FETCHES           *             156  100.0%  *              0     0.0%  *             156       *
*      DB2 OPENS                     *              24  100.0%  *              0     0.0%  *              24       *
*      ******* TOTAL GET CALLS       *             180  100.0%  *              0     0.0%  *             180       *
*      ******* AVG GET CALLS / TRAN  *           6.000          *          0.000           *           6.000       *
*                                    *                          *                          *                       *
*      DB2 INSERTS                   *               6  100.0%  *              0     0.0%  *               6       *
*      DB2 DELETES                   *               6  100.0%  *              0     0.0%  *               6       *
*      DB2 UPDATES                   *              18  100.0%  *              0     0.0%  *              18       *
*      ******* TOTAL UPDATE CALLS    *              30  100.0%  *              0     0.0%  *              30       *
*      ******* AVG UPDATE CALLS / TRAN*           1.000          *          0.000           *           1.000       *
*                                    *                          *                          *                       *
*      DB2 DATA DEF. LANGUAGE (DDL)  *               0    0.0%  *              0     0.0%  *               0       *
*      DB2 DYNAMIC SQL CALLS         *               0    0.0%  *              0     0.0%  *               0       *
*      DB2 SQL CONTROL CALLS         *               0    0.0%  *              0     0.0%  *               0       *
*      DB2 OTHER CALLS               *              24  100.0%  *              0     0.0%  *              24       *
*      ******* TOTAL SPECIAL CALLS   *              24  100.0%  *              0     0.0%  *              24       *
*      ******* AVG SPECIAL CALLS / TRAN*          0.800          *          0.000           *           0.800       *
*                                    *                          *                          *                       *
*      TOTAL DB2 CALLS               *             234  100.0%  *              0     0.0%  *             234       *
*      ******* AVG DB2 CALLS / TRAN  *           7.800          *          0.000           *           7.800       *
*      ******* % UPDATE CALLS        *              12.8%         *              0.0%        *              12.8%    *
*                                    *                          *                          *                       *
*****************************************************************************************************************
```

Note: The DB2 workload page is not produced if there is no DB2 activity through the IMS Attach Facility or if the parameter FEATURE=NODB2 is specified in PARMLIB member IMFSYS00 (see PARMLIB member IMFSYSBB for more information).

Table 3-3 describes Total IMS Resource Usage Analysis report elements. The reference numbers (with the **<n>** format) match the elements in the report example to the elements described in the table.

Table 3-3 IMS Resource Usage Analysis Report Elements (Part 1 of 7)

<1> CURRENT DATE Date this report was generated, in mm/dd/yy format.
<2> IMSID Identification code for the IMS that processed the transactions.
<3> SMFID Identification code from the SMCA for the system that processed the transactions.
<4> IMS LEVEL IMS release number and modification level.
<5> LSO OPTION LSO processing option (N, Y, X, or S) in effect.
<6> EARLIEST START Julian date and time of day when the first terminal session started.
<7> LATEST STOP Julian date and time of day when the last terminal session ended.
<8> RESOURCE IDENTIFICATION Resource used. Resources are grouped by IMS OVERHEAD CPU USAGE IMS CHARGEABLE CPU USAGE IMS TOTAL CPU USAGE IMS SCHEDULING ACTIVITY IMS TERMINAL I/O (full function transactions) IMS FULL FUNCTION DATABASE REQUESTS IMS FULL FUNCTION DATABASE I/O IMS TERMINAL I/O (Fast Path transactions) IMS FAST PATH DATABASE REQUESTS IMS FAST PATH DATABASE I/O DB2 REQUESTS
<9> MPP WORKLOAD IMS workload that is MPP (message processing program), JMP (Java message processing program), TPI (CPI-C–driven program), DBCTL threads (CICS and ODBA), and MDP (message-driven program). **QUANTITY**. Amount of the IMS workload attributable to MPPs, JMPs, TPI, DBCTL threads, and MDPs for CPU consumed, scheduling activity, I/O activity, or requests made to a database or DB2 subsystem. **% TOTAL WORKLOAD**. Percentage of the total resources consumed that is attributable to MPPs, JMPs, TPI, DBCTL threads, and MDPs.

Table 3-3 IMS Resource Usage Analysis Report Elements (Part 2 of 7)

<10> BMP WORKLOAD IMS workload that is BMP (batch message processing), JBP (Java batch message processing), FPU (Fast Path utility), and NDP (non-message-driven program). **QUANTITY**. Amount of the IMS workload attributable to BMPs, JBPs, FPU, and NDP for CPU consumed, scheduling activity, I/O activity, or requests made to a database or DB2 system. **% TOTAL WORKLOAD**. Percentage of the total resources consumed that is attributable to BMPs, JBPs, FPU, and NDP.
<11> TOTAL WORKLOAD Total amount of resources used for the total workload.
<12> IMS OVERHEAD CPU USAGE Amount of CPU time (expressed in seconds) consumed as IMS overhead. **CONTROL REGION/DLISAS CPU TIME**. Amount of CPU time used by the IMS DLISAS address spaces after buffer handling, OPEN/CLOSE, and program scheduling CPU time have been subtracted. (For more information, see “Control Region Overhead” on page 2-11.) The calculation method for this field uses the program record (PAR) field that includes only the nonattributable overhead values. This method is more accurate when subsetted IRUFs are used as input (all matching transaction and program records may not be available). **BUFFER HANDLING CPU TIME**. Amount of CPU time used in searching and managing the database I/O buffer pool. (For more information, see “Message Buffer CPU” on page 2-8 and “Control Buffer CPU” on page 2-9.) **OPEN/CLOSE PROCESSING CPU TIME**. Amount of CPU time used in opening and closing data sets for use by DL/I. (For more information, see “Message OPEN/CLOSE CPU” on page 2-9.) **PROGRAM SCHEDULING CPU TIME**. Amount of CPU time used for program scheduling and termination in the control region and DLISAS address spaces. (For more information, see “Program Scheduling CPU” on page 2-10.) **MESSAGE REGION OVERHEAD CPU TIME**. Amount of additional overhead CPU time used in the message region. The value includes all dependent region CPU time except for application program and message DL/I, OPEN/CLOSE, or DB2 CPU time. (For more information, see “Message Region Overhead CPU” on page 2-10.) **TOTAL OVERHEAD CPU TIME**. Sum of control region/DLISAS, buffer handler, OPEN/CLOSE, program scheduling, and message region overhead CPU times. **AVG OVERHEAD CPU/TRAN**. Average overhead CPU time per transaction.

Table 3-3 IMS Resource Usage Analysis Report Elements (Part 3 of 7)

<13> IMS CHARGEABLE CPU USAGE

Amount of CPU time (expressed in seconds) directly attributed to the processing of a particular transaction.

APPLICATION PROGRAM CPU TIME. CPU directly attributable to the application program. (For more information, see “Application Program CPU” on page 2-7.)

DL/I CPU TIME. Amount of CPU time used by DL/I in processing the DL/I requests, excluding the overhead items OPEN/CLOSE CPU times and optionally buffer handler CPU time. (For more information, see “Message DL/I CPU” on page 2-7 and “Control DL/I CPU” on page 2-8.)

DB2 CPU TIME. Amount of CPU time spent processing DB2 calls. (For more information, see “DB2 CPU” on page 2-8.)

TOTAL CHARGEABLE CPU. Sum of application program, DL/I, and DB2 CPU time.

AVG CHARGEABLE CPU/TRAN. Average amount of chargeable CPU time per transaction.

AVG DL/I CPU / DB CALL. Average amount of chargeable DL/I CPU time per call to a DL/I database.

AVG DB2 CPU / DB2 CALL. Average amount of chargeable DB2 CPU time per call to a DB2 subsystem.

<14> IMS TOTAL CPU USAGE

Amount of control region, DLISAS, and dependent region CPU time spent processing transactions.

CONTROL REGION/DLISAS CPU TIME. Sum of control region DL/I, buffer, program scheduling, OPEN/CLOSE (full function databases), and overhead CPU time.

DEPENDENT REGION CPU TIME. Sum of application program, DB2, message region DL/I, buffer, OPEN/CLOSE (Fast Path databases), and message region overhead CPU time.

TOTAL IMS CPU. Sum of the control, DLISAS, and dependent region CPU time used.

AVG CPU/TRAN. Average CPU time spent processing each transaction.

% DEP. REGION/TOTAL CPU. Dependent region usage percentage of total CPU, calculated as

```
(Dependent Region CPU × 100) ÷ Total IMS CPU
```

% CHARGEABLE TOTAL CPU. Percentage of total CPU consumed that is chargeable, calculated as

```
[(DLI CPU + DB2 CPU + Application Program) × 100]) ÷ Total CPU
```

<15> IMS SCHEDULING ACTIVITY

Number of programs executed and transactions processed during the summarization period. These figures allow approximation of I/O required for IMS supervisory functions.

NUMBER OF PROGRAMS. Number of programs executed.

NUMBER OF PROGRAM ABENDS - SYSTEM. Number of programs that incurred a system abend.

NUMBER OF PROGRAM ABENDS - USER. Number of programs that incurred a user abend.

NUMBER OF TRANSACTIONS. Number of transactions processed.

NUMBER OF TRANS. ACCESSING DB2. Number of transactions that accessed a DB2 subsystem.

AVG TRANS/PROGRAM. Average number of transactions per program, calculated as

```
Number of Transactions ÷ Number of Programs
```

Table 3-3 IMS Resource Usage Analysis Report Elements (Part 4 of 7)

<16> IMS TERMINAL I/O

Number of DL/I message calls (terminal I/O) issued in processing the full function message queue transaction volume.

FULL FUNCTION TRANS (MSG Q). Number of transactions processed through the full function message queue.

INPUT CALLS - MGU/MGN. Number of MESSAGE GET UNIQUE and MESSAGE GET NEXT calls.

OUTPUT CALLS - MISRT/MPURG. Number of MESSAGE INSERT and MESSAGE PURGE calls.

TOTAL TERMINAL I/O. Sum of the input and output calls.

AVG TERMINAL I/O / TRAN. Average amount of terminal activity per transaction, calculated as

```
Total Terminal I/O ÷ Number of Transactions
```

<17> IMS FULL FUNCTION DATA BASE REQUESTS

Number of DL/I requests issued by transactions.

TRANS ACCESSING FF DBS. Number of transactions accessing full function databases.

DL/I GET UNIQUES. Number of GET UNIQUE calls.

DL/I GET NEXT. Number of GET NEXT calls.

TOTAL GET CALLS. Sum of GET UNIQUE and GET NEXT calls.

AVG GET CALLS/TRAN. Average number of GET calls per transaction, calculated as

```
Total GET Calls ÷Number of Transactions
```

Number of DL/I updates issued by transactions for

DL/I DELETES. Number of DELETE calls.

DL/I REPLACES. Number of REPLACE calls.

DL/I INSERTS. Number of INSERT calls.

TOTAL UPDATE CALLS. Sum of DELETE, REPLACE, and INSERT calls.

AVG UPDATE CALLS / TRAN. Average number of update calls per transaction, calculated as

```
Total Update Calls ÷ Number of Transactions
```

TOTAL DL/I DATA BASE CALLS. Total GET and UPDATE calls.

AVG DL/I CALLS / TRAN. Average number of DL/I calls per transaction, calculated as

```
Total DL/I Database Calls ÷ Number of Transactions
```

% UPDATE CALLS. Percentage of database calls for updates, calculated as

```
(Total Update Calls × 100) ÷ Number of DL/I Calls
```

Table 3-3 IMS Resource Usage Analysis Report Elements (Part 5 of 7)

<18> IMS FULL FUNCTION DATA BASE I/O

Amount of database I/O activity.

KEY READS. Number of reads to VSAM KSDSs to satisfy DL/I requests.

NONKEY READS. Number of reads to QSAM or VSAM KSDSs to satisfy DL/I requests.

TOTAL READ I/O. Sum of key and nonkey reads.

AVG READ I/O / TRAN. Average number of reads per transaction, calculated as

```
Total Read I/O ÷ Number of Transactions
```

KEY WRITES. Number of writes to VSAM KSDSs to satisfy DL/I requests.

NONKEY WRITES. Number of writes to QSAM or VSAM KSDSs to satisfy DL/I requests.

TOTAL WRITE I/O. Sum of key and nonkey writes.

AVG WRITE I/O / TRAN. Average number of writes per transaction, calculated as

```
Total Write I/O ÷ Number of Transactions
```

TOTAL DATA BASE I/O. Sum of total I/O reads and writes.

AVG I/O / TRAN. Average I/O activity per transaction, calculated as

```
Total I/O ÷ Number of Transactions
```

% KEY I/O. Percentage of I/O activity for KSDSs, calculated as

```
(Total Key I/O × 100) ÷Total Database I/O
```

% WRITE I/O. Percentage of I/O activity for database writes, calculated as

```
(Total Write I/O × 100) ÷ Total Database I/O
```

(See “Database Reads” on page 2-12 and “Database Writes” on page 2-13.)

<19> IMS TERMINAL I/O (not printed if there is no Fast Path activity)

Number of DL/I message calls (terminal I/O) issued in processing the Fast Path transaction volume.

FAST PATH TRANSACTIONS (EMH). Number of Fast Path transactions processed through the Expedited Message Handler.

INPUT CALLS - MGU. Number of MESSAGE GET UNIQUE calls.

OUTPUT CALLS - MISRT/MPURG. Number of MESSAGE INSERT and MESSAGE PURGE calls.

TOTAL TERMINAL I/O. Sum of the input and output calls.

AVG TERMINAL I/O / TRAN. Average amount of terminal activity, calculated as

```
Total Terminal I/O ÷ Number of Fast Path Transactions
```

Table 3-3 IMS Resource Usage Analysis Report Elements (Part 6 of 7)

<20> IMS FAST PATH DATA BASE REQUESTS (not printed if there is no Fast Path activity)

Number of DL/I requests issued to Fast Path databases (DEDBs and MSDBs).

TRANS ACCESSING FP DBS. Number of transactions accessing Fast Path databases.

DL/I GET UNIQUES. Number of GET UNIQUE calls.

DL/I GET NEXT. Number of GET NEXT calls.

TOTAL GET CALLS. Sum of GET UNIQUE and GET NEXT calls.

% MSDB GET CALLS. Percentage of MSDB calls for GET calls, calculated as

```
(Total Get Calls × 100) ÷ Number of MSDB Calls
```

Number of DL/I updates issued to Fast Path databases (DEDBs and MSDBs) for

DL/I DELETES. Number of DELETE calls.

DL/I REPLACES. Number of REPLACE calls.

DL/I INSERTS. Number of INSERT calls.

TOTAL UPDATE CALLS. Sum of DELETE, REPLACE, and INSERT calls.

% MSDB UPDATE CALLS. Percentage of MSDB calls for update calls, calculated as

```
(Total Update Calls × 100) ÷ Number of MSDB Calls
```

TOTAL DL/I DATA BASE CALLS. Total GET and UPDATE calls.

AVG DL/I CALLS / TRAN. Average number of calls per Fast Path transaction, calculated as

```
Total DL/I Database Calls ÷ Number of Fast Path Transactions
```

% MSDB CALLS. Percentage of MSDB calls for DL/I calls, calculated as

```
(Total MSDB Calls × 100) ÷ Number of DL/I Calls
```

<21> IMS FAST PATH DATA BASE I/O (not printed if there is no Fast Path activity)

Amount of Fast Path database I/O activity.

DEDB READS. Number of reads to DEDBs to satisfy DL/I requests.

AVG READ I/O / TRAN. Average number of reads per Fast Path transaction, calculated as

```
Total Read I/O ÷ Number of Fast Path Transactions
```

DEDB WRITES. Number of DEDB writes to satisfy DL/I requests.

AVG WRITE I/O / TRAN. Average number of writes per Fast Path transaction, calculated as

```
Total Write I/O ÷ Number of Fast Path Transactions
```

TOTAL DATA BASE I/O. Sum of DEDB reads and writes.

AVG I/O / TRAN. Average I/O activity per Fast Path transaction, calculated as

```
Total I/O ÷ Number of Fast Path Transactions
```

% WRITE I/O. Percentage of I/O activity for DEDB writes, calculated as

```
(Total Write I/O × 100) ÷ Total DEDB I/O
```

(See “Database Reads” on page 2-12 and “Database Writes” on page 2-13.)

Table 3-3 IMS Resource Usage Analysis Report Elements (Part 7 of 7)

<22> DB2 REQUESTS SSID (not printed if there is no DB2 activity or if FEATURE=NODB2 in IMFSYS00)

Number of DB2 requests issued by transactions. The SSID (subsystem identification code) is the ID of the first DB2 subsystem accessed.

NUMBER OF TRANS ACCESSING DB2. Number of transactions that accessed a DB2 subsystem.

DB2 SELECTS/FETCHES. Number of SQL SELECTs and FETCHes to the DB2 subsystem.

DB2 OPENS. Number of SQL OPEN calls to the DB2 subsystem.

TOTAL GET CALLS. Sum of SQL SELECT/FETCH and OPEN calls.

AVG GET CALLS / TRAN. Average number of SELECT/FETCH and OPEN calls issued per DB2 transaction.

DB2 INSERTS. Number of SQL INSERT calls to the DB2 subsystem.

DB2 DELETES. Number of SQL DELETE calls to the DB2 subsystem.

DB2 UPDATES. Number of SQL UPDATE calls to the DB2 subsystem.

TOTAL UPDATE CALLS. Sum of SQL INSERT, DELETE, and UPDATE calls.

AVG UPDATE CALLS / TRAN. Average number of update calls made by each DB2 transaction.

DB2 DATA DEF. LANGUAGE (DDL). Number of SQL Data Definition Language calls to the DB2 subsystem (CREATE, DROP, ALTER, COMMENT, LABEL).

DB2 DYNAMIC SQL CALLS. Number of SQL dynamic calls to the DB2 subsystem (PREPARE, DESCRIBE, EXECUTE).

DB2 SQL CONTROL CALLS. Number of SQL control-type calls to the DB2 subsystem (GRANT, REVOKE).

DB2 OTHER CALLS. Number of other SQL control-type calls to the DB2 subsystem (EXPLAIN, LOCK, LABEL, CLOSE).

TOTAL SPECIAL CALLS. Total DDL, DYNAMIC, control, and other SQL calls.

AVG SPECIAL CALLS / TRAN. Average number of special SQL calls per transaction, calculated as

`Total Special SQL Calls ÷ Number of DB2 Transactions`

TOTAL DB2 CALLS. Total number of all DB2 calls.

AVG DB2 CALLS / TRAN. Average number of DB2 calls per transactions, calculated as

`Total DB2 Calls ÷ Number of DB2 Transactions`

% UPDATE CALLS. Percentage of DB2 calls that are updates, calculated as

`(Total Update Calls × 100) ÷ Total DB2 Calls`

TASCOSTR Job Control Statements

The charge-out process is a two-step batch execution procedure (as shown in the JCL example on page 3-24). The first procedure, defined by STEP1, sorts the IRUF by customer ID, transaction code, and LTERM sequence.
Any IBM-compatible SORT program can be executed. The second procedure executes the MVIMS TASCOSTR program.

Table 3-4 describes the JCL statements required for TASCOSTR execution.

Table 3-4 TASCOSTR JCL Statements (Part 1 of 2)

Statement	Function
JOB	Initiates the job.
Sort Procedure:	
STEP1 EXEC	Specifies the name of an IBM-compatible SORT program for batch execution and the size of the region required to run the program.
SYSOUT DD	Defines the output class.
SORTLIB DD	Defines the program library containing sort load modules (site-dependent installation).
SORTIN DD	Defines the data (IRUF) to be sorted.
SORTOUT DD	Defines the data set for the sorted output. DBC parameters should be the same as those of the SORTIN DD DCB.
SORTMSG DD	Defines the data set for the SORT messages.
SORTWK*nn* DD	Defines work data sets for data sorting; *nn* is a numeric.
SYSIN	Defines the SORT utility control statement. The record fields that must be sorted are Customer ID Transaction Code: Field 9, length of 26 bytes, character format, ascending sequence. LTERM Name: Field 41, length of 8 bytes, character format, ascending sequence.
Charge-Out Procedure:	
STEP2 EXEC	Specifies the name of the MVIMS charge-out program as PGM=TASCOSTR Also specifies the region required to run the program and the parameters options (see “PARM Options in the EXEC Statement” on page 3-25). The region requirement can be affected by • block size of the IRUF • number of buffers specified for the data sets **Note:** TASCOSTR loads and executes a supplied user exit routine that accesses a summarized IRUF. For more information about the exit, see the *MAINVIEW for IMS Offline – Customization and Utilities Guide*.

Table 3-4 TASCOSTR JCL Statements (Part 2 of 2)

Statement	Function
STEPLIB DD	Defines the program library (IMF.LOAD) that contains the TASCOSTR load module.
RESUTIL DD	Defines the sorted IRUF as input to the charge-out process. The DCB attributes of the data set are RECFM=VBS,LRECL=30970,BLKSIZE=30974.
DETCOSTS DD	Contains the summarized version, charged-out version, or both versions of the IRUF. The characteristics can be the same as those defined in RESUTIL above. The DCB parameters for the DETCOSTS file must match those of the input IRUF.
RATEREPT DD	Contains the Rate Charge-Out report. The characteristics of the data set are RECFM=FB,LRECL=133. BLKSIZE must be specified explicitly.
CHARGOUT DD	Contains the Detail Charge-Out Analysis report. The characteristics of the data set are RECFM=FB,LRECL=133. BLKSIZE must be specified explicitly.
DISTREPT DD	Contains the Total IMS Resource Usage Analysis report. The characteristics of the data set are RECFM=FB,LRECL=133. BLKSIZE must be specified explicitly.
LISTRREP DD	Contains the Control Level Parameter report with response thresholds. The characteristics of the data set are RECFM=FB,LRECL=133. BLKSIZE must be specified explicitly.
ERRORS DD	Contains the Parameter File Error report, which provides diagnostic messages that are produced when an error is encountered during report control statement verification. The characteristics of the data set are RECFM=FB,LRECL=133. BLKSIZE must be specified explicitly.
RATEDIT DD	Contains charge-out rates, which are described in “Defining Charge-Out Rates” on page 3-32.
LISTRCNT DD	Contains report control statements (described in “Cost Center Category Control Statements” on page 3-28) and optional response threshold control statements (see the “Response Threshold Definition” section in the *MAINVIEW for IMS Offline – Customization and Utilities Guide*).
SYSOUT DD	Defines the output class.

Figure 3-9 on page 3-24 provides sample JCL for the charge-out process.

Figure 3-9 Sample JCL for the Charge-Out Process

```
//JOBNAME  JOB  ..........
//*************************************************
//** SORT THE IRUF INTO CUSTOMER ID SEQUENCE      *
//*************************************************
//STEP1    EXEC PGM=SORT,REGION=2048K
//SYSOUT   DD   SYSOUT=A
//SORTLIB  DD   DSN=SYS1.SORTLIB,DISP=SHR
//SORTIN   DD   DSN=IRUF.MONTHS,DISP=SHR
//SORTOUT  DD   DSN=&TEMP1,DISP=(,PASS),UNIT=SYSDA,
//              SPACE=(CYL,(20,5)),
//              DCB=(RECFM=VBS,LRECL=30970,BLKSIZE=30974)
//SORTMSG  DD   SYSOUT=A
//SORTWK01 DD   SPACE=(CYL,20),UNIT=SYSDA
//SORTWK02 DD   SPACE=(CYL,20),UNIT=SYSDA
//SORTWK03 DD   SPACE=(CYL,20),UNIT=SYSDA
//SORTWK04 DD   SPACE=(CYL,20),UNIT=SYSDA
//SORTWK05 DD   SPACE=(CYL,20),UNIT=SYSDA
//SORTWK06 DD   SPACE=(CYL,20),UNIT=SYSDA
//SYSIN    DD   *
   SORT FIELDS=(9,26,CH,A,41,8,CH,A)
//*************************************************
//** EXECUTE THE TRANSACTION ACCOUNTANT           *
//*************************************************
//STEP2    EXEC PGM=TASCOSTR,REGION=2048K,PARM='FULL,EXIT'
//STEPLIB  DD   DSN=IMF.LOAD,DISP=SHR
//RESUTIL  DD   DSN=&TEMP1,DISP=(OLD,DELETE)
//DETCOSTS DD   DSN=IRUF.COST.MONTHS,DISP=(NEW,KEEP),
//              UNIT=TAPE,SPACE=(CYL,(20,5)),
//              DCB=(RECFM=VBS,LRECL=30970,BLKSIZE=30974)
//RATEREPT DD   SYSOUT=A,DCB=BLKSIZE=133
//CHARGOUT DD   SYSOUT=A,DCB=BLKSIZE=133
//DISTREPT DD   SYSOUT=A,DCB=BLKSIZE=133
//LISTRREP DD   SYSOUT=A,DCB=BLKSIZE=133
//ERRORS   DD   SYSOUT=A,DCB=BLKSIZE=133
//RATEDIT  DD   *
STDRESC         002000 000000 000000 002000 000000
STDDBDR         010000 015000 010000 010000 010000
STDTERM         050000 001000 001000 001000
//LISTRCNT DD   *
CR010102YDIVISION NAME
CR020303NDEPARTMENT CODE
CR030605NPROJECT/APPLICATION
//SYSOUT   DD   SYSOUT=A
//SYSUDUMP DD   SYSOUT=A
//
```

PARM Options in the EXEC Statement

The TASCOSTR EXEC statement PARM options can be used to define

- processing mode
- user exit specification
- response option
- suppression option
- MVIMS 3.2 compatible format option

The options are enclosed in single quotation marks and can be separated by a comma or a blank space (commas are shown as the separators in the following sections).

Processing Mode

In the Transaction Accountant, TASCOSTR can operate in one of the following three modes.

PARM Positions	Options
05 – 09	FULL | SUMM | COST FULL Summarizes the IRUF and produces all the accounting reports (the default). SUMM Summarizes the IRUF and produces only the Total IMS Resource Usage Analysis report. COST Does not summarize the IRUF and produces only the Distribution Charge-Out Analysis report and the Chargeable Rate Table report.

Table 3-5 illustrates the output of each TASCOSTR processing mode option.

Table 3-5 TASCOSTR Processing Mode Options

Output	FULL	SUMM	COST
Summarized IRUF file	yes	yes	no
Distribution Charge-Out Analysis report	yes	no	yes
Detail Charge-Out Analysis report	yes	no	no
Chargeable Rate Table report	yes	no	yes
Total IMS Resource Usage Analysis report	yes	yes	no

User Exit Specification

If specified, a user-written exit routine can be given control during TASCOSTR processing. (For more information, see the chapter called "Customizing with User Exit Routines" in the *MAINVIEW for IMS Offline – Customization and Utilities Guide*).

PARM Positions	Options
05 – 09	,EXIT | ,NOEX | ,EXT4 EXIT Gives control to the initialization, costed record, and termination exits. NOEX Does not give control to the initialization, costed record, and termination exits. EXT4 Gives control to the initialization, pre-costed record, costed record, and termination exits.

Response Option

If specified, this parameter requests the alternate response time (TAR R RESPONSE). Only transactions that made a response to the originating terminal will be counted. If this parameter is not used, the normal response time (INPUT QUEUE TIME + ELAPSED TIME) is summarized. (For more information, see "User-Generated Response Time Segments" in the *MAINVIEW for IMS Offline – Customization and Utilities Guide*.)

PARM Positions	Option
10 – 11	,R R specifies the use of the alternate response time. **Note:** PARM positions 1 through 10 must be included.

Suppression Option

If specified, this parameter requests suppression of return code 140.

PARM Positions	Option
12 – 18	,SUP140 SUP140 specifies suppression of return code 140.

MVIMS 3.2 Compatible Format Option

When the IMFLEP00 parameter CMPFMT32 is set to YES, IRUF records are created in the MVIMS version 3.2 format. If specified in the TASCOSTR EXEC statement, the CMPFMT32 parameter processes the 3.2-formatted IRUF records and creates a DETCOSTS output file in the 3.2 format. (For more information about the CMPFMT32 parameter, see the Log Edit chapter in the *MAINVIEW for IMS Offline – Customization and Utilities Guide*.)

PARM Positions	Option
19 – 27	,CMPFMT32 CMPFMT32 specifies use of the MVIMS version 3.2 TASCOSTR routines.

Note: The CMPFMT32 parameter is provided so that users who do not include LTERM name as part of the customer ID can continue to perform IRUF summarization as they did with MVIMS version 3.2. Without the CMPFMT32 option in the TASCOSTR EXEC statement, TASCOSTR can process records created with the IMFLEP00 CMPFMT32=YES option, but customer IDs that do not include an LTERM name will not be processed properly and the DETCOSTS output file will be in the MVIMS version 3.3 format.

If the CMPFMT32 option is included in the TASCOSTR EXEC statement, the IRUF must have been created with CMPFMT32=YES in IMFLEP00.

PARM Options Example

The following parameters for the TASCOSTR EXEC statement summarize the IRUF and print the Total IMS Resource Usage Analysis report. No control is given to a user exit. Alternate response time is not used, and return code 140 is not suppressed.

```
PARM='SUMM,NOEX'
```

Defining the Cost Center Category and ID

Meaningful cost distribution and charge-out requires a systematic means of customer/transaction identification.

Associating transactions with specific customers in the IMS environment is accomplished with a unique transaction identifier. The 26-byte identifier is composed of a customer ID and a transaction code. The 18-byte customer ID is defined by the user. The 8-byte transaction code identifies the unit of work.

The IRUF maintains the customer ID in the terminal and transaction accounting records. The contents of the customer ID field are set in the customer exit routine (PRSCEXIT) in the Log Edit (IMFLEDIT) program. The default, set by the distributed version of PRSCEXIT, is to use the name of the input logical terminal of the transaction as the customer ID. However, PRSCEXIT can be modified to set the customer ID field as required.

Note: To avoid loss of data granularity during summarization, the LTERM should be maintained (either physically or logically) as part of the customer ID field. For more information, see the section “Set Up Customer IDs” in the *MAINVIEW for IMS Offline – Customization and Utilities Guide*.

The customer ID and transaction code are used by the Transaction Accountant to accumulate processing charges. All charges are calculated at the transaction level and then accumulated for each customer category.

Cost Center Category Control Statements

Cost center levels are defined by control statements (CR) with positional values that define the control level hierarchy, the cost center ID, page breaks, and the cost center category title. Cost center specifications are defined with the data definition LISTRCNT JCL statement (in Figure 3-9 on page 3-24).

The statement syntax for specifying a cost center category and ID is shown in Table 3-6 on page 3-29.

Table 3-6 Cost Center Statement Syntax

Position	Data Element and Definition
01 – 02	Statement ID: CR
03 – 04	Control Level Indicates the cost center hierarchy by control-break levels. The most major cost center category is 01; the most minor cost center category is 05.
05 – 06	Starting Position Specifies the starting position of the cost center category within the customer ID field. The value must be in the range 01 to 18.
07 – 08	Cost Center Field Length Specifies the length (number of bytes) of this cost center control level. The value must be in the range 01 to 18.
09	Page Skip Option Specifies whether the accounting reports are to skip to the next page when a break on this cost center control level is encountered. Y Yes, skip to next page. N No skip requested.
10 – 29	Cost Center Description Defines the literal title of this cost center control level for the report (for example, DIVISION).

The following considerations apply to cost center control levels.

- One to five hierarchical cost center control levels can be defined.
- The transaction code does not need be specified as the most minor cost center control level. The code is automatically established as the most minor level by the system, in addition to any user-defined cost center control levels.
- The sum of a cost center field length must not exceed the length of the customer ID, which is 18 characters.
- These control level definitions should remain unchanged for the duration of an accounting cycle.
- The cost center control statements should be stored as a member of a PDS to allow easy access by the charge-out process and to ensure that they are not accidentally modified.

Cost Center Specification Example

Using a customer ID field, you can set up the accounting system to recognize up to five unique hierarchical cost center categories.

For example:

Company ZYX maintains cost control on a divisional and departmental basis. The company also wants to monitor costs at the project level within departments.

- Division identification can be obtained from the first two positions of the logical terminal name recorded in the IRUF transaction accounting record (TAR).

- Department identification can be obtained from the first three positions of the transaction code recorded in the IRUF TAR.

- Project or application numbers can be obtained from the last five positions of the transaction code recorded in the IRUF TAR.

A customer exit can be added to the Log Edit process to build the customer ID data element based on the user requirements. The contents of the customer ID field could include

- division code (from the first two positions, 1 and 2, of the LTERM name) in positions 01 and 02 of the customer ID field

- department code (from the first three positions, 1 through 3, of the transaction code) in positions 03 through 05 of the customer ID field

- project number (from the last five positions, 4 through 8, of the transaction code) in positions 06 through 10 of the customer ID field

- filler set to a value of spaces in positions 11 through 18 of the customer ID field

These cost center control levels are defined to the Transaction Accountant as control statement in the LISTRCNT DD JCL statement.

The JCL example on page 3-24 shows the control statements required to generate a report for three cost center levels. Using Table 3-6, “Cost Center Statement Syntax,” on page 3-29 as a guide, the control statements are defined as follows:

CR010102YDIVISION NAME

Division code (cost center ID) is two characters long and starts in the first position (column 1) of the customer ID field. This control break is the most major (01) of the three specified. When a break is encountered on this control element, the reports skip to the next page after printing the divisional totals qualified by the title DIVISION NAME.

CR020303NDEPARTMENT CODE

Department code (cost center ID) is three characters long and starts in the third position (column 3) of the customer ID field. This control break is the first intermediate break (02) within a division code. No page eject occurs when a break is encountered on this control element. The printing of the department totals is qualified by the title DEPARTMENT CODE.

CR030605NPROJECT/APPLICATION

The project/application code is five characters long (cost center ID) and starts in the sixth position (column 6) of the customer ID field.
This control break is the second intermediate break (03) within a division code. A page eject does not occur when a break is encountered on this control element. The printing of the project/application totals is qualified by the title PROJECT/APPLICATION.

These cost center control level definitions create the following cost center category hierarchies in the Detail Charge-Out Analysis report.

Cost Center Level	Description
Major	Total of all charges for the division.
First intermediate	Department total of all charges for a department within a division.
Second intermediate	Project total of all charges for a project within a department in a division.
Minor	Transaction total of all charges for a transaction within project, department, and division.

Defining Charge-Out Rates

The charge-out rates are defined with user-specified control statements. The control statements are positional. The statement position defines the rate type and the charge-out. The control statements can be easily changed from run to run without requiring program modification. The control statements are entered in the RATEDIT DD JCL statement either as an instream data set or as a member of a PDS.

Rate Control Statement Syntax

Follow the specification guidelines below when you complete or change the rate specification statements:

1. All rates must be specified as a six-digit number. There is an implied decimal point after the second digit. For example, $1.50 would be written as 015000.

2. Standard and special-charge are the two types of rate statement entries. For standard rate statements, a rate is considered to have a zero value if the rate is either zero or blank. For special-charge rate statements, a rate is considered zero only if specified as zero in the rate field.
   This difference is caused by the rate repeater provision described in item 4.

   Standard rate statements include

   - basic resource rates
   - BMP and JBP basic resource rates
   - database rates
   - BMP and JBP database rates
   - DB2 rates
   - terminal rates

   Special-charge rate statements include

   - special-charge database rates
   - special-charge DB2 plan name rates
   - special-charge terminal rates
   - special-charge customer rates
   - unit-charge transaction rates

3. Standard rate statements must be specified only once for each set of charge-out rates. BMP/JBP basic resource rates are used for BMP/JBP transactions instead of basic resource rates. BMP/JBP database rates are used for BMP/JBP transactions instead of database rates.

4. Special-charge rate statements can be specified numerous times for each set of charge-out rates. A rate repeater provision facilitates specification of the same rate more than once.

   In a special-charge rate statement, if a rate is left blank, it will not be zero, as in a standard rate statement. Instead, it repeats a preceding rate specified with this type of rate statement.

   For example, if 20 special-charge terminal rates are to be the same for all LTERMs that use 3270 terminals, the rates need to be defined only for the first special-charge terminal rate statement. For each succeeding special-charge terminal rate statement, the rates can be left blank, which causes the initial set of rates to be repeated.

5. The number of times that each rate statement can be specified is as follows:

Rate Statement	Number of Statements
Basic resource rates	1
BMP and JBP basic resource rates	1
Database rates	1
BMP and JBP database rates	1
Special-charge database rates	30
DB2 rates	1
Special-charge DB2 plan name rates	30
Terminal rates	1
Special-charge terminal rates	50
Special-charge customer rates	35
Unit-charge transaction rates	2400

The following sections describe each of the provided rate entries in detail. “Rate Specification Example” on page 3-43 shows how the rates are specified.

Standard Basic Resource Rate Control Statement

The rates in the standard basic resource rate control statement descriptions are the charge rates for basic resource usage. Table 3-7 shows the rate statement syntax.

Table 3-7 Standard Basic Resource Rate Statement Syntax (Part 1 of 2)

Position	Data Element and Definition
01 – 08	Rate statement ID: STDRESC
09 – 11	Blanks
12	BMP and JBP Costing Option Charge-out or do not charge-out batch message processing (BMP) and Java batch message processing (JBP) activity. Also controls charge-out for Fast Path non-message-driven (NDP) and Fast Path utility (FPU) programs. Y Charge-out BMP, JBP, NDP, and FPU activity (the default). N Do not charge-out BMP, JBP, NDP, and FPU activity. **Note:** If the data collection option BMP=NO was specified, no BMP or JBP information is available (see Chapter 2, “Event Collector Options”).
13	DBCTL Costing Option Charge-out or do not charge-out DBCTL CICS and ODBA thread activity. N Do not charge-out DBCTL thread activity (the default). Y Charge-out DBCTL thread activity. **Note:** TASCOSTR summarizes the IRUF DBCTL records regardless of the DBCTL charge-out setting. The IRUF transaction record (TAR) for DBCTL threads may not be suitable for charge-out, because it includes only the CPU time for the IMS DL/I calls. CPU time used by the application within CICS or DB2 calls is not included in the IRUF records.
14 – 17	Blanks
18 – 23	Message region CPU rate per second of message region CPU time. This value is a six-digit number with an implied decimal point after the second digit. **Note:** For more information, see “Application Program CPU” on page 2-7.
24	Blank
25 – 30	Storage allocation rate per storage minute allocated. This value is a six-digit number with an implied decimal point after the second digit. `Allocated Storage Minute = Transaction Elapsed Minutes × Storage Allocated`
31	Blank
32 – 37	Storage used rate per storage minute used. This value is a six-digit number with an implied decimal point after the second digit. `Used Storage Minute = Transaction Elapsed Minutes × Storage Used`

Table 3-7 Standard Basic Resource Rate Statement Syntax (Part 2 of 2)

Position	Data Element and Definition
38	Blank
39 – 44	DL/I CPU rate per second of DL/I processor CPU time. This value is a six-digit number with an implied decimal point after the second digit. **Note:** For more information, see “Message DL/I CPU” on page 2-7 and “Control DL/I CPU” on page 2-8.
45	Blank
46 – 51	Minimum transaction processing charge to be added to each transaction’s standard resource charge. This value is a six-digit number with an implied decimal point after the second digit. This minimum charge is always added, except when the transaction has been special charged (unit-cost). This rate is applied on a per-100-transactions basis.
52	Blank
53 – 58	DB2 CPU rate per second of dependent region DB2 processor CPU time. This value is a six-digit number with an implied decimal point after the second digit. **Note:** If this rate is not specified, the default is to use the application program (message region) CPU rate.

Standard BMP/JBP Basic Resource Rate Control Statement

The standard BMP/JBP basic resource rate control statement ID is BMPRESC. This statement has the same format as the standard basic resource rate control statement described in the previous section. When the BMP/JBP basic resource rate control statement is specified, the BMP/JBP basic resource rates are used for the BMP/JBP transactions instead of the basic resource rates.

Standard Database Rate Control Statement

The rates in the standard database rate control statement descriptions are the charge rates for database usage. Table 3-8 shows the rate statement syntax.

Note: There are no defaults for these rates.

Table 3-8 Standard Database Rate Statement Syntax

Position	Charge-Out Item
01 – 08	Rate statement ID: STDDBDR
09 – 17	Blanks
18 – 23	DL/I GET UNIQUE usage rate per 100 GET UNIQUE calls issued. This value is a six-digit number with an implied decimal point after the second digit.
24	Blank
25 – 30	DL/I GET NEXT usage rate per 100 GET NEXT calls issued. This value is a six-digit number with an implied decimal point after the second digit.
31	Blank
32 – 37	DL/I REPLACE usage rate per 100 REPLACE calls issued. This value is a six-digit number with an implied decimal point after the second digit.
38	Blank
39 – 44	DL/I INSERT usage rate per 100 INSERT calls issued. This value is a six-digit number with an implied decimal point after the second digit.
45	Blank
46 – 51	DL/I DELETE usage rate per 100 DELETE calls issued. This value is a six-digit number with an implied decimal point after the second digit.
52	Blank
53 – 58	NO I/O rate per 100 NO I/O actions. This value is a six-digit number with an implied decimal point after the second digit. For more information, see “NO I/O” on page 2-13.
59	Blank
60 – 65	Key I/O rate per 100 key I/O actions. This value is a six-digit number with an implied decimal point after the second digit. Key I/Os are represented by read and write requests to key data set areas. **Note:** For more information, see “Database Reads” on page 2-12 and “Database Writes” on page 2-13.
66	Blank
67 – 72	Nonkey I/O rate per 100 nonkey I/O actions. This value is a six-digit number with an implied decimal point after the second digit. Nonkey I/Os are represented by read and write requests to OSAM and nonkey data sets. **Note:** For more information, see “Database Reads” on page 2-12 and “Database Writes” on page 2-13.

Standard BMP/JBP Database Rate Control Statement

The standard BMP/JBP database rate control statement ID is BMPDBDR. This statement has the same format as the database rate statement described in the previous section. When the BMP/JBP database rate control statement is specified, the BMP/JBP database rates are used instead of the database rates for the BMP/JBP transactions.

Special-Charge Database Rate Control Statement

The special-charge database rate control statement provides a mechanism for differential charge-out of access to specific databases. The rates in the statement descriptions are default charge-out rates. Table 3-9 shows the rate statement syntax.

Table 3-9 Special-Charge Database Rate Statement Syntax

Position	Charge-Out Item
01 – 08	Rate statement ID: SPCDBDR
09 – 16	One- to eight-character name of the database (DBD name) to be special charged. All access to the named database will be charged-out based on the rates in this entry, rather than the rates supplied by the STDDBDR entry.
17	Blank
18 – 72	The remainder of this entry has the same format as that of the standard database rates entry (in Table 3-8 on page 3-36).

Standard DB2 Rate Control Statement

The standard DB2 rate control statement specifies the standard charges for DB2 calls. Table 3-10 shows the rate statement syntax.

Note: There are no defaults for these rates.

Table 3-10 Standard DB2 Rate Statement Syntax

Position	Charge-Out Item
01 – 08	Rate statement ID: STDDB2
09 – 17	Blanks
18 – 23	DB2 read-type call rate per 100 calls issued (SELECT/FETCH and OPEN). This value is a six-digit number with an implied decimal point after the second digit.
24	Blank
25 – 30	DB2 update-type call rate per 100 calls issued (INSERT, DELETE and UPDATE). This value is a six-digit number with an implied decimal point after the second digit.
31	Blank
32 – 37	DB2 Data Definition Language (DDL) call rate per 100 calls issued. This value is a six-digit number with an implied decimal point after the second digit.
38	Blank
39 – 44	DB2 dynamic SQL call rate per 100 calls issued. This value is a six-digit number with an implied decimal point after the second digit.
45	Blank
46 – 51	DB2 control type call rate per 100 calls issued. This value is a six-digit number with an implied decimal point after the second digit.
52	Blank
53 – 58	DB2 OTHER call rate per 100 calls issued. This value is a six-digit number with an implied decimal point after the second digit.

Special-Charge DB2 Plan Name Rate Control Statement

The special-charge DB2 plan name rate control statement designates charges for DB2 calls to a specified DB2 application plan name. Table 3-11 shows the rate statement syntax.

Table 3-11 Special-Charge DB2 Plan Name Rate Statement Syntax

Position	Charge-Out Item
01 – 08	Rate statement ID: SPCDB2
09 – 16	One- to eight-character name of the DB2 application plan to be charged. All usage of the specified plan will be charged from the rates in this entry, rather than the rates specified with a STDDB2 control statement.
17	Blank
18 – 58	The remainder of this entry is the same as the STDDB2 control statement for DB2 usage rates (in Table 3-10 on page 3-38).

Standard Terminal Rate Control Statement

The rates in the standard terminal rate control statement descriptions are the rates for terminal activity charge-out. Table 3-12 shows the rate statement syntax.

Table 3-12 Standard Terminal Rate Statement Syntax

Position	Charge-Out Item
01 – 08	Rate statement ID: STDTERM
09 – 11	Blanks
12	Terminal charge option Y Charge-out terminal activity (the default). N Do not charge-out terminal activity.
13 – 17	Blanks
18 – 23	Terminal connect hour rate per terminal connect hour. This value is a six-digit number with an implied decimal point after the second digit.
24	Blank
25 – 30	Input character rate per 1000 input characters transferred. This value is a six-digit number with an implied decimal point after the second digit.
31	Blank
32 – 37	Output character rate per 1000 output characters transferred. This value is a six-digit number with an implied decimal point after the second digit.
38	Blank
39 – 44	Other character rate per 1000 characters transferred to other programs and terminals. This value is a six-digit number with an implied decimal point after the second digit. The rate is not directly transferred on the originating LTERM.
45	Blank
46 – 51	MESSAGE GET UNIQUE rate per 100 MESSAGE GET UNIQUE calls issued to the terminal. This value is a six-digit number with an implied decimal point after the second digit.
52	Blank
53 – 58	MESSAGE GET NEXT rate per 100 MESSAGE GET NEXT calls issued to the terminal. This value is a six-digit number with an implied decimal point after the second digit.
59	Blank
60 – 65	Rate per 100 message INSERT/PURGE/OTHER calls issued to the terminal. This value is a six-digit number with an implied decimal point after the second digit.

Special-Charge Terminal Rate Control Statement

Table 3-13 shows the format of the special-charge terminal rate control statement.

Table 3-13 Special-Charge Terminal Rate Statement Syntax

Position	Charge-Out Item
01 – 08	Rate statement ID: SPCTERM
09 – 16	One- to eight-character name of the logical terminal to be charged.
17	Blank
18 – 65	The remainder of this control statement is the same as the STDTERM control statement (in Table 3-12 on page 3-40).

Special-Charge Customer Rate Control Statement

The special-charge customer rate control statement should be submitted only for customers requiring a markup or discount charge-out.

A prorated percentage is applied against all charges for a specific customer identification. When the prorated percentage is greater than 100 percent, all charges for this customer will be increased or marked up by the percentage amount. When the prorated percentage is less than 100 percent, all charges for this customer will be decreased or discounted.

Table 3-14 shows the format of the special-charge customer rate control statement.

Table 3-14 Special-Charge Customer Rate Statement Syntax

Position	Charge-Out Item
01 – 08	Rate statement ID: SPCCUST
09 – 26	One- to eight-character customer name.
27 – 31	Blanks
32 – 37	Standard charge-out factor. This value is a six-digit number with an implied decimal point after the third digit. This factor is used as a multiplier against all charges for this customer. As an example, consider the need to bill an outside user at a higher rate than for internal users of the system. The customer could be assigned a special charge-out factor of 1.25. That factor would charge-out the customer's activity at 25% in excess (1.25 equals 125%) of the standard charges.

Unit-Charge Transaction Rate Control Statement

The unit-charge transaction rate control statement specifies a unit-charge rate for a transaction. This special charge overrides all other charging mechanisms in the system for the transactions specified.

After transactions have operated in a production environment, it may be possible to arrive at an average processing cost. This figure could then serve as the unit charge for the transaction each time it is executed.

Table 3-15 shows the format of the unit-charge transaction rate control statement.

Table 3-15 Unit-Charge Rate Control Statement Syntax

Position	Charge-Out Item
01 – 07	Rate statement ID: SPCTRAN
08	Blank
09 – 16	One- to eight-character name of the transaction to which the special charge is applied.
17	Blank
18 – 23	Special execution unit rate per 100 executions of this transaction. This value is a six-digit number with an implied decimal point after the second digit. This charge overrides all other charges specified for this transaction.
24	Blank
25	Override per 100 transactions. Enter **Y** in this field if distribution charge-out totals are to be based on each transaction rather than on each 100 transactions. Otherwise, leave the field blank.

Rate Specification Example

The following example illustrates the specification of charging rates.

Assumption: The transaction accounting administrator has the following set of constraints in establishing the charge-out rates for the billing system:

- The basic rates to be charged include

  message region CPU time
  DL/I CPU time
  database usage based on DL/I requests
  terminal connect time
  terminal characters transferred

- The main database of the system has a supporting cost for maintenance, backup, and security that is significantly greater than for any other database. This extra cost is to be distributed only to the users of that database (DBDNAME FINMAST).

- Six logical terminals were made to operate with 3270s and are to be charged a higher connect time than the standard rates.

- The personnel management information system consists of four key transactions (named PERSTR01, PERSTR02, PERSTR03, and PERSTR04) and is designated for unit costing instead of charging for the resources used.

- In addition to processing its own activity, the organization realized it could offer IMS time for sale during its normal production hours. The objective was to earn a 50% markup over costs for the outside machine rental. The two outside customers have the customer names CUST01 and CUST02.

To satisfy the above requirements, the rate statements in Figure 3-10 on page 3-44 were defined. Explanations of the rate statements are provided below Figure 3-10.

Figure 3-10 Sample Charge-Out Rate Statements

```
//RATEDIT  DD    *
STDRESC          002000 000000 000000 002000 000000
STDDBDR          010000 015000 010000 010000 010000
SPCDBDR FINMAST  017500 025000 017500 017500 017500
STDTERM          050000 001000 001000 001000
SPCTERM ORDENT01 080000
SPCTERM ORDENT02
SPCTERM ORDENT03
SPCTERM ORDENT04
SPCTERM ORDENT05
SPCTERM ORDENT06
SPCTRAN PERSTR01 001200
SPCTRAN PERSTR02 000675
SPCTRAN PERSTR03 002650
SPCTRAN PERSTR04 001170
SPCCUST CUST01                 001500
SPCCUST CUST02
```

`STDRESC  002000 000000 000000 002000 000000`

BMP, JBP, NDP, and FPU activity will be charged-out at the same rates as other basic resources (N not specified in column 12 to override the Y default).

Standard message region CPU time is $0.20 per second. Standard storage allocated and storage used resources are not charged. Standard DL/I CPU time is $0.20 per second.

No minimum transaction processing charge will be added to each transaction's standard resource charge.

`STDDBDR  010000 015000 010000 010000 010000`

Standard database GET UNIQUE, INSERT, REPLACE, and DELETE calls are $1.00 per 100. Standard database GET NEXT calls are $1.50 per 100.

`SPCDBDR FINMAST  017500 025000 017500 017500 017500`

Special-charge rates apply to the FINMAST database. GET UNIQUE, REPLACE, INSERT, and DELETE calls are charged at $1.75 per 100. GET NEXT calls are charged at $2.50 per 100.

`STDTERM  050000 001000 001000 001000`

Standard terminal connect time is $5.00 per hour. Standard terminal activity is $0.10 per 1000 characters. Standard terminal I/O is not charged.

`SPCTERM ORDENT01 080000`
`SPCTERM ORDENT`*`nn`*

The six terminals using 3270s are being charged a special rate of $8.00 per hour for terminal connect time.

`SPCTRAN PERSTR01 001200`
`SPCTRAN PERSTR`*`nn`* `000`*`nnn`*

The unit-charge execution rates for the four key transactions used by the personnel department are $0.12, $0.0675, $0.265, and $0.117.

`SPCCUST CUST01  001500`
`SPCCUST CUST02`

The users renting IMS time from this organization are charged-out at a rate of 1.5 times their actual calculated costs.

Rate Specification Error Analysis

The charge-out process ensures that the rates submitted have passed basic edit tests before they are accepted into the system. A rate field must be numeric. If an alpha or alphanumeric entry is encountered, it is flagged and the charge-out process is terminated. Figure 3-11 shows an example of an error report.

Figure 3-11 Rate Specification Error Analysis Report

```
**** IMF ****                                IMS TRANSACTION ACCOUNTANT                                **** IMF ****
CURRENT DATE - 03/22/yy                   RATE SPECIFICATION ERROR ANALYSIS                         PAGE NO - 1
1                                  THE FOLLOWING STANDARD/SPECIAL IMS CHARGE RATES HAVE
                                   BEEN FOUND IN ERROR AND ARE  FLAGGED BY THE (*) SYMBOL
                                             OVER THE INCORRECT CARD COLUMN.
                          ....5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80
                                              *
                          STDRESC    N     002X00 000000 000100 002000 000000
                          RECORDS IN ERROR - RESUBMIT...
```

The following errors can be encountered during rate statement verification.

- Rate specification identification is invalid.
- Item identification (for example, database name) is blank.
- Too many statement specifications are used:

  More than 50 special-charge terminal rates statements
  More than 30 special-charge database rates statements
  More than 30 special-charge DB2 plan name rates statements
  More than 2400 special-charge transaction rates statements
  More then 30 special-charge customer rates statements

Return Codes

This section describes the return codes that indicate the results of TASCOSTR execution.

Code	Explanation
016	An error was detected during control level parameter verification (see the Control Level Parameter report).
028	An error was detected during PARM parameter processing. The first parameter specified must be FULL, SUMM, or COST. The second parameter must be EXIT, NOEX, or EXT4.
040	No detail IRUF record was read by the program, possibly due to an empty data set.
128	An error was detected in the input charge-out rates (see “Rate Specification Error Analysis” on page 3-45).
136	The input IRUF was not in sequence by transaction code within customer ID.
140	If the CMPFMT32 parameter was specified in the TASCOSTR EXEC statement (see page 3-27), database, terminal, or response data was combined in transaction accounting records during summarization by customer ID and transaction code (because only 50 segments are allowed). Summarization by segment occurs as follows: DBD segment (TYPE=D) — DBD name organization type DB2 segment (TYPE=E) — DB2 application plan name PCB segment (TYPE=P) — Terminal name Response segment (TYPE=R) — Transaction category A message is written for each occurrence, as follows: `MAX-SEG EXCEEDED CUST ID=custid, TRANCODE=trancode,segtype SEG=segid, COMBINED IN IRUF` **Note:** The most common cause of return code 140 is not retaining LTERM as part of the customer ID. Additional information is provided in the *MAINVIEW for IMS Offline – Customization and Utilities Guide* in the sections about the MVIMS customer ID and IRUF summarization considerations.

Chapter 4 Financial Summary Analysis (TASFINSM)

The Financial Summary Analysis reports provide management with a concise distribution of charge-outs. Report statement definitions allow the user to select the most important charge-outs to be reported.

The reports quantify charge-outs by customer, customer/transaction, or transaction, and they can be used to determine which customers and transactions are responsible for the highest and lowest charges.

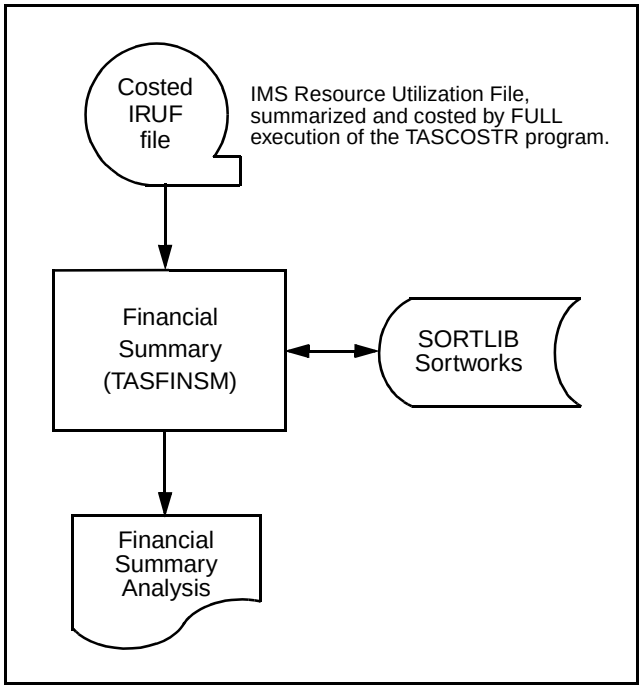
Input and Output

TASFINSM is a batch execution report program that reads a summarized, costed IRUF file and user-specified report control statements to produce one or more Financial Summary Analysis reports. The reports show the number of transactions processed, total charge-out dollars, and percentage of total charge-out by customer or transaction.

The IRUF file that serves as input to TASFINSM is the output of a full execution of the TASCOSTR program (see “PARM Options in the EXEC Statement” on page 3-25).

Figure 4-1 shows system flow for TASFINSM.

Figure 4-1 TASFINSM System Flow



Report Element Description

The presentation of the report elements depends on the report code selected (see “Control Statement Report Codes” on page 4-9). Quantities are sorted in descending order. For example, if 09 (number of transactions executed) is selected, the transaction that had the highest number of executions appears first. The control statement can be used to report, for example, the 20 transactions with the most executions or the 30 transactions that have the highest percent of total charge-outs.

DBCTL Threads

DBCTL CICS and ODBA thread activity can be reported by TASFINSM if CICS=YES or CICS=OFFLINE is specified for the Event Collector in BBPARM member IMFECP00.

The following DBCTL thread considerations apply to Financial Summary Analysis reports.

- Message region CPU time for DBCTL threads represents only the CPU time used to process the DL/I calls.
- Processor charges are for the DBCTL CPU time. They do not include CPU time in CICS.
- If the LTERM is used in the customer ID field, it is the four-byte CICS terminal ID for DBCTL threads.

Figure 4-2 on page 4-4 shows an example of the Financial Summary Analysis report.

Figure 4-2 Financial Summary Analysis Report

```
**** IMF ****                                  IMS TRANSACTION ACCOUNTANT                                *** IMF ****
CURRENT DATE - 03/22/yy <1>                    FINANCIAL SUMMARY ANALYSIS                                 PAGE NO.    1
NUMBER OF EXECUTIONS (TRANSACTION) <2>    REPORT NUMBER 09 <3>          <4> REPORT WILL HAVE FIRST     50 ITEMS LISTED
*************************************************************************************************************************
*                                          *                                          *                   *
*        TRANSACTION                       *     TOTAL TRANSACTIONS      TOTAL CHARGE-OUT   *   PERCENTAGE OF   *
*           NAME                           *         PROCESSED                APPLIED       *  TOTAL CHARGE-OUT *
*                                          *                                          *                   *
*************************************************************************************************************************
*                                          *                                          *                   *
*         T01100                           *               4,953                148.16     *        99.90      *
*                                          *                                          *                   *
*         T01120                           *                  10                  0.14     *         0.09      *
*                                          *                                          *                   *
*************************************************************************************************************************
**** IMF ****                                  IMS TRANSACTION ACCOUNTANT                                **** IMF ****
CURRENT DATE - 03/22/yy                        FINANCIAL SUMMARY ANALYSIS                                 PAGE NO.    2
NUMBER OF EXECUTIONS (CUST/TRANS)         REPORT NUMBER 05                   REPORT WILL HAVE FIRST     50 ITEMS LISTED
*************************************************************************************************************************
*                                          *                                          *                   *
*         CUSTOMER           TRANSACTION   *     TOTAL TRANSACTIONS      TOTAL CHARGE-OUT   *   PERCENTAGE OF   *
*           NAME               NAME        *         PROCESSED                APPLIED       *  TOTAL CHARGE-OUT *
*                                          *                                          *                   *
*************************************************************************************************************************
*                                          *                                          *                   *
*     <5> THFA49          <5> T01100       *              <6> 78              <7> 2.12     *     <8> 1.43      *
*                                          *                                          *                   *
*         TOFF61              T01100       *                  76                  2.09     *         1.41      *
*                                          *                                          *                   *
*         THFA23              T01100       *                  74                  2.89     *         1.94      *
*                                          *                                          *                   *
*         TFRH34              T01100       *                  72                  2.61     *         1.76      *
*                                          *                                          *                   *
*         TNUE28              T01100       *                  63                  1.89     *         1.27      *
*                                          *                                          *                   *
*         TKOE14              T01100       *                  63                  1.94     *         1.30      *
*                                          *                                          *                   *
*         TFAA16              T01100       *                  62                  1.60     *         1.08      *
*                                          *                                          *                   *
*         THAU66              T01100       *                  62                  2.06     *         1.39      *
*                                          *                                          *                   *
*         TESE05              T01100       *                  59                  2.06     *         1.39      *
*                                          *                                          *                   *
*         TFAA18              T01100       *                  54                  1.40     *         0.94      *
*                                          *                                          *                   *
*         TBER35              T01100       *                  54                  1.99     *         1.34      *
*                                          *                                          *                   *
*         TDOR05              T01100       *                  54                  1.49     *         1.00      *
*                                          *                                          *                   *
*         TFAA24              T01100       *                  54                  1.19     *         0.80      *
*                                          *                                          *                   *
*         TFAA80              T01100       *                  53                  1.50     *         1.01      *
*                                          *                                          *                   *
*         TFAA89              T01100       *                  53                  1.17     *         0.79      *
*                                          *                                          *                   *
*         THFA34              T01100       *                  53                  1.84     *         1.24      *
*                                          *                                          *                   *
*         TSTT07              T01100       *                  53                  1.73     *         1.16      *
*                                          *                                          *                   *
*         THFA48              T01100       *                  49                  1.56     *         1.05      *
*                                          *                                          *                   *
*         THFA66              T01100       *                  48                  2.37     *         1.60      *
*                                          *                                          *                   *
*         TSGM27              T01100       *                  48                  1.59     *         1.07      *
*                                          *                                          *                   *
*         TBRE08              T01100       *                  48                  1.27     *         0.86      *
*                                          *                                          *                   *
*************************************************************************************************************************
```

Table 4-1 describes the Financial Summary Analysis report elements. The reference numbers (with the **<n>** format) match the elements in the report example to the elements described in the table.

Table 4-1 Financial Summary Analysis Report Elements

<1> CURRENT DATE Date this report was generated, in mm/dd/yy format.
<2> subtitle A user-specified subtitle (see “Control Statement Report Codes” on page 4-9) or a default subtitle (40 characters maximum). The default subtitle is determined by the control statement report code. One report is printed for each statement. The reports are printed by report code in descending order.
<3> REPORT NUMBER *xx* The report code specified in the report control statement.
<4> REPORT WILL HAVE FIRST *nn* ITEMS LISTED The print limit request specified for this report.
<5> CUSTOMER NAME or TRANSACTION NAME The presentation of transaction execution and charge-out summaries by customer ID, transaction code, or both. The presentation can be reported alphabetically by ID or in descending sequence by number of transaction executions, charge-outs incurred, or percentage of total charge-outs. The report code selected determines the report presentation for each ID, which can be • CUSTOMER NAME and TRANSACTION NAME • CUSTOMER NAME only • TRANSACTION NAME only
<6> TOTAL TRANSACTIONS PROCESSED The number of transactions processed for this customer ID, transaction code, or both.
<7> TOTAL CHARGE-OUT APPLIED The sum of all the charges applied to this customer ID and/or transaction code. A plus sign in this field indicates some DB2 activity.
<8> PERCENTAGE OF TOTAL CHARGE-OUT The percentage of the total charges that are charge-outs to this customer ID, transaction code, or both.

TASFINSM Job Control Statements

Financial summary analysis is a one-step, batch execution procedure. This section describes the JCL required for TASFINSM execution.

Table 4-2 TASFINSM JCL Statements

Statement	Function
JOB	Initiates the job.
STEP1 EXEC	Specifies the name of the financial analysis program as PGM=TASFINSM Also specifies the region required to run the program and the PARM parameters required to define an internal sort size (see “PARM Options on the EXEC Statement” on page 4-7). The region requirement can be affected by • block size of the IRUF • number of buffers specified for the data sets • internal sort size requirements A region size of 192 K should be specified.
STEPLIB DD	Defines the program library (IMF.LOAD) containing the TASFINSM load module.
DETCOST DD	Defines the IMS Resource Utilization File (IRUF), produced by full execution of the TASCOSTR program, as input (see “TASCOSTR Job Control Statements” on page 3-22). The characteristics of the data set are RECFM=VBS,LRECL=30970,BLKSIZE=30974.
FINLIST DD	Defines the print data set to contain the Financial Summary Analysis reports. The characteristics of the data set are RECFM=FB,LRECL=133. BLKSIZE must be specified explicitly.
TEMPFILE DD	Defines a temporary data set used during statistics gathering and sorting. The characteristics of the data set are RECFM=FB,LRECL=61. BLKSIZE must be specified explicitly.
FINSELEC DD	Defines an instream or named data set of report control statements (which are described in “Report Control Statements” on page 4-7). If the DSN parameter is used to define the data set, the characteristics of the data set are RECFM=FB,LRECL=80.
SORTLIB DD	Defines the library for the modules loaded by an internally invoked sort program.
SORTWK*nn* DD	Defines work data sets for data sorting; *nn* is a numeric.

Figure 4-3 provides an example of JCL for TASFINSM.

Figure 4-3 Sample JCL for TASFINSM

```
//JOBNAME   JOB   ..............
//STEP1     EXEC  PGM=TASFINSM,REGION=192K,PARM='050000'
//STEPLIB   DD    DSN=IMF.LOAD,DISP=SHR
//DETCOST   DD    DSN=IRUF.COST.MONTHS,DISP=SHR
//FINLIST   DD    SYSOUT=A,DCB=BLKSIZE=133
//TEMPFILE  DD    UNIT=SYSDA,SPACE=(CYL,(20,4)),
                  DCB=(RECFM=FB,LRECL=61,BLKSIZE=nnnnn)
//FINSELEC  DD    *
FIN 05 00030
FIN 11 00030
FIN 12 00000
/*
//SORTLIB   DD    DSN=SYS1.SORTLIB,DISP=SHR
//SYSOUT    DD    SYSOUT=A
//SORTWK01  DD    UNIT=SYSDA,SPACE=(CYL,(20))
//SORTWK02  DD    UNIT=SYSDA,SPACE=(CYL,(20))
//SORTWK03  DD    UNIT=SYSDA,SPACE=(CYL,(20))
//
```

PARM Options on the EXEC Statement

The TASFINSM EXEC statement PARM parameter is used to define the main storage size for the internal sorting process. The storage size can be from 018000 up to the maximum available storage.

Report Control Statements

Financial Summary Analysis reports are selected with positional report control statements. A report control statement defines the type of report, selects the financial summary to be performed, limits the number of data items reported, and subtitles the report as specified by the user or by default.

If no control statements are defined, the TASFINSM report 8, 12, and 16 defaults are used.

- Report 8 is a financial summary of charge-outs by customer ID and transaction code. The report presentation is alphabetical by customer ID.
- Report 12 summarizes charge-outs alphabetically by transaction code.
- Report 16 summarizes charge-outs alphabetically by customer ID.

The report codes that produce these reports are described in “Control Statement Report Codes” on page 4-9.

All control statements are input to the FINSELEC DD JCL statement, either as an instream data set or as a member of a partitioned data set. Table 4-3 shows the report control statement format.

Table 4-3 Financial Summary Control Statement Syntax

Position	Input
01 – 03	Statement ID: FIN
04	Blank
05 – 06	Code for the report to be produced. Valid codes are 05 through 16. For example, 09 in this position of a TASFINSM report control statement requests a financial summary by number of transactions executed. The report presentation starts with the transaction that had the highest number of executions and continues to the transaction with the lowest number of executions. If no report code is specified, reports 8, 12, and 16 are produced (see “Control Statement Report Codes” on page 4-9).
07	Blank
08 – 12	A number in this position limits the number of data items to be summarized and reported. If 00000 is defined for this position, all items, as specified by the selected report code, are reported. For example, 00030 limits the report to 30 data items. If quantities are selected, such as report 09, the 30 highest data items are reported.
13	Blank
14 – 53	User-specified title. If no title is specified, the default title associated with the report code is used.

The following control statements are from the JCL sample on page 4-7:

```
FIN 05 00030
FIN 11 00030
FIN 12 00000
```

The control statements produce the following financial summaries:

- The first control statement requests a financial summary for the 30 customer/transactions with the highest number of executions (report code 05 in positions 5 and 6 of the statement).

- The second control statement requests a financial summary for the 30 transactions that have the highest percent of total charge-outs (report code 11 in positions 5 and 6).

- The third control statement requests an alphabetical financial summary by code for all transactions processed (report code 12 in positions 5 and 6).

Control Statement Report Codes

Twelve financial summaries can be reported. A report is specified by a report code in positions 5 and 6 of a report control statement. A report is printed by report code in descending sequence for each specified statement. Each report is produced in the format shown in Figure 4-2 on page 4-4.

The report elements can be summarized by

- transaction within customer ID
- transaction code only
- customer ID only

The order of elements in report is determined by report codes, which are shown in Table 4-4.

Table 4-4 Financial Summary Analysis Report Codes

Report Code	Data Item ID	Report Presentation
05	Customer ID Transaction Code	Number of transaction executions (descending sequence)
06	Customer ID Transaction Code	Dollar charge-outs incurred (descending sequence)
07	Customer ID Transaction Code	Percent of total charge-outs (descending sequence)
08	Customer ID Transaction Code	Alphabetical list by customer ID with associated transactions
09	Transaction Code	Number of transactions executed (descending sequence)
10	Transaction Code	Dollar charge-outs incurred (descending sequence)
11	Transaction Code	Percent of total charge-outs (descending sequence)
12	Transaction Code	Alphabetical list by transaction code
13	Customer ID	Number of transactions executed (descending sequence)
14	Customer ID	Dollar charge-outs incurred (descending sequence)
15	Customer ID	Percent of total charge-outs (descending sequence)
16	Customer ID	Alphabetical list by customer ID

Return Codes

This section describes the return codes that indicate the results of TASFINSM execution.

Code	Explanation
064	The sort size was specified incorrectly. The value specified was not six digits long, was not numeric, or was less than 18,000.
128	An error was detected in the financial selection statement analysis. An error in statement format or content was encountered.
132	The first internal sort (alpha sort) returned with an unsuccessful status.
136	Reports were requested, but no records were found for the second sort.
140	The second interval sort returned with an unsuccessful status.

Appendix A How Product Libraries Should Be Used

Several distributed libraries are included with your MAINVIEW products, including a parameter library (BBPARM), a sample library (BBSAMP), and a profile library (BBPROF). Use the contents of these distributed libraries as models to create site-customized product libraries, either manually or automatically, with AutoCustomization.

Warning! The distributed libraries should never be modified. If you change the distributed libraries, subsequent SMP maintenance will overwrite your changes.

Throughout the MAINVIEW documentation set, references to these libraries use the distributed name. However, when you need to make changes, be sure to use the corresponding library that has been customized for your site. Table A-1 lists the distributed name, the corresponding customized library created by AutoCustomization, and leaves space for you to note any other corresponding library that may have been created for your site.

Table A-1 Product Libraries

Distributed Library Name	Library Created by AutoCustomization	Other Site-Customized Copy
BBPARM	UBBPARM	
BBSAMP	UBBSAMP	
BBPROF	SBBPROF	

For more detailed information about all the product libraries, see “Using MAINVIEW Product Libraries” in the *MAINVIEW Common Customization Guide* or “Using Product Libraries” in the *MAINVIEW Administration Guide*.

Index

A

B

C

D

E

F

I

J

L

M

N

P

R

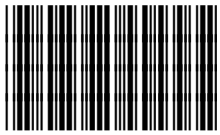
S

T

U

W

Notes



41358