z/OS

MVS System Management Facilities (SMF)

SA22-7630-12

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Note

Before using this information and the product it supports, be sure to read the general information under “Notices” on page B-1.

Thirteenth Edition, April 2006

This is a major revision of SA22-7630-11.

This edition applies to Version 1 Release 7 of z/OS (5694-A01), Version 1 Release 7 of z/OS.e (5655-G52), and to all subsequent releases and modifications until otherwise indicated in new editions.

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About this document

This book supports z/OS (5694-A01) and z/OS.e (5655-G52).

This document describes the system management facilities (SMF) component of an MVS/ESA system. This document can be used to aid an installation by helping plan install, and use SMF in an MVS/ESA system.

Who should use this document

This document is primarily intended for system programmers who support accounting and billing services for an installation. It can be used by installation managers and system programmers who are responsible for problem resolution, system tuning, and capacity planning for an MVS/ESA system. This document assumes that the reader has extensive experience with MVS, is familiar with its basic concepts, and can code JCL statements to run programs or cataloged procedures, can code in assembler language, and can read assembler, loader, and linkage editor output.

How this document is organized

This document is organized as follows:

- Chapter 1, “Introduction” introduces SMF and describes how installations use SMF.
- Chapter 2, “System Requirements and Considerations” describes what must be done to run SMF on your system.
- Chapter 3, “The SMF Dump Program” describes the SMF dump program, how to switch and dump the SMF data sets.
- Chapter 4, “Customizing SMF” describes methods of tailoring SMF to meet the specific needs of the installation.
- Chapter 5, “Using SMF Macros” includes SMF macros and how to use them.
- Chapter 6, “User-Written Report Programs” describes how to design and produce SMF reports.
- Chapter 7, “APPC/MVS Accounting” describes recording information for APPC/MVS work.
- Chapter 8, “OpenMVS Accounting” describes z/OS UNIX information in various SMF records.
- Chapter 9, “System Logger accounting” describes recording information for system logger.
- Chapter 10, “EXCP Count” includes information on how EXCP counts are included in SMF records.
- Chapter 11, “CPU Time” describes CPU time under TCBs and SRBs and possible variations.
- Chapter 12, “IFAUSAGE — Collecting Usage Data” describes the IFAUSAGE macro that MVS provides for collecting data related to CPU time usage and other resource usage.
- Chapter 13, “SMF Records” includes the formats of SMF records and describes SMF header standards.

Highlighting

This document uses different type styles to identify certain kinds of information. General information is printed in the standard type style (the type style used for this sentence). The following type styles indicate special information:

New terms
: Each time a new term is introduced, its first occurrence is printed in bold italic type (for example, "***racfbname*** specifies the name of a RACF data base").

SYSTEM PARTS
: The names for commands, subcommands, keywords, utilities, and other parts of the system are printed in uppercase type (for example, "the ALTER command").

Variable information
: The names for information that you must provide are printed in italic type (for example, "type *yourname*").

Variable information that appears in system messages is also printed in this type style, for example, "LOCATE *entryname*". In this case, the italicized word (*entryname*) that is used in this document is replaced by the actual entry name when the system displays the message.

When numerical variables appear in the system messages, this document uses the following convention: *nnn*. In this case, what the system supplies on the screen is an actual number that you can use to determine the cause of the problem. Similarly, in the case of alphabetic variables, this document uses the characters *xxx*, *yyy*, or *zzz*.

`Information that you are to type or that appears on your screen`
: Information that you should type (in response to a message) is printed in monospace type (for example, "type `yes` and press Enter").

Also, when this document refers directly to a message that appears on the screen, this type style is used. An example of such a message is "`Enter password`."

Where to find more information

Where necessary, this document references information in other documents, using shortened versions of the document title. For complete titles and order numbers of the documents for all products that are part of z/OS, see *z/OS Information Roadmap*. The following table lists titles and order numbers for documents related to other products. Select the document that supports the version of the product your installation is using.

Short Title Used in This Document	Title	Order Number
CICS Customization Guide	*CICS/ESA Customization Guide* *CICS/ESA Version 3.1.1 Customization Guide* *CICS/MVS Version 2.1 Customization Guide*	SC33-1165 SC33-0665 SC33-0507
IBM DB2 Administration Guide	*IBM DB2 Version 2 Administration Guide*	SC26-4374
IBM 3800 Printing Subsystem Programmer's Guide	*IBM 3800 Printing Subsystem Programmer's Guide*	GC26-3846
NetView Administration Reference	*NetView Administration Reference*	SC31-6014

Short Title Used in This Document	Title	Order Number
NPM Installation and Customization Guide	*NetView Performance Monitor Installation and Customization Guide*	SH20-6361
Implementing Concurrent Copy	*Implementing Concurrent Copy*	GG24-3990

Using LookAt to look up message explanations

LookAt is an online facility that lets you look up explanations for most of the IBM® messages you encounter, as well as for some system abends and codes. Using LookAt to find information is faster than a conventional search because in most cases LookAt goes directly to the message explanation.

You can use LookAt from these locations to find IBM message explanations for z/OS® elements and features, z/VM®, VSE/ESA™, and Clusters for AIX® and Linux™:

- The Internet. You can access IBM message explanations directly from the LookAt Web site at http://www.ibm.com/servers/eserver/zseries/zos/bkserv/lookat/.
- Your z/OS TSO/E host system. You can install code on your z/OS or z/OS.e systems to access IBM message explanations using LookAt from a TSO/E command line (for example: TSO/E prompt, ISPF, or z/OS UNIX® System Services).
- Your Microsoft® Windows® workstation. You can install LookAt directly from the *z/OS Collection* (SK3T-4269) or the *z/OS and Software Products DVD Collection* (SK3T-4271) and use it from the resulting Windows graphical user interface (GUI). The command prompt (also known as the DOS > command line) version can still be used from the directory in which you install the Windows version of LookAt.
- Your wireless handheld device. You can use the LookAt Mobile Edition from http://www.ibm.com/servers/eserver/zseries/zos/bkserv/lookat/lookatm.html with a handheld device that has wireless access and an Internet browser (for example: Internet Explorer for Pocket PCs, Blazer or Eudora for Palm OS, or Opera for Linux handheld devices).

You can obtain code to install LookAt on your host system or Microsoft Windows workstation from:

- A CD-ROM in the *z/OS Collection* (SK3T-4269).
- The *z/OS and Software Products DVD Collection* (SK3T-4271).
- The LookAt Web site (click **Download** and then select the platform, release, collection, and location that suit your needs). More information is available in the LOOKAT.ME files available during the download process.

Using IBM Health Checker for z/OS

IBM Health Checker for z/OS is a z/OS component that installations can use to gather information about their system environment and system parameters to help identify potential configuration problems before they impact availability or cause outages. Individual products, z/OS components, or ISV software can provide checks that take advantage of the IBM Health Checker for z/OS framework. This book refers to checks or messages associated with this component.

For additional information about checks and about IBM Health Checker for z/OS, see *IBM Health Checker for z/OS: User's Guide*. z/OS V1R4, V1R5, and V1R6 users can obtain the IBM Health Checker for z/OS from the z/OS Downloads page at http://www.ibm.com/servers/eserver/zseries/zos/downloads/.

SDSF also provides functions to simplify the management of checks. See *z/OS SDSF Operation and Customization* for additional information.

Information updates on the web

For the latest information updates that have been provided in PTF cover letters and Documentation APARs for z/OS and z/OS.e, see the online document at:

`http://www.s390.ibm.com:80/bookmgr-cgi/bookmgr.cmd/BOOKS/ZIDOCMST/CCONTENTS`

This document is updated weekly and lists documentation changes before they are incorporated into z/OS publications.

Summary of changes

Summary of changes
for SA22-7630-12
z/OS Version 1 Release 7
as updated April 2006

This document contains information previously presented in *z/OS MVS System Management Facilities (SMF)*, SA22-7630-11 which supports z/OS Version 1 Release 7.

This document contains terminology, maintenance, and editorial changes, including changes to improve consistency and retrievability.

Summary of changes
for SA22-7630-11
z/OS Version 1 Release 7

This document contains information previously presented in *z/OS MVS System Management Facilities (SMF)*, SA22-7630-10, which supports z/OS Version 1 Release 6.

New and changed Information

- Updates to user account validation, job validation, and step initiation exits. See "Deciding which exits to use" on page 4-12.
- Multiple updates to Record Type 22. See "Record Type 22 (16) — Configuration" on page 13-85.
- Multiple updates to Record Type 30. See "Record Type 30 (1E) — Common Address Space Work" on page 13-115.
- Update to Record Type 64 in the Extent Information Section. See "Extent Information Section" on page 13-262.
- Multiple updates to Record Type 70. See "Record Type 70 (46) — RMF Processor Activity" on page 13-275.
- Multiple updates to Record Type 74. See "Record Type 74 (4A) — RMF Activity of Several Resources" on page 13-331.
- Multiple updates to Record Type 78, subtype 3. See "Subtype 3 — I/O Queuing Activity" on page 13-389.
- Multiple updates to Record Type 79. See "Record Type 79 (4F) — RMF Monitor II Activity" on page 13-393.
- Multiple updated to Record Type 88. See "Record Type 88 (58) — System Logger Data" on page 13-468.
- Update to Record Type 92, subtype 11. See "Subtype 11" on page 13-500.
- Multiple updates to Record Type 94. See "Record Type 94 (5E) — IBM Tape Library Dataserver Statistics" on page 13-501.
- Update to Record Type 99, subtype 7. See "Subtype 7" on page 13-576.

References to OpenEdition have been replaced with z/OS UNIX System Services or z/OS UNIX.

This document contains terminology, maintenance, and editorial changes. Technical changes or additions to the text and illustrations are indicated by a vertical line to the left of the change.

Starting with z/OS V1R2, you may notice changes in the style and structure of some content in this document—for example, headings that use uppercase for the first letter of initial words only, and procedures that have a different look and format. The changes are ongoing improvements to the consistency and retrievability of information in our documents.

Summary of changes for SA22-7630-10 z/OS Version 1 Release 6 as updated March 2005

This document contains information previously presented in *z/OS MVS System Management Facilities (SMF)*, SA22-7630-09, which supports z/OS Version 1 Release 6.

New and changed Information:

- Updates to record type 30 in the Processor Accounting Section. See "Processor Accounting Section" on page 13-127.
- Multiple updates to record type 94. See "Record Type 94 (5E) — IBM Tape Library Dataserver Statistics" on page 13-501.

This document contains terminology, maintenance, and editorial changes, including changes to improve consistency and retrievability.

Summary of changes for SA22-7630-09 z/OS Version 1 Release 6

This document contains information previously presented in *z/OS MVS System Management Facilities (SMF)*, SA22-7630-08, which supports z/OS Version 1 Release 5.

New Information

Updates to the explanations of fields SMF6PQLN, SMF6PRTQ, SMF6BYTD, SMF6URIL, and SMF6URI in record type 6. See "File Transfer Section for IP PrintWay" on page 13-40.

Updates to record type 22. See "Record Type 22 (16) — Configuration" on page 13-85.

Information about new SMFPRMxx keywords BUFSIZMAX and BUFUSEWARN has been added. See "Specifying SMF buffer options" on page 4-10.

Beginning with z/OS V1R3, WLM compatibility mode is no longer available. Accordingly, SMF records and fields that were available only in WLM compatibility mode are no longer valid. Some of the information has been left here for reference purposes and for use on backlevel systems.

This document contains terminology, maintenance, and editorial changes, including changes to improve consistency and retrievability.

Summary of changes for SA22-7630-08 z/OS Version 1 Release 5

This document contains information previously presented in *z/OS MVS System Management Facilities (SMF)*, SA22-7630-07, which supports z/OS Version 1 Release 4.

New Information

SMF22CYS, SMF22PCY fields added to Record Type 22.

R84_SYSCONMIN, R84_SYSCONMAX, R84_SYSCONAVG fields added to Record Type 84.

Changed Information

This document contains terminology, maintenance, and editorial changes, including changes to improve consistency and retrievability.

Summary of changes for SA22-7630-07 z/OS Version 1 Release 4 as updated October 2003

This document contains information previously presented in *z/OS MVS System Management Facilities (SMF)*, SA22-7630-06, which supports z/OS Version 1 Release 4.

New and changed Information:

- Updates to record type 82, ICSF record, in subtypes 7, 11, 14, 15, 16, and 18. New subtype 19 added. See "Record Type 82 (52) — ICSF Record" on page 13-421.
- Updates to record type 89, system ID section. See "System ID Section" on page 13-477.

This document contains terminology, maintenance, and editorial changes, including changes to improve consistency and retrievability.

Summary of changes for SA22-7630-06 z/OS Version 1 Release 4 as updated June 2003

This document contains information previously presented in *z/OS MVS System Management Facilities (SMF)*, SA22-7630-05, which supports z/OS Version 1 Release 4.

New and changed Information

- Record type 70: For systems running on a z990 processor, SMF record 70 subtype 1 can now grow large enough (greater than 32K) to break into self-contained records.
- Record type 74:
  - Added bit 2 in field SMF74ENF (offset 10) to record type 74, subtype 1.
  - Added field SMF74CMR (offset 164) to record type 74, subtype 1.
  - Change to field R744RSST (offset 72) to record type 74, subtype 4.
  - Added new field R744RSSS (offset 76) to record type 74, subtype 4
  - Added field R744RSSD (offset 92) to record type 74, subtype 4.

- Record type 79:
  - Added fields R799CUB (offset 68), R799DPB (offset 88), and R799CMR (offset 92) to record type 79, subtype 9.
  - Added bits 4 and five to field R799CNX (offset 74) in record type 79, subtype 9.
- Record type 99:
  - Added field SMF998_PC_CSS_NUMBER (offset 108) to record type 99, subtype 8.
  - Added field SMF999_CSS_NUMBER (offset 90) to record type 99, subtype 9.

This document contains terminology, maintenance, and editorial changes, including changes to improve consistency and retrievability.

Summary of changes
for SA22-7630-05
z/OS Version 1 Release 4
as updated December 2002

This document contains information previously presented in *z/OS MVS System Management Facilities (SMF)*, SA22-7630-04, which supports z/OS Version 1 Release 4.

New Information

- Information is added about converting binary timestamps to time of day format.

Changed Information

- Type 4, 8, 9, 10, 11, 14, 30, 34, 40— Text clarifying the identification of Virtual I/O devices is added.
- Type 26 — Text describing bits in the SMF26IX2 field is added.

This document contains terminology, maintenance, and editorial changes, including changes to improve consistency and retrievability.

Summary of changes
for SA22-7630-04
z/OS Version 1 Release 4

This document contains information previously presented in *z/OS MVS System Management Facilities (SMF)*, SA22-7630-03, which supports z/OS Version 1 Release 3.

New Information

- Information is added to indicate this document supports z/OS.e.
- Type 84 — New fields for the C/I JSAM buffer queue.
- Type 94 — A new subtype 02 is written to contain volume pooling statistics.

This document contains terminology, maintenance, and editorial changes, including changes to improve consistency and retrievability.

Chapter 1. Introduction

System management facilities (SMF) collects and records system and job-related information that your installation can use in:
- Billing users.
- Reporting reliability.
- Analyzing the configuration.
- Scheduling jobs.
- Summarizing direct access volume activity.
- Evaluating data set activity.
- Profiling system resource use.
- Maintaining system security.

These examples show the types of reports that can be created by using the information that SMF collects. "Using SMF Data" on page 1-4 describes each of these in more detail.

SMF formats the information that it gathers into system-related records (or job-related records). System-related SMF records include information about the configuration, paging activity, and workload. Job-related records include information on the CPU time, SYSOUT activity, and data set activity of each job step, job, APPC/MVS transaction program, and TSO/E session. (Chapter 13, "SMF Records" includes the formats of the SMF records.)

An installation can provide its own routines as part of SMF. These routines will receive control either at a particular point as a job moves through the system, or when a specific event occurs. For example, an installation written routine can receive control when the CPU time limit for a job expires or when an initiator selects the job for processing. The routine can collect additional information, or enforce installation standards. Chapter 4, "Customizing SMF," summarizes the available installation-written exits. *z/OS MVS Installation Exits* describes each SMF installation exit. Table 3-1 on page 3-2 describes the SMF dump program exits.

Chapter 3, "The SMF Dump Program" describes the dump program and how to dump SMF data sets. and explains how to code and use them.

Because SMF data-collection and exit routines are independent of each other, the installation can use them separately or in combination. After analyzing the information that the SMF data-collection routines obtained, for example, the installation might choose to set a time limit for all jobs running on the system and then terminate any job that exceeds this limit. However, to allow certain jobs to bypass this restriction, the installation could add a routine at the SMF time limit exit (IEFUTL) to extend the time limit for those selected jobs.

Figure 1-1 on page 1-2 illustrates the functional overview of SMF. This figure includes the SMF process and a reference to where the information can be found within the book.

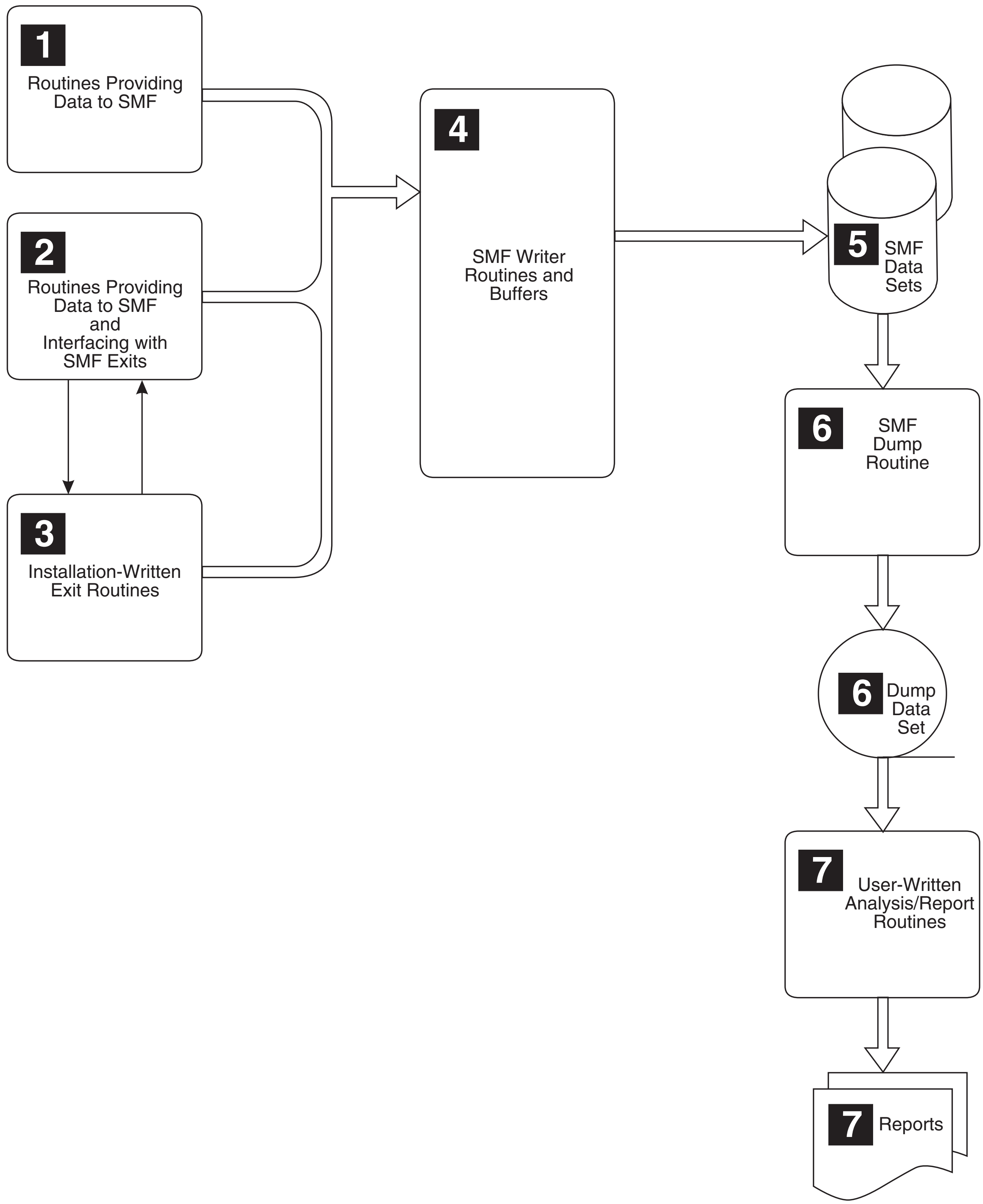


Figure 1-1. SMF Overview

Description of Process	Reference
1 — Routines (SMF, system, program-product, installation-written) collect and format data into records and then pass the records to the SMF writer.	Chapter 4, “Customizing SMF” lists the macros used to interface with the SMF writer. *z/OS MVS Programming: Authorized Assembler Services Reference ENF-IXG* and *z/OS MVS Programming: Authorized Assembler Services Reference SET-WTO* contain the detailed description of the macros. Chapter 13, “SMF Records” provides information about the records that includes: • The specific events that cause SMF to write records. • The contents of each record.
2 — In addition to collecting data for SMF, some routines interface with the SMF exits, passing control to them at several points during job (and job step) processing.	Chapter 4, “Customizing SMF” describes how SMF exits are controlled and how these routines interact with the SMF exits.
3 — The SMF exits get control when specific events occur, such as when a data set exceeds the output limit or at designated points during job processing.	Chapter 4, “Customizing SMF” describes the installation exits that are available. The *z/OS MVS Installation Exits* book describes each SMF installation exit and explains how to code them. Table 3-1 on page 3-2 describes the dump program exits.
4 — SMF routines copy records to SMF buffers, transfer records from the SMF buffers to the SMF data sets, and issue messages to the operator indicating the successful or unsuccessful completion of specific SMF-related events.	Chapter 2, “System Requirements and Considerations” describes the requirements for running SMF and several SMF performance considerations. Chapter 4, “Customizing SMF” describes how an installation can use SMF parameters to vary the amount of information SMF routines collect and record. The chapter includes the formats, uses, and default values of these parameters.
5 — The SMF data sets are filled one at a time; while SMF writes records on one data set, other SMF data sets can be dumped or cleared.	Chapter 2, “System Requirements and Considerations” describes creating and switching of SMF data sets.
6 — The SMF dump program copies data from SMF data sets to dump data sets for permanent storage.	Chapter 3, “The SMF Dump Program” describes the dump program and how to dump SMF data sets.
7 — Analysis and report routines, either user-written or those such as the Tivoli Performance Reporter for OS/390 program product, process information records. Analysis routines read the SMF data set, list the dumped SMF data set, use a sort/merge program to order the SMF-recorded information, or perform a detailed investigation of one particular SMF data item, such as job CPU time under TCBs. Report routines usually format and print the statistics and/or results of the analysis routines.	Chapter 6, “User-Written Report Programs” describes sort/merge routines and includes a sample report program.

Using SMF Data

SMF Data Examples

The majority of examples under “Uses of SMF Data” in this manual are taken from the GUIDE 35 Proceedings “What To Do With SMF Data” published by GUIDE International, Inc. These examples are based on the experience of the speakers at that GUIDE session, Mr. Brian Currah and Mr. Mario Morino. As such, they have not been submitted to any formal IBM test; SMF users should evaluate the applicability of these examples in their environment before implementing them.

The volume and variety of information in the SMF records enables installations to produce many types of analysis reports and summary reports. For example, by keeping historical SMF data and studying its trends, an installation can evaluate changes in the configuration, workload, or job scheduling procedures. Similarly, an installation can use SMF data to determine system resources wasted because of problems, such as inefficient operational procedures or programming conventions.

The following examples show the types of reports that can be created from SMF data. The examples should be viewed primarily as suggestions to assist you in beginning to plan SMF reports.

Billing Users

SMF reports data that installations can use as a basis for billing algorithms and reports. The following sample procedure briefly summarizes one approach installations might follow in creating algorithms and reports from SMF data:

1. Establish the primary goal(s) that the installation wants to achieve from billing its users for computer services.
2. Break down these goals into specific billing objectives.
3. Review the SMF-recorded data items to determine the data items that best satisfy the installation’s billing objectives.
4. Create billing algorithms using the appropriate SMF-recorded data items.
5. Generate billing reports for the installation’s users (or for management review).

The following scenarios show ways that an installation might implement this procedure.

Scenario 1

An installation whose primary goal is to recover its total cost, including such items as personnel, equipment, and supplies, might set the following billing objectives:

- The billing algorithms and reports must not require expensive programming to control.
- The users must easily understand the charges.
- The charges must be repeatable; that is, the charge for a job must be the same each time the user runs the job.

Given these objectives, the installation might want to create a billing algorithm that is based on one specific SMF-recorded data item such as the, “number of cards read/punched,” or “number of lines/pages printed”.

Scenario 2

An installation that has a limited variety of computer applications might have the following billing objectives:

- The charges must accurately represent the amount of time required for each application.
- The charges must be consistent for the same types of applications. (For example, all payroll applications must have the same base cost.)

To fulfill these objectives, the installation might take the following steps to create its billing algorithms:

1. Using SMF, establish an average-run time (through actual running or simulation) for each type of computer application.
2. Estimate the average-run-time cost for each type of application.
3. Set a cost-per-hour rate (using steps 1 and 2 above).
4. Multiply this rate times the “job elapsed time” recorded by SMF for each application.

Scenario 3

An installation that is operating at or near full system capacity might want to encourage better use of its limited resources through billing. The major billing objectives of such an installation might include:

- The users must pay only for the system resources they use.
- The rates for abundant resources must be lower than the rates for scarce ones.
- The charges for each system resource must fluctuate with the demand for that resource.

Assuming that it has cost-conscious users, the installation might use degradation and/or efficiency billing, as described later in this section, to satisfy these objectives.

Scenario 4

An installation that uses TSO/E heavily might set these specific objectives:

- TSO/E billing must be understandable to its users in the terms of the work they do.
- The billing must be predictable; TSO/E users should be able to estimate the charge for a given terminal session.
- The billing must recover TSO/E costs.

The installation can use transaction billing, described later in this section, to satisfy these objectives.

Degradation Billing

Installations can use degradation billing to enforce standards created to balance system resource use. Degradation billing allows a job to run even though it has violated a specified resource-use standard. However, because of the violation, the installation will charge the user an additional “punitive” cost for the job.

For example, one installation standard might state that a single job step should not allocate more than six tape units out of the system’s available ten. For each of the first six tape units allocated, the installation charges a base cost; for each unit allocated over the allowed six, however, it might charge a progressively higher rate.

Another installation standard might state that programs using the ADDRSPC=REAL facility should not allocate more than 100K bytes, and that any program allocating more than 300K bytes is not only violating the standard but is totally degrading the system. This installation might charge its users for ADDRSPC=REAL storage by establishing a price per K-storage hour used as follows (shown in Figure 1-2):

- For an allocation of 100K bytes or less, the charge is a minimum base rate per K-storage hour.
- For an allocation greater than 100K bytes but less than the critical level of 300K bytes, the charge is a higher base rate per K-storage hour plus a small "punitive" rate based on hour of tie-up.
- For an allocation of 300K bytes or more, the charge is a very large "punitive" rate based on hour of tie-up.

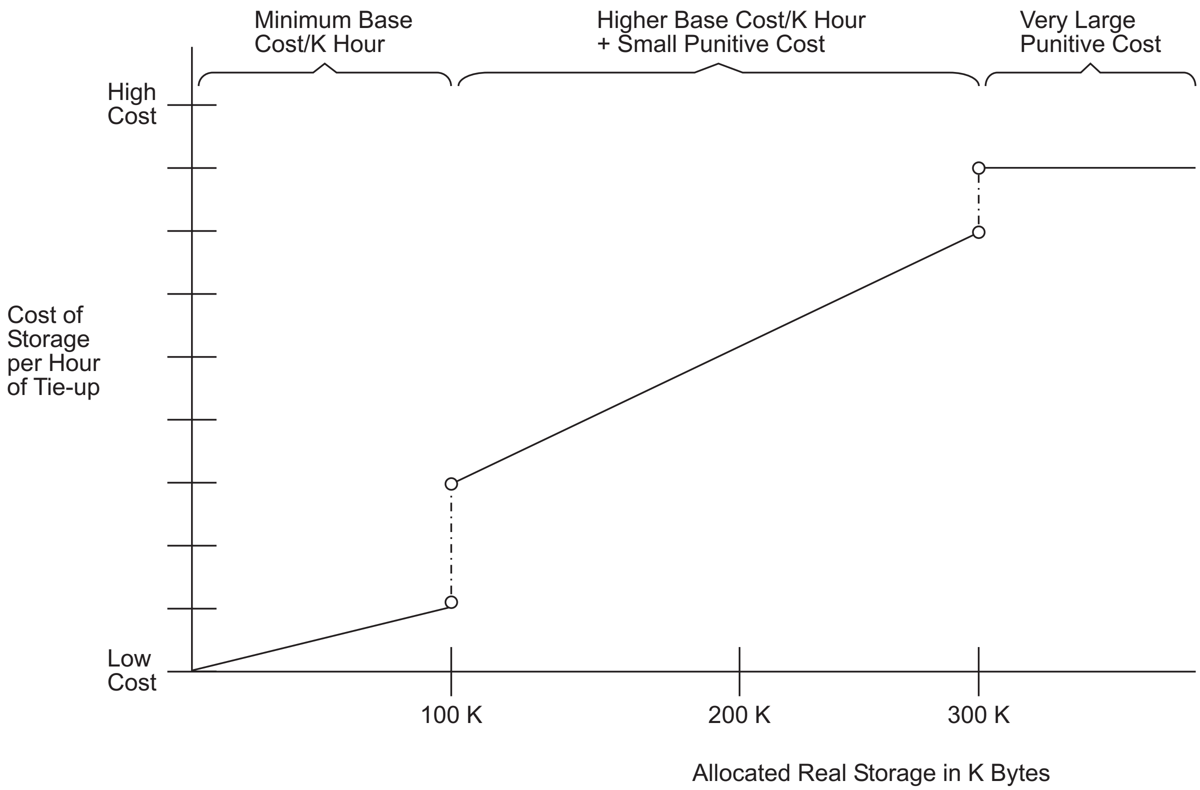


Figure 1-2. Sample Degradation Billing for ADDRSPC=REAL Storage

Efficiency Billing

Efficiency billing is very similar to degradation billing in that it encourages the conservative use of system resources. Efficiency billing, however, *reduces* the charge for those who use the system efficiently. For example, by evaluating the "date" information in each SMF job initiation record, an installation might charge less for those jobs submitted for Sunday or holiday processing. Likewise, an installation might use the SMF-recorded "time" information to charge less for jobs started during the second or third shifts. Another example of efficiency billing is to give special reduced rates for jobs that represent low-priority background work.

Transaction Billing

Transaction billing charges for work in units that are meaningful to the user. Transaction units can include runs of a particular program, online invocations of a defined function, or records read or printed by a standard application. Bills based on transaction units show a clear relationship between the service requested and the payment due, a relationship that, for TSO/E and IMS, is not apparent from a list of resources actually consumed.

Techniques of specifying storage allocation, for instance, are not visible to many terminal users, who therefore have trouble relating their actions to a charge for storage hours. However, charging in terms of commands used is clear to the terminal user.

Transaction billing helps users to see the correlation between what they do and what they pay. With this information, they can develop cost-effective operating standards. If transaction prices incorporate the average cost of resources consumed, the users can evaluate alternatives and make decisions based on their own operations.

Transaction billing might include billing for the use of some TSO/E commands. To be suitable as a billing unit, a transaction should involve processing costs that are consistent enough over time for the average to be meaningful. The transactional billing data collected for TSO/E is how many times each TSO/E command is issued. Note that a TSO/E command does not relate to the system resources manager (SRM) definition of a TSO/E transaction as described in *z/OS MVS Initialization and Tuning Guide*.

The following steps can be used to develop a method of transaction billing for the use of TSO/E commands:

1. Determine the TSO/E costs you want to recover. To determine the TSO/E cost, summarize the total installation cost and then allocate part of it to TSO/E. You can obtain a gross allocation ratio from the data in type 30 records by comparing the resource consumption for TSO/E with the overall resource consumption.
2. For each type of TSO/E command, measure the average resource consumption and the number of times the command is used over a representative time period. You can obtain this data from SMF record type 32 (with the DETAIL option). For further discrimination, you can break down the calculations to the specific user ID.
3. Based on the number of commands issued (obtained during step 2) and any other relevant information, predict the command use by type (for a billing period).
4. Set rates for the resources measured in SMF record type 32, so that the use predicted in step 3 recovers the TSO/E costs from step one. That is, the resources used multiplied by the rates set for the resources should equal the cost you recover.
5. Set prices for each type of TSO/E command, based on the use of the command as determined in step 2, at the rates established in step 4. That is, divide the cost of the resources by the number of times the command was issued to determine the price for each command type.
6. For the duration of each billing period, you can use the date in SMF record type 32 to count the commands being issued by type and user ID. Use the prices determined in step 5 to bill each user ID for the commands used.
7. Repeat step 6 for each billing period until you recalculate the prices. (Deciding how often to recalculate the prices represents a trade off between accuracy and stability.) If costs have changed, start with step 1, otherwise start with step 2.

Reporting Reliability

The following examples describe a few ways of using SMF to report the reliability of the system.

Approximate System Availability — SMF produces records at IPL time and when the operator enters a HALT EOD command preceding the scheduled shutdown of the system. By examining these records and the last SMF record recorded before shutdown of the system, an installation can establish the following information for a given time period:

- Reporting interval.
- Number of IPLs.
- System up time and system down time.
- Number of scheduled stoppages and the approximate amount of scheduled down time.
- Number of unscheduled stoppages and the approximate amount of unscheduled down time.
- Reasons for system failure.
- Operator's name.

In addition, JES2 and JES3 produce the SMF subsystem start (type 43) and subsystem stop (type 45) records. From these records, an installation can further analyze the system's availability by checking the start time, stop times, and circumstances under which JES2 or JES3 was started (for example, a cold start versus a warm start).

Abend Code Summary — SMF reports a system or user abend (abnormal end of task) code for each job (and job step) that abends. By tracking those codes issued by operational procedures (such as codes 122 and 222 for operator cancels), an installation can account for any loss of CPU time due to job reruns. More generally, a summary of the abend codes by program name or code allows an installation to determine which programs are abending frequently and which codes are occurring most often. This information might show the need for software error corrections, JCL revisions, or better operating instructions.

Direct Access VTOC Errors — The SMF record type 19 has a "VTOC indicator" bit that the system sets if there is a failure while updating a VTOC (volume table of contents). By checking the setting of this bit, operations personnel can identify any VTOCs that might have missing tracks or overlapping data sets.

Tape Error Statistics — SMF record type 21 provides tape error statistics such as the number of temporary read and write errors, permanent read and write errors, noise blocks, erase gaps, and cleaner actions. By sorting and summarizing these error statistics by tape volume (or tape unit), operations personnel can identify volumes that might need reconditioning or replacement, or point out tape drives that might require cleaning or maintenance.

Analyzing the Configuration

SMF generates records that describe changes in the system configuration:

- At IPL for online devices (types 0, 8, 19, and 22).
- When a device is added to the configuration (types 9 and 10).
- When a device is removed from the configuration (type 11).

- When a processor, channel path, storage device moves online or offline (type 22).

In addition to these records, operations management can use specific information in other SMF records to report configuration statistics. The examples that follow show this use of SMF.

Device and Channel Loading — From SMF records, an installation can obtain the total problem program EXCP counts by device and by channel over a given reporting period. (See Chapter 10, “EXCP Count” for a detailed explanation of EXCP counts and their use in SMF records.) While this summary does not provide a true picture of the I/O load distribution, it might be helpful in identifying a gross loading imbalance among various devices or channels.

Concurrent Device Use — An installation can combine the data in the SMF step termination records to report the number of devices per device type that problem programs used during specified intervals. By using this report with the RMF device activity records (type 74), an installation can identify periods of the day when the percentage of problem program device use was exceptionally high or low. Further evaluation might show the cause of concurrent device use. If, for example, no more than 12 of the available 16 tape drives are ever in use at the same time, one of the following situations might be responsible:
- Job classes are conflicting.
- Too few initiators are started.

Note: You would find it very difficult to perform tape-allocation analysis for long-running started tasks that dynamically allocate and deallocate tape drives. SMF does not record such information. HSM and DB2 are examples of such started tasks.

Scheduling Jobs

Using SMF collected data, it is possible to identify specific intervals when the problem program use of system resources is at an extremely high or low level. By studying the trends in this SMF data, and the relationships among the trends, operations management can establish and enforce its job scheduling procedures. The following examples describe a few potentially useful SMF data-trend analyses for scheduling jobs.

Concurrent Job Activity — The SMF job initiation and termination records contain the start and stop times of each batch job, job step, TSO/E session, APPC/MVS transaction program, and started task. Using these times, an installation can determine the jobs that are running during the same interval. From a scheduling point of view, a low number of concurrent jobs might indicate the need for establishing more job classes or using more initiators.

Job Wait Time in Initiation and SYSIN/SYSOUT Queues — The SMF step termination records have the following three time stamps: step initiation time, device allocation start time, and problem program start time. By calculating the differences in these three times, an installation can identify any abnormally long job step initiation.

In addition, an installation can use the SMF output writer and job purge records to track job wait times in both the SYSIN and SYSOUT queues over a given period of time. If the resulting pattern of wait times shows any significant variances, the installation might want to further investigate the problem areas and perhaps alleviate them by rescheduling manpower or changing hardware.

Job Throughput and Turnaround Time — By examining the SMF-recorded job accounting fields (such as department number, project number, and user ID), and the SMF-recorded job initiation time and date fields, an installation can create a fairly accurate picture of its job throughput and turnaround time. For instance, one installation might analyze its throughput by calculating the total number of jobs initiated within each 15-minute interval and categorizing its jobs into test and production jobs.

Such an installation could use SMF to determine the time of day when the largest number of production jobs were going through the system. Then, by limiting the number of test jobs during that time, the installation might improve its production turnaround time.

Workload Characteristics — SMF provides job and job step information such as:
- Job/step name
- CPU time
- Elapsed (turnaround) time
- Address space dispatching priority
- JES2/JES3 job selection priority
- JES3 deadline type
- Service units
- Workload name
- Service class name and goal
- Resource group name.

By summarizing this type of SMF information for all jobs and job steps over a given period of time, an installation can establish its workload characteristics and set specific standards for each job class and priority. An installation can use this information to determine whether it is meeting its service goals.

Summarizing Direct Access Volume Activity

SMF reports information about problem-program use of direct access volumes. The examples that follow show how operations personnel can use this SMF information to examine problem-program use of direct access storage.

Allocated But Unused Direct Access Storage — There are many times when users make allocation requests for direct access storage that exceed the actual requirement. This misuse can be a significant drain on the direct access resource pool. To determine the number of tracks allocated for sequential data sets but not used, an installation can compare the following two fields in the SMF type 15 records:
- The relative track of the last record written in the DASD extension of the DCB/DEB section.
- The total number of tracks allocated in the DASD extension of the UCB section.

Volume Mounting — SMF writes a type 19 record whenever a volume that is defined by a DD statement is demounted. Summarizing these records by volume can give an installation some indication of its direct access volume mounting activity for problem programs.

In addition, an installation can use the SMF type 25 records to summarize the JES3 volume mounting for problem programs. JES3 produces a type 25 record for each job that main device scheduling (MDS) processes. These records show both the number of tape volumes and the number of disk volumes mounted for a job.

Fragmented Volumes — Periodic analysis of the SMF type 19 records can be useful in identifying direct access volumes whose unallocated space is fragmented. An installation can identify the volumes that might need reorganization by examining the relationship of the following SMF fields:
- The number of unallocated cylinders and tracks.
- The number of cylinders and tracks in the largest unallocated extent.
- The number of unallocated extents.

An installation can further analyze the unallocated space on direct access volumes by comparing the number of unallocated tracks with the number of available data set control blocks (DSCB). For example, such a comparison might show that even though a given volume still has 50 free tracks, its amount of additional space is limited because there is only one available DSCB.

Evaluating Data Set Activity

SMF produces several records that contain information on data set activity. These records, which include types 4, 14, 15, 17, 18, 30, and 34 can help the installation to answer the following questions:
- What is the average data set size for both tape and direct access devices?
- Is the number of multi-volume data sets significantly large?
- What percentage of all data sets are permanent? What percentage are temporary?
- What percentage of all temporary data sets does VIO (virtual input output) control?
- Which data sets do applications use most frequently?
- How often do applications re-use permanent data sets?
- What is the average block size, block count, and EXCP count for each tape data set?
- How are problem programs using chained scheduling?

The following examples show different ways of evaluating problem-program data set activity from SMF records.

Multiple Extents — By checking the "number of extents" field in the UCB section of SMF type 14 and 15 records, an installation can identify direct access data sets that have exceeded their primary allocation and have used secondary allocation. Although useful, secondary allocation might affect system performance and fragment the space on direct access volumes.

One reason to check for data sets that are going into multiple extents is to avoid an X37 abend in a production job the next time it runs. While the job may get the space it needs this time, the next allocation may be on a volume that only has enough space for the primary allocation. The attempt at secondary allocation will fail and waste resources in reruns.

Data Set Modifications — SMF generates a record each time a user:
- Scratches a non-VSAM data set (type 17).
- Renames a non-VSAM data set (type 18).
- Updates a VSAM data set (type 60).
- Defines a catalog entry for the integrated catalog facility (type 61).

- Alters or renames a catalog entry for the integrated catalog facility (type 66).
- Defines or alters a VSAM catalog entry (type 63).
- Deletes a catalog entry for the integrated catalog facility (type 65).
- Deletes a VSAM catalog entry (type 67).
- Renames a VSAM catalog entry (type 68).

By sorting these records by job name or user ID, an installation can produce a report of the data sets that were defined, modified, or deleted by problem programs during a specified interval. Such a report might be useful in a backup situation, especially when critical data sets have been unintentionally altered or destroyed.

Open/Close Activity — SMF writes a type 14 or 15 record whenever a data set is closed or processed by EOV. The installation can determine how many times EOV closed or processed a given data set by counting the number of type 14 and 15 records. (For this kind of report, an installation might want to exclude any SMF records for programs such as sorts, where it is known in advance that the open/close activity is significant.)

Blocking Factors — By examining the “block size” and “logical record length” fields recorded in the SMF type 14 and 15 records, an installation can identify those data sets that the system is processing with ineffective blocking factors. For instance, assume a data set having 10,000 records is processed unblocked with a logical record length of 80 using a 3380 device. An installation discovering such a data set through SMF might increase its block size to 6160 (77 records) to minimize I/O processing overhead and reduce direct access storage requirements.

Optional Services — Although useful, some optional services might hinder system performance if not used appropriately. For example, the write validity check (OPTCD=W) service requires an additional disk rotation to reread the data written for each output block. Similarly, a data set that over uses the chained scheduling (OPTCD=C) service might monopolize the available time on a channel. An installation can use the SMF type 14 and 15 records to ensure that each application that uses an optional service is authorized or justified in using it.

Profiling System Resource Use

Most SMF records contain general identification fields such as the job name, step name, programmer name, reader start time, and reader start date. By sorting and summarizing SMF data according to these types of fields, an installation can create reports or profiles that show each batch job, job step, and TSO/E session’s use of system resources such as:
- CPU time
- Storage
- Paging facilities
- I/O devices
- Service units
- Programming languages.

CPU Time Use — SMF accumulates the job/step CPU time in two separate fields of each job/step termination record: processing time under TCBs and processing time under SRBs. (Chapter 11, “CPU Time” includes a list of the different times that are included and those that are excluded for these CPU time fields). An installation might want to summarize these time fields by program name over a given interval to compare each program’s SRB time with its total CPU time. This summary might identify programs that have excessive interrupt processing.

In addition to CPU time, SMF reports many different times relating to job, job step, APPC/MVS transaction program, and TSO/E session processing including:
- Job/step/TSO/E session/ APPC/MVS work start and stop times.
- Job/step/TSO/E session elapsed (turnaround) time.
- Device allocation start time.
- Problem program start time.
- Initiator selection time.
- TSO/E logon enqueue time.
- Reader start and stop times.
- Converter start and stop times.
- Run processor start and stop times.
- Output processor start and stop times.

By examining these time fields, an installation can profile each job's flow through the system. Such a profile might identify jobs that have abnormally long wait times. These jobs are usually good candidates for further detailed examination. An installation might want to use these time fields to determine which jobs are running on the system at the same time.

Storage Use and Paging Activity — The RMF paging activity record (type 71) is written for specified measurement intervals. It contains information about the demands made on the system paging facilities and the use of real and auxiliary storage including, for example, the number of:
- Non-VIO page-ins and page-outs
- Swap-ins and swap-outs
- Address space swap sequences
- VIO page-ins and page-outs.

An installation can calculate the system paging rate for each specified interval by dividing the number of page-ins and page-outs by the interval's CPU time. By plotting several paging rates over time, an installation can correlate its workload with its real storage capacity.

SMF reports the following information on storage use and paging activity for each job step and TSO/E session:
- Amount of contiguous real storage reserved for a program specifying ADDRSPC=REAL
- Storage used from the top of the private area (includes the LSQA and the SWA)
- Storage used from the bottom of the private area (includes subpools 0-127, 129-132, 244, 251, and 252)
- Number of non-VIO page-ins and page-outs
- Number of swap-ins and swap-outs
- Number of address space swap sequences
- Number of VIO page-ins and page-outs.

An installation can use the SMF field "storage used from the bottom of the private area", along with the paging statistics for the address space, to estimate a job's use of real storage.

I/O Activity — Several SMF records contain useful information about a job, job step, or TSO/E session's I/O activity. For example, the step termination records contain device entries that include the device class, unit type, channel/unit address, and EXCP count. An installation might want to use these SMF fields to isolate those job steps whose I/O activity exceeded certain limits, for example:

- More than a given percentage of the I/O activity was on a certain unit
- More than a given percentage of the I/O activity was on a certain channel path
- More than a given number of data sets on the same direct access volume each had a significantly large number of EXCPs.

Service Activity — An installation can use the SMF termination records to report the number of service units, transaction active time, and performance group number for each job step and TSO/E session. By comparing this information with the information reported in the RMF workload records (type 72), an installation can calculate the percentage of the total system services that it gives to particular performance groups. Such a comparison might be helpful in determining whether service is being distributed according to the goals of the installation. (See *z/OS MVS Initialization and Tuning Guide* for more information on service, transaction active time, and performance group numbers.)

Programming Language Use — SMF type 4, 30, and 34 records contain the name of the program used (taken from the PGM= parameter on the EXEC statement). By sorting these records by program name, an installation can determine to what extent users are compiling in various programming languages, such as PL/1, COBOL, and FORTRAN.

Similarly, an installation can produce reports for specific job categories or installation departments by using key program names such as SORTJOBS, PAYROLL, and STANDRDS. By assigning unique step names and evaluating the SMF step termination records (which report those names), an installation can produce reports for each step in a cataloged procedure.

Maintaining System Security

An installation can use Resource Access Control Facility (RACF) SMF record types (80, 81 and 83) to:

- Track the total use of a resource.
- Identify the resources that are repeated targets of detected unauthorized attempts to access them.
- Identify the users who make detected unauthorized requests.
- Track the activity of a particular user.
- Perform operator command auditing.

z/OS Security Server RACF Auditor's Guide describes how the installation can request that records be written, and how to use the RACF report writer to look at the results.

RACF provides options that allow your installation to control access to resources and, through SMF records, audit your security controls. Note that many of these options significantly increase the number of SMF records your system generates.

Chapter 2. System Requirements and Considerations

Setting up SMF requires your installation to decide what kind of records it wants SMF to produce or what information it wants SMF to gather. Then you can make decisions about how to set SMF up to meet these requirements. Several questions to consider are:

1. What records must SMF produce to give you the information your installation wants?
2. What is the environment SMF will run in and how many jobs run through the system? (The number of records generated by SMF depends on the number of jobs.)
3. Are you running program products (such as RMF or DB2) that might require special considerations for SMF? (See "Special Considerations" on page 2-8.)
4. What is the impact of the system configuration, particularly the type and degree of multiprogramming?
5. How much contention is there for the resources that SMF needs?

To enable SMF to meet your installation's requirements, you must:

- Decide how many SMF data sets you need, allocate the space for the data sets, and then catalog them. (For more information, see "Allocating SMF Data Sets.")
- Decide how to define the parameters of the SMFPRM*xx* parmlib member. (See Chapter 4, "Customizing SMF.")
- Decide if you need additional processing from installation-written routines you provide to the SMF installation exits. (See Chapter 4, "Customizing SMF.")

Allocating SMF Data Sets

To record SMF data, an installation must allocate direct access space and catalog the SMF data sets. **IBM recommends** that you catalog the SMF data sets in the master catalog.

SMF should have a minimum of two data sets for its use, and **IBM recommends** that you run with three SMF data sets to ensure availability.

Select DASDs that can handle the volume of data that SMF generates at your installation. If the I/O rate for a device is too slow, SMF places the data it generates in buffers. The buffers will eventually fill, which could result in lost data. Several factors, such as the specific system configuration, the amount of SMF data to be written, the size of SMF buffers (the control interval size), and your installation's report program requirements, determine which device type is most efficient for a particular installation.

Creating SMF Data Sets

You should create at least two SMF data sets to store the system and job-related information that SMF collects. SMF data sets should be RACF-protected. Each one is identified by a 1-44 character data set name.

SMF data-gathering routines fill the data sets one at a time. While the gathering routines write records on one data set, SMF can write out or clear the others. SMF continues to write records while it can find an empty inactive data set when the active data set becomes full (see "Using SMFPRMxx parameters" on page 4-1).

You can use the DEFINE command of the access methods services utility to create the data sets after system installation (see "Using DEFINE to Create SMF Data Sets"). Allocate each SMF data set as a single-extent VSAM cluster on a single volume and catalog it in the master catalog. Do not specify secondary space for any of the cluster's components. Specify the same control interval size for all SMF data sets that a particular system will use.

You can specify the data sets to be used for SMF recording on the DSNAME parameter in the SMFPRMxx parmlib member. In a multisystem environment, you can use system symbols to allow each system to generate unique SMF data set names from a single definition, as explained in the following section.

Sharing an SMFPRMxx Parmlib Member

When you set up SMF in a multisystem environment, you might need to specify a recording data set for each system. If two or more systems share an SMFPRMxx parmlib member, you can specify symbols in the recording data set name in SMFPRMxx to allow the systems to specify unique values. For example, suppose two systems share an SMFPRMxx parmlib member that specifies the following:

```
DSNAME(&SID..MAN1,&SID..MAN2,&SID..MAN3)
```

Suppose the substitution text for the &SID symbol is SYSA on one system and SYSB on the other. When you IPL system SYSA, the recording data sets are:
- SYSA.MAN1
- SYSA.MAN2
- SYSA.MAN3

When you IPL system SYSB, the recording data sets are:
- SYSB.MAN1
- SYSB.MAN2
- SYSB.MAN3

If system A and system B are sharing the same catalog, you can easily identify the systems to which the SMF data sets are associated.

For more information about symbols and how to specify them in SMFPRMxx, see the chapter on sharing parmlib members and the description of SMFPRMxx in *z/OS MVS Initialization and Tuning Reference*.

Using DEFINE to Create SMF Data Sets

Before you can use an SMF data set, you must both define the data set and preformat the data set. To define the data set, use the DEFINE access methods services utility. To preformat the data set with dummy records, use the IFASMFDP program. If you do not preformat an SMF data set, SMF preformats it during initialization, which increases the time needed to IPL the system.

Defining an SMF data set: When you define an SMF data set, specify the following options for DEFINE:

- REUSE indicates that the data set can be cleared by the dump program.
- CONTROLINTERVALSIZE indicates the size of the SMF buffer. For the SMF data sets, you can specify ANY value between 0.5 (512 bytes) and 26K (26624 bytes), with certain restrictions. See "Selecting the SMF Data Set Control Interval" on page 2-4 for more details.

- SHAREOPTIONS has two sub-options (values) that define the level of sharing. The cross-region value must be 2. This indicates that sharing occurs with reading and serialization occurs with writing. The cross-system value is allowed to default.
- NONINDEXED indicates that the entries are entry-sequenced.
- SPANNED indicates that the records can span control intervals.
- SPEED indicates that the data set will not be preformatted by VSAM while IFASMFDP is preformatting. (If SPEED is not selected, VSAM and SMF preformat concurrently.)

Note: SMF does not support extended-addressability VSAM data sets. Thus, the largest SMF data set cannot be larger than 4 gigabytes. For example, you must limit the number of cylinders you request to a maximum of 5800 for a data set on a 3390 device type.

If DATABASE 2 (DB2) performance, serviceability, or audit data is sent to SMF, see “Special Considerations” on page 2-8.

Figure 2-1 shows the JCL statements needed to use the DEFINE utility to allocate one SMF data set on a direct access device and catalog it in the system catalog. This figure assumes that an IPL with the NOACTIVE SMF parameter was performed. For VSAM catalog users, this figure also assumes that the VSAM data space already exists. Each SMF data set must be created according to this example before the first IPL that starts SMF recording.

```
//CREATE EXEC PGM=IDCAMS
//SYSPRINT DD SYSOUT=A
//SYSIN DD *
   DEFINE CLUSTER  (NAME(SYS1.MANX)             +
                   VOLUME(xxxxxx)               +
                   NONINDEXED                   +
                   CYLINDERS(nn)                +
                   REUSE                        +
                   RECORDSIZE(4086,32767)       +
                   SPANNED                      +
                   SPEED                        +
                                   CONTROLINTERVALSIZE(nnnn)    +
                   SHAREOPTIONS(2))
/*
```

Figure 2-1. Sample JCL Statements for Allocating the SMF Data Sets

Preformatting an SMF data set: When you use the IFASMFDP SMF dump program to preformat an SMF data set, use the BUFFERSPACE(81920) AMP=BUFND=nn option parameter on the DD statement specified in the INDD(ddname,OPTIONS(CLEAR)) parameter to improve the performance of the preformatting processing. (The number of data buffers desired is specified by nn, e.g., 10. Note that 10 buffers with a CISIZE of 26K will require 260K of memory.)

The step in Figure 2-2 preformats the data set. As stated earlier, using IFASMFDP to preformat the data set during the definition process avoids increasing the time required to IPL the system.

```
//FORMAT EXEC PGM=IFASMFDP
//SYSPRINT DD SYSOUT=A
//NEWDS DD DSN=SYS1.MANX,DISP=SHR
//SYSIN DD *
   INDD(NEWDS,OPTIONS(CLEAR))
/*
```

Figure 2-2. Sample JCL Statements for Preformatting the SMF Data Sets

Regardless of how the SMF data sets are created, the amount of DASD space they require depends on the amount of data generated and how often the data sets are dumped. The amount of data generated depends on the system work load and the record types selected for writing to the SMF data set.

If SMF data is available from a system similar to your own, you can use the report produced by the SMF dump program to estimate the amount of data generated. Otherwise, you might select a trial size for the data sets and adjust it as necessary. For example, you might start with two SMF data sets, each with 25 cylinders of space on a 3390. If the data sets fill up too quickly and data is lost, you can allocate more space for each data set, or create additional data sets.

Selecting the SMF Data Set Control Interval: The control-interval (CI) size of SMF data sets can range from 0.5K (512 bytes) to 26K (26624 bytes) in size, with certain restrictions. The user specifies the CI size of the SMF data set and the device type when the VSAM data set is defined. Then, VSAM chooses the physical record size of the data set based on the specified CI size and the track size of the specified device type. SMF requires the CI size to equal the physical record size; otherwise, SMF cannot open the data set. Instead, SMF issues an error message to the console in addition to displaying the 'feedback' code.

The default CI size is 4K. Choose a larger value only if the default is so small that it makes the I/O rate too high.

When you choose a CI size, verify that the physical record size that VSAM selects for the DASD you specify equals that CI size. The following table shows some examples of valid user CI-size choices and the physical-record sizes that VSAM chooses for specific DASD.

Control Interval (CI) Size	Physical Record Size	DASD
16K (16384 bytes)	16K (16384 bytes)	3350
22K (22528 bytes)	22K (22528 bytes)	3380
26K (26624 bytes)	26K (26624 bytes)	3390

Before choosing a CI size, determine the size of your typical SMF record. To avoid wasting DASD storage, select a value that is either an integral multiple or an even divisor of that record size because records that cross a CI boundary when copied to DASD waste DASD storage. For example, if you specify a CI of 26K for a 30K SMF record, the record requires two 26K intervals (or 52K of storage) when copied to DASD, wasting 22K of DASD storage.

The CI size of the first SMF data set that the system opens during an IPL will be the CI size for all SMF data sets for that IPL. If SMF encounters a data set with a different CI size, then the data set is not used, and the system displays a message on the console informing the operator of the problem. A data set that has any error does not go on the list of active data sets. If all data sets fail to be successfully opened and allocated, then 4K (4096 bytes) is chosen as the default CI size for the IPL, and SMF buffers the data.

If you define a new group of SMF data sets with a different CI size, you must re-IPL to use these data sets. When you define an SMF data set, the logical record size must be 10 less than the CI size.

Using SMF Data Sets

During initialization, SMF searches the list of data sets specified on the DSNAME parameter of the SMFPRMxx member for the first non-full data set. The search proceeds in the order that the data sets were defined. If a data set is found, that one becomes the ACTIVE data set. The remaining data sets are processed such that any non-empty data set will be set to status of DUMP REQUIRED, and any empty data set will be set to status of ALTERNATE.

If no non-full data set is found, SMF stores the records in its buffers until a data set is made available. To make a data set available, or to empty it, you must run the SMF dump program. For more information, see Chapter 3, "The SMF Dump Program."

The first data set specified on the DSNAME parameter of the SMFPRMxx parmlib member is called the primary data set and should be allocated on a high performance device; the rest are secondary data sets.

The following examples show the result of a D SMF command issued under different SMF initialization environments:

Data Set Initialization Example 1

The following example shows the results of initialization when there is 1 non-full and 2 empty data sets.

```
d smf
IEE949I 11.05.21 SMF DATA SETS 728
  NAME        VOLSER SIZE(BLKS) %FULL STATUS
P-SYS1.MANA SMFVL1       15000   15  ACTIVE
S-SYS1.MANB SMFVL2        300    0   ALTERNATE
S-SYS1.MANC SMFVL2        300    0   ALTERNATE
```

Data Set Initialization Example 2

The following example shows the results of initialization when the first data set is full (contains data left over from the previous system IPL) and the second one is non-full.

```
d smf
IEE949I 11.05.21 SMF DATA SETS 728
  NAME        VOLSER SIZE(BLKS) %FULL STATUS
P-SYS1.MANA SMFVL1       15000  100  DUMP REQUIRED
S-SYS1.MANB SMFVL2        300    1   ACTIVE
S-SYS1.MANC SMFVL2        300    0   ALTERNATE
```

Data Set Initialization Example 3

The following example shows the result when the first data set is non-full, and the second and third data sets contain data left over from previous system IPL.

```
d smf
IEE949I 11.05.21 SMF DATA SETS 728
  NAME        VOLSER SIZE(BLKS) %FULL STATUS
```

```
P-SYS1.MANA SMFVL1       15000   20  ACTIVE
S-SYS1.MANB SMFVL2        300    1   DUMP REQUIRED
S-SYS1.MANC SMFVL2        300   100  DUMP REQUIRED
```

Switching the SMF Data Sets

When the SMF data set that is currently being recording on becomes full, SMF does the following:

- Automatically closes the full data set, making it available for dumping.
- Locates the new data set to open by starting at the **top** of the list of data sets specified on the DSNAME parameter of the SMFPRM*xx* member and looking for the first available data set.

For example, suppose an installation defined three data sets, DS1, DS2, and DS3, in that order on the DSNAME parameter of SMFPRM*xx*. Now, lets say that SMF is writing to DS2, while DS1 and DS3 are empty. When DS2 fills, the installation issues `I SMF`to switch to a data set that still has room, SMF will use data set DS1 because it is at the top of the list in SMFPRMxx.

If the first available data set is not completely empty, SMF will begin to store the records in its buffers, even though there might be enough room in that data set for the records it is trying to write, and even though others of the SMF data sets might be completely empty.

Full means that the record which SMF is currently preparing to write out will not fit into the space left on the current SMF data set. It is possible that a data set might become “full” when it is less than 100% filled.

To prepare an SMF data set for dumping *before* it becomes full, the operator uses the SWITCH SMF command. When switching the SMF data sets, an inactive data set cannot become active unless it is empty. Therefore, before issuing the SWITCH command, the operator should use the DISPLAY SMF command to verify that there is at least one alternate data set. If the operator does not make this check, data might be lost.

The HALT EOD command causes a switch of SMF data sets but should be used only if the operator intends to quiesce the system in preparation to shut down. The HALT command should never be used if you intend to keep running, because it closes the system log.

When the operator issues either the HALT EOD or the SWITCH SMF command, the following actions occur:

- A type 19 record is created for each online direct access device (if a type 19 record was specified)
- For a SWITCH SMF command, a type 90 record is created to show the old and new data set names
- The SMF buffer is written to the active SMF data set
- The SMF data sets are switched so that the operator can dump the previously active data set.

Dumping SMF Data Sets

See Chapter 3, “The SMF Dump Program” for a discussion about the SMF dump program, and how to dump SMF data sets.

Preserving SMF Data

SMF copies records (that are passed to SMF) to buffers and asynchronously writes these records to the SMF data sets. The control interval size (size of an SMF data set) you select for the SMF data sets determines the size of each SMF buffer. To keep real storage use to a minimum, SMF automatically obtains and releases more buffers as SMF activity increases and decreases.

When no output data sets are available for use or when SMF collects data more quickly than it can write records, SMF holds the data in its address space. You must correct the condition causing the problem before SMF uses all of the available storage, or data will be lost.

SMF writes message IEE986E to the console when the percentage of buffers in use in the SMF address space reaches or exceeds the buffer usage warning percentage for all available storage. The buffer usage warning percentage is specified with the BUFUSEWARN parameter (the default value is 25 percent, see “Using SMFPRMxx parameters” on page 4-1 for more information). The maximum amount of storage available to SMF is set with the BUFSIZMAX parameter (the default is 128M, see “Using SMFPRMxx parameters” on page 4-1). Until the percentage of buffers in use decreases below the specified BUFUSEWARN value, message IEE986E is redisplayed with updated percentage values as each additional SMF buffer is made ready for use or becomes available. When the percentage of buffers in use decreases below the specified BUFUSEWARN value, the message is deleted. If the percentage of use does not decrease then following possible system actions can be taken:

1. Use the DISPLAY SMF command to check on the status of the SMF data sets. If there are no data sets active, use the SMF dump program (IFASMFDP) to clear one and make it available for use.
2. The DISPLAY SMF, O command can be used to determine the maximum amount of buffer space available for SMF to use. If the percentage of buffer space in use is approaching or has reached the 100 percent level of all available storage for SMF buffering, then consider increasing the BUFSIZMAX value to allow for additional SMF record buffering. This action can aid in reducing the loss of SMF record data when there is a spike in SMF recording activity and there is a temporary inhibitor to making the SMF data set available for use. Since the BUFSIZMAX value can also be reduced from its current setting, if an increase is put into effect to handle a temporary constraint condition, then the BUFSIZMAX value can be reduced when the constraint clears.
3. In addition, use the DISPLAY SMF,O command to check the record types that are being collected. Reducing the number of records being collected will slow the allocation and use of the buffers.

After taking the above possible system actions, if the percentage of use still does not decrease SMF will eventually run out of storage for its buffers and stop recording data resulting in lost SMF records. Use the SMF NOBUFFS parameter (see “Using SMFPRMxx parameters” on page 4-1), to specify what the system is to do in this situation. The possible system actions are:
1. continue processing with the loss of SMF data or
2. enter a restartable wait state.

In the same way, you can control system action when the last available SMF data set is filled using the SMF LASTDS parameter.

Use the MAXDORM parameter to minimize the amount of data lost because of system failure. By specifying MAXDORM, your installation specifies the period of real time that data is permitted to remain in the SMF buffer before it is written. (See “Using SMFPRMxx parameters” on page 4-1.)

When there is a system failure, data in the SMF address space is lost, because it has not yet been written to a data set. If the events recorded in SMF records are very important to your installation, you should take a system dump that includes the SMF address space.

You can use the Interactive Problem Control System (IPCS) subcommand SMFDATA to read the dump, extract the data in the SMF buffers, and write it to an SMF data set. For more information on SMFDATA, see *z/OS MVS IPCS Commands*.

Special Considerations

If your environment includes programs like RMF, JES3, or DB2, you may have to take their requirements into consideration when setting up SMF.

If SMF is processing records for DB2, the volume of data can be quite large. You must ensure an adequate number of VSAM buffers at initialization and sufficiently large SMF data sets.

If you are running a JES3 complex or using RMF, you might need to allocate larger data sets. If DASD space is severely limited in your installation, you might have to dump the data sets more frequently. The same considerations apply if you are using RACF and auditing many security-related events.

Chapter 3. The SMF Dump Program

When the current recording data set cannot accommodate any more records, the SMF writer routine automatically switches recording from the active SMF data set to an empty SMF data set, and then passes control to the IEFU29 SMF dump exit. The operator is then informed that the data set needs to be dumped. (For more information on the IEFU29 exit, see the *z/OS MVS Installation Exits* book.)

Dumping the SMF Data Sets

SMF data sets cannot be shared across systems. IBM does not recommend that the SMF dump program be run from one system in an attempt to clear a SMF data set used by another system.

When notified by the system that a full data set needs to be dumped, the operator uses the SMF dump program (IFASMFDP) to transfer the contents of the full SMF data set to another data set, and to reset the status of the dumped data set to empty so that SMF can use it again for recording data.

The SMF dump program dumps the contents of multiple VSAM or QSAM data sets to sequential data sets on either tape or direct access devices. The SMF dump program allows the installation to route different records to separate files and produce a summary activity report. This report is described in “Creating the Summary Activity Report” on page 3-7. The job control language (JCL) to execute the SMF dump program is described in “Running the SMF Dump Program” on page 3-5.

The SMF dump program copies the input data sets to the output data sets. During the copy process, the SMF dump program creates two SMF records and writes them to every output data set: a dump header (record type 2) at the beginning of the data set and a dump trailer (record type 3) at the end of the data set.

If problems are encountered, the SMF dump program writes messages, as required, to the SYSOUT data set. The messages describe the following problems:

- The operator must not clear a data set that is being filled. If the operator attempts to clear the active SMF data set, the SMF dump program returns a code of X'08' in register 15. The operator can, however, dump the active or alternate data set without clearing it.
- If the SMF dump program is unable to open either the input or output data sets, it writes an error message indicating which data set was not successfully opened.
- If all SMF data sets and the SMF buffers become full, SMF will be in a data lost condition (unable to record) until dumping takes place. When this condition occurs, SMF tracks the number of lost records in record type 7 and the operator receives a message stating that data is being lost.

The SMF dump program writes a message to the SYSPRINT data set for all input and output data sets and includes the names of the data sets in the message.

Processing the SMF Dump Program

Parameters control the processing of the SMF dump program. When you specify the parameters as input to the program, the following syntax rules apply:

- Specify data in columns 1 to 71 of the input statement.
- You cannot continue a statement.

- Blanks are allowed anywhere in the statement except within a keyword or value.
- You can specify comments by enclosing them with /* */ delimiters. However, the comments do not appear in the SYSPRINT listing.

Table 3-1 lists the parameters that control IFASMFDP processing.

Table 3-1. SMF dump program (IFASMFDP) parameters

Parameter	Meaning and Use
INDD(*ddname*,OPTIONS(*data*))	Describes the input data set, where *ddname* is the data definition name (DDNAME) of the data set and *data* can be any one of the following: • DUMP indicates that the input data set is to be read or copied without being reset. • CLEAR indicates that the input data set is to be reset and preformatted. The information on the data set is not copied and therefore lost. • ALL indicates both the DUMP and CLEAR options. If INDD is not specified, the default is: INDD(DUMPIN,OPTIONS(ALL)) If DUMP or ALL is specified, a summary activity report is written if at least one record was read or written. For more information, see "Creating the Summary Activity Report" on page 3-7.
OUTDD(*ddname*,TYPE(*list*)), OUTDD(*ddname*,NOTYPE(*list*))	Describes the output data set, where *ddname* is the data definition name (DDNAME) of the output data set. TYPE indicates that the records specified in *list* are to be included in the data set. NOTYPE indicates that all record types and subtypes specified in *list* are to be excluded in the data set. The *list* variable can be any record type and subtype or combination of records; the record types and subtypes can be specified individually or as a range. For example, TYPE(2,4:7,9,30(2,4:6)) indicates that records 2, 4, 5, 6, 7, 9, and subtypes 2, 4, 5, and 6 of the type 30 record are to be included in the data set. NOTYPE(30(1,3:5)) indicates that subtypes 1, 3, 4, and 5 of record type 30 will not be recorded. If OUTDD is not specified, the default is: OUTDD(DUMPOUT,TYPE(000:255)) in which all types and subtypes are included in the data set. If both TYPE and NOTYPE are specified for the same data set, the first valid specification is used. If a syntax error occurs in the OUTDD option and any INDD option specified ALL, DUMP, or CLEAR, the job is terminated.
DATE({*yyddd|yyyyddd},* *yyddd|yyyyddd*})	Specifies the start and end date for the period for which records are to be written, where *yy* is the last two digits of the year, *yyyy* is the year digits of the year and *ddd* is the Julian date. If only the last two digits of the year is specified, the first two digits defaults to 19. For example, DATE(92001,92366) indicates only records from January 1, 1992 to December 31, 1992 are to be written. The value for *ddd* cannot exceed 366. If DATE is specified, both a start and an end date must be included. If DATE is not specified, the default is: DATE(1900000,2099366)
START(*hhmm*)	Specifies that only those records that were recorded after the START time and before the END time are to be written, where *hh* is the hours and *mm* is the minutes (based on a 24-hour clock). If START is not specified, the default is: START(0000)

Table 3-1. SMF dump program (IFASMFDP) parameters (continued)

Parameter	Meaning and Use
END(*hhmm*)	Specifies that only those records that were recorded after the START time and before the END time are to be written, where *hh* is the hours and *mm* is the minutes (based on a 24-hour clock). If END is not specified, the default is: END(2400)
SID(*xxxx*)	Specifies that only records written by the operating system with the specified system identifier can be written to the output data set, where *xxxx*, which indicates the system identifier, can be any one to four alphameric characters. SID can be specified for each system the SMF dump program is expected to handle. If SID is not specified, records pertaining to any operating system are written.
ABEND(RETRY|NORETRY)	Specifies whether the SMF dump program attempts to recover from an abend (abnormal end of task). When specified, this option overrides the SMF parmlib option (DUMPABND). If the RETRY parameter is issued, then the SMF dump program attempts to recover from the abend. If the NORETRY parameter is issued, then the SMF dump program terminates after the abend has occurred. The SMF dump program overrides NORETRY when, while SMF dump is dumping and clearing the input data set, an ABEND occurs after the input data set has been cleared. In this case, the SMF dump program tries to recover from the ABEND to prevent the deletion of the output data set and the loss of SMF data when the SMF dump program abnormally ends.
USER1(*name*)	Specifies the *name* of a installation-written exit routine that is given control after each record is read and the counters incremented. The parameter list pointed to by register 1 contains the address of the three-word user work area in word 1, the address of the SMF record in word 2, and the address of the INDD *ddname* in word 3. The exit routine must set a return code in register 15 before passing control back to the SMF dump program. The return codes are as follows: **Code** **Meaning** **00** Normal processing should continue **04** The record should not be written to the output data set. Any other return code indicates that a problem was encountered and that the SMF dump program is not to invoke the exit again.
USER2(*name*)	Specifies the *name* of the installation-written exit routine that is given control only when the SMF dump program selects a record to be written. The parameter list pointed to by register 1 contains the address of the three-word user work area in word 1, the address of the SMF record in word 2, and the address of the OUTDD *ddname* in word 3. This exit is always called by the SMF dump program before any records are written. The return codes are the same as those for USER1.

Table 3-1. SMF dump program (IFASMFDP) parameters (continued)

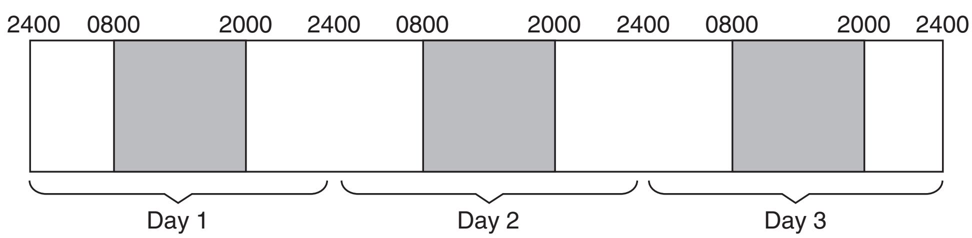
Parameter	Meaning and Use
USER3(*name*)	Specifies the *name* of the installation-written exit routine that is given control after the output data set is closed. This routine is invoked for each output data set. The parameter list pointed to by register 1 contains the address of the three-word user work area in word 1, the address of the output DCB in word 2, and the address of the OUTDD *ddname* in word 3. The exit routine must set a return code in register 15 before passing control back to the SMF dump program. The return codes for USER3 are as follows: **Code** **Meaning** **0** Normal processing should continue **Non 0** A problem was encountered and the SMF dump program is not to invoke the exit again.
Note: The name field in USER1, USER2, or USER3 specifies the name of a load module that the SMF dump program loads and calls at the indicated times. You can either link-edit each exit into an APF-authorized library in LINKLIST (but do not use the AC=1 attribute) or use a //STEPLIB DD card.	

Notes:

1. If a syntax error occurs in the processing of a parameter, SMF does not process the parameter and sends a message to the SYSPRINT data set. If a parameter is not specified, the default is used. The valid dump parameters specified or used by default are listed in the SYSPRINT data set on completion of the SMF dump program.
2. If the start time is less than the end time, the records selected for any particular day are those records produced after the start time and before the end time. For example, if you specify:

   START(0800),END(2000)

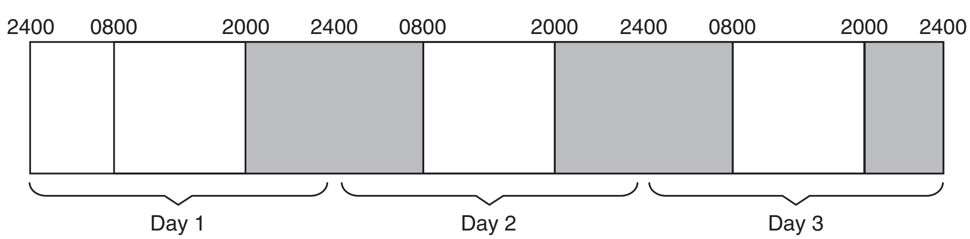
   SMF selects records during the period indicated by the shaded area:



   If the start time is greater than the end time, all records produced between the start time and the end time on the following day are selected. For example, if you specify:

   START(2000),END(0800)

   SMF selects records during the time period indicated by the shaded area:



Note that SMF does not select the records produced between 0800 hours and 2000 hours in any day.

3. User records must include a standard record header; the SMF dump program might not flag an error in a record that does not have a standard header.

Running the SMF Dump Program

IBM recommends that you use the IEFU29 SMF dump exit to run the SMF dump program. When the current recording data set cannot hold any more records, the SMF writer routine automatically switches recording from the active SMF data set to an empty SMF data set, and passes control to the IEFU29 dump exit. This avoids the need for operator intervention. See the *z/OS MVS Installation Exits* book for more information about the IEFU29 dump exit.

Another method to run the SMF dump program is shown (sample JCL) in Figure 3-1. The output is a non-temporary data set on a standard-labeled tape. The operator should record the volume serial number of the output data set so that other jobs can reference it. In this example, the DCB= keyword is not specified, so the SMF dump program assigns the following DCB attributes.

- BLKSIZE=0 (allows the system to determine the optimum block size)
- LRECL=32767
- RECFM=VBS

If you specify DCB parameters, you must specify RECFM=VBS. You can specify LRECL=32760 instead of 32767. You can also specify any block size from 4096 to the maximum allowed for the chosen device.

```
//DUMPX     JOB   MSGLEVEL=1
//STEP1     EXEC  PGM=IFASMFDP
//DUMPIN    DD    DSN=data set name, DISP=SHR
//DUMPOUT   DD    DSN=SMFDATA,UNIT=tapeaddr,
//                DISP=(NEW,KEEP),LABEL=(,SL),VOL=SER=serial
//SYSPRINT  DD    SYSOUT=A
```

Figure 3-1. Sample JCL for Running the SMF Dump Program

Figure 3-2 shows a sample job using the SMF dump program to dump and clear an SMF data set (INDD1) and to combine its records with those in an old dumped data set (INDD2) to three data sets.

Figure 3-2 illustrates the following:

```
//IFASMFDP  JOB   accounting information
//STEP      EXEC  PGM=IFASMFDP
//INDD1     DD    DSN=SYS1.MANB,DISP=SHR
//INDD2     DD    DSN=SMFDATA,UNIT=TAPE,DISP=SHR,VOL=SER=SMFTAP
//OUTDD1    DD    DSN=ALLSMF.TYPE0.TYPE40,DISP=SHR
//OUTDD2    DD    DSN=ALLSMF.TYPE10.TYPE255,DISP=SHR,DCB=BLKSIZE=32000
//OUTDD3    DD    DSN=ALLSMF.TYPE10.TYPE255B,DISP=SHR,DCB=LRECL=32760
//SYSPRINT  DD    SYSOUT=A
//SYSIN     DD    *
       INDD(INDD1,OPTIONS(ALL))
       INDD(INDD2,OPTIONS(DUMP))
       OUTDD(OUTDD1,TYPE(0,2,10,15:40))
       OUTDD(OUTDD2,TYPE(10:255))
       OUTDD(OUTDD3,TYPE(10:255))
       DATE(92002,92366)
       SID(308A)
       SID(308B)
/*
```

Figure 3-2. Sample Job for Dumping SMF Data Sets

- The DCB= keyword has been coded for the output data set defined by OUTDD2. Any block size 4096 or greater may be specified. Choosing a block size suitable for the device type being used will improve storage resource use. For this job, the data set specified by OUTDD1 will have a system determined block size while the data set specified by OUTDD2 will have a block size of 32000.
- The LRECL= keyword has been coded for an output data set defined as OUTDD3. For this job, the data set specified by OUTDD3 will have an LRECL of 32760. For OUTDD2, the LRECL will default to 32767.

There can be any number of input (INDD) or output (OUTDD) files in the SMF dump program. The input files are dumped in reverse order unless concatenated under one input file. For example, in Figure 3-2 on page 3-5, two input files are specified. After the SMF dump program is processed, the output file contains the records from INDD2 first, followed by the records from INDD1.

After the SMF dump program job shown in Figure 3-2 on page 3-5 runs, the following information is listed in the SYSPRINT data set.

```
SMF DUMP PARAMETERS
SID(308A) - SYSIN
SID(308B) - SYSIN
END(2400) - DEFAULT
START(0000) - DEFAULT
DATE(92002,92366) - SYSIN
OUTDD(OUTDD3,TYPE(10:255)) - SYSIN
OUTDD(OUTDD2,TYPE(10:255)) - SYSIN
OUTDD(OUTDD1,TYPE(0,2,10,15:40)) - SYSIN
INDD(INDD2,,OPTIONS(DUMP)) - SYSIN
INDD(INDD1,OPTIONS(ALL)) - SYSIN
```

One method of running the SMF dump program is to enter jobs that specify the SMF dump program into the system, and hold them on the job queue until a dump is required. Another method is to start a reader to an input stream containing the JCL for the SMF dump program. Figure 3-3 on page 3-7 shows two sample procedures (DUMPX and DUMPY) for dumping the SMF data sets to a standard-labeled tape (VOL=SER=SMFTAP) with the operator START command. In both procedures, the default tape specified on the PROC statements is 192. Figure 3-3 on page 3-7 shows sample JCL for adding these procedures to SYS1.PROCLIB.

```
//UPDATE    JOB   MSGLEVEL=1
//UPDATE    EXEC  PGM=IEBUPDTE,PARM=NEW
//SYSUT1    DD    DSN=SYS1.PROCLIB,DISP=SHR
//SYSUT2    DD    DSN=SYS1.PROCLIB,DISP=SHR
//SYSPRINT  DD    SYSOUT=A
//SYSIN     DD    DATA
./          ADD   NAME=DUMPX,LIST=ALL
//DUMPX     PROC  TAPE=192
//SMFDMP    EXEC  PGM=IFASMFDP
//DUMPIN    DD    DSNAME=SMFDATA,UNIT=&TAPE,DISP=(MOD,KEEP),
//                LABEL=(,SL),VOL=SER=SMFTAP
//SYSPRINT  DD    SYSOUT=A
./          ADD   NAME=DUMPY,LIST=ALL
//DUMPY     PROC  TAPE=192
//SMFDMP    EXEC  PGM=IFASMFDP
//DUMPIN    DD    DSNAME=SYS1.MANY,DISP=SHR
//DUMPOUT   DD    DSNAME=SMFDATA,UNIT=&TAPE,DISP=(MOD,KEEP),
//                LABEL=(,SL),VOL=SER=SMFTAP
//SYSPRINT  DD    SYSOUT=A
./ENDUP
/*
```

Figure 3-3. Sample Procedures for Dumping the SMF Data Sets

The CLEAR function of the SMF dump program requires APF-authorization. Running the SMF dump program shown in the above JCL examples preserves the APF-authorization assigned to the SMF dump program. Invoking the SMF dump program in any way other than as shown above (for example, invoking the SMF dump program from another program or invoking it as a TSO/E command), might cause it to lose its authorization.

The DUMP function is permitted in an unauthorized environment. If the CLEAR function is attempted, a message is written indicating that the request was denied.

For more information on APF-authorization, see *z/OS MVS Programming: Authorized Assembler Services Guide*. For more information on running authorized programs under TSO/E, see *z/OS TSO/E Customization*.

The dump utility of the SMF dump program issues the following return codes:

Code	**Meaning**
00	The dump was successful; no errors were encountered.
04	The dump was successful; one or more errors were detected but processing continued.
08	The dump was not successful; an error terminated processing.

Creating the Summary Activity Report

The SMF dump program creates a summary activity report when the DUMP option was specified for any of the input data sets and at least one record was read or written.

Table 3-2 shows an example of the summary activity report the SMF dump program creates. The meaning of each heading is:

- START DATE-TIME indicates the date and time of the earliest record read, excluding record types 2, 3, and those greater than 127.
- END DATE-TIME indicates the date and time of the latest record read, excluding record types 2, 3, and those greater than 127.

- RECORD TYPE indicates the identifying number of each record type read by the SMF dump program.
- RECORDS READ indicates the number of input records read for each record type.
- PERCENT OF TOTAL indicates the number of records read for each type divided by total number of records read.
- AVG RECORD LENGTH, MIN RECORD LENGTH, and MAX RECORD LENGTH indicate, respectively, the average, minimum, and maximum lengths of the records read for each record type.
- RECORDS WRITTEN indicates the number of output records written to the output data sets as specified by the SYSIN parameters.
- TOTAL indicates the total activity for each column.
- NUMBER OF RECORDS IN ERROR indicates the number of records that were not dumped because of errors. There are two types of errors:
  1. Incorrectly-spanned records cannot be read. (A spanned record is larger than the control-interval size of the SMF data set.) These records may be encountered if a physical I/O error occurred on a recording data set while a spanned record was being written. The SMF dump program is unable to read incorrectly-spanned records.
  2. Incorrectly-formatted time or date values in record-header fields prevent processing of the record. The record is read but not written or processed. If your installation writes user records (record types ranging from 128 through 255), see “Standard SMF Record Header” on page 13-1 for a description of the proper header format.

  If there are any records in error, the INDD-name, type of error (INVALID TIME OR DATE or INCONSISTENT SPANNED RECORD), record sequence number, and the first 32 bytes of the record (in error) are printed. This processing is performed only for the first 500 records in error of each SMF recording data set. When more than 500 records in error are found, the SMF dump program writes message IFA024I to the SYSPRINT data set. Subsequent records in error are not printed, but are counted in the total number of records in error. The record sequence number is the sequential number of the record in the INDD.

Table 3-2. Summary Activity Report

START DATE-TIME 12/28/1992				**END DATE-TIME 12/28/1992—23:29:02**		
RECORD TYPE	**RECORDS READ**	**PERCENT OF TOTAL**	**AVG. RECORD LENGTH**	**MIN. RECORD LENGTH**	**MAX. RECORD LENGTH**	**RECORDS WRITTEN**
0	13	.01%	35.00	35	35	13
2	0					1
3	0					1
4	25,399	12.90%	265.93	183	935	25,399
5	5,084	2.58%	161.92	130	186	5,084
6	11,526	5.86%	90.80	88	94	11,526
9	60	.03%	24.40	24	32	60
10	368	.19%	48.00	48	48	368
11	331	.17%	24.00	24	24	331
19	2,483	1.26%	68.00	68	68	2,483
20	7,953	4.04%	94.75	74	130	7,953

Table 3-2. Summary Activity Report (continued)

START DATE-TIME 12/28/1992				**END DATE-TIME 12/28/1992—23:29:02**		
RECORD TYPE	**RECORDS READ**	**PERCENT OF TOTAL**	**AVG. RECORD LENGTH**	**MIN. RECORD LENGTH**	**MAX. RECORD LENGTH**	**RECORDS WRITTEN**
21	3,115	1.58%	48.00	48	48	3,115
26	10,394	5.28%	236.00	236	236	10,394
31	23	.01%	58.00	58	58	23
34	2,604	1.32%	436.64	183	1,055	2,604
35	2,602	1.32%	130.00	130	130	2,602
40	107,178	54.45%	84.36	74	882	107,178
43	17	.01%	32.00	32	32	17
45	4	.00%	28.00	28	28	4
47	75	.04%	54.53	52	90	75
48	16	.01%	74.53	73	75	16
70	360	.18%	500.00	500	500	360
71	359	.18%	344.00	344	344	359
72	4,308	2.19%	158.05	136	312	4,308
73	360	.18%	795.30	660	926	360
74	1,083	.55%	5,662.60	148	8,128	1,083
75	2,513	1.28%	160.00	160	160	2,513
170	7,689	3.92%	95.00	95	95	7,689
248	790	.40%	86.00	86	86	790
249	108	.05%	86.00	86	86	208
TOTAL	196,825	100%	159.00	24	8,128	196,825
NUMBER OF RECORDS IN ERROR: 3						

Figure 3-4 shows an example of a record in error.

```
                        INDD: INDD1


ERROR TYPE: INCONSISTENT SPANNED RECORD
RECORD SEQUENCE NUMBER: 5
005B0000 1E140056 51510092 060FF3F0 F9F0D4E2 E3D1C3D3 F0F00056 4D840092  * j 3090MSTJCL00 *


ERROR TYPE: INVALID TIME OR DATE
RECORD SEQUENCE NUMBER: 1,555,988
021D0000 1E3C0000 00000000 000003F0 F9F04040 4040E4D7 00000028 000A0001  * j 3090 UP      *




                        INDD: INDD2


ERROR TYPE: INCONSISTENT SPANNED RECORD
RECORD SEQUENCE NUMBER: 8
010A0000 DE1E0056 51510092 060FF3F0 F9F0E2E3 C3400001 00000070 00160001  * j 3090STC      *
```

Figure 3-4. Example of a Record in Error

Special Considerations

Installations that choose to read the SMF data sets directly rather than using the SMF dump program, should note that SMF preformats its data sets with dummy records. A dummy record is shorter than any valid SMF record and is easily identified because it contains the characters “SMFEOFMARK”. The SMF dump program terminates processing when it encounters a dummy record, thereby improving data set processing performance.

Cancelling the SMF dump program is not advised, as it can leave the SMF data sets in an unpredictable state.

Programs that access the output of the SMF dump program are required to specify the correct logical record length (LRECL) value. Failure to specify a large enough LRECL value might result in an 002 abend. The LRECL value must equal the length of the longest SMF record being created plus four bytes for the record descriptor word (RDW). The LRECL value can be larger than the BLKSIZE value because the records can be segmented.

Your installation can give control during dump processing to three 24-bit addressable installation exit routines. By doing this, you can examine or modify the record before it is written. When each exit is invoked, register 1 contains the address of a three-word parameter list (Figure 3-5 on page 3-11).

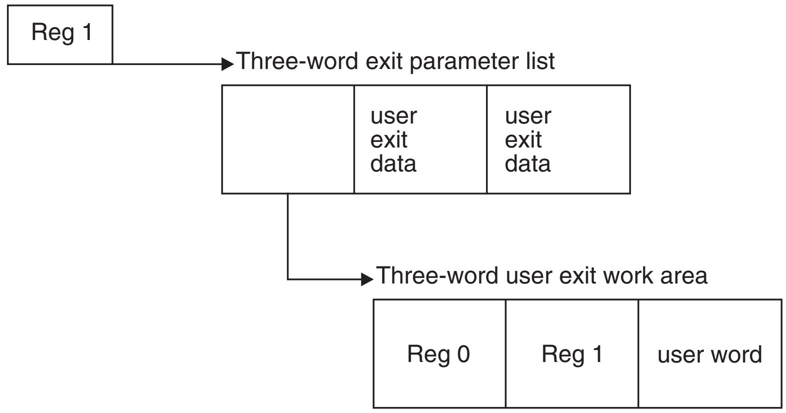


Figure 3-5. SMF Dump Program Input Parameter Structure

The first word is the address of a three word user work area. The contents of the user work area are:

word 1 register 0 on entry to the SMF dump program

word 2 register 1 on entry to the SMF dump program

word 3 reserved for user. This word is initialized to zero before the first installation exit is invoked.

The contents of the second and third words depend on the installation exit being invoked. The installation exits are described in “Processing the SMF Dump Program” on page 3-1.

Chapter 4. Customizing SMF

Reference books

z/OS MVS Initialization and Tuning Reference contains information about the SMFPRMxx parameters. *z/OS MVS System Commands* contains information about the operator commands. *z/OS MVS Installation Exits* contains information about SMF installation exits. (Table 3-1 on page 3-2 describes the SMF dump program exits.)

An installation has several ways to customize SMF to meet its needs.
- SMF parameters on the SMFPRM*xx* parmlib member.
- Installation-written exit routines.
- Operator commands.

Using SMFPRMxx parameters

The SMF parameters allow you to:
- Record status changes.
- Pass data to a subsystem.
- Select specific records.
- Specify data set names.
- Specify the system identifier to be used in all SMF records.
- Select specific subtypes.
- Perform interval accounting.
- Collect SMF statics.
- Perform TSO/E command accounting.
- Perform started task accounting.

Recording status changes

Record type 90 describes changes in SMF and system status. The type 90 record allows the installation to track operator changes (such as the use of the SET or SETSMF command), and with the PROMPT option, to establish availability and reliability statistics for the processor.

If PROMPT (IPLR or ALL) is specified, the system issues a message when an IPL occurs. This message prompts the operator to reply with the time when the failure occurred, the name of the operator, and the reason for the IPL. This information is recorded in a type 90 record.

The installation can set up standard operator replies to the prompt message and then use a post processing program to summarize the reliability data contained in the type 90 record. For example, an operator reply of FTIME=00.00.00 might indicate a scheduled IPL while any other reply indicates a system failure. A standard set of IPL reasons might be provided to the operator, such as scheduled production, processor failure, channel failure, JES failure code *xxxx*, or scheduled test.

Passing data to a subsystem

SMF allows an installation to pass up to 60 characters of information (such as accounting information) to a user-defined subsystem. A user-defined subsystem is any subsystem other than TSO/E, ASCH, STC, JES2, or JES3. You specify the information to be passed in the SUBPARM parameter of the SMFPRM*xx* parmlib member, and it can be changed by an IPL or by the SET or SETSMF operator command.

To use the information, the subsystem issues the SMFSUBP macro during its initialization to determine if any SUBPARM information is present or if the values have been changed by a subsequent IPL. (See *z/OS MVS Programming: Authorized Assembler Services Reference SET-WTO* for more information.)

In response to a SET command, SMF issues a subsystem interface (SSI) call to all user-defined subsystems that have a SUBSYS or SUBPARM option specified. In response to a SETSMF command, SMF issues an SSI call only to the subsystem specified in the SETSMF command.

When each subsystem receives the SSI call, it must issue the SMFSUBP macro instruction to determine if any values that affect its operation have been changed. If the subsystem determines that the information string passed to it is incorrect, it uses the SMFCHSUB macro instruction to change the information. (See *z/OS MVS Programming: Authorized Assembler Services Reference SET-WTO* for more information.)

Selecting SMF records

SMF records are selected by specifying either the type desired (or the types not desired) with the TYPE or NOTYPE option of the SYS or SUBSYS parmlib parameter.

If any one of record types 14, 15, 17, 62, 63, 64, 67, or 68 is specified with the TYPE option, data is collected for all records. However, only those records that are selected by TYPE or NOTYPE request are written to the SMF data set.

Installation-written exit routines IEFU83, IEFU84, and IEFU85 (SMF writer) and IEFACTRT (termination) can control which records are to be written to the SMF data set. After inspecting an SMF record, these routines return a code to the system indicating whether the record is to be written to the SMF data set.

Specifying data set names

To specify a data set name use the DSNAME parameter in the SMFPRMxx parmlib member. This parameter allows the installation to specify the set of data sets to be used for SMF recording.

For more information on the DSNAME parameter see *z/OS MVS Initialization and Tuning Reference*.

Specifying the system identifier

The SID parameter specifies the system identifier that is used in all SMF records.

For more information on the SID parameter see *z/OS MVS Initialization and Tuning Reference*.

Selecting subtypes

Subtype selectivity for SMF records is an option of the TYPE or NOTYPE option on the SYS and SUBSYS parameters used for SMF recording. Subtype selectivity allows more flexibility in post-processing records and helps control the amount of data stored in SMF data sets.

The subtype selectivity function supports only those records which use the standard SMF record header. The header requires the subtype field is at offset 22 (decimal) and the ‘subtypes used’ bit (bit position 1), of the system indicator byte at offset 4 (decimal), is set to X'1'. SMF processes the record for subtype selectivity when both conditions are met. To see if subtypes are used, check the individual records in Chapter 13, “SMF Records.”

The TYPE option of the SYS and SUBSYS parameter provides inner parentheses to indicate the subtypes to be collected. If subtype selection is not used, the default is all subtypes. The following is an example of how the TYPE option should be used to record subtypes 1, 2, 3, 5, 6, 7, and 8 for the type 30.

```
SYS(TYPE(30(1:3,5:8)))  or  SUBSYS(STC,TYPE(30(1:3,5:8)))
```

The NOTYPE option provides inner parentheses to indicate the subtypes **not** to be collected. If subtype selection is used, all subtypes except the ones specified are collected. The following is an example of how the NOTYPE option should be used to record all subtypes except subtype 4 for the type 30 record.

```
SYS(NOTYPE(30(4)))  or  SUBSYS(STC,NOTYPE(30(4)))
```

When using the NOTYPE keyword, data is collected for all records **except** those specified. In the preceding example, data is collected for record types 0 through 29; all record 30 subtypes except subtype 4; and records 31 through 255.

Notes:

1. If subtype selectivity is specified for a record type for which subtypes are not supported, the specification of the subtype(s) is ignored and the record type is recorded. No warning message is used.
2. The specification of a subtype more than once is accepted. No warning message is issued.
3. If an incorrect range is specified (that is, the first value of the range is greater than the second value) a message IEE948I is issued (for more information, see *z/OS MVS System Messages, Vol 7 (IEB-IEE)*. The operator must then re-enter the valid range.

Performing interval accounting

With interval accounting, you specify an interval of time called a **recording interval**. This interval repeats continuously, starting when a unit of work begins to run. Interval accounting allows you to periodically save resource data for the work unit so that, if a system failure occurs, not all of this data is lost.

A work unit (such as a job or job step) uses system resources to accomplish its tasks. As the work unit runs, the system saves data about the resources that it uses at the end of each recording interval. If the system fails during an interval, you do not lose the resource data generated through the end of the previous interval. Only the data accumulated since the end of the last interval is lost.

Example: Assume that you specify an interval of 30 minutes, that a job starts at 9:10 and runs for an hour and 42 minutes, and that the job uses resources as follows:

Time	Action	Resources Used Since Job Start	Resources Used During Interval
9:10 AM	job starts	—	—
9:40 AM	30 minute interval ends	7	7

Time	Action	Resources Used Since Job Start	Resources Used During Interval
10:10 AM	30 minute interval ends	12	5
10:40 AM	30 minute interval ends	21	9
10:52 AM	job ends	23	2

Interval accounting allows you to see how many resources the work unit used during a specified interval of time. In this example, the job used 5 resources between 9:40 and 10:10 AM (a 30-minute interval) and used a total of 12 resources since the job started.

SMF global recording interval

The SMF global recording interval is a recording interval that is available globally to SMF, RMF, and other requestors. The installation can specify the length of the SMF global recording interval which can be from 1 through 60 minutes; the system default is 30. Specify the length using the INTVAL parameter.

The SMF global recording interval is always synchronized with some part of the hour. The installation can specify that the SMF global recording interval be synchronized with the beginning of the hour (00 minutes past the hour) or any number of minutes past the hour up to 59; the system default is 00. Specify the synchronization value using the SYNCVAL parameter.

Example: Assume the installation wants the SMF global recording interval to have a length of 15 minutes and to be synchronized with 15 minutes past the hour, which means that the SMF global recording interval ends at 15, 30, 45, and 60 minutes past the hour. To establish this interval, code the following statements in the SMFPRMxx parmlib member:

```
INTVAL(15)
SYNCVAL(15)
```

Listening for the occurrence of accounting events

Using the ENFREQ macro, an authorized program can request notification when SMF accounting events occur. Event code 37 signals SMF accounting events. For more information about how to use the ENFREQ macro, see *z/OS MVS Programming: Authorized Assembler Services Guide*. The macro that maps the parameter list for SMF events is IFAENF37; see *z/OS MVS Data Areas, Vol 2 (DCCB-ITZYRETC)*.

The system signals the end of each SMF global recording interval. SMF, RMF, and any other requestors listening for this event can schedule their own interval accounting function based on the end of this interval.

If the installation changes either the length value (using INTVAL) or the synchronization value (using SYNCVAL) for the SMF global recording interval, the system ends the interval, schedules a new interval based on that changed value. SMF, RMF, and any other requestors that are listening for either event can synchronize with this new interval.

The following table lists all of the SMF accounting events. Each event is identified by an ENFREQ qualifier:

ENFREQ Qualifier	SMF Accounting Event Signalled	Example Application
ENF37Q00	SMF completed initialization or reinitialization.	Start collecting data to generate interval records.
ENF37Q01	SMF ended abnormally.	Defer generating interval records until SMF is reinitialized. See ENFREQ qualifier ENF37Q00.
ENF37Q02	The global interval value (INTVAL option) has changed. The new value is passed as a parameter of the ENF signal.	Make appropriate changes based on recalculated SMF global recording interval.
ENF37Q03	The global synchronization value (SYNCVAL option) has changed. The new value is passed as a parameter of the ENF signal.	Make appropriate changes based on recalculated SMF global recording interval.
ENF37Q04	The SMF global recording interval ended. The interval end time is passed as a parameter of the ENF signal.	Generate interval records when the SMF global recording interval ends. **Note:** Use the interval end time on any record that a requestor generates as a result of this signal. Using this time allows for the exact merging of all such records.
ENF37Q05	An SMF global recording interval processing error (which also causes message IEE500I) occurred.	Stop listening for event code 37.

Using interval synchronization to compare interval records

With interval synchronization, you can directly compare type 23, 30, 32, and 42 interval records generated by SMF with interval records generated by other requestors (such as RMF). These other requestors can use the global interval and synchronization values that SMF provides to generate interval records whenever the SMF global recording interval ends.

For example, your installation might need to compare type 30 SMF records (user-level data) with RMF interval records (system-level data) to gain a more complete picture of system activity during a specified time period. If a performance problem occurred between 9:30 AM and 10:00 AM, you could easily compare RMF interval record data with type 30 SMF record data, because global synchronization allowed them both to be generated at 10:00 AM. Without synchronization, interval records are generated at different times. It is hard to compare records generated at different times because work units use resources unpredictably during an interval.

SMF Type 30 record interval accounting

For type 30 (common address space work) SMF interval records, you can:
- specify interval accounting that is synchronized or not synchronized.
- request interval accounting at the system or subsystem level.

For type 30 SMF records, there are five subtype records that provide address space level accounting information. SMF writes a subtype 1 record at the start of a work unit (such as a job), a subtype 2 record at the end of each recording interval, subtype 3 and 4 records at the end of a job step, and a subtype 5 record at the end of a work unit (such as a job). See “Record Type 30 (1E) — Common Address Space Work” on page 13-115 for information about when these subtype records are written.

Type 32 SMF record interval accounting: If you have TSO/E installed, SMF generates type 32 (TSO/E user work accounting) records at the same intervals as type 30 records.

Nonsynchronized interval accounting

When interval accounting is not synchronized, SMF generates type 30 interval records for a work unit at the end of a recording interval based on the start time of a the work unit. Each interval record contains data for the resources used during the recording interval.

Example: Assume a recording interval of 30 minutes. If a job step starts at 9:10 AM, and runs for two hours and six minutes, then SMF generates a type 30 record at the following times:

```
 9:10 AM    (job step start time)
 9:40 AM    (30 minute interval ends)
10:10 AM    (30 minute interval ends)
10:40 AM    (30 minute interval ends)
11:10 AM    (30 minute interval ends)
11:16 AM    (job step completion time)
```

Changes to interval value: If the SET SMF or SETSMF command changes the interval value, the new interval does not take effect until the current interval expires. If interval recording is not active when a job starts, there is no interval recording for that job. If interval recording is turned off and then back on with a SET command, interval recording for a job starts at the new value, at the beginning of the next job step.

Synchronized interval accounting

When interval accounting is synchronized, SMF generates interval records for a work unit based on the end of the SMF global recording interval, rather than the start time of a job. Interval synchronization is particularly useful when you want to compare interval records generated by SMF, RMF, and other requestors.

Example: Assume the SMF global recording interval has a length of 30 minutes and is synchronized with 15 minutes past the hour. If a job starts at 9:10 AM, and runs for two hours and six minutes, then SMF generates a type 30 record at the following times:

```
 9:10 AM    (job start time)
 9:15 AM    (SMF global recording interval ends)
 9:45 AM    (SMF global recording interval ends)
10:15 AM    (SMF global recording interval ends)
10:45 AM    (SMF global recording interval ends)
11:15 AM    (SMF global recording interval ends)
11:16 AM    (job completion time)
```

Changes to interval value: If the SET SMF or SETSMF command changes the interval value, then the current interval ends immediately and the new interval takes effect. If interval recording is not active when a job starts, there is no interval recording for that job. If interval recording is turned off and then back on with a SET command, interval recording for a job starts at the new value, at the beginning of the next job step.

If either INTVAL or SYNCVAL are changed, then the system reschedules the SMF global recording interval at that time.

Specifying a system or subsystem recording interval

You can request a recording interval at the system level by using the SYS INTERVAL parameter (or at the subsystem level using SUBSYS INTERVAL) to:

- Specify an interval value, between 1 second and 24 hours, in *hhmmss* format.
- Request that SMF use the global interval value specified on the INTVAL parameter. Specify the SMF,NOSYNC subparameter.
- Request that SMF synchronize with the SMF global recording interval. Specify the SMF,SYNC subparameter.

If you do not request a value for a subsystem, the subsystem takes its interval value from SYS INTERVAL.

Example 1: Assume you want a recording interval of 30 minutes, that is not synchronized, for started tasks (such as VTAM). SMF generates a type 30 record at 30-minute intervals after the beginning of every started task step if you specify:

SUBSYS(STC,INTERVAL(003000))

Example 2: Assume you set the global interval value to 15 minutes, and set the global synchronization value to 15 minutes past the hour. These values mean that the SMF global recording interval will end at 15, 30, 45, and 60 minutes past the hour. You want jobs of type “STC” (started tasks and system address spaces) to have type 30 records generated every 15 minutes. Therefore, you request that “STC” type jobs use the global interval and synchronization values. Code the following statements in the SMFPRMxx parmlib member:

```
INTVAL(15)
SYNCVAL(15)
SUBSYS(STC,INTERVAL(SMF,SYNC))
```

Collecting SMF statistics

Type 23 records collect SMF statistics. Your installation can track SMF recording with the type 23 record, which is generated at the expiration of the recording interval specified in the STATUS parameter. Use the STATUS parameter to either:

- Specify an interval value, between 1 second and 24 hours, in *hhmmss* format.
- Request that SMF use the global interval value specified on the INTVAL parameter. Specify the SMF,NOSYNC subparameter.
- Request that SMF synchronize with the SMF global recording interval. Specify the SMF,SYNC subparameter. See “SMF Type 30 record interval accounting” on page 4-5 for information about interval accounting and synchronization.

Performing TSO/E command accounting

Type 32 records allow the installation to keep track of individual TSO/E commands entered during a TSO/E session, during recording interval, or in a command list (CLIST). If no commands are entered during a reporting interval, no record is created. SMF writes record type 32 when a TSO/E user logs off or when an SMF recording interval expires.

Note: To use the type 32 record and TSO/E command accounting, you must have installed TSO/E Version 1 for MVS/XA or Version 2 for MVS/ESA.

The installation can specify, through the DETAIL parameter in SMFPRM*xx*, that the record is to include the total CPU time under task control blocks (TCB) and SRBs and the total number of TPUTs, execute channel programs (EXCP), transactions, and TGETs associated with the command.

Many TSO/E commands, such as EDIT, have subcommands. These subcommands are counted in the type 32 record. However, these subcommands are not recorded as entered at the terminal. They are recorded with a prefix that associates the subcommand with a command. For example, under EDIT, the INPUT subcommand is recorded as EDINPUT. The prefixes are described later in this section.

The record includes all TSO/E commands attached directly by the terminal monitor program (TMP). However, some TSO/E products or, possibly, user applications currently do not count TSO/E commands and thus do not support the type 32 record. For example, the Interactive Problem Control System (IPCS) does not count TSO/E commands but TSO/E subcommands are counted.

The TSO/E command interface lets a user application avoid this problem. The user application must take the following steps both before each TSO/E command (or subcommand) to be counted begins and after the command completes:

1. Load register 1 with the address of a parameter list containing a four-byte flag word. The parameter list must start on a word boundary. The high-order bit of this word is set as follows:
   - 1 -- indicates the start of a command
   - 0 -- indicates that the command has completed.

Following the four-byte flag word is an eight-byte command (or prefixed-subcommand) name field. The command must be left-justified and padded with blanks.

- Load register 15 with X'19'
- Issue SVC 109.

The user must include the name of the command or prefixed-subcommand in module IEEMB846 before invoking the interface.

The IBM-supplied module IEEMB846, contains a partial list of the TSO/E commands, prefixed subcommands, and aliases that are counted in the type 32 record. All other commands are counted in the '***OTHER' field.

An installation can use the IBM-supplied IEEMB846 or create its own module in SYS1.LINKLIB. The SMFTSOCM member of SYS1.SAMPLIB is provided so that the user can add or delete commands for the installation. The SMFTSOCM member contains the source code for the IBM-supplied IEEMB846. The format of IEEMB846 is:

Offset	**Length**	**Content**
0	4	Number of commands in the module
4	4	Reserved
8	8	Command name field
16	8	Command name field
.	.	.
.	.	.
.	.	.
.	.	.

Each command name field is 8 characters long. Therefore, each name must be left-justified and padded with blanks. The commands can appear in any order. However, by placing the most frequently used commands near the beginning of the module and deleting the commands that are not used, an installation can reduce the average time SMF needs to find the command. For example, after the following

CSECT is link-edited into SYS1.LINKLIB, the ALLOCATE, ALLOC, SEND and GETINPUT commands are recorded in record type 32. (The GETINPUT command is a locally-defined command.)

```
IEEMB846   CSECT
    DC     F'4'
    DC     F'0'
    DC     CL8'ALLOCATE'
    DC     CL8'ALLOCbbb'
    DC     CL8'SENDbbbb'
    DC     CL8'GETINPUT'
    END
```

Note: Both ALLOCATE and ALLOC, its alias, are specified. If ALLOC, or any other alias, is not explicitly specified in IEEMB846, each use of the alias is counted under '***OTHER' and not under the corresponding command.

When adding subcommand names to IEEMB846, use the following prefixes:

Command	Subcommand Prefix
ACCOUNT	AC
CONSOLE	CN
EDIT	ED
OUTPUT	O
OPERATOR	OP
TEST	T
User-defined	U

If the length of the prefix plus the subcommand name exceeds eight characters, the subcommand name is truncated on the right. For example, the CONTINUE subcommand of OUTPUT appears in IEEMB846 as OCONTINU.

The subcommand prefix "U" allows an installation to collect data on user-defined subcommands while they use the TSO/E Command interface. An installation that has more than one user-defined command processor can add a one-digit qualifier (0-9, A-Z) to the prefix to differentiate between user commands.

Performing started task accounting

The system handles accounting for started tasks much as it does for batch jobs and TSO/E work. Started task accounting includes:
- Accumulating CPU time under started task TCBs and SRBs
- Counting started task I/O operations
- Invoking SMF exits for started tasks
- Creating SMF records for started task activity.

For accounting purposes, the system sees:
- The master address space
- The system address spaces
- The mounts
- The job entry subsystem
- The tasks initiated with a START command (at the operator console as started tasks).

The SYS default in SMFPRM*xx* requests that SMF write all possible records for what the system sees as started tasks. You can suppress started task accounting records by suppressing the accounting record types through the SUBSYS option in SMFPRM*xx* (STC parameter). If you specify any other record types it might cause loss of data other than accounting data for started tasks. For example:

- A JES2 installation runs the Resource Measurement Facility (RMF), which the system sees as a started task, to monitor system activity. To suppress started task accounting records for RMF, the installation specifies record type 70. However, the installation has inadvertently suppressed important data collected by RMF about CPU activity.
- An installation suppresses record types 6 and 26 to eliminate accounting for started tasks. However, this eliminates record types 6 and 26 completely (even for batch jobs), because JES, as a started task, is told to not write these record types.

For an initiator, the only meaningful data is in a type 4, 5, or 30 record is job or session name, program name, step name, and reader start time and date. IEFIIC in the program name field identifies an initiator record.

Because CPU time is accumulated for started tasks, wait time limits and job step time limit abends can occur. To avoid these abends, you can code TIME=1440 on the EXEC statement in the cataloged procedure or set on the system task bit in the program properties table (PPT). For more information on the program properties table, see *z/OS MVS Initialization and Tuning Reference*.

Notes:

1. MSTRJCL includes TIME=1440 so that the master scheduler does not time out.
2. Many IBM-supplied entries in the PPT have the system task bit set on, which prevents an abend because of time limits.

Specifying SMF buffer options

You can use the BUFSIZMAX and BUFUSEWARN parameters to specify SMF buffering options. The BUFSIZMAX parameter specifies the maximum amount of storage that SMF can allocate for buffering purposes. The value of BUFSIZMAX can range from a minimum of 128M to a maximum of 1G. The default value of BUFSIZMAX is 128M. The BUFUSEWARN parameter specifies the overall buffer warning level percentage which, when exceeded, will cause SMF to start issuing message IEE986E. The value of BUFUSEWARN can range from 10 to 90 percent; the default value being 25 percent. When the overall SMF buffer in use percentage drops below the specified BUFUSEWARN value, SMF will DOM message IEE986E.

You can use the combination of BUFSIZMAX and BUFUSEWARN parameters to prevent SMF data loss conditions (see “Preserving SMF Data” on page 2-7).

After setting the SMF buffer options, if you still can not prevent data loss conditions, then use the SMF NOBUFFS parameter (see “Using SMFPRMxx parameters” on page 4-1), to specify what the system is to do in this situation. The following are the possible system actions:

1. Continue processing with the loss of SMF data and if parmlib option NOBUFFS(MSG) is in effect, then message IEE979W will be issued. All records presented to SMF will be lost until buffers become available.
2. Enter a restartable wait state.

Entering SMFPRMxx in SYS1.PARMLIB

When you have determined which SMF parameters you want to change, place them in a SMFPRM*xx* parmlib member. The two alphameric characters, represented by *xx*, are appended to SMFPRM to identify your SMFPRM*xx* member. If you do not specify an SMFPRM*xx* member (with system parameters, such as SMF=01 for member SMFPRM01, or with an alternate member, such as

IEASYS*xx*), the default member SMFPRM00 is used. You may place alternate values, or additional values, in one or more alternate SMFPRM*xx* members.

For information about coding the SMFPRMxx member, see *z/OS MVS Initialization and Tuning Reference*.

Adding SMFPRMxx to SYS1.PARMLIB

To add the SMFPRM*xx* parameters as a member of SYS1.PARMLIB, use the IEBUPDTE utility program. Figure 4-1 shows sample JCL for using IEBUPDTE to enter SMFPRM01 into SYS1.PARMLIB. To change the default member, SMFPRM00, or the installation-defined SMFPRM*xx* member, replace them with a new version by again running IEBUPDTE.

```
//ENTER    JOB   MSGLEVEL=1
//         EXEC  PGM=IEBUPDTE,PARM=NEW
//SYSPRINT DD    SYSOUT=A
//SYSUT2   DD    DSNAME=SYS1.PARMLIB,DISP=(OLD,KEEP)1
//SYSIN    DD    DATA
./         ADD   LIST=ALL,NAME=SMFPRM01,LEVEL=01,SOURCE=0
(SMFPRM01 member)
./        ENDUP
/*
```

[1]To access SMFPRM00 on the distribution package before system installation, use the SYS1.PARMLIB data set.

Figure 4-1. Sample JCL for Entering SMFPRM01 into SYS1.PARMLIB Using IEBUPDTE

If PROMPT (LIST or ALL) was specified, the operator can modify the values in SMFPRM*xx* parameter from the console during system initialization or SET SMF processing. If parameter errors occur, the operator will be prompted for correct parameters regardless of the value specified for PROMPT.

Using installation exit routines

This section provides a brief overview of installation-written exits. *z/OS MVS Installation Exits* describes the SMF installation exits. Table 3-1 on page 3-2 describes the SMF dump program exits.

You can customize SMF to meet your installation's requirements by coding installation exit routines or by writing application programs that use SMF macros.

SMF provides exits in the control program that allow installations to add installation-written routines to the control program to perform additional processing. Installation-written routines at SMF exits receive control at different times as a job moves through the system. They receive control when specific events occur, such as when a job CPU-time limit expires. These installation-written routines could collect additional information, cancel jobs, or enforce installation standards.

The IEFUJV, IEFUJP, and IEFU85 exits must run in 31-bit addressing mode. All other exits can execute in either 24-bit or 31-bit addressing mode. IBM recommends that you use 31-bit addressing mode whenever possible.

Exit routines that access SMF records with sub-sections, such as record type 30, should be coded using triplets (offset to *xxx* section, number of *xxx* sections, length of *xxx* section) rather than coding the exit to access the fields directly. An installation can use the triplets to calculate the location of each field, and avoid the need to recompile the exit with the mapping macro each time a field is added to the end of a section. When the position of a field changes, the exit will locate the field relative to the beginning of the section in which it is contained.

A brief description of the IBM-supplied exits is included here. *z/OS MVS Installation Exits* describes the SMF installation exits and how to code and use them. Table 3-1 on page 3-2 describes the SMF dump program exits.

Deciding which exits to use

The following are the SMF-supplied exits. When the exit receives control, the information passed to each exit, and the type of return from each exit to the control program is summarized. They can link to installation-written exit routines.

- The termination exit (IEFACTRT) receives control on the normal or abnormal termination of each job step and job. A return code from this exit indicates whether the system is to continue the job (for job steps only) and whether SMF termination records are to be written to the SMF data set. The parameters passed to this exit are the addresses of:
  - The common exit parameter area
  - The job step name
  - The programmer name
  - The job CPU time
  - The job accounting fields
  - The step CPU time
  - The step accounting fields
  - The completion code
  - The SMF termination record
  - The name of the subsystem for the job being processed.
- The user account validation exit (IEFUAV) receives control during the set-up and execution of APPC/MVS transaction programs (TPs), and during the creation of a z/OS UNIX System Services forked or spawned address space whose profiles specify TAILOR_ACCOUNT(YES). IEFUAV is used to validate the accounting information of TP users and forked and spawned address spaces. Note that IEFUAV does not receive control for local spawns, as these only create processes in the same address space as the parent. A return code from this exit routine indicates whether processing for the unit of work should continue or be cancelled.

  The parameters passed to this exit are the addresses of the common exit parameter area, an area containing the programmer's name, an indication of the processing environment (Exit Function Code), accounting information, and an 80 byte area into which the exit can place a message to be issued to the APPC/MVS or z/OS UNIX System Services job log.
- The job initiation exit (IEFUJI) receives control before a job on the input queue is selected for initiation. A return code from this exit indicates whether the system is to continue processing the job. The parameters passed to this exit are the addresses of the common exit parameter area, programmer name, job priority, job accounting fields, and the name of the subsystem for the job being processed.
- The job purge exit (IEFUJP) receives control when a job is ready to be purged from the system (after the job has terminated and all SYSOUT output that pertains to the job has been written). A return code from this exit indicates whether the SMF job purge record (type 26) is to be written to the SMF data set. The parameters passed to this exit are the addresses of the common exit parameter area, and SMF job purge record.

- The job validation exit (IEFUJV) receives control before each job control statement (or cataloged procedure) in the input stream is converted. This exit receives control after all the JCL is converted and again after all the JCL is interpreted. IEFUJV is not invoked for JCL comment statements. A return code from this exit indicates whether the system is to continue processing the job. For an alternative to IEFUJV, examine JES exits in *z/OS JES2 Installation Exits* and *z/OS JES3 Customization*.

  The parameters passed to this exit are the addresses of:
  – The common exit parameter area
  – The JCL statement image (this address is zero for entry codes 16 and 32)
  – The entry code (type of JCL statement for all entry codes except 16 and 32)
  – The converter parameter
  – The name of the subsystem for the job being processed
  – The environment indicator associated with the subsystem for the job being processed
- The step initiation exit (IEFUSI) receives control before each job step is started (before allocation). A return code from this exit indicates whether the system is to continue processing the job step, or whether the job is to be cancelled. The parameters passed to this exit are the addresses of:
  – The common exit parameter area
  – The job step name
  – The program name
  – The step accounting fields
  – An area which the exit can use to communicate to MVS the region size and region limit it desires for the job step
  – A flag indicating whether the job is running V=R
  – IBM-supplied default values for data spaces, hiperspaces, and data sharing (through the IARVSERV macro)
  – The name of the subsystem for the job being processed
  – MEMLIMIT information.
- The SYSOUT limit exit (IEFUSO) receives control when the number of records written to an output data set exceeds the output limit for that data set. A return code from this exit indicates whether the system is to continue processing the job with a new output limit. The parameter passed to this exit is the address of the common exit parameter area.
- The time limit exit (IEFUTL) receives control when one of the following time limits expires:
  – The job CPU time limit (from the JOB statement).
  – The step CPU time limit (from the EXEC statement, the default from the job entry subsystem).
  – The continuous wait time limit for the job (from the SMFPRM*xx* JWT parameter). Continuous wait time is defined as time spent waiting while the application program is in control. For example, for data sets allocated dynamically (while the application program is running, for example) either or both of the following count toward a job's continuous wait time:
    - The time required to recall a data set from HSM Migration Levels 1 or 2
    - The time required to mount a tape

    If a data set was allocated statically (for a DD statement, for example) these activities will not be counted towards the job’s continuous wait time.

  A return code from this exit indicates whether the system is to continue processing the job step with a new time limit. The parameters passed to this exit are the type of time limit that expired, and the addresses of the common exit parameter area, and the name of the subsystem being processed.

- The SMF dump exit (IEFU29) receives control when an SMF data set becomes full. A return code from this exit indicates whether the dump message (IEE362I or IEE362A) is to be issued. The parameter passed to this exit is the the address of SMF data set name.
- The SMF record exit (IEFU83) receives control before each record is written to the SMF data set. A return code from this exit indicates whether the system is to suppress the current SMF record. The parameter passed to this exit is the address of the SMF record to be written.
- The SMF record exit (IEFU84) receives control when the SMF writer routine is branch-entered and is **not** entered in cross-memory mode. A return code from this exit indicates whether the system is to suppress the current SMF record. The parameter passed to this exit is the address of the SMF record to be written.
- The SMF record exit (IEFU85) receives control when the SMF writer routine is branch-entered and is entered in cross-memory mode. A return code from this exit indicates whether the system is to suppress the current SMF record. The parameter passed to this exit is the address of the SMF record to be written.

Using operator commands

The following operator commands affect SMF:
- SET SMF=*xx*
- SETSMF
- DISPLAY SMF.

Note: SET SMF, SETSMF, and DISPLAY SMF commands cannot run simultaneously; one waits for the other to complete before starting.

For detailed information about the SMF commands see *z/OS MVS System Commands*.

Using the SET command

The SET operator command is used to restart SMF or modify the SMF recording options dynamically by specifying which SMFPRM*xx* parmlib member is to be used. If SMF ends, you may use the SET command to restart SMF. It is not necessary to IPL again.

The SET command allows the installation to replace the existing SMF options. For example, when NOACTIVE is specified after an IPL, an installation can activate SMF recording by using the SET and choosing the parmlib member that contains the ACTIVE option. In addition, the installation can use the SET command to reactivate SMF recording after an I/O error has terminated recording; however, the installation should define a new data set or correct the cause of the I/O error before reactivating SMF recording.

Special considerations

- To avoid installation exit communication problems, an installation should terminate:
  - All address spaces except the master scheduler address space.
  - The system address spaces (such as PCAUTH, ALLOCAS, and GRS)
  - The job entry subsystem before issuing a SET command that changes the EXIT keyword.
- The SET command cannot be used to change the SID parameter; if a value is specified, it is ignored.

- The new values for STATUS or MAXDORM do not take effect until the old ones, if any, expire.
- For each IPL, you can define a maximum of eight subsystems to SMF (by use of the SUBSYS parameter). This is a combined total of subsystems specified at IPL and subsequent SET commands. If the maximum is reached, no new subsystems may be added. Subsystems previously specified can be given different options.
- In response to a SET command, SMF issues a subsystem interface (SSI) call to each user-defined subsystem specified in the SMF parameters SUBSYS and/or SUBPARM. This includes parameters specified in previous SET commands and at IPL.
- Unless it is necessary, recording data set switching does not take place at SET time. For example, if the current active data set is not included in the new options, the first empty data set in the new data set list becomes the active recording data set.
- If recording is not active at SET SMF time, the first non-full data set is used as the recording data set.

Using the SETSMF command

The SETSMF operator command allows an installation to add a SUBPARM parameter or to replace any previously-specified parameter in the active SMF parmlib member except the ACTIVE, PROMPT, SID, or EXITS parameters. The SETSMF command cannot be used with a parmlib member that specified NOPROMPT.

Using the DISPLAY command

The DISPLAY (D) operator command can be used to display the status of the SMF data sets or the current SMFPRM*xx* options to the operator console.

Chapter 5. Using SMF Macros

This section provides a detailed description of SMF macros to use in any application program.

SMF Macros

SMF supplies the following macros that can be used in any problem program application or in installation-written exit routines.

IFASMFR
Use the IFASMFR macro in any problem program application or in installation-written exit routines to symbolically address SMF record fields.

SMFCHSUB
Use the SMFCHSUB macro to change the information string specified in the current SUBPARM parameter.

SMFDETAL
Use the SMFDETAL macro to determine if detail recording is active for the current subsystem.

SMFEWTM
Use the SMFEWTM macro to write records to the SMF data set in any exit routine that is in supervisor state, except where noted.

SMFEXIT
Use the SMFEXIT macro to branch directly to any installation-written SMF exit residing in the SYS1.LPALIB.

SMFINTVL
Use the SMFINTVL macro to determine the current interval and synchronization values.

SMFRTEST
Use the SMFRTEST macro to determine if a particular type, or subtype, of a record is being recorded.

SMFSUBP
Use the SMFSUBP macro to determine if any SUBPARM information is present or if the values have been changed during a subsequent IPL.

SMFWTM
Use the SMFWTM macro to write records to the SMF data set in any exit routine that has a storage protect key of zero through seven, except were noted.

Using a Macro to Write Records

SMF supplies two macros that you can use to write records to the SMF data set: SMFWTM and SMFEWTM (SMFWTM generates a supervisor call (SVC) instruction). These macros differ in the entry method that they use to the record-writing routine.

If a branch entry is required, use the SMFEWTM macro with BRANCH=YES. Use the SMFEWTM macro with BRANCH=NO (or the SMFWTM macro) if all of the following are true:
- The calling program is running enabled
- The calling program is not in supervisor state
- The calling program is APF-authorized.

IFASMFR — Addressing SMF Record Fields

Use the IFASMFR macro in any problem program application or in installation-written exit routines to symbolically address SMF record fields. If you do not want the IFASMFR macro to use part of the problem program's storage, then supply a CSECT or DSECT statement ahead of the macro.

Note: If you invoke the IFASMFR macro within a DSECT, multiple record types are mapped contiguously. That is, each record type will not have a zero origin.

Do not specify both record type 14 and record type 15 in the same program. These records are identical, whenever record type 15 is specified in the IFASMFR macro, record type 14 is defined.

The syntax is as follows:

```
IFASMFR n
```

The parameters are as follows:

n

is the record type to be defined. You must specify at least one record type with the macro; if you specify more than one record type, you must enclose the record types in parentheses and separate them by commas. The values for *n* can be any of the current record types. Exceptions to this include record types 100, 101, 102 and 110. Other exceptions are record types that explicitly mention the proper macro to use.

Note: In all the SMF record formats, the 'name' column contains the symbolic addresses defined by the IFASMFR macro.

SMFCHSUB — Changing Subsystem Parameters

A user-defined subsystem issues the SMFCHSUB macro to change the information string specified in the current SUBPARM parameter. A user-defined subsystem issues this macro when the subsystem determines that an error, such as a spelling error, exists in the information string. Issuing the macro instruction to correct the error causes the SMF options to be displayed correctly on the operators console.

When you invoke the SMFCHSUB macro, you must include the IEESMCA mapping macro, which maps the SMCA.

The syntax is as follows:

```
(label) SMFCHSUB SUBPARM={(reg)} [,SUBSYS= {name  } ]
                         {addr } [         {(reg) } ]
```

The parameters are as follows:

SUBPARM=*(reg)*
SUBPARM=*addr*

specifies the *address* of a 60-byte area or a *register* (2-12) that contains the address of the 60 bytes that is to replace the current SUBPARM value for the specified subsystem.

SUBSYS=*name*
SUBSYS=*(reg)*

specifies the one to four character subsystem *name* or *register* (2-12) that contains the address of the subsystem name. If a register is used, the register must be enclosed in parentheses. If SUBSYS= is not specified, the SUBPARM value (if one exists) of the current subsystem is changed.

Return Codes

When the SMFCHSUB macro returns control, register 15 contains one of the following return codes.

Code dec(hex)	Meaning
00 (00)	Successful completion of the macro.
04 (04)	No SUBPARM value found; thus, the value was not changed.
08 (08)	A SETSMF or a SET SMF command is currently being processed. SUBPARM is not changed for this request. The subsystem can reissue the macro instruction.
12 (0C)	A DISPLAY command for SMF is currently being processed. SUBPARM is not changed for this request. The subsystem can reissue the macro instruction.
16 (10)	SMF has ended abnormally.

SMFDETAL — Testing Detail Recording

The SMFDETAL macro allows you to determine if detail recording is active for the current subsystem. A user subsystem can use this macro to determine what level of data to collect. For example, TSO/E uses SMFDETAL to determine if type 32 detail data or type 32 summary data is to be collected.

When you invoke the SMFDETAL macro, you must include the IEESMCA mapping macro, which maps the SMCA.

The syntax is as follows:

```
[label] SMFDETAL [(SUBSYS={ name}]
                 [        {(reg)}]
```

The parameters are as follows:

SUBSYS=*name*
SUBSYS=*(reg)*
specifies the one to four character subsystem *name* or *register* (2-12) that contains the address of the four-byte subsystem name. The subsystem name must be left-justified and padded with blanks. If you use a register, it must be enclosed in parentheses. The macro looks for the subsystem name in SMFPRM*xx* and uses the options for that subsystem to determine if the record is written.

If you do not specify a SUBSYS, the macro uses the subsystem name of the current address space: for example, TSO for TSO/E users, ASCH for APPC/MVS transactions programs, STC for started tasks, or the name of the job entry subsystem (JES2 or JES3) for batch jobs. The macro uses the options specified for the entire system on the SYS option to determine if the record is written.

Return Codes

When the SMFDETAL macro returns control, register 15 contains one of the following return codes.

Code dec(hex)	Meaning
00 (00)	Detail recording is in effect
04 (04)	Detail recording for the subsystem is not in effect
16 (10)	SMF has ended abnormally.

SMFEWTM — Writing SMF Records

The SMFEWTM macro can be used to write records to the SMF data set. You can use this macro in any exit routine that is in supervisor state except IEFU83, IEFU84, IEFU85, and IEFU29 and in any installation problem program that has APF authorization. The SMFEWTM macro verifies that SMF recording is active and allows the issuer to branch directly to SMF.

When you invoke the SMFEWTM macro, you must include the IEESMCA mapping macro, which maps the SMCA.

The syntax is as follows:

```
[label] SMFEWTM {record address} {,BRANCH=NO } [{,SUBSYS=name } {,WRKAREA=addr } [,MODE=XMEM]]
                {(r)           } {,BRANCH=YES} [{,SUBSYS=(reg)} {,WRKA=(reg)   }            ]
```

The parameters are as follows:

record address
: is the symbolic address of the record to be written.

(r)
: is the *register* number (2-12), that contains the address of the record to be written.

BRANCH=NO
BRANCH=YES
: Specifies a branch entry (YES) or an SVC entry (NO) to the requested SMF writer routine. The default is BRANCH=NO.

If you specify BRANCH=NO, before SMF writes the record to the SMF data set, the SMF record is given to installation exit IEFU83.

If you specify BRANCH=YES, before SMF writes the record to the SMF data set, the SMF record is given to installation exit IEFU84, or IEFU85 if MODE=XMEM. To use BRANCH=YES, the caller must be in supervisor state, have a protection key of zero, and set register 13 to point to a standard 72-byte save area.

You should note therefore that if you change from using the SMFWTM macro to write SMF records and use the SMFEWTM macro, BRANCH=YES, then the SMF records are given to installation exit IEFU84 (rather than installation exit IEFU83) or IEFU85 if MODE=XMEM.

SUBSYS=*name*
SUBSYS=*(reg)*
: specifies the one to four-character subsystem *name* or *register* (2-12) that contains the address of the four-byte subsystem name. If you use the subsystem name, it must be left-justified and padded with blanks. If you code a

register, it must be enclosed in parentheses. The macro looks for the subsystem name in SMFPRM*xx* and uses the options for that subsystem to determine if the record is written.

If you do not specify SUBSYS, the macro will use the subsystem name for the current address space, for example, TSO for TSO/E users, STC for started tasks, ASCH for APPC/MVS transactions programs, or the name of the job entry subsystem (JES2 or JES3) for batch jobs. The macro uses the options specified for the entire system on the SYS option to determine if the record is written.

WRKAREA=*addr*
WRKAREA=*(reg)*
specifies the *address* or a *register* (2-12) that contains the address of a five-word work area that you must supply for SMF to use. If you specify a register, it must be enclosed in parentheses. You must specify WRKAREA when you specify MODE=XMEM.

MODE=XMEM
specifies that the caller is entered in cross-memory mode (the primary address space is not the home address space). The caller must be in primary ASC mode. If you specify MODE=XMEM, you must specify BRANCH=YES and WKAREA.

Record types 0 through 127, which are SMF-formatted records, are reserved for IBM products. For record types 0 through 127, you must supply the record descriptor word and the record type field in the standard SMF record header. The SMFEWTM macro supplies the remaining header information.

Record types 128 through 255 are available for user-written records. When using the SMFEWTM macro to write user records, you must provide the standard SMF record header, including the record descriptor word, the date, time, and system identifier. While the system identifier can be any four character identifier, specifying the value of the SID parameter is consistent with the system records SMF produces.

Return Codes

When the SMFEWTM macro returns control, register 15 contains one of the following return codes.

Code dec(hex)	Meaning
00 (00)	The record was written without error.
08 (08)	The record was not written because the length specified in the RDW was less than 18 bytes.
16 (10)	The record was not written because SMF is not active or has ended abnormally.
20 (14)	The record was not written because the installation-written IEFU83, IEFU84, or IEFU85 exit routine suppressed the record.
24 (18)	The record was not written because the data was lost.
36 (24)	The record was not written because the record type specified is not currently being recorded.

40 (28)	The record was not written because a buffer shortage caused the data to be lost.
44 (2C)	The record was not written because SMF could not establish recovery.
48 (30)	The caller was not in primary ASC mode or an incorrect ASID was encountered.

SMFEXIT — Branching to the SMF Exits

The SMFEXIT macro allows the user to branch directly to any installation-written SMF exit residing in the SYS1.LPALIB. You must define the SMF exit name to SMF with the EXIT parameter before issuing the macro.

When you invoke the SMFEXIT macro, you must include the IEESMCA mapping macro, which maps the SMCA.

The syntax is as follows:

```
[label] SMFEXIT exitname  [,SUBSYS={name }]
                          [        {(reg)}]
```

The parameters are as follows:

exitname
The name of the exit as it is specified in SMFPRMxx, with the format SYS.yyyy or SYSxxxx.yyyy.

SUBSYS=*name*
SUBSYS=*(reg)*
specifies the one to four character subsystem *name* or *register* (3-12) that contains the address of the four-byte subsystem name. If you use a register, it must be enclosed in parentheses.

Note: SMF uses register 2 regardless of which register is specified. The subsystem name must be left-justified and padded with blanks. The macro looks for the subsystem name in SMFPRM*xx* and uses the options for that subsystem to determine if the record is written.

If you do not specify a SUBSYS, the macro uses the subsystem name for the current address space: for example, TSO for TSO/E users, ASCH for APPC/MVS transactions programs, STC for started tasks, or the name of the job entry subsystem (JES2 or JES3) for batch jobs. The macro uses the options specified for the entire system on the SYS option to determine if the record is written.

Register use

On entry to the macro, register 13 must point to a 72-byte save area. Parameters can be passed to the exit in register 0 or 1; the parameters must be placed in the registers before the macro is invoked.

When control returns to the issuer, a return code of zero in register 15 indicates that the exit was not invoked either because SMF is not active, or because the exit is not active for the requesting subsystem. When the exit is invoked, the installation exit routine can place a return code in register 15.

SMFINTVL — Determining Interval Time

The SMFINTVL macro allows the requestor to determine the current interval and synchronization values. A requestor can use this value, for example, to set up interval recording for a subsystem.

The syntax is as follows:

```
[label] SMFINTVL (intvlreg) [,SUBSYS={(namereg)}][,SYNC=(syncreg)][,GLOBAL][,INTEXPT=(intexptreq)]
                            [       { name    }]
```

The parameters are as follows:

(intvlreg)
: specifies a register (2-12). When the macro returns control, this register contains the address of an eight-byte area that contains the interval value. The interval value is in time-of-day (TOD) format, an unsigned 64-bit fixed-point number where bit 51 is equivalent to 1 microsecond.

SUBSYS=*name*
SUBSYS=*(namereg)*
: If you specify SUBSYS, the macro returns the interval value for the subsystem that you specified in *name* (which is four bytes long) or a four-byte field pointed to by register *namereg* (2-12). The subsystem name must be left-justified, padded with blanks, and one to four characters long. If you specify a register, it must be enclosed in parentheses. The macro looks for the subsystem name in SMFPRMxx and uses the options for that subsystem.

  If you do not specify SUBSYS or GLOBAL, the macro returns the interval value for the subsystem represented by the current address space: for example, TSO for TSO/E users, ASCH for APPC/MVS transaction programs, STC for started tasks, or the name of the job entry subsystem (JES2 or JES3) for batch jobs. The macro looks for the subsystem name in SMFPRMxx and uses the options for that subsystem.

  If you specify GLOBAL, the system ignores SUBSYS (even if you specified it).

SYNC=*(syncreg)*
: specifies a register (2-12). When the macro returns control, this register contains the 31-bit address of an eight-byte area that contains the synchronization value in time-of-day (TOD) format, an unsigned 64-bit fixed-point number where bit 51 is equivalent to 1 microsecond. This value is taken from the two-digit global synchronization value specified using the SYNCVAL parameter in the SMFPRMxx parmlib member.

  The macro returns a value of -1 (X'FFFFFFFF') in *syncreg* if the subsystem specified by the SUBSYS parameter did not request synchronization.

GLOBAL
: requests that the system return the 31-bit addresses of the global interval value in *(intvlreg)* and the synchronization value, if requested, in *syncreg*. These values were specified using the INTVAL and SYNCVAL options of SMFPRMxx.

  When you specify GLOBAL, the system ignores SUBSYS.

,INTEXPT=*(intexptreg)*
: specifies a register (2-12). When the macro returns control, this register contains the 31-bit address of an eight-byte area that contains the time when the next SMF global recording interval ends in time-of-day (TOD) format, an unsigned 64-bit fixed-point number where bit 51 is equivalent to 1 microsecond.

This is the interval that is scheduled as a result of the combination of the INTVAL and SYNCVAL options of SMFPRMxx.

The macro returns a value of -1 (X'FFFFFFFF') in *intexptreg* when SMF interval synchronization processing is disabled.

Return codes

When the SMFINTVL macro returns control, register 15 contains one of the following return codes.

Code dec(hex)	Meaning
00 (00)	Successful completion — requested information was returned in registers that were specified on the macro invocation.
04 (04)	No interval specified for the requested subsystem, or SMF is not active.
16 (10)	SMF has ended abnormally

Environment

Authorization:	None
Dispatchable unit mode:	Task or SRB
Cross memory mode:	PASN = HASN = SASN
AMODE:	24- or 31-bit (AMODE 31 is required if you specify the SYNC, GLOBAL, or INTEXPT keywords.)
ASC mode:	Primary
Serialization:	Enabled for I/O and external interrupts
Locks:	No Requirement
Control Parameters:	None

Register Information

Register	Contents
AR 0 to 15	Unchanged
GPR 0 to 12	Unchanged — unless specified for macro output data
GPR 13	Pointer to 72-byte save area
GPR 14	Work Register
GPR 15	Return code

SMFRTEST — Testing Record Recording

The SMFRTEST macro allows you to determine if a particular type, or subtype, of a record is being recorded. Issue this macro before collecting data for a particular record or subtype to avoid the overhead of data collection if it is not written.

When you invoke the SMFRTEST macro, you must include the IEESMCA mapping macro, which maps the SMCA.

The syntax is as follows:

```
[label] SMFRTEST RECTYPE={record}[,SUBTYPE={subtype}][,SUBSYS={name }]
                        {(reg) }[         {(reg)  }][        {(reg)}]
```

The parameters are as follows:

RECTYPE=*record*
RECTYPE=*(reg)*
specifies the SMF record type to be checked, where *record* can be any one to three decimal digits (0-255). If you use a register, the *register* (2-12) contains the record type. You must code the parentheses if you code a register, and you must right justify the record type within the register.

SUBTYPE=*subtype*
SUBTYPE=*(reg)*
specifies the SMF record *subtype* to be checked, where *record* can be any one to three decimal digits (0-255). If *reg* is specified, the register (2-12) contains the record subtype. You must code the parentheses if you code a register and you must right justify the record subtype within the register.

SUBSYS=*name*
SUBSYS=*(reg)*
specifies the one to four character subsystem *name* or *register* (2-12) that contains the address of the four-byte subsystem name. The subsystem name must be left-justified and padded with blanks. If you use a register, it must be enclosed in parentheses. The macro looks for the subsystem name in SMFPRM*xx* and uses the options for that subsystem to determine if the record is written.

If you do not specify a SUBSYS, the macro uses the subsystem name for the current address space: for example, TSO for TSO/E users, ASCH for APPC/MVS transactions programs, STC for started tasks, or the name of the job entry subsystem (JES2 or JES3) for batch jobs. The macro uses the options specified for the entire system on the SYS option to determine if the record is written.

Return Codes

When the SMFRTEST macro returns control, register 15 contains one of the following return codes.

Code dec(hex)	Meaning
00 (00)	The record type is being recorded
16 (10)	SMF is not active or has ended abnormally.
36 (24)	Information for the specified record type is not being recorded.

Register use

Registers 14 and 15 are used by the macro and are not reset. On entry to the macro, register 13 must point to a 72-byte save area.

SMFSUBP — Determining Subsystem Parameters

An installation may pass information to a user-defined subsystem. The user-defined subsystem issues the SMFSUBP macro during its initialization to determine if any SUBPARM information is present or if the values have been changed by a subsequent IPL.

The subsystem issues the SMFSUBP macro after the subsystem interface (SSI) call generated by a SET or SETSMF operator command. The macro determines if any values that affect the sub-system’s operation have changed.

When you invoke the SMFSUBP macro, you must include the IEESMCA mapping macro, which maps the SMCA.

The syntax is as follows:

```
(label) SMFSUBP addr [,SUBSYS= {(reg)}]
                     [         {name }]
```

The parameters are as follows:

addr
specifies a register (2-12). When the macro return control, this register contains the address of the 60-byte information string followed by a sixteen-byte field that contains:

- The length of the field in the first two bytes.
- The source flags in the third byte. They are as follows:

Bit	Meaning When Set
0	SMF is active
1	Not applicable
2	Information string was issued by parmlib member
3	Information string was issued by operator reply
4	Information string was issued by default
5	Information string was changed due to conflicts or errors
6	Information string was changed by IPL, SET, or SETSMF
7	Not applicable.

- The single byte console identifier.
- The 4-byte console identifier.
- The 8-character token field.

SUBSYS=*(reg)*
SUBSYS=*name*
specifies the one to four character subsystem *name* or *register* (2-12) that contains the address of the four-byte subsystem name. The subsystem name must be left-justified and padded with blanks. If you use a register, it must be enclosed in parentheses.

If you do not specify SUBSYS=, the macro returns the address of the SUBPARM value for the subsystem name of the current address space.

Return Codes

When the SMFSUBP macro returns control, register 15 contains one of the following return codes.

Code dec(hex)	Meaning
00 (00)	Successful completion of the macro
04 (04)	No SUBPARM parameters are entered for the specified subsystem
16 (10)	SMF has ended abnormally.

SMFWTM — Writing SMF Records

The SMFWTM macro is used to write records to the SMF data set. You can use this macro in any exit routine that has a storage protect key of zero through seven except for IEFU83, IEFU84, IEFU85, and IEFU29 (and in any installation problem program that is APF-authorized).

All SMF records are given to installation exits before they are written to the SMF data set. If you use SMFWTM, installation exit IEFU83 is invoked.

Note that you can also write SMF records without using a macro. See smf_record (BPX1SMF, BPX4SMF) -- Write an SMF record in *z/OS UNIX System Services Programming: Assembler Callable Services Reference*.

The syntax is as follows:

```
[label] SMFWTM {record address|(r)}
```

The parameters are as follows:

record address
: is the symbolic address of the record to be written.

(r)
: is a register containing the address of the record to be written. The value for (*r*) can be either the absolute register number or a symbol for the register. In either case, you must code the parentheses, for example, (2) or (REG2).

Record types 0 through 127, which are SMF-formatted records, are reserved for IBM products. For record types 0 through 127, you must supply the record descriptor word (RDW) and the record type field in the standard SMF record header. The SMFWTM macro supplies the remaining header information.

Record types 128 through 255 are available for user-written records. When using the SMFWTM macro to write user records, you must provide the standard SMF record header, which includes a RDW for the record. You must fill in the date, time, and system identifier in the record header. While the system identifier can be any four character identifier, specifying the value of the SID parameter is consistent with the system records SMF produces. For a description of the standard SMF record header, see 'Chapter 10: SMF Records' in *z/OS MVS System Management Facilities (SMF)*.

All SMF records are given to installation exit IEFU83 before they are written to the SMF data set.

Return Codes

When the SMFWTM macro returns control, register 15 contains one of the following return codes.

Code dec(hex)	Meaning
00 (00)	The record was written without error.
08 (08)	The record was not written because the length specified in the RDW was less than 18 bytes.
16 (10)	The record was not written because SMF is not active or has ended abnormally.

20 (14)	The record was not written because the installation-written IEFU83 exit routine suppressed the record.
24 (18)	The record was not written because the data was lost.
36 (24)	The record was not written because the record specified is not currently being recorded.
40 (28)	The record was not written because a buffer shortage problem caused the data to be lost.
44 (2C)	The record was not written because SMF could not establish recovery.

Chapter 6. User-Written Report Programs

You can use the SMF dump program (IFASMFDP) to create data sets containing certain record types and to also produce a summary activity report. You can use Tivoli Performance Reporter for OS/390 an IBM program product, to process data sets that are produced by SMF. An installation may want to produce their own report. Producing a report usually requires at least two operations: sorting the SMF records and then writing them in an appropriate format.

For those installations that choose to read the SMF data sets directly (rather than using the dump program), note that the SMF data sets are preformatted with dummy records. A dummy record is shorter than any valid SMF record and is easily identified because it contains the characters SMFEOFMARK. The SMF dump program terminates processing when it encounters a dummy record, improving data set processing performance.

Sorting SMF Records

Any sort/merge program can be used to sort SMF records; this section describes two sample sort/merge exit routines that you may use with the IBM DFSORT (Data Facility Sort) Licensed Program (No. 5740-SM1).

Sample Sort/Merge Exit Routines

The IBM DFSORT Program Product can, during various phases of processing, pass control to routines designed and written to perform specific functions. SYS1.SAMPLIB has two sample routines that receive control from exits E15 and E35 of this sort/merge program. The sample E15 exit routine, called SMFE15, extracts all SMF records without a job log identification (job name, time, and date that the reader recognized the JOB card) from the SMF dump data set. The SMFE15 exit routine retains the dump header and dump trailer records (types 2 and 3) in the temporary data set HDRDATA. It retains all other system-oriented records (records without a job log identification) in the temporary data set SORDATA.

The sample E35 exit routine, called SMFE35, places all the records extracted by the SMFE15 routine in the sort output data set. These records are inserted in the data set as follows: dump header records, dump trailer records, all other system-oriented records, and the sorted job-oriented records.

Note: If tape work devices are used, the minimum block length the IBM Sort/Merge Program Product can sort is 18 bytes. Otherwise, the minimum is one byte. The sample routines SMFE15 and SMFE35 use SMF record types 0 through 13 for input; the minimum length of these SMF records is 18 bytes.

Figure 6-1 shows sample JCL for obtaining a listing of the SMFE15 and SMFE35 exit routines from SYS1.SAMPLIB. Figure 6-1 also shows sample JCL for obtaining a listing of the SYS1.SAMPLIB member named SMFSORT. SMFSORT contains sample JCL for running the IBM DFSORT Program Product.

```
//PRINT     JOB     123456,SMITH
//          EXEC    PGM=IEBPTPCH
//SYSPRINT  DD      SYSOUT=A
//SYSUT1    DD      DSNAME=SYS1.SAMPLIB,DISP=(OLD,KEEP),
//                  UNIT=xxxx,VOLUME=SER=xxxxxx1
//SYSUT2    DD      SYSOUT=A
//SYSIN     DD      *
            PRINT   TYPORG=PO,MAXNAME=4,MAXFLDS=4
            MEMBER  NAME=SMFSORT
            RECORD  FIELD=(80)
            MEMBER  NAME=SMFE15
            RECORD  FIELD=(80)
            MEMBER  NAME=SMFE35
            RECORD  FIELD=(80)
/*
```

1

The volume and unit parameters depend on your installation's request.

Figure 6-1. Sample JCL for Obtaining a Listing of Sample Sort Exit Routines

To include the sample exit routines in your sort application, you must first assemble and link-edit them before running the sort/merge program. Figure 6-2 shows sample JCL for this procedure, including one possible sort application. In this example, SMF records are to be sorted first on the job log identification (major control field), and then on the time and date portions of the time stamp (minor control fields). Displacements of these fields (shown in the record formats in Chapter 13, "SMF Records," on page 13-1) are 14, 6, and 2. However, you must add four bytes for the record descriptor word (RDW) and one byte for the sort procedures (initial count of 1) to these displacements. Hence, displacements 19, 11, and 7 are shown in the SORT FIELDS=statement in Figure 6-2.

```
//SMFSORT          JOB     MSGLEVEL=1
//STEP1            EXEC    ASMFCL[1]
//ASM,SYSIN        DD      *
  (E15 Source Deck)
/*
//LKED.SYSLMOD     DD      DSNAME=SMF1.EXITS,UNIT=SYSDA,[2]
//                         DISP=(NEW,KEEP),SPACE=(TRK,(10,5,1)),
//                         VOL=SER=xxxxxx
//LKED.SYSIN       DD      *
                   NAME    E15(R)[3]
/*
//STEP2            EXEC    ASMFCL[1]
//ASM,SYSIN        DD      *
  (E35 Source Deck)
/*
//LKED.SYSLMOD     DD      DSNAME=SMF1.EXITS,DISP=(OLD,KEEP),[2]
//                         UNIT=SYSDA,VOL=SER=xxxxxx
//LKED.SYSIN       DD      *
                   NAME    E35(R)[3]
/*
//SORTSTEP         EXEC    PGM=SORT,REGION=100K[4]
//SYSOUT           DD      SYSOUT=A
//SORTLIB          DD      DSNAME=SYS1,SORTLIB,DISP=SHR
//EXITLIB          DD      DSNAME=SMF1,EXITS,DISP=(OLD,KEEP),[5]
//                         UNIT=SYSDA,VOL=SER=xxxxxx
//SORTIN           DD      UNIT=3480,VOL=SER=SYSMAN,DISP=OLD,[6]
//                 LABEL=(,SL),DCB=(RECFM=VBS,LRECL=600,BLKSIZE=200)[7]
//SORTWK01         DD      UNIT=SYSDA,SPACE=(CYL,(50),,CONTIG)[8]
//SORTWK02         DD      UNIT=SYSDA,SPACE=(CYL,(50),,CONTIG)[8]
//SORTWK03         DD      UNIT=SYSDA,SPACE=(CYL,(50),,CONTIG)[8]
//SORTOUT          DD      UNIT=3480,DSNAME=SMF1,SORTOUT,LABEL=(,SL),[9]
//                 DISP=(KEEP),DCB=(RECFM=VBS,LRECL=600,BLKSIZE=200)[7]
//SORDATA          DD      UNIT=SYSDA,SPACE=(CYL,(1,1)),[10]
//                         DCB=(RECFM=VBS,LRECL=600,BLKSIZE=200)[7]
//HDRDATA          DD      UNIT=SYSDA,SPACE=(TRK,(5,5)),[10]
//                         DCB=(RECFM=VBS,LRECL=600,BLKSIZE=200)[7]
//SYSIN            DD      *
  SORT                     FIELDS=(19,16,A,11,4,A,7,4,A),FORMAT=BI,SIZE=E4000[11]
  MODS                     E15=(E15,700,EXITLIB,N),E35=(E35,1500,EXITLIB,N)[11]
  END
/*
```

Figure 6-2. Sample JCL for Running a Sort Procedure

Notes:

1 EXEC statement for catalogued procedure ASMFCL (assemble and link-edit). (For a description of the ASMFCL procedure, see *IBM High Level Assembler/MVS & VM & VSE Programmer's Guide*.)

2 The sample sort exit routines will be link-edited into data set SMF1.EXITS.

3 Link-edit control statements specifying that E15 and E35 will be the load module names of the exit routines.

4 EXEC statement for the sort/merge program.

5 Data set SMF1.EXITS is specified as the library in which sort exit routines can be found.

6 Input to the sort program is the SMF dump data set, contained on a tape having a volume serial number of SYSMAN.

7 The LRECL value can be larger than the BLKSIZE value because records might be segmented. The LRECL value must be as large as the longest SMF record being created plus four bytes for the RDW. Modify these parameters according to the longest record to be collected.

8 Three sort work units are defined as being direct access devices.

9 The sort output data set is to be written on tape.

10 Two data sets required by the sample sort exit routines are defined on direct access devices.

11 The sort/merge control statements define the sort control fields and exit routines to be used in this sort application.

Designing a Report Program

The basic operations of a report are formatting and printing data from SMF records. The input to a report program is normally the sorted SMF data set.

SYS1.SAMPLIB has a sample PL/1 source report program, called SMFFRMT, which formats record types 23 and 90. Contained within the program are declares for record types 23, 30, 32, and 90.

Before using the SMFFRMT program, you must compile the program using the PL/I compiler. Figure 6-3 shows a sample JCL for running the SMFFRMT program after it is compiled and link-edited into SYS1.LINKLIB.

```
//FORMAT    JOB  MSGLEVEL=1
//FRMT      EXEC PGRM=SMFFRMT
//SYSPRINT  DD   SYSOUT=A
//RPORT23   DD   SYSOUT=A
//RPORT90   DD   SYSOUT=A
//SMFDATA   DD   DISP=(OLD,KEEP),LABEL=(,SL),VOL=SER=xxxxxx,DSN=nnn,
//               UNIT=3480
```

Figure 6-3. Sample JCL for Running SMFFRMT

Converting Binary Fields to Time of Day Format

As stated above, the basic operations of a report program include formatting and printing data from SMF records. Many SMF records have timestamp fields that contain a binary value that represents the time since midnight, in hundredths of seconds. One example is the SMFxxTME field which exists in all SMF record headers and contains a value representing the time when the record was moved into the SMF buffer. Listed below are steps to follow in order to convert any timestamp into time of day format. For more detailed information on SMF record headers see Standard SMF Record Header.

Example 1:

Assume the time value in binary hundredths of a second past midnight is 005C5E00:

Step 1. Convert the value of the binary timestamp to a decimal value:
  a. `005C5E00 = 6053376`

Step 2. Detemine the number of hours past midnight the timestamp was created:
  a. Divide the decimal value from step 1 by 100. The result is the number of seconds past midnight.

     `6053376/100 = 60533.76`
  b. Divide by the number of seconds in an hour to obtain the number of hours past midnight. There are 3600 seconds in an hour. For this example the hours portion of the time of day is equal to 16.

     `60533.76/3600 = 16.814933333`

c. Determine the number of hundredths of a second in that number of hours.

```
16 * 3600 * 100 = 5760000
```

d. Subtract that number of hundredths of a second from the original decimal value.

```
6053376 - 5760000 = 293376
```

The remainder from step 2 is 293376.

Step 3. Determine the number of minutes past midnight the timestamp was created:

a. Divide the remainder from step 2 by 100. This is the number of seconds past the hour.

```
293376/100 = 2933.76
```

b. Now divide your answer from part a by the number of seconds in a minute. The result is the number of minutes past the hour. In this example the minutes portion of the time of day is equal to 48.

```
2933.76/60 = 48.896
```

c. Determine the number of hundredths of a second in that number of minutes.

```
48 * 60 * 100 = 288000
```

d. Subtract that number of 100ths of a second from the remainder from step 2.

```
293376 - 288000 = 5376
```

The remainder from step 3 is 5376.

Step 4. Determine the number of seconds, tenths, and hundredths.

a. Divide the remainder from step 3 by 100.

```
5376/100 = 53.76
```

Therefore the actual time of day is 16:48:53.76.

Example 2:

Assume the time value in binary hundredths of a second past midnight is 005D7740:

Step 1. Convert the value of the binary timestamp to a decimal value:

a. `005D7740 = 6125376`

Step 2. Detemine the number of hours past midnight the timestamp was created:

a. Divide the decimal value from step 1 by 100. The result is the number of seconds past midnight.

```
6125376/100 = 61253.76
```

b. Divide by the number of seconds in an hour to obtain the number of hours past midnight. There are 3600 seconds in an hour. For this example the hours portion of the time of day is equal to 17.

```
61253.76/3600 = 17.014933333
```

c. Determine the number of hundredths of a second in that number of hours.

```
17 * 3600 * 100 = 6120000
```

d. Subtract that number of hundredths of a second from the original decimal value.

```
6125376 - 6120000 = 5376
```

The remainder from step 3 is 5376.

Step 3. Determine the number of minutes past midnight the timestamp was created:

a. Divide the remainder from step 2 by 100. This is the number of seconds past the hour.

```
5376/100 = 53.76
```

b. Now divide your answer from part a by the number of seconds in a minute. The result is the number of minutes past the hour. In this example the minutes portion of the timestamp equal 0.

```
53.76/60 = 0.896
```

c. Determine the number of hundredths of a second in that number of minutes.

```
0 * 60 * 100 = 0
```

d. Subtract that number of 100ths of a second from the remainder from step 2.

```
5376 - 0 = 5376
```

The remainder from step 3 is 5376.

Step 4. Determine the number of seconds, tenths, and hundredths.

a. Divide the remainder from step 3 by 100.

```
5376/100 = 53.76
```

Therefore the actual time of day is 17:00:53.76.

The following tables list the number of hundredths of a second in each full hour (0-24) and the number of hundredths of a second in each full minute (0-60) respectively. They may be used to make the calculations easier by finding the numbers that are just below the numbers calculated and subtracting them. See example 3, below, which is a recalculation of example 1 from above, using these tables.

Table 6-1. Number of hundredths of a second in each full hour of a day

Hundredths Of Seconds	Hour
000000	0
360000	1
720000	2
1080000	3
1440000	4
1800000	5
2160000	6
2520000	7
2880000	8
3240000	9
3600000	10
3960000	11
4320000	12
4680000	13
5040000	14
5400000	15
5760000	16
6120000	17
6480000	18

Table 6-1. Number of hundredths of a second in each full hour of a day (continued)

Hundredths Of Seconds	Hour
6840000	19
7200000	20
7560000	21
7920000	22
8280000	23
8640000	24

Table 6-2. Number of hundredths of a second in each full minute of an hour

Hundredths of Seconds	Minutes
000000	0
006000	1
012000	2
018000	3
024000	4
030000	5
036000	6
042000	7
048000	8
054000	9
060000	10
066000	11
072000	12
078000	13
084000	14
090000	15
096000	16
102000	17
108000	18
114000	19
120000	20
126000	21
132000	22
138000	23
144000	24
150000	25
156000	26
162000	27
168000	28
174000	29
180000	30
186000	31
192000	32
198000	33
204000	34
210000	35

Table 6-2. *Number of hundredths of a second in each full minute of an hour (continued)*

Hundredths of Seconds	Minutes
216000	36
222000	37
228000	38
234000	39
240000	40
246000	41
252000	42
258000	43
264000	44
270000	45
276000	46
282000	47
288000	48
294000	49
300000	50
306000	51
312000	52
318000	53
324000	54
330000	55
336000	56
342000	57
348000	58
354000	59
360000	60

Example 3:

Assume the time value in binary hundredths of a second past midnight is 005C5E00:

Step 1. Convert the value of the binary timestamp to a decimal value:

a. `005C5E00 = 6053376`

Step 2. Detemine the number of hours past midnight the timestamp was created:

a. Find the value in Table 6-1 which is closest to, but less than, the decimal value in step 1. In our example, the hours portion of the timestamp is equal to 16.

```
5760000  16
```

b. Subtract the number of hundredths of a second from the original decimal value.

```
6053376 - 5760000 = 293376
```

The remainder from step 2 is 293376.

Step 3. Determine the number of minutes past midnight the timestamp was created:

a. Find the value in Table 6-2 which is closest to, but less than, the remainder of step 2. In our example, the minutesportion of the timestamp is equal to 48.

```
288000  48
```

b. Subtract the number of hundredths of a second from the remainder of step 2.

```
293376 - 288000 = 5376
```

The remainder from step 3 is 5376.

Step 4. Determine the number of seconds, tenths, and hundredths.

a. Divide the remainder from step 3 by 100.

```
5376/100 = 53.76
```

Therefore the actual time of day is 16:48:53.76.

Chapter 7. APPC/MVS Accounting

Advanced Program-to-Program Communication/MVS (APPC/MVS) is the MVS support for cooperative processing. For example, an APPC/MVS administrator defines a host program to process user requests. A user of a PS/2 can run a PS/2 program to interact with this host program. APPC/MVS allows the PS/2 user to access host system (MVS) data without having to log on to the MVS system directly. This data can reside on more than one system, and can be maintained in distributed databases.

The host and PS/2 programs communicate using APPC/MVS services, and are called transaction programs (TPs). The interaction between the PS/2 TP and the host TP is called a conversation. After the conversation is established, each “partner” in the conversation can send data to, or receive data from, the other partner. Each partner in a conversation is identified by its logical unit name (LU name) which is the VTAM “port” on the system, through which communication flows.

APPC/MVS work consists of inbound and outbound conversations. From an MVS point of view, an inbound conversation originates from a TP that requests service of an MVS TP. The requesting TP may be external to MVS (**remote** — such as a PS/2 program) or internal to MVS (**local** — such as TSO/E users or batch jobs). An outbound conversation originates from an MVS TP to another TP. See “Recording SMF Information for APPC/MVS Work” on page 7-5 for information that SMF collects for inbound and outbound conversations.

SMF accounts for each TP scheduled by the APPC/MVS transaction scheduler (ASCH) as a single accountable entity, in the same way that batch jobs or TSO/E sessions are accountable entities. Your installation can collect, sort, and report on TP resources by using methods similar to those used for other work.

SMF also accounts for each conversation (inbound or outbound) in the system as a single accountable entity. Conversation-level accounting is particularly useful when your installation uses an APPC/MVS server application to process multiple conversations concurrently. Conversation level accounting allows your installation to collect information for each conversation in the server address space.

Note!

SMF does not produce records 4, 5, 20, 34, 35 for TPs.

To use APPC conversation information and APPC/MVS transaction records, your installation must customize any accounting packages that read the SMF records.

Note: Use the user account validation exit (IEFUAV) to validate the accounting information of users of APPC/MVS TPs.

Transaction Programs (TPs)

To SMF, a TP scheduled by the APPC/MVS transaction scheduler (ASCH) is a separate address space (like a batch job or TSO/E user). APPC/MVS and ASCH each run in their own system address spaces.

The requested TP can run on either the same system as the request or on another system elsewhere in the network. SMF reports on whatever part of the function actually runs on the current MVS system. If an APPC/MVS-scheduled job requires resources from other systems, then you must correlate the accounting data for each participating system.

In contrast, if a TSO/E user requests a TP that runs on the same MVS system, then SMF reports on both ends of the conversation.

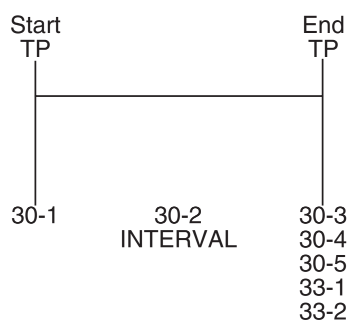
There are two kinds of scheduling available for APPC/MVS TPs: standard and multi-trans. And, as an alternative to scheduling, APPC/MVS also allows inbound conversation requests to be routed directly to an APPC/MVS server (thus bypassing a transaction scheduler). TPs that are processed by APPC/MVS servers are sometimes called *served TPs*.

This section shows how SMF reports on each type of TP (standard, multi-trans, and served).

Standard TP Processing

APPC/MVS initializes standard TPs for each inbound conversation request and terminates them when they finish processing. With standard scheduling, a TP's resources are allocated and deallocated for each inbound conversation request.

For a standard TP:



Note: Points at which SMF writes type 30 (subtypes 1, 2, 3, 4, and 5) and type 33 (subtypes 1 and 2) records to reflect standard TP processing.

Multi-trans TP Processing

A multi-trans TP remains active between inbound conversation requests, with its resources available. The first inbound request starts the multi-trans TP. Subsequent requests can use the same instance of the TP and avoid the overhead of repeated resource allocation and deallocation.

When a multi-trans TP is ready to run a user request, it issues a Get_Transaction call (GETTRANS — a request to get a transaction) to the APPC/MVS transaction scheduler. The scheduler informs the TP when there is work to do. If there is no work, the scheduler informs the TP, and then the TP ends itself.

When the multi-trans TP does some processing not directly related to a user request it can issue a Return_Transaction call (RETTRANS — a request to return a transaction).

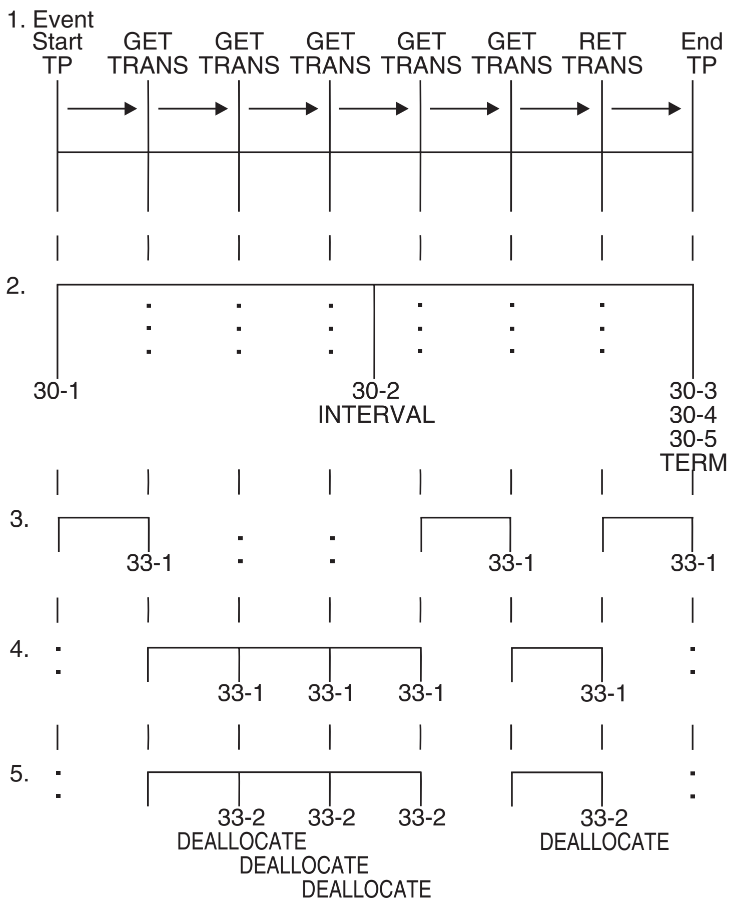
Multi-trans Shell

A multi-trans TP is typically coded with a multi-trans shell, an environment that performs initialization and termination processing, surrounding the part of the TP that holds conversations.

Multi-trans shell processing can be distinguished by the generic ID (also indicated by a “generic” flag) associated with the type 33 record. The generic ID is charged for the setup and cleanup work done by the multi-trans TP when it begins and ends, and when it does processing following a Return_Transaction call. Charging a generic ID means the first user is not charged for initialization processing for all users, nor is the last user charged for cleanup processing for all users.

Your billing for the multi-trans shell will probably be similar to your billing procedures for system address spaces.

For a multi-trans TP:



1. Represents possible events in the life of a multi-trans TP. Items 2, 3, 4, and 5 correspond with these events.
2. Points at which SMF writes the type 30 (subtypes 1, 2, 3, 4, and 5) record. INIT represents initialization and TERM represents termination.
3. Points at which SMF writes a type 33 (subtype 1) record to reflect multi-trans shell activity. This record represents the time period since the last event. Multi-trans shell records do not contain scheduler data (such as LU names and queue times).

4. Points at which SMF writes a type 33 (subtype 1) record to reflect individual user requests to receive service (GETTRANS) from the multi-trans TP. This record represents the time period since the last event.
5. Points at which SMF writes a type 33 (subtype 2) record to reflect individual conversations within the multi-trans shell. DEALLOCATE represents conversation deallocation.

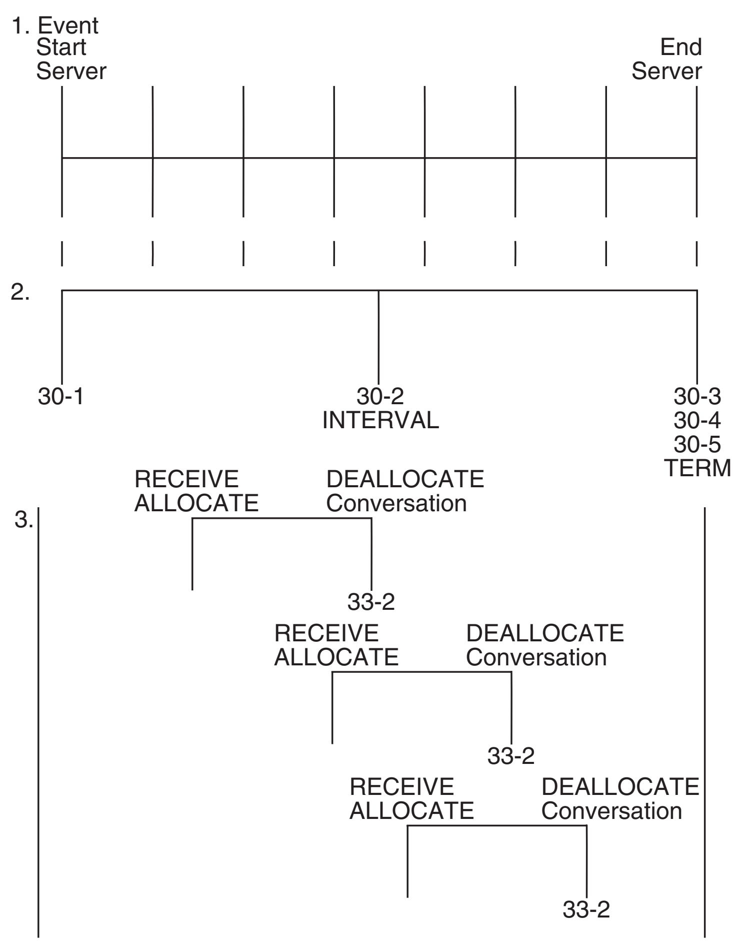
APPC/MVS Server Processing

Besides scheduling TPs in response to inbound requests, APPC/MVS also allows for inbound requests to be routed to an APPC/MVS server.

An APPC/MVS server is an MVS application that uses the Receive_Allocate callable service to receive inbound conversation requests directly (rather than through a transaction scheduler). APPC/MVS servers avoid the overhead associated with APPC/MVS scheduling.

Because APPC/MVS servers can process multiple inbound conversations concurrently, a single server address space might contain multiple *interleaved* (or overlapping) conversations concurrently.

For served TPs:



1. Represents possible events in the life of a server address space. Items 2 and 3 correspond with these events.

2. Points at which SMF writes the type 30 (subtypes 1, 2, 3, 4, and 5) record. INIT represents initialization and TERM represents termination.
3. Points at which SMF writes type 33 (subtype 2) records to reflect individual conversations within a server address space. RECEIVE ALLOCATE represents the start of conversation activity and DEALLOCATE represents conversation deallocation.

Recording SMF Information for APPC/MVS Work

For every job that issues APPC/MVS callable services, SMF writes summary conversation information in a type 30 record. This record reflects the total conversation activity for a particular job's address space. In addition, SMF writes type 33 records (subtypes 1 and 2) as follows:

- Subtype 1 records for individual APPC/MVS transactions that are scheduled by the APPC/MVS transaction scheduler.
- Subtype 2 records for individual APPC/MVS conversations (inbound and outbound) on the system. Subtype 2 records are written for work that is scheduled by the APPC/MVS transaction scheduler, or processed by an APPC/MVS server.

The following sections describe the contents of each of these SMF record types.

Record Type 30

As it does for any address-space level recording in MVS, SMF writes a type 30 record for APPC/MVS work. When APPC/MVS work begins, SMF marks its beginning with a subtype 1 record and marks its end with subtype 4 and 5 records. All SMF type 30 records for APPC/MVS work include summary conversation information, such as the number of conversations, the number of sends and receives, and the amount of data sent and received. Summary conversation information appears in records generated for both outbound and inbound conversations.

You may choose to collect type 30 job level detail information for transactions by using record type selection control.

Record Type 33, Subtype 1

When APPC/MVS inbound conversations create work scheduled by the APPC/MVS transaction scheduler, SMF writes a type 33 subtype 1 record.[1] For each TP request that is executed, SMF provides information such as TP name, local and partner LU names, user and account number, and I/O statistics. When a TP uses scheduling resources, SMF provides information such as:

- Schedule class
- Schedule type
- Specific dates and times that work was:
  - Received
  - Queued
  - Started
  - Ended.

The TP Usage Detail Section of the type 33 record contains zeroes for multi-trans shell processing records (a generic user ID is in effect). You can collect multi-trans

1. APPC/MVS inbound conversations scheduled by a different transaction scheduler can also provide information to SMF for accounting.

TP resource information under a generic user ID or the account number associated with that TP. The costs can then be billed either to the specific users of the TP or to system users. Group these records together based on some criteria (TP name, job name), and charge users based on that criteria.

Record Type 33, Subtype 2

When APPC/MVS conversations are deallocated by either partner program, SMF writes a type 33 subtype 2 record. For each conversation, SMF provides information such as:

- Conversation ID
- Name of the TP that issued the conversation request
- Local and partner LU name
- Number of sends and receives
- Amount of data sent and received.

For inbound conversations that are processed by APPC/MVS servers, rather than transaction schedulers, subtype 2 records also contain information that is specific to server processing. For example, SMF records the specific dates and times that the conversation request was:

- Received by APPC/MVS
- Added to the server's allocate queue
- Received by the server for subsequent processing
- Deallocated.

To help correlate conversations between partner programs, APPC/MVS applications can write user-specific information to a 255-byte user data field in the subtype 2 record through the Set_Conversation_Accounting_Information service. For information about using this service, see *z/OS MVS Programming: Writing Transaction Programs for APPC/MVS*.

Chapter 8. OpenMVS Accounting

Much information regarding z/OS UNIX is available in various SMF records:

- Address space level information is available in the common address space work record (type 30).
- HFS data set caching information is available in the DFSMS statistics and configuration record (type 42).
- RMF support for z/OS UNIX Services is reflected in SMF record types 70 through 79.
- HFS file system activity data is available in SMF record type 92.

The Common Address Space Work Record (Type 30)

The Common Address Space Work record (type 30) provides the following information related to z/OS UNIX:

- Process accounting data for the address space
- Special accounting for the exec family of functions

Process Accounting Data

For address spaces which use z/OS UNIX callable services, a repeating section for process accounting is provided in SMF record type 30. Collection of process accounting data is triggered by the following events:

- Job step termination
- Invoking one of the exec functions (substep termination)
- SMF type 30 interval processing
- Invoking MVS process cleanup (undub)

Each time process accounting data is collected, another repeating section is added to the appropriate SMF type 30 subtype records.

Accounting for fork()

When a program issues a **fork()**, the activity of the child process is not included in the accounting data for the parent process. That is, when the program issues a **fork()**, the child process has its own SMF type 30 records. The parent's type 30 records do not include the activity of the child process. However, you can associate the parent process with the child process using the following:

- The process user ID, specified in the SMF30OUI field
- The process user group, specified in the SMF30OUG field
- The process session ID (SID), specified in the SMF30OSI field
- The process parent ID, specified in the SMF30OPP field

The field SMF30EXN provides the name of the program that was run. It is specified as up to 16 characters. After a **fork()**, the child process runs the same program as the parent. The program name of the child matches that of the parent at the time of the **fork()**. For more information about the contents of the SMF30EXN, see "Accounting for Exec Functions" on page 8-2.

Accounting for attach_exec

As part of setting up an interactive environment, the OMVS command must start another process, the shell, to interpret and run shell commands. When you specify the NOSHAREAS parameter, the shell is started using **fork()** and **exec**. However, when you specify the SHAREAS parameter, the OMVS command starts the shell using **attach_exec**. This function starts the shell process running in the address space of the OMVS command. Other applications can also use **attach_exec** to start a process without the overhead of an additional address space.

Because SMF data is collected on an address space basis, process identification (such as process ID and session ID) is recorded only for the parent process in the address space. However, z/OS UNIX resource consumption is accumulated for the parent process and all local child processes.

Accounting for Exec Functions

When a program issues an **exec** function, the requesting job goes through step termination, including record generation and the invocation of the IEFACTRT exit. Then the job goes through step initialization, including invocation of the IEFUSI exit. However, the new unit of work is not a job step, but a substep. The step number is unchanged, but the substep field is incremented. SMF provides the following fields to support exec processing:

- A “step completion” flag indicates the step is ending due to an **exec** request. The flag is in the Completion Section of the SMF Type 30 record.

  This flag indicates that the step is not really terminating (in the normal sense) and that there is another step in the job with the same step name and number.
- A field reporting the substep number is in the ID section of the SMF Type 30 record.

  This field is used in addition to job name, job start time, and step number to put records in sequence.
- The field SMF30EXN provides the name of the program that was run. It is specified as up to 16 characters.

  MVS load modules can be distinguished from HFS executable files in the SMF30EXN field as follows:
  - Names that are longer than 8 bytes must be HFS executable files
  - For names that are 8 bytes or less, check the terminating character:
    - X'00'—HFS executable file (z/OS UNIX program)
    - X'40'—MVS load module (MVS program)

  SMF30EXN contains information as follows:
  - **HFS executable filename**. SMF30EXN provides the name of a hierarchical file system (HFS) file that is invoked using the exec family of functions. The filename can be up to 16 characters in length.

    For HFS executable files, SMF30EXN contains the portion of the pathname after the last slash. HFS filenames, if not truncated, are followed by the terminating character X'00'.

    For example, if the HFS executable file with pathname **/bin/grep** is invoked using an exec function, SMF30EXN contains **grep** followed by the terminating character X'00'.

    HFS filenames longer than 16 bytes (including the terminating character) are truncated. For example, the name **/usr/joe/somelongprogramname** is recorded as **somelongprogramn**. Because the filename is truncated, no terminating character is recorded.

    It is recommended that you not use blanks in HFS filenames. An HFS file with a name padded with blanks appears in the SMF type 30 record to be an MVS load module name.
  - **MVS load module name**. For MVS load modules invoked using exec functions, SMF30EXN contains the unqualified name of the load module, padded with blanks, to a length of 16 characters.

Address Space Accounting for z/OS UNIX File System Activity

SMF type 30 records provide a summary of the I/O activity done using z/OS UNIX. The I/O activity is summarized in the following categories:

- I/O activity to regular files. This includes all I/O to HFS files.
- I/O activity to pipe files. Although there is no physical I/O associated with pipes, this activity is still listed as I/O. This field contains I/O activity to pipe files and to UNIX domain sockets.
- I/O activity to special files. This includes I/O activity to terminals.
- I/O activity to network sockets. This field includes I/O activity to network sockets as returned by the TCP/IP physical file system.

Notes:

1. These values may contain zeros if your TCP/IP physical file system does not support address space level accounting.
2. Different TCP/IP physical file systems may account differently for the same network activity.

Sample SMF Job Flows

Figure 8-1 shows the key for the following examples.

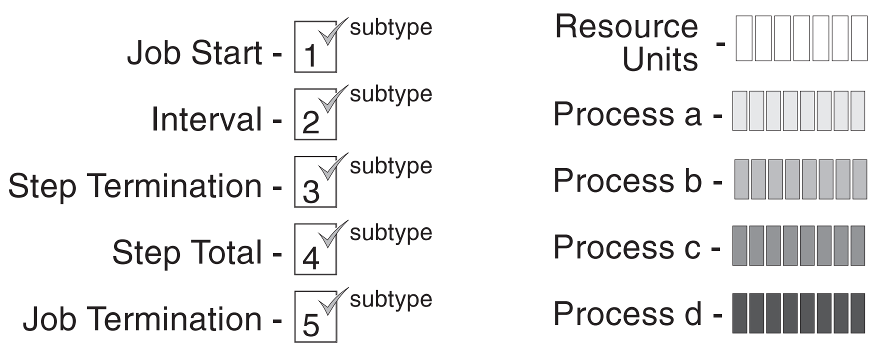


Figure 8-1. SMF Job Flow Examples - Key

The following examples show how the process data is accumulated and reported in several instances:

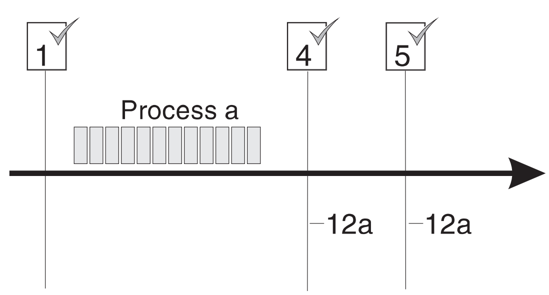


Figure 8-2. SMF Record Type 30: Example 1

In Figure 8-2, the flow is as follows:

1. The job starts and a Job Start (subtype 1) record is written.
2. Process a begins and consumes 12 units of resource.

3. The step ends and a Step Total record (subtype 4) is written. This record contains one z/OS UNIX Process section showing the 12 units of resource consumed by process a.
4. The job ends and a Job Termination record (subtype 5) is written. Because this job contained only one step, the Job Termination record contains one z/OS UNIX Process section matching that of the Step Total record.

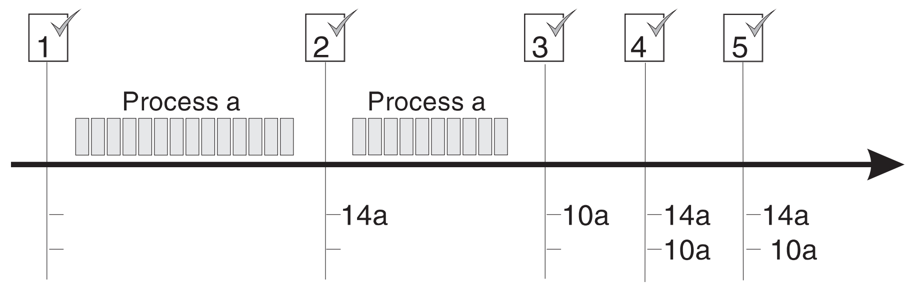


Figure 8-3. SMF Record Type 30: Example 2

In Figure 8-3, the flow is as follows:

1. The job starts and a Job Start (subtype 1) record is written.
2. Process a begins and consumes 14 units of resource.
3. An Interval record (subtype 2) is written containing one z/OS UNIX Process Section showing the 14 units of resource consumed by process a.
4. The job continues and process a consumes an additional 10 units of resource.
5. The step ends:
   a. A Step Termination record (subtype 3) is written. This record contains a single z/OS UNIX Process Section showing the additional 10 units of resource consumed by process a after the interval.
   b. A Step Total record (subtype 4) is written. This record contains two z/OS UNIX Process sections:
      - One showing the 14 units of resource consumed by process a before the interval
      - One showing the 10 units of resource consumed by process a after the interval
6. The job ends and a Job Termination record (subtype 5) is written. Because this job contained only one step, the z/OS UNIX Process Sections in the Job Termination record are identical to those written in the Step Total record.

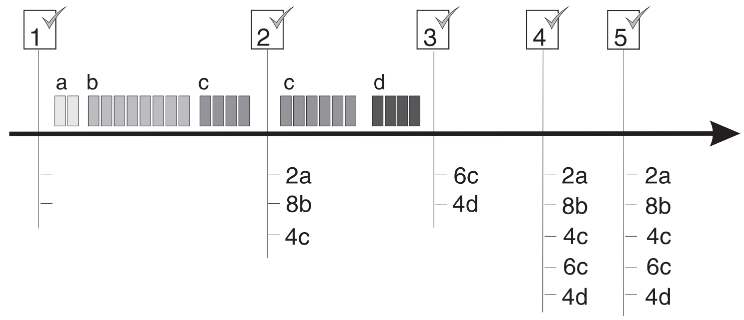


Figure 8-4. SMF Record Type 30: Example 3

In Figure 8-4, the flow is as follows:

1. The job starts and a Job Start (subtype 1) record is written.
2. Process a begins and consumes 2 units of resource.
3. The job is “undubbed” and “dubbed” again as process b. Process b consumes 8 units of resource.
4. The job is “undubbed” and “dubbed” again as process c. Process c consumes 4 units of resource.
5. An Interval record (subtype 2) is written containing three z/OS UNIX Process Sections:
   - One showing the 2 units of resource consumed by process a
   - One showing the 8 units of resource consumed by process b
   - One showing the 4 units of resource consumed by process c
6. The job continues and process c consumes an additional 6 units of resource.
7. The job is “undubbed” and “dubbed” again as process d. Process d consumes 4 units of resource.
8. The step terminates:
   a. A Step Termination record (subtype 3) is written. This record contains two z/OS UNIX Process Sections:
      - One showing the 6 units of resource consumed by process c after the interval
      - One showing the 4 units of resource consumed by process d

   b. A Step Total record (subtype 4) is written. This record contains five z/OS UNIX Process sections:
      - One showing the 2 units of resource consumed by process a
      - One showing the 8 units of resource consumed by process b
      - One showing the 4 units of resource consumed by process c before the interval
      - One showing the 6 units of resource consumed by process c after the interval
      - One showing the 4 units of resource consumed by process d
9. The job ends and a Job Termination record (subtype 5) is written. Because this job contained only one step, the z/OS UNIX Process Sections in the Job Termination record are identical to those written in the Step Total record.

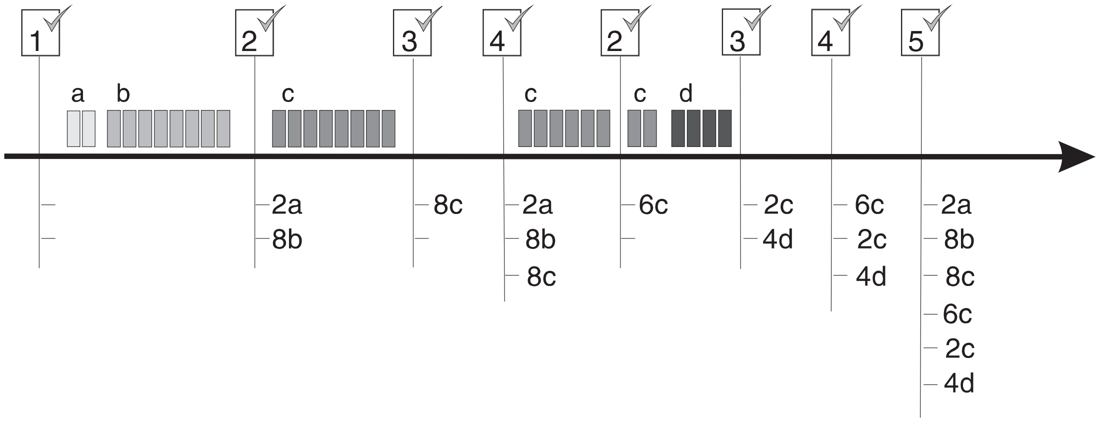


Figure 8-5. SMF Record Type 30: Example 4

In Figure 8-5, the flow is as follows:

1. The job starts and a Job Start (subtype 1) record is written.
2. Process a begins and consumes 2 units of resource.
3. The job is “undubbed” and “dubbed” again as process b. Process b consumes 8 units of resource.
4. The job is “undubbed.”
5. An Interval record (subtype 2) is written containing two z/OS UNIX Process Sections:
   - One showing the 2 units of resource consumed by process a
   - One showing the 8 units of resource consumed by process b
6. The job is “dubbed” again as process c. Process c consumes 8 units of resource.
7. The **exec** service is invoked, causing the job to go through step termination and to start another substep.
   a. A Step Termination record (subtype 3) is written. This record contains one z/OS UNIX Process Section showing the 8 units of resource consumed by process c before the **exec**.
   b. A Step Total record (subtype 4) is written. This record contains three z/OS UNIX Process sections:
      - One showing the 2 units of resource consumed by process a
      - One showing the 8 units of resource consumed by process b
      - One showing the 8 units of resource consumed by process c before the **exec**
8. The job continues processing the new substep and process c consumes an additional 6 units of resource.
9. An Interval record (subtype 2) is written containing one z/OS UNIX Process Section showing the 6 units of resource consumed by process c since the **exec**.
10. The job continues and process c consumes an additional 2 units of resource.
11. The job is “undubbed” and “dubbed” again as process d. Process d consumes 4 units of resource.
12. The step ends:
    a. A Step Termination record (subtype 3) is written. This record contains two z/OS UNIX Process Sections:

- One showing the 2 units of resource consumed by process c after the second interval
- One showing the 4 units of resource consumed by process d

b. A Step Total record (subtype 4) is written. This record contains three z/OS UNIX Process sections:
   - One showing the 6 units of resource consumed by process c after the **exec** but before the second interval
   - One showing the 2 units of resource consumed by process c after the second interval
   - One showing the 4 units of resource consumed by process d

13. The job ends and a Job Termination record (subtype 5) is written. This record contains all the z/OS UNIX Process sections written with the first Step Total record followed by all the z/OS UNIX Process Sections written with the second Step Total record. The following six sections are written to the Job Termination record:
    - One showing the 2 units of resource consumed by process a
    - One showing the 8 units of resource consumed by process b
    - One showing the 8 units of resource consumed by process c before the **exec**
    - One showing the 6 units of resource consumed by process c after the **exec** but before the second interval
    - One showing the 2 units of resource consumed by process c after the second interval
    - One showing the 4 units of resource consumed by process d

DFSMS Statistics and Configuration Record (Type 42)

The DFSMS Statistics and Configuration record (type 42, subtype 6) provides information about data set level performance. Each mountable file system resides in an HFS data set. I/O statistics for an HFS data set represent I/O statistics for the mountable file system.

RMF Record Support (Types 70–79)

RMF records provide the following support for z/OS UNIX.

1. RMF supports the forked address space type, OMVS, in the CPU Activity report (type 70) and in various Monitor II reports (type 79).
2. RMF supports swap reason codes z/OS UNIX Input Wait and z/OS UNIX Output Wait in the Paging Activity report (type 71) and in various Monitor II reports (type 79).
3. SRM supports SUBSYS=OMVS in the IEAICSxx member of SYS1.PARMLIB. Therefore, this subsystem type may appear in the Workload Activity report (type 72).
4. RMF provides an OMVS Kernel Activity report showing status on kernel resources. Data for this report can be found in SMF record type 74, subtype 3.

File System Activity Record (Type 92)

The File System activity record (type 92) provides information on:
- Mount and unmount of a file system
- Quiesce and unquiesce of a file system
- Open and close of a file

All file system activity records contain information needed to associate them with a particular job and jobstep.

- Jobname
- Reader start time and date
- Step name
- z/OS UNIX process ID
- z/OS UNIX process group ID

All file system activity records also contain information needed to associate them with a particular user, when appropriate.

- System authorization facility (SAF) group ID
- SAF user ID
- z/OS UNIX real user ID
- z/OS UNIX real group ID
- z/OS UNIX session ID

These fields can be used to link file system records with related common address space records (type 30) or with other related file system records.

Accounting for open() and close()

An **open()** or **opendir()** request generates an open record. No open record is written for **dup()**, **pipe()**, or **fork()**. A **fork()** or **dup()** function results in more than one file descriptor accessing the same file with the same cursor. (A cursor refers to the current position in the file.) In this case, when you have more than one file descriptor with the same cursor, if a **close()** or **closedir()** request occurs, no close record is written until the last file descriptor associated with the cursor is closed.

Because of the **fork()** function, a close record may be written by a process other than the one that opened the file. Open records that are created have a correlator, called the open file token. The open file token can be used to correlate open and close records.

Chapter 9. System Logger accounting

System logger produces SMF record type 88 to record the system logger activity of a single system in a sysplex; these records are written to the active SMF data set on that system. Using the IBM DFSORT program product, or its equivalent, you can sort and merge SMF data sets from each system into a single dump data set. System logger provides a SAMPLIB program, IXGRPT1, to show how an installation might write a program to analyze the dump data set input and summarize system logger activity across the sysplex.

Capacity planning

For capacity planning purposes, IBM recommends that you view the steady-state performance requirements of an application. Various flags in the SMF record type 88 highlight exception scenarios for additional analysis or changes in report processing. For example, if a log stream was temporarily unavailable during an SMF global interval, you might decide to exclude records written during that interval from a capacity planning study, because the interval did not exhibit normal capacity demands.

This chapter describes the following:

Record Type 88

Record type 88 focuses on the log stream data for a system in a sysplex, including use of interim storage. **Interim storage** is where log data is initially written, before being written to DASD log data sets. Data in interim storage can be accessed quickly without incurring DASD I/O. In a coupling facility log stream, interim storage for log data is in coupling facility list structures. In a DASD-only log stream interim storage for log data is contained in local storage buffers on the system and duplexed to staging data sets. Using record type 88 can help an installation avoid the STRUCTURE FULL exception, and perform other tuning and/or capacity planning analysis.

Record type 88 focuses on the coupling facility structure data and the log stream data for a system in a sysplex. Using the record can help an installation avoid the STRUCTURE FULL exception, and perform other tuning and/or capacity planning analysis.

Given a specific log stream, a record type 88 summarizes all of that log stream’s activity on that system, as long as at least one address space is connected to the log stream on that system. If no system logger write activity is performed against the log stream during a particular SMF interval, a record is produced showing zero for the various system logger activity total fields.

The system logger SMF record is cut for all log streams connected at the expiration of the SMF global recording interval. Record type 88 is also triggered by the disconnection of the last log stream on that system.

Analysis of fields

SMF fields relating to resource events, either structure full or staging data set full conditions, should be handled depending on the following:

- Whether the resource is shared sysplex-wide and each system will take action.
- Whether the resource is shared sysplex-wide but only one system will take action.
- Whether the resource is consumed on a system-local basis.

To obtain a sysplex-wide view of system logger activity, correct processing for most SMF 88 data fields is to sum the field contents for the target interval across all the SMF 88 records produced in the sysplex. There are, however, exceptions to this rule. Because each system must take its own action — that is, wait for an ENF signal indicating that system logger is available — an analysis program should use the maximum value for these fields: SMF88ERI, SMF88ERC, and SMF88ESF. For example, if a structure rebuild is initiated in a sysplex with three systems, the event is recorded on all three systems. The correct number of structure rebuild initiations is not three, however, it is one, or the maximum number provided SMF88ERI.

For dasd only log streams, staging data sets are a required part of the log stream configuration. For coupling facility log streams, on the other hand, use of staging data sets implies a trade-off between performance workload and data integrity. You should try to tune the staging data set size to minimize the number of Staging_Dataset_Threshold_Hit conditions. Without this type of tuning, such conditions can impact performance during staging data set processing. Note that only an installation can determine what the proper trade-off between performance and data integrity should be. For more information about staging data sets, for coupling facility log streams, see *z/OS MVS Setting Up a Sysplex*.

Because system logger maintains interim storage differently for coupling facility based versus dasd only log streams, the difference is reflected in SMF record 88 report:

- For a coupling facility based log stream, Structure (Interim Storage) Section of the record 88 report shows information about usage of coupling facility structure space allocated for a log stream and the flow of log data through the structure.
- For a dasd only log stream, the Structure (Interim Storage) section of the record 88 report shows information about usage of staging data set space and flow of data through the staging data set for the log stream.

  Not all fields in the Structure (Interim Storage) Section of the record 88 report apply to dasd only log streams. For a dasd only log stream, fields that do not apply will contain zeros. Field SMF88STN contains *DASDONLY* for a dasd only log stream because there is no structure name. Use this field to identify a dasd only log stream.

Primary storage full condition for Logstreams

When a system logger user issues the IXGWRITE macro for a Logstream, system logger writes data to primary storage. When the write completes, system logger categorizes the event as a type-1, type-2, or type-3 completion. These categorizations indicate how much space in the primary storage is being used by the Logstream when the IXGWRITE completion occurred. Field SMF88SC1 indicates a type-1 event, SMF88SC2 a type-2 event, and SMF88SC3 a type-3 event. SMF88SC3 will only be maintained for structure based Logstreams. It is not defined for DASDONLY Logstreams and will contain zero.

- A type-1 completion (field SMF88SC1) indicates that after the write completed, the percentage of resource in use by the primary storage was less than the high offload threshold.
- A type-2 completion (field SMF88SC2) indicates that after the write completed, the percentage of resource in use by the primary storage was equal to or greater than the high offload threshold, so system logger begins managing storage resources by migrating data from the coupling facility to DASD.
- A type-3 completion (field SMF88SC3) indicates that a given log stream is close to consuming all the coupling facility structure space or if the system logger configuration is tuned incorrectly. For example, system logger's access to its DASD log data sets would be slowed if those data sets reside on the same device as some other heavily-used data sets. A type-3 can also occur if many Logstreams are defined to share the same structure, because each newly defined Logstream causes system logger to dynamically repartition storage among the existing Logstreams. If a log stream has a large proportion of type-3 completions, system logger is getting dangerously close to the STRUCTURE FULL condition. SMF88SC3 will not be defined for DASDONLY Logstreams.

Note: The counts of bytes written to the coupling facility structure and bytes written to DASD log data sets are sampled data; output totals are expected to be roughly proportional to the count of bytes written via IXGWRITE rather than a precise calculation.

IXGRPT1 SAMPLIB program

IXGRPT1 is available in SYS1.SAMPLIB. This program can help you analyze system logger SMF data for the systems in a sysplex. IXGRPT1 provides the following:

- System logger interim storage related I/O activity
- Nearness of the STRUCTURE FULL condition
- Selected capacity planning information

Notes:

1. Input to IXGRPT1 should be sorted by timestamp and log stream name. For sorting purposes, analysis programs should use timestamp field SMF88LTD (note that this field is in GMT format), created when the ENF signal was issued, rather than fields SMF88TME and SMF88DTE, which indicate when a particular record was written. If IXGRPT1 detects a sorting error in the input, an error message is produced and the program ends.
2. When you use the IXGRPT1 program, make sure to include type 88 subtype 1 records and indicate whether or not you wish to include dasd only log stream information in this report or coupling facility data only. See the IXGRPT1 program for examples of how to do this.
3. Follow the instructions in the prolog of IXGRPT1 to run the utility or refer to JCL sample IXGRPT1J to run the utility.

System Logger interim storage related I/O activity

IXGRPT1 analyzes system logger-related I/O by calculating:

- Number of bytes written by users via IXGWRITE during the interval (SMF88LWB)
- Number of bytes written to interim storage during the interval (SMF88SWB)
- Number of bytes written to DASD during the interval (SMF88LDB)
- Number of bytes deleted from interim storage during interval without having been written to the log data set (SMF88SIB)
- Number of deletes from interim storage during interval without having been written to the log data set (SMF88SII)

- Number of bytes written to the DASD log data set and then deleted from interim storage during the interval (SMF88SAB)
- Number of deletes from interim storage during interval written to the DASD log data set and then deleted (SMF88SAI)
- Number of times the log stream was offloaded during interval (SMF88EO)
- Number of times a request was made by system logger to write log stream data to DASD during the expiring SMF interval (SMF88LIO)
- Number of times system logger had to suspend before writing log stream data to DASD because a previously-initiated write to DASD had not yet completed during the expiring SMF interval (SMF99LIS).

When the percentage of resource in use by a log stream exceeds the high offload threshold, data is asynchronously offloaded from interim storage to DASD log data sets, and then deleted from interim storage. Thus, SMF88SWB shows I/O from the main processor to interim storage. SMF88SIB shows the success of an application in avoiding offloads for data that it intends to delete from interim storage. SMF88SAB shows bytes deleted from interim storage and implies I/O from the interim storage to DASD log data sets.

Nearness of the primary storage full condition for Logstreams

IXGRPT1 analyzes the nearness of primary storage full condition for Logstreams as follows. For DASDONLY Logstreams the type-3 completion is not defined and will contain zero.

- Number of IXGWRITE invocations of completion type-1 (primary storage fullness in “normal” range).
- Number of IXGWRITE invocations of completion type-2 (primary storage fullness in “warning” range).
- Number of IXGWRITE invocations of completion type-3 (primary storage fullness in “critical” range). This field will be zero for DASDONLY Logstreams.
- Number of times all log stream in structure offloaded during interval
- Number of times the structure full condition was actually reached.

Selected capacity planning information

IXGRPT1 flags the existence of events that affect the interpretation of system logger data for capacity planning. Some events apply to coupling facility based log streams only, while others apply to both coupling facility and dasd only log streams.

Coupling facility log stream only events include:

- For every interval, IXGRPT1 displays the number of STRUCTURE FULL events that were detected for a coupling facility log stream. Frequent STRUCTURE FULL events can indicate a poorly sized coupling facility or that the applications writing to the coupling facility log stream have sporadic bursts of high activity. The installation should perform additional analysis.
- For every interval, IXGRPT1 displays the number of STRUCTURE REBUILD events that occur. Frequent STRUCTURE REBUILD events indicate a need for further analysis.

Coupling facility and dasd only log stream events include:

- For every interval, IXGRPT1 displays the number of bytes written to the coupling facility (SMF88SWB) and to the DASD log stream data set (SMF88LDB).
- For every interval, IXGRPT1 displays the number of staging data set full and staging data set threshold hit conditions for the log stream.

- For every interval, IXGRPT1 displays the number of DASD shift events that occur. Frequent DASD-shift events can indicate a poorly tuned system or a very high volume of system logger activity. The installation should perform additional analysis.

  Note: A DASD-shift event occurs when system logger determines that a log stream must stop writing to one log data set and start writing to a different data set. A DASD-shift event generally occurs when a log data set becomes full.
- For a given log stream, IXGRPT1 displays the number of systems in the sysplex which contribute to an SMF record during the interval. In some cases a system expected to contribute a record might not do so. The count of contributing systems therefore may be used as a signal for further analysis, or to exclude exception records from normal state capacity planning.

Chapter 10. EXCP Count

SMF record types 4, 14, 15, 30, 32, 34, 40, and 64 have fields that contain a count related to I/O activity. EXCP is the name of a macro that initiates I/O. These fields are called execute channel program (EXCP) counts.[1] There are two levels of EXCP counts, the DD level and the address space level. The type 30 record provides the address space level counts in the I/O Activity section and the DDLEVEL counts in the EXCP section. All other records provide only the DDLEVEL.

Note: Most I/O is VSAM (that counts channel programs that are not done with EXCP), or BSAM, QSAM, or BPAM (that count blocks).

DD Level

The DD level EXCP count includes:

- I/O for system services, for example:
  - Joblib/steplib processing
  - Jobcat/stepcat processing
  - Overlay supervisor processing
  - Checkpoint data set processing.
- Number of channel programs for VSAM data sets
- Number of channel programs for VSAM data sets (excludes VSAM extended format data sets)
- Number of 4k blocks for DIV objects (includes reads, writes and re-reads)
- Starting a channel program via an EXCP macro (includes VIO, excludes BSAM, QSAM, BPAM on DASD)
- Starting a channel program via TCBEXCP macro (includes VIO, excludes BSAM, QSAM, BPAM on DASD)
- Starting a channel program via an EXCPVR macro (includes VIO, excludes BSAM, QSAM, BPAM on DASD)
- Starting a channel program in a system or user provided channel-end appendage
- Starting a channel program in an abnormal-end appendage
- EXCPs for VIO data sets
- EXCPs issued to the SYSUDUMP, SYSABEND, and SYSMDUMP data sets when these data sets reside on a direct access or tape device.

The DD level EXCP count does not include:

- EXCPs issued by the job entry subsystem
- TPUTs and TGETs handled by macro instructions (For TPUTs and TGETs, EXCPs are accumulated on a system basis and are contained in SMF record types 30, 32 (if detail is specified), 34 and 35 only.)
- I/O to or from spool

Only the type 6 and 26 SMF records contain counts for a job or step I/O activity to spool data sets managed by either job entry subsystem.

Type 30 and 64 records are data set oriented and may contain the EXCP count for one or more concurrent users.

1. In a typical system most counts are not EXCP. This term is used for simplicity only.

Address Space Level

The address space level EXCP count in the type 30 record contains all of the I/O counts described for the DD level, plus the following:

- Library searches and fetches from data sets in the LINKLIST
- I/O initiated to the JES2 spool data sets from the address space being reported
- Catalog management I/O activity and VTOC and VTOC index I/O activity done by DADSM.
- OPEN and CLOSE I/O activity beyond priming and purging the buffers.
- For OpenMVS, I/O activity for:
  - The physical file system
  - Pipes, including FIFO special files (named pipes)
  - Sockets, including the UNIX domain and INET

  The address space EXCP level excludes all of the I/O counts that the DD level excludes, plus the following:
  - Paging and swapping I/O activity
  - VTAM I/O activity
  - MSCC, OLTEP, and IOS retry.

Notes:

1. In SMF record types 14 and 15, the EXCP count accumulates over the entire job step. Therefore, if a data set is opened and closed twice during a single job step, the count in the second record is the sum of all EXCPs for both uses of the data set. For multi-volume data sets (such as tape files), the EXCP count is accumulated over the volumes if all the volumes of the data set are mounted on the same device. If more than one device is used, the EXCP counts will not be cumulative.
2. The EXCP count in the last type 14 and 15 records for a given job step equals the corresponding entry for the data set in the type 4 and 34 records.
3. If concatenated data sets reside on the same physical device, the EXCP count is accumulated in the first data set entry having that device entry.
4. If SMF cannot acquire storage to expand the area where the EXCP count is maintained, only the existing data sets are counted.
5. If a data set is dynamically unallocated, the EXCP count is in record types 30 and 40; there is no EXCP-count entry in record types 4 and 34.

Chapter 11. CPU Time

SMF record types 4, 5, 30, 32, 34 and 35 have fields that contain the job and job step CPU times. This chapter summarizes the different times that are included and those that are excluded in these CPU-time fields. This chapter lists a few examples of some of the major causes of CPU-time variation between different runs of the same job or job step.

Job step CPU time is the amount of time devoted by the central processing unit to the processing of instructions for a given job step. Job CPU time is the sum of job step CPU times for all of the steps in a given job. CPU timing is done on an address space basis. The accumulation of CPU time is separated into processing time under TCBs and processing time under SRBs.

Note: If you want to account for CPU time for a single TCB or SRB (rather than a whole address space), use either the TIMEUSED or the CPUTIMER macro. Do not use a store CPU timer (STPT) instruction, which can cause incorrect (such as negative) values. Use TIMEUSED either under a TCB or an SRB. See the *z/OS MVS Programming: Authorized Assembler Services Reference SET-WTO* for more information on the TIMEUSED macro. Use CPUTIMER under a TCB. See *z/OS MVS Programming: Authorized Assembler Services Reference ALE-DYN* for more information on the CPUTIMER macro.

CPU Time Under TCBs

This section describes times related to the Vector Facility, and times under TCBs that are included or excluded in CPU-time fields of certain SMF record types.

Vector Facility Time

If the current task uses the Vector Facility (VF), the system accumulates VF affinity time and VF usage time; these times are found in record type 30. VF affinity time is the job step time for tasks accumulated while the task had affinity to processors with the Vector Facility. This time is useful for capacity management of the Vector Facility. VF usage time, a subset of the VF affinity time, is the time that the task actually spent processing vector instructions. The units for VF affinity and VF usage time are the same units as TCB time. Use the TIMEUSED macro to get the vector time usage for individual TCBs.

Included/Excluded TCB Times

Timing values accumulated for the address space under TCB control include:

- Problem program time
- SVCs
- Lock spins encountered in an MP environment
- EMS (emergency signals between CPUs) interrupt occurring within a lock spin
- Abend/Abterm
- User SPIE and ESPIE exit processing.

Times excluded are:

- External interrupt time
- Page fault processing time, including resolving page faults from expanded storage

- CPU "stopped" time if the QUIESCE command is used
- Attention processing time for TSO/E.

The following times are excluded but are available in record type 30:

- I/O interrupt time (accumulated separately in SMF30IIP)
- Swap-out/swap-in processing and I/O error recovery processing (accumulated separately in SMF30RCT)
- Managing hiperspaces
- Program check handling.

CPU Time Under SRBs

This section describes times under SRBs that are included or excluded in CPU-time fields of certain SMF record types.

Included/Excluded SRB Times

Timing values accumulated for the address space under SRB control include:

- Swap control
- Cross-memory communications
- Any supervisor service under SRB control
- Page stealing
- I/O completion processing
- Enclave timing.

Times excluded are:

- Lock request suspension
- Hiperspace management.

CPU-Time Variation

There are many reasons why CPU time varies between different runs of the same job or job step. The following list describes some of the major causes of variation:

- Cycle stealing on systems with integrated channels — CPU instruction processing is temporarily suspended when channels require the use of hardware resources shared with the CPU.
- CPUs using a high speed buffer — CPU time may vary due to any of the following:
  - Buffer interference caused by concurrent tasks
  - Partial or full disabling of a buffer because of storage errors
  - Translation lookaside buffer (TLB) affect on instruction processing rate.
- Storage access — The CPU cannot access central storage if a channel is using it. Storage-access time depends on CPU architecture such as interleaving, data widths and paths.
- DASD space allocation — If the number of extents is not exactly the same as before, additional end-of-extent processing is required.
- Temporary I/O errors — Additional processing may be required for temporary I/O errors.
- Expanded storage frame accesses — If a run has a different number of such accesses than another run, the CPU time may differ. Accessing expanded storage requires more time than central.
- BLDL/FIND requests — If BPAM is used extensively, CPU time for processing BLDL/FIND requests varies if there was change in the PDS directory. That is, a

change in the location of the entry for the required member is reflected by a change in the time needed to find the block containing it.

- STOW processing — A difference in the PDS directory may vary STOW processing time because of the additional reordering or bumping that may be necessary.
- Macro processing — Processing time for macros such as LINK, LOAD, XCTL, ATTACH and BLDL is affected by where the requested module is located. For example, CPU time may be less if the module is in the LPA and JOBLIBS and STEPLIBS are not used.
- Availability of serially reusable resources (locks) — For example, the system ENQ routine time will vary depending on whether the resource is available. DEQ time increases if other tasks have subsequently requested the resource that the current task is releasing.
- Wait processing — CPU time varies depending on whether ECBs have been posted before issuing the WAIT macro instruction.
- Lock spins — If a job is run on an MP, CPU time may vary due to lock spins encountered in supervisor services.
- Queue searching — System service time varies with the status of the queue environment.
- Generalized trace facility (GTF) — When GTF is active, CPU time increases depending on the system functions (SVC, SSCH, IO, PCI, DSP) that are selected for current GTF recording. If USR functions are to be recorded and the application contains GTRACE macros, the CPU time variability is even more pronounced.
- System resource manager (SRM) — SRM processing may cause CPU time to vary when it is invoked from supervisor services that issue SYSEVENT, such as ENQ, WAIT (LONG=YES option), TPUT and TGET.
- Page stealing — Page stealing affects the number of page faults that a particular job incurs. CPU time varies depending on both the number of page faults resolved by I/O and the number of page faults resolved by reclaim.
- Sequential access method and chain scheduling — CPU time can vary from run to run depending on the amount of chain scheduling that was successful. The number of starts for I/O will vary under different system loads.
- MP-serialization — Contention for resources between CPs in a processor will vary.

Chapter 12. IFAUSAGE — Collecting Usage Data

Any product or application can measure usage. If you are a software vendor or application owner, use the information in this section to enable your software product to measure its usage, perhaps to participate in measured usage pricing.

The measurement function collects data using SMF record types 30 and 89. SMF record type 30 (Version 5 only) contains usage data for the product's address space. System-wide usage data for each product is recorded on SMF record type 89. The control and writing of these records is the same as for any SMF record type.

Collecting Your Own Data Using the IFAUSAGE Macro

MVS provides the IFAUSAGE macro for collecting usage data as CPU time. For products that need to collect some other type of usage data, IFAUSAGE also allows a product to define its own usage data. Information about the IFAUSAGE macro appears in this chapter. The data that IFAUSAGE collects is periodically written in type 89 SMF records. See "Record Type 89 (59) — Usage Data" on page 13-474 for a complete description.

IBM provides a program to generate usage reports so that customers can send usage reports to product owners. Information about the usage report program appears in *MVS/ESA Support for Measured Usage License Charges*. The reports are generated using the data in the type 89 SMF records. If these reports are not sufficient for the needs of your product, you can provide an exit routine that the usage reporting program will call or you can process the type 89 records via a program you provide for that purpose.

Collecting Usage Data

First you must decide what usage data you need. The IFAUSAGE macro supports collection of the following:
- all CPU time for an address space
- all CPU time for a task
- CPU time for a function
- data other than CPU time for a function.

In all cases you must identify the product for which usage data is to be collected. Use REQUEST=REGISTER on the IFAUSAGE macro to identify the product and to begin data collection. Issue REQUEST=DEREGISTER to end data collection.

Requesting the Status of the Measurement Function

You can verify that SMF is active and that the installation has requested SMF record 89 by specifying REQUEST=STATUS on the IFAUSAGE macro. Two reasons for requesting status are:
- to warn the user if usage data is not being collected
- to stop your product from being used if usage data is not being collected.

Collecting CPU Time for an Address Space or Task

You might want to collect CPU time for an address space or task when all of the processing for the address space or task is product processing. If your product is the job step task, collect all CPU time for the address space. When your product runs under some other task, collect CPU time for that task.

Use macro IFAUSAGE with REQUEST=REGISTER to begin collection of CPU time. To collect CPU time for the task, specify DOMAIN=TASK. To collect CPU time for the address space, specify DOMAIN=ADDRSP. When data collection is complete, specify REQUEST=DEREGISTER on the IFAUSAGE macro.

Collecting CPU Time for a Function

Some products run in a user address space to perform services requested by the user. In this case, not all processing for the address space or task is product processing. For this type of product, you need to collect usage data on a function basis.

Let's use an I/O system as an example. The user issues a GET or PUT to transfer data. Before the first GET request, the user must issue an OPEN so that the I/O system can recognize requests. After the last GET or PUT, the user issues a CLOSE to indicate that processing is complete. The I/O subsystem could collect CPU time on a function basis by capturing the CPU time for each GET and PUT request, as follows:

```
User issues OPEN
        Product issues IFAUSAGE REQUEST=REGISTER,SCOPE=FUNCTION
User issues GET
        Product issues IFAUSAGE REQUEST=FUNCTIONBEGIN
                .
                .product processing
                .
        Product issues IFAUSAGE REQUEST=FUNCTIONEND
User issues PUT
        Product issues IFAUSAGE REQUEST=FUNCTIONBEGIN
                .
                .product processing
                .
        Product issues IFAUSAGE REQUEST=FUNCTIONEND
                .
                .
                .other GETs and PUTs
                .
User issues CLOSE
         Product issues IFAUSAGE REQUEST=DEREGISTER
```

Collecting Data Other Than CPU Time

You might need to collect resource usage data other than CPU time. Examples of usage data you might chose to collect are number of transactions or number of bytes of data transferred.

To collect data other than CPU time, you must register with SCOPE=FUNCTION. Provide the resource data for accumulation by first issuing IFAUSAGE with REQUEST=FUNCTIONBEGIN. Collect the resource data by issuing IFAUSAGE with REQUEST=FUNCTIONDATA, specifying the resource data and its format. When you select the data format, consider how large you expect the numbers to be. Selecting floating point format allows any size number to be represented. If you select a different format, wrapping is possible, so you should ensure the unit of measure is one that will preclude wrapping. Resource data values are collected by adding the current resource data value to the accumulated resource data value.

Collection Intervals

If you are performing your own usage data analysis, (perhaps through an exit routine you provide for IEAURP), you may need to analyze two records. If your customer does not specify interval synchronization and are collecting data at the task level, you may receive multiple type 89 records for the same reporting interval. Without synchronization, task data collection, which is invoked by SMF address space interval processing, might not coincide with type 89 record generation (although both may have the same interval value, such as 30 minutes).

Suppose task data collection is scheduled for 4:45 and 5:15, and type 89 record generation is scheduled for 5:00 and 5:30. Both are on a 30 minute interval, but not synchronized. It is possible that the 5:30 reporting interval will include usage data from both the 4:00 - 5:00 and the 5:00 - 6:00 usage data intervals. Because the usage reporting program presents product usage in hourly buckets, SMF generates two records for the 5:30 interval. The first represents usage for the 4:00 - 5:00 usage data interval and the second reflects usage for the 5:00 - 6:00 usage data interval.

There can also be multiple type 89 records for a given interval if the number of products to be reported causes the record to exceed the maximum allowable size (32,756 bytes). In this case, the information is continued on a subsequent record.

IFAUSAGE Macro

IFAUSAGE identifies individual products as users of a system and identifies the type and level of usage data for each product. If you do not provide your own product-specific usage data, IFAUSAGE collects data that already exists in the system, generally CPU time. (See Chapter 11, “CPU Time,” on page 11-1 for detailed information about CPU time.) The usage reporting program analyzes the usage data and produces a report that contains identification and usage data for each product over specific intervals of time. Together, IFAUSAGE and the usage reporting program enable you to track product usage on a system or a sysplex basis, assuming that the system or systems are running SMF.

You identify a product to SMF by issuing the IFAUSAGE macro with the REQUEST=REGISTER parameter. You must register a product before issuing any of the other REQUEST parameters.

When you specify REQUEST=REGISTER, the system returns a token that you can use on subsequent request options. Specifying this token eliminates the need to specify the product registration information (PRODOWNER, PRODNAME, PRODVERS, PRODQUAL, and PRODID parameters). If you do not code the optional parameters PRODVERS, PRODQUAL, and PRODID on REQUEST=REGISTER and any subsequent requests, a blank field will appear in the corresponding report field. For the report program only, specifying PRODOWNER=NONE, PRODNAME=NONE, or PRODVERS=NONE, has the same effect as not coding the parameter at all.

When registering a product, you also can identify the scope of data you want to accumulate for the eventual report. For example, you can attribute all CPU time for an address space or for a task to a specified product.

If you choose to accumulate data for a task, you can further choose to record the product’s use of resources on the REQUEST=FUNCTIONDATA parameter. In this case, IFAUSAGE starts collecting data only when you specify REQUEST=FUNCTIONBEGIN, and it ends when you specify REQUEST=FUNCTIONEND. Resources identified on the FUNCTIONDATA parameter are recorded in the SMF type 89 record. The report program, IFAURP, does not currently process the FUNCTIONDATA fields in the type 89 record or include the data in its report.

You cannot specify any of the other request options for a particular product once you have specified REQUEST=DEREGISTER for the product. When you specify REQUEST=DEREGISTER for a product, the system no longer collects usage data for this registration instance of the product. If other registrations for the product are still active, data recorded under those registrations continues to be collected. The system stops collecting data for the product only when there are no active registrations for the product.

Programs in both supervisor and problem state can issue the IFAUSAGE macro. However, programs running in problem state can only issue LINKAGE=SVC with the REQUEST=REGISTER or REQUEST=STATUS parameters. For problem state programs, IFAUSAGE allows only two REQUEST=REGISTER invocations for each domain specified on the DOMAIN parameter.

Environment

The requirements for the caller are:

Minimum authorization:	Problem state and any PSW key. For LINKAGE=BRANCH, REQUEST=DEREGISTER, REQUEST=FUNCTIONBEGIN, and REQUEST=FUNCTIONDATA, supervisor state.
Dispatchable unit mode:	Task
Cross memory mode:	PASN=HASN=SASN
AMODE:	31-bit
ASC mode:	Primary
Interrupt status:	Enabled for I/O and external interrupts
Locks:	No locks held
Control parameters:	None

Programming Requirements

None.

Restrictions

None.

Input Register Information

Before issuing the IFAUSAGE macro with LINKAGE=BRANCH, the caller must ensure that the following general purpose registers (GPRs) contain the specified information.

Register	Contents
13	The address of a standard 72-byte work area

Output Register Information

When control returns to the caller, the GPRs contain:

Register	Contents
0	Unchanged
1	Used by the system
2-13	Unchanged
14	Used by the system (LINKAGE=BRANCH) or unchanged (LINKAGE=SVC)
15	Return code

When control returns to the caller, the ARs contain:

Register	Contents
0-15	Unchanged

Some callers depend on register contents remaining the same before and after issuing a service. If the system changes the contents of registers on which the caller depends, the caller must save them before issuing the service, and restore them after the system returns control.

Performance Implications

None.

REQUEST=REGISTER

The standard form of the IFAUSAGE macro with the REQUEST=REGISTER parameter is written as follows:

name	*name:* symbol. Begin *name* in column 1.
ƀ	One or more blanks must precede IFAUSAGE.
IFAUSAGE	
ƀ	One or more blanks must follow IFAUSAGE.
REQUEST=REGISTER	
,PRODOWNER=*product owner*	*product owner:* RS-type address or address in register (2) - (12).
,PRODNAME=*product name*	*product name:* RS-type address or address in register (2) - (12).
,PRODVERS=*product version*	*product version:* RS-type address or address in register (2) - (12).
,PRODQUAL=*product qualifier*	*product qualifier:* RS-type address or address in register (2) - (12).
,PRODID=*product id*	*product id:* RS-type address or address in register (2) - (12).
,DOMAIN=ADDRSP ,DOMAIN=TASK	**Default**: DOMAIN=ADDRSP
,SCOPE=ALL ,SCOPE=FUNCTION	**Default**: SCOPE=ALL SCOPE is valid only with DOMAIN=TASK
,PRTOKEN=*product token*	*product token:* RS-type address or address in register (2) - (12).
,LINKAGE=SVC ,LINKAGE=BRANCH	**Default**: LINKAGE=SVC
,RETCODE=*return code*	*return code*: RS-type address or address in register (2) - (12).

Parameters

The parameters are explained as follows:

REQUEST=REGISTER
Specifies that you are identifying a product for which you want to collect usage data, and specifies the level of data you want to collect for that product.

,PRODOWNER=*product owner*
Specifies the name or address of a required 16-byte input field into which you place the product owner's name. IBM products use the character string "IBM CORP."

,PRODNAME=*product name*
Specifies the name or address of a required 16-byte input field into which you place the product's name.

,PRODVERS=*product version*
Specifies the name or address of an optional 8-byte input field into which you place the product version identification.

,PRODQUAL=*product qualifier*
Specifies the name or address of an optional 8-byte input field into which you place the qualifier of the product. You might wish to use this parameter when there are several iterations of the same product running on one system and you want to record usage data for each iteration, rather than grouping all product usage together. if a product is running multiple times on a specific system, you can record usage based on individual system use of the product. A subsystem product could use as the qualifier the subsystem name under which each copy of the product runs.

,PRODID=*product id*
Specifies the name or address of an optional 8-byte input field into which you place the product identifier. IBM products use the product's order number.

,DOMAIN=ADDRSP
,DOMAIN=TASK
Specifies whether IFAUSAGE attributes all CPU time for the address space or for the current task to the product. The actual amount of task CPU time attributed to the product is defined by the SCOPE parameter. The default is DOMAIN=ADDRSP.

,SCOPE=ALL
,SCOPE=FUNCTION
Specifies the level of data that IFAUSAGE collects within the current task and attributes to the specified product. ALL specifies that IFAUSAGE is to track all CPU time in the current task for the specified product. FUNCTION specifies that IFAUSAGE is to track CPU time for parts of the current task defined as the periods between the time you issue REQUEST=FUNCTIONBEGIN and REQUEST=FUNCTIONEND for the specified product.

,PRTOKEN=*product token*
Specifies the name or address of an optional 8-character output field into which IFAUSAGE returns a product token. You can use this product token as input on other requests. Using the token as input on other requests eliminates the need to specify PRODNAME, PRODVERS, PRODOWNER, PRODQUAL, and PRODID on each invocation.

,LINKAGE=SVC
,LINKAGE=BRANCH
Specifies the type of linkage used in IFAUSAGE processing. LINKAGE=BRANCH indicates branch entry. You may specify LINKAGE=BRANCH if you are in supervisor state. LINKAGE=SVC indicates the linkage is by non-branch entry, and is the default.

,RETCODE=*return code*
Specifies an optional fullword location into which IFAUSAGE stores the return code. The return code is also in GPR 15.

REQUEST=DEREGISTER

The standard form of the IFAUSAGE macro with REQUEST=DEREGISTER parameter is written as follows:

name	*name:* symbol. Begin *name* in column 1.
ƀ	One or more blanks must precede IFAUSAGE.
IFAUSAGE	
ƀ	One or more blanks must follow IFAUSAGE.
REQUEST=DEREGISTER	
,PRTOKEN=*product token*	*product token:* RS-type address or address in register (2) - (12).
,PRODOWNER=*product owner*	*product owner:* RS-type address or address in register (2) - (12).
,PRODNAME=*product name*	*product name:* RS-type address or address in register (2) - (12).
,PRODVERS=*product version*	*product version:* RS-type address or address in register (2) - (12).
,PRODQUAL=*product qualifier*	*product qualifier:* RS-type address or address in register (2) - (12).
,PRODID=*product id*	*product id:* RS-type address or address in register (2) - (12).
,ENDTIME=*ending tcb time*	*ending tcb time*: RS-type address or address in register (2) - (12).
,ENDDATA=*ending level*	*ending level*: RS-type address or address in register (2) - (12).
,LINKAGE=SVC ,LINKAGE=BRANCH	**Default**: LINKAGE=SVC
,RETCODE=*return code*	*return code*: RS-type address or address in register (2) - (12).

Parameters

The parameters are explained as follows:

REQUEST=DEREGISTER
Specifies that the system is to stop collecting usage data for the specified product.

,PRTOKEN=*product token*
Specifies the product token that was returned on the REQUEST=REGISTER request. You can specify either PRTOKEN or PRODOWNER, PRODNAME, PRODVERS, PRODQUAL, and PRODID.

,PRODOWNER=*product owner*
Specifies the name or address of a required 16-character input field into which you place the owner of the product for which IFAUSAGE is to no longer collect usage data. PRODOWNER is required if you do not specify PRTOKEN.

,PRODNAME=*product name*
Specifies the name or address of a required 16-character input field into which you place the name of the product for which IFAUSAGE is to no longer collect usage data. PRODNAME is required if you do not specify PRTOKEN.

,PRODVERS=*product version*
Specifies the name or address of an optional eight-character input field into which you place the version of the product for which IFAUSAGE is to no longer collect usage data. PRODVERS is valid only if you specify PRODOWNER.

,PRODQUAL=*product qualifier*
Specifies the name or address of an optional eight-character input field into which you place the qualifier of the product for which IFAUSAGE is to no longer collect usage data. PRODQUAL is valid only if you specify PRODOWNER.

,PRODID=*product id*
Specifies the name or address of an optional 8-byte input field into which you place the product identifier. PRODID is valid only if you specify PRODOWNER. IBM products use the product's order number.

,ENDTIME=*ending tcb time*
Specifies the name or address of an optional eight-character output area into which IFAUSAGE returns the amount of TCB time, from the time you issued REQUEST=REGISTER, or the time the task has run up to the point you issue REQUEST=DEREGISTER.

,ENDDATA=*ending level*
Specifies the name or address of an optional eight-character output area into which IFAUSAGE returns data accumulated by all FUNCTIONDATA requests for the product recorded under this domain since the REQUEST=REGISTER.

,LINKAGE=SVC
,LINKAGE=BRANCH
Specifies the type of linkage used in IFAUSAGE processing. LINKAGE=BRANCH indicates branch entry. You may specify LINKAGE=BRANCH or LINKAGE=SVC if you are in supervisor state. LINKAGE=SVC indicates the linkage is by non-branch entry, and is the default.

,RETCODE=*return code*
Specifies the fullword location where the system stores the return code. The return code is also in GPR 15.

REQUEST=FUNCTIONBEGIN

The standard form of the IFAUSAGE macro with REQUEST=FUNCTIONBEGIN parameter is written as follows:

name	*name:* symbol. Begin *name* in column 1.
ƀ	One or more blanks must precede IFAUSAGE.
IFAUSAGE	
ƀ	One or more blanks must follow IFAUSAGE.
REQUEST=FUNCTIONBEGIN	
,PRTOKEN=*product token*	*product token:* RS-type address or address in register (2) - (12).
,PRODOWNER=*product owner*	*product owner:* RS-type address or address in register (2) - (12).
,PRODNAME=*product name*	*product name:* RS-type address or address in register (2) - (12).
,PRODVERS=*product version*	*product version:* RS-type address or address in register (2) - (12).
,PRODQUAL=*product qualifier*	*product qualifier:* RS-type address or address in register (2) - (12).
,PRODID=*product id*	*product id:* RS-type address or address in register (2) - (12).
,BEGTIME=*beginning cpu time*	*beginning cpu time*: RS-type address or address in register (2) - (12).
,LINKAGE=SVC ,LINKAGE=BRANCH	**Default**: LINKAGE=SVC
,RETCODE=*return code*	*return code*: RS-type address or address in register (2) - (12).

Parameters

The parameters are explained as follows:

REQUEST=FUNCTIONBEGIN
Specifies that IFAUSAGE is to start accumulating data for the current function and associates the data with the specified product.

,PRTOKEN=*product token*
Specifies the product token that was returned on the REQUEST=REGISTER request. You can specify either PRTOKEN or PRODOWNER, PRODNAME, PRODVERS, PRODQUAL, and PRODID.

,PRODOWNER=*product owner*
Specifies the name or address of a required 16-character input field into which you place the product owner's name. PRODOWNER is required if you do not specify PRTOKEN.

,PRODNAME=*product name*
Specifies the name or address of a required 16-character input field into which

you place the name of the product for which IFAUSAGE is to begin collecting usage data. PRODNAME is required if you do not specify PRTOKEN.

,PRODVERS=*product version*
Specifies the name or address of an optional eight-character input field into which you place the version of the product for which IFAUSAGE is to begin collecting usage data. PRODVERS is valid only if you specify PRODOWNER.

,PRODQUAL=*product qualifier*
Specifies the name or address of an optional eight-character input field into which you place the qualifier of the product for which IFAUSAGE is to begin collecting usage data. PRODQUAL is valid only if you specify PRODOWNER.

,PRODID=*product id*
Specifies the name or address of an optional 8-byte input field into which you place the product identifier. PRODID is valid only if you specify PRODOWNER. IBM products use the product's order number.

,BEGTIME=*beginning cpu time*
Specifies the name or address of an optional eight-character output area into which IFAUSAGE returns the CPU time for the current task, which is the beginning time for the function.

,LINKAGE=SVC
,LINKAGE=BRANCH
Specifies the type of linkage used in IFAUSAGE processing. LINKAGE=BRANCH indicates branch entry. You may specify LINKAGE=BRANCH if you are in supervisor state. LINKAGE=SVC indicates the linkage is by non-branch entry, and is the default.

,RETCODE=*return code*
Specifies an optional fullword location into which IFAUSAGE stores the return code. The return code is also in GPR 15.

REQUEST=FUNCTIONDATA

The standard form of the IFAUSAGE macro with REQUEST=FUNCTIONDATA parameter is written as follows:

name	*name:* symbol. Begin *name* in column 1.
ƀ	One or more blanks must precede IFAUSAGE.
IFAUSAGE	
ƀ	One or more blanks must follow IFAUSAGE.
REQUEST=FUNCTIONDATA	
,PRTOKEN=*product token*	*product token:* RS-type address or address in register (2) - (12).
,PRODOWNER=*product owner*	*product owner:* RS-type address or address in register (2) - (12).
,PRODNAME=*product name*	*product name:* RS-type address or address in register (2) - (12).
,PRODVERS=*product version*	*product version:* RS-type address or address in register (2) - (12).
,PRODQUAL=*product qualifier*	*product qualifier:* RS-type address or address in register (2) - (12).
,PRODID=*product id*	*product id:* RS-type address or address in register (2) - (12).
,DATA=*resource data*	*resource data:* RS-type address or address in register (2) - (12).
,FORMAT=CPUTIME ,FORMAT=BINARY ,FORMAT=FLOAT	**Default**: FORMAT=CPUTIME
,CURRENTDATA=*current resource*	*current resource*: RS-type address or address in register (2) - (12).
,LINKAGE=SVC ,LINKAGE=BRANCH	**Default**: LINKAGE=SVC
,RETCODE=*return code*	*return code*: RS-type address or address in register (2) - (12).

Parameters

The parameters are explained as follows:

REQUEST=FUNCTIONDATA
Specifies that IFAUSAGE will accumulate data based on product specifications, that is, you can record product usage based on your own data specifications in addition to the CPU time accumulated by default. You must have issued REQUEST=FUNCTIONBEGIN before issuing REQUEST=FUNCTIONDATA.

,PRTOKEN=*product token*
Specifies the product token that was returned on the REQUEST=REGISTER

request. You can specify either PRTOKEN or PRODOWNER, PRODNAME, PRODVERS, PRODQUAL, and PRODID.

,PRODOWNER=*product owner*
Specifies the name or address of a required 16-character input field into which you place the product owner's name. PRODOWNER is required if you do not specify PRTOKEN.

,PRODNAME=*product name*
Specifies the name or address of a required 16-character input field into which you place the name of the product for which IFAUSAGE is to provide usage data. PRODNAME is required if you do not specify PRTOKEN.

,PRODVERS=*product version*
Specifies the name or address of an optional eight-character input field into which you place the version of the product for which IFAUSAGE provides usage data. PRODVERS is valid only if you specify PRODOWNER.

,PRODQUAL=*product qualifier*
Specifies the name or address of an optional eight-character input field into which you place the qualifier of the product for which IFAUSAGE is to provide usage data. PRODQUAL is valid only if you specify PRODOWNER.

,PRODID=*product id*
Specifies the name or address of an optional 8-byte input field into which you place the product identifier. PRODID is valid only if you specify PRODOWNER. IBM products use the product's order number.

,DATA=*resource data*
Specifies the name or address of a required eight-character field where IFAUSAGE obtains the resource data you want to accumulate. Fixed data should be right justified and padded with zeros.

,FORMAT=CPUTIME
,FORMAT=BINARY
,FORMAT=FLOAT
Specifies the format of the data specified on the DATA parameter. The default is CPUTIME.

CPUTIME indicates that the data is to be CPU time, in TOD format (bit position 51 represents 1 micro second); the data is reported in floating point, .01 seconds. BINARY indicates that the data is to be in 64-bit binary format. FLOAT indicates that the data is to be in long floating point hex format.

,CURRENTDATA=*current resource*
Specifies the name or address of an optional eight-character output area into which IFAUSAGE returns data accumulated by this and previous FUNCTIONDATA requests for the product since the REQUEST=REGISTER.

,LINKAGE=SVC
,LINKAGE=BRANCH
Specifies the type of linkage used in IFAUSAGE processing. LINKAGE=BRANCH indicates branch entry. You may specify LINKAGE=BRANCH if you are in supervisor state. LINKAGE=SVC indicates the linkage is by non-branch entry, and is the default.

,RETCODE=*return code*
Specifies an optional fullword location into which IFAUSAGE stores the return code. The return code is also in GPR 15.

REQUEST=FUNCTIONEND

The standard form of the IFAUSAGE macro with REQUEST=FUNCTIONEND parameter is written as follows:

name	*name:* symbol. Begin *name* in column 1.
ƀ	One or more blanks must precede IFAUSAGE.
IFAUSAGE	
ƀ	One or more blanks must follow IFAUSAGE.
REQUEST=FUNCTIONEND	
,PRTOKEN=*product token*	*product token:* RS-type address or address in register (2) - (12).
,PRODOWNER=*product owner*	*product owner:* RS-type address or address in register (2) - (12).
,PRODNAME=*product name*	*product name:* RS-type address or address in register (2) - (12).
,PRODVERS=*product version*	*product version:* RS-type address or address in register (2) - (12).
,PRODQUAL=*product qualifier*	*product qualifier:* RS-type address or address in register (2) - (12).
,PRODID=*product id*	*product id:* RS-type address or address in register (2) - (12).
,ENDTIME=*ending time*	*ending time:* RS-type address or address in register (2) - (12).
,ENDDATA=*end resource level*	*end resource level*: RS-type address or address in register (2) - (12).
,LINKAGE=SVC ,LINKAGE=BRANCH	**Default**: LINKAGE=SVC
,RETCODE=*return code*	*return code*: RS-type address or address in register (2) - (12).

Parameters

The parameters are explained as follows:

REQUEST=FUNCTIONEND
Specifies that IFAUSAGE is to end data accumulation for the current function and associate the data with the specified product.

,PRTOKEN=*product token*
Specifies the product token that was returned on the REQUEST=REGISTER request. You can specify either PRTOKEN or PRODOWNER, PRODNAME, PRODVERS, PRODQUAL, and PRODID.

,PRODOWNER=*product owner*
Specifies the name or address of a required 16-character input field into which you place the product owner's name. PRODOWNER is required if you do not specify PRTOKEN.

,PRODNAME=*product name*
Specifies the name or address of a required 16-character input field into which you place the name of the product for which IFAUSAGE is to stop collecting usage data. PRODNAME is required if you do not specify PRTOKEN.

,PRODVERS=*product version*
Specifies the name or address of an optional eight-character input field into which you place the version of the product for which IFAUSAGE is to stop collecting usage data.

,PRODQUAL=*product qualifier*
Specifies the name or address of an optional eight-character input field into which you place the qualifier of the product for which IFAUSAGE is to stop collecting usage data. PRODQUAL is valid only if you specify PRODOWNER.

,PRODID=*product id*
Specifies the name or address of an optional 8-byte input field into which you place the product identifier. IBM products use the product's order number.

,ENDTIME=*ending time*
Specifies the name or address of an optional eight-character output area in which IFAUSAGE returns the current accumulation of the CPU time data for the specified product since the REQUEST=FUNCTIONBEGIN was issued.

,ENDDATA=*end resource level*
Specifies the name or address of an optional eight-character output area in which IFAUSAGE returns the current accumulation of resource data for the specified product since the REQUEST=FUNCTIONBEGIN was issued.

,LINKAGE=SVC
,LINKAGE=BRANCH
Specifies the type of linkage used in IFAUSAGE processing. LINKAGE=BRANCH indicates branch entry. You may specify LINKAGE=BRANCH if you are in supervisor state. LINKAGE=SVC indicates the linkage is by non-branch entry, and is the default.

,RETCODE=*return code*
Specifies an optional fullword location into which IFAUSAGE stores the return code. The return code is also in GPR 15.

REQUEST=STATUS

The standard form of the IFAUSAGE macro with REQUEST=STATUS parameter is written as follows:

name	*name:* symbol. Begin *name* in column 1.
ƀ	One or more blanks must precede IFAUSAGE.
IFAUSAGE	
ƀ	One or more blanks must follow IFAUSAGE.

REQUEST=STATUS	
,LINKAGE=SVC ,LINKAGE=BRANCH	**Default:** LINKAGE=SVC
,RETCODE=*return code*	*return code:* RS-type address or address in register (2) - (12).

Parameters

The parameters are explained as follows:

REQUEST=STATUS
: Specifies that IFAUSAGE is to return an indication of whether the installation has requested SMF record 89.

  Register 15 and RETCODE, if specified, will contain the return code indicating the status.

,LINKAGE=SVC
,LINKAGE=BRANCH
: Specifies the type of linkage used in IFAUSAGE processing. LINKAGE=BRANCH indicates branch entry. You may specify LINKAGE=BRANCH if you are in supervisor state. LINKAGE=SVC indicates the linkage is by non-branch entry, and is the default.

,RETCODE=*return code*
: Specifies an optional fullword location into which IFAUSAGE stores the return code. The return code is also in GPR 15.

ABEND Codes

None.

Return Codes

When the IFAUSAGE macro returns control to your program, GPR 15 (and *retcode* if you coded RETCODE) contains the return code.

Table 12-1. Return codes for the IFAUSAGE macro

Return Code (in decimal)	Meaning and Action
00	**Meaning**: IFAUSAGE completed successfully. **Action**: None.

Table 12-1. Return codes for the IFAUSAGE macro (continued)

Return Code (in decimal)	Meaning and Action
04	**Meaning**: The error is due to one of the following conditions: • **DOMAIN -** Another product has already registered for the domain you specified on the DOMAIN parameter. IFAUSAGE records the data for each product. **Action**: None necessary. However, you may receive duplicate data for each product. • **FORMAT -** The data format you specified on the FORMAT parameter of REQUEST=FUNCTIONDATA does not match the format specified by a previous caller. All subsequent invocations of REQUEST=FUNCTIONDATA must specify the same data format as the first caller. **Action**: Check usage records or read SMF type 89 records to identify the specified data format. Ensure that you specify the same format on the FORMAT parameter on any subsequent invocations of REQUEST=FUNCTIONDATA. • **STATUS -** You specified REQUEST=STATUS, but the installation is not collecting SMF record 89. **Action**: Ensure that the installation intends to collect type 89 records. If it does not, do not issue IFAUSAGE. If the installation does intend to collect type 89 records, check with your installation programmer that the record type is specified on the SMFPRMxx parmlib member.
08	**Meaning**: • **REGISTER –** IFAUSAGE could not process more than two problem state program invocations of REQUEST=REGISTER for a domain. **Action**: Do not specify REQUEST=REGISTER more than two times for any specific domain. • **DEREGISTER –** You specified REQUEST=DEREGISTER for a product that has not first specified REQUEST=REGISTER. **Action**: Issue IFAUSAGE with the REQUEST=REGISTER parameter to identify the product to the system for usage data collection. • **FUNCTIONBEGIN –** You specified REQUEST=FUNCTIONBEGIN for a product that has not first specified REQUEST=REGISTER. **Action**: Issue IFAUSAGE with the REQUEST=REGISTER parameter to identify the product to the system for usage data collection. • **FUNCTIONDATA –** You specified REQUEST=FUNCTIONDATA without first identifying the start of the function with REQUEST=FUNCTIONBEGIN. **Action**: Issue IFAUSAGE with the REQUEST=FUNCTIONBEGIN parameter to identify the function to the system for usage data collection. • **FUNCTIONEND –** You specified REQUEST=FUNCTIONEND without first specifying REQUEST=FUNCTIONBEGIN. **Action**: Issue IFAUSAGE with the REQUEST=FUNCTIONBEGIN parameter to identify the function to the system for usage data collection. **Note:** This return code also results if you make a mistake in coding PRODOWNER, PRODNAME, PROVERS, PRODQUAL or PRODID and what you code for them on REQUEST=DEREGISTER, FUNCTIONBEGIN, FUNCTIONDATA, or FUNCTIONEND does not match what you coded on REQUEST=REGISTER.

Table 12-1. Return codes for the IFAUSAGE macro (continued)

Return Code (in decimal)	Meaning and Action
12	**Meaning**: You specified a token on the PRTOKEN parameter that the system cannot identify. **Action**: Check your specification on the PRTOKEN parameter, ensuring that it is the same token returned by the REQUEST=REGISTER invocation. Also check that you received a return code of 0 when REQUEST=REGISTER completed. • You specified a token on the PTOKEN parameter that the system cannot identify, which implies that you specified REQUEST=DEREGISTER for a product that has not first specified REQUEST=REGISTER. **Action**: Issue IFAUSAGE with the REQUEST=REGISTER parameter to identify the product to the system for usage data collection. • You specified a token on the PTOKEN parameter that the system cannot identify, which implies that you specified REQUEST=FUNCTIONBEGIN for a product that has not first specified REQUEST=REGISTER. **Action**: Issue IFAUSAGE with the REQUEST=REGISTER parameter to identify the product to the system for usage data collection. • You specified a token on the PTOKEN parameter that the system cannot identify, which implies that you specified REQUEST=FUNCTIONDATA without first identifying the start of the function with REQUEST=FUNCTIONBEGIN. **Action**: Issue IFAUSAGE with the REQUEST=FUNCTIONBEGIN parameter to identify the function to the system for usage data collection. • You specified a token on the PTOKEN parameter that the system cannot identify, which implies that you specified REQUEST=FUNCTIONEND without first specifying REQUEST=FUNCTIONBEGIN. **Action**: Issue IFAUSAGE with the REQUEST=FUNCTIONBEGIN parameter to identify the function to the system for usage data collection.
16	**Meaning**: IFAUSAGE cannot complete processing because SMF usage processing is not available on the system. **Action**: Do not issue IFAUSAGE.

Table 12-1. Return codes for the IFAUSAGE macro (continued)

Return Code (in decimal)	Meaning and Action
20	**Meaning**: The error is due to one of the following conditions: • **DEREGISTER –** IFAUSAGE could not process a problem state invocation of REQUEST=DEREGISTER. **Action**: Change the problem state invocation to a supervisor state invocation. • **FUNCTIONBEGIN –** IFAUSAGE could not process a problem state invocation of REQUEST=FUNCTIONBEGIN. **Action**: Change the problem state invocation to a supervisor state invocation. • **FUNCTIONDATA –** IFAUSAGE could not process a problem state invocation of REQUEST=FUNCTIONDATA. **Action**: Change the problem state invocation to a supervisor state invocation. • **FUNCTIONEND –** IFAUSAGE could not process a problem state invocation of REQUEST=FUNCTIONEND. **Action**: Change the problem state invocation to a supervisor state invocation. • Otherwise, an internal error was detected. Record the return code and contact the appropriate IBM support personnel.

IFAUSAGE – List Form

Use the list form of the IFAUSAGE macro together with the execute form of the macro for applications that require reentrant code. The list form of the macro defines an area of storage, which the execute form of the macro uses to contain the parameters.

The list form of the IFAUSAGE macro is written as follows:

name	*name:* symbol. Begin *name* in column 1.
ƀ	One or more blanks must precede IFAUSAGE.
IFAUSAGE	
ƀ	One or more blanks must follow IFAUSAGE.
MF=(L,*list addr*) MF=(L,*list addr,attr*) MF=(L,*list addr*,0D)	*list addr:* symbol. *attr:* 1- to 60-character input string. **Default:** 0D

The parameters are explained under the standard form of the IFAUSAGE macro with the following exception:

MF=(L,*list addr***)**
MF=(L,*list addr,attr***)**
MF=(L,*list addr***,0D)**
Specifies the list form of the IFAUSAGE macro.

list addr is the name of a storage area to contain the parameters.

attr is an optional 1- to 60-character input string, which can contain any value that is valid on an assembler DS pseudo-op. You can use this parameter to force boundary alignment of the parameter list. If you do not code *attr*, the system provides a value of 0D, which forces the parameter list to a doubleword boundary.

IFAUSAGE – Execute Form

Use the execute form of the IFAUSAGE macro together with the list form of the macro for applications that require reentrant code. The execute form of the macro stores the parameters into the storage area defined by the list form.

The execute form of the IFAUSAGE macro is written as follows:

name	*name:* symbol. Begin *name* in column 1.
ƀ	One or more blanks must precede IFAUSAGE.
IFAUSAGE	
ƀ	One or more blanks must follow IFAUSAGE.
	The parameters on the execute form are identical to those on the standard form with the exception of the MF and COMPLETE parameters listed below.
,MF=(E,*list addr*) ,MF=(E,*list addr*,COMPLETE)	*list addr:* RX-type address or address in register (2) - (12). **Default:** COMPLETE

The parameters are explained under the standard form of the IFAUSAGE macro with the following exception:

,MF=(E,*list addr***)**
,MF=(E,*list addr***,COMPLETE)**
Specifies the execute form of the IFAUSAGE macro.

list addr specifies the area that the system uses to contain the parameters.

COMPLETE, which is the default, specifies that the system is to check for required parameters and supply defaults for omitted optional parameters.

Chapter 13. SMF Records

SMF Record Information

This section contains the following information:
- General information about SMF records.
- Standard SMF record header information.
- Examples of standard SMF record headers.
- Individual SMF records.

Summary of SMF Records

The following list contains some general information about SMF records.
- To write any SMF-formatted records (except record types 2, 3, and 7) to the SMF data set, specify the ACTIVE parameter. To write record type 17 for temporary data sets, specify REC(ALL).
- The method of entry to a particular SMF record type determines whether installation-exit routine IEFU83, IEFU84, or IEFU85 receives control before control is returned to the caller of the SVC routine. A branch entry by a cross-memory caller causes IEFU85 to receive control. A branch entry by a non-cross-memory caller causes IEFU84 to receive control. An SVC 83 call causes IEFU83 to receive control.
- Many current SMF records contain variable sections. The user of these records should be aware that the record pointers must be updated by the length of each variable section of the record when the record data is being manipulated. Failure to do the address calculation will result in writing over valid data in previously processed sections. Other SMF records, (types 23, 30, 32, and 90), contain offsets that point directly from the record header to the data section.
- Unless otherwise specified, all EBCDIC fields within the SMF records are left-justified and right filled with blanks.
- Detailed information about the device type and device class, within a record, can be found in *z/OS MVS Data Areas, Vol 3 (IVT-RCWK)* and *z/OS MVS Data Areas, Vol 5 (SSAG-XTLST)*.
- In JES2 and JES3 records, information found in the 'Common Section' and the 'Identification Section' is defined in JESPARMS.
- In a loosely-coupled multiprocessing environment (such as JES2 shared spool or JES3), it is possible for the job START/LOGON time to be greater than the STOP/LOGOFF time because the installation does not synchronize the CPU clocks. The difference occurs when the START/LOGON time is initialized on processor A and the job is then processed on processor B. The STOP/LOGOFF time is recorded from processor B.

Standard SMF Record Header

Each record written to the SMF data set by the SMF writer routine contains the standard SMF record header. Each user record written to the SMF data set, by user-written routines, should include the standard record header. The length and field types for the record header vary with the kind of record writer. Table 13-1 shows the header for records without subtypes; its length is 18 bytes. Table 13-2 shows the header for records with subtypes; its length is 24 bytes.

The header contains information about the record, such as; record type, record subtype (if the record includes subtypes), record length, and the time and date the record was written to the data set. Record subtypes are used to group related data and control record types. For example, one record might contain three separate subtypes, each reporting different kinds of data. By using those subtypes you can eliminate the need for three separate record numbers. When designing your SMF record, you should use record subtypes efficiently. Many small subtypes within a record could create excessive I/O when written to the SMF data set, while a larger record with fewer subtypes can help avoid high I/O overhead.

The header section *must include* the record descriptor word (RDW). The RDW is a 4-byte field that must introduce each SMF record when it is written to the SMF data set by the SMFWTM macro instruction. The first two bytes of the RDW must contain the length of the logical record (including the four bytes of the RDW). The second two bytes are used for variable blocked spanned records; that is, records that contain more than 32,756 bytes. This field (the second two bytes) is set to zero if the record is *not* spanned. The remainder of the record immediately follows the RDW.

Because the record formats include the RDW, it is not necessary to add four bytes to the offset listed in the record; however, depending on the access method used to read the record from the SMF data set, these fields might not be present in your SMF record. You might have to subtract four bytes from the offsets listed in your record.

Table 13-1. Standard SMF Record Header for Records without Subtypes

Offsets		Name	Length	Format	Description
00	00	SMF*x*LEN	2	binary	Record length (maximum size of 32,756). This field and the next field (total of four bytes) form the record descriptor word (RDW). The first two bytes (this field) must contain the logical record length including the RDW. The second two bytes (the following field) are used for variable block spanned records. If the record is not spanned, set these two bytes to hexadecimal zeroes. These fields must be filled in before writing the record to the SMF data set.
02	02	SMF*x*SEG	2	binary	Segment descriptor (see record length field).
04	04	SMF*x*FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3** MVS/SP Version 4 and above. Bits 3, 4, 5, and 6 are on.* **4** MVS/SP Version 3. Bits 4, 5, and 6 are on. **5** MVS/SP Version 2. Bits 5 and 6 are on. **6** VS2. Bit 6 is on. **7** Reserved. *IBM recommends that you use information located elsewhere in this record to determine the MVS product level.
05	05	SMF*x*RTY	1	binary	Record type (hexadecimal values are 0-FF).
06	06	SMF*x*TME	4	binary	Time since midnight, in hundredths of a second, record was moved into the SMF buffer. In record types 2 and 3 this field indicates the time that the record was moved to the dump data set.
10	0A	SMF*x*DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF* (where *c* is 0 for 19xx and 1 for 20xx, *yy* is the current year (0-99), *ddd* is the current day (1-366), and *F* is the sign). In record types 2 and 3, this field indicates the date that the record was moved into the dump data set.
14	0E	SMF*x*SID	4	EBCDIC	System identification (from the SID parameter).

Table 13-2. Standard SMF Record Header for Records with Subtypes

Offsets		Name	Length	Format	Description
00	00	SMF*x*LEN	2	binary	Record length (maximum size of 32,756). This field and the next field (total of four bytes) form the record descriptor word (RDW). The first two bytes (this field) must contain the logical record length including the RDW. The second two bytes (the following field) are used for variable block spanned records. If the record is not spanned, set these two bytes to hexadecimal zeroes. These fields must be filled in before writing the record to the SMF data set.
02	02	SMF*x*SEG	2	binary	Segment descriptor (see record length field).
04	04	SMF*x*FLG	1	binary	System indicator **Bit** **Meaning When Set** **0** Reserved. **1** Subtypes are valid. **2** Reserved. **3** MVS/SP Version 4 and above. Bits 3, 4, 5, and 6 are on.* **4** MVS/SP Version 3. Bits 4, 5, and 6 are on. **5** MVS/SP Version 2. Bits 5 and 6 are on. **6** VS2. Bit 6 is on. **7** Reserved. *IBM recommends that you use record type 30 to obtain the MVS product level.
05	05	SMF*x*RTY	1	binary	Record type (hexadecimal values are 0-FF).
06	06	SMF*x*TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer. In record types 2 and 3, this field indicates the time that the record was moved into the dump data set.
10	0A	SMF*x*DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 00*yydddF* or 0*cyydddF* (where *c* is 0 for 19xx and 1 for 20xx, *yy* is the current year (0-99), *ddd* is the current day (1-366), and *F* is the sign). In record types 2 and 3, this field indicates the date that the record was moved to the dump data set.
14	E	SMF*x*SID	04	EBCDIC	System identification (from the SID parameter).
18	12	SMF*x*SSI	4	EBCDIC	Subsystem identification. This field is a four byte character value set by the SUBSYS=option specified in the SMF macros.
22	16	SMF*x*STY	2	binary	Record subtype (hexadecimal values are 0-FF). See “Selecting subtypes” on page 4-2 for a description of subtype selectivity.

Record Type 0 (00) — IPL

Record type 0 is written after every SMF initialization. It includes the virtual and central storage sizes and some of the SMF options in effect. See record type 90 (subtype 9) for information about the IPL of SMF.

Record Environment

The following conditions exist for the generation of this record:

Macro SMFEWTM(1), BRANCH=YES (record exit: IEFU84)

Record Mapping

Header/Self-defining Section

This section contains the common SMF record header fields and, if applicable, the triplet fields (offset/length/number) that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF0LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	SMF0SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF0FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See “Standard SMF Record Header” on page 13-1 for a detailed description.
5	5	SMF0RTY	1	binary	Record type 0 (X'00')
6	6	SMF0TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.
10	A	SMF0DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
14	E	SMF0SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF0JWT	4	binary	Limit, in minutes, of continuous wait for the job (taken from JWT parameter). Continuous wait time is defined as time spent waiting while the application program is in control. For example, for data sets allocated dynamically (while the application program is running, for example) either or both of the following count toward a job's continuous wait time: • The time required to recall a data set from HSM Migration Levels 1 or 2 • The time required to mount a tape If a data set was allocated statically (for a DD statement, for example) these activities will not be counted towards the job’s continuous wait time.
22	16	SMF0BUF	4	binary	This field contains meaningless information.
26	1A	SMF0VST	4	binary	Number of 1K bytes in virtual storage.
30	1E	SMF0OPT	1	binary	SMF options **Bit** **Meaning When Set** **0** Reserved **1** Reserved **2** Reserved. **3** Data set accounting. Record types selected. This bit is on when one of the following record types is selected: 14, 15, 17, 18, 62, 63, 64, 67 or 68. (See “Selecting SMF records” on page 4-2.) **4** Volume accounting. Record types 10 or 69 selected. (See “Selecting SMF records” on page 4-2.) **5** Reserved. **6** Type 17 records will be written for temporary data sets (REC(ALL)). **7** Reserved.

Offsets		Name	Length	Format	Description
31	1F	SMF0RST	4	binary	Number of 1K bytes in central storage.
35	23	SMF0RSV	1		Reserved.
36	24	SMF0OSL	8	EBCDIC	MVS product name.
44	2C	SMF0SYN	8	EBCDIC	System name (from the SYSNAME parameter in the IEASYSxx parmlib member).
52	34	SMF0SYP	8	EBCDIC	Sysplex name (from the SYSPLEX parameter in the COUPLExx parmlib member).

Record Type 2 (02) — Dump Header

The SMF dump program writes record type 2 to the dump data set. This record consists of the standard SMF record header only. It indicates the beginning of a dump of the SMF data set from a direct access device (usually to a tape).

Record Environment

The following conditions exist for the generation of this record:

Macro None

Record Mapping

Header/Self-defining Section

This section contains the common SMF record header fields and, if applicable, the triplet fields (offset/length/number) that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF2LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	SMF2SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF2FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See “Standard SMF Record Header” on page 13-1 for a detailed description.
5	5	SMF2RTY	1	binary	Record type 2 (X'02').
6	6	SMF2TME	4	binary	Time since midnight, in hundredths of a second, when the record was moved into the dump data set.
10	A	SMF2DTE	4	packed	Date when the record was moved into the dump date set, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
14	E	SMF2SID	4	EBCDIC	System identification (from the SID parameter).

Record Type 3 (03) — Dump Trailer

The SMF dump program writes record type 3 to the dump data set. This record consists of the standard SMF record header only. It marks the end of a dump of the SMF data set from a direct access device (usually to a tape).

Record Environment

The following conditions exist for the generation of this record:

Macro None

Record Mapping

Header/Self-defining Section

This section contains the common SMF record header fields and, if applicable, the triplet fields (offset/length/number) that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF3LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See "Standard SMF Record Header" on page 13-1 for a detailed description.
2	2	SMF3SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF3FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See "Standard SMF Record Header" on page 13-1 for a detailed description.
5	5	SMF3RTY	1	binary	Record type 3 (X'03').
6	6	SMF3TME	4	binary	Time since midnight, in hundredths of a second, when the record was moved into the dump data set.
10	A	SMF3DTE	4	packed	Date when the record was moved into the dump data set, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
14	E	SMF3SID	4	EBCDIC	System identification (from the SID parameter).

Record Type 4 (04) — Step Termination

Reference information

For information on service and transaction time, see *z/OS MVS Initialization and Tuning Guide*.

For more information on EXCP count and CPU time, see Chapter 10, "EXCP Count" and Chapter 11, "CPU Time."

Record type 4 is written at the normal or abnormal termination of a job step for a background job, or when a job step is flushed during or after job initiation. It is not written for a job step that follows a CANCEL operator command.

Note: IBM recommends that you use record type 30 rather than record types 4, 5, 20, 34, 35, and 40. Use of record type 4 may cause you to miss key workload indicators.

This record identifies the job step by the job log identification, step name, number of the step within the job, user identification, program name and performance group number. The job name, time, and date that the reader recognized the JOB card (for this job) constitute the job log identification. If accounting numbers (which can be alphameric) were specified in the EXEC statement, they are included.

This record also contains operating information such as:
- The job step start and end times
- Step CPU time
- Step service
- Step termination status
- Number of records in DD DATA and DD* data sets (processed by the step)
- Device allocation start time
- Problem program start time
- Storage protect key.

It contains the number of page-ins, page-outs, swap-ins, and swap-outs for both VIO and non-VIO data sets.

Record type 4 has an entry for each non-spooled data set that was defined by a DD statement. Each entry lists the device class, unit type, channel address, unit address, and EXCP count for the data set. Data sets are usually recorded in the order of the step DD statements; they are not identified by name. (An installation written IEFUJV exit routine can record this order as each statement is validated). Dynamic allocation or deallocation can affect the order. For data sets that are dynamically unallocated, the data set entry information is in record type 40 — not record type 4.

When the TIOT size is greater than 32K (more than 1635 DD statements), device data is not collected for the type 4 record. The data is available in the type 30 record.

The record contains information on service and transaction active timer.

Record Environment

The following conditions exist for the generation of this record:

Macro SMFEWTM(1), BRANCH=YES (record exit: IEFU84)

Record Mapping

Header/Self-defining Section

This section contains the common SMF record header fields and, if applicable, the triplet fields (offset/length/number) that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF4LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	SMF4SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF4FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See “Standard SMF Record Header” on page 13-1 for a detailed description.

Offsets		Name	Length	Format	Description
5	5	SMF4RTY	1	binary	Record type 4 (X'04').
6	6	SMF4TME	4	binary	Time since midnight, in hundredths of a second, that the record is passed to the SMF writer. This is the time when the step terminated.
10	A	SMF4DTE	4	packed	Date when the record is passed to the SMF writer, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description. This is the date when the step terminated.
14	E	SMF4SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF4JBN	8	EBCDIC	Job name. The job name, time, and date that the reader recognized the JOB card (for this job) constitute the job log identification, or transaction name (for APPC output).
26	1A	SMF4RST	4	binary	Time since midnight, in hundredths of a second, that the reader recognized the JOB card (for this job).
30	1E	SMF4RSD	4	packed	Date when the reader recognized the JOB card (for this job), in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
34	22	SMF4UIF	8	EBCDIC	User-defined identification field (taken from common exit parameter area, not from USER=parameter on job statement).
42	2A	SMF4STN	1	binary	Step number (first step=1, etc.).
43	2B	SMF4SIT	4	binary	Time since midnight, in hundredths of a second, that the initiator selected this step.
47	2F	SMF4STID	4	packed	Date when the initiator selected this step, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
51	33	SMF4NCI	4	binary	Number of card-image records in DD DATA and DD* data sets read by the reader for the step.
55	37	SMF4SCC	2	binary	Step completion code: X'0ccc' indicates system ABEND in the job step where *ccc* is the system ABEND code. (See *z/OS MVS System Codes*.) X'8ccc' indicates user ABEND in the job step where *ccc* is the user ABEND code. X'nnnn' indicates normal completion where *nnnn* is the contents of the two low-order bytes in register 15 at termination. X'0000' indicates either 1. The job step was flushed (not processed) because of an error during allocation or in a preceding job step, or 2. normal job completion with a return code of zero. Use this field in conjunction with the step termination indicator field (offset 87).
57	39	SMF4PRTY	1	binary	Address space dispatching priority (taken from DPRTY= parameter on EXEC card or the default APG value). For more information see *z/OS MVS Initialization and Tuning Guide*.
58	3A	SMF4PGMN	8	EBCDIC	Program name (taken from PGM= parameter on EXEC card). If a backward reference was used, then this field contains *.DD.
66	42	SMF4STMN	8	EBCDIC	Step name (taken from name on EXEC card).

Offsets		Name	Length	Format	Description
74	4A	SMF4RSV5	2	binary	Reserved. SMF4RSH0, formerly a two-byte field at this offset, has been increased to four bytes and moved to offset 82.
76	4C	SMF4SYST	2	binary	Largest amount of storage used from top of private area, in 1K units. This storage area includes the LSQA and SWA (subpools 229, 230, 236, 237, 249, and 253-255). If ADDRSPC=REAL is specified, this field equals the amount of storage used that was not from the contiguous central storage reserved for the program. See offsets 82 and 102. If storage was not allocated (job step was flushed), these fields equal zero.
78	4E	SMF4HOST	2	binary	Largest amount of storage from bottom of private area, in 1K units. This storage area includes subpools 0-127, 129–132, 244, 251 and 252. If ADDRSPC=REAL is specified, this field equals the amount of contiguous central storage that was used. See offsets 82 and 102.
80	50	SMF4RV1	2		Reserved.
82	52	SMF4RSH0	4	binary	Region size established, in 1K units taken from the REGION= parameter in the JCL, and rounded up to a 4K boundary. If ADDRSPC=REAL is specified, this field equals the amount of contiguous central storage reserved for the program. If the region requested was greater than 16 megabytes, the region established resides above 16 megabytes, and this field will contain a minimum value of 32 megabytes.
86	56	SMF4SPK	1	binary	Storage protect key, in the form *xxxx*0000 (where *xxxx* is the key).
87	57	SMF4STI	1	binary	Step termination indicator **Bit** **Meaning When Set** **0** Reserved **1** Canceled by exit IEFUJV **2** Canceled by exit IEFUJI **3** Canceled by exit IEFUSI **4** Canceled by exit IEFACTRT **5** Step is to be restarted **6** If 0, normal completion. If 1, ABEND. If step completion code (offset 55) equals 0322 or 0522, IEFUTL caused ABEND. If step completion code equals 0722, IEFUSO caused ABEND. **7** If 0, normal completion. If 1, step was flushed.
88	58	SMF4RV2	2		Reserved.
90	5A	SMF4AST	4	binary	Device allocation start time, in hundredths of a second.
94	5E	SMF4PPST	4	binary	Problem program start time, in hundredths of a second.
98	62	SMF4RV3	1	binary	Reserved.
99	63	SMF4SRBT	3	binary	Step CPU time under SRBs, in hundredths of a second. This field includes the CPU time for various supervisory routines that are dispatched via SRBs: locking routines, page resolution, swap control, cross-memory communications (WAIT, POST, I/O POST), and TQE scheduling.

Offsets		Name	Length	Format	Description
102	66	SMF4RIN	2	binary	Record indicator **Bit** **Meaning When Set** **0-3** Reserved **4** Field SMF4SETM is not valid. An overflow condition occurs when the length of the value for the step CPU time under TCBs is greater than 3 bytes. In this case, the step CPU time under TCBs is not recorded in the type 4 record (SMF4SETM); The value is available in the type 30 record (SMF30CPT). If your installation uses an accounting program that does not use the type 30 record to gather step CPU time, you must update that program. Only the type 30 record should be considered valid. **5** Device data not recorded. When the TIOT size is greater than 32K (more than 1635 DD statements), device data is not collected for the type 4 record. The data is available in the type 30 record. **6** EXCP count might be wrong. For more information on EXCP count, see Chapter 10, “EXCP Count.” **7** If 0, storage is virtual. If 1, storage is central (real). **8-15** Reserved.
104	68	SMF4RLCT	2	binary	Offset from the beginning of the record (SMF4FLG) header to the relocate section. The displacement depends upon the size of the accounting fields and the number of devices.
106	6A	SMF4LENN	2	binary	Length of device entry portion of record. Equals: (8 times the number of devices) + 2

Device Data Section

For each device assigned to each non-spooled data set, there is an eight-byte entry with the following format:

Note: When the TIOT size is greater than 32K (more than 1635 DD statements), device data is not collected for the type 4 record. The data is available in the type 30 record.

Offsets		Name	Length	Format	Description
0	0	SMF4EXPS	8	structure	Data set access information. **Note:** Virtual I/O devices are identified by the following: Device Class 0 Unit Type 0 Device Number X'7FFF' It is important to understand the following: Allocation messages for VIO data sets will show VIO ALLOCATED TO ddname. SMF records will show VIO unit addresses as X'7FFF'. The actual in-storage UCB built for VIO will show address X'3FFF'. For example, the messages: • IEF237I X'3FFF' ALLOCATED TO ddname • IEF237I X'7FFF' ALLOCATED TO ddname indicate that ddname is not allocated to a Virtual I/O device, but is instead allocated to a real device whose unit address is X'3FFF' or X'7FFF' respectively.

Offsets		Name	Length	Format	Description
0	0	SMF4DEVC	0	binary	Device class.
1	1	SMF4UTYP	1	binary	Unit type.
2	2	SMF4CUAD	2	binary	Device number.
4	4	SMF4EXCP	4	binary	EXCP count (see offset 102).

Accounting Section

After the device entries are the following fields:

Offsets		Name	Length	Format	Description
0	0	SMF4LNTH	1	binary	Length of accounting section, excluding this field.
1	1	SMF4SETM	3	binary	Step CPU time under TCBs, in hundredths of a second. This field includes the CPU time for all tasks that are dispatched via TCBs below the level of RCT. CPU time is not expected to be constant between different runs of the same job step. For more information on CPU time, see Chapter 11, "CPU Time."
4	4	SMF4NAF	1	binary	Number of accounting fields.
5	5	SMF4ACTF	variable	EBCDIC	Accounting fields. Each entry for an accounting field contains the length of the field (one byte, binary) followed by the field (EBCDIC). A zero indicates an omitted field.

Relocate Section

Offsets		Name	Length	Format	Description
0	0	SMF4PGIN	4	binary	Number of non-VIO, non-swap page-ins for this step. This field includes page-ins required through page faults, specific page requests, and page fixes. It does not include page reclaims, page-ins for VIO data sets, pages that are swapped in, and page-ins for the common area.
4	4	SMF4PGOT	4	binary	Number of non-VIO, non-swap page-ins for this step. This field includes page-outs required through page requests as well as those pages stolen by the paging supervisor through infrequent use. It does not include page-outs for VIO data sets, pages that are swapped out, and page-outs for the common area.
8	8	SMF4NSW	4	binary	Number of address space swap sequences. (A swap sequence consists of an address space swap-out and swap-in.)
12	C	SMF4PSI	4	binary	Number of pages swapped in. This field includes: LSQA, fixed pages, and those pages that the real storage manager determined to be active when the address space was swapped in. It does not include page reclaims nor pages found in storage during the swap-in process (such as pages brought in via SRBs started after completion of swap-in Stage 1 processing).
16	10	SMF4PSO	4	binary	Number of pages swapped out. This field includes: LSQA, private area fixed pages, and private area non-fixed changed pages.
20	14	SMF4VPI	4	binary	Number of VIO page-ins for this step. This field includes page-ins resulting from page faults or specific page requests on a VIO window. It does not include VIO swap-ins or page-ins for the common area.
24	18	SMF4VPO	4	binary	Number of VIO page-outs for this step. This field includes page-outs resulting from specific page requests on a VIO window, as well as those pages stolen by the paging supervisor through infrequent use. It does not include VIO swap-outs or page-outs for the common area.

Offsets		Name	Length	Format	Description
28	1C	SMF4SST	4	binary	Step service, in service units. This field equals: total job service minus the accumulated job service before this step's initialization.
32	20	SMF4ACT (SMF4TAT)	4	binary	Step transaction active time, in 1024-microsecond units equals: total job transaction active time minus the accumulated transaction active time before this step's initialization.
36	24	SMF4PGNO	2	binary	Step performance group number (taken from PERFORM= parameter on JOB or EXEC card or the RESET operator command).
38	26	SMF4TRAN	4	binary	Step transaction residency time in 1024-microsecond units. That is the time the transaction was in central storage.
42	2A	SMF4CPM	4	binary	Number of attempts to read data from an ESO hiperspace that were not satisfied because the data has been deleted.
46	2E	SMF4RCLM	4	binary	Number of VIO reclaims for this step.
50	32	SMF4CPGN	4	binary	Number of common area page-ins for this step (LPA+CSA).
54	36	SMF4HSPI	4	binary	Number of hiperspace page-ins from auxiliary to processor storage.
58	3A	SMF4PGST	4	binary	Number of pages stolen from the storage for this step.
62	3E	SMF4PSEC	8	binary	Number of page seconds for this step, in page millisecond units. Equals: the number of pages used by this step times the processing time it held that number of pages.
70	46	SMF4LPAI	4	binary	Number of link pack area page-ins for the step.
74	4A	SMF4HSPO	4	binary	Number of hiperspace page-outs from processor to auxiliary storage.
78	4E	SMF4CPUS	4	binary	Step CPU service, in service units.
82	52	SMF4IOCS	4	binary	Step I/O service, in service units.
86	56	SMF4MSOS	4	binary	Step main storage service, in service units.
90	5A	SMF4SRBS	4	binary	Step SRB service, in service units.
94	5E	SMF4RSV1	8		Reserved.

Record Type 5 (05) — Job Termination

Reference information

For more information on service, transaction active time, and performance group number see *z/OS MVS Initialization and Tuning Guide*.

For more information on EXCP count and CPU time, see Chapter 10, "EXCP Count" and Chapter 11, "CPU Time" respectively.

Record type 5 is written at the normal or abnormal termination of a background job.

Note: IBM recommends that you use record type 30 rather than record types 4, 5, 20, 34, 35, and 40. Use of record type 5 may cause you to miss key workload indicators.

This record identifies the job by job log identification, user identification, priority, input class, and programmer's name. If accounting numbers (which can be alphameric) were specified in the JOB statement, they are included. The job name, time, and date that the reader recognized the Job card (for this job) constitute the job log identification. If the job that is terminating is 'JES2' or 'JES3' then these might be set to zero.

This record also contains operating information such as:
- The job step start and end times
- Number of steps in the job
- Number of records in DD DATA and DD* data sets (processed by the job)
- Job termination status
- Device class
- Unit type
- Storage protect key
- Job service and job CPU time (the job CPU time equals the sum of the job step times).

When a step in a multi-step job terminates abnormally, the subsequent steps, whether processed or flushed, do not propagate the step abend code for processing by this record. The code appears in the step termination record (type 4). Offset 55, can contain X'nnnn' or X'0000' (the job termination indicator (offset 65, bit 6) is set to 1 if an abend occurred in the job).

Record Environment

The following conditions exist for the generation of this record:

Macro SMFEWTM(1), BRANCH=YES (record exit: IEFU84)

Record Mapping

Header/Self-defining Section

This section contains the common SMF record header fields and, if applicable, the triplet fields (offset/length/number) that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF5LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	SMF5SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF5FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See “Standard SMF Record Header” on page 13-1 for a detailed description.
5	5	SMF5RTY	1	binary	Record type 5 (X'05').
6	6	SMF5TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.
10	A	SMF5DTE	4	packed	Date when the record is passed to the SMF writer, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description. This is the date that the job terminated.
14	E	SMF5SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF5JBN	8	EBCDIC	Job name. The job name, time, and date that the reader recognized the JOB card (for this job) constitute the job log identification, or transaction name (for APPC output).
26	1A	SMF5RST	4	binary	Time since midnight, in hundredths of a second, that the reader recognized the JOB card (for this job).

Offsets		Name	Length	Format	Description
30	1E	SMF5RSD	4	packed	Date when the reader recognized the JOB card (for this job), in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
34	22	SMF5UIF	8	EBCDIC	User-defined identification field (taken from common exit parameter area, not from USER=parameter on job statement).
42	2A	SMF5NST	1	binary	Number of steps in the job.
43	2B	SMF5JIT	4	binary	Time since midnight, in hundredths of a second, that the initiator selected the job.
47	2F	SMF5JID	4	packed	Date when the initiator selected the job, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
51	33	SMF5NCI	4	binary	Number of card-image records in DD DATA and DD* data sets read by the reader for the job.
55	37	SMF5JCC	2	binary	Job completion code: X'0ccc' indicates system ABEND in the last job step where *ccc* is the system ABEND code (see *z/OS MVS System Codes*). X'8ccc' indicates user ABEND in the last job step where *ccc* is the user ABEND code. X'nnnn' indicates normal completion where *nnnn* is the contents of the two low-order bytes in register 15 at termination. X'0000' indicates either: (see note) 1. The last job step was flushed (not processed) because of an error during allocation or in a preceding job step, or 2. normal job completion with a return code of 0. **Note:** When a step in a multi-step job terminates abnormally, the subsequent steps, whether executed or flushed, do not propagate the step abend code for processing this record. The code appears in the job termination record (type 4). In this case, the field - SMF5JCC, can contain X'nnnn'. If an abend occurred in the job, the job termination indicator (bit 6 in the SMF5JBTI field) is set to 1. Use this field in conjunction with the job termination indicator field, SMFJBTI.
57	39	SMF5JPTY	1	binary	Job selection priority. This field normally equals the user-assigned priority of zero to 13, but if the job fails while being scheduled, this field equals 14 (taken from the PRTY parameter on the JOB card). If no value is specified for the PRTY parameter on the JOB card, this field contains: • For JES3, the default priority specified on the JES3 STANDARDS initialization card • For JES2, a zero. Note that JES2 does not use the priority value reported in this field.
58	3A	SMF5RSTT	4	binary	Time since midnight, in hundredths of a second, that the reader recognized the end of the job.
62	3E	SMF5RSTD	4	packed	Date when the reader recognized the end of the job, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.

Offsets		Name	Length	Format	Description
66	42	SMF5JBTI	1	binary	**Bit** **Meaning When Set** **0** Reserved **1** Canceled by exit IEFUJV **2** Canceled by exit IEFUJI **3** Canceled by exit IEFUSI **4** Canceled by exit IEFACTRT (step exit only) **5** Reserved **6** If 0, normal completion (if 1, then ABEND). **7** Reserved.
67	43	SMF5MCI	1		Reserved.
68	44	SMF5TRAN	4	binary	Job transaction residency time, in 1024-microsecond units. That is the total amount of time the transaction was in central storage.
72	48	SMF5CKRE	1		Reserved.
73	49	SMF5RDCL	1	binary	Reader device class. (This field is not filled in for jobs submitted by way of an internal reader.)
74	4A	SMF5RUTY	1	binary	Reader unit type. (This field is not filled in for jobs submitted via an internal reader.)
75	4B	SMF5JICL	1	EBCDIC	Job input class (taken from JOB card; default equals 'A').
76	4C	SMF5SPK	1	binary	Storage protect key, in the form *xxxx*0000 where *xxxx* is the key.
77	4D	SMF5SRBT	3	binary	Job CPU time under SRBs, in hundredths of a second. This field includes the CPU time for various supervisory routines that are dispatched via SRBs: locking routines, page resolution, swap control, cross-memory communications (WAIT, POST, I/0 POST), and TQE scheduling.
80	50	SMF5TJS	4	binary	Job service, in service units.
84	54	SMF5TTAT	4	binary	Job transaction active time, in 1024-microsecond units.
88	58	SMF5RV2	4		Reserved.
92	5C	SMF5PGNO	2	binary	Reserved.
94	5E	SMF5RV3	2		Reserved.
96	60	SMF5TLEN	1	binary	Length of rest of the fixed portion of the record.
97	61	SMF5PRGN	20	EBCDIC	Programmer's name.
117	75	SMF5JCPU	3	binary	Reserved.
120	78	SMF5ACTF	1	binary	Number of accounting fields.
121	79	SMF5JSAF	variable	EBCDIC	Accounting fields. Each entry for an accounting field contains the length of the field (one byte, binary) followed by the field (EBCDIC). A zero indicates an omitted field.

Relocate Section

Offsets		Name	Length	Format	Description
0	0	SMF5CPUS	4	binary	Job CPU service, in service units.
4	4	SMF5IOCS	4	binary	Job I/O service in service units.
8	8	SMF5MSOS	4	binary	Job main storage service, in service units.
12	C	SMF5SRBS	4	binary	Job SRB service, in service units.
16	10	SMF5RSV1	8		Reserved.

Record Type 6 (06) — External Writer

The external writer writes record type 6 when processing is completed for the job output element (JOE). If a printer is running under the control of a functional subsystem (FSS), record type 6 is written for each data set printed on that printer.

This record identifies the output writer by SYSOUT class and form number, and identifies the job according to job log identification, JES2-assigned job number, and user identification. The job name, time, and date that the reader recognized the JOB card for this job constitute job log identification. It contains information on the output writer activity such as the number of data sets processed, and the FCB and universal character set identification for the printer.

The external writer does not fill every field in the common section. Unfilled fields are left with zeroes.

Any post-processor accounting routine that scans a type 6 record can determine the writer of the record from field SMF6SBS and check field SMF6PAD1 to determine the optional sections that are present in the record. When scanning the record for data, the accounting routine obtains the length for each extension section at run time when it moves from one section to the next. The length is a two-byte field at the beginning of each section.

It is possible that records with truncated job numbers will be generated (refer to SMF6JNM for details). This erroneous output will cause problems with customer's accounting programs as well as other report programs such as Tivoli Performance Reporter for OS/390. A change may be required in the testing of the record level indicator.

If a SYSOUT data set, such as one that is held, is deleted before printing, a record type 6 will not be written.

If an external writer or user-supplied writer is used, SMF produces an incomplete record type 6. SMF produces this incomplete record only when the external writer directs output to a printer or punch. If the external writer directs output to a tape or disk, then SMF does not produce this record. The incomplete record type 6 differs from the JES2 record type as follows:
- Its length is 88 bytes (offsets 88 and 92 are not produced)
- The following fields are zero:
  - The number of logical records (offset 51)
  - I/O status indicators (offset 55)
  - Subsystem generating identification (offset 62)
  - Data set control indicators (offset 66)
  - JES2 logical output device name (offset 72).

Record Mapping

Header/Self-defining Section for External Writer

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF6LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See "Standard SMF Record Header" on page 13-1 for a detailed description.

Offsets		Name	Length	Format	Description
2	2	SMF6SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF6FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See “Standard SMF Record Header” on page 13-1 for a detailed description.
5	5	SMF6RTY	1	binary	Record type 6 (X'06').
6	6	SMF6TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.
10	A	SMF6DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
14	E	SMF6SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF6JBN	8	EBCDIC	Job name (taken from job’s RESQ). The job name, time, and date that the reader recognized the JOB card (for this job) log identification, or transaction name (for APPC output).
26	1A	SMF6RST	4	binary	Time since midnight, in hundredths of a second, that the reader recognized the JOB card (for this job).
30	1E	SMF6RSD	4	packed	Date that the reader recognized the JOB card for this job, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
34	22	SMF6UIF	8	EBCDIC	User identification (taken from common exit parameter area not from USER= parameter on job statement).
42	2A	SMF6OWC	1	EBCDIC	SYSOUT class (this field is blank for non-SYSOUT data sets).
43	2B	SMF6WST	4	binary	Start time since midnight, in hundredths of a second, of print/punch processor including remote device working on the data in this record.
47	2F	SMF6WSD	4	packed	Start date of print/punch processor including remote device working on the data in this record, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
51	33	SMF6NLR	4	binary	Number of logical records written by the writer, by form number and class (this field includes JOBLOG information and data set copies). For an example, a data set of 1000 lines with two copies will show 2000 in this field.
55	37	SMF6IOE	1	binary	Zero or X’04’ if the system detects an error while processing the input data set.
56	38	SMF6NDS	1	binary	Number of data sets processed by the writer and included in this record. If multiple copies are produced, each copy is counted. (This field includes JOBLOG information.)
57	39	SMF6FMN	4	EBCDIC	Form number as defined in the FORM= parameter of the DD statement.
61	3D	SMF6PAD1	1	binary	Section indicator **Bit** **Meaning When Set** **0** Reserved **1** Common section present **2** Reserved. **3** Enhanced SYSOUT support section present **4-7** Reserved.
62	3E	SMF6SBS	2	binary	Subsystem identification (X'0000' indicates external writer).

I/O Data Section for External Writer

Offsets		Name	Length	Format	Description
0	0	SMF6LN1	2	binary	Length of this section, including this field.
2	2	SMF6DCI	1	binary	X'0000' indicates external writer.
3	3	SMF6INDC	1	binary	Record level indicator **Value** **Release — Support** **0** Reserved **1** MVS/XA SP2.2.0 and before — restructured SMF type 6 record **2** Reserved **3** MVS/ESA SP3.1.0 — greater than 10K job support **4-7** Reserved. This field definition changes with each new version of the SMF type 6 record.
4	4	SMF6JNM	4	EBCDIC	When SMF6INDC contains a X'1', this field contains a four-digit EBCDIC job number. When SMF6INDC contains a X'3' or greater, the job number has more than four digits, and this field contains zeroes. The correct job number is then found in SMF6JBID.
8	8	SMF6OUT	8	EBCDIC	X'0000' external writer.
16	10	SMF6FCB	4	EBCDIC	FCB image identification (printer only).
20	14	SMF6UCS	4	EBCDIC	UCS image identification (printer only).

Common Section for External Writer

Offsets		Name	Length	Format	Description
0	0	SMF6LN3	2	binary	Length of the common section, including this field.
2	2	SMF6ROUT	4	binary	Output route code (this field is always set to zero). The route code is specified on the /*OUTPUT or DD statement.
6	6	SMF6EFMN	8	EBCDIC	Output form number. This field is set regardless of the number of characters in the forms field (SMF6FMN). The form number is specified on the FORM= parameter of the DD statement.
14	E		16		Reserved.
30	1E	SMF6JBID	8	EBCDIC	Job ID, or transaction ID (for APPC output).
The following fields (up to and including SMF6OTOK) are only present if SMF6INDC is equal to or greater than X'04':					
38	26	SMF6STNM	8	EBCDIC	This field is not filled in for an output writer.
46	2E	SMF6PRNM	8	EBCDIC	This field is not filled in for an output writer.
54	36	SMF6DDNM	8	EBCDIC	This field is not filled in for an output writer.
62	3E	SMF6USID	8	EBCDIC	The user ID associated with the job/session that created the data set, or the user ID associated with the transaction ID (for APPC output).
70	46	SMF6SECS	8	EBCDIC	The security label of the created data set, or data set level seclabel.
78	4E	SMF6PRMD	8	EBCDIC	The processing mode of the data set.
86	56	SMF6DSNM	53	EBCDIC	The name of the data set being printed.
139	8B		3		Reserved.
142	8E	SMF6OTOK	20	EBCDIC	Reserved.

Enhanced SYSOUT Support (ESS) Section for External Writer

This section contains the output descriptor (if any) for first offloaded data set in this record.

Offsets		Name	Length	Format	Description
64	40	SMF6LN5	2	binary	Length of ESS section (including this field).
66	42	SMF6SGID	4	binary	Segment identifier. Contains 0 when the file is not segmented.
70	46	SMF6IND	1	binary	Section indicator **Bit** **Meaning When Set** **0** Error obtaining scheduler JCL facility (SJF) information. Scheduler work block text unit (SWBTU) data area is not present. **1-7** Reserved.
71	47	SMF6RSV	1		Reserved.
72	48	SMF6JDVT	8	EBCDIC	JCL definition table (JDT) name in JCL definition vector table (JDTV).
80	50	SMF6TUL	2	binary	Text unit (SWBTU) data area length.
82	52	SMF6TU	VAR	binary	Text unit (SWBTU) data area. The data area can be processed using the SWBTUREQ macro and is mapped by MVS macro IEFSJPFX.

Record Type 6 (06) — JES2 Output Writer

Reference book

For additional information on the 3800 printer, see *IBM 3800 Printing Subsystem Programmer's Guide*.

The JES2 writer writes record type 6 when processing is completed for a job output element (JOE), or when there is a change in certain information (indicated by "*") describing SYSOUT data sets processed in the same JOE. Record 6 is written for SYSOUT data sets that are printed or routed to a remote worstation. It is not written for held then deleted SYSOUT data sets. If a printer is running under the control of a functional subsystem (FSS), record type 6 is written for each data set printed on that printer. This record is written for spin data sets. JES2 can be induced to not write this record on a job class basis.

This record identifies the output writer by SYSOUT class and form number, and identifies the job according to job log identification, JES2-assigned job number, and user identification. It contains information on the output writer activity such as the number of logical records processed, number of data sets processed, writer start and end times, input/output status indicators data set control indicators, and JES2 logical output device name.

The JES2 writer does not fill every field in the common section. Unfilled fields are left with zeroes.

Any post-processor accounting routine that scans a type 6 record can determine the writer of the record from field SMF6SBS and check field SMF6PAD1 to determine the optional sections that are present in the record. When scanning the record for data, the accounting routine obtains the length for each extension section at run time when it moves from one section to the next. The length is a two-byte field at the beginning of each section.

This record also provides information on the activity of the 3800 (non-impact) printing subsystem.

Record Mapping

Header/Self-defining Section for JES2 Output Writer

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF6LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See "Standard SMF Record Header" on page 13-1 for a detailed description.
2	2	SMF6SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF6FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See "Standard SMF Record Header" on page 13-1 for a detailed description.
5	5	SMF6RTY	1	binary	Record type 6 (X'06').
6	6	SMF6TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.
10	A	SMF6DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
14	E	SMF6SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF6JBN	8	EBCDIC	Job name (taken from job's RESQ). The job name, time, and date that the reader recognized the JOB card (for this job) log identification, or transaction name (for APPC output).
26	1A	SMF6RST	4	binary	Time from midnight, in hundredths of a second, that the reader recognized the JOB card (for this job).
30	1E	SMF6RSD	4	packed	Date when the reader recognized the JOB card for this job, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
34	22	SMF6UIF	8	EBCDIC	User-defined identification field (taken from common exit parameter area, not from USER=parameter on job statement).
42	2A	SMF6OWC	1	EBCDIC	*SYSOUT class (this field is blank for non-SYSOUT data sets).
43	2B	SMF6WST	4	binary	Start time from midnight, in hundredths of a second, of print/punch processor including remote device that is working on the data in this record.
47	2F	SMF6WSD	4	packed	Start date of print/punch processor including remote device that is working on the data in this record, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
51	33	SMF6NLR	4	binary	Number of logical records written by the writer, by form number and class (this field includes JOBLOG information and data set copies). For an example, a data set of 1000 lines with two copies will show 2000 in this field.

Offsets		Name	Length	Format	Description
55	37	SMF6IOE	1	binary	I/O status indicators **Bit** **Meaning When Set** **0-4** Reserved **5*** Data buffer read error **6** Reserved **7*** Control buffer read error. *A change in this field will cause a new record type 6.
56	38	SMF6NDS	1	binary	Number of data sets processed by the writer and included in this record. If multiple copies are produced, each copy is counted. (This field includes JOBLOG information.)
57	39	SMF6FMN	4	EBCDIC	Output form number as defined in the FORM= parameter of the DD statement. If the source field contains four or fewer characters, SMF6FMN will be set. Otherwise, this field contains blanks and the contents of the source field appear only in SMF6EFMN, described under the JES2 Common Section later in this record.
61	3D	SMF6PAD1	1	binary	Section indicator **Bit** **Meaning When Set** **0** 3800 printing subsystem section present **1** Common section present **2** Reserved **3** Enhanced SYSOUT support section present **4-7** Reserved.
62	3E	SMF6SBS	2	binary	Subsystem identification — X'0002' signifies JES2.

I/O Data Section for JES2 Output Writer

This section contains the remainder of the record information.

Offsets		Name	Length	Format	Description
0	0	SMF6LN1	2	binary	Length of this section, including this field.
2	2	SMF6DCI	1	binary	Data set control indicators **Bit** **Meaning When Set** **0** Reserved **1** Record represents spin data sets **2*** Operator ended this data group **3*** Operator interrupted this data group **4*** Operator restarted this data group **5*** Record represents continuation of interrupted data group **6*** Operator overrode programmed carriage control (printer only) **7*** Punch output was interpreted (3525 only). * A change in this field will cause a new record type 6
3	3	SMF6INDC	1	binary	Record level indicator **Value** **Release — Support** **0** Reserved **1** MVS/XA JES2 SP2.2.0 and before — restructured SMF type 6 record. **2** Reserved **3** MVS/ESA JES2 SP3.1.1 — greater than 10K job support. **4** MVS/ESA JES2 SP3.1.3 — security support. **5** MVS/ESA JES2 SP4.1.0 **6-7** Reserved. This field definition changes with each new version of the SMF type 6 record.

Offsets		Name	Length	Format	Description
4	4	SMF6JNM	4	EBCDIC	When SMF6INDC contains a X'1', this field contains a 4-digit EBCDIC job number. When SMF6INDC contains a X'3' or greater, and the job number has more than 4 digits, this field contains zeroes. If the job number is greater than or equal to 999, this field contains the job number. For an APPC transaction, this field contains zeroes. The correct job number or APPC transaction is found in SMF6JBID.
8	8	SMF6OUT	8	EBCDIC	JES2 logical output device name defined in JESPARMS.
16	10	SMF6FCB	4	EBCDIC	FCB image identification (for printer only). A change in this field will cause a new record type 6.
20	14	SMF6UCS	4	EBCDIC	UCS image identification (for printer only). A change in this field will cause a new record type 6.
24	28	SMF6PGE	4	binary	Approximate page count (printer only). For a printer controlled by JES2, the count is updated: • On a new page* definition if LINECT=0 is specified on the JOBPARM JECL statement, in the accounting field of the JOB statement, on the OUTPUT JECL statement, or on the OUTPUT JCL statement. • After the number of lines specified in LINECT or on a new page* definition. *New page NEWPAGE=, on PRINTDEF or PRT(nnnn) JES2 Initialization statement determines the method of counting pages. If NEWPAGE=ALL or NEWPAGE=DEFAULT, then skip to any channel will be counted as a page. If NEWPAGE=1, then skip to channel 1 will only be counted as a page. For a printer controlled by an FSS, the count is affected by one or more of the following: • A PAGEDEF statement • A FORMDEF statement • The presence of page mode data.
28	1C	SMF6RTE	2	binary	Output route code defined in JESPARMS. The route code is specified on the /*OUTPUT or DD statement. The form number is specified on the FORM= parameter of the DD statement. This field is defined as follows: X'0100' indicates local routine; X'nnrr' (where *nn* is the node number and *rr* is the remote device within the node) indicates remote routing; and X'00nn' indicates local routing. If more than 255 remotes are specified (in JESPARMS) for the system, this field is set to zero.

3800 (non-impact) Printing Subsystem Section for JES2 Output Writer

This section contains information on the activity of the 3800 (non-impact) printing subsystem.

Offsets		Name	Length	Format	Description
64	40	SMF6LN2	2	binary	Length of 3800 printing subsystem section including this field.
66	42	SMF6CPS	8	binary	Number of copies in each copy group. Each byte represents one copy group, and the sum of the 8 bytes is the total number of copies printed. A change in this field will cause a new record type 6 record.

Offsets		Name	Length	Format	Description
74	4A	SMF6CHR	16	EBCDIC	Names of the character arrangement tables that define the characters used in printing. Each name is 4 bytes long, with a maximum of 4 names. A change in this field will cause a new record type 6.
90	5A	SMF6MID	4	EBCDIC	Names of the copy modification module used to modify the data. A change in this field will cause a new record type 6.
94	5E	SMF6FLI	4	EBCDIC	Name of the forms overlay printed on the copies. A change in this field will cause a new record type 6.
98	62	SMF6FLC	1	binary	Number of copies on which the forms overlay is printed A change in this field will cause a new record type 6.
99	63	SMF6BID	1	binary	Options indicator **Bit** **Meaning When Set** **0*** Output was burst into sheets by the Burster-Trimmer-Stacker **1*** DCB subparameter OPTCD=J was specified. Each output data line contained a table reference character that selected the character arrangement table used when printing that line. **2-7** Reserved. *A change in this field will cause a new record type 6.

JES2 Common Section for JES2 Output Writer

This section contains the general output information including the user ID associated with the job or session.

Offsets		Name	Length	Format	Description
64	40	SMF6LN3	2	binary	Length of common section (including this field).
66	42	SMF6ROUT	4	binary	Output route code This field is defined as follows: X'00010000' indicates local routing; X'nnnnrrrr' (where *nnnn* is the node number and *rrrr* is the remote device within that node) indicates remote routine; and X'0000nnnn' indicates special local routing. This field is always set regardless of the number of remotes specified by the system. The node and remote devices are defined in JESPARMS. See *z/OS JES2 Initialization and Tuning Guide* for more information.
70	46	SMF6EFMN	8	EBCDIC	Output form number. This field is set regardless of the number of characters in the forms field (SMF6FMN).
78	4E		16		Reserved.
94	5E	SMF6JBID	8	EBCDIC	Job name, transaction ID (for APPC output), or TSO/E userid.
The following fields (up to and including SMF6OTOK) are only present if SMF6INDC is equal to or greater than X'04':					
102	66	SMF6STNM	8	EBCDIC	This field is not filled in for an output writer.
110	6E	SMF6PRNM	8	EBCDIC	This field is not filled in for an output writer.
118	76	SMF6DDNM	8	EBCDIC	This field is not filled in for an output writer.
126	7E	SMF6USID	8	EBCDIC	The user ID associated with the job/session that created the data set, or the user ID associated with the transaction ID (for APPC output).
134	86	SMF6SECS	8	EBCDIC	The security label of the created data set, or the data set level seclabel.
142	8E	SMF6PRMD	8	EBCDIC	The processing mode of the data set.
150	96	SMF6DSNM	53	EBCDIC	The name of the data set being printed.
203	CB		3		Reserved.

Offsets		Name	Length	Format	Description
206	CE	SMF6OTOK	20	EBCDIC	Output security token: The identifier JES assigns to those SYSOUT data sets that share common printing attributes and security information. Data sets thus grouped are then printed sequentially. If your installation also produces job header and trailer pages, these data sets appear between those job header and trailer pages as a job.

Enhanced SYSOUT Support (ESS) Section for JES2 Output Writer

This section contains the output descriptor (if any) for first offloaded data set in this record.

Offsets		Name	Length	Format	Description
64	40	SMF6LN5	2	binary	Length of ESS section (including this field).
66	42	SMF6SGID	4	binary	Segment identifier. Contains 0 when the file is not segmented.
66	42	SMF6BNOF	2	binary	Offset to bin section.
66	42	SMF6RES	2	binary	Reserved - redefines SMF6BNOF.
70	46	SMF6IND	1	binary	Section indicator **Bit** **Meaning When Set** **0** Error obtaining scheduler JCL facility (SJF) information. Scheduler work block text unit (SWBTU) data area is not present. **1-7** Reserved.
71	47	SMF6RSV	1		Reserved.
72	48	SMF6JDVT	8	EBCDIC	JCL definition table (JDT) name in JCL definition vector table (JDTV).
80	50	SMF6TUL	2	binary	Text unit (SWBTU) data area length.
82	52	SMF6TU	VAR	binary	Text unit (SWBTU) data area. The data area can be processed using the SWBTUREQ macro and is mapped by MVS macro IEFSJPFX.

Record Type 6 (06) — JES3 Output Writer

Reference book

This record provides information on the activity of the 3800 printer, see *IBM 3800 Printing Subsystem Programmer's Guide*.

The JES3 output writer writes record type 6 for each data set processed by JES3 output service. One type 6 record is written for each data set section within an output scheduler element (OSE). If you issue the *RESTART command to restart a data set, one type 6 record is written when the data set is restarted and another type 6 record is written when the data set completes. If a printer is running under the control of a functional subsystem (FSS), record type 6 is written on the processor which has the FSS address space that processed the data set. The FSS writes the record if it processes the data set (JES3 does not).

This record identifies the output writer by SYSOUT class and form number, and identifies the job according to job log identification, JES3-assigned job number, and user identification. It contains information on the output writer activity such as:

- The number of logical records processed
- Number of data sets processed

- Output service start time and date
- I/O status indicators
- Data set control indicators
- JES3 logical output device name
- Output activity.

The JES3 writer does not fill every field in the common section. Unfilled fields are left with zeroes.

Any post-processor accounting routine that scans a type 6 record can determine the writer of the record from field SMF6SBS and check field SMF6PAD1 to determine the optional sections that are present in the record. When scanning the record for data, the accounting routine obtains the length for each extension section at run time when it moves from one section to the next. The length is a two-byte field at the beginning of each section.

It is possible that records with truncated job numbers will be generated (refer to SMF6JNM for details). This erroneous output will cause problems with customer's accounting programs as well as other report programs such as Tivoli Performance Reporter for OS/390. A change may be required in the testing of the record level indicator.

Record Environment

The following conditions exist for the generation of this record:

Macro SMFEWTM, BRANCH=NO (record exit: IEFU83)

Storage Residency 31-bit

Record Mapping

Header/Self-defining Section for JES3 Output Writer

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF6LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See "Standard SMF Record Header" on page 13-1 for a detailed description.
2	2	SMF6SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF6FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See "Standard SMF Record Header" on page 13-1 for a detailed description.
5	5	SMF6RTY	1	binary	Record type 6 (X'06').
6	6	SMF6TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.
10	A	SMF6DTE	4	packed	Date that the record was moved into the SMF buffer, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
14	E	SMF6SID	4	EBCDIC	System identification (from the SID parameter).

Offsets		Name	Length	Format	Description
18	12	SMF6JBN	8	EBCDIC	Job name (taken from job's RESQ). The job name, time, and date that the reader recognized the JOB card (for this job) constitutes the log identification, or transaction name (for APPC output).
26	1A	SMF6RST	4	binary	Time since midnight, in hundredths of a second, that the reader recognized the JOB card (for this job).
30	1E	SMF6RSD	4	packed	Date that the reader recognized the JOB card for this job, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
34	22	SMF6UIF	8	EBCDIC	User-defined identification field (taken from common exit parameter area, not from USER=parameter on job statement.)
42	2A	SMF6OWC	1	EBCDIC	SYSOUT class (this field is blank for non-SYSOUT data sets).
43	2B	SMF6WST	4	binary	Start time since midnight, in hundredths of a second, of output service working on the data in this record. This field is filled in at JES3 LOGIN time for the writer job.
47	2F	SMF6WSD	4	packed	Start date of output service working on the data in this record, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description. This field is filled in at JES3 LOGIN time for the writer job.
51	33	SMF6NLR	4	binary	Number of logical records written by the writer. This field is filled in when a data set is completed or restarted. The count is a cumulative count which includes repeats and restarts. It does not include records skipped due to forward repositioning of the writer.
55	37	SMF6IOE	1	binary	I/O status indicators **Bit** **Meaning When Set** **0-4** Reserved **5** Data buffer read error **6** Reserved **7** Control buffer read error.
56	38	SMF6NDS	1	binary	Number of data sets processed by the writer and included in this record. If multiple copies are produced, each copy is counted. (This field is filled in when data set is completed or restarted; it does not include restarts.)
57	39	SMF6FMN	4	EBCDIC	Form number — If the source field contains four or fewer characters, SMF6FMN will be set. Otherwise, this field contains blanks and the contents of the source field appears only in SMF6EFMN.
61	3D	SMF6PAD1	1	binary	Section indicator **Bit** **Meaning When Set** **0** 3800 printing subsystem section present **1** Common section present **2** Reserved **3** Enhanced SYSOUT support section present **4-7** Reserved.
62	3E	SMF6SBS	2	binary	Subsystem identification — X'0005' signifies JES3.

I/O Data Section for JES3 Output Writer

Offsets		Name	Length	Format	Description
00	00	SMF6LN1	2	binary	Length of this section, including this field.

Offsets		Name	Length	Format	Description
02	02	SMF6DCI	1	binary	Data set control indicators. (These bits are set when a data set is completed or restarted.) **Bit** **Meaning When Set** **0** Reserved **1** Record represents spin data sets **2** Operator ended this data group **3** Operator restarted data set with destination **4** Operator restarted this data group **5** Received operator restarted data set **6** Operator started with single space **7** Punch output was interpreted.
03	03	SMF6INDC	1	binary	Record level indicator **Value** **Release — Support** **0** Reserved **1** MVS/XA JES3 SP2.2.1 and before — restructured SMF type 6 record **2** Reserved **3** MVS/ESA JES3 SP3.1.1 — greater than 10K job support **4** MVS/ESA JES3 SP3.1.3 — security support **5-7** Reserved. This field definition changes with each new version of the SMF type 6 record.
04	04	SMF6JNM	4	EBCDIC	When SMF6INDC contains a X'1', this field contains a four-digit EBCDIC job number. When SMF6INDC contains a X'3' or greater, the job number has more than four digits, and this field contains zeroes. The correct job number is then found in SMF6JBID.
08	08	SMF6OUT	8	EBCDIC	JES3 logical output device name.
16	10	SMF6FCB	4	EBCDIC	FCB image identification (printer only).
20	14	SMF6UCS	4	EBCDIC	UCS image identification (printer only).
24	18	SMF6PGE	4	binary	For printer, approximate page count (A skip to carriage control channel one is counted as a page.) For punch, the number of cards punched. This field is filled in when a data set is completed or restarted. The count is a cumulative count which includes repeats and restarts. It does not include pages skipped due to forward repositioning of the writer.
28	1C	SMF6DFE	2	binary	Data format error indicators. (These bits are set when a data set is completed or restarted.) **Bit** **Meaning When Set** **0-5** Reserved **6** Some first character control data bad, default used **7** Bad record length (truncate or pad) **8-15** Reserved.
30	1E	SMF6OPR	2	binary	Output priority.
32	20	SMF6GRP	8	EBCDIC	JES3 logical output device group name.
40	28	SMF6RSVJ	8		Reserved for JES3.
48	30	SMF6RSVU	4		Reserved for user.

3800 (non-impact) Printing Subsystem Section for JES3 Output Writer

Offsets		Name	Length	Format	Description
0	0	SMF6LN2	2	binary	Length of 3800 printing subsystem section, including this field.

Offsets		Name	Length	Format	Description
2	2	SMF6CPS	8	binary	Number of copies printed in each copy group. Each byte represents one copy group, and the sum of the 8 bytes is the total number of copies printed.
10	A	SMF6CHR	16	EBCDIC	Names of the character arrangement tables that define the characters used in printing. Each name is 4 bytes long, with a maximum of 4 names.
26	1A	SMF6MID	4	EBCDIC	Name of the copy modification module used to modify the data.
30	1E	SMF6FLI	4	EBCDIC	Name of the forms overlay printed on the copies.
34	22	SMF6FLC	1	binary	Number of copies on which the forms overlay is printed.
35	23	SMF6BID	1	binary	Options indicator **Bit** **Meaning When Set** **0** Output was burst into sheets by the Burster-Trimmer-Stacker. **1** DCB subparameter OPTCD=J was specified. Each output data line contained a table reference character that selected the character arrangement table used when printing that line. **2-7** Reserved.

JES3 Common Section for JES3 Output Writer

Offsets		Name	Length	Format	Description
0	0	SMF6LN3	2	binary	Length of common section (including this field).
2	2	SMF6ROUT	4		Reserved.
6	6	SMF6EFMN	8	EBCDIC	Output form number. This field is set regardless of the number of characters in the forms field (SMF6FMN).
14	E		16		Reserved.
30	1E	SMF6JBID	8	EBCDIC	Job ID, or transaction ID (for APPC output).
The following fields (up to and including SMF6OTOK) are only present if SMF6INDC is equal to or greater than X'04':					
38	26	SMF6STNM	8	EBCDIC	This field is not filled in for an output writer.
46	2E	SMF6PRNM	8	EBCDIC	This field is not filled in for an output writer.
54	36	SMF6DDNM	8	EBCDIC	This field is not filled in for an output writer.
62	3E	SMF6USID	8	EBCDIC	The user ID associated with the job/session that created the data set, or the user ID associated with the transaction ID (for APPC output).
70	46	SMF6SECS	8	EBCDIC	The security label of the created data set, or data set level seclabel.
78	4E	SMF6PRMD	8	EBCDIC	The processing mode of the data set.
86	56	SMF6DSNM	53	EBCDIC	The name of the data set being printed.
139	8B		3		Reserved.
142	8E	SMF6OTOK	20	EBCDIC	Reserved.

Enhanced SYSOUT Support (ESS) Section for JES3 Output Writer

This section contains the output descriptor (if any) for first offloaded data set in this record.

Offsets		Name	Length	Format	Description
00	00	SMF6LN5	2	binary	Length of ESS section (including this field).

Offsets		Name	Length	Format	Description
02	02	SMF6SGID	4	binary	Segment identifier. Contains 0 when the file is not segmented.
06	06	SMF6IND	1	binary	Section indicator **Bit** **Meaning When Set** **0** Error obtaining scheduler JCL facility (SJF) information. Scheduler work block text unit (SWBTU) data area is not present. **1-7** Reserved.
07	07	SMF6RSV	1		Reserved.
08	08	SMF6JDVT	8	EBCDIC	JCL definition table (JDT) name in JCL definition vector table (JDTV).
16	10	SMF6TUL	2	binary	Text unit (SWBTU) data area length.
18	12	SMF6TU	VAR	binary	Text unit (SWBTU) data area. The data area can be processed using the SWBTUREQ macro and is mapped by MVS macro IEFSJPFX.

Record Type 6 (06) — Print Services Facility (PSF)

Reference book

For additional information on the 3800 printer, see *IBM 3800 Printing Subsystem Programmer's Guide*.

PSF writes record type 6 whenever data set processing is complete, that is, whenever the JES subsystem that PSF is running under is informed that the user data set is to be released. This type 6 record includes any auxiliary data sets.

For example, a job that includes a job header, data set header, two user data sets, and a job trailer produces two type 6 records. The first record contains data for the job header, the data set header, the first user data set, and any associated message data set. The second record contains data for the second user data set, any associated message data set, and the job trailer.

This record identifies the output writer by SYSOUT class and form number, and subsystem identification. It identifies the job according to job log identification, JES-assigned job number, and user identification. It contains information on the output writer activity such as:
- The number of logical records processed
- Writer start time
- I/O status indicators
- Logical output device name.

Also covered is information about the number of resources, such as:
- Fonts
- Overlays
- Page segments
- PAGEDEFS
- FORMDEFS.

This record provides information in separate sections on the activity of the non-impact printing subsystem, and information on the activity of the all-points-addressable (APA) printing subsystem.

Any post-processor accounting routine that scans a type 6 record can determine the writer of the record from field SMF6SBS and check field SMF6PAD1 to determine the optional sections that are present in the record. When scanning the record for data, the accounting routine obtains the length for each extension section at run time when it moves from one section to the next. The length is a two-byte field at the beginning of each section.

It is possible that records with truncated job numbers will be generated (refer to SMF6JNM for details). This erroneous output will cause problems with customer's accounting programs as well as other report programs such as Tivoli Performance Reporter for OS/390. A change may be required in the testing of the record level indicator.

Record Environment

The following conditions exist for the generation of this record:

Macro SMFWTM (record exit: IEFU83)

Mode Task

Storage Residency 24-bit

Record Mapping

Header/Self-defining Section for PSF

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF6LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See "Standard SMF Record Header" on page 13-1 for a detailed description.
2	2	SMF6SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF6FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See "Standard SMF Record Header" on page 13-1 for a detailed description.
5	5	SMF6RTY	1	binary	Record type 6 (X'06')
6	6	SMF6TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer. Before the SVC 83, PSF fills in this field via SVC 11 for use with PSF exit 5.
10	A	SMF6DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description. Before the SVC 83, PSF fills in this field via SVC 11 for use with PSF exit 5.
14	E	SMF6SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF6JBN	8	EBCDIC	Job name (taken from job's RESQ). The job name, time, and date that the reader recognized the JOB card (for this job) log identification, or transaction name (for APPC output).
26	1A	SMF6RST	4	binary	Time, in hundredths of a second, that the reader recognized the JOB card (for this job).

Offsets		Name	Length	Format	Description
30	1E	SMF6RSD	4	packed	Date that the reader recognized the JOB card for this job, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
34	22	SMF6UIF	8	EBCDIC	User-defined identification field (taken from common exit parameter area, not from USER=parameter on job statement).
42	2A	SMF6OWC	1	EBCDIC	SYSOUT class (this field is blank for non-SYSOUT data sets).
43	2B	SMF6WST	4	binary	Start time, in hundredths of a second, of output service working on the data in this record. This field is filled in at JES3 LOGIN time for the writer job. **Note:** The timestamps should not be used to determine printer utilization.
47	2F	SMF6WSD	4	packed	Start date of output service working on the data in this record, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description. This field is filled in at JES3 LOGIN time for the writer job. **Note:** The timestamps should not be used to determine printer utilization.
51	33	SMF6NLR	4	binary	Number of logical records written by the writer. (This field is filled in when a data set is completed or restarted; it includes repeats and restarts). This field is non-cumulative across interrupts.
55	37	SMF6IOE	1	binary	I/O status indicators **Bit** **Meaning When Set** **0-4** Reserved **5** Data buffer read error **6** Reserved **7** Control buffer read error.
56	38	SMF6NDS	1	binary	Number of data sets processed by the writer and included in this record. If multiple copies are produced, each copy is counted.
57	39	SMF6FMN	4	EBCDIC	Form number — only the first four bytes appear in this field. This value is taken from the last SETUP message or from the FORMS parameter of the OUTPUT statement for the user data set.
61	3D	SMF6PAD1	1	binary	Section indicator **Bit** **Meaning When Set** **0** Non-impact printing subsystem section present **1** Common section present. **2** All-points-addressable (APA) printing subsystem section present **3** Enhanced SYSOUT support section present **4** File Transfer section present **5-7** Reserved.
62	3E	SMF6SBS	2	binary	Subsystem identification — X'0007' signifies PSF.

I/O Data Section for PSF

Offsets		Name	Length	Format	Description
0	0	SMF6LN1	2	binary	Length of this section, including this field.

Offsets		Name	Length	Format	Description
2	2	SMF6DCI	1	binary	Data set control indicators. (These bits are set when a data set is completed or restarted.) **Bit** **Meaning When Set** **0** Reserved **1** Record represents spin data sets **2** Operator ended this data group **3** Operator restarted data set with destination **4** Operator restarted this data group **5** Received operator restarted data set **6** Operator started with single space **7** Reserved.
3	3	SMF6INDC	1	binary	Record level indicator. Bits 0-3 are reserved. Bits 4-7 have a value as follows: **Value** **Release — Support** **1** PSF/MVS release 1.1 — restructured SMF type 6 record **2** Reserved **3** MVS/ESA JES2 SP3.1.1 — greater than 10K job support **4** MVS/ESA JES2 SP3.1.3 and above — security support **5** MVS/ESA JES2 SP4.1.0 **6** PSF/MVS Release 3.1.0. This field definition changes with each new version of the SMF type 6 record.
4	4	SMF6JNM	4	EBCDIC	When SMF6INDC contains a X'1', this field contains a four-digit EBCDIC job number. When SMF6INDC contains a X'3' or greater, the job number has more than four digits, and this field contains zeroes. The correct job number is then found in SMF6JBID.
8	8	SMF6OUT	8	EBCDIC	For SNA-attached printers, the VTAM logical unit name. For channel-attached printers, the printer device name.
16	10	SMF6FCB	4		Reserved.
20	14	SMF6UCS	4		Reserved.
24	18	SMF6PGE	4	binary	Approximate physical page count, including duplicates and separators. This field is not incremented in the following cases: • When blank pages are sent through the printer after a job because of an NPRO request. • When a blank page is generated because PSF is not generating header and trailer pages, but mark forms is active.

Non-impact Printing Subsystem Section for PSF

This section contains information about the number of copies and the types of fonts used.

Note: This field is non-cumulative across interrupts.

Offsets		Name	Length	Format	Description
0	0	SMF6LN2	2	binary	Length of non-impact printing subsystem section, including this field.
2	2	SMF6CPS	8	binary	Number of copies specified in the COPIES parameter of the OUTPUT statement for the user data set. Each byte represents one copy group. These values can be changed by operator commands.

Offsets		Name	Length	Format	Description
10	A	SMF6CHR	16	EBCDIC	Names of the fonts that define the characters used in printing as specified in the JCL. Each name is 4 bytes long, with a maximum of 4 names.
26	1A	SMF6MID	4		Reserved.
30	1E	SMF6FLI	4	EBCDIC	Name of the forms overlay printed on the copies, taken from the data set JCL.
34	22	SMF6FLC	1	binary	Number of copies on which the forms overlay is printed, taken from the data set JCL.
35	23	SMF6BID	1	binary	Device indicator **Bit** **Meaning When Set** **0** Output was burst into sheets by the Burster-Trimmer-Stacker. **1** DCB subparameter OPTCD=J was specified. Each output data line contained a table reference character that selected the font used when printing that line. **2** Cut-sheet printer. This field is valid only when SMF6SBS equals X'0007', and SMFINDC is equal to or greater than X'02'. **3-7** Reserved.

Common Section for PSF

This section contains the general output information including the user ID associated with the job or session.

Offsets		Name	Length	Format	Description
0	0	SMF6LN3	2	binary	Length of the common section, including this field.
2	2	SMF6ROUT	4		Output route code. This field is defined as follows: • X'00010000' indicates local routing. • X'nnnnrrrr' (where nnnn is the node number and rrrr is the remote device within that node) indicates remote routine • X'0000nnnn' indicates special local routing. This field is always set regardless of the number of remote specified by this system. The node and remote devices are defined in JESPARMS.
6	6	SMF6EFMN	8	EBCDIC	Output form number. SMF6EFMN is derived from the last setup message, the JES initialization statements, or from the FORMS parameter of the OUTPUT statement.
14	E		16		Reserved.
30	1E	SMF6JBID	8	EBCDIC	Job ID, or Transaction ID (for APPC output).
The following fields (up to and including SMF6OTOK) are only present if SMF6INDC is equal to or greater than X'04':					
38	26	SMF6STNM	8	EBCDIC	This field is not filled in for an output writer.
46	2E	SMF6PRNM	8	EBCDIC	This field is not filled in for an output writer.
54	36	SMF6DDNM	8	EBCDIC	This field is not filled in for an output writer.
62	3E	SMF6USID	8	EBCDIC	The user ID associated with the job/session that created the data set, or the user ID associated with the transaction ID (for APPC output).
70	46	SMF6SECS	8	EBCDIC	The security label of the created data set, or data set level seclabel.
78	4E	SMF6PRMD	8	EBCDIC	The processing mode of the data set.
86	56	SMF6DSNM	53	EBCDIC	The name of the data set being printed.
139	8B		3		Reserved.

Offsets		Name	Length	Format	Description
142	8E	SMF6OTOK	20	EBCDIC	Output security token: the identifier JES assigned to those SYSOUT data sets that share common printing attributes and security information. Data sets thus grouped are then printed sequentially. If your installation also produces job header and trailer pages, these data sets appear between those job header and trailer pages as a job.

All-Points-Addressable Printing Subsystem Section for PSF

This section contains meaningful data fields only if the all-points-addressable printing subsystem is running under the control of print services facility (PSF), that is, SMF6SBS equals X'0007'.

Offsets		Name	Length	Format	Description
0	0	SMF6LN4	2	binary	Length of the section (including this field).
2	2	SMF6BNOF	2	binary	Offset to the Multi-Bins Header Section from start of APA section.
4	4	SMF6FONT	4	binary	Number of fonts mapped with an MCF.
8	8	SMF6LFNT	4	binary	Number of fonts loaded.
12	C	SMF6OVLY	4	binary	Number of overlays mapped with an MMO.
16	10	SMF6LOLY	4	binary	Number of overlays loaded.
20	14	SMF6PGSG	4	binary	Number of page segments mapped with an MPS.
24	18	SMF6LPSG	4	binary	Number of page segments loaded.
28	1C	SMF6IMPS	4	binary	Number of sides of sheets of paper printed (number of logical impressions), including duplicates and separators. This field is non-cumulative across interrupts and is valid only when SMFINDC is equal to or greater than X'02'. This field is not incremented in the following cases: • When blank pages are sent through the printer after a job because of an NPRO request. • When a blank page is generated because PSF is not generating header and trailer pages, but mark forms is active.
32	20	SMF6FEET	4	binary	Number of feet of paper printed for the document (zero for printers that do not report paper size). This field is non-cumulative across interrupts. This field is not incremented in the following cases: • When blank pages are sent through the printer after a job because of an NPRO request. • When a blank page is generated because PSF is not generating header and trailer pages, but mark forms is active.
36	24	SMF6PGDF	4	binary	Number of PAGEDEFS used.
40	28	SMF6FMDF	4	binary	Number of FORMDEFS used.
44	2C	SMF6BIN	1	binary	Bin indicators. This field is valid only when SMF6INDC is equal to or greater than X'02' and for printers that support bin selection. **Bit** **Meaning When Set** **0** Bin 1 used for any part of the data set **1** Bin 2 used for any part of the data set **2** Bin 3 used for any part of the data set **3** Bin 4 used for any part of the data set **4-7** Reserved.

Offsets		Name	Length	Format	Description
45	2D	SMF6PGOP	1	binary	Duplex indicators. This field is valid only when SMF6INDC is equal to or greater than X'02'. **Bit** **Meaning When Set** **0** Standard duplex was used for any part of the data set. **1** Tumble duplex was used for any part of the data set. System security indicators. Valid only when SMF6INDC is equal to or greater than X'04'. **2** Keyword SYSAREA=YES **3** Keyword DPAGELBL=YES **4** Print operation was successful **5** Keyword SPAGELBL=YES **6** Error occurred processing the security overlay **7** Image generator overrun error occurred.
46	2E	SMF6FLG3	1	binary	Flags **Bit** **Meaning When Set** **0** Security label integrity is guaranteed. Valid only when SMF6INDC is equal to or greater than X'04' **1** The job header page was printed **2** The job trailer page was printed **3** Data page labelling was suppressed **4** User printable area was suppressed.
47	2F		1		Reserved.
48	30	SMF6NSOL	4	binary	Number of security overlays used while printing the data set. Valid only when SMF6INDC is equal to or greater than X'04'.
52	34	SMF6NSFO	4	binary	Number of security fonts used while printing the data set. Valid only when SMF6INDC is equal to or greater than X'04'.
56	38	SMF6NPS	4	binary	Number of security page segments used while printing the data set. Valid only when SMF6INDC is equal to or greater than X'04'.
60	3C	SMF6FDNM	8	EBCDIC	FORMDEF name used to print the data set.
68	44	SMF6PDNM	8	EBCDIC	PAGEDEF name used to print the data set.
76	4C	SMF6PTDV	8	EBCDIC	PRINTDEV name used to print the data set.
84	54	SMF6SETU	8	EBCDIC	COMSETUP name used to print the data set.
92	5C		24		Reserved.
116	74	SMF6LPGE	4	binary	Number of logical pages processed. (The accumulative number of logical pages per side.) This field is non-accumulative across interrupts. This field is not incremented in the following case: • When blank pages are sent through the printer after a job because of an NPRO request. • When a blank page is generated because PSF is not generating header and trailer pages, but forms marking is active.

Multi-Bins Header Section for PSF

Offsets		Name	Length	Format	Description
0	0	SMF6BNLN	2	binary	Length bins section including FLD.
2	2	SMF6BNUM	2	binary	Number of counters entries.

Multi-Bins Counter Section for PSF

Offsets		Name	Length	Format	Description
0	0	SMF6BNNO	1	binary	Bin number.
1	1	SMF6BNCT	3	binary	Bin counter. This field is not incremented in the following cases: • When blank pages are sent through the printer after a job because of an NPRO request. • When a blank page is generated because PSF is not generating header and trailer pages, but mark forms is active.
4	4	SMF6BNLE	2	binary	Paper length in millimeters.
6	6	SMF6BNWI	2	binary	Paper width in millimeters.

Enhanced SYSOUT Support (ESS) Section for PSF

This section contains the output descriptor (if any) for the first offloaded data set in this record.

Offsets		Name	Length	Format	Description
0	0	SMF6LN5	2	binary	Length of ESS section (including this field).
2	2	SMF6SGID	4	binary	Segment identifier. Contains 0 when the file is not segmented.
6	6	SMF6IND	1	binary	Section indicator **Bit** **Meaning When Set** **0** Error obtaining scheduler JCL facility (SJF) information. Scheduler work block text unit (SWBTU) data area is not present. **1-7** Reserved.
7	7	SMF6RSV	1		Reserved.
8	8	SMF6JDVT	8	EBCDIC	JCL definition table (JDT) name in JCL definition vector table (JDTV).
16	10	SMF6TUL	2	binary	Text unit (SWBTU) data area length.
18	12	SMF6TU	VAR	binary	Text unit (SWBTU) data area. The data area can be processed using the SWBTUREQ macro and is mapped by MVS macro IEFSJPFX.

File Transfer Section for PSF

Offsets		Name	Length	Format	Description
0	0	SMF6LN6	2	binary	Length of File Transfer section (including this field).
2	2	SMF6BYTE	4	binary	Total bytes sent.
6	6	SMF6IP1	1	binary	First segment of target IP address.
7	7	SMF6IP2	1	binary	Second segment of target IP address.
8	8	SMF6IP3	1	binary	Third segment of target IP address.
9	9	SMF6IP4	1	binary	Fourth segment of target IP address.
10	A		12	char	Reserved.
22	16	SMF6PQLN	2	binary	Length of Print Queue Name.
24	18	SMF6PRTQ	variable	EBCDIC	Print Queue Name.

Record Type 6 (06) — IP PrintWay

IP PrintWay writes record type 6 before deleting a data set from the JES spool or before releasing the data set back to the system (JES).

If IP PrintWay has attempted to transmit the data set to the target system, the file-transfer section contains the number of bytes IP PrintWay transmitted or attempted to transmit. If IP PrintWay attempted to transmit the data set more than once, the file-transfer section contains the total number of bytes in all transmission attempts, including the number of bytes in the successful transmission, if any.

If IP PrintWay restarts a data set that IP PrintWay had previously released back to the system, two SMF records may be written for the same data set. IP PrintWay writes one SMF record when it releases the data set back to the system and writes another when it deletes the data set from the JES spool. When IP PrintWay writes a record for a data set that it restarted, that record contains only the number of bytes transmitted, if any, after IP PrintWay restarted the data set. The calculation of records read in the main section (SMF6NLR) is handled like that of bytes transmitted. If IP PrintWay basic mode resubmits a data set to Print Interface for filtering, IP PrintWay basic mode writes two SMF type-6 records for the data set, one record when IP PrintWay sends the data set to Print Interface, and another record when it sends the data set to the printer. You can use the IP PrintWay SMF exit to suppress the first SMF record written.

Determining the writer of the IP PrintWay record type 6: Any post-processor accounting routine that scans a type 6 record can determine the writer of the record from field SMF6SBS and check field SMF6PAD1 to determine the optional sections that are present in the record. When scanning the record for data, the accounting routine obtains the length for each extension section at run time when it moves from one section to the next. The length is a two-byte field at the beginning of each section.

Distinguishing between IP PrintWay basic and extended modes: To ascertain whether type 6 records were written by IP PrintWay basic mode or IP PrintWay extended mode, use the following flag field:

- IP PrintWay basic mode: SMF6INDC is set to 1
- IP PrintWay extended mode: SMF6INDC is set to 7

For additional information about this record: See *z/OS Infoprint Server Operation and Administration*.

Record Environment

The following conditions exist for the generation of this record:

Macro	SMFWTM (record exit: IEFU83)
Mode	Task
Storage Residency	31-bit

Record Mapping

Header/Self-defining Section for IP PrintWay

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF6LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	SMF6SET	2	binary	Segment descriptor (see record length field).
4	4	SMF6FLG	1	binary	System Indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See “Standard SMF Record Header” on page 13-1 for a detailed description.
5	5	SMF6RTY	1	binary	Record type 6 (X’06’)
6	6	SMF6TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.
10	A	SMF6DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0cyydddF. *See “Standard SMF Record Header” on page 13-1 for a detailed description.
14	E	SMF6SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF6JBN	8	EBCDIC	Job name (taken from job’s RESQ). The job name, time, and date that the reader recognized the JBO card (for this job) log identification, or transaction name (for APPC output).
26	1A	SMF6RST	4	binary	Time, in hundredths of a second, that the reader recognized the JOB card (for this job).
30	1E	SMF6RSD	4	packed	Date that the reader reconciled the JOB card for this job, in the form 0cyydddF. *See “Standard SMF Record Header” on page 13-1 for a detailed description.
34	22	SMF6UIF	8	EBCDIC	User identification (taken from common exit parameter area not from USER=parameter on job statement).
42	2A	SMF60OWC	1	EBCDIC	SYSOUT class (this field is blank for non-SYSOUT data sets).
43	2B	SMF6WST	4	binary	Start time, in hundredths of a second, of output service working on the data in this record. This field is filled in at JES3 LOGIN time for the writer job. **Note:** The timestamps should not be used to determine printer utilization.
47	2F	SMF6WSD	4	packed	Start date of output service working on the data in this record, in the form 0cyydddF. *See “Standard SMF Record Header” on page 13-1 for a detailed description. This field is filled in at JES3 LOGIN time for the writer job. **Note:** The timestamps should not be used to determine printer utilization.
51	33	SMF6NLR	4	binary	Number of logical records read by the writer. This field contains a value established like the byte count described in the introduction.
55	37	SMF6IOE	1	binary	I/O status indicators **Bit** **Meaning When Set** **0-4** Reserved **5** Data buffer read error **6** Reserved. **7** Control buffer read error
56	38	SMF6NDS	1	binary	Number of copies of the data set requested.
57	39	SMF6FMN	4	EBCDIC	Form number — only the first four bytes appear in this field. This value is taken from the last SETUP message or from the FORMS parameter of the OUTPUT statement for the user data set.

Offsets		Name	Length	Format	Description
61	3D	SMF6PAD1	1	binary	Section indicator **Bit** **Meaning When Set** **0** Reserved **1** Common section present **2** Reserved. **3** Enhanced SYSOUT support section present **4** File Transfer section present **5-7** Reserved
62	3E	SMF6SBS	2	binary	Subsystem identification -- X'0009' signifies IP PrintWay.

I/O Data Section for IP PrintWay

Offsets		Name	Length	Format	Description
0	0	SMF6LN1	2	binary	Length of this section, including this field.
2	2	SMF6DCI	1	binary	Data set control indicators (These bits are set when a data set is completed or restarted). **Bit** **Meaning When Set** **0** Transmission attempted **1** Transmission successful **2** Reserved. **3** Data set released to the system with checkpoint **4** Data set restarted using checkpoint information. **5-7** Reserved
3	3	SMF6INDC	1	binary	Record level indicator **Bit** **Meaning When Set** **0-3** Reserved **4–7** Have a value as follows: **Value** **Release — Support** **1** IP PrintWay basic mode **2-6** Reserved **7** IP PrintWay extended mode - z/OS V1R5 and above This field definition changes with each new version of the SMF type 6 record.
4	4	SMF6JNM	4	EBCDIC	This field contains zeroes. The correct job number is found in SMF6JBID.
8	8	SMF6OUT	8	EBCDIC	Printer name.
16	10	SMF6FCB	4		Reserved.
20	14	SMF6UCS	4		Reserved.
24	18	SMF6PGE	4		Reserved.

Common Section for IP PrintWay

This section contains the general output information including the user ID associated with the job or session.

Offsets		Name	Length	Format	Description
0	0	SMF6LN3	2	binary	Length of the common section, including this field.
2	2	SMF6ROUT	4		Reserved.
6	6	SMF6EFMN	8	EBCDIC	Output form number. SMF6EFMN is derived from the last setup message, the JES initialization statements, or from the FORMS parameter of the OUTPUT statement.
14	E		16		Reserved
30	1E	SMF6JBID	8	EBCDIC	Job ID.

Offsets		Name	Length	Format	Description
38	26	SMF6STNM	8	EBCDIC	Step name.
46	2E	SMF6PRNM	8	EBCDIC	Proc step name.
54	36	SMF6DDNM	8	EBCDIC	DD name.
62	3E	SMF6USID	8	EBCDIC	The user ID associated with the job/session that created the data set.
70	46	SMF6SECS	8	EBCDIC	Reserved.
78	4E	SMF6PRMD	8	EBCDIC	The processing mode of the data set.
86	56	SMF6DSNM	53	EBCDIC	The name of the data set being printed.
139	8B		3		Reserved.
142	8E	SMF6OTOK	20	EBCDIC	Output security token: assigns to those SYSOUT data sets that share common printing attributes and security information. Data sets thus grouped are then printed sequentially. If your installation also produces job header and trailer pages, these data sets appear between those job header and trailer pages as a job.

Enhanced SYSOUT Support (ESS) Section for IP PrintWay

This section contains the output descriptor (if any) for first offloaded data set in this record:

Offsets		Name	Length	Format	Description
0	0	SMF6LN5	2	binary	Length of ESS section (including this field).
2	2	SMF6SGID	4	binary	Segment identifier.
6	6	SMF6IND	1	binary	Section indicator: **Bit** **Meaning When Set** **0** Error obtaining scheduler JCL facility (SJF) information. Scheduler work block text unit (SWBTU) data area is not present. **1-7** Reserved.
7	7	SMF6RSV	1		Reserved.
8	8	SMF6JDVT	8	EBCDIC	JCL definition table (JDT) name in JCL definition vector table (JDTV).
16	10	SMF6TUL	2	binary	Text unit (SWBTU) data area length.
18	12	SMF6TU	VAR	binary	Text unit (SWBTU) data area. The data area can be processed using the SWBTUREQ macro.

File Transfer Section for IP PrintWay

Offsets		Name	Length	Format	Description
0	0	SMF6LN6	2	binary	Length of File Transfer section (including this field).
2	2	SMF6BYTE	4	binary	Total number of bytes transmitted, described in the section introduction.
6	6	SMF6IP1	1	binary	1st segment of IP address of target address. If these records are written in IP PrintWay extended mode, these fields contain 0. IP PrintWay basic mode fills in the IP address only when it uses the LPR or direct sockets protocols to send data to the printer.
7	7	SMF6IP2	1	binary	2nd segment of IP address of target address. If these records are written in IP PrintWay extended mode, these fields contain 0. IP PrintWay basic mode fills in the IP address only when it uses the LPR or direct sockets protocols to send data to the printer.

Offsets		Name	Length	Format	Description
8	8	SMF6IP3	1	binary	3rd segment of IP address of target address. If these records are written in IP PrintWay extended mode, these fields contain 0. IP PrintWay basic mode fills in the IP address only when it uses the LPR or direct sockets protocols to send data to the printer.
9	9	SMF6IP4	1	binary	4th segment of IP address of target address. If these records are written in IP PrintWay extended mode, these fields contain 0. IP PrintWay basic mode fills in the IP address only when it uses the LPR or direct sockets protocols to send data to the printer.
10	A	SMF6FTL	1	binary	File transfer level indicator
11	B		11		Reserved.
22	16	SMF6PQLN	2	binary	Length of the Print Queue Name field. When IP PrintWay basic mode writes the record, SMF6PQLN contains the length of the SMF6PRTQ field. When IP PrintWay extended mode writes the record, SMF6PQLN contains the length of the meaningful portion of SMF6PRTQ.
24	18	SMF6PRTQ	24	EBCDIC	Print Queue Name. If IP PrintWay basic mode writes the record, SMF6PRTQ is variable in length, with the length as specified in SMF6PQLN. If IP PrintWay extended mode writes the record, SMF6PRTQ is always 24 bytes in length and the print queue name is padded to the right with blanks. SMF6PQLN can be used to extract the print queue name from SMF6PRTQ.
48	30	SMF6BYTD	8	binary	For IP PrintWay extended mode, the total bytes transmitted (64-bit integer), described in the section introduction. For IP PrintWay basic mode, the SMF6BYTD field is not present.
56	38		16		Reserved
72	48	SMF6URIL	2	binary	For IP PrintWay extended mode, the length of the target device universal resource indicator (URI). For IP PrintWay basic mode, the SMF6URIL field is not present.
74	4A	SMF6URI	variable	EBCDIC	For IP PrintWay extended mode, the target device universal resource indicator (URI). For IP PrintWay basic mode, the SMF6URI field is not present.

Record Type 7 (07) — Data Lost

If all SMF buffers become full (either a result of no available output data sets for SMF to write to OR the system generating records at a rate faster than SMF can physically write them), SMF data will be lost. When this condition occurs, record type 7 tracks the number of lost records. It contains a count of the SMF records that were not written and the start and end times of the period when data was lost. (The end time is the time recorded in SMF7TME at offset 6).

Record type 7 is not built until SMF buffers become available again. Data existing in the SMF buffer, prior to data lost, is written to available SMF data sets before record type 7 is written to a data set.

Record Environment

The following conditions exist for the generation of this record:

Macro SMFEWTM(1), BRANCH=YES (record exit: IEFU84)

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF7LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See "Standard SMF Record Header" on page 13-1 for a detailed description.
2	2	SMF7SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF7FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See "Standard SMF Record Header" on page 13-1 for a detailed description.
5	5	SMF7RTY	1	binary	Record type 7 (X'07').
6	6	SMF7TME	4	binary	Time since midnight, in hundredths of a second, when the record was built into the SMF buffer.
10	A	SMF7DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
14	E	SMF7SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF7NRO	2	binary	Number of SMF records lost because no SMF data sets were available for recording.
20	14	SMF7STM	4	binary	Start time since midnight, in hundredths of a second, of the period during which no SMF data sets were available for recording.
24	18	SMF7STD	4	packed	Start date, of the period during which no SMF data sets were available for recording, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.

Record Type 8 (08) — I/O Configuration

Record type 8 is written after an SMF IPL is completed and the SET DATE operator command is issued. This record identifies each device that is online at IPL by device class, unit type, and device number.

Record Environment

The following conditions exist for the generation of this record:

Macro SMFEWTM(1), BRANCH=YES (record exit: IEFU84)

Record Mapping

Header/Self-defining Section

This section contains the common SMF record header fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF8LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	SMF8SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF8FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See “Standard SMF Record Header” on page 13-1 for a detailed description.
5	5	SMF8RTY	1	binary	Record type 08 (X'08').
6	6	SMF8TME	4	binary	Time since midnight, in hundredths of a second, when the record was moved into the SMF buffer.
10	A	SMF8DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
14	E	SMF8SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF8LENN	2	binary	Length of rest of record including this field.

Device Data Section

For each device online at IPL, there is a four-byte entry with the following format:

Offsets		Name	Length	Format	Description
0	0	SMF8IODV	4	structure	Device identification. **Note:** Virtual I/O devices are identified by the following: Device Class 0 Unit Type 0 Device Number X'7FFF' It is important to understand the following: Allocation messages for VIO data sets will show VIO ALLOCATED TO ddname. SMF records will show VIO unit addresses as X'7FFF'. The actual in-storage UCB built for VIO will show address X'3FFF'. For example, the messages: • IEF237I X'3FFF' ALLOCATED TO ddname • IEF237I X'7FFF' ALLOCATED TO ddname indicate that ddname is not allocated to a Virtual I/O device, but is instead allocated to a real device whose unit address is X'3FFF' or X'7FFF' respectively.
0	0	SMF8DUT	2	binary	Device class and unit type.
2	2	SMF8CHA	2	binary	Device number.

Record Type 9 (09) — VARY Device ONLINE

Record type 9 is written when a VARY Device ONLINE command is processed. This record identifies the device being added to the configuration by device class, unit type, and device number.

Record Environment

The following conditions exist for the generation of this record:

Macro SMFWTM (record exit: IEFU83)

Storage Residency 31-bit

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF9LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See "Standard SMF Record Header" on page 13-1 for a detailed description.
2	2	SMF9SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF9FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See "Standard SMF Record Header" on page 13-1 for a detailed description.
5	5	SMF9RTY	1	binary	Record type 9 (X'09').
6	6	SMF9TME	4	binary	Time since midnight, in hundredths of a second, when the record was built into the SMF buffer.
10	A	SMF9DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
14	E	SMF9SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF9LENN	2	binary	Length of rest of record including this field.

Data Device Section

For each device varied online, there is an entry with the following format:

Offsets		Name	Length	Format	Description
0	0	SMF9DVAD	8	structure	Device identification. **Note:** Virtual I/O devices are identified by the following: Device Class 0 Unit Type 0 Device Number X'7FFF' It is important to understand the following: Allocation messages for VIO data sets will show VIO ALLOCATED TO ddname. SMF records will show VIO unit addresses as X'7FFF'. The actual in-storage UCB built for VIO will show address X'3FFF'. For example, the messages: • IEF237I X'3FFF' ALLOCATED TO ddname • IEF237I X'7FFF' ALLOCATED TO ddname indicate that ddname is not allocated to a Virtual I/O device, but is instead allocated to a real device whose unit address is X'3FFF' or X'7FFF' respectively.
0	0	SMF9DUT	2	binary	Device class and unit type.
2	2	SMF9CUA	2	binary	Device number.
4	4	SMF9VPC	1	binary	Identifies the issuer of the vary path command that causes the specified device to change states **Value** **Meaning** **0** Operator **2** Enterprise Systems Connection Manager Program Product (5688-008) **3-7** Reserved.
5	5	SMF9RSV	3		Reserved.

Record Type 10 (0A) — Allocation Recovery

Record type 10 is written after a successful device allocation recovery.

This record identifies the device that is made available by device class, unit type, channel address, and unit address. It identifies the job requiring the allocation job log identification and user identification.

Note: This record is produced only when the response to message IEF238D is a device number. This record is not produced for any other responses.

Record Environment

The following conditions exist for the generation of each of the subtypes of this record:

Macro SVC 83 (record exit: IEFU83)

Mode Task

Storage Residency 24-bit

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF10LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See "Standard SMF Record Header" on page 13-1 for a detailed description.
2	2	SMF10SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF10FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See "Standard SMF Record Header" on page 13-1 for a detailed description.
5	5	SMF10RTY	1	binary	Record type 10 (X'0A').
6	6	SMF10TME	4	binary	Time since midnight, in hundredths of a second, that the record was built into the SMF buffer.
10	A	SMF10DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
14	E	SMF10SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF10JBN	8	EBCDIC	Job name The job name, time, and date that the reader recognized the JOB card (for this job) constitute the job log identification, or transaction name (for APPC output). **Note:** This field contains blanks if allocation recovery is for a system task.
26	1A	SMF10RST	4	binary	Time since midnight, in hundredths of a second, that the reader recognized the JOB card (for this job). This field equals zero if allocation recovery is for a system task.
30	1E	SMF10RSD	4	packed	Date when the reader recognized the JOB card (for this job), in the form 0*cyydddF*. See Table 13-1 on page 13-2 for a detailed description. This field equals zero if allocation recovery is for a system task.
34	22	SMF10UIF	8	EBCDIC	User-defined identification field (taken from common exit parameter area, not from USER=parameter on job statement).
42	2A	SMF10LN	2	binary	Length of rest of record including this field.

Data Definition Section

For each device made available there is an entry with the following format:

Offsets		Name	Length	Format	Description
0	0	SMF10DEV	4	structure	Device identification. **Note:** Virtual I/O devices are identified by the following: Device Class 0 Unit Type 0 Device Number X'7FFF' It is important to understand the following: Allocation messages for VIO data sets will show VIO ALLOCATED TO ddname. SMF records will show VIO unit addresses as X'7FFF'. The actual in-storage UCB built for VIO will show address X'3FFF'. For example, the messages: • IEF237I X'3FFF' ALLOCATED TO ddname • IEF237I X'7FFF' ALLOCATED TO ddname indicate that ddname is not allocated to a Virtual I/O device, but is instead allocated to a real device whose unit address is X'3FFF' or X'7FFF' respectively.
0	0	SMF10DUT	2	binary	Device class and unit type.
2	2	SMF10CUA	2	binary	Device number.

Record Type 11 (0B) — VARY Device OFFLINE

Record type 11 is written when a VARY device OFFLINE command is processed. This record identifies the device being removed from the configuration by device class, unit type, and device number.

Record Environment

The following conditions exist for the generation of this record:

Macro	SMFWTM (record exit: IEFU83)
Mode	Task
Storage Residency	24-bit

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF11LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	SMF11SEG	2	binary	Segment descriptor (see record length field).

Offsets		Name	Length	Format	Description
4	4	SMF11FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See "Standard SMF Record Header" on page 13-1 for a detailed description.
5	5	SMF11RTY	1	binary	Record type 11 (X'0B').
6	6	SMF11TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.
10	A	SMF11DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
14	E	SMF11SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF11LN	2	binary	Length of the rest of the record (including this field).

Data Definition Section

For each device varied offline, there is an entry with the following format:

Offsets		Name	Length	Format	Description
0	0	SMF11DEV	8	structure	Device identification. **Note:** Virtual I/O devices are identified by the following: Device Class 0 Unit Type 0 Device Number X'7FFF' It is important to understand the following: Allocation messages for VIO data sets will show VIO ALLOCATED TO ddname. SMF records will show VIO unit addresses as X'7FFF'. The actual in-storage UCB built for VIO will show address X'3FFF'. For example, the messages: • IEF237I X'3FFF' ALLOCATED TO ddname • IEF237I X'7FFF' ALLOCATED TO ddname indicate that ddname is not allocated to a Virtual I/O device, but is instead allocated to a real device whose unit address is X'3FFF' or X'7FFF' respectively.
0	0	SMF11DUT	2	binary	Device class and unit type.
2	2	SMF11CUA	2	binary	Device number.
4	4	SMF11VPC	1	binary	Identifies the issuer of the vary path command that causes the specified device to change states **Value** **Meaning** **0** Operator **2** Enterprise Systems Connection Manager Program Product (5688-008).
5	5	SMF11RSV	3		Reserved.

Record Type 14 (0E) — INPUT or RDBACK Data Set Activity

Record type 14 is written for non-VSAM direct access data sets, tape data sets, or VIO data sets. that are defined by DD statements or dynamic allocation and opened for RDBACK or INPUT processing by problem programs. It is written when a data set, as described above, is closed or processed by EOV. Its length varies, depending upon the number of volumes for the data set.

If a data set is closed multiple times within a single step, a record is written with each close, and the data counts are cumulative. Post processing programs should consider this or duplicate counts will be processed.

This record contains information from the TIOT, JFCB, DCB, DEB, and UCB data areas. The job name and the time and date the reader recognized the JOB card for this job constitute the job log identification.

Note: Record type 14 is not written for a data set defined by a DD* or DD DATA statement. Record type 14 is not written for BPAM if only z/OS UNIX directories are allocated. For accounting purposes, the card-image count for these data sets is provided in record type 4.

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF14LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See "Standard SMF Record Header" on page 13-1 for a detailed description.
2	2	SMF14SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF14FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See "Standard SMF Record Header" on page 13-1 for a detailed description.
5	5	SMF14RTY	1	binary	Record type 14 (X'0E').
6	6	SMF14TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.
10	A	SMF14DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
14	E	SMF14SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF14JBN	8	EBCDIC	Job name. The job name, time, and date that the reader recognized the JOB card (for this job) constitute the job log identification, or transaction name (for APPC output).
26	1A	SMF14RST	4	binary	Time since midnight, in hundredths of a second, that the reader recognized the JOB card (for this job).

Offsets		Name	Length	Format	Description
30	1E	SMF14RSD	4	packed	Date when the reader recognized the JOB card (for this job), in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
34	22	SMF14UID	8	EBCDIC	User-defined identification field (taken from common exit parameter area, not from USER=parameter on job statement).
42	2A	SMF14RIN	2	binary	Record and data set indicator **Bit** **Meaning When Set** **0** Reserved **1** Record written by end of volume (EOV) **2** DASD **3** Temporary data set **4** DCBDSORG=DA (the data set organization being used is direct access-BDAM) **5** DCBSORG=IS and DCBMACRF not EXCP (the data set organization being used is indexed sequential and the EXCP access method is not being used) **6** JFCDSORG=IS (the data set organization being used is indexed sequential) **7** Virtual input output (VIO) data set access **8** Partitioned data set directory entries (PDSE) data set **9** The QSAM TRUNC macro has been issued against a PDSE. **10** Null segment encountered in a PDSE. **11** Extended sequential data set indicator **12** Hiperbatch section present **13** Extended information segment present **14,15** Reserved. **Note:** A data set is considered temporary if: • It has a system-generated name where the first qualifier starts with SYS and the second qualifier starts with T (SYS____.T___.___). or • It is created within a job step and exists only for the duration of that job step.

Section Sizes

This section contains the UCB information associated with this record.

Offsets		Name	Length	Format	Description
44	2C	SMF14SDC	1	binary	Size of DCB/DEB section.
45	2D	SMF14NUC	1	binary	Number of UCB sections. There is always one UCB section for each UCB currently processing except for ISAM and BPAM-concatenated data sets. For ISAM data sets, this field is calculated as: one for the index extent, one per volume for primary extents, and one for the overflow extent. For BPAM there is one UCB section for each data set in the concatenation except that any z/OS UNIX directories are omitted. For extended format data sets, there is one UCB section for each volume.
46	2E	SMF14SUC	1	binary	Size of each UCB section.
47	2F	SMF14SET	1	binary	Size of ISAM extension section. This field equals 28 (or 0 if there are no ISAM data sets). For PDSE data sets, this field will always contain X'0'.
48	30	SMF14OPE	4	binary	Time since midnight, in hundredths of a second, when the data set was opened.

TIOT Section

This section contains a portion of the TIOT from the DD entry, the TIOT section is 16 bytes long.

Offsets		Name	Length	Format	Description
52	34	SMFTIOE1	1	binary	Length, in bytes, of the DD entry (including all device entries). This field is mapped by TIOELNGH in the TIOT mapping.
53	35	SMFTIOE2	1	binary	Status indicator. This field indicates the tape label processing to be performed; whether unallocating, rewinding, or unloading tape data sets is required. This field is mapped by TIOESSTA in the TIOT mapping.
54	36	SMFTIOE3	1	binary	Number of devices requested for this data set during allocation. For PDSE data sets, this field will always contain X'1'. This field is mapped by TIOEWTCT in the TIOT mapping.
55	37	SMFTIOE4	1	binary	A data set and device indicator. This field is mapped by TIOELINK in the TIOT mapping.
56	38	SMFTIOE5	8	EBCDIC	Data definition name (DDname). This field is mapped by TIOEDDNM in the TIOT mapping.
64	40	SMFTIOE6	3	binary	Scheduler Work Area (SWA) address of the job file control block (JFCB). This field is mapped by TIOEJFCB in the TIOT mapping.
67	43	SMFTIOE7	1	binary	This field is mapped by TIOESTTC in the TIOT mapping.

JFCB Section

This section contains information concerning the job file control block.

Offsets		Name	Length	Format	Description
68	44	SMFJFCB1	176	binary	The job file control block (JFCB), excluding JFCB extensions.
		JFCBTSDM			Used to find uncataloged data sets.
		JFCBADBF			Indicates number of data buffers.
		JFCBLTYP			Indicates type of label.
		JFCBCRDT			Indicates file’s creation date.
		JFCBXPDT			Indicates file’s expiration date.
		JFCBIND1			Indicates bits flag RLSE processing, extension onto a new volume and whether the file is a member of a GDG or a PDS.
		JFCBIND2			Indicates DISP= settings.
		JFCBCTRI			Indicates type of space request.
		JFCBPQTY			Indicates primary space request size.
		JFCBSQTY			Indicates secondary space request size.

DCB/DEB Section (tape and DASD)

This section contain portions of the DCB and DEB, including:

Offsets		Name	Length	Format	Description
244	F4	SMFDCBOR	2	binary	Data set organization being used. This field is mapped by DCBDSORG in the DCB mapping.
246	F6	SMFDCBRF	1	binary	Record format. This field is mapped by DCBRECFM in the DCB mapping.
247	F7	SMFDCBMF	2	binary	Type of I/O macro instruction and options. This field is mapped by DCBMACRF in the DCB mapping.
249	F9	SMFDCBFL	1	binary	Indicator used by the OPEN, CLOSE, EOV routines such as the type of the last I/O operation. This field is mapped by DCBOFLGS in the DCB mapping.

Offsets		Name	Length	Format	Description
250	FA	SMFDCBOP	1	binary	Option codes used by access-method interfaces. This field is mapped by DCBOPTCD in the DCB mapping.
251	FB	SMF14RV2	1	binary	Reserved.
252	FC	SMFDEBFL	1	binary	Data set and device status indicator. This field indicates whether a data set is modified, new or old, and shows the status of DASD. This field is mapped by DEBOFLGS in the DEB mapping. For information about DEBOFLGS, see *z/OS DFSMSdfp Diagnosis*.
253	FD	SMFDEBOP	1	binary	Indicator showing both the method of I/O processing and the disposition that is to be performed when an end-of-volume (EOV) condition occurs. This field is mapped by DEBOPATB in the DEB mapping.
254	FE	SMFDEBVL	2	binary	Volume sequence number. For direct access, the sequence number is relative to the first volume of the data set. For tape, the sequence number is relative to the first volume processed. This field is valid only for sequential data sets. This field is mapped by DEBVOLSQ in the DEB mapping.

The following 16 bytes apply to the DCB/DEB Tape extension:

Offsets		Name	Length	Format	Description
256	100	SMFDCBBL	4	binary	Block count for each volume. For PDSE data sets, this field will always contain X'0'. This field is mapped by DCBBLKCT in the DCB mapping.
260	104	SMFDSSNO	6	EBCDIC	Data set serial number. For PDSE data sets, this field will always contain X'0'. This field is mapped by UCBFSER in the UCB mapping.
266	10a	SMF14RV3	2		Reserved.
268	10c	SMF14OPD	4	packed	Date when the data set was opened, in the form 0cyyddF.

The following 16 bytes apply to the DCB/DEB DASD extension:

Offsets		Name	Length	Format	Description
256	100	SMF14NTU	4	binary	Relative track and record of the last user block in the form of TTR0 if a basic format data set. Relative track and record of the last user block in the form of TTTR if a large format data set. For extended data sets, this field will accumulate the number of tracks used across all the volumes (TTTT).
260	104	SMF14NTR	4	binary	Number of tracks released by the DADSM routine. For PDSE data sets, this field will always contain X'0'.
264	108	SMF14NER	1	binary	Number of extents released by the DADSM routine. For PDSE data sets, this field will always contain X'0'.

Offsets		Name	Length	Format	Description
265	109	SMF14EDI	1	binary	Enhanced Data Integrity (EDI) flag indicator. **Bit** **Meaning when set** **0** Data set name found in EDI exclusion table. **1** Data set being opened for output but is currently open for output. **2** Data set being opened for input but is currently open for output and the data set is not excluded from EDI processing.. **3** Application requested EDI processing be bypassed and the data set is not excluded from EDI processing.. **4–7** Reserved.
266	10A	SMF14FG1	1		Flag byte. **Bit** **Meaning when set** **0** Large format data set. SMF14NTU is in TTTR format. **1–7** Reserved.
267	10B	SMF14RV4	1		Reserved.
268	10C	SMF14OPD	4	packed	Date when the data set was opened, in the form 0cyyddF.

UCB Section

This section contains a portion of the UCB (see fields SMF14NUC and SMF14SUC) including:

Offsets		Name	Length	Format	Description
0	0	SMFUCBDV	2	binary	Device number. If this field contains X'7FFF', this could be a virtual I/O (VIO) data set. If bit 7 of field SMF14RIN is set to one, this is a VIO data set. **Note:** Virtual I/O devices are identified by the following: Device Class 0 Unit Type 0 Device Number X'7FFF' It is important to understand the following: Allocation messages for VIO data sets will show VIO ALLOCATED TO ddname. SMF records will show VIO unit addresses as X'7FFF'. The actual in-storage UCB built for VIO will show address X'3FFF'. For example, the messages: • IEF237I X'3FFF' ALLOCATED TO ddname • IEF237I X'7FFF' ALLOCATED TO ddname indicate that ddname is not allocated to a Virtual I/O device, but is instead allocated to a real device whose unit address is X'3FFF' or X'7FFF' respectively.
2	2	SMFSRTEV	6	EBCDIC	Volume serial number.
8	8	SMFUCBTY	4	binary	Unit type. This field is mapped by UCBTYP in the UCB mapping.

Offsets		Name	Length	Format	Description
12	C	SMFSRTES	1	binary	DASD volume status indicator. This field indicates whether this DASD volume is a private, public, storage, or control volume. For PDSE data sets, this field will always contain X'0'. This field is mapped by UCBSTAB in the UCB mapping.
13	D	SMF14NEX	1	binary	Number of extents.
14	E	SMF14RV5	2		Reserved.
16	10	SMFEXCP	4	binary	EXCP count for entire step. Note that if a data set is opened and closed twice during a single step, the count in the second type 14 record is the sum of all EXCPs for both uses of the data set. (The EXCP count in the last type 14 record for the step is equal to the corresponding entry for the data set in record type 4). For more information about EXCP count, see Chapter 10, “EXCP Count,” on page 10-1. For PDSE data sets, the number of pages that were read or written. For compressed data sets the number of physical blocks (see SMF14CIS for physical block size) that were read or written.

For each UCB tape extension, there is a four-byte entry with the following format:

Offsets		Name	Length	Format	Description
0	0	SMFSRTEF	2	binary	Data set sequence count.
2	2	SMFSRTEQ	2	binary	Data set sequence number.

The following four bytes apply to the UCB section if DASD (see SMFUCBTY):

Offsets		Name	Length	Format	Description
0	0	SMF14NTA	4	binary	Number of tracks allocated on the device. For PDSE data sets, this field will always contain X’0’.

Hiperbatch Section

This section describes the DASD information acquired from Hiperbatch. These fields are only valid for data sets accessed using Hiperbatch (see SMF14RIN):

Offsets		Name	Length	Format	Description
0	0	SMFIOREQ	4	binary	Number of requests for I/O issued by the access method for this data set for which Hiperbatch attempted to find the requested data in its buffers (see SMFCHITS and SMFPHIOS).
4	4	SMFCHITS	4	binary	Number of requests for I/O issued by the access method for this data set satisfied by moving data from Hiperbatch buffers.
8	8	SMFNMWTS	4	binary	Number of times Hiperbatch temporarily suspended this requester because another user was already reading some or all of the requested data.
12	C	SMFPHIOS	4	binary	Number of requests for I/O issued by the access method for this data set satisfied by performing DASD I/O. Note that the sum of SMFPHIOS and SMFCHITS should equal SMFIOREQ.
16	10	SMFCIOS	4	binary	Number of DASD I/Os (as recorded in SMFPHIOS) for which Hiperbatch copied the data into its buffers.

ISAM Extension Section

DCBBSORG=IS and DCBMACRF not EXCP. For PDSE data sets, this section will contain all zeroes.

Offsets		Name	Length	Format	Description
0	0	SMF14RV6	2		Reserved.
2	2	SMFDCBMA	1	binary	Extension of I/O macro instruction (DCBMACRF) for ISAM. This field is mapped by DCBMACCT in the DCB mapping.
3	3	SMFDCBNL	1	binary	Number of index levels. This field is mapped by DCBNLVET in the DCB mapping.
4	4	SMFDCBR3	4	binary	For each use of the data set, number of read or write accesses to an overflow record which is not first in a chain of such records. This field is mapped by DCBRORG3 in the DCB mapping.
8	8	SMFDCBNR	4	binary	Number of logical records in prime data area. This field is mapped by DCBNRECT in the DCB mapping.
12	C	SMFDCBR2	2	binary	Number of tracks (whole or partial remaining in overflow area). This field is mapped by DCBRORG2 in the DCB mapping.
14	E	SMFDCBNO	2	binary	Number of logical records in overflow area. This field is mapped by DCBNOREC in the DCB mapping.
16	10	SMFDCBR1	2	binary	Number of cylinder overflow areas that are full. This field is mapped by DCBRORG1 in the DCB mapping.
18	12	SMF14RV7	1		Reserved.
19	13	SMFDEBNI	1	binary	Number of extents in independent index area. This field is mapped by DEBNIEEQ in the DEB mapping.
20	14	SMFDEBNP	1	binary	Number of extents in prime data area. This field is mapped by DEBNPEEQ in the DEB mapping.
21	15	SMFDEBNO	1	binary	Number of extents in independent overflow area. This field is mapped by DEBNOEEQ in the DEB mapping.
22	16	SMFNCYLS	2	binary	Number of cylinders in independent index area.
24	18	SMFNPCYL	2	binary	Number of cylinders in prime data area.
26	1A	SMFNOCYL	2	binary	Number of cylinders in independent overflow area.

Extended Information Segment

This segment contains a 2 byte segment length, which is the length of all sections that are contained in it. Each section contains its section length, a section type code, and variable information depending upon the section type.

Extended Information Segment Descriptor

Offsets		Name	Length	Format	Description
0	0	SMF14SXS	2	binary	Size of extended information segment (size of all sections including this length field).

Extended Information Section Descriptor Word

Offsets		Name	Length	Format	Description
0	0	SMF14ESL	2	binary	Size of this extended information section (size of variable length fields including this 4 byte section descriptor word).
2	2		1	binary	Reserved.

Offsets		Name	Length	Format	Description
3	3	SMF14STY	1	binary	Section type code. **Type** **Meaning When Set** **1** Compressed format data set section **2** SMS class information section **3** Step Information section **4** ISO/ANSI Version 4 CCSID (coded character set ID) information section **5** Additional data set characteristics section

Compressed Format Data Set Section (Type 1)

This describes the information acquired for extended format data sets.

Offsets		Name	Length	Format	Description
4	4	SMF14XF1	1	binary	Indicators: **Bit** **Meaning When Set** **0** Compressed format data set size values (SMF14CDS and SMF14UDS) are invalid. **1** Compression of the data set has been rejected. **2-7** Reserved.
5	5	SMF14XF2	1	binary	Indicators: **Bit** **Meaning When Set** **0-7** Reserved.
6	6	SMF14CDL	8	binary	Number of bytes of compressed data read or written since this open.
14	E	SMF14UDL	8	binary	Number of bytes of data read or written since this open (data length prior to compression).
22	16	SMF14CDS	8	binary	Size of the compressed format data set (number of compressed user data bytes).
30	1E	SMF14UDS	8	binary	Size of the compressed format data set (number of uncompressed user data bytes).
38	26	SMF14CIS	4	binary	Physical block size of extended format data set.
42	2A	SMF14TKL	2	binary	Length of dictionary token, SMF14TKN field (not including the length of this field). Currently equals 36.
44	2C	SMF14TKN	36	binary	Dictionary token for compressed format data set.

SMS Class Section (Type 2)

This describes the management, data and storage classes for SMS managed data sets.

Offsets		Name	Length	Format	Description
4	4	SMF14MCN	8	EBCDIC	SMS Management class name.
12	C	SMF14DCN	8	EBCDIC	SMS Data class name.
20	14	SMF14SCN	8	EBCDIC	SMS Storage class name (first 8 characters).

Step Information Section (Type 3)

This describes the step name and the active program name for the data set.

Offsets		Name	Length	Format	Description
4	4	SMF14SPN	8	EBCDIC	Job step name.
12	C	SMF14PGN	8	EBCDIC	Job step program name.

ISO/ANSI Version 4 CCSID Information Section (Type 4)

This describes the CCSID information specified for an ISO/ANSI Version 4 tape data set.

Offsets		Name	Length	Format	Description
4	4	SMF14CFG	1	binary	Indicators: **Bit** **Meaning When Set** **0** IBM format Version 4 tape **1** Opened for OUTPUT not DISP=MOD (Note 1) **2** Opened for OUTPUT DISP=MOD (Note 1) **3** User CCSID value is defaulted to CCSID=500 **4** Tape CCSID value is defaulted to CCSID=367 **5** CCSID value specified on DD statement was ignored **6-7** Reserved.
5	5	SMF14USR	4	binary	CCSID user application expects data records to be in (specified on JOB/EXEC statement or defaulted). (Note 2)
9	9	SMF14TPE	4	binary	CCSID of data records on tape (specified on DD statement or in tape label). (Note 2)
13	D	SMF14LBL	4	binary	CCSID specified in the tape label of an existing tape when opened for input processing.

Notes:

1. If opened for input processing, then bit 1 and 2 will both be off.
2. If no CCSID information is specified (in other words SMF14USR and SMF14TPE are 0), then the IBM standard ASCII/EBCDIC (XLATE) was used to process this Version 4 tape.

Additional Data Set Characteristics Section (Type 5)

This section contains information about the additional data set characteristics optionally provided for tape data sets.

Offsets		Name	Length	Format	Description
4	4	SMF14BFG	2	binary	Indicators: **Bit** **Meaning When Set** **0** Block size value present **1-15** Reserved.
6	6	SMF14LBS	8	binary	Block size value.
14	E		12	binary	Reserved.

Record Type 15 (0F) — OUTPUT, UPDAT, INOUT, or OUTIN Data Set Activity

Record type 15 is written for non-VSAM direct access, or VIO tape data sets that are defined by DD statements or dynamic allocation and opened for OUTPUT, UPDAT, INOUT, or OUTIN processing by problem programs. It is written when a data set, as described above, is closed or processed by the end-of-volume (EOV). Its length varies, depending upon the number of volumes for the data set.

This record contains information from the TIOT, JFCB, DCB, DEB, and UCB data areas.

Note: Record type 15 is not written for data sets defined as SYSOUT data sets on DD statements. For accounting purposes, the SYSOUT logical record count is provided in record type 6.

The format for this record is the same as the format for record type 14.

Record Type 16 (10) — DFSORT Statistics

Record type 16 is written to record information about events and operations of the IBM DFSORT licensed program. Depending on the option specified at initialization (and whether DFSORT runs successfully), a short record, full record, or no record is produced.

DFSORT creates an SMF record when SMF=FULL, SMF=SHORT or TEXIT=YES is in effect (see *z/OS DFSORT Installation and Customization* for details about these DFSORT parameters). However, values for some fields are not provided in certain circumstances, such as technique used or abnormal termination. Text in the description column of the record mapping indicates when values are not provided.

Macro to Symbolically Address Record Type 16

Because the type 16 record consists of sections that might be found at different displacements from one release to the next, always use the ICESMF mapping macro to reference fields in the type 16 SMF record. This macro provides separate DSECTs for each SMF record section and eliminates the need to use hard-coded offsets.

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
+0	+0	SMF16LEN	2	binary	Record length. This value is always provided.
+2	+2	SMF16SEG	2	binary	Segment descriptor. This value is not provided in the SMF record passed to the termination exit.

Offsets		Name	Length	Format	Description
+4	+4	ICESIND	1	binary	System indicator **Bit** **Meaning When Set** **0** Subsystem name follows standard header. This value is not provided in the SMF record passed to the termination exit. **1-3** Reserved. **4** MVS/ESA This value is always provided. **5** MVS/XA This value is always provided. **6** MVS This value is always provided. **7** Reserved.
+5	+5	ICERTYP	1	binary	Record type. This value is always provided.
+6	+6	ICEBTIME	4	binary	Time since midnight, in hundredths of a second, record was moved to SMF buffer. This value is not provided in the SMF record passed to the termination exit.
+10	+A	ICEBDATE	4	packed	Date record was moved to SMF buffer, in the form 0CYYDDDF where F is the sign. This value is not provided in the SMF record passed to the termination exit.
+14	+E	ICESID	4	EBCDIC	System identification (taken from SID parameter). This value is not provided in the SMF record passed to the termination exit.
+18	+12	ICEJOBNM	8	EBCDIC	Job name. This value is always provided.
+26	+1A	ICERST	4	binary	Time reader recognized job card. This value is not provided in the SMF record passed to the termination exit.
+30	+1E	ICERDS	4	packed	Date reader recognized job card. This value is not provided in the SMF record passed to the termination exit.
+34	+22	ICEUIF	8	EBCDIC	Installation dependent information. This value is not provided in the SMF record passed to the termination exit.
+42	+2A	ICESTN	1	binary	Step number. This value is not provided in the SMF record passed to the termination exit.
+43	+2B	ICERES1	1		Reserved.
+44	+2C	ICETRN	2	binary	Number of triplets supported by DFSORT. See Note 9 on page 13-76. A triplet is a set of values that define an SMF record section. These descriptors begin at ICEPROD. This value is always provided.
+46	+2E	ICESUBID	4	EBCDIC	Subsystem identification. This value is always provided.

Offsets		Name	Length	Format	Description
+50	+32	ICERSUB	2	binary	This value is always provided. See Note 3 on page 13-76. Record subtype: 1: Short record, successful execution. 2: Full record, successful execution. 3: Short record, unsuccessful execution.
+52	+34	ICEPROD	4	binary	Offset to product section. This value is always provided.
+56	+38	ICEPRODL	2	binary	Product section length. This value is always provided.
+58	+3A	ICEPRODN	2	binary	Number of product sections. This field will be zero if no product section is provided. This value is always provided.
+60	+3C	ICEDATA	4	binary	Offset to common data section. This value is always provided.
+64	+40	ICEDATAL	2	binary	Common data section length. This value is always provided.
+66	+42	ICEDATAN	2	binary	Number of data sections. This field will be zero if no data section is provided. This value is always provided.
+68	+44	ICESTAT	4	binary	Offset to record-length distribution section. This value is always provided.
+72	+48	ICESTATL	2	binary	Record-length distribution section length.
+74	+4A	ICESTATN	2	binary	Number of record-length distribution sections. This field will be zero if no record-length distribution section is provided.
+76	+4C	ICEINDS	4	binary	Offset to first input data set section. This value is always provided.
+80	+50	ICEINDSL	2	binary	Input data set section length. This value is always provided.
+82	+52	ICEINDSN	2	binary	Number of input data set sections. This field will be zero if no input data set sections are provided. This value is always provided.
+84	+54	ICEOTDS	4	binary	Offset to SORTOUT data set section. This value is always provided.
+88	+58	ICEOTDSL	2	binary	SORTOUT data set section length. This value is always provided.
+90	+5A	ICEOTDSN	2	binary	Number of SORTOUT data set sections. This field will be zero if no SORTOUT data set section is provided. This value is always provided.
+92	+5C	ICEOFDS	4	binary	Offset to first OUTFIL data set section. This value is always provided.
+96	+60	ICEOFDSL	2	binary	OUTFIL data set section length. This value is always provided.

Offsets		Name	Length	Format	Description
+98	+62	ICEOFDSN	2	binary	Number of OUTFIL data set sections. This field will be zero if no OUTFIL data set sections are provided. This value is always provided.
+100	+64	ICERES1B	2		Reserved.
+102	+66	ICESPGN	2	binary	Performance group number. This value is always provided.
+104	+68	ICEUSER	8	EBCDIC	User ID for which the job or session is being executed. This field is provided only when RACF is active. This value is always provided.
+112	+70	ICEGROUP	8	EBCDIC	Group ID for which the job or session is being executed. This field is provided only when RACF is active. This value is always provided.
+120	+78	ICERES1D	8	Reserved.	
Product Section:					
+0	+0	ICERECV	2	EBCDIC	Record version: “01”. This value is always provided.
+2	+2	ICEPRDCT	8	EBCDIC	Product name: “5740SM1ƀ”. This value is always provided.
+10	+A	ICERELNM	4	EBCDIC	DFSORT release level, such as “14.0”. This value is always provided.
+14	+E	ICERES1C	2	Reserved.	
Data Section:					
+0	+0	ICERES2	2		Reserved.
+2	+2	ICESTPNM	8	EBCDIC	Step name; blank if no step name. This value is always provided.
+10	+A	ICERCDS	4	binary	Number of records sorted. See Note 10 on page 13-76. A 64-bit integer version of this field is defined as ICEEXRCS. See Note 5 on page 13-76. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful.
+14	+E	ICEBYTES	4	binary	Number of bytes sorted. See Note 10 on page 13-76. A 64-bit integer version of this field is defined as ICEEXBYS. See Note 5 on page 13-76. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful.
+18	+12	ICECPUT	4	binary	Processor time (TCB time), in hundredths of a second. See Note 1, 5 on page 13-76. This value is always provided.
+22	+16	ICELEN	2	binary	Specified record length. This value is not provided when DFSORT terminates abnormally (that is, with record subtype X'03').

Offsets		Name	Length	Format	Description
+24	+18	ICEIBLK	2	binary	Maximum input block size or control interval size (15-bit). See Note 2 on page 13-76. A 31-bit version of this field is defined as ICEIBLKF. See Note 17 on page 13-77. This value is not provided when DFSORT terminates abnormally (that is, with record subtype X'03').
+26	+1A	ICEOBLK	2	binary	Maximum output block size or control interval size (15-bit). See Note 2 on page 13-76. A 31-bit version of this field is defined as ICEOBLKF. See Note 17 on page 13-77. This value is not provided when DFSORT terminates abnormally (that is, with record subtype X'03').
+28	+1C	ICEKEYLN	2	binary	Total control field length (number of bytes actually compared by DFSORT). This value is not provided when DFSORT terminates abnormally (that is, with record subtype X'03').
+30	+1E	ICEWBLK	4	binary	Number of work data set tracks used. See Note 5 on page 13-76. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful.
+34	+22	ICEFLBYT	1	binary	**Bit** **Meaning When Set** **0** Reserved. **1-2** 00=Fixed-length records. See Note 3 on page 13-76. 01=Variable-length records. 10=Variable-length spanned records. **3-4** 00=Blockset technique. 01=Peerage technique. 10=Vale technique. 11=Conventional technique. See Note 13 on page 13-76. **5** DFSORT was invoked through a program. **6** Sorting was completed in memory (work space was not needed). **7** Reserved. For bits 1-2 and 6, this value is not provided when DFSORT terminates abnormally (that is, with record subtype X'03'). For bits 3-4, if DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful. For bit 5, this value is always provided.
+35	+23	ICENDYNA	1	binary	Number of allocated work data sets. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful.
+36	+24	ICEFLBY2	1	binary	If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful. **Bit** **Meaning When Set** **0** A sort was specified. See Note 4 on page 13-76. **1** A merge was specified. **2** A copy was specified. **3** DFSORT was called by ICETOOL. **4-7** Reserved.

Offsets		Name	Length	Format	Description
+37	+25	ICEIOTYP	1	binary	This value is only provided for a Blockset application. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful. Type of input source/output destination: **Bit** **Meaning When Set** **0** E15 exit was used. **1** E32 exit was used. **2** E35 exit was used. **3** SORTIN data sets were used. **4** SORTINnn data sets were used. **5** SORTOUT data set was used. **6** OUTFIL data sets were used. **7** Reserved.
+38	+26	ICECSFLG	1	binary	This value is only provided for a Blockset application. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful. Control statement flags byte: **Bit** **Meaning When Set** **0** ALTSEQ was specified. **1** INREC was specified. **2** INCLUDE was specified. **3** OMIT was specified. **4** OUTREC was specified. **5** SUM was specified. **6** OUTFIL was specified. **7** Reserved.
+39	+27	ICERES3	1		Reserved.
+40	+28	ICETIMES	4	binary	Time DFSORT started processing (local time, in hundredths of a second). This value is always provided.
+44	+2C	ICEDATES	4	packed	Date DFSORT started processing, in the form 0CYYDDDF where F is the sign (local date). This value is always provided.
+48	+30	ICETIMEE	4	binary	Time DFSORT ended processing (local time, in hundredths of a second). This value is always provided.
+52	+34	ICEDATEE	4	packed	Date DFSORT ended processing, in the form 0CYYDDDF where F is the sign (local date). This value is always provided.
+56	+38	ICERCBYT	1	binary	The values for bits 0, 1, and 4-6 are always provided. Return code status: (See Note 8 on page 13-76.) **Bit** **Meaning When Set** **0** System abend detected. **1** User abend detected. **2-3** Reserved. **4** User requested ABEND issued by DFSORT. **5** RC=16 returned to caller. **6** RC=20 returned to caller. **7** Reserved.

Offsets		Name	Length	Format	Description
+57	+39	ICERC	1	binary	Return code of DFSORT to its invoker. This field will contain X'FF' if a user-requested or system ABEND is issued. This value is always provided.
+58	+3A	ICERESN	2	binary	Reason code. If ICERC is not 0 or 4, then this field will contain the system or user ABEND code, or the number of the DFSORT message describing the reason for an unsuccessful execution. This value is always provided.
+60	+3C	ICEAVLR	4	binary	Average record length of sorted variable length records. This value is not provided when DFSORT terminates abnormally (that is, with record subtype X'03').
+64	+40	ICEDSA	2	binary	DSA value in effect (in megabytes). This value is only provided for a Blockset application. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful.
+66	+42	ICEFLBY3	1	binary	If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful. **Bit** **Meaning When Set** **0** Hipersorting was used. **1** Data space was used. **2** Work data sets were used. **3** Locale processing was used for a SORT or MERGE control field. **4** Locale processing was used for an INCLUDE or OMIT compare field. **5** EQUALS was used for a sort or merge application. **6** 31-bit block size fields are available. **7** Reserved.
+67	+43	ICEWKFLG	1	binary	If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful. Work data set flags byte: **Bit** **Meaning When Set** **0** Work data set tracks were allocated dynamically. **1** Cache fast write was used for one or more work data sets. **2-7** Reserved.
+68	+44	ICEWEXS	2	binary	Number of extents initially allocated for all work data sets. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful.
+70	+46	ICEWEXE	2	binary	Number of extents allocated for all work data sets when sorting ended. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful.
+72	+48	ICEWALLS	4	binary	Number of tracks initially allocated for work data sets. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful.

Offsets		Name	Length	Format	Description
+76	+4C	ICEWALLE	4	binary	Number of tracks allocated to work data sets when sorting ended. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful.
+80	+50	ICERES5	3		Reserved.
+83	+53	ICEIAMB	1	binary	If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful. SORTIN access method byte: (See Note 7 on page 13-76.) **Bit** **Meaning When Set** **0** EXCP was used for SORTIN. **1** VSAM was used for SORTIN. **2** BSAM was used for SORTIN. **3-7** Reserved.
+84	+54	ICEINIO	4	binary	Number of calls to the access method used for SORTIN. See Note 6 on page 13-76. A 64-bit integer version of this field is defined as ICEEXINN. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful.
+88	+58	ICERES6	3		Reserved.
+91	+5B	ICEOAMB	1	binary	If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful. SORTOUT access method byte: (See Note 7 on page 13-76.) **Bit** **Meaning When Set** **0** EXCP was used for SORTOUT. **1** VSAM was used for SORTOUT. **2** BSAM was used for SORTOUT. **3-7** Reserved.
+92	+5C	ICEOUTIO	4	binary	Number of calls to the access method used for SORTOUT. See Note 6 on page 13-76. A 64-bit version of this field is defined as ICEEXOUT. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful.
+96	+60	ICEIBLKF	4	binary	Maximum input block size or control interval size (31-bit). See Note 2 on page 13-76. A 15-bit version of this field is defined as ICEIBLK. See Note 17 on page 13-77. This value is not provided when DFSORT terminates abnormally (that is, with record subtype X'03').
+100	+64	ICEWKIO	4	binary	Number of EXCPs for all work data sets. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful.
+104	+68	ICESRBTS	4	binary	Cumulative value of the SRB time for the region when DFSORT started processing, in hundredths of a second. This value is always provided.

Offsets		Name	Length	Format	Description
+108	+6C	ICESRBTE	4	binary	Cumulative value of the SRB time charged to the address space when DFSORT ended processing. This field is obtained from the ASCBSRBT field in the ASCB control block. The difference between this value and the ICESRBTS value will be the SRB time charged to this DFSORT application, provided there is no other activity in the address space. This value is always provided.
+112	+70	ICETCBS	2	binary	Number of TCBs defined in the region while DFSORT is processing. If the number is different at the end of processing from the number at the start of processing, this field will contain the larger number. This value is always provided.
+114	+72	ICEKEYNM	2	binary	Number of Sort or Merge fields. This value is always provided.
+116	+74	ICEHSPMX	2	binary	HIPRMAX value in effect. This value is only provided for a Blockset application. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful.
+118	+76	ICEDSPSZ	2	binary	DSPSIZE value in effect. This value is only provided for a Blockset application. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful.
+120	+78	ICEEXRCS	8	binary	Number of records sorted (64-bit integer). See Note 10 on page 13-76. A 32-bit integer version of this field is defined as ICERCDS. See Note 16 on page 13-77. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful.
+128	+80	ICEEXBYS	8	binary	Number of bytes sorted (64-bit integer). See Note 10 on page 13-76. A 32-bit integer version of this field is defined as ICEBYTES. See Note 16 on page 13-77. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful.
+136	+88	ICEEXINN	8	binary	Number of calls to the access method used for SORTIN (64-bit integer). See Note 6 on page 13-76. A 32-bit integer version of this field is defined as ICEINIO. See Note 16 on page 13-77. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful.
+144	+90	ICEEXOUT	8	binary	Number of calls to the access method used for SORTOUT (64-bit integer). See Note 6 on page 13-76. A 32-bit integer version of this field is defined as ICEOUTIO. See Note 16 on page 13-77. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful.

Offsets		Name	Length	Format	Description
+152	+98	ICEHSPN	2	binary	Number of Hiperspaces created. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful.
+154	+9A	ICEHSPU	4	binary	Number of Hiperspace pages used. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful.
+158	+9E	ICEDSPN	2	binary	Number of data spaces created. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful.
+160	+A0	ICEDSPU	4	binary	Number of data space pages used. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful.
+164	+A4	ICEPRCNM	8	EBCDIC	Proc step name; blank if no proc step name. This value is always provided.
+172	+AC	ICEIDSNM	44	EBCDIC	SORTIN data set name. See Note 14 on page 13-77. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful.
+216	+D8	ICEIVOLS	6	EBCDIC	SORTIN volume serial. See Note 14 on page 13-77. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful.
+222	+DE	ICEODSNM	44	EBCDIC	SORTOUT data set name. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful.
+266	+10A	ICEOVOLS	6	EBCDIC	SORTOUT volume serial. See Note 15 on page 13-77. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful.
+272	+110	ICEINPDS	2	binary	Number of SORTIN data sets, including concatenated data sets. This value is only provided for a Blockset application. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful.
+274	+112	ICEINNDS	2	binary	Number of SORTINnn data sets. This value is only provided for a Blockset application. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful.
+276	+114	ICEOUTDS	2	binary	Number of SORTOUT data sets. This value is only provided for a Blockset application. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful.

Offsets		Name	Length	Format	Description
+278	+116	ICEOFLDS	2	binary	Number of OUTFIL data sets. This value is only provided for a Blockset application. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful.
+280	+118	ICERCINP	8	binary	Number of input records (64-bit integer). See Note 11 on page 13-76. This value is only provided for a Blockset application. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful.
+288	+120	ICERCOUT	8	binary	Number of output records (64-bit integer). See Note 11 on page 13-76. This value is only provided for a Blockset application. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful.
+296	+128	ICERCINS	8	binary	Number of inserted records (64-bit integer). See Note 12 on page 13-76. This value is only provided for a Blockset application. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful.
+304	+130	ICERCDEL	8	binary	Number of deleted records (64-bit integer). See Note 12 on page 13-76. This value is only provided for a Blockset application. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful.
+312	+138	ICEMD15N	8	EBCDIC	Routine name specified for MODS E15 exit. This value is only provided for a Blockset application. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful.
+320	+140	ICEMD15M	4	binary	Storage specified for MODS E15 exit. This value is only provided for a Blockset application. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful.
+324	+144	ICEMD15S	8	EBCDIC	Library ddname specified for MODS E15 exit. This value is only provided for a Blockset application. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful.
+332	+14C	ICEMD15E	1	EBCDIC	Requirements specified for MODS E15 exit. This value is only provided for a Blockset application. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful.
+333	+14D	ICERES10	3		Reserved.

Offsets		Name	Length	Format	Description
+336	+150	ICEMD35N	8	EBCDIC	Routine name specified for MODS E35 exit. This value is only provided for a Blockset application. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful.
+344	+158	ICEMD35M	4	binary	Storage specified for MODS E35 exit. This value is only provided for a Blockset application. to the value provided when termination is successful.
+348	+15C	ICEMD35S	8	EBCDIC	Library ddname specified for MODS E35 exit. This value is only provided for a Blockset application. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful. This value is only provided for a Blockset application. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful.
+356	+164	ICEMD35E	1	EBCDIC	Requirements specified for MODS E35 exit. This value is only provided for a Blockset application. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful. This value is only provided for a Blockset application. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful.
+357	+165	ICERES11	3		Reserved.
+360	+168	ICELCALE	32	EBCDIC	Active locale name or NONE. This value is only provided for a Blockset application. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful.
+392	+188	ICEESMAX	4	binary	EXPMAX value in effect. This value is only provided for a Blockset application. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful.
+396	+18C	ICEESOLD	4	binary	EXPOLD value in effect. This value is only provided for a Blockset application. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful.
+400	+190	ICEESRES	4	binary	EXPRES value in effect. This value is only provided for a Blockset application. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful.
+404	+194	ICEOBLKF	4	binary	Maximum output block size or control interval size (31-bit). See Note 2 on page 13-76. A 15-bit version of this field is defined as ICEOBLK. See Note 17 on page 13-77. This value is not provided when DFSORT terminates abnormally (that is, with record subtype X’03’).

Offsets		Name	Length	Format	Description
+408	+198	ICEFILSZ	8	binary	Value specified for FILSZ/SIZE (64-bit integer). This value is only provided for a Blockset application. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful.
+416	+1A0	ICEAVGRL	4	binary	Value specified for AVGRLEN. This value is only provided for a Blockset application. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful.
+420	+1A4	ICEFSZFL	1	binary	This value is only provided for a Blockset application. If DFSORT terminates abnormally, the value provided might not be identical to the value provided when termination is successful. FILSZ/SIZE flags byte: (See Note 7 on page 13-76.) **Bit** **Meaning When Set** **0** FILSZ/SIZE value specified as n. **1** FILSZ/SIZE value specified as En. **2** FILSZ/SIZE value specified as Un. **3-7** Reserved.
+421	+1A5	ICERES2A	2		Reserved.
+423	+1A7	ICERES2B	1		Reserved.
+424	+1A8	ICERES2C	8		Reserved.
Record-Length Distribution Section:					
+0	+0	ICECTR01	4	binary	Records with length 5-15. This value is only provided when a variable-length record application is successful and SMF=FULL is specified.
+4	+4	ICECTR02	4	binary	Records with length 16-31. This value is only provided when a variable-length record application is successful and SMF=FULL is specified.
+8	+8	ICECTR03	4	binary	Records with length 32-63. This value is only provided when a variable-length record application is successful and SMF=FULL is specified.
+12	+C	ICECTR04	4	binary	Records with length 64-127. This value is only provided when a variable-length record application is successful and SMF=FULL is specified.
+16	+10	ICECTR05	4	binary	Records with lengths 128-191. This value is only provided when a variable-length record application is successful and SMF=FULL is specified.
+20	+14	ICECTR06	4	binary	Records with lengths 192-255. This value is only provided when a variable-length record application is successful and SMF=FULL is specified.
+24	+18	ICECTR07	4	binary	Records with lengths 256-511. This value is only provided when a variable-length record application is successful and SMF=FULL is specified.
+28	+1C	ICECTR08	4	binary	Records with lengths 512-1023. This value is only provided when a variable-length record application is successful and SMF=FULL is specified.

Offsets		Name	Length	Format	Description
+32	+20	ICECTR09	4	binary	Records with lengths 1024-2047. This value is only provided when a variable-length record application is successful and SMF=FULL is specified.
+36	+24	ICECTR10	4	binary	Records with lengths 2048-4095. This value is only provided when a variable-length record application is successful and SMF=FULL is specified.
+40	+28	ICECTR11	4	binary	Records with lengths 4096-7167. This value is only provided when a variable-length record application is successful and SMF=FULL is specified.
+44	+2C	ICECTR12	4	binary	Records with lengths 7168-10751. This value is only provided when a variable-length record application is successful and SMF=FULL is specified.
+48	+30	ICECTR13	4	binary	Records with lengths 10752-15359. This value is only provided when a variable-length record application is successful and SMF=FULL is specified.
+52	+34	ICECTR14	4	binary	Records with lengths 15360-20991. This value is only provided when a variable-length record application is successful and SMF=FULL is specified.
+56	+38	ICECTR15	4	binary	Records with lengths 20992-26623. This value is only provided when a variable-length record application is successful and SMF=FULL is specified.
+60	+3C	ICECTR16	4	binary	Records with lengths 26624-32756. This value is only provided when a variable-length record application is successful and SMF=FULL is specified.
Input Data Set Section: One section is provided for each of up to 16 SORTIN data sets (including concatenations) or for each of up to 16 SORTINnn data sets.					
+0	+0	ICEINFL1	1	binary	These values are only provided when a Blockset sort, copy, or merge application is successful and SMF=FULL is specified. **Bit** **Meaning When Set** **0** SORTIN data set. **1** SORTINnn data set. **2-7** Reserved.
+1	+1	ICEINFL2	1	binary	These values are only provided when a Blockset sort, copy, or merge application is successful and SMF=FULL is specified. **Bit** **Meaning When Set** **0** SmartBatch pipe data set. **1** Striped data set. **2** Compressed data set. **3** VSAM extended addressability data set. **4** HFS file. **5-7** Reserved.

Offsets		Name	Length	Format	Description
+2	+2	ICEINAMB	1	binary	These values are only provided when a Blockset sort, copy, or merge application is successful and SMF=FULL is specified. Access method flags byte: **Bit** **Meaning When Set** **0** EXCP was used for data set. **1** VSAM was used for data set. **2** BSAM was used for data set. **3-7** Reserved.
+3	+3	ICEINTYP	1	binary	These values are only provided when a Blockset sort, copy, or merge application is successful and SMF=FULL is specified. Data set type flags byte: **Bit** **Meaning When Set** **0** Tape data set. **1** DASD data set. **2** Spool, dummy or SmartBatch Pipe data set, or HFS file. **3-7** Reserved.
+4	+4	ICEINRCF	1	binary	Record format (flags are identical to those in JFCRECFM). This value is only provided when a Blockset sort, copy, or merge application is successful and SMF=FULL is specified.
+5	+5	ICEINRS1	3		Reserved.
+8	+8	ICEINBYT	8	binary	Number of bytes read from data set (64-bit integer). This value is only provided when a Blockset sort, copy, merge application is successful and SMF=FULL is specified. This value is only provided when a Blockset sort, copy, merge application is successful and SMF=FULL is specified.
+16	+10	ICEINAMC	8	binary	Number of calls to access method for data set (64-bit integer). See Note 6 on page 13-76. This value is only provided when a Blockset sort, copy, merge application is successful and SMF=FULL is specified.
+24	+18	ICEINRS2	2		Reserved.
+26	+1A	ICEINLRL	2	binary	Logical record length (LRECL). This value is only provided when a Blockset sort, copy, merge application is successful and SMF=FULL is specified.
+28	+1C	ICEINRS3	2		Reserved.
+30	+1E	ICEINBKZ	2	binary	Block size or control interval size (15-bit). A 31-bit version of this field is defined as ICEINBKF. See Note 17 on page 13-77. This value is only provided when a Blockset sort, copy, merge application is successful and SMF=FULL is specified.
+32	+20	ICEINDDN	8	EBCDIC	Data set ddname. This value is only provided when a Blockset sort, copy, merge application is successful and SMF=FULL is specified.
+40	+28	ICEINNAM	44	EBCDIC	Data set name. This value is only provided when a Blockset sort, copy, merge application is successful and SMF=FULL is specified.

Offsets		Name	Length	Format	Description
+84	+54	ICEINVOL	6	EBCDIC	First volume serial. This value is only provided when a Blockset sort, copy, merge application is successful and SMF=FULL is specified.
+90	+5A	ICEINRS4	2		Reserved.
+92	+5C	ICEINBKF	4	binary	Block size or control interval size (31-bit). A 15-bit version of this field is defined as ICEINBKZ. See Note 17 on page 13-77. This value is only provided when a Blockset sort, copy, merge application is successful and SMF=FULL is specified.
SORTOUT Data Set Section:					
+0	+0	ICEOTFL1	1	binary	These values are only provided when a Blockset sort, copy, or merge application is successful and SMF=FULL is specified. **Bit** **Meaning When Set** **0** SmartBatch pipe data set. **1** Striped data set. **2** Compressed data set. **3** VSAM extended addressability data set. **4** HFS file. **5-7** Reserved.
+1	+1	ICEOTAMB	1	binary	These values are only provided when a Blockset sort, copy, or merge application is successful and SMF=FULL is specified. Access method flags byte: **Bit** **Meaning When Set** **0** EXCP was used for data set. **1** VSAM was used for data set. **2** BSAM was used for data set. **3-7** Reserved.
+2	+2	ICEOTTYP	1	binary	These values are only provided when a Blockset sort, copy, or merge application is successful and SMF=FULL is specified. Data set type flags byte: **Bit** **Meaning When Set** **0** Tape data set. **1** DASD data set. **2** Spool, dummy or SmartBatch pipe data set, or HFS file. **3-7** Reserved.
+3	+3	ICEOTRCF	1	binary	Record format (flags are identical to those in JFCRECFM). This value is only provided when a Blockset sort, copy, merge application is successful and SMF=FULL is specified.
+4	+4	ICEOTRS1	4		Reserved.
+8	+8	ICEOTBYT	8	binary	Number of bytes written to data set (64-bit integer). This value is only provided when a Blockset sort, copy, merge application is successful and SMF=FULL is specified.
+16	+10	ICEOTREC	8	binary	Number of records written to data set (64-bit integer). This value is only provided when a Blockset sort, copy, merge application is successful and SMF=FULL is specified.

Offsets		Name	Length	Format	Description
+24	+18	ICEOTAMC	8	binary	Number of calls to access method for data set (64-bit integer). See Note 6 on page 13-76. This value is only provided when a Blockset sort, copy, merge application is successful and SMF=FULL is specified.
+32	+20	ICEOTRS2	2		Reserved.
+34	+22	ICEOTLRL	2	binary	Logical record length (LRECL). This value is only provided when a Blockset sort, copy, merge application is successful and SMF=FULL is specified.
+36	+24	ICEOTRS3	2		Reserved.
+38	+26	ICEOTBKZ	2	binary	Block size or control interval size (15-bit). A 31-bit version of this field is defined as ICEOTBKF. See Note 17 on page 13-77. This value is only provided when a Blockset sort, copy, merge application is successful and SMF=FULL is specified.
+40	+28	ICEOTDDN	8	EBCDIC	Data set ddname. This value is only provided when a Blockset sort, copy, merge application is successful and SMF=FULL is specified.
+48	+30	ICEOTNAM	44	EBCDIC	Data set name. This value is only provided when a Blockset sort, copy, merge application is successful and SMF=FULL is specified.
+92	+5C	ICEOTVOL	6	EBCDIC	First volume serial. This value is only provided when a Blockset sort, copy, merge application is successful and SMF=FULL is specified.
+98	+62	ICEOTRS4	2		Reserved.
+9A	+64	ICEOTBKF	4	binary	Block size or control interval size (31-bit). A 15-bit version of this field is defined as ICEOTBKSZ. See Note 17 on page 13-77. This value is only provided when a Blockset sort, copy, merge application is successful and SMF=FULL is specified.
OUTFIL Data Set Section: One section is provided for each of up to 16 OUTFIL data sets.					
+0	+0	ICEOFFL1	1	binary	This value is only provided when a Blockset sort, copy, or merge application is successful and SMF=FULL is specified. **Bit** **Meaning When Set** **0** SmartBatch pipe data set. **1** Striped data set. **2** Compressed data set. **3** VSAM extended addressability data set. **4** HFS file. **5-7** Reserved.
+1	+1	ICEOFAMB	1	binary	This value is only provided when a Blockset sort, copy, or merge application is successful and SMF=FULL is specified. Access method flags byte: **Bit** **Meaning When Set** **0** EXCP was used for data set. **1** VSAM was used for data set. **2** BSAM was used for data set. **3-7** Reserved.

Offsets		Name	Length	Format	Description
+2	+2	ICEOFTYP	1	binary	This value is only provided when a Blockset sort, copy, or merge application is successful and SMF=FULL is specified. Data set type flags byte: **Bit** **Meaning When Set** **0** Tape data set. **1** DASD data set. **2** Spool, dummy or SmartBatch pipe data set, or HFS file. **3-7** Reserved.
+3	+3	ICEOFRCF	1	binary	Record format (flags are identical to those in JFCRECFM). This value is only provided when a Blockset sort, copy, merge application is successful and SMF=FULL is specified.
+4	+4	ICEOFPRM	1	binary	This value is only provided when a Blockset sort, copy, or merge application is successful and SMF=FULL is specified. OUTFIL parameter flags byte: **Bit** **Meaning When Set** **0** OUTFIL STARTREC or ENDREC parameter specified. **1** OUTFIL INCLUDE, OMIT, or SAVE parameter specified. **2** OUTFIL SPLIT parameter specified. **3** OUTFIL OUTREC parameter specified. **4** OUTFIL CONVERT parameter specified. **5** OUTFIL report parameter specified. **6** OUTFIL VLFILL parameter specified. **7** Reserved.
+5	+5	ICEOFRS1	3		Reserved.
+8	+8	ICEOFBYT	8	binary	Number of bytes written to data set (64-bit integer). This value is only provided when a Blockset sort, copy, merge application is successful and SMF=FULL is specified.
+16	+10	ICEOFREC	8	binary	Number of records written to data set (64-bit integer). This value is only provided when a Blockset sort, copy, merge application is successful and SMF=FULL is specified.
+24	+18	ICEOFAMC	8	binary	Number of calls to access method for data set (64-bit integer). See Note 6 on page 13-76. This value is only provided when a Blockset sort, copy, merge application is successful and SMF=FULL is specified.
+32	+20	ICEOFRS2	2		Reserved.
+34	+22	ICEOFLRL	2	binary	Logical record length (LRECL). This value is only provided when a Blockset sort, copy, merge application is successful and SMF=FULL is specified.
+36	+24	ICEOFRS3	2		Reserved.
+38	+26	ICEOFBKZ	2	binary	Block size or control interval size (15-bit). A 31-bit version of this field is defined as ICEOFBKF. See Note 17 on page 13-77. This value is only provided when a Blockset sort, copy, merge application is successful and SMF=FULL is specified.
+40	+28	ICEOFDDN	8	EBCDIC	Data set ddname. This value is only provided when a Blockset sort, copy, merge application is successful and SMF=FULL is specified.

Offsets		Name	Length	Format	Description
+48	+30	ICEOFNAM	44	EBCDIC	Data set name. This value is only provided when a Blockset sort, copy, merge application is successful and SMF=FULL is specified.
+92	+5C	ICEOFVOL	6	EBCDIC	First volume serial. This value is only provided when a Blockset sort, copy, merge application is successful and SMF=FULL is specified.
+98	+62	ICEOFRS4	2		Reserved.
+9A	+64	ICEOFBKF	4	binary	Block size or control interval size (31-bit). A 15-bit version of this field is defined as ICEOFBKSZ. See Note 17 on page 13-77. This value is only provided when a Blockset sort, copy, merge application is successful and SMF=FULL is specified.

Notes:

1. ICECPUT is set to zero if STIMER=NO.
2. ICEIBLK and ICEIBLKF are set to zero if the input data set is not present. ICEOBLK and ICEOBLKF are set to zero if the output data set is not present.
3. If ICEFLBYT bits 1-2 are binary zeros (indicating fixed length record), the short form of the SMF record is produced, even if the user has specified the full SMF record. In addition, ICERSUB is initialized to X'0001' to indicate that a short record will be written.
4. If all bits of ICEFLBY2 are zero, then the function to be performed could not be determined.
5. Since ICERCDS, IECBYTES, ICECPUT, and ICEWBLK are not each on full word boundaries within the DSECT for the data section, alignment errors occur when assembling programs referencing these fields as full word fields. See the warning described in *z/OS DFSORT Installation and Customization*.
6. The number of calls to the access method used for a particular data set will be the total count of EXCPs, or READ/WRITEs (BSAM), or GET/PUTs (VSAM).
7. If all the bits of ICEIAMB or ICEOAMB are zero and DFSORT terminated abnormally, then the type of access method used for SORTIN and SORTOUT could not be determined.
8. This field is zero if termination is *normal*.
9. Depending on the application, this number may not be representative of the number of SMF record sections that DFSORT actually provides in its SMF record.
10. Refer to message ICE134I for a description of the meaning of the number of records/bytes sorted. The Blockset technique provides a 64-bit value; the Peerage and Vale techniques provide a 31-bit value. You should reference the 64-bit fields containing these values. For Blockset, the smaller fields contain only the least significant 32 bits.
11. Refer to message ICE054I for a description of the meaning of the number of input/output records.
12. Refer to message ICE055I for a description of the meaning of the number of inserted/deleted records.
13. The following fields are provided for the Conventional technique SMF record:
    - All of the fields in the header section except ICETRN, ICEUSER and ICEGROUP.
    - All of the fields in the Product section.

- ICESTPNM and the technique and program invoked flags of ICEFLBYT in the Data section.

14. This information is provided for the first SORTIN or SORTINnn data set only. This field will contain binary zeroes if no SORTIN or SORTINnn data set is present.
15. This information is provided for the first SORTOUT volume serial only. This field will contain binary zeroes if no SORTOUT data set is present.
16. The Blockset technique provides a 64-bit value; the Peerage and Vale techniques provide a value in the lower 31 bits only.
17. The Blockset technique provides a 31-bit value; the Peerage and Vale techniques provide a 15-bit value only. You should reference the 31-bit fields containing these values. For Blockset, the smaller fields contain only the last significant 16 bits.

Record Type 17 (11) — Scratch Data Set Status

Record type 17 is written when a non-temporary DASD data set or a temporary DASD data set is scratched. This record contains the data set name, number of volumes, and volume serial numbers. The job name, time, and date that the reader recognized the JOB card (for this job) constitute the job log identification. Its length varies, depending upon the number of volumes for the data set. Refer to record type 65 for information on renaming a VSAM object.

Note: You use the REC parameter, in the SMFPRM*xx* parmlib member, to specify record type 17 is to be collected. REC(ALL) specifies that record type 17 is to be written for both temporary and non-temporary data sets. REC(PERM) specifies that SMF is to write record type 17 only for non-temporary data sets; it is not to be written for temporary data sets (data sets having names that start with SYSyyddd.Thhmmss, either from DSN=&&datasetname or from the absence of any data set name).

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF17LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	SMF17SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF17FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See “Standard SMF Record Header” on page 13-1 for a detailed description.
5	5	SMF17RTY	1	binary	Record type 17 (X'11').

Offsets		Name	Length	Format	Description
6	6	SMF17TME	4	binary	Time since midnight, in hundredths of a second, when the record was moved into the SMF buffer.
10	A	SMF17DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
14	E	SMF17SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF17JBN	8	EBCDIC	Job name. The job name, time, and date that the reader recognized the JOB card (for this job) constitute the job log identification, or transaction name (for APPC output).
26	1A	SMF17RST	4	binary	Time since midnight, in hundredths of a second, that the reader recognized the JOB card (for this job).
30	1E	SMF17RSD	4	packed	Date when the reader recognized the JOB card (for this job), in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
34	22	SMF17UID	8	EBCDIC	User-defined identification field (taken from common exit parameter area, not from USER=parameter on job statement).
42	2A	SMF17RIN	2		Reserved.
44	2C	SMF17DSN	44	EBCDIC	Data set name.
88	58	SMF17RV1	3		Reserved.
91	5B	SMF17NVL	1	binary	Number of volumes.

Volume Information Section

For each volume there is an eight-byte entry with the following format:

Offsets		Name	Length	Format	Description
0	0	SMF17RV2	2		Reserved.
2	2	SMF17FVL	6	EBCDIC	Volume serial number.

Record Type 18 (12) — Rename Non-VSAM Data Set Status

Record type 18 is written when a non-VSAM data set defined by a DD statement (either explicitly or implicitly) is renamed. (When a DD statement defines a volume, all the data sets on that volume are implicitly defined.) This record contains the old data set name, new data set name, number of volumes, and volume serial numbers. Its length varies, depending upon the number of volumes for the data set.

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF18LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	SMF18SEG	2	binary	Segment descriptor (see record length field).

Offsets		Name	Length	Format	Description
4	4	SMF18FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See “Standard SMF Record Header” on page 13-1 for a detailed description.
5	5	SMF18RTY	1	binary	Record type 18 (X'12').
6	6	SMF18TME	4	binary	Time since midnight, in hundredths of a second, when the record was moved into the SMF buffer.
10	A	SMF18DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
14	E	SMF18SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF18JBN	8	EBCDIC	Job name. The job name, time, and date that the reader recognized the JOB card (for this job) constitute the job log identification, or transaction name (for APPC output).
26	1A	SMF18RST	4	binary	Time since midnight, in hundredths of a second, that the reader recognized the JOB card (for this job).
30	1E	SMF18RSD	4	packed	Date when the reader recognized the JOB card (for this job), in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
34	22	SMF18UID	8	EBCDIC	User-defined identification field (taken from common exit parameter area, not from USER=parameter on job statement).
42	2A	SMF18RIN	2		Reserved.
44	2C	SMF180DS	44	EBCDIC	Old data set name.
88	58	SMF18NDS	44	EBCDIC	New data set name.
132	84	SMF18RV1	3		Reserved.
135	87	SMF18NVL	1	binary	Number of volumes.

Volume Information Section

For each volume there is an eight-byte entry with the following format:

Offsets		Name	Length	Format	Description
0	0	SMF18RV2	2		Reserved.
2	2	SMF18FVL	6	EBCDIC	Volume serial number.

Record Type 19 (13) — Direct Access Volume

Record type 19 is written:

1. For each online device associated with a specific IPL time frame,
2. For each online device associated with a processed HALT EOD or SWITCH SMF command, and
3. When a direct access volume that is defined by DD statement is demounted.

This record contains:

- The volume serial number
- The volume table of contents (VTOC) address
- The owner identification

- The unit type
- The number of unused alternate tracks
- The number of unallocated cylinders and tracks
- The number of cylinders and tracks in the largest free extent
- The number of unallocated extents.

It contains the device number and module identification for devices having movable plugs.

Notes:
1. Record type 19 is not produced for DOS volumes used under the operating system.
2. In order to determine the latest status of a shared file, the CPU clocks must be synchronized.

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF19LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See "Standard SMF Record Header" on page 13-1 for a detailed description.
2	2	SMF19SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF19FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See "Standard SMF Record Header" on page 13-1 for a detailed description.
5	5	SMF19RTY	1	binary	Record type 19 (X'13').
6	6	SMF19TME	4	binary	Time since midnight, in hundredths of a second, when the record was moved into the SMF buffer.
10	A	SMF19DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
14	E	SMF19SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF19RV1	2		Reserved.
20	14	SMF19VOL	6	EBCDIC	Volume serial number.
26	1A	SMF19OID	10	EBCDIC	Owner identification from the VTOC.
36	24	SMF19DEV	4	binary	Device type.
40	28	SMF19VTC	5	binary	Volume table of contents (VTOC) address (format of CCHHR).

Offsets		Name	Length	Format	Description
45	2D	SMF19VTI	1	binary	Volume table of contents (VTOC) indicator **Bit** **Meaning When Set** **0** Format 5 data set control blocks (DSCB) missing or erroneous **1-2** Reserved **3** VTOC does not begin on record 1 **4** Accurate Format 5 and 6 data set control blocks (DSCB); bit 0 set to zero **5** Possible VTOC or VTOC index error **6** VTOC error has been fixed; bit 5 set to zero **7** Indexed VTOC.
46	2E	SMF19NDS	2	binary	Number of data set control blocks (DSCB) calculated as: number of DSCBs per track times number of tracks in VTOC.
48	30	SMF19DSR	2	binary	Number of data set control blocks (DSCB) — format 0 DSCBs, that is, number of available DSCBs.
50	32	SMF19NAT	2	binary	Number of unused alternate tracks.
52	34	SMF19SPC	2	binary	Number of unallocated cylinders.
54	36		2	binary	Number of unallocated tracks.
56	38	SMF19LEX	2	binary	Number of cylinders in the largest unallocated extent.
58	3A		2	binary	Number of tracks in the largest unallocated extent.
60	3C	SMF19NUE	2	binary	Number of unallocated extents.
62	3E	SMF19RV2	2		Reserved.
64	40	SMF19CUU	2	binary	Device Number.
66	42	SMF19IND	2	binary	Module identification or drive number indicating physical identity of devices having moveable address plugs. This field is taken from bits 2-7 of sense byte 4 for these devices. (See the component descriptions of these devices for the meaning of sense byte 4.)

Record Type 20 (14) — Job Initiation

Reference book

For information about the RACF Report Writer, see *z/OS Security Server RACF Auditor's Guide*.

Record type 20 is written at job initiation (including TSO/E logon). This record contains the job log identification programmer's name, number of accounting fields on the JOB statement, accounting fields, and RACF-related information. The job name, time, and date the reader recognized the JOB card (for this job) constitute the job log identification. It is used by the RACF Report Writer in combination with record types 30, 80, 81, and 83 to produce RACF reports.

The length of record type 20 includes the length of the JOB statement accounting fields and the relocatable RACF section.

Note: IBM recommends that you use record type 30 rather than record types 4, 5, 20, 34, 35, and 40.

Record Environment

The following conditions exist for the generation of this record:

Macro SMFEWTM(1), BRANCH=YES (record exit: IEFU84)

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF20LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See "Standard SMF Record Header" on page 13-1 for a detailed description.
2	2	SMF20SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF20FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See "Standard SMF Record Header" on page 13-1 for a detailed description.
5	5	SMF20RTY	1	binary	Record type 20 (X'14').
6	6	SMF20TME	4	binary	Time since midnight, in hundredths of a second, when the record was moved into the SMF buffer.
10	A	SMF20DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
14	E	SMF20SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF20JBN	8	EBCDIC	Job name. The job name, time, and date that the reader recognized the JOB card (for this job) constitute the job log identification, or transaction name (for APPC output).
26	1A	SMF20RST	4	binary	Time since midnight, in hundredths of a second, that the reader recognized the JOB card (for this job).
30	1E	SMF20RSD	4	packed	Date when the reader recognized the JOB card for this job, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
34	22	SMF20UID	8	EBCDIC	User-defined identification field (taken from common exit parameter area, not from USER=parameter on job statement).
42	2A	SMF20RLO	2	binary	Offset to relocatable area. See *z/OS Security Server RACF Macros and Interfaces* for more information about relocatable areas for RACF-owned records.
44	2C	SMF20PGM	20	EBCDIC	Programmer's name.
64	40	SMF20NAF	1	binary	Number of accounting fields.
65	41	SMF20ACT	variable	EBCDIC	Accounting fields. Each entry for an accounting field contains the length of the field (one byte, binary) followed by the field (EBCDIC). A zero indicates an omitted field.

Relocate Section

Offsets		Name	Length	Format	Description
0	0	SMF20FLS	2	binary	Size of relocate section (including this field).
2	2	SMF20GRP	8	EBCDIC	RACF Group ID. If RACF is not active, this field is set to zero.
10	A	SMF20RUD	8	EBCDIC	RACF User ID. If RACF is not active, this field is set to zero.

Offsets		Name	Length	Format	Description
18	12	SMF20TID	8	EBCDIC	RACF terminal ID. If RACF is not active, or if RACF is active and the user is not a terminal user, then this field is set to zero.

Record Type 21 (15) — Error Statistics by Volume

Record type 21 is written when a data set on magnetic tape is demounted. This record contains statistics for the entire volume during the period of time that the volume is mounted, regardless of the number of data sets on the volume being accessed (and regardless of the number of CLOSE macro instructions issued).

This record contains the volume serial number, device number, unit type, and tape format. It contains the number of temporary and permanent read and write errors, START Subchannel (SSCH) instruction, noise blocks, erase gaps, and cleaner actions.

Notes:

1. The IFHSTATR utility program formats and prints the error-statistics-by-volume (ESV) information in this record.
2. The current record does not describe who requested the amount or who performed the I/O.
3. Record type 21 does not indicate which records are written because of environmental record editing and printing (EREP).
4. If a maximum count is reached, it is no longer increased. A count at its maximum value indicates at least that number because no record is written when the counter is full.
5. A record type 21 is written, in addition to demount time, any time the environmental record editing and printing (EREP) program is run or when EOD is issued. Therefore, more than one type 21 record may be written for each tape that was mounted.

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF21LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	SMF21SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF21FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See “Standard SMF Record Header” on page 13-1 for a detailed description.
5	5	SMF21RTY	1	binary	Record type 21 (X'15').

Offsets		Name	Length	Format	Description
6	6	SMF21TME	4	binary	Time since midnight, in hundredths of a second, when the record was moved into the SMF buffer.
10	A	SMF21DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
14	E	SMF21SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF21LGH	2	binary	Length of rest of record.
20	14	SMF21VOL	6	EBCDIC	Volume serial number.
26	1A	SMF21CA	2	binary	Device number or device address.
28	1C	SMF21UCB	4	binary	UCBTYP value.
31	1F	SMF21DEV	1	binary	Low order byte of UCB device type. Values less than X'80' represent reel tapes. Values of X'80' or greater represent cartridge tapes.
32	20	SMF21TR	1	binary	Number of temporary read errors (non-buffered log).
33	21	SMF21TW	1	binary	Number of temporary write errors (non-buffered log).
34	22	SMF21SIO	2	binary	Number of start sub-channel (SSCH) instructions.
36	24	SMF21PR	1	binary	Number of permanent read errors.
37	25	SMF21PW	1	binary	Number of permanent write errors.
38	26	SMF21NB	1	binary	Number of noise blocks (non-buffered log).
39	27	SMF21ERG	2	binary	Number of erase gaps.
41	29	SMF21CLN	2	binary	Number of cleaner actions.
43	2B	SMF21DEN SMF21625 SMF21F62 SMF21160 SMF21F16 SMF21800 SMF21780 SMF21556 SMF21200	1	binary	**Tape format — 2400 and 3400 series magnetic tape units** Dens Devtype Code Hex 6250 9-track 4 D3 3424 4 C2 1600 9-track 3 C3 3424 3 42 800 9-track 2 CB 7-track 2 83 556 7-track 1 43 200 7-track 0 03
44	2C	SMF21BLS	2	binary	Block size of the last data set closed on the tape if the tape was demounted during CLOSE processing, not at a different time. Some programs that use EXCP do not provide a block size. This field is valid only (but still might contain zero) when bit SMF21LB is off.
46	2E	SMF21OFL SMF21OUT SMF21RDB	1	binary	DCBOFLGS. **Bit** **Meaning** 1... .... Output tape .1.. .... Input tape (READ BACKWARD)
47	2F	SMF21TUS	3	packed	Tape unit serial.
50	32	SMF21TRF	2	binary	Temporary read forward errors.
52	34	SMF21TRB	2	binary	Temporary read backward errors.
54	36	SMF21TWF	2	binary	Temporary write errors.
56	38	SMF21BR	3	binary	Number of bytes read, in units of 4096. The length of each block is rounded up to a multiple of 4096 before being counted. This count includes volume mount and verify, in addition to task I/O. Provided only for cartridge tape devices. Maximum value is X'FFFFFF'.
59	3B	SMF21BW	3	binary	Number of bytes written, in units of 4096. The length of each block is rounded up to a multiple of 4096 before being counted. Provided only for cartridge tape devices. Maximum value is X'FFFFFF'.

Offsets		Name	Length	Format	Description
62	3E	SMF21FL1	1	binary	General flag bytes. **Bit** / **Meaning** 1... .... (SMF21NCT) SMF21BRN and SMF21BWN at 64 and 68 contain valid values. Currently this bit is on only for 3590. .1.. .... (SMF21LS) SMF21LST has a valid value. ..1. .... (SMF21LB) SMF21LBS has a valid value. ...x xxxx Reserved.
63	3F	SMF21FL2	1	bit string	Reserved.
64	40	SMF21BRN	4	unsigned binary	Number of bytes read, in units of 4096. The length of each block is rounded up to a multiple of 4096 before being counted. Valid only if SMF21NCT is on. If the value is less than X'FFFFFF', it is also in SMF21BR.
68	44	SMF21BWN	4	unsigned binary	Number of bytes written, in units of 4096. The length of each block is rounded up to a multiple of 4096 before being counted. Valid only if SMF21NCT is on. If the value is less than X'FFFFFF', it is also in SMF21BW.
72	48	SMF21LST	4	unsigned binary	Number of I/Os initiated on current volume. Valid only if SMF21LS is on.
76	4C	SMF21LBS	4	unsigned binary	Block size. Valid only if SMF21LB is on.

Record Type 22 (16) — Configuration

Record type 22 is written:

- After every SMF initialization.
- When any of the following operator commands are processed:
  - CONFIG CPU
  - CONFIG CHP
  - CONFIG VF
  - CONFIG STOR
  - CONFIG ONLINE,S
  - CONFIG OFFLINE,S.
- When an ACTIVATE command or ACTIVATE function from a Hardware Configuration Definition (HCD) panel results in successful dynamic configuration changes.
- When Asynchronous Operations Manager (AOM) attention-handling code is processing volume state change interrupts or when processing subsystem status change interrupts.
- During pack-change interrupt processing, when the subsystem or originating device status has changed.

This record describes processor, channel path, storage in effect after the IPL or change. Record type 22 contains the current and previous status of the subsystem and originating device. The storage section contains 31-bit central storage addresses.

The length of record type 22 is variable. The maximum length of the type 22 record is 32,756 bytes. If the space required for data is such that the length would exceed the maximum length, one or more additional type 22 records are produced.

Record Environment

The following conditions exist for the generation of this record:

Macro SMFEWTM(1), BRANCH=YES (record exit: IEFU84)

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and a count of the number of other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF22LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	SMF22SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF22FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See “Standard SMF Record Header” on page 13-1 for a detailed description.
5	5	SMF22RTY	1	binary	Record type 22 (X'16').
6	6	SMF22TME	4	binary	Time since midnight, in hundredths of a second, when the record was moved into the SMF buffer.
10	A	SMF22DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
14	E	SMF22SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF22IND	2	binary	Record creator indicator **Value** **Meaning** **1** IPL **2** VARY ONLINE **3** VARY OFFLINE **7** VARY CHANNEL PATH ONLINE OR OFFLINE **8** 3990 State Change **9** ACTIVATE **99** This record was continued from the previous record, because the previous record was filled. If this is the first record, SMF22IND can not equal 99.
20	14	SMF22ECT	2	binary	Number of sections that are to follow.

CPU Section

The following section contains information about the CPU flags, CPU section identification, model number, and identifier:

Offsets		Name	Length	Format	Description
0	0	SMF22CFG	1	binary	CPU Flags **Bit** **Meaning When Set** **0** Vector feature indicator **1** Reserved **2** CPU reconfiguration indicator **3-7** Reserved.
1	1	SMF22PID	1	binary	CPU section identification (this field is always 1).
2	2	SMF22CPN	2	binary	CPU model number (taken from CONFIG CPU command).

Offsets		Name	Length	Format	Description
4	4	SMF22RV1	1		Reserved.
5	5	SMF22CPA	1	binary	CPU identifier (taken from CONFIG CPU command or default in PSACPUPA).

Storage Section

The following section contains the storage flags, storage identifier, and contiguous storage information.

Offsets		Name	Length	Format	Description
0	0	SMF22MFL	1	EBCDIC	Storage flags **Bit** **Meaning When Set** **0** Central storage frames are interleaved **1-7** Reserved.
1	1	SMF22TID	1	binary	Storage section identification (this field is always 3).
2	2	SMF22PGL	4	binary	Address of lowest frame in central contiguous storage (taken from CONFIG STOR command).
6	6	SMF22NPG	4	binary	Number of frames in central contiguous storage (taken from CONFIG STOR command).

Channel Path (CHP) Section

| The following section contains channel path information.

Offsets		Name	Length	Format	Description
0	0	SMF22RV7	1		Reserved.
1	1	SMF22UID	1	binary	Channel Path section Identification (this field is always 7).
2	2	SMF22PAR	256	EBCDIC	Array of 256 entries to map each unique CHP (channel path).
		SMF22PFG	X'80'		If 1=CHP, CHP is valid for this installation. If 0, SMF22POW=0 and SMF22PON=0
		SMF22POW	X'40'		If 1=CHP, CHP is owned by this system, and SMF22PFG=1; if 0, SMF22PON=0
		SMF22PON	X'20'		If 1=CHP,CHP is ONLINE, SMF22PFG=1, and SMF22POW=1

Reconfigured Channel Path Section

This section contains reconfigured channel path information.

Offsets		Name	Length	Format	Description
0	0	SMF22RV8	1		Reserved.
1	1	SMF22RID	1	binary	Reconfigured Channel Path section identification (this field is always 8).
2	2	SMF22CNT	1	binary	Count of channel path IDs (CHPIDs) in this section.
3	3	SMF22CHI	1	EBCDIC	Array of channel path identifiers.

Expanded Storage Section

This section contains one contiguous block of online expanded storage.

Offsets		Name	Length	Format	Description
0	0		1		Reserved.
1	1	SMF22XID	1	binary	Expanded storage identification (this field is always 9).

Offsets		Name	Length	Format	Description
2	2	SMF22XAD	4	binary	Beginning expanded storage frame (E-frame) address in this contiguous block (taken from the CONFIG command). **Note:** Expanded storage is always addressed in frames.
6	6	SMF22XNP	4	binary	Number of 4K expanded storage frames in this contiguous block (taken from the CONFIG command).

Storage Control Section

Offsets		Name	Length	Format	Description
0	0		1		Reserved.
1	1	SMF22GID	1	binary	Storage control section identification (this field is always 10, X'0A').
2	2	SMF22SSI	2	binary	3990 subsystem identifier.
4	4	SMF22MDL	1	binary	3990 model identifier.
5	5	SMF22VOL	6	EBCDIC	Originating device volume serial (this field is blank if device is offline).
11	B	SMF22CUA	2	binary	Originating device identification.
13	D	SMF22CCA	1	binary	Originating device channel connection address (CCA).
14	E	SMF22DDC	1	binary	Originating device director-to-device connection (DDC).
15	F	SMF22PDC	1	binary	Originating device previous DDC.
16	10	SMF22SCS	1	binary	3990 subsystem caching status **Bit** **Meaning When Set** **0-2** 000=active 001=pending active 010=deactivated-subsystem 100=deactivated-host 110=pending 111=pending off failed. **3** Subsystem storage is disabled for maintenance **4-5** Reserved **6** IML device is not available **7** Cache fast write is disabled.
17	11	SMF22PCS	1	binary	Previous subsystem caching status (the bit meanings are the same as SMF22SCS).
18	12	SMF22SNV	1	binary	3990 subsystem NVS status **Bit** **Meaning When Set** **0-1** 00=active 01=deactivated-subsystem 10=deactivated-host 11=pending. **2** Reserved **3** Disabled for maintenance **4** Pending due to error **5-7** Reserved.
19	13	SMF22PNV	1	binary	Previous subsystem NVS status (the bit meanings are the same as SMF22SNV).

Offsets		Name	Length	Format	Description
20	14	SMF22SDS	2	binary	Device status **Bit** **Meaning When Set** **0-1** Caching status 00=active 10=deactivation pending 11=deactivated **2-3** Fast write status 00=allowed 10=deactivation pending 11=deactivated **4** Primary of duplex pair **5** Secondary of duplex pair **6-7** Duplex pair status 00=available 01=pending 10=failed duplex, originally on primary 11=failed duplex, originally not on primary **8-9** Pinned data 00=no pinned data exists for device 01=pinned data exists for device, fast write not suspended 10=reserved 11=pinned data exists for device, fast write suspended **10-15** Low-order 6 bits of CCA value of other device in duplex.
22	16	SMF22PDS	2	binary	Device previous status (the bit meanings are the same as SMF22SDS).
24	18	SMF22ADS	2	binary	Additional device status **Bit** **Meaning When Set** **0-1** Reserved **2** Data exists in failed MVS for the device **3-15** Reserved, and set to zero.
26	1A	SMF22PAD	2	binary	Device previous status (the bit meanings are the same as SMF22ADS).
28	1C	SMF22CYS	1	binary	State of copy services functions. **Bit** **Meaning When Set** **0** XRC active for the device **1** PPRC active for the device **2** PPRC primary or secondary volume **ON** Volume is PPRC secondary **OFF** Volume is PPRC primary **3** Volume in XRC suspended or quiesced state **4** PPRC volume is State Change pending **5** Concurent Copy is active **6** Flash Copy is active **7** Reserved and set to zero
29	1D	SMF22PCY	1	binary	State of copy services functions previous (the bit meanings are the same as SMF22CYS).

I/O Configuration Change Element

The following maps the I/O configuration change element which is only contained in an ACTIVATE record event (SMF22IND=9) for processors that support dynamic I/O. You can perform software-only configuration changes that write type 22 records on processors not supporting dynamic I/O, but the configuration change elements only contain software entries. In that case, the device (except SMF22DVN), physical control unit, and CHPID entries all contain zeros.

The I/O configuration change element consists of a header section, followed by an array containing a variable number of entries. Each entry identifies an I/O component (device, control unit, or CHPID) that has been added, deleted, or modified.

I/O Configuration Change Element Header Section

Offsets		Name	Length	Format	Description
0	0		1		Reserved.
1	1	SMF22OID	1	binary	I/O configuration change element ID (this field is always 11).
2	2	SMF22R#	1	binary	Record number of this record.
3	3	SMF22TR	1	binary	Total number of records for this I/O configuration change. For example, if there are 3 records total, and this record is the first, SMF22R# would contain 1, and SMF22TR would contain 3 (indicating record 1 of 3).
4	4	SMF22OFF	2	binary	Offset of first entry in this record.
6	6	SMF22ELN	2	binary	Length of each entry in the array of I/O configuration change elements.
8	8	SMF22T#E	4	binary	Total number of entries for this I/O configuration change.
12	C	SMF22#E	4	binary	Number of entries in this record.
16	10	SMF22FLS	1	binary	Flags **Bit** **Meaning When Set** **0** Requestor of the ACTIVATE specified the SOFT option. This indicates that only software configuration changes are to be made. **1** Requestor of the ACTIVATE specified the FORCE option. **2-7** Reserved.
17	11		1		Reserved.
18	12	SMF22IDN	44	EBCDIC	Name of IODF data set that contains the new I/O configuration definition.
62	3E		4		Reserved.
66	42	SMF22EDT	2	EBCDIC	ID of the eligible device table (EDT) or '**' if the new EDT could not be rebuilt during dynamic activation of the I/O configuration.
68	44	SMF22CFI	8	EBCDIC	Operating system configuration ID for new configuration.
76	4C	SMF22HCT	64	binary	Hardware configuration token that represents the new I/O configuration.
140	8C	SMF22#UA	4	binary	Number of unit control blocks (UCB) added for this I/O configuration change.
144	90	SMF22#UD	4	binary	Number of unit control blocks (UCB) deleted for this I/O configuration change.
148	94	SMF22FNC	1	binary	Activate function requested. See Note 1 (below) for possible values of this field.
149	95		3		Reserved.

Entry Array in the I/O Configuration Change Element Section

Offsets		Name	Length	Format	Description
0	0	SMF22EHD	4	EBCDIC	Entry header.
0	0	SMF22ETY	1	binary	Entry type. See Note 2 (below) for possible values of this field.
1	1	SMF22ERQ	1	binary	Entry request. See Notes 3, 4, 5, and 6 (below) for possible values of this field.
2	2	SMF22EFL	1	binary	Entry flags **Bit** **Meaning When Set** **0** Hardware change **1** Software change **2** Indicates that this entry was created because an installation-static device is being changed to a dynamic device. This entry represents the delete request (SMF22ERQ=SMF22DDD). There will be another entry that represents the add request. **3** Indicates whether the UCB for the device is connected to a subchannel. Valid only when the entry type is “device” (SMFETY=SMF22DEV) and entry request is “add device” (SMFERQ=SMF22DAD). **4** Indicates that this entry represents a change affecting the current logical channel subsystem (LCSS). **5** Reserved. **6** Indicates that the activating partition will lose access to the device because either the device is deleted from the configuration or the activating partition is to be removed from the candidate list of the device. **7** Indicates that this entry was created because the candidate list of the device was changed. When SMF22ETY=SMF22DEV, SMF22ERQ=SMF22DDD and SMF22ECC is on, one or more partitions were deleted from the device candidate list. When SMF22ETY=SMF22DEV, SMF22ERQ=SMF22DAD and SMF22ECC is on, one or more partitions were added to the device candidate list.
3	3	SMF22ECSS	1	binary	Logical channel subsystem (LCSS) ID
4	4	SMF22ESI	28	EBCDIC	Entry type specific information follows.

Device Entry Section (SMF22ETY=SMF22DEV or SMF22MDEV or SMF22SDEV)

For I/O devices in subchannel set 0, use SMF22ETY=SMF22DEV. For I/O devices in subchannel set 1, use SMF22ETY=SMF22SDEV.

Offsets		Name	Length	Format	Description
0	0	SMF22DVN	2	binary	Device number.
2	2	SMF22DCM	1	binary	Mask of channel path IDs (CHPID) contained in SMF22DCH that were added to or deleted from this device. Valid only under one of the following conditions (zero otherwise): **Entry request** — **SMF22ERQ value** Modify to add CHPIDs — SMF22DAH Modify to remove CHPIDs — SMF22DDH

Offsets		Name	Length	Format	Description
3	3	SMF22DPM	1	binary	Mask of physical control unit numbers in SMF22DPC that were added to or deleted from this device. Valid only under one of the following conditions (zero otherwise): **Entry request** / **SMF22ERQ value**: Modify to add CUs — SMF22DAP; Modify to remove CUs — SMF22DDP
4	4	SMF22DCH	8	EBCDIC	Array of one-byte elements that represent channel path IDs (CHPID) that were added to or deleted from this device. Valid only under one of the following conditions (zero otherwise): **Entry request** / **SMF22ERQ value**: Modify to add CHPIDs — SMF22DAH; Modify to remove CHPIDs — SMF22DDH
12	C	SMF22DPC	16	EBCDIC	Array of two-byte elements that represent physical control unit numbers that were added to or deleted from this device. Valid only under one of the following conditions (zero otherwise): **Entry request** / **SMF22ERQ value**: Modify to add CUs — SMF22DAP; Modify to remove CUs — SMF22DDP

Optional device expansion entry (SMF22ETY=SMF22DEVE)

This entry will immediately follow an SMF22SDEV entry. It is provided to fully qualify the device with the subchannel set id when necessary.

Offsets		Name	Length	Format	Description
0	0	SMF22SSID	1	binary	Subchannel set id
1	1	SMF22DCM	27	char	Reserved.

Physical Control Unit Entry Section (SMF22ETY=SMF22PCU or SMF22MP)

Offsets		Name	Length	Format	Description
0	0	SMF22PCN	2	binary	Physical control unit number.
2	2		1		Reserved.
3	3	SMF22PCM	1	binary	Mask of channel path IDs in SMF22PCH that were added to or deleted from this control unit. Valid only under one of the following conditions (zero otherwise): **Entry request** / **SMF22ERQ value**: Modify to add CHPIDs — SMF22PAH; Modify to remove CHPIDs — SMF22PDH
4	4	SMF22PCH	8	EBCDIC	Array of 1-byte elements that represent channel path IDs (CHPID) that were added to or deleted from this control unit. Valid only under one of the following conditions (zero otherwise): **Entry request** / **SMF22ERQ value**: Modify to add CHPIDs — SMF22PAH; Modify to remove CHPIDs — SMF22PDH

Offsets		Name	Length	Format	Description
12	C	SMF22PUA	4	EBCDIC	Range of unit addresses that were added to or deleted from this control unit. Valid only under one of the following conditions (zero otherwise): **Entry request** / **SMF22ERQ value** Modify to add unit address range — SMF22PAU Modify to remove unit address range — SMF22PDU
16	10		1		Reserved.
17	11	SMF22PUC	1	binary	Count of unit addresses.
18	12		1		Reserved.
19	13	SMF22PSU	1	binary	Starting unit address.
20	14		8		Reserved.

CHPID Entry Section (SMF22ETY=SMF22CH)

Offsets		Name	Length	Format	Description
0	0	SMF22CCH	1	binary	Channel path ID (CHPID).
1	1		27		Reserved.

Logical Partition Entry Section (SMF22ETY=SMF22LP)

Offsets		Name	Length	Format	Description
0	0	SMF22LP_Name	8	EBCDIC	Logical partition name.
8	8	SMF22LP_MIFID	8	binary	Multiple Image Facility (MIF) identifier.

Continuation Section

If this record is filled (length exceeds 32,756 bytes), this section is present to indicate the next record is a continuation of this one.

Offsets		Name	Length	Format	Description
0	0	SMF22L99	1	binary	Length of this section.
1	1	SMF22CON	1	binary	Identifies next record as a continuation (this field is always 99).

Note 1: The following constants identify the function in **SMF22FNC**:

Constant	Value	Description
SMF22ACT	X'01'	Activate function.
SMF22PCU	X'02'	Recover function.

Note 2: The following constants identify the entry type in **SMF22ETY**:

Constant	Value	Description
SMF22DEV | SMF22SDEV | SMF22DEVE	X'01'	Device entry.
SMF22PCU	X'02'	Control unit entry.
SMF22CH	X'03'	Channel path ID (CHPID) entry.
SMF22MDEV	X'04'	Coupling facility device entry.

Constant	Value	Description
SMF22MP	X'05'	Coupling facility control unit.
SMF22LP	X'06'	Logical partition entry.

Note 3: The following constants define **SMF22ERQ** when the entry type is “device” (SMF22ETY equals SMF22DEV or SMF22SDEV):

Constant	Value	Description
SMF22DDD	X'01'	Delete device.
SMF22DAD	X'02'	Add device.
SMF22DDH	X'03'	Modify to remove channel path IDs (CHPID).
SMF22DAH	X'04'	Modify to add channel path IDs (CHPID).
SMF22DDP	X'05'	Modify to remove CUs.
SMF22DAP	X'06'	Modify to add CUs.
SMF22DMC	X'07'	Modify subchannel characteristics (illegal status detection, and/or interface timeout).
SMF22DMP	X'08'	Modify preferred path.

Note 4: The following constants define **SMF22ERQ** when the enty type is “control unit” (SMF22ETY equals SMF22PCU):

Constant	Value	Description
SMF22PDP	X'01'	Delete control unit.
SMF22PAP	X'02'	Add control unit.
SMF22PDH	X'03'	Modify to delete channel path IDs (CHPID).
SMF22PAH	X'04'	Modify to add channel path IDs (CHPID).
SMF22PDU	X'05'	Modify to delete unit address range.
SMF22PAU	X'06'	Modify to add unit address range.
SMF22PNM	X'07'	Modify to change the number of managed CHPIDs.
SMF22PDM	X'08'	Modify to delete a managed CHPID.
SMF22PAS	X'09'	Modify to delete a managed CHPID in order to add a static CHPID.

Note 5: The following constants define **SMF22ERQ** when the entry type is “CHPID” (SMF22ETY equals SMF22CH).

Constant	Value	Description
SMF22CDH	X'01'	Delete channel path ID (CHPID).
SMF22CAH	X'02'	Add channel path ID (CHPID).
SMF22CDI	X'03'	Modify to delete partitions from the channel path candidate list.
SMF22CAI	X'04'	Modify to add partitions to the channel path candidate list.

Note 6: The following constants define **SMF22ERQ** when the entry type is “logical partition” (SMF22ETY equals SMF22LP).

Constant	Value	Description
SMF22LDEL	X'01'	Delete logical partition.

Constant	Value	Description
SMF22LADD	X'02'	Add logical partition.

Record Type 23 (17) — SMF Status

Record type 23 is written at the interval specified by the STATUS keyword in SMFPRMxx. It records SMF statistics collected during the reporting interval.

Record Environment

The following conditions exist for the generation of this record:

Macro SMFEWTM(1), BRANCH=YES (record exit: IEFU84)

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF23LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	SMF23SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF23FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See “Standard SMF Record Header” on page 13-1 for a detailed description.
5	5	SMF23RTY	1	binary	Record type 23 (X'17').
6	6	SMF23TME	4	binary	Time since midnight, in hundredths of a second, when the record was moved to the SMF buffer.
10	A	SMF23DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
14	E	SMF23SID	4	EBCDIC	System identification (from the SID parameter).
18	12		2		Reserved.
20	14	SMF23POF	4	binary	Offset to product section from start of record, including the record descriptor word (RDW).
24	18	SMF23PLN	2	binary	Length of product section.
26	1A	SMF23PON	2	binary	Number of product sections.
28	1C	SMF23SOF	4	binary	Offset to system section from start of record, including the record descriptor word (RDW).
32	20	SMF23SLN	2	binary	Length of system section.
34	22	SMF23SON	2	binary	Number of system sections.
36	24	SMF23ROF	4	binary	Offset to SMF statistics section from start of record, including the record descriptor word (RDW).
40	28	SMF23RLN	2	binary	Length of SMF statistics section.

Offsets		Name	Length	Format	Description
42	2A	SMF23RON	2	binary	Number of SMF statistics sections.

Product Section

Offsets		Name	Length	Format	Description
0	0	SMF23TID	2	binary	Subtype identification — '0'.
2	2	SMF23RVN	2	character	Record version number — '02'.
4	4	SMF23PNM	8	EBCDIC	Product name — 'SMF'.

System Section

Offsets		Name	Length	Format	Description
0	0	SMF23INT	6	EBCDIC	Length of measurement interval.
6	6	SMF23FLS	4	EBCDIC	Operating system release level.
10	A	SMF23OSL	8	character	MVS product name (taken from CVTPRODN).
18	12	SMF23TOD	8	binary	Time and date that the interval ended for the STATUS function, in time-of-day (TOD) format, an unsigned 64-bit fixed-point number where bit 51 is equivalent to 1 microsecond. If you requested synchronized interval recording for SMF statistics, a field in other records, similar to this field, contains the same time so you can compare this record with other records generated at the end of the same interval.
26	1A	SMF23SYN	8	EBCDIC	System name (from the SYSNAME parameter in the IEASYSxx parmlib member).
34	22	SMF23SYP	8	EBCDIC	Sysplex name (from the SYSPLEX parameter in the COUPLExx parmlib member).

SMF Statistics Section

Offsets		Name	Length	Format	Description
0	0	SMF23BFW	4	binary	Number of buffers written.
4	4	SMF23BFQ	4	binary	Maximum number of buffers used at one time.
8	8	SMF23SUS	4		Reserved.
12	C	SMF23RCW	4	binary	Number of records written.
16	10	SMF23BFA	4	binary	Amount of each buffer allocation request.
20	14	SMF23BFT	4	binary	Total amount of buffer storage currently allocated (and recently used).
24	18	SMF23BFH	4	binary	'High water mark' of buffer storage allocation.
28	1C	SMF23BFM	4	binary	Buffer storage maximum in effect (BUFSIZMAX binary value).
32	20	SMF23BFL	4	binary	Buffer storage usage warning level in effect (BUFUSEWARN binary value).

Record Type 24 (18) — JES2 Spool Offload

Record type 24 is written whenever a job or SYSOUT data set is transmitted to or received from an offload data set. JES2 writes one type 24 record for each pre-processing job that is transmitted to an offload data set or received back to spool. Because one type 24 record is written for each SYSOUT data set header that is transmitted or received, multiple type 24 records can be expected for each post-processing job.

This record identifies the name, time and date of each job that has been transmitted or received. It includes specific information about jobs in a record subtype. For jobs not yet run, it reports job-related information such as job class and system affinity in both the job selection criteria section and in the system affinity section. For jobs that have already run, it reports information about SYSOUT data sets such as output group id and forms name in the SYSOUT selection criteria section. Record type 24 never contains both the job selection criteria section and the SYSOUT selection criteria section.

This record can be used with the subtype selectivity function. Refer to "Selecting subtypes" on page 4-2 for a description of subtype selectivity.

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number) that locate the other sections on the record.

This triplet information should be checked prior to accessing a section of the record. All three fields being non-zero mean that the section exists on the record; conversely any of the fields being zero indicates that the section does not exist on the record. The 'number' triplet field is the primary indication of the existence of the field.

Offsets		Name	Length	Format	Description
0	0	SMF24LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See "Standard SMF Record Header" on page 13-1 for a detailed description.
2	2	SMF24SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF24FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See "Standard SMF Record Header" on page 13-1 for a detailed description.
5	5	SMF24RTY	1	binary	Record type 24 (X'18').
6	6	SMF24TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.
10	A	SMF24DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
14	E	SMF24SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF24SSI	4	EBCDIC	Subsystem identification.
22	16	SMF24SUB	2	binary	Record subtype **Value** **Meaning** **1** Job transmitted **2** Job received **3** SYSOUT transmitted **4** SYSOUT received.
24	18	SMF24NTR	2	binary	Number of triplets. A triplet is a set of offsets/length/numbers values that define a section of the record.
26	1A	SMF24RSV	2		Reserved.
28	1C	SMF24OPS	4	binary	Offset to product section.

Offsets		Name	Length	Format	Description
32	20	SMF24LPS	2	binary	Length of product section.
34	22	SMF24NPS	2	binary	Number of product sections.
36	24	SMF24OGN	4	binary	Offset to general sections.
40	28	SMF24LGN	2	binary	Length of general section.
42	2A	SMF24NGN	2	binary	Number of general sections.
44	2C	SMF24OSP	4	binary	Offset to job or SYSOUT selection criteria section.
48	30	SMF24LSP	2	binary	Length of job or SYSOUT selection criteria section.
50	32	SMF24NSP	2	binary	Number of job or SYSOUT selection criteria sections.
52	34	SMF24OSW	4	binary	Offset to enhanced SYSOUT support (ESS) section.
56	38	SMF24LSW	2	binary	Length of enhanced SYSOUT support (ESS) section.
58	3A	SMF24NSW	2	binary	Number of enhanced SYSOUT support (ESS) section.
60	3C	SMF24OSA	4	binary	Offset to system affinity section.
64	40	SMF24LSA	2	binary	Length of system affinity section.
66	42	SMF24NSA	2	binary	Number of system affinity sections.

Product Section

Triplet Information: This section is located on the record using the following triplet fields, which are located in the 'Header/self-defining' section:
Offset SMF24OPS
Length SMF24LPS
Number SMF24NPS

Offsets		Name	Length	Format	Description
0	0	SMF24PVR	2	EBCDIC	Record version number.
2	2	SMF24PNM	8	EBCDIC	Product name 'JES2'.
10	A	SMF24RS2	2		Reserved.

General Section

This section contains the statistics for spool offload devices.

Triplet Information: This section is located on the record using the following triplet fields, which are located in the 'Header/self-defining' section:
Offset SMF24OGN
Length SMF24LGN
Number SMF24NGN

Offsets		Name	Length	Format	Description
0	0	SMF24GLN	2	binary	Length of general section.
2	2	SMF24BCF	1	binary	Buffer continuation flags **Bit** **Meaning When Set** **0** First SMF buffer for job **1** Continuation of SMF buffer **2** Last SMF buffer for job **3-7** Reserved.

Offsets		Name	Length	Format	Description
3	3	SMF24EOJ	1	binary	End of job flags **Bit** **Meaning When Set** **0** Completed job offloaded **1** Job completed with skipped data sets **2** Uncompleted job offloaded **3** Job cancelled by operator **4-7** Reserved.
4	4	SMF24JBN	8	EBCDIC	Job name.
12	C	SMF24JID	8	EBCDIC	Original job identification.
20	14	SMF24CJD	8	EBCDIC	Current identification.
28	1C	SMF24SYS	4	EBCDIC	System identification.
32	20	SMF24DSN	44		Offload data set name.
76	4C	SMF24CNT	4	binary	Number of records transmitted or received.
80	50	SMF24TDS	4	binary	Time since midnight, in hundredths of a second, that offload data set was allocated.
84	54	SMF24DDS	4	packed	Date when the offload data set was allocated, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
88	58	SMF24ORG	8	EBCDIC	Node of origin.
96	60	SMF24TRD	4	binary	Time on reader since midnight, in hundredths of a second.
100	64	SMF24DRD	4	binary	Date on the reader, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.

Job Selection Criteria Section

Triplet Information: This section is located on the record using the following triplet fields, which are located in the ‘Header/self-defining’ section:
Offset SMF24OSP
Length SMF24LSP
Number SMF24NSP

Offsets		Name	Length	Format	Description
0	0	SMF24LN1	2	binary	Length of job section.
2	2	SMF24JFG	1	binary	Job Flags **Bit** **Meaning When Set** **0** Held job **1** Affinity = any **2-7** Reserved.
3	3	SMF24JCL	1	EBCDIC	Job class.
4	4	SMF24JND	8	EBCDIC	Node name.
12	C	SMF24JAF	28	EBCDIC	Affinity system identification.

System Affinity Section

Triplet Information: This section is located on the record using the following triplet fields, which are located in the ‘Header/self-defining’ section:
Offset SMF24OSA
Length SMF24LSA
Number SMF24NSA

Offsets		Name	Length	Format	Description
0	0	SMF24LSA	2	binary	Length of system affinity section.
2	2	SMF24SAN	4	binary	Number of system affinities.
6	6	SMF24LN4	4	binary	Length of system name.
10	A	SMF24SAC	*	binary	Start of system affinity names.

Note: *The length of the SMF24SAC field is variable and depends on the amount of system affinity names.

SYSOUT Selection Criteria Section

Triplet Information: This section is located on the record using the following triplet fields, which are located in the 'Header/self-defining' section:
Offset SMF24OSP
Length SMF24LSP
Number SMF24NSP

Offsets		Name	Length	Format	Description
0	0	SMF24LN2	2	binary	Length of SYSOUT section.
2	2	SMF24SFG	1	binary	SYSOUT flags **Bit** **Meaning When Set** **0** Held SYSOUT **1** Bursted SYSOUT **2** Held job **3** Incomplete data set **4** Multi-destination data set **5-7** Reserved.
3	3	SMF24SCL	1	EBCDIC	SYSOUT class.
4	4	SMF24SND	8	EBCDIC	Node name.
12	C	SMF24SRN	8	EBCDIC	Remote name.
20	14	SMF24FCB	4	EBCDIC	Forms control buffer (FCB).
24	18	SMF24FOR	8	EBCDIC	Forms overlay name.
32	20	SMF24FLS	4	EBCDIC	Flash cartridge name.
36	24	SMF24PRM	8	EBCDIC	Print data set (PR) mode.
44	2C	SMF24UCS	4	EBCDIC	Universal character set (UCS).
48	30	SMF24WID	8	EBCDIC	Writer.
56	38	SMF24REC	4	binary	Data set record count.
60	3A	SMF24PRY	1	binary	Output selection priority.

Enhanced SYSOUT Support (ESS) Section

This section contains the output descriptor (if any) for first offloaded data set in this record.

Triplet Information: This section is located on the record using the following triplet fields, which are located in the 'Header/self-defining' section:
Offset SMF24OSW
Length SMF24LSW
Number SMF24NSW

Offsets		Name	Length	Format	Description
0	0	SMF24LN3	2	binary	Length of ESS section (including this field).
2	2	SMF24SGT	4	binary	Segment identifier.

Offsets		Name	Length	Format	Description
6	6	SMF24IND	1	binary	Section indicator **Bit** **Meaning When Set** **0** Error obtaining scheduler JCL facility (SJF) information. Scheduler work block text unit (SWBTU) data area is not present **1-7** Reserved.
7	7		1		Reserved.
8	8	SMF24JDT	8	EBCDIC	JCL definition table (JDT) name in JCL definition vector table (JDTV).
16	10	SMF24TUL	2	binary	Text unit (SWBTU) data area length.
18	12	SMF24TU	VAR	binary	Text unit (SWBTU) data area. The data area can be processed using the SWBTUREQ macro.

Record Type 25 (19) — JES3 Device Allocation

Record type 25 is written for each job that completed JES3 converter/interpreter (C/I) processing. One type 25 record is written for each job, whether the job contains DD statements. A separate type 25 record is written for each job that uses a private catalog. A separate type 25 record is written for each main device scheduling (MDS) dynamic unallocation request.

This record contains allocation-related information such as the number of tape and disk volumes fetched and mounted, and the time and date of JES3 device verification. The job name, time, and date that the reader recognized the JOB card (for the job) constitute the job log identification.

Record Environment

The following conditions exist for the generation of this record:

Macro SMFEWTM, BRANCH=NO (record exit: IEFU83)

Storage Residency 31-bit

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF25LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	SMF25SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF25FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See “Standard SMF Record Header” on page 13-1 for a detailed description.
5	5	SMF25RTY	1	binary	Record type 25 (X'19').

Offsets		Name	Length	Format	Description
6	6	SMF25TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.
10	A	SMF25DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
14	E	SMF25SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF25JBN	8	EBCDIC	Job name. The job name, time, and date that the reader recognized the JOB card (for this job) constitute the job log identification, or transaction name (for APPC output).
26	1A	SMF25RST	4	binary	Time since midnight, in hundredths of a second, that the reader recognized the JOB card (for this job).
30	1E	SMF25RSD	4	packed	Date when the reader recognized the JOB card for this job, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
34	22	SMF25UIF	8	EBCDIC	User-defined identification field (taken from common exit parameter area, not from USER=parameter on job statement).

Descriptor Section

Offsets		Name	Length	Format	Description
42	2A	SMF25IND	2	binary	Allocation indicators **Bit** **Meaning When Set** **0** If zero, allocation by user’s DD statements. If 1, dynamic allocation. **1** If zero, non-catalog allocation by JES3. If 1, catalog allocation by JES3. **2** If zero, manual allocation by operator. If 1, automatic allocation by JES3 (see the ALLOCATE= keyword on the JES3 SETPARAM initialization statement in *z/OS JES3 Initialization and Tuning Reference*). **3-15** Reserved.
44	2C	SMF25NTF	4	binary	Number of IAT5110 GET messages for tape volumes issued for the job.
48	30	SMF25NDF	4	binary	Number of IAT5110 GET messages for disk volumes issued for the job.
52	34	SMF25FST	4	binary	Time since midnight, in hundredths of a second, that the fetch processing ended. That is, the time that the first phase of MDS ended. (During this phase, messages are issued to inform the operator of the volumes required for the job to run.)
56	38	SMF25FSD	4	packed	Date when the fetch processing ended, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
60	3C	SMF25SST	4	binary	If manual allocation, the time when the *START SETUP operator command was issued. If automatic allocation, this field contains zeroes.
64	40	SMF25SSD	4	packed	If manual allocation, the date when the *START SETUP operator command was issued. If automatic allocation, this field contains zeroes.
68	44	SMF25NTM	4	binary	Number of tape volumes mounted by MDS.

Offsets		Name	Length	Format	Description
72	48	SMF25NDM	4	binary	Number of disk volumes mounted by MDS.
76	4C	SMF25MST	4	binary	Time since midnight, in hundredths of a second, when all JES3 volume mount messages have been issued. If not mounts were required, this field equals the time of JES3 allocation.
80	50	SMF25MSD	4	packed	Date when all JES3 volume mount messages have been issued, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description. If no mounts were required, this field equals the date of JES3 allocation.
84	54	SMF25VVT	4	binary	Time since midnight, in hundredths of a second, of JES3 device verification.
88	58	SMF25VVD	4	packed	Date of JES3 device verification, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
92	5C	SMF25NMV	4	binary	Number of Mass Storage Volume requests allocated by MDS for the job. **Note:** As of MVS/SP4.1, this field is no longer valid.

Record Type 26 (1A) — JES2 Job Purge

When all SYSOUT for a job is processed, JES2 invokes exit IEFUJP to allow an installation to decide whether to write record type 26. Then, JES2 writes this record at job purge. This record identifies the job-by-job log identification, JES2-assigned job number, and programmer's name. JES2 can be induced to not write this record on a job class basis.

Record type 26 contains operating information such as:
- Message class
- Job class
- JES2 job selection priority
- JES2 logical input device name
- Output lines
- Output punched cards
- Print/punch route codes
- Start and stop times for:
  - The reader
  - The Converter
  - The Execution processor
  - The output processor.

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF26LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See "Standard SMF Record Header" on page 13-1 for a detailed description.
2	2	SMF26SEG	2	binary	Segment descriptor (see record length field).

Offsets		Name	Length	Format	Description
4	4	SMF26FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See “Standard SMF Record Header” on page 13-1 for a detailed description.
5	5	SMF26RTY	1	binary	Record type 26 (X'1A').
6	6	SMF26TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.
10	A	SMF26DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
14	E	SMF26SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF26JBN	8	EBCDIC	Job name. The job name, time, and date that the reader recognized the JOB card (for this job) constitute the job log identification, or transaction name (for APPC output).
26	1A	SMF26RST	4	binary	Time since midnight, in hundredths of a second, that the reader recognized the JOB statement (for this job).
30	1E	SMF26RSD	4	packed	Date when the reader recognized the JOB statement (for this job), in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
34	22	SMF26UIF	8	EBCDIC	User-defined identification field (taken from common exit parameter area, not from USER=parameter on job statement).
42	2A	SMF26RSV	4		Reserved.
46	2E	SMF26SBS	2	binary	Subsystem identification — X'0002' signifies JES2.
48	30	SMF26IND	2	binary	Entry type indicator **Bit** **Meaning When Set** **0** Descriptor section present **1** Events section present **2** Actuals section present **3** JES2 network section present **4** JES2 routing section present **5** Print section present **6** Reserved **7** Triplet section present **8-15** Reserved.

Descriptor Section

Offsets		Name	Length	Format	Description
50	32	SMF26LN1	2	binary	Length of descriptor section, including this field.
52	34	SMF26RV1	2		Reserved.

Offsets		Name	Length	Format	Description
54	36	SMF26IN2	1	binary	Job information indicator **Bit** **Meaning When Set** **0** Background batch job **1** Foreground TSO/E user **2** System task **3** No journal option **4** No output option **5** TYPRUN=SCAN was specified **6** TYPRUN=COPY was specified **7** RESTART = Y was specified.
55	37	SMF26INF	1	binary	Job information indicator **Bit** **Meaning When Set** **0** /*PRIORITY statement present or keyword 'PRTY =' was specified on JOB statement **1** /*SETUP statement(s) present **2** TYPRUN=HOLD was specified **3** No job log option **4** Execution batching **5** Job was entered on internal reader **6** Job was rerun by JES2 **7** Job was canceled by the operator.
56	38	SMF26JNM	4	EBCDIC	JES2-assigned job number if less than 10,000. If the job number is greater or equal to 10,000, this field is zeroes and the job number is in the SMF26JID field.
60	3C	SMF26JID	8	EBCDIC	8-character job identifier
68	44	SMF26NAM	20	EBCDIC	Programmer's name (taken from JOB statement).
88	58	SMF26MSG	1	EBCDIC	Message class (taken from JOB statement).
89	59	SMF26CLS	1	EBCDIC	Job class (taken from JOB statement).
90	5A	SMF26XPI	1	binary	JES2 job selection priority when the job was initially read.
91	5B	SMF26XPS	1	binary	JES2 job selection priority when the job was selected.
92	5C	SMF26IX2	1	Binary	Job information indicator **Bit** **Meaning When Set** **0** Job delayed due to duplicate job name **1** Job purged as a result of spool offload **2** Job went through unspun in its lifetime **3** Job had at least one JOE purged due to PSO/SAPI
93	5D	SMF26OPS	1		Reserved.
94	5E	SMF26LOC	2	binary	Input route code. These fields are defined as follows: X'0100' indicates local routing; X'nnrr' is remote routing; and X'00nn' indicates special local routing. If more than 255 remotes are specified for the system, this field is set to zero. See the Routing Section described later in this record.
96	60	SMF26DEV	8	EBCDIC	JES2 logical input device name as defined in JESPARMS.
104	68	SMF26ACT	4	EBCDIC	Programmer's accounting number. JES2-defined sub-field from the accounting information field in the JOB statement or default values assigned for this job or from /*JOBPARM, JES2 control statement.
108	6C	SMF26ROM	4	EBCDIC	Programmer's room number. JES2-defined sub-field from the accounting information field in the JOB statement or default values assigned for this job or from /*JOBPARM, JES2 control statement.
112	70	SMF26XTM	4	binary	Estimated processing time, in seconds. JES2-defined sub-field from the accounting information field in the JOB statement or default values assigned for this job or from /*JOBPARM, JES2 control statement.

Offsets		Name	Length	Format	Description
116	74	SMF26ELN	4	binary	Estimated output lines. JES2-defined sub-field from the accounting information field in the JOB statement or default values assigned for this job or from /*JOBPARM, JES2 control statement.
120	78	SMF26EPU	4	binary	Estimated output punched cards. JES2-defined sub-field from the accounting information field in the JOB statement or default values assigned for this job or from /*JOBPARM, JES2 control statement.
124	7C	SMF26FRM	4	EBCDIC	Output form number. If the source field contain four or fewer characters, SMF26FRM is set. Otherwise, this field is set to blanks, and the contents of the source field appear only in SMF26EFM, described under the Routing Section later in this record.
128	80	SMF26CYP	2	binary	Job print copy count. JES2-defined sub-field from the accounting information field in the JOB statement or default values assigned for this job or from /*JOBPARM, JES2 control statement.
130	82	SMF26LIN	2	binary	Lines per page. JES2-defined sub-field from the accounting information field in the JOB statement or default values assigned for this job or from /*JOBPARM, JES2 control statement.
132	84	SMF26PRR	2	binary	Job print route code. These fields are defined as follows: X'0100' indicates local routing; X'nnrr' is remote routing; and X'00nn' indicates special local routing. If more than 255 remotes are specified for the system, this field is set to zero. See the Routing Section described later in this record.
134	86	SMF26PUR	2	binary	Job punch route code. These fields are defined as follows: X'0100' indicates local routing; X'nnrr' is remote routing; and X'00nn' indicates special local routing. If more than 255 remotes are specified for the system, this field is set to zero. See the Routing Section described later in this record.
136	88	SMF26PDD	8	EBCDIC	Procedure data definition name (DDNAME) used for JCL conversion.

Events Section

Offsets		Name	Length	Format	Description
50	32	SMF26LN2	2	binary	Length of events section, including this field.
52	34	SMF26RV2	2		Reserved.
54	36	SMF26RPT	4	binary	Reader stop time, in hundredths of a second.
58	3A	SMF26RPD	4	packed	Reader stop date, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
62	3E	SMF26CST	4	binary	Converter start time since midnight, in hundredths of a second.
66	42	SMF26CSD	4	packed	Converter start date, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
70	46	SMF26CPT	4	binary	Converter stop time since midnight, in hundredths of a second.
74	4A	SMF26CPD	4	packed	Converter stop date, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
78	4E	SMF26XST	4	binary	Execution processor start time since midnight, in hundredths of a second.

Offsets		Name	Length	Format	Description
82	52	SMF26XSD	4	packed	Execution processor start date, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
86	56	SMF26XPT	4	binary	Execution processor stop time since midnight, in hundredths of a second.
90	5A	SMF26XPD	4	packed	Execution processor stop date, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
94	5E	SMF26OST	4	binary	Output processor start time since midnight, in hundredths of a second.
98	62	SMF26OSD	4	packed	Output processor start date, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
102	66	SMF26OPT	4	binary	Output processor stop time since midnight, in hundredths of a second.
106	6A	SMF26OPD	4	packed	Output processor stop date, in the form 0*cyydddF*. see "Standard SMF Record Header" on page 13-1 for a detailed description.

Actuals Section

Offsets		Name	Length	Format	Description
50	32	SMF26LN3	2	binary	Length of actuals section, including this field.
52	34	SMF26RV4	2		Reserved.
54	36	SMF26ICD	4	binary	Number of input statements for job. This field includes JCL and SYSIN statements.
58	3A	SMF26XLN	4	binary	Number of output lines generated to spool.
62	3E	SMF26XPU	4	binary	Number of punched cards generated to spool.
66	42	SMF26RID	4	EBCDIC	Input processor system (CPU) identification.
70	46	SMF26CID	4	EBCDIC	Conversion processor system (CPU) identification.
74	4A	SMF26XID	4	EBCDIC	Execution processor system (CPU) identification.
78	4E	SMF26OID	4	EBCDIC	Output processor system (CPU) identification.

Network Section

Offsets		Name	Length	Format	Description
50	32	SMF26LN4	2	binary	Length of network section including this field.
52	34	SMF26RV5	2		Reserved.
54	36	SMF26NID	4	EBCDIC	Job transmitter system identifier.
58	3A	SMF26NST	4	binary	Job transmitter start time since midnight, in hundredths of a second.
62	3E	SMF26NSD	4	packed	Job transmitter start date, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
66	42	SMF26NPT	4	binary	Job transmitter stop time since midnight, in hundredths of a second.
70	46	SMF26NPD	4	packed	Job transmitter stop date, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
74	4A	SMF26NAC	8	EBCDIC	Network accounting number.
82	52	SMF26NJB	8	EBCDIC	Original job identification.
90	5A	SMF26NDV	8	EBCDIC	Job transmitter device name.

Offsets		Name	Length	Format	Description
98	62	SMF26NON	8	EBCDIC	Original node name.
106	6A	SMF26NXN	8	EBCDIC	Processing node name.
114	72	SMF26NNM	8	EBCDIC	Next node name.
122	7A	SMF26NLN	8	EBCDIC	Last node name.
130	82	SMF26SUI	8	EBCDIC	Submitting userid.
138	8A	SMF26NN	8	EBCDIC	Job end execution notify node.
146	92	SMF26NU	8	EBCDIC	Job end execution notify userid.

Routing Section

Offsets		Name	Length	Format	Description
50	32	SMF26LN5	2	binary	Length of routing section (including this field).
52	34	SMF26INR	4	binary	Input route code. These fields are defined as follows: X'00010000' indicated local routing; X'nnrrnnnn' indicates remote routing; and X'0000nnnn' indicates special local routing. This field is always set regardless of the number of remotes specified for the system.
56	38	SMF26PRD	4	binary	Default print route code. These fields are defined as follows: X'00010000' indicated local routing; X'nnrrnnnn' indicates remote routing; and X'0000nnnn' indicates special local routing. This field is always set regardless of the number of remotes specified for the system.
60	3C	SMF26PUD	4	binary	Default punch route code. These fields are defined as follows: X'00010000' indicated local routing; X'nnrrnnnn' indicates remote routing; and X'0000nnnn' indicates special local routing. This field is always set regardless of the number of remotes specified for the system.

Print Section

Offsets		Name	Length	Format	Description
50	32	SMF26LN6	2	binary	Length of print section including this field.
52	34	SMF26EBT	4	binary	Estimated SYSOUT byte count.
56	38	SMF26XBT	4	binary	Actual SYSOUT byte count.
60	3C	SMF26EPG	4	binary	Estimated page count.
64	40	SMF26XPG	4	binary	Actual page count. For page mode data sets, JES2 updates the page count when it encounters a “begin page” indicator in the date stream header.
68	44	SMF26EFM	8	EBCDIC	Output form number. This field is set regardless of the number of characters in the forms field.

Triplet Section

Offsets		Name	Length	Format	Description
50	32	SMF26LN7	2	binary	Length of triplet section.
52	34	SMF26OAG	4		Offset of accounting section.
56	38	SMF26LAG	2	binary	Length of accounting section (including length of field SMF26LN8).
58	3A	SMF26NAG	2	binary	Number of accounting sections.
60	3C	SMF26OWL	4		Offset of Workload Management section.
64	40	SMF26LWL	2	binary	Length of Workload Management section.
66	42	SMF26NWL	2	binary	Number of Workload Management sections.

Workload Management Section

Offsets		Name	Length	Format	Description
0	0	SMF26WCL	8	EBCDIC	Service class name at the time of execution.
8	8	SMF26WOC	8	EBCDIC	Original service class (assigned by WLM classification when the job finished conversion).
16	10	SMF26WIN	1	binary	Indicators **Bit** **Meaning When Set** **0** Job ran in MODE=WLM **1** Job ran because of $S J **2-7** Reserved
17	11	SMF26WJC	8	EBCDIC	Eight character job class (padded on right with blanks).
25	19	SMF26WSE	16	EBCDIC	Sixteen character scheduling environment (padded on right with blanks).

Accounting Section

Offsets		Name	Length	Format	Description
0	0	SMF26LN8	2	binary	Length of accounting section.
2	2	SMF26NRA	1	binary	Number of accounting pairs.
3	3	SMF26AC1	variable	EBCDIC	An accounting pair consists of a 1-byte length field, which contains the length of the following string. The string contains accounting data. If the length field is zero, there is no following string.

Record Type 26 (1A) — JES3 Job Purge

Record type 26 is written at job purge after all SYSOUT for the job is processed. This record identifies the job by job log identification, JES3-assigned job number, and programmer’s name.

Record type 26 contains operating information such as:
- Message class
- Job class
- JES3 job selection priority
- JES3 logical input device name
- Processing time
- Output lines
- Output punched cards
- Deadline schedule type
- Deadline schedule time and date
- Start and stop times for:
  - The reader
  - The Converter
  - The Execution processor
  - The output processor.

Note: The format of all fields in this record are binary unless data is entered in the field.

Record Environment

The following conditions exist for the generation of this record:

Macro SMFEWTM, BRANCH=NO (record exit: IEFU83)

Storage Residency 24-bit

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF26LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	SMF26SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF26FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See “Standard SMF Record Header” on page 13-1 for a detailed description.
5	5	SMF26RTY	1	binary	Record type 26 (X'1A').
6	6	SMF26TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.
10	A	SMF26DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
14	E	SMF26SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF26JBN	8	EBCDIC	Job name. The job name, time, and date that the reader recognized the JOB card (for this job) constitute the job log identification, or transaction name (for APPC output).
26	1Q	SMF26RST	4	binary	Time since midnight, in hundredths of a second, that the reader recognized the JOB statement (for this job).
30	1E	SMF26RSD	4	packed	Date when the reader recognized the JOB statement (for this job), in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
34	22	SMF26UIF	8	EBCDIC	User-defined identification field (taken from common exit parameter area, not from USER=parameter on job statement).
42	2A	SMF26RSV	4		Reserved.
46	2E	SMF26SBS	2	binary	Subsystem identification — X'0005' signifies JES3.
48	30	SMF26IND	2	binary	Entry type indicator **Bit** **Meaning When Set** **0** Descriptor section present **1** Events section present **2** Actuals section present **3-4** Reserved **5** Print section present **6** Reserved. **7** Triplet section present **8-15** Reserved

Descriptor Section

Offsets		Name	Length	Format	Description
50	32	SMF26LN1	2	binary	Length of descriptor section, including this field.
52	34	SMF26RV1	2		Reserved.
54	36	SMF26IN3	1	binary	Job information indicator **Bit** **Meaning When Set** **0** Dependent job (//* NET statement processed) **1** Deadline scheduling (DEADLINE parameter was specified on //* MAIN statement) **2** Deadline job met deadline **3** Process job (//* PROCESS statement processed) **4-5** Reserved **6** Job left system by way of DJ (dump job) **7** Job entered system by way of DJ (dump job).
55	37	SMF26INF	1	binary	Job information indicator **Bit** **Meaning When Set** **0** Job priority (taken from PRTY=parameter on JOB statement) **1** Job processed by preexec setup **2** TYPRUN=HOLD was specified on JOB statement **3-4** Reserved **5** Job was entered on internal reader **6** Job was rerun on a JES3 reader **7** Job was canceled by the operator.
56	38	SMF26JNM	4	EBCDIC	JES3-assigned job number if less than 10,000. If the job number is greater or equal to 10,000, this field contains zeros and the job number is in the SMF26JID field.
60	3C	SMF26JID	8	EBCDIC	8-character job identifier
68	44	SMF26NAM	20	EBCDIC	Programmer's name (taken from JOB statement).
88	58	SMF26MSG	1	EBCDIC	Message class (taken from MSGCLASS=parameter on JOB statement).
89	59	SMF26CLS	1	EBCDIC	Job class (taken from CLASS= parameter on JOB statement). This field is blank if the default is used or if a valid CLASS= parameter is specified on the //* MAIN statement (see SMF26CLN at offset 176).
90	5A	SMF26XPI	1	binary	JES3 job selection priority when the job was initially read (taken from: 1) PRTY= parameter on JOB statement, 2) class default priority from main processor job class table, or 3) default JES3 job priority).
91	5B	SMF26XPS	1	binary	JES3 job selection priority when the job was selected (taken from job's RESQ).
92	5C	SMF26RV8	4		Reserved.
96	60	SMF26DEV	8	EBCDIC	JES3 logical input device name, or user identification if TSO/E job.
104	68	SMF26RVA	8		Reserved.
112	70	SMF26XTM	4	binary	Estimated processing time, in seconds.
116	74	SMF26ELN	4	binary	Estimated output lines (taken from LINES= parameter on //* MAIN statement or JES3 complex-wide default, which is in units of 1000).
120	78	SMF26EPU	4	binary	Estimated output punched cards (taken from CARDS= parameter on //* MAIN statement or JES3 complex-wide default, which is in units of 100).
124	7C	SMF26DTY	1	EBCDIC	Deadline schedule type (taken from DEADLINE parameter on //* MAIN statement). Valid types are A-Z and 0-9.
125	70	SMF26RV6	3		Reserved.
128	80	SMF26IGP	8	EBCDIC	JES3 logical input device group name.

Offsets		Name	Length	Format	Description
136	88	SMF26PD3	8	EBCDIC	Procedure data definition name (DDNAME) used for JCL conversion (taken from PROC= parameter on //* MAIN statement or default).
144	90	SMF26NJO	8	EBCDIC	Name of system to which the job is sent.
152	98	SMF26NJI	8	EBCDIC	Name of local terminal supplied by the JES3 initialization deck.
160	A0	SMF26NET	8	EBCDIC	Identification of dependent job net to which this job belongs (taken from //* NET statement).
168	A8	SMF26DTM	4	binary	Deadline schedule time, in hundredths of a second (taken from DEADLINE parameter on //* MAIN statement).
172	AC	SMF26DDT	4	packed	Deadline schedule date, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description. This is taken from the DEADLINE parameter on //* MAIN statement.
176	B0	SMF26CLN	8	EBCDIC	Job class (taken from CLASS= parameter on //* MAIN statement if valid, or the default (JES3BATCH)).

Events Section

Offsets		Name	Length	Format	Description
184	B4	SMF26LN2	2	binary	Length of events section, including this field.
186	BA	SMF26RV2	2		Reserved.
188	BC	SMF26RPT	4	binary	Reader stop time, in hundredths of a second. This field is filled in during JOB statement processing.
192	C0	SMF26RPD	4	packed	Reader stop date, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description. This field is filled in during JOB statement processing.
196	C4	SMF26CST	4	binary	Converter start time, in hundredths of a second. This field is filled in following the JES3 LOGIN of the interpreter job.
200	C8	SMF26CSD	4	packed	Converter start date, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description. This field is filled in following the JES3 LOGIN of the interpreter job.
204	CC	SMF26CPT	4	binary	Converter stop time, in hundredths of a second. This field is filled in at the end of the interpreter function.
208	D0	SMF26CPD	4	packed	Converter stop date, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description. This field is filled in at the end of the interpreter function.
212	D4	SMF26XST	4	binary	Execution processor start time, in hundredths of a second. This field is filled in when the job is scheduled to run on a JES3 local or logical processor.
216	D8	SMF26XSD	4	packed	Execution processor start date, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description. This field ID is filled in when the job is scheduled to run on a JES3 local or logical processor.
220	DC	SMF26XPT	4	binary	Execution processor stop time, in hundredths of a second. This field is filled in when the job ends on a JES3 local or global processor.
224	E0	SMF26XPD	4	packed	Execution processor stop date, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description. This field is filled in when the job ends on a JES3 local or global processor.

Offsets		Name	Length	Format	Description
228	E4	SMF26OST	4	binary	Output processor start time, in hundredths of a second. This field is filled in when output service starts to process the job's data sets.
232	E8	SMF26OSD	4	packed	Output processor start date, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description. This field is filled in when output service starts to process the job's data sets.
236	EC	SMF26OPT	4	binary	Output processor stop time, in hundredths of a second. This field is filled in when: 1) an RQ is removed from the writer queue, 2) all output OSEs are deleted/released, and 3) a request from the SYSOUT interface is processed.
240	F0	SMF26OPD	4	packed	Output processor stop date, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description. This field is filled in when: 1) an RQ is removed from the writer queue, 2) all output OSEs are deleted/released, and 3) a request from the SYSOUT interface is processed.

Actuals Section

Offsets		Name	Length	Format	Description
244	F4	SMF26LN3	2	binary	Length of actuals section, including this field.
246	F6	SMF26RV4	2		Reserved.
248	F8	SMF26ICD	4	binary	Number of input statements for the job. This field includes JCL and SYSIN statements.
252	FC	SMF26XLN	4	binary	Number of output lines generated to spool. This field if filled in when the job is ended on a JES3 local or global processor.
256	100	SMF26XPU	4	binary	Number of punched cards generated to spool. This field is filled in when the job is ended on a JES3 local or global processor.
260	104	SMF26RID	4	EBCDIC	Input processor system (CPU) identification.
264	108	SMF26CID	4	EBCDIC	Conversion processor system (CPU) identification.
268	10C	SMF26XID	4	EBCDIC	Execution processor system (CPU) identification.
272	110	SMF26OID	4	EBCDIC	Output processor system (CPU) identification.
276	114	SMF26JAF	42		Reserved for job accounting fields.
318	13E	NJEJMRID	8	EBCDIC	Networking identifier 'NJEJMR'.
326	146	NJEJMRLN	2	binary	Length of data that follows, including this field.
328	148	NJEJOBNO	2	EBCDIC	Original job number.
330	14A	NJEJOBNM	8	EBCDIC	Job name.
338	152	NJEXEQM	8	EBCDIC	Processing node name.
346	15A	NJEPRGMR	20	EBCDIC	Programmer name.
366	16E	NJEUSRID	8	EBCDIC	Origin or notify identification.
374	176	NJEACCT	8	EBCDIC	Networking account number.
382	17E	NJEDEPT	8	EBCDIC	Programmer's department number.
390	186	NJEBLDG	8	EBCDIC	Programmer's building number.
398	18E	NJEROOM	8	EBCDIC	Programmer's room number.
406	196	NJEXEQU	8	EBCDIC	Processing user identifier.
414	19E	NJETRANS	4		Reserved.
418	1A2	SMF26SRC	4	binary	Number of spool records.

Print Section

Offsets		Name	Length	Format	Description
0	0	SMF26LN6	2	binary	Length of print section, including this field.
2	2	SMF26EBT	4	binary	Estimated SYSOUT byte count.
6	6	SMF26XBT	4	binary	Actual SYSOUT byte count.
10	A	SMF26EPG	4	binary	Estimated page count.
14	E	SMF26XPG	4	binary	Actual page count. For page mode data sets, JES3 updated the page count when it encounters a “begin page” indicator in the data stream header.
18	12	SMF26EFM	8	EBCDIC	Output form number. This field is set regardless of the number of characters in the forms field.

Triplet Section

Offsets		Name	Length	Format	Description
50	32	SMF26LN7	2	binary	Length of triplet section.
52	34	SMF26OAG	4	binary	Offset of accounting section.
56	38	SMF26LAG	2	binary	Length of accounting section.
58	3A	SMF26NAG	2	binary	Number of accounting section.
60	3C	SMF26OWL	4		Offset of Workload Management section.
64	40	SMF26LWL	2	binary	Length of Workload Management section.
66	42	SMF26MWL	2	binary	Number of Workload Management sections.

Workload Management Section

Offsets		Name	Length	Format	Description
0	0	SMF26WCL	8	EBCDIC	Service class name at the time of execution.
8	8	SMF26WOC	8	EBCDIC	Original service class (assigned by WLM classification when the job finished conversion).
16	10	SMF26WIN	1	binary	Indicators **Bit** **Meaning When Set** **0** Job ran in MODE=WLM **1** Job ran because of F J=job, RUN **2-7** Reserved
17	11	SMF26WJC	8	EBCDIC	Eight character job class (padded on right with blanks).
25	19	SMF26WSE	16	EBCDIC	Sixteen character scheduling environment (padded on right with blanks).

Accounting Section

Offsets		Name	Length	Format	Description
0	0	SMF26LN8	2	binary	Length of accounting section.
2	2	SMF26NRA	1	binary	Number of accounting pairs.
3	3	SMF26AC1	variable	EBCDIC	An accounting pair consists of a 1-byte length field, which contains the length of the following string. The string contains accounting data. If the length field is zero, there is no following string.

Record Type 28 (1C) — NPM Statistics

The NetView Performance Monitor (NPM) writes record type 28 at user-specified intervals and contains network statistics.

Reference book

For more information about the type 28 record, see *NPM Installation and Customization Guide*.

Record Type 30 (1E) — Common Address Space Work

Reference book

SMFPRM*xx* parameters are described in *z/OS MVS Initialization and Tuning Reference*.

Information on system address spaces and full function start are described in *z/OS MVS Initialization and Tuning Guide*.

The type 30 SMF record provides accounting information. It consolidates data that is found in record types 4, 5, 20, 34, 35, and 40 (which simplifies accounting by installation-written post processing routines), and it provides additional information. Use record type 30, because the record types that it replaces are generally not being updated with new measurement data. SMF writes record type 30 when:

- A work unit (such as a TSO/E session, APPC/MVS transaction program, OMVS forked or spawned address space, started task, or batch job) starts. This subtype 1 record identifies the work unit but contains no resource data.
- An SMF interval ends, if you requested interval accounting.

  If this is the first interval since the work unit started, then this subtype 2 record contains the total resources used from the start of the work unit until the end of the current interval. With interval synchronization, this span of time is normally shorter than the length of the SMF global recording interval. For global interval recording without interval synchronization, this span of time is the same as the length of the SMF global recording interval.

  For other intervals, this subtype 2 record contains the total resources used from the end of the previous interval until the end of the current interval.

  For system address spaces that do not go through full function start, SMF generates a subtype 6 record that contains the total resources used since the start of the address space. Note that the data in the subtype 6 record is cumulative, unlike the subtype 2 record.
- A work unit (such as a TSO/E session, APPC/MVS transaction program, OMVS forked or spawned address space, started task, or batch job) completes.

  If you requested interval accounting, SMF generates a subtype 3 record that contains the total resources used from the end of the previous recording interval until the end of the work unit. This span of time is normally shorter than the length of the specified recording interval.

  For a job step, SMF generates a subtype 4 record that contains the total resources used from the time when the job step started until the time when the job step completed. If you requested interval recording, then this subtype 4 record generally contains the accumulated totals of the data in the interval subtype 2 and subtype 3 records that were generated for the step.

For a job, SMF generates a subtype 5 record that contains the total resources used from the time when the job started until the time when the job completed. This subtype 5 record generally contains the accumulated totals of the data in the step total subtype 4 records that were generated for the job.

For a description of the use of record type 30 for interval accounting, see “Performing interval accounting” on page 4-3.

The type 30 record contains operation information such as the job and step start and end times, step CPU time, step termination status, number of records in DD DATA and DD * data sets processed by the step and job, device allocation start time, problem program start time, and storage protect key. The record contains the number of page-ins, page-outs, swap-ins, and swap-outs for both virtual input output (VIO) and non-VIO data sets. The record contains information on the number of hiperspace page moves and the movement of pages between expanded storage and central storage. This data can be used in resource planning. Information is added to account for time spent in hiperspace processing on a step or interval basis. The record contains an entry for each data set defined by a DD statement or dynamic allocation. Each entry lists the device class, unit type, device number, the execute channel program (EXCP) count, and device connect time for the data set. The usage data section contains information that can be used to attribute usage of a product to the address space.

The type 30 record can be used with subtype selectivity function. Refer to “Selecting subtypes” on page 4-2 for a description of subtype selectivity. The subtypes are:

Subtype	Meaning
1	Job start or start of other work unit
2	Activity since previous interval ended
3	Activity for the last interval before step termination
4	Step total
5	Job termination or termination of other work unit
6	System address space, which did not go through full function start

Information in specific fields may differ for different subtypes. For example, the record identifies the job (and job step) by the:

- Job log identification (job name, time and date that the reader recognized the job card for this job).
- Step name
- Number of the step within the job
- User identification
- Program name
- Performance group number or service class name
- JES job number.

If accounting numbers (which can be alphameric) are specified in the JOB or EXEC statements, they are included. For subtype 1 and subtype 5, the accounting numbers are taken from the JOB statement. For all other subtypes, the accounting numbers are taken from the EXEC statement.

Because some of the information necessary to complete a field is not always available when a type 30 record is written, some fields might be empty. For example, the SMF30AST, SMF30PPS, SMF30SIT, and SMF30STD fields are not filled in for a subtype 1 record.

Because system address spaces do not use full function start, the subtype 6 record is incomplete; that is, only certain fields in each section are valid. All unused fields are set to zero or blank.

The subtype 6 records are written only at the expiration of an interval; the values are cumulative and indicate data collected since the initialization of the address space. If a system address space later goes through full function start, data is not reported for the period between the expiration of the previous interval and the time that the address space goes through full function start. The subtype 6 record contains data for the APPC/MVS Cumulative Resource section, but data in the APPC/MVS Resource section is not reported in subtype 6.

The length of record type 30 is variable. The maximum length of the type 30 record is 32,756 bytes. If the volume of data in the type 30 record is such that the length would exceed the maximum length, one or more additional type 30 records are produced. The additional records contain only the header/self-defining, subsystem, identification, and one or more sections that can repeat. An example of a section that can repeat is the execute channel program (EXCP) section.

Note: The following rules apply to all subtypes (except subtype 1). When examining a type 30 record:

- A record is the first record if at least one of the following fields is non-zero:
  - SMF30AON
  - SMF30ARN
  - SMF30CON
  - SMF30DRN
  - SMF30OON
  - SMF30PON
  - SMF30RON
  - SMF30TON
  - SMF30UON
- A record is an additional record if the following fields are all zero:
  - SMF30AON
  - SMF30ARN
  - SMF30CON
  - SMF30DRN
  - SMF30OON
  - SMF30PON
  - SMF30RON
  - SMF30TON
  - SMF30UON
- In either a **first** or **additional** record:
  - there are more records to follow if at least one of the following fields is non-zero:
    - SMF30EOS
    - SMF30MOS
    - SMF30OPM
    - SMF30RMS
    - SMF30UDS
  - this is the **last** record if the following fields are all zero:

- SMF30EOS
- SMF30MOS
- SMF30OPM
- SMF30RMS
- SMF30UDS

The IEFACTRT exit will be called, at step and job termination, for each type 30 (subtype 4 and subtype 5) record written to the SMF data set. A separate call to IEFACTRT is made for each additional record, as defined above.

Notes:

1. Data sets are recorded in the order of the DD statements; they are not identified by name. However, the data definition name (ddname) is included in the record. (An installation-written IEFUJV exit routine can record this order as each statement is validated). For concatenated DD statements, the ddname is the same on each entry, respectively.
2. CPU time is not expected to be constant between different runs of the same job step. For more information on EXCP count and CPU time, see Chapter 10, “EXCP Count” and Chapter 11, “CPU Time.”
3. If the SMFPRM*xx* parameter DDCONS(YES) is specified, then duplicate execute channel program (EXCP) entries are consolidated. If DDCONS(NO) is specified, then duplicate EXCP entries are not consolidated. SMFPRM*xx* parameters are described in *z/OS MVS Initialization and Tuning Reference*.
4. If a section is not included in the record, the “number of” entry is zero. For example, subtype 1 does not have a completion segment, and SMF30TON is set to zero to indicate this.
5. If the IEFUSI exit changes the size of the private area, a flag is set in SMF30SFL in the paging and storage section.
6. Specifying the DETAIL parameter of the SMFPRM*xx* parmlib member for STC includes all EXCP sections in subtypes 4 and 5 for the step or job. Specifying the NODETAIL parameter excludes EXCP sections from subtypes 4 and 5 for STC class subsystem jobs, but not for batch or TSO/E subsystems.

Record Environment

The following conditions exist for the generation of each of the subtypes of this record:

Macro
SMFEWTM, BRANCH=YES (record exit: IEFU84)

Mode

Subtype	Mode
1,3,4,5	Task
2, 6	SRB

Storage Residency
31-bit

SUBSYS
Current value for address space being reported on (see SMF30WID field)

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number) that locate the other sections on the record.

This triplet information should be checked prior to accessing a section of the record. All three fields being non-zero mean that the section exists on the record; conversely any of the fields being zero indicates that the section does not exist on the record. The 'number' triplet field is the primary indication of the existence of the field.

Offsets		Name	Length	Format	Description
0	0	SMF30LEN	2	binary	Record Length. This field along with the next, are referred to as the RDW (record descriptor word). See "Standard SMF Record Header" on page 13-1 for a detailed description.
2	2	SMF30SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF30FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0** Subsystem identification follows system identification **1** Subtypes used **2** Reserved **3-6** Version indicators* **7** Reserved. *See "Standard SMF Record Header" on page 13-1 for a detailed description.
5	5	SMF30RTY	1	binary	Record type 30 (X'1E').
6	6	SMF30TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved to the SMF buffer.
10	A	SMF30DTE	4	packed	Date that the record was moved to the SMF buffer, in the form 0*cyydddF* (in local time). See "Standard SMF Record Header" on page 13-1 for a detailed description.
14	E	SMF30SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF30WID	4	EBCDIC	Work type indicator for the address space. The value identifies the type of address space that is being reported on (for example: "STC" for started tasks and system address spaces, "TSO" for TSO/E users, etc).
22	16	SMF30STP	2	binary	Record subtype. For a list of the record subtypes, see page 13-116.
24	18	SMF30SOF	4	binary	Offset to subsystem section from start of record, including the record descriptor word (RDW).
28	1C	SMF30SLN	2	binary	Length of subsystem section.
30	1E	SMF30SON	2	binary	Number of subsystem sections.
32	20	SMF30IOF	4	binary	Offset to identification section from start of record, including the record descriptor word (RDW).
36	24	SMF30ILN	2	binary	Length of identification section.
38	26	SMF30ION	2	binary	Number of identification sections.
40	28	SMF30UOF	4	binary	Offset to I/O activity section from start of record, including the record descriptor word (RDW).
44	2C	SMF30ULN	2	binary	Length of I/O activity section.
46	2E	SMF30UON	2	binary	Number of I/O activity sections.
48	30	SMF30TOF	4	binary	Offset to completion section from start of record, including the record descriptor word (RDW).
52	34	SMF30TLN	2	binary	Length of completion section.
54	36	SMF30TON	2	binary	Number of completion sections.
56	38	SMF30COF	4	binary	Offset to processor section from start of record, including the record descriptor word (RDW).
60	3C	SMF30CLN	2	binary	Length of processor section.
62	3E	SMF30CON	2	binary	Number of processor sections.

Offsets		Name	Length	Format	Description
64	40	SMF30AOF	4	binary	Offset to accounting section from start of record, including the record descriptor word (RDW).
68	44	SMF30ALN	2	binary	Total length of the single accounting section.
70	46	SMF30AON	2	binary	Number of variable length text segments.
72	48	SMF30ROF	4	binary	Offset to storage section from start of record, including the record descriptor word (RDW).
76	4C	SMF30RLN	2	binary	Length of storage section.
78	4E	SMF30RON	2	binary	Number of storage sections.
80	50	SMF30POF	4	binary	Offset to performance section from start of record, including the record descriptor word (RDW).
84	54	SMF30PLN	2	binary	Length of the performance section.
86	56	SMF30PON	2	binary	Number of performance sections.
88	58	SMF30OOF	4	binary	Offset to operator section from start of record, including the record descriptor word (RDW).
92	5C	SMF30OLN	2	binary	Length of the operator section.
94	5E	SMF30OON	2	binary	Number of operator sections.
96	60	SMF30EOF	4	binary	Offset to the execute channel program (EXCP) section from start of record, including the record descriptor word (RDW).
100	64	SMF30ELN	2	binary	Length of the execute channel program (EXCP) section, in this record.
102	66	SMF30EON	2	binary	Number of execute channel program (EXCP) sections in this record.
104	68	SMF30EOR	2	binary	Number of execute channel program (EXCP) sections in subsequent records. When this number exceeds two bytes, it is invalid. See SMF30EOS for the correct value.
106	6A	SMF30RVD	2		Reserved.
108	6C	SMF30EOS	4	binary	Number of execute channel program (EXCP) sections in subsequent records.
112	70	SMF30DRO	4	binary	Offset to APPC/MVS resource section from start of record, including the record descriptor word (RDW).
116	74	SMF30DRL	2	binary	Length of APPC/MVS resource section.
118	76	SMF30DRN	2	binary	Number of APPC/MVS resource sections in this record (this number is 0 or 1).
120	78	SMF30ARO	4	binary	Offset to APPC/MVS cumulative resource section from start of record, including the record descriptor word (RDW).
124	7C	SMF30ARL	2	binary	Length of APPC/MVS cumulative resource section.
126	7E	SMF30ARN	2	binary	Number of APPC/MVS cumulative resource sections in this record (this number is 0 or 1).
128	80	SMF30OPO	4	binary	Offset to OpenMVS process section.
132	84	SMF30OPL	2	binary	Length of OpenMVS process section.
134	86	SMF30OPN	2	binary	Number of OpenMVS process sections on current record.
136	88	SMF30OPM	4	binary	Number of OpenMVS process sections on subsequent records.
140	8C	SMF30UDO	4	binary	Offset to first usage data section from the start of the record, including the record descriptor word (RDW).
144	90	SMF30UDL	2	binary	Length of each usage data section - ‘76’.
146	92	SMF30UDN	2	binary	Number of usage data sections in this record.
148	94	SMF30UDS	4	binary	Number of usage data sections in subsequent records.
152	98	SMF30RMO	4	binary	Offset to first automatic restart management section.
156	9C	SMF30RML	2	binary	Length of automatic restart management section.
158	9E	SMF30RMN	2	binary	Number of automatic restart management sections.

Offsets		Name	Length	Format	Description
160	A0	SMF30RMS	4	binary	Number of automatic restart management sections in subsequent records.
164	A4	SMF30MOF	4	binary	Offset to the Multisystem Enclave Remote Data section.
168	A8	SMF30MLN	2	binary	Length of MultiSystem Enclave Remote System Data section.
170	AA	SMF30MNO	2	binary	Number of MultiSystem Enclave Remote System Data sections in this record.
172	AC	SMF30MOS	4	binary	Number of MultiSystem Enclave Remote System Data sections in subsequent records.

Subsystem Section

This section contains general record and system identification information that you can use to determine the level of information on the rest of the record.

Triplet Information: This section is located on the record using the following triplet fields, which are located in the 'header/self-defining' section:

Offset SMF30SOF

Length SMF30SLN

Number SMF30SON - This field will always be '1' as this section is on each of the Type 30 records that is generated.

Offsets		Name	Length	Format	Description
0	0	SMF30TYP	2	binary	Subtype identification **Value** **Meaning** **1** Job start or start of other work unit. **2** Activity since previous interval ended. Produced only when interval recording is active. **3** Activity for the last interval before step termination. Produced only when interval recording is active. **4** Step total **5** Job termination or termination of other work unit. **6** System address space.
2	2	SMF30RS1	2		Reserved.
4	4	SMF30RVN	2	EBCDIC	Record version number **Value** **Meaning** **C'05'** MVS/SP Version 5 **X'04'** MVS/SP Version 4 **X'03'** MVS/SP Version 3 **X'02'** MVS/SP Version 2 **X'01'** VS2
6	6	SMF30PNM	8	EBCDIC	Subsystem or product name, for example SMF.
14	E	SMF30OSL	8	EBCDIC	MVS software level (consists of an acronym and the version, release, and modification level numbers).
22	16	SMF30SYN	8	EBCDIC	System name (from the SYSNAME parameter in the IEASYSxx parmlib member).
30	1E	SMF30SYP	8	EBCDIC	Sysplex name (from the SYSPLEX parameter in the COUPLExx parmlib member).

Identification Section

This section contains general address space and user information which can be used to identify the address space that the data is being reported for or to merge this record with other records that are generated for this address space.

Triplet Information: This section is located on the record using the following triplet fields, which are located in the 'header/self-defining' section:

Offset SMF30IOF

Length SMF30ILN

Number SMF30ION - This field will always be '1' as this section is on each of the Type 30 records that are generated.

Offsets		Name	Length	Format	Description
0	0	SMF30JBN	8	EBCDIC	Job or session name. The job name, time and date that the reader recognized the JOB card (for this job) constitute the job log identification.
8	8	SMF30PGM	8	EBCDIC	Program name (taken from PGM= parameter on EXEC card). If a backward reference was used, this field contains PGM=*.DD.
16	10	SMF30STM	8	EBCDIC	Step name (taken from name on EXEC card).
24	18	SMF30UIF	8	EBCDIC	User-defined identification field (taken from common exit parameter area, not from USER=parameter on job statement).
32	20	SMF30JNM	8	EBCDIC	JES job identifier. Jobs scheduled by the APPC/MVS transaction scheduler (ASCH) start with an "A" followed by a seven-digit number.
40	28	SMF30STN	2	binary	Step number (first step = 1, etc.).
42	2A	SMF30CLS	1	binary	Job class (blank for TSO/E session or started tasks).
43	2B	SMF30JF1	1	binary	Flag word **Bit** **Meaning When Set** **0** Job/Session ID section flag **1-7** Reserved.
44	2C	SMF30PGN	2	binary	Beginning with z/OS V1R3, this field is always zero.
46	2E	SMF30JPT	2	binary	JES input priority. If no value is specified for the PRTY parameter (on the JOB card), this field contains: • For JES3, the default priority specified on the JES3 STANDARDS initialization card • For JES2, a zero. Note that JES2 does not use the priority value reported in the field. (The JES2 job selection priority is requested via the JES2 PRIORITY control statement.)
48	30	SMF30AST	4	binary	Device allocation start time, in hundredths of a second.
52	34	SMF30PPS	4	binary	Problem program start time, in hundredths of a second.
56	38	SMF30SIT	4	binary	Time since midnight, in hundredths of a second, that the initiator selected this step or job.
60	3C	SMF30STD	4	packed	Date that the initiator selected this step, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
64	40	SMF30RST	4	binary	Time since midnight, in hundredths of a second, that the reader recognized the JOB card (for this job).
68	44	SMF30RSD	4	packed	Date that the reader recognized the JOB card (for this job), in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
72	48	SMF30RET	4	binary	Time since midnight, in hundredths of a second, that the reader recognized the end of the job or started task (reader stop time). For TSO/E this is the logon enqueue time.

Offsets		Name	Length	Format	Description
76	4C	SMF30RED	4	packed	Date that the reader recognized the end of the batch job or started task (reader stop date), in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
80	50	SMF30USR	20	EBCDIC	Programmer’s name.
100	64	SMF30GRP	8	EBCDIC	RACF group ID. 0 = RACF is not active.
108	6C	SMF30RUD	8	EBCDIC	RACF user ID. 0 = RACF is not active.
116	74	SMF30TID	8	EBCDIC	RACF terminal ID. This field is zero if RACF is not active (or the user is not a terminal user).
124	7C	SMF30TSN	8	EBCDIC	Terminal symbolic name.
132	84	SMF30PSN	8	EBCDIC	The name of the step that invoked the procedure. This field contains blanks if not part of a procedure.
140	8C	SMF30CL8	8	EBCDIC	8-character job class (left justified, padded with blanks). For JES2, taken from the SMF30CLS field (if not specified), blank for TSO session or started tasks. For JES3, taken from CLASS= parameter on //* MAIN card (if valid), or the default (JES3BATCH).
148	94	SMF30ISS	8	binary	Time and date that the interval started for subtype 2 and 3 records, in time-of-day (TOD) format, an unsigned 64-bit fixed-point number where bit 51 is equivalent to 1 microsecond. The representation of this value in local time is stored in SMF30IST and SMF30IDT. Variations in setting the local time can make the times appear to be out of synchronization.
156	9C	SMF30IET	8	binary	Time and date that the interval ended for subtype 2 and 3 records, in time-of-day (TOD) format, an unsigned 64-bit fixed-point number where bit 51 is equivalent to 1 microsecond. If you requested synchronized interval recording, you can use this field to compare this record with other records generated at the end of the same interval. If the address space being reported was not swapped in when the interval ended then the time contained in this field might be earlier than the time that the record was generated.
164	A4	SMF30SSN	4	binary	Substep number. This field is set to zero for non-OpenMVS steps. When the OpenMVS `exec` function is requested, a new substep is begun and this value is incremented.
168	A8	SMF30EXN	16	binary	Program name. For a z/OS UNIX program, this contains the name, for up to 16 bytes, starting after the last slash in the filename, of the program that was run. The z/OS UNIX name ends with the null character X'00'. For an MVS program, it is an unqualified name of up to 8 characters of the program that was executed. The MVS program name is padded with blanks to a length of 16 characters. For example, for a z/OS UNIX name of **/usr/joe/somepgm**, the field in SMF record type 30 is **somepgm** ended by X'00'. For a z/OS UNIX name of **/usr/joe/someverylongprogramname**, the field is truncated to **someverylongprog**.

I/O Activity Section

This section contains the summary I/O information at the address space level. This differs from the I/O information in the EXCP sections of the record which present the data at a DD Name/Device level.

Triplet Information: This section is located on the record using the following triplet fields, which are located in the 'header/self-defining' section:

Offset SMF30UOF

Length SMF30ULN

Number SMF30UON - Reports the number of I/O activity sections on the current record. Because only one I/O activity section can appear on the record, this field is '1' (if the section exists) or '0' (if it doesn't).

Offsets		Name	Length	Format	Description
0	0	SMF30INP	4	binary	Number of card-image records in DD DATA and DD* data sets read by the reader for the map. This field is not set for subtypes 2 or 3.
4	4	SMF30TEP	4	binary	Total blocks transferred (accumulated execute channel program (EXCP) counts).
8	8	SMF30TPT	4	binary	Number of TPUTS (terminal writes) for a TSO/E session. If a batch job or a started task successfully processes TPUTs, this field might be non-zero for batch jobs or started tasks.
12	C	SMF30TGT	4	binary	Number of TGETS (terminal reads) for a TSO/E session.
16	10	SMF30RDR	1	binary	Reader device class as defined in JESPARMS. 0 — for TSO/E sessions or started tasks.
17	11	SMF30RDT	1	binary	Reader device type as defined in JESPARMS. 0 — for TSO/E sessions or started tasks.
18	12	SMF30TCN	4	binary	Total device connect time (in 128 micro-second units) for this address space. For a DIV object, this field contains total device connect time for reads, writes, and re-reads.
22	16	SMF30DCF	4	binary	Flag word **Bit** **Meaning When Set** **0** Device connect time may be incorrect If this flag is set, the system resources manager (SRM) disabled the channel measurement while the job was running. If channel measurement is disabled, device connect time is not recorded. Thus, if this bit is set, SMF30TCN and SMF30DCT reflect less than the actual total connect time. **1** If this bit is on, the following fields contain incomplete data: (SRM could not deliver deltas or values for this interval) SMF30AIC SMF30EIC SMF30AID SMF30EID SMF30AIW SMF30EIW SMF30AIS SMF30EIS **2-31** Reserved.
26	1A	SMF30RSB	2		Reserved.
28	1C	SMF30TRR	4	binary	Total address space REREAD count.
32	20	SMF30AIC	4	binary	DASD I/O connect time, in 128-microsecond units, for address space plus dependent enclaves.
36	24	SMF30AID	4	binary	DASD I/O disconnect time, in 128-microsecond units, for address space plus dependent enclaves.
40	28	SMF30AIW	4	binary	DASD I/O pending plus control unit queue time, in 128-microsecond units, for address space plus dependent enclaves.
44	2C	SMF30AIS	4	binary	DASD I/O start subchannel count for address space plus dependent enclaves.

Offsets		Name	Length	Format	Description
48	30	SMF30EIC	4	binary	DASD I/O connect time, in 128-microsecond units, for indpendent enclaves owned by the address space.
52	34	SMF30EID	4	binary	DASD I/O disconnect time, in 128-microsecond units, for independent enclaves owned by the address space.
56	38	SMF30EIW	4	binary	DASD I/O pending plus control unit queue time, in 128-microsecond units, for independent enclaves owned by the address space.
60	3C	SMF30EIS	4	binary	DASD I/O start subchannel count for independent enclaves.

Completion Section

This section contains the completion information for the step on the Step Termination record (Subtype-4) and for the job on the Job Termination record (Subtype-5).

This section does not appear on the Job Initialization (Subtype-1) or Interval (Subtype-2 and 3) records.

Note: The SMF30STI field also contains some general record indicator flags which are not necessarily completion in nature. The system may fail a step or job even if the return code is zero. This could happen, for example, as a result of specifying CATLG_ERR FAILJOB(YES) and incurring that type of post execution error. (A return code is generated by the application program and is never changed by the operating system.) A user can deduce that a step failed due to a “post execution error” if bit SMF30SYE in the two-byte SMF30STI field in the SMF30 subtype 4 record is on.

Triplet Information: This section is located on the record using the following triplet fields, which are located in the ‘header/self-defining’ section:

Offset SMF30TOF

Length SMF30TLN

Number SMF30TON - Reports the number of completion sections on the current record. Because only one completion section can appear on the record, this field is ‘1’ (if the section exists) or ‘0’ (if it doesn’t).

Offsets		Name	Length	Format	Description
0	0	SMF30SCC	2	binary	Step completion code: X'0ccc' indicates system abnormal end of task (abend) in the job step where *ccc* is the system abend code. (See *z/OS MVS System Codes*.) X'8ccc' indicates user abend in the job step where *ccc* is the user abend code. X'nnnn' indicates normal completion where *nnnn* is the contents of the two low-order bytes in register 15 at termination. X'0000' indicates either: 1. The job step was flushed (not processed) because of an error during allocation or in a preceding job step, or 2. Normal job completion with a return code of 0. Use this field in conjunction with the job/step termination indicator field, SMF30STI. Job completion code: X'0ccc' indicates system ABEND in the last job step where *ccc* is the system abend code. (See *z/OS MVS System Codes*.) X'8ccc' indicates user abend in the job step where *ccc* is the user abend code. X'nnnn' indicates normal completion where *nnnn* is the contents of the two low-order bytes in register 15 at termination. X'0000' indicates either: (see note) 1. The last job step was flushed (not processed) because of an error during allocation or in a preceding job step, or 2. Normal job completion with a return code of 0. Use this field in conjunction with the job/step termination indicator field, SMF30STI. **Note:** When a step in a multi-step job terminates abnormally, the subsequent steps, whether executed or flushed, do not propagate the step abend code for processing this record. The code appears in the step termination record (subtype 4). In this case, the field, SMF30SCC, can contain X'nnnn' or X'0000'. If an abend occurred in the job, the job termination indicator (bit 7 in the SMF30STI field).

Offsets		Name	Length	Format	Description
2	2	SMF30STI	2	binary	Step/Job termination indicator **Bit** **Meaning When Set** **0** Reserved **1** Canceled by exit IEFUJV **2** Canceled by exit IEFUJI **3** Canceled by exit IEFUSI **4** Canceled by exit IEFACTRT **5** Step is to be restarted **6** If zero, then normal completion. If 1, then abnormal end of task (abend). If step completion code equals 0322 or 0522, then IEFUTL caused the abend. If step completion code equals 0722, then IEFUSO caused the abend. **7** If zero, then normal completion. If 1, then step was flushed. **8** EXCP counts might be incorrect because the record did not include all the DD statements. **9** Previous interval record was not written because an error occurred. The cumulative count might be incorrect because the counters were cleared. **10** EXCP sections were not merged from the interval to the step record or from the step to the job record **11** Step completed with a "post execution" error. Post-execution errors include a failure that occurred because the ALLOCxx parmlib member specified CATLG_ERR FAILJOB(YES). **12** Step completed due to OpenMVS `exec` function request. **13** JOB abnormally ended because of COND= condition on the JOB card. This flag will be set on in the subtype 5 job termination record only. **14-15** Reserved.
4	4	SMF30ARC	4	binary	Abend reason code.

Processor Accounting Section

This section contains various Processor times for the address space for the period that the record represents.

Triplet Information: This section is located on the record using the following triplet fields, which are located in the 'header/self-defining' section:

Offset SMF30COF

Length SMF30CLN

Number SMF30CON - Reports the number of processor accounting sections on the current record. Because only one processor accounting section can appear on the record, this field is '1' (if the section exists) or '0' (if it doesn't).

Offsets		Name	Length	Format	Description
0	0	SMF30PTY	2	binary	Reserved.

Offsets		Name	Length	Format	Description
2	2	SMF30TFL	2	binary	Invalid timer flags **Bit** **Meaning When Set** **0** Indicates that timer flags are used. **1** SMF30CPT has an invalid value due to a timer value calculation error. **2** SMF30CPS has an invalid value due to a timer value calculation error. **3** SMF30JVU has an invalid value due to a timer value calculation error. **4** SMF30JVA has an invalid value due to a timer value calculation error. **5** SMF30ISB has an invalid value due to a timer value calculation error. **6** SMF30ICU has an invalid value due to a timer value calculation error. **7** SMF30IVU has an invalid value due to a timer value calculation error. **8** SMF30IVA has an invalid value due to a timer value calculation error. **9** SMF30IIP has an invalid value due to a timer value calculation error. **10** SMF30HPT has an invalid value due to a timer value calculation error. **11** SMF30RCT has an invalid value due to a timer value calculation error. **12** SMF30ASR has an invalid value due to a timer value calculation error. **13** SMF30ENC has an invalid value due to a timer value calculation error. **14** SMF30DET has an invalid value due to a timer value calculation error. **15** Reserved.
4	4	SMF30CPT	4	binary	All standard CPU step time in hundredths of a second. Includes enclave time, preemptable class SRB time, client SRB time. Also includes time consumed by IFA eligible work running on a standard processor. For time spent on an IFA, see SMF30_TIME_ON_IFA. Note that a workload may generate different values for SMF30CPT if some IFA eligible work runs on a standard processor. If a repeatable value is more desirable than the possible performance benefits of letting IFA eligible work run on both IFAs and standard processors, specify IFACROSSOVER=NO in the IEAOPTxx parmlib member. | This value includes the value in field SMF30OST.
8	8	SMF30CPS	4	binary	Step CPU time under the service request block (SRB), in hundredths of a second. | This value includes the value in field SMF30OST.
12	C	SMF30ICU	4	binary	Initiator CPU time under the task control block (TCB), in hundredths of a second. This field is set at step termination.
16	10	SMF30ISB	4	binary	Initiator CPU time under the service request block (SRB), in hundredths of a second. This field is set at step termination.
20	14	SMF30JVU	4	binary	Step vector CPU time, in hundredths of a second.
24	18	SMF30IVU	4	binary	Initiator vector CPU time, in hundredths of a second. This field is set at step termination.
28	1C	SMF30JVA	4	binary	Step vector affinity time, in hundredths of a second.
32	20	SMF30IVA	4	binary	Initiator vector affinity time, in hundredths of a second. This field is set at step termination.
36	24	SMF30IST	4	binary	Interval start time for type 30 subtype 2 and 3 records, in hundredths of a second.
40	28	SMF30IDT	4	packed	Interval start date for type 30 subtype 2 and 3 records, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
44	2C	SMF30IIP	4	binary	Amount of CPU time used to process I/O interrupts, in hundredths of a second.

Offsets		Name	Length	Format	Description
48	30	SMF30RCT	4	binary	Amount of CPU time used by the region control task (RCT), in hundredths of a second.
52	34	SMF30HPT	4	binary	CPU time consumed for the step, in hundredths of a second, to support requests for data to be transferred between a hiperspace and an address space, when the hiperspace is backed by expanded storage. The CPU time may vary depending on the availability of expanded storage.
56	38	SMF30CSC	4	binary	Integrated Cryptographic Service Facility/MVS (ICSF/MVS) service count. This is the number of cryptographic instructions executed on behalf of caller (within caller's address space).
60	3C	SMF30DMI	4	binary	ADMF-Number of pages moved with ADMF WRITE operation.
64	40	SMF30DMO	4	binary	ADMF-Number of pages moved with ADMF READ operation.
68	44	SMF30ASR	4	binary	Additional CPU time accumulated by the preemptable SRBs and client SRBs for this job, in hundredths of a second. This value is also included in the value in SMF30CPT.
72	48	SMF30ENC	4	binary	CPU time used by the independent enclave, but only when in the WLM enclave. Note that independent enclave time on an IFA is not included. See field SMF30_ENCLAVE_TIME_ON_IFA for that value. SMF30ENC is also part of the value in SMF30CPT.
76	4C	SMF30DET	4	binary	CPU time used by the dependent enclave, but only when in the WLM enclave. Note that dependent enclave time on an IFA is not included - see field SMF30_DEP_ENCLAVE_TIME_ON_IFA for that value. SMF30DET is also part of the value in SMF30CPT.
80	50	SMF30CEP	4	binary	Cumulative CPU time consumed for an address space or job while enqueue promoted (in 1.024 millisecond units).
84	54	SMF30TF2	2	binary	Additional timer flags **Bit** **Meaning When Set** **0** SMF30_TIME_ON_IFA has an invalid value due to a timer value calculation error. **1** SMF30_ENCLAVE_TIME_ON_IFA has an invalid value due to a timer value calculation error. **2** SMF30_DEP_ENCLAVE_TIME_ON_IFA has an invalid value due to a timer value calculation error. **3** SMF30_TIME_IFA_ON_CP has an invalid value due to a timer value calculation error. **4** SMF30_ENCLAVE_TIME_IFA_ON_CP has an invalid value due to a timer value calculation error. **5** SMF30_DEP_ENCLAVE_TIME_IFA_ON_CP has an invalid value due to a timer value calculation error.
86	56		2	binary	Reserved.
88	58	SMF30_TIME_ON_IFA	4	binary	CPU time spent on IFA in hundredths of a second (including enclave time).
92	5C	SMF30_ENCLAVE_TIME_ON_IFA	4	binary	Enclave time spent on IFA in hundredths of a second.
96	60	SMF30_DEP_ENCLAVE_TIME_ ON_IFA	4	binary	Dependent enclave time spent on IFA in hundredths of a second.
100	64	SMF30_TIME_IFA_ ON_CP	4	binary	CPU time spent running IFA eligible work on a standard CP in hundredths of a second (including enclave time).
104	68	SMF30_ENCLAVE_TIME_ IFA_ON_CP	4	binary	IFA Enclave time spent on a standard CP in hundredths of a second.
108	6C	SMF30_DEP_ENCLAVE_ TIME_IFA_ON_CP	4	binary	IFA Dependent enclave time spent on a standard CP in hundredths of a second.
112	70	SMF30CEPI	4	binary	CPU time consumed for an address space or job while enqueue promoted (in 1.024 millisecond units). Contains only the time consumed during the interval (not cumulative).

Execute Channel Program (EXCP) Section

This section contains the I/O information for a specific DD Name/Device address pair for the address space. There can be multiple EXCP sections for a given address space.

Triplet Information: This section is located on the record using the following triplet fields, which are located in the 'header/self-defining' section:

Offset SMF30EOF

Length SMF30ELN

Number SMF30EON - Reports the number of EXCP sections on the current record.

This section also has additional control fields in the 'header/self-defining' section:

- SMF30EOS reports the number of EXCP sections for the current period on Subsequent Type 30 records. These are known as the 'chained' Type 30 records.
- SMF30EOR also reports this same information but is only a 2 byte field which can overflow so SMF30EOS is the preferred field for processing this data.

Offsets		Name	Length	Format	Description
0	0	SMF30EXP	30	structure	Data set access information. **Note:** Virtual I/O devices are identified by the following: Device Class 0 Unit Type 0 Device Number X'7FFF' It is important to understand the following: Allocation messages for VIO data sets will show VIO ALLOCATED TO ddname. SMF records will show VIO unit addresses as X'7FFF'. The actual in-storage UCB built for VIO will show address X'3FFF'. For example, the messages: • IEF237I X'3FFF' ALLOCATED TO ddname • IEF237I X'7FFF' ALLOCATED TO ddname indicate that ddname is not allocated to a Virtual I/O device, but is instead allocated to a real device whose unit address is X'3FFF' or X'7FFF' respectively.
0	0	SMF30DEV	1	binary	Device class.
1	1	SMF30UTP	1	binary	Unit type.
2	2	SMF30CUA	2	binary	Device number.
4	4	SMF30DDN	8	EBCDIC	DD Name used to access the data set.
12	C	SMF30BLK	4	binary	Count of blocks issued for the device against the data set.
16	10	SMF30BSZ	2	binary	Largest blocksize of the data set **Bit** **Meaning When Set** **0** Indicated changed blocksize for the data set. Post processors should use this field to avoid the possibility of negative numbers. **1-15** Largest blocksize of the data set.
18	12	SMF30DCT	4	binary	Device connect time for this data set (in 128 micro-second units). For DIV object, device connect time is not collected by SMF; however, this field may not always be zero. For example, if a user is using a DIV data set and calls a VSAM utility to process it using the same DD statement, this will result in device connect time being charged by VSAM to the DIV object.
22	16	SMF30XBS	8	binary	Block size value.

Accounting Section

This section contains the user accounting information for the address space and the unit of work that is being reported on.

The JOB level accounting information, taken from the ACCT parm of the JOB card is presented on the Job records for the address space (Subtype-1 and Subtype-5); while STEP level accounting information, taken from the ACCT parm of the EXEC card is presented on the Step records for the address space (Subtype-2, Subtype-3 and Subtype-4).

The format of the data in the section is continuous 'internal text' which is:

Length: 1 Byte; '0' indicates no associated accounting field

Field Variable - length defined by previous 'length' field

Triplet Information: This section is located on the record using the following triplet fields, which are located in the 'header/self-defining' section:

Offset SMF30AOF

Length SMF30ALN

Number SMF30AON - This field will contain the number of 'subsections' in the accounting section (which each subfield is defined above).

Offsets		Name	Length	Format	Description
0	0	SMF30ACL	1	binary	Length of accounting section (excluding this field).
1	1	SMF30ACT	*variable*	EBCDIC	Job or step accounting field.

Storage and Paging Section

This section contains the statistics on the use of different kinds of storage by the address space and the different kinds of paging activity for the address space.

Triplet Information: This section is located on the record using the following triplet fields, which are located in the 'header/self-defining' section:

Offset SMF30ROF

Length SMF30RLN

Number SMF30RON - Reports the number of storage and paging sections on the current record. Because only one storage and paging section can appear on the record, this field is '1' (if the section exists) or '0' (if it doesn't).

Offsets		Name	Length	Format	Description
0	0	SMF30RSV	2		Reserved. Note that SMF30RGN, formerly a two-byte field at this offset, has been increased to four bytes and moved to the end of the Storage and Paging Section.

Offsets		Name	Length	Format	Description
2	2	SMF30SFL	1	binary	Storage Flags. If storage was not allocated (job step was flushed), these fields equal zero. **Bit** **Meaning When Set** **0** V=R is specified. This bit has no meaning for subtype 5 records. **1** IEFUSI changed region limit values for the extended private area **2** IEFUSI changed memlimit value. **3** If this bit is on, the following fields contain incomplete data: (SRM could not deliver deltas or values for this interval) SMF30ERS SMF30KIE SMF30POA SMF30BIA SMF30KOA SMF30POE SMF30BIE SMF30KOE SMF30PSC SMF30BOA SMF30LPI SMF30PSF SMF30BOE SMF30NSW SMF30PSO SMF30CPI SMF30PAI SMF30PST SMF30CPM SMF30PEI SMF30VPI SMF30HPI SMF30PIA SMF30VPO SMF30HPO SMF30PIE SMF30VPR SMF30KIA **4-7** Reserved.
3	3	SMF30SPK	1	binary	Storage protect key, in the form *xxxx*0000 where *xxxx* is the key.
4	4	SMF30PRV	2	binary	Largest amount of storage used from bottom of private area, in 1 K units. This storage area includes subpools 0-127, 129–132, 244, 251 and 252. If ADDRSPC=REAL is specified, this field equals the amount of contiguous real storage that was used.
6	6	SMF30SYS	2	binary	Largest amount of storage used from top of private area, in 1K units. This storage area includes the local system queue area (LSQA) and the SWA — subpools 229, 230, 236, 237, 249, and 253-255. If ADDRSPC=REAL is specified, this field equals the amount of storage used that was not from the contiguous real storage reserved for the program.
8	8	SMF30PGI (SMF30PIA)	4	binary	Number of pages that were paged in from auxiliary storage.
12	C	SMF30PGO (SMF30POA)	4	binary	Number of pages that were paged out to auxiliary storage.
16	10	SMF30CPM	4	binary	Number of attempts to read data from an ESO hiperspace that were not satisfied because the data has been deleted.
20	14	SMF30NSW	4	binary	Number of address space swap sequences. (A swap sequence consists of an address space swap-out and swap-in. Logical swap-out and swap-in are not included.)
24	18	SMF30PSI	4	binary	Number of pages swapped in from auxiliary storage to central storage. This field includes: (local system queue area (LSQA), fixed pages, and pages that the real storage manager determined to be active when the address space was swapping in. It does not include page reclaims or pages found in storage during the swap-in process (such as pages brought in by the service request blocks (SRB), started after completion of swap-in Stage 1 processing).
28	1C	SMF30PSO	4	binary	Number of pages swapped out from central storage to auxiliary storage. This field includes: local system queue area (LSQA), private area fixed pages, and private area non-fixed changed pages.
32	20	SMF30VPI	4	binary	Number of VIO page-ins from auxiliary storage to central storage for this step. This field includes page-ins resulting from page faults or specific page requests on a VIO window. It does not include VIO swap-ins or page-ins for the common area.

Offsets		Name	Length	Format	Description
36	24	SMF30VPO	4	binary	Number of VIO page-outs from central storage to auxiliary storage for this step. This field includes page-outs resulting from specific page requests on a VIO window as well as those pages stolen by the paging supervisor through infrequent use. It does not include VIO swap-outs or page-outs for the common area.
40	28	SMF30VPR	4	binary	Number of VIO reclaims.
44	2C	SMF30CPI	4	binary	Number of common area page-ins (LPA + CSA) from auxiliary storage to central storage.
48	30	SMF30HPI	4	binary	Number of hiperspace page-ins from auxiliary to processor storage.
52	34	SMF30LPI	4	binary	Number of LPA page-ins from auxiliary storage to central storage.
56	38	SMF30HPO	4	binary	Number of hiperspace page-outs from processor to auxiliary storage.
60	3C	SMF30PST	4	binary	Number of pages stolen from this address space.
64	40	SMF30PSC	8	binary	Number of CPU page seconds for this address space, in page millisecond units. (A page millisecond unit equals 1.024 milliseconds.)
72	48	SMF30RGB	4	binary	Private area size in bytes (less than 16 megabytes).
76	40	SMF30ERG	4	binary	Private area size in bytes (greater than 16 megabytes).
80	50	SMF30ARB	4	binary	Maximum virtual storage in bytes allocated from the local system queue area (LSQA) and the SWA subpools (less than 16 megabytes).
84	54	SMF30EAR	4	binary	Maximum virtual storage in bytes allocated from the local system queue area (LSQA) and the SWA subpools (greater than 16 megabytes).
88	58	SMF30URB	4	binary	Maximum virtual storage in bytes allocated from the user subpools (less than 16 megabytes).
92	5C	SMF30EUR	4	binary	Maximum virtual storage in bytes allocated from the user subpools (greater than 16 megabytes).
96	60	SMF30RGN	4	binary	Region size established, in 1K units, rounded up to a 4K boundary. The contents of this field is determined as follows: • If the ADDRSPC=REAL parameter is specified in the JCL, the contents of this field equals the amount of contiguous central storage reserved for the program. • If the REGION= parameter value in the JCL **exceeds** 16 megabytes: – If the IEFUSI exit changes the region limit or size **above** 16 megabytes, the contents of this field equals the changed region limit or size – Otherwise, the contents of this field equals the REGION parameter value (minimum value of 32 megabytes). • If the REGION= parameter value in the JCL **equals or is less than** 16 megabytes: – If the IEFUSI exit changes the region limit or size **below** 16 megabytes, the contents of this field equals the changed region limit or size – Otherwise, the contents of this field equals the REGION parameter value. **Note:** If both the region limit and size are changed, but do not match, the contents of this field equals the smaller of the changed region limit or size.

Offsets		Name	Length	Format	Description
100	64	SMF30DSV	4	binary	Amount of user key data space and hiperspace virtual storage (high water mark) used during the step/job (in megabytes).
104	68	SMF30PIE	4	binary	Number of unblocked pages that were paged in from expanded storage.
108	6C	SMF30POE	4	binary	Number of unblocked pages that were paged out to expanded storage.
112	70	SMF30BIA	4	binary	Number of blocked pages that were paged in from auxiliary storage.
116	74	SMF30BOA	4	binary	Number of blocked pages that were paged out to auxiliary storage.
120	78	SMF30BIE	4	binary	Number of blocked pages that were paged in from expanded storage.
124	7C	SMF30BOE	4	binary	Number of blocked pages that were paged out to expanded storage.
128	80	SMF30KIA	4	binary	Number of blocks that were paged in from auxiliary storage.
132	84	SMF30KOA	4	binary	Number of blocks that were paged out to auxiliary storage.
136	88	SMF30KIE	4	binary	Number of blocks that were paged in from expanded storage.
140	8C	SMF30KOE	4	binary	Number of blocks that were paged out to expanded storage.
144	90	SMF30PSF	8	binary	Number of CPU page seconds for the IARVSERV shared central storage frames in use by this address space, in page milliseconds.
152	98	SMF30PAI	4	binary	Number of IARVSERV shared pages that were paged in from auxiliary storage in this address space.
156	9C	SMF30PEI	4	binary	Number of IARVSERV shared pages that were paged in from expanded storage in this address space.
160	A0	SMF30ERS	8	binary	Expanded storage page residency time in page-milliseconds.
168	A8	SMF30MEM	8	binary	Memlimit value (in MB).
176	B0	SMF30MLS	1	binary	Source of Memlimit, which is one of the following: **Value** **Meaning** **01** MEMLIMIT set by SMF. **02** MEMLIMIT set explicitly in the JCL with MEMLIMIT parameter on JOB or EXEC statement. **03** MEMLIMIT is unlimited based on REGION=0 specification. **04** MEMLIMIT set by IEFUSI.
177	B1		23		Reserved.

Performance Section

This section contains the SRM service units used by the address space for the period being reported on. For more information on SRM service units, see *z/OS MVS Initialization and Tuning Guide*.

Triplet Information: This section is located on the record using the following triplet fields, which are located in the 'header/self-defining' section:

Offset SMF30POF

Length SMF30PLN

Number SMF30PON - Reports the number of performance sections on the current record. Because only one performance section can appear on the record, this field is '1' (if the section exists) or '0' (if it doesn't).

Offsets		Name	Length	Format	Description
0	0	SMF30SRV	4	binary	Total service units.
4	4	SMF30CSU	4	binary	CPU service units.
8	8	SMF30SRB	4	binary	Service request block (SRB) service units.
12	C	SMF30IO	4	binary	I/O service units.
16	10	SMF30MSO	4	binary	Main storage occupancy (MSO) service units.
20	14	SMF30TAT	4	binary	System resources manager (SRM) transaction active time, in 1024-microsecond units.
24	18	SMF30SUS	4	binary	Copy of RmctAdjC when this SMF record was produced, number of sixteenths of one CPU microsecond per CPU service unit.
28	1C	SMF30RES	4	binary	System resources manager (SRM) transaction residency time, in 1024-microsecond units. That is the amount of time the SRM transaction was in real storage.
32	20	SMF30TRS	4	binary	Number of system resources manager (SRM) transactions.
36	24	SMF30WLM	8	EBCDIC	Workload name. This field is blank (X‘40’) when in workload management compatibility mode.
44	2C	SMF30SCN	8	EBCDIC	Service class name. This field will contain SYSOTHER during the time of a WLM POLICY switch.
52	34	SMF30GRN	8	EBCDIC	Resource group name.
60	3C	SMF30RCN	8	EBCDIC	Report class name. This field is blank (X‘40’) during the time of a WLM POLICY switch.
68	44	SMF30ETA	4	binary	Independent enclave transaction active time in 1024-microsecond units.
72	48	SMF30ESU	4	binary	Independent enclave CPU service units.
76	4C	SMF30ETC	4	binary	Independent enclave transaction count.
80	50	SMF30PFL	16	EBCDIC	Scheduling environment name. Binary zeros if no scheduling environment is specified.
96	60	SMF30JQT	4	binary	Job preparation time. This is the elapsed time before the job was first queued for execution. It excludes time to read the job into the system. It includes delays incurred waiting for and during conversion, such as when eligible systems are not active to convert the job. If the JOB statement specified TYPRUN=JCLHOLD, this time is 0. The time is in 1024-microsecond units. It is available with OS/390 JES2 Release 4 and higher.
100	64	SMF30RQT	4	binary	Time following job preparation when the job was ineligible for execution due to either the job’s eligible systems being inactive or the job’s scheduling environment not being available. The time is in 1024-microsecond units. It is available on OS/390 JES2 Release 4 and higher.
104	68	SMF30HQT	4	binary	Time following job preparation when the job was ineligible for execution for reasons not included in SMF30RQT. This includes job hold, job class hold, job queue hold, duplicate jobname serialization, and job class execution limits. If the JOB statement specified TYPRUN=HOLD, the time that the job is held for this reason is not included. The time is in 1024-microsecond units. It is available with OS/390 JES2 Release 4 and higher.
108	6C	SMF30SQT	4	binary	Time the job was eligible for execution. This is the amount of time the job waited for an initiator. The time is in 1024-microsecond units. Prior to OS/390 JES2 Release 4, and for all JES3 releases, this field includes time the job was ineligible for execution.

Offsets		Name	Length	Format	Description
112	70	SMF30PF1	1	EBCDIC	Performance section flag byte: **X'80' (SMF30PFJ)** Job service class association was modified by a system operator prior to job initiation. **X'40' (SMF30PFR)** Job service class association was modified by a system operator during job execution. **X'20' (SMF30PFF)** Job initiation forced by a system operator. **X'10' (SMF30RTR)** Job has been restarted. There is one set of SMF30 records for each time the job is restarted. **X'08' (SMF30MSI)** Remote system data is incomplete. **X'04' (SMF30WMI)** Job is executing in a workload manager batch initiator. **X'02' (SMF30CCP)** Service class assigned to the address space was designated CPU-critical in the WLM service definition. **X'01' (SMF30CSP)** Service class assigned to the address space was designated storage-critical in the WLM service definition.
113	71	SMF30PF2	1	EBCDIC	Performance section flag byte: **X'80' (SMF30ASP)** Address space was designated storage-critical. **X'40' (SMF30SME)** Address space cannot be managed to transaction goals, because "manage region to goals of region" was specified in the WLM service definition. **X'20' (SMF30CPR)** Address space is currently CPU-protected. **X'10' (SMF30SPR)** Address space is currently storage-protected. **X'08 (SMF30PIN)** If this bit is on, the following fields contain incomplete data: (SRM could not deliver deltas or values for this interval) SMF30CSU SMF30MSO SMF30SPR SMF30ESU SMF30PFL SMF30SQT SMF30ETA SMF30PFR SMF30SRB SMF30ETC SMF30RCN SMF30SRV SMF30GRN SMF30RES SMF30SUS SMF30HQT SMF30RQT SMF30TAT SMF30IO SMF30RTR SMF30TRS SMF30JPN SMF30SCN SMF30WLM SMF30JQT SMF30SME

Offsets		Name	Length	Format	Description
114	72	SMF30RS4	2	EBCDIC	Reserved.
116	74	SMF30JPN	8	EBCDIC	Subsystem collection name from IWMCLSFY SUBCOLN.
124	7C	SMF30MSC	4	binary	MSO Service Definition Coefficient (SDC) scaled by 10000.
128	80	SMF30CPC	2	binary	CPU Service Definition Coefficient (SDC) scaled by 10
130	82	SMF30LOC	2	binary	IOC Service Definition Coefficient (SDC) scaled by 10
132	84	SMF30SRC	2	binary	SRB Service Definition Coefficient (SDC) scaled by 10
134	86	SMF30ZNF	2	binary	Normalization factor for IFA service time. Used to convert between real IFA times and "normalized" IFA times, that is, the equivalent time on a standard CP. Multiply SMF30_TIME_ON_IFA by this value and divide by 256 to calculate the normalized IFA time.

Operator Section

This section contains the actions performed by the operator for this address space during the period being reported.

Counts are increased by one when the mount is verified. If an incorrect volume is mounted, the count is not increased even though another mount message is issued.

Triplet Information: This section is located on the record using the following triplet fields, which are located in the 'header/self-defining' section:

Offset SMF30OOF

Length SMF30OLN

Number SMF30OON - Reports the number of operator sections on the current record. Because only one operator section can appear on the record, this field is '1' (if the section exists) or '0' (if it doesn't).

Offsets		Name	Length	Format	Description
0	0	SMF30PDM	4	binary	Number of non-specific DASD mounts.
4	4	SMF30PRD	4	binary	Number of specific DASD mounts.
8	8	SMF30PTM	4	binary	Number of non-specific tape mounts.
12	C	SMF30TPR	4	binary	Number of specific tape mounts.
16	10	SMF30MTM	4	binary	Number of non-specific MSS mounts. As of MVS/SP4.1, this field is no longer valid, and contains zeroes.
20	14	SMF30MSR	4	binary	Number of specific MSS mounts. As of MVS/SP4.1, this field is no longer valid, and contains zeroes.

APPC/MVS Resource Section

This section contains summary data related to how an address space uses APPC/MVS resources. For information about cumulative summary data, see the "APPC/MVS Cumulative Resource Section". For more information about APPC/MVS, see Chapter 7, "APPC/MVS Accounting," on page 7-1.

This section will appear on the record only if the address space has used APPC/MVS services and there is data to be reported.

Triplet Information: This section is located on the record using the following triplet fields, which are located in the 'header/self-defining' section:

Offset SMF30DRO

Length SMF30DRL

Number SMF30DRN - Reports the number of APPC/MVS resource sections on the current record. Because only one APPC/MVS resource section can appear on the record, this field is ‘1’ (if the section exists) or ‘0’ (if it doesn’t).

Offsets		Name	Length	Format	Description
0	0	SMF30DC	4	binary	Number of conversations, both currently active and deallocated, associated with the transaction program ID.
4	4	SMF30DCA	4	binary	Number of all conversations allocated.
8	8	SMF30DSC	4	binary	Number of times the transaction program issued a Send call. **Note:** Because an interval or step might end in the middle of a Send call, this field might contain zero while SMF30DDS contains a nonzero value.
12	C	SMF30DDS	8	long floating point hex	Amount of data, in bytes, sent by the transaction program.
20	14	SMF30DRC	4	binary	Number of times the transaction program issued a Receive call. **Note:** Because an interval or step might end in the middle of a Receive call, this field might contain zero while SMF30DDR contains a nonzero value.
24	18	SMF30DDR	8	long floating point hex	Amount of data, in bytes, received by the transaction program.
32	20	SMF30DAC	4	binary	Number of active conversations.
36	24	SMF30DTR	4	binary	Number of APPC/MVS transactions programs scheduled by the APPC/MVS transaction scheduler (ASCH).

APPC/MVS Cumulative Resource Section

This section contains cumulative summary data related to how an address space uses APPC/MVS resources. Regardless of whether the record is an interval, step termination, or step total record, this section represents cumulative data since the start of the job.

This section will only appear on the record if the address space has used APPC/MVS services and there is data to be reported.

Triplet Information: This section is located on the record using the following triplet fields, which are located in the ‘header/self-defining’ section:

Offset SMF30ARO

Length SMF30ARL

Number SMF30ARN - This field will be ‘1’ (if the section is on the record) or ‘0’ (if it isn’t)

Offsets		Name	Length	Format	Description
0	0	SMF30CN	4	binary	Total number of conversations associated with the transaction program (TP) ID, both currently active and deallocated.
4	4	SMF30CNA	4	binary	Total number of all conversations allocated.
8	8	SMF30SEN	4	binary	Total number of times the transaction program (TP) issued a Send call.
12	C	SMF30DAT	8	long floating point hex	Total amount of data sent by the transaction program (TP) in bytes (long floating point).
20	14	SMF30REC	4	binary	Total number of times the transaction program (TP) issued a Receive call.
24	18	SMF30DAR	8	long floating point hex	Total amount of data received by the transaction program (TP) in bytes (long floating point).

Offsets		Name	Length	Format	Description
32	20	SMF30TAC	4	binary	Total number of active conversations.
36	24	SMF30ATR	4	binary	Total number of APPC/MVS transactions programs scheduled by the APPC/MVS transaction scheduler (ASCH).

OpenMVS Process Section

Reports on OpenMVS processes' use of OpenMVS services:

Offsets		Name	Length	Format	Description
0	0	SMF30OPI	4	binary	OpenMVS process ID.
4	4	SMF30OPG	4	binary	OpenMVS process group ID.
8	8	SMF30OUI	4	binary	OpenMVS process user ID.
12	C	SMF30OUG	4	binary	OpenMVS process user group ID.
16	10	SMF30OSI	4	binary	OpenMVS process session ID.
20	14	SMF30OSC	4	binary	Number of OpenMVS services requested by the process.
24	18	SMF30OST	4	binary	Total CPU time (in hundredths of a second) accumulated by OpenMVS services requested by the process. Note that the value in SMF30OST is already included in fields SMF30CPT or SMF30CPS.
28	1C	SMF30ODR	4	binary	Number of OpenMVS directory reads for the process.
32	20	SMF30OFR	4	binary	Number of reads from OpenMVS HFS regular files.
36	24	SMF30OFW	4	binary	Number of writes to OpenMVS HFS regular files.
40	28	SMF30OPR	4	binary	Number of reads from OpenMVS HFS pipe.
44	2C	SMF30OPW	4	binary	Number of writes to OpenMVS HFS pipe.
48	30	SMF30OSR	4	binary	Number of reads from OpenMVS HFS special files.
52	34	SMF30OSW	4	binary	Number of writes to OpenMVS HFS special files.
56	38	SMF30OLL	4	binary	Number of pathname lookup calls to the logical file system.
60	3C	SMF30OLP	4	binary	Number of pathname lookup calls to the physical file system.
64	40	SMF30OGL	4	binary	Number of pathname generation calls to the logical file system.
68	44	SMF30OGP	4	binary	Number of pathname generation calls to the physical file system to determine a pathname.
72	48	SMF30OPP	4	binary	Parent process ID.
76	4C	SMF30OKR	4	binary	Number of reads for network socket.
80	50	SMF30OKW	4	binary	Number of writes for network socket.
84	54	SMF30OMS	4	binary	Number of bytes that message queues sent.
88	58	SMF30OMR	4	binary	Number of bytes that message queues received.
92	5C	SMF30OSY	4	binary	Number of times the **sync()** function was called.

Automatic Restart Management Section

This section contains information related to a batch job or started task that registers as an element of automatic restart management. The element name, element type, and timestamps of the completion of various events are recorded. If the timestamp for an event is zero, then that particular event had not been completed by the time the record was generated.

Triplet Information: This section is located on the record using the following triplet fields, which are located in the 'header/self-defining' section:

Offset SMF30RMO

Length SMF30RML

Number SMF30RMN

Offsets		Name	Length	Format	Description
0	0	SMF30RNM	16	EBCDIC	Element name.
16	10	SMF30RTP	8	EBCDIC	Element type.
24	18	SMF30RRG	16	EBCDIC	Restart group for element in SMF30RNM.
40	28	SMF30RSN	8	EBCDIC	The system name for the system on which the element was initially started; blank, for the initial start. **Note:** The current system name is in the SMF30SYN field.
48	30	SMF30RGT	4	binary	The time (local) when the element issued the IXCARM macro with the REGISTER parameter, in hundredths of a second.
52	34	SMF30RGD	4	binary	The date when the element issued the REGISTER request, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
56	38	SMF30RWT	4	binary	The time (local) when the element issued the IXCARM macro with the WAITPRED parameter, in hundredths of a second. This field will be zero if this function was not requested.
60	3C	SMF30RWD	4	binary	The date when the element issued IXCARM with the WAITPRED parameter, in the form 0*cyydddF* (where ‘F’ is the sign). This field will be zero if this function was not requested.
64	40	SMF30RYT	4	binary	The time (local) when the element issued the IXCARM macro with the READY parameter, in hundredths of a second.
68	44	SMF30RYD	4	binary	The date when this element issued the IXCARM macro with the READY parameter, in the format 0*cyydddF* (where ‘F’ is the sign).
72	48	SMF30RTT	4	binary	The time (local) when the element was deregistered, in hundredths of a second. This field will be zero if this element is not yet deregistered or if it ended abnormally.
76	4C	SMF30RTD	4	binary	The date when this element was deregistered, in the format 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description. This field will be zero if this element is not yet deregistered or if it ended abnormally.

Usage Data Section

This section contains the product ID information (specified on the REGISTER request of the IFAUSAGE macro) and the usage data that has been collected for the time period (interval, step, or job), for the product in the current address space only.

For registered products with a domain of TASK and a scope of ALL (example, IMS), there will be one usage section in the record for each unique product that is actively registered at the time the specified interval ended (as opposed to any part of the specified interval). In addition, there will be one section in the record for each unique product ID that has deregistered at least once during the specified interval.

Note: The data for deregistered products with a domain of TASK and a scope of FUNCTION is consolidated into one section in the record by unique product id. This is only performed at the specified interval level.

For all other registered products, there will be one section in the record for each unique product ID (owner, name, version, qualifier) that is actively registered for any part of that specified interval.

Triplet Information: This section is located on the record using the following triplet fields, which are located in the 'header/self-defining' section:

Offset SMF30UDO

Length SMF30UDL

Number SMF30UDN

Offsets		Name	Length	Format	Description
0	0	SMF30UPO	16	EBCDIC	Product owner or vendor name (specified on the PRODOWNER option of the IFAUSAGE macro).
16	10	SMF30UPN	16	EBCDIC	Product name (specified on the PRODNAME option of the IFAUSAGE macro).
32	20	SMF30UPV	8	EBCDIC	Product version (if specified on the PRODVERS option of the IFAUSAGE macro or 'NONE').
40	28	SMF30UPQ	8	EBCDIC	Product qualifier (if specified on the PRODQUAL option of the IFAUSAGE macro or 'NONE').
48	30	SMF30UPI	8	EBCDIC	Product ID (if specified on the PRODID option of the IFAUSAGE macro or 'NONE').
56	38	SMF30UCT	4	binary	Product TCB Time (in hundredths of a second).
60	3C	SMF30UCS	4	binary	Product SRB Time (in hundredths of a second).
64	40	SMF30URD	8	various	Product specific resource data (specified on the DATA option on the IFAUSAGE macro FUNCTIONDATA request). SMF30UDF identifies the format of the data in this field.
72	48	SMF30UDF	1	binary	Data format of value in SMF30URD **Value** **Meaning** **0** No data specified. **1** CPU time in long floating Point (in hundredths of a second). **2** Binary (64-bit). **3** Long floating point.
73	49	SMF30UFG	1	binary	Usage entry flags **Bit** **Meaning when set** **0** Unauthorized register **1-7** Unused
74	4A		2		Reserved.

Multisystem Enclave Remote System Data Section

This section contains remote system data for each system that executed work under a multisystem enclave.

Triplet Information: This section is located on the record using the following triplet fields, which are located in the 'header/self-defining' section:

Offset SMF30MOF

Length SMF30MLN

Number SMF30MNO

Offsets		Name	Length	Format	Description
0	0	SMF30MRS	8	EBCDIC	System name on which enclaves created by this address space executed.
8	8	SMF30MRA	4	binary	CPU rate adjustment factor for the system named by SMF30MRS. This is the number of sixteenths of one microsecond of CPU time per CPU service unit.

Offsets		Name	Length	Format	Description
12	C	SMF30MRD	4	binary	CPU time, in hundredths of a second, accumulated by dependent enclaves that executed on the system named by SMF30MRS.
16	10	SMF30MRI	4	binary	CPU time, in hundredths of a second, accumulated by independent enclaves that executed on the system named by SMF30MRS.

Record Type 31 (1F) — TIOC Initialization

Record type 31 is written when a MODIFY TCAM operator command is issued. This record contains the number of time-sharing buffers, buffer size, maximum number of output and input buffers allowed per terminal before OWAIT or LWAIT, OWAIT and RESTART thresholds, number of buffers reserved on the free queue, and the size of one terminal status block. OWAIT is the suspension of the program during input/output processing to the terminal because no output buffers are available. LWAIT is the locking of the terminal's keyboard because the terminal user filled all of the available input buffers.

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	TTI31LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	TTI31SEG	2	binary	Segment descriptor (see record length field).
4	4	TTIRFLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See “Standard SMF Record Header” on page 13-1 for a detailed description.
5	5	TTIRCDTY	1	binary	Record type 31 (X'1F').
6	6	TTIRCDTS	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.
10	A	TTIRCDTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
14	E	TTICPUID	4	EBCDIC	System identification (from the SID parameter).
18	12	TTINBF	2	binary	Number of time-sharing buffers.
20	14	TTIBUFSE	2	binary	Time-sharing buffer size, in bytes.
22	16	TTIRSVRD	2		Reserved.
24	18	TTIOMAX	2	binary	Maximum number of output buffers allowed per terminal before OWAIT.
26	1A	TTIIMAX	2	binary	Maximum number of input buffers allowed per terminal before LWAIT.
28	1C	TTIOWTH	2	binary	OWAIT threshold. The number of buffers that must be freed in order to be freed from OWAIT.

Offsets		Name	Length	Format	Description
30	1E	TTIRSTH	2	binary	RESTART threshold. The number of buffers that must be freed in order to be freed from LWAIT.
32	20	TTIUSLW	2	binary	Number of buffers reserved on the free queue (less than this number results in a system-wide LWAIT).
34	22	TTIUSSL	2		Reserved.
36	24	TTITSBS	1	binary	Size of one terminal status block (TSB).
37	25	TTIUSCH	21		Reserved.

Record Type 32 (20) — TSO/E User Work Accounting

Record type 32 is written at normal or abnormal termination of a TSO/E session. It is written at the expiration of a TSO/E accounting interval. For more information on using this information see “Transaction Billing” on page 1-6 and “Performing TSO/E command accounting” on page 4-7.

To use the type 32 record, you must have installed MVS TSO/E. Type 32 records are produced for TSO/E sessions only, TSO/E commands entered from batch jobs are not counted. You can monitor the TSO/E commands users issue and record the number of times a user issues a specific command or subcommand. For example, you can:

- Keep track of and compare how frequently certain commands at your installation are used. You may want to provide better performance for the more commonly used commands by placing them in LPALIB.
- Keep track of the number of times users issue TSO/E commands so you can bill users for their computer use.
- Audit the commands users issue to ensure they do not violate security practices at your installation.

The record contains the names of the commands and the number of times each command was used during the session and the device connect times for each command. Only those commands included in CSECT IEEMB846 (and entered at least once) are used. Aliases of commands are counted in separate entries in the record. For instance SEND and SE are counted as separate commands. Statistics for all other commands is included in ‘***OTHER’. Incorrect or unknown commands appear under ‘EXEC’.

The subtype is indicated in the SMF32TYP field. For information on subtype selectivity see “Selecting subtypes” on page 4-2.

- Subtypes 1 and 3 contain data on TSO/E activity since the start of the session or since the last interval record was produced.
- Subtypes 2 and 4 contain data on the cumulative TSO/E activity for the entire session. If there is no activity during an interval, no interval record is produced.

If DETAIL is specified in SMFPRM*xx*, the resource data found under logon represents the resources used from the start of the session to the time when the first command is obtained.

The length of the record is variable.

Record Environment

The following conditions exist for the generation of each of the subtypes of this record:

Macro SMFEWTM, BRANCH=YES (record exit: IEFU84)

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF32LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See "Standard SMF Record Header" on page 13-1 for a detailed description.
2	2	SMF32SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF32FLG	1	binary	System indicator **Bit** **Meaning When Set** **0** Subsystem name follows system identification **1** Subtypes used **2** Reserved **3-6** Version indicators* **7** Reserved. *See "Standard SMF Record Header" on page 13-1 for a detailed description.
5	5	SMF32RTY	1		Record type 32 (X'20').
6	6	SMF32TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.
10	A	SMF32DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
14	E	SMF32SID	4		System identification (from the SID parameter).
18	12	SMF32WID	4	EBCDIC	Subsystem identifier.
22	16	SMF32STP	2	binary	Record subtype.
24	18	SMF32POF	4	binary	Offset to product section from start of record, including the record descriptor word (RDW).
28	1C	SMF32PLN	2	binary	Length of product section.
30	1E	SMF32PON	2	binary	Number of product sections.
32	20	SMF32IOF	4	binary	Offset to the identification section from start of record, including the record descriptor word (RDW).
36	24	SMF32ILN	2	binary	Length of the identification section.
38	26	SMF32ION	2	binary	Number of identification sections.
40	28	SMF32COF	4	binary	Offset to the TSO/E command section from start of record, including the record descriptor word (RDW).
44	2C	SMF32CLN	2	binary	Length of the TSO/E command section.
46	2E	SMF32CON	2	binary	Number of TSO/E command sections.

Product Section

Offsets		Name	Length	Format	Description
0	0	SMF32TYP	2	binary	Subtype identification for the record: 1 — TSO/E user interval record 2 — TSO/E user session end record 3 — TSO/E user interval record (with detail) 4 — TSO/E user session end record (with detail).
2	2	SMF32RVN	2	EBCDIC	Record version number.

Offsets		Name	Length	Format	Description
4	4	SMF32PNM	8	EBCDIC	Product name.
12	C	SMF32OSL	8	EBCDIC	MVS product name.
20	14	SMF32SYN	8	EBCDIC	System name (from the SYSNAME parameter in the IEASYSxx parmlib member).
28	1C	SMF32SYP	8	EBCDIC	Sysplex name (from the SYSPLEX parameter in the COUPLExx parmlib member).

Identification Section

Offsets		Name	Length	Format	Description
0	0	SMF32JBN	8	EBCDIC	TSO user id session name.
8	8	SMF32PGM	8	EBCDIC	Program Name.
16	10	SMF32STM	8	EBCDIC	Step name.
24	18	SMF32UIF	8	EBCDIC	User-defined identification field (taken from common exit parameter area, not from USER=parameter on job statement).
32	20	SMF32JNM	8	EBCDIC	JES job number.
40	28	SMF32STN	2	binary	Step number.
42	2A		2		Reserved.
44	2C	SMF32PGN	2	binary	Reserved.
46	2E	SMF32JPT	2	binary	JES input priority at initiation.
48	30	SMF32AST	4	binary	Device allocation start time from midnight, in hundredths of seconds.
52	34	SMF32PPS	4	binary	Problem program start time from midnight, in hundredths of a second.
56	38	SMF32SIT	4	packed	Step initiation time from midnight, in hundredths of a second.
60	3C	SMF32STD	4	packed	Step initiation date, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
64	40	SMF32RST	4	binary	Reader start time from midnight, in hundredths of second.
68	44	SMF32RSD	4	packed	Reader start date, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
72	48	SMF32RET	4	binary	Time from midnight, in hundredths of a second, that the reader recognized the end of the job or started task. For TSO/E, this is the logon enqueue time.
76	4C	SMF32RED	4	packed	Date when the reader recognized the end of the batch job or started task, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description. For TSO/E, it is the logon enqueue date.
80	50	SMF32USR	20	EBCDIC	Programmer name.
100	64	SMF32GRP	8	EBCDIC	RACF group ID.
108	6C	SMF32RUD	8	EBCDIC	RACF user ID.
116	74	SMF32TID	8	EBCDIC	RACF terminal ID. This field is zero if RACF is not active or if user is not a terminal user.

TSO/E Command Segment (subtypes 1 and 2)

This section contains subtypes 1 and 2.

Offsets		Name	Length	Format	Description
0	0	SMF32CMD	8	EBCDIC	TSO/E command name. See “Performing TSO/E command accounting” on page 4-7 for additional information.

Offsets		Name	Length	Format	Description
8	8	SMF32CNT	4	binary	Number of TSO/E commands.

TSO/E Command Segment (subtypes 3 and 4)

This section contains subtypes 3 and 4.

Offsets		Name	Length	Format	Description
0	0	SMF32CMD	8	EBCDIC	TSO/E command name. See "Performing TSO/E command accounting" on page 4-7 for additional information.
8	8	SMF32CNT	4	binary	Number of times the TSO/E command was entered.
12	C	SMF32TCB	4	binary	Total task control block (TCB) time, in hundredths of a second, for the command.
16	10	SMF32SRB	4	binary	Total service request block (SRB) time, in hundredths of a second, for the command.
20	14	SMF32TGT	4	binary	Total TGET (terminal read) count for the command.
24	18	SMF32TPT	4	binary	Total TPUT (terminal output) count for the command.
28	1C	SMF32TRN	4	binary	Total transaction count for the command. **Note:** See the *z/OS MVS Initialization and Tuning Guide* for a definition of this field.
32	20	SMF32EXP	4	binary	Total execute channel program (EXCP) count for the command.
36	24	SMF32TCT	4	binary	Total device connect time (in 128 micro-second units) for this command.
40	28	SMF32FLG	4	binary	Detail section flags
					Bit **Meaning When Set**
		SMF32TCF			**0** Count in SMF32TRN is not valid.

Record Type 33 (21) — APPC/MVS TP Accounting

When APPC/MVS inbound conversations create work scheduled by the APPC/MVS transaction scheduler, SMF writes a type 33 subtype 1 record. When an APPC/MVS inbound or outbound conversation is deallocated, SMF writes a type 33 subtype 2 record. See Chapter 7, "APPC/MVS Accounting," on page 7-1 for more detailed information about APPC/MVS accounting.

The subtype is indicated in the SMF33TYP field. For information on subtype selectivity, see "Selecting subtypes" on page 4-2.

Record Environment

The following conditions exist for the generation of each of the subtypes of this record:

Macro

Subtype	Macro
1	SMFEWTM,BRANCH=YES (record exit: IEFU84)
2	SMFEWTM,BRANCH=YES,MODE=XMEM (record exit: IEFU85)

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF33LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	SMF33SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF33FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0** Subsystem name follows standard header **1** Subtypes used **2** Reserved **3-6** Version indicators* **7** Reserved. *See “Standard SMF Record Header” on page 13-1 for a detailed description.
5	5	SMF33RTY	1	binary	Record type 33 (X'21')
6	6	SMF33TME	4	packed	Time since midnight, in hundredths of a second, when the record was moved into the SMF buffer.
10	A	SMF33DTE	4	packed	Date that the record was moved into the SMF buffer, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
14	E	SMF33SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF33WID	4	EBCDIC	Subsystem identifier (ASCH for APPC/MVS-scheduled TPs).
22	16	SMF33STP	2	binary	Record subtype 1 — APPC/MVS transaction record. 2 — APPC/MVS conversation record.
Self-Defining Section:					
24	18	SMF33SDL	4	binary	Length of Self-defining Section.
28	1C	SMF33POF	4	binary	Offset to Product section.
32	20	SMF33PLN	2	binary	Length of Product section.
34	22	SMF33PON	2	binary	Number of Product Sections in this record.
36	24	SMF33IOF	4	binary	Offset to TP Identification Section.
40	28	SMF33ILN	2	binary	Length of TP Identification Section.
42	2A	SMF33ION	2	binary	Number of TP Identification Sections in this record.
44	2C	SMF33UOF	4	binary	Offset to TP Usage Section.
48	30	SMF33ULN	2	binary	Length of TP Usage Section.
50	32	SMF33UON	2	binary	Number of TP Usage Sections in this record.
52	34	SMF33SOF	4	binary	Offset to Address Space ID Section.
56	38	SMF33SLN	2	binary	Length of Address Space ID Section.
58	3A	SMF33SON	2	binary	Number of Address Space ID Sections in this record.
60	3C	SMF33COF	4	binary	Offset to Conversation ID Section.
64	40	SMF33CLN	2	binary	Length of Conversation ID Section.
66	42	SMF33CON	2	binary	Number of Conversation ID Sections in this record.
68	44	SMF33FOF	4	binary	Offset to User Data Field Section.
72	48	SMF33FLN	2	binary	Length of User Data Field Section.
74	8A	SMF33FON	2	binary	Number of User Data Field Sections in this record.

Product Section

This section contains the product that generated the record.

Offsets		Name	Length	Format	Description
0	0	SMF33TYP	2	binary	Record Subtype 1 — APPC/MVS transaction record. 2 — APPC/MVS conversation record.
2	2	SMF33RVN	2	EBCDIC	Record version number — 01.
4	4	SMF33PNM	8	EBCDIC	Product name — ASCH for APPC/MVS-scheduled TPs. APPC for APPC/MVS Conversion Records. If you use your own scheduler, you will not have access to IBM's APPC/MVS accounting support.
12	C	SMF33OSL	8	EBCDIC	MVS operating system name.
20	14	SMF33SYN	8	EBCDIC	System name (from the SYSNAME parameter in the IEASYSxx parmlib member).
28	1C	SMF33SYP	8	EBCDIC	Sysplex name (from the SYSPLEX parameter in the COUPLExx parmlib member).

Address Space ID Section

Offsets		Name	Length	Format	Description
0	0	SMF33JID	8	EBCDIC	Job or session name.
8	8	SMF33RST	4	binary	Time since midnight, in hundredths of a second, reader recognized this job.
12	C	SMF33RSD	4	binary	Date when the reader recognized this job, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
16	10	SMF33STN	8	EBCDIC	Step name (taken from the name on the EXEC card).

Subtype 1

TP Identification Section

Offsets		Name	Length	Format	Description
0	0	SMF33TPO	4	binary	Offset to TP name section.
4	4	SMF33TPC	8	EBCDIC	TP Class — a general grouping of TPs with related scheduling properties (like the MVS Job Class — CPU Time limit, shift execution requirements, etc).
12	C	SMF33TSC	4	binary	APPC/MVS TP schedule type **Value** **Schedule Type** **0** Standard **1** Multi-trans.
16	10	SMF33TPF	8	EBCDIC	TP profile name.

TP Program Name Section

Offsets		Name	Length	Format	Description
0	0	SMF33TPL	2	binary	Length of TP name in SMF33TPN field.
2	2	SMF33TPN	255 (max)	binary	TP name.

TP Usage Section

This section identifies the user requesting the TP being reported on. This section contains the general user identification information.

Offsets		Name	Length	Format	Description
0	0	SMF33UID	8	EBCDIC	RACF user ID (of the requesting user).
8	8	SMF33GRP	8	EBCDIC	RACF group ID (of the requesting user).
16	10	SMF33UST	4	binary	Type of user **Value** **User** **0** Standard **1** Multi-trans shell.
20	14	SMF33AOF	4	binary	Offset to Accounting Section.
24	18	SMF33ALN	2	binary	Length of Accounting Section.
26	1A	SMF33AON	2	binary	Number of Accounting Sections in this record.
28	1C	SMF33UCT	4	binary	Count of uses of this TP (by this user).
32	20	SMF33TDO	4	binary	Offset to TP Usage Detail Section.
36	24	SMF33TDL	2	binary	Length of TP Usage Detail Section.
38	26	SMF33TDN	2	binary	Number of TP Usage Detail Sections.

TP Usage Accounting Section

This section identifies the variable length accounting information for the user requesting the TP being reported on.

Offsets		Name	Length	Format	Description
0	0	SMF33ACL	1	binary	First accounting sub-field length (this field is set to zero for no accounting data).
1	1	SMF33ACT	175 (max)	EBCDIC	Accounting sub-fields.

TP Usage Detail Section

This section identifies detailed information about the specific execution of TP that is being reported on:

Offsets		Name	Length	Format	Description
0	0	SMF33TSO	4	binary	Offset to TP Usage Scheduler Section.
4	4	SMF33TSL	2	binary	Length of TP Usage Scheduler Section.
6	6	SMF33TSN	2	binary	Number of TP Usage Scheduler Sections.
8	8	SMF33CN	4	binary	Total number of conversations for this request.
12	C	SMF33CNA	4	binary	Total number of conversations allocated by this request.
16	10	SMF33SEN	4	binary	Total number of sends issued by this request.
20	14	SMF33DAS	8	long floating point hex	Total number of bytes sent by this request.
28	1C	SMF33REC	4	binary	Total number of receives issued by this request.
32	20	SMF33DAR	8	long floating point hex	Total number of bytes received by this request.
40	28	SMF33TCB	4	binary	Task control block (TCB) time for this request, in hundredths of a second.
44	2C	SMF33SRB	4	binary	Service request block (SRB) time for this request, in hundredths of a second.
48	30	SMF33EXP	4	binary	Execute channel programs (EXCP) for this request.

Offsets		Name	Length	Format	Description
52	34	SMF33DCT	4	binary	Total accumulated device connect time for the address during the life of the transaction. The field reported (in 128 micro-second units) of I/O activity in the address space by some chargeback schemes. See SMF30TCN in the 'I/O Activity' section of SMF type 30 record.

TP Usage Scheduler Section

This section identifies scheduler data about the specific execution of TP that is being reported on. This section does not appear for a multi-trans shell.

Offsets		Name	Length	Format	Description
0	0	SMF33LLU	17	EBCDIC	Local logical unit (LU) name for the TP.
17	11	SMF33PLU	17	EBCDIC	Partner logical unit (LU) name for this user's use of this TP (format = node.LUname).
34	22	SMF33RV2	2		Reserved.
36	24	SMF33FMT	4	binary	Time since midnight, in hundredths of a second, request recognized by functional manager header (FMH) 5.
40	28	SMF33FMD	4	packed	Date request recognized by functional manager header (FMH) 5, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
44	2C	SMF33TQT	4	binary	Time since midnight, in hundredths of a second, that the request was placed on scheduler work queue.
48	30	SMF33TQD	4	packed	Date that the request was placed on scheduler work queue, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
52	34	SMF33TST	4	binary	Time since midnight, in hundredths of a second, that the request started execution.
56	38	SMF33TSD	4	packed	Date that the request started execution, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
60	3C	SMF33TET	4	binary	Time since midnight, in hundredths of a second, that the request ended execution.
64	40	SMF33TED	4	packed	Date that the request ended execution, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.

Subtype 2

Conversation ID Section

Offsets		Name	Length	Format	Description
0	0	SMF33CID	8	binary	The conversation ID. This ID uniquely identifies a particular conversation.
8	8	SMF33CCO	8	binary	The conversation correlator. This field contains zeroes when there is no conversation correlator.
16	10	SMF33CLO	4	binary	Offset to the logical unit of work ID (LUWID) section.
20	14	SMF33CIO	1	binary	Conversation inbound / outbound indicator. Possible values are: **0** When conversation is outbound **1** When conversation is inbound.
21	15	SMF33CLR	1	binary	Conversation partner LU location. Possible values are: **0** When partner LU is local **1** When partner LU is remote.

Offsets		Name	Length	Format	Description
22	16	SMF33CKD	1	binary	Conversation kind. For inbound conversations, this field indicates whether this conversation was processed by an APPC/MVS transaction scheduler or an APPC/MVS server. Possible values are: **0** Transaction scheduler **1** APPC/MVS server For outbound conversations, this field is always set to zero.
23	17	SMF33CSL	1		Sync level of the conversation. Possible values are: **0** None **1** Confirm
24	18	SMF33CLL	17	EBCDIC	Conversation local LU name (not fully qualified).
41	29	SMF33CPL	17	EBCDIC	Conversation partner LU name (fully qualified).
58	3A	SMF33RS2	2		Reserved.
60	3C	SMF33CSH	8	EBCDIC	Conversation scheduler name (for example, 'ASCH'). When there is no scheduler for this conversation (because an APPC/MVS server is processing the conversation), this field contains blanks.
68	44	SMF33CPO	4	binary	Offset (from beginning of record) to Partner TP Name Section.
72	48	SMF33CTO	4	binary	Offset (from beginning of record) to Local TP Name Section.
76	4C	SMF33RS1	10	EBCDIC	Reserved.
86	56	SMF33CPU	10	EBCDIC	Partner user ID.
96	60	SMF33CRT	8	binary	Date/Time (in STCK format) allocate request was received for the conversation. The field is zero for outbound requests.
104	68	SMF33CQT	8	binary	Date/Time (in STCK format) conversation was put on allocate queue. The field is zero for outbound requests and for scheduled inbound requests.
112	6C	SMF33CST	8	binary	Inbound Requests: Date/Time (in STCK format) when the conversation was associated with a new address space for processing. If an APPC/MVS server processed this conversation, this field shows the time when the server received the conversation through the Receive_Allocate service. Outbound Requests: Date/Time (in STCK format) when the local program called the Allocate service.
120	78	SMF33CET	8	binary	Date/time (in STCK format) when the conversation was deallocated.
128	80	SMF33CMN	8	EBCDIC	Mode name of the conversation.
136	88	SMF33CSN	4	binary	Number of Send calls issued during the conversation.
140	88	SMF33CDS	8	long floating point hex	Amount of data (in bytes) sent through the conversation.
148	90	SMF33CRE	4	binary	Number of Receive calls issued during the conversation.
152	98	SMF33CDR	8	long floating point hex	Amount of data (in bytes) received during the conversation.
160	A0	SMF33CVB	4	binary	Number of callable service requests issued during the conversation.
164	A4	SMF33CRC	4	binary	Return code from the last callable service on this conversation (Possible return codes are documented in the APPC/MVS publications.)
168	A8	SMF33CRS	4	binary	Last reason code from a callable service in this conversation (Possible reason codes are documented in the APPC/MVS publications.)

Offsets		Name	Length	Format	Description
172	AC	SMF33CSA	4	binary	Conversation state. Possible values are: **1** Reset **2** Initialize **3** Send **4** Receive **5** Send pending **6** Confirm **7** Confirm send **8** Confirm deallocate
176	B0	SMF33CSS	8	binary	Date/Time (in STCK format) when the last APPC/MVS callable service was requested during the conversation.
184	B8	SMF33CSE	8	binary	Date/Time (in STCK format) when the last APPC/MVS callable service completed during the conversation.

Partner TP Program Name Section

Offsets		Name	Length	Format	Description
0	0	SMF33TPL	2	binary	Length of the partner TP name field (SMF33TPN).
2	2	SMF33TPN	64 (max)	binary	Partner transaction program name. If this conversation is inbound, this field contains the name of the program that initiated the conversation (through the Allocate service). If this conversation is outbound, this field contains the name of the program that was attached on this LU as a result of an Allocate call.

Local TP Program Name Section

Offsets		Name	Length	Format	Description
0	0	SMF33TPL	2	binary	Length of the local TP name field (SMF33TPN).
2	2	SMF33TPN	64 (max)	binary	Local transaction program name. If this conversation is inbound, this field contains the name of the program that was attached on this LU in response to an Allocate call. If this conversation is outbound, this field contains the name of the program that initiated the conversation (that is, issued the Allocate call).

Logical Unit of Work ID (LUWID) Section

Offsets		Name	Length	Format	Description
0	0	SMF33LUL	2	binary	Length of logical unit of work ID (SMF33LUW).
2	2	SMF33LUW	26 (max)	binary	Logical unit of work ID (LUW_ID).

User Data Field Section

Offsets		Name	Length	Format	Description
0	0	SMF33UDL	2	binary	Length of data in user data field (SMF33UDF).
2	2	SMF33UDF	255 (max)	binary	User data field. This is user-defined data that one of the partner programs wrote to this record, through the Set_Conversation_Accounting_Information service.

Record Type 34 (22) — TS-Step Termination

Reference book

For more information on service, transaction active time, and performance group number, see *z/OS MVS Initialization and Tuning Guide*.

Record type 34 is written when the TSO/E logoff function processes a job step termination.

Note: IBM recommends that you use record type 30 rather than record types 4, 5, 20, 34, 35, and 40. Use of this record may cause missing key workload indicators.

This record identifies the job by job name, logon time and date, user identification, program name, and performance group number. If accounting numbers (which can be alphameric) were specified on the EXEC card, they are included.

This record contains operating information such as:
- Initiator start time
- Number of TPUTs issued
- Number of TGETs satisfied
- Termination status
- Device allocation start time
- Problem program start time
- Step CPU time
- Step service
- Storage protect key
- Number of page-ins
- Number of page-outs
- Number of swap-ins
- Number of swap-outs (for both VIO and non-VIO data sets).

Record type 34 has an entry for each non-spooled data set that was defined by a DD statement. Each entry lists the device class, unit type, device number, and execute channel program (EXCP) count for the data set.

Notes:
1. Data sets are recorded in order of the step DD statements; they are not identified by name. (An installation-written IEFUJV exit routine can record this order as each statement is validated.)
2. For data sets that are dynamically unallocated, the data set entry information is in record type 40 — not in record type 34.
3. For more information on EXCP count and CPU time, see Chapter 10, “EXCP Count” and Chapter 11, “CPU Time” respectively.

Record Environment

The following conditions exist for the generation of this record:

Macro SMFEWTM(1), BRANCH=YES (record exit: IEFU84)

Record Mapping

Header/Self-defining Section

This section contains the common SMF record header fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	TIVRLEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See "Standard SMF Record Header" on page 13-1 for a detailed description.
2	2	TIVRSEG	2	binary	Segment descriptor (see record length field).
4	4	TIVRFLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See "Standard SMF Record Header" on page 13-1 for a detailed description.
5	5	TIVRCDTY	1	binary	Record type 34 (X'22').
6	6	TIVRCDTS	4	binary	Time since midnight, in hundredths of a second, that the record is passed to the SMF writer. This is the time the step ended.
10	A	TIVRCDTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description. This is the date the step ended.
14	E	TIVCPUID	4	EBCDIC	System identification (from the SID parameter).
18	12	TIVUIF	8	EBCDIC	Job name.
26	1A	TIVONTME	4	binary	Logon time, in hundredths of a second.
30	1E	TIVONDTE	4	packed	Logon date, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
34	22	TIVUDATA	8	EBCDIC	User-defined identification field (taken from common exit parameter area, not from USER=parameter on job statement).
42	2A	TIVINVSQ	1	binary	Step number (this field always equals 1).
43	2B	TIVSIT	4	binary	Time since midnight, in hundredths of a second, that the initiator selected this step.
47	2F	TIVOUTCT	4	binary	Number of lines of terminal output, that is, number of TPUTs issued.
51	33	TIVINCT	4	binary	Number of lines of terminal input, that is, number of TGETs satisfied.

Offsets		Name	Length	Format	Description
55	37	TIVSTAT	2	binary	Step completion code: X'0ccc' indicates system ABEND where *ccc* is the system ABEND code. (See *z/OS MVS System Codes*.) X'8ccc' indicates user ABEND where *ccc* is the user ABEND code. X'nnn' indicates normal completion where *nnn* is the contents of the two low-order bytes in register 15 at end. X'000' indicates either: (1) the job step was flushed (not processed) because of an error during allocation, or (2) normal job completion with a return code of 0. Use this field in conjunction with the step-termination indicator field (offset 87).
57	39	TIVPRI	1	binary	Address space dispatching priority (taken from DPTRTY=parameter on the EXEC card or the default APG value).
58	3A	TIVPRGNM	8	EBCDIC	Program name (taken from PGM=parameter on EXEC card). If a backward reference was used, then this field contains *.DD.
66	42	TIVINVNM	8	EBCDIC	Step name (taken from name on EXEC card).
74	4A	TIVRSV5	2		Reserved. Note that TIVEFRGN, formerly a two-byte field at this offset, has been increased to four bytes and moved to offset 82.
76	4C	TIVSYST	2	binary	Largest amount of storage used from top of private area, in 1K units. This storage area includes the local system queue area (LSQA) and SWA (subpools 229, 230, 236, 237, 249, and 253-255). If ADDRSPC=REAL is specified, this field equals the amount of storage used that was *not* from this contiguous real storage reserved for the program. See offsets 82 and 102.
78	4E	TIVMCRE	2	binary	Largest amount of storage used from bottom of private area, in 1K units. This storage area includes sub-pool 0-127, 129-132, 244, 251 and 252. If ADDRSPC=REAL is specified, this field equals the amount of contiguous real storage that was used. See offsets 82 and 102. If storage was not allocated (job step was flushed), these fields equal zero.
80	50	TIVRVC	2		Reserved.
82	52	TIVEFRGN	4	binary	Region size established, in 1K units taken from the REGION=parameter in the JCL, and rounded up to a four K boundary. If ADDRSPC=REAL is specified, this field equals the amount of contiguous real storage reserved for the program. If the region requested was greater than 16 megabytes, the region established resides above 16 megabytes, and this field will contain a minimum value of 32 megabytes.
86	56	TIVSPK	1	binary	Storage protect key, in the form *xxxx*0000 where *xxxx* is the key.

Offsets		Name	Length	Format	Description
87	57	TIVSTI	1	binary	Step termination indicator **Bit** **Meaning When Set** **0** Reserved. **1** Canceled by exit IEFUJV. **2** Canceled by exit IEFUJI. Job steps canceled by IEFUJI and IEFUSI will not be processed; therefore bit 7 will be on. **3** Canceled by exit IEFUSI Job steps canceled by IEFUJI and IEFUSI will not be processed; therefore bit 7 will be on. **4** Reserved **5** Step is to be restarted. **6** If zero, then normal completion. If 1, then and abnormal end of task (abend) will occur. If step completion code (offset 55) equals 0322 or 0522, IEFUTL caused the abend. If step completion code equals 0722, IEFUSO caused the abend. **7** If zero, then normal completion. If 1, step was flushed.
88	58	TIVRV1	2		Reserved.
90	5A	TIVAST	4	binary	Device allocation start time, in hundredths of a second.
94	5E	TIVPPST	4	binary	Problem program start time, in hundredths of a second.
98	62	TIVRV2	1		Reserved.
99	63	TIVSRBT	3	binary	Step CPU time under SRBs, in hundredths of a second. This field includes the CPU time for various supervisory routines that are dispatched via SRBs: locking routines, page resolution, swap control, cross-memory communications (WAIT, POST, I/O POST), and TQE scheduling. CPU time is not expected to be constant between different runs of the same job step. (See Chapter 11, "CPU Time.")

Offsets		Name	Length	Format	Description
102	66	TIVRIN	2	binary	Record indicator **Bit** **Meaning When Set** **0-3** Reserved. **4** Field TIVCPUTM is not valid. An overflow condition is when the length of the value for the step CPU time under TCBs is greater than 3 bytes. This condition is not recorded in the type 34 record (TIVCPUTM). The time is available in the type 30 record (SMF30CPT). If your installation uses an accounting program that does not use the type 30 record to gather step CPU time, you must update that program. Only the type 30 record should be considered valid. **5** Device data not recorded. When there are more than 1635 DD statements, device data is not collected for the type 34 record. The data is available in the type 30 record. **6** EXCP count may be wrong. For more information on EXCP count, see Chapter 10, "EXCP Count." **7** If zero, storage is virtual (if 1, storage is real). **8-15** Reserved.
104	68	TIVRLCT	2	binary	Offset from the beginning of the record header to relocate section.

Offsets		Name	Length	Format	Description
106	6A	TIVVAR	2	binary	Length of execute channel program (EXCP) count fields.

Execute Channel Program (EXCP) Section

For each device assigned to each *non-spooled* data set, there is an eight-byte entry with the following format:

Offsets		Name	Length	Format	Description
0	0	TIVEXCP	8	Structure	Data set access information. **Note:** Virtual I/O devices are identified by the following: Device Class 0 Unit Type 0 Device Number X'7FFF' It is important to understand the following: Allocation messages for VIO data sets will show VIO ALLOCATED TO ddname. SMF records will show VIO unit addresses as X'7FFF'. The actual in-storage UCB built for VIO will show address X'3FFF'. For example, the messages: • IEF237I X'3FFF' ALLOCATED TO ddname • IEF237I X'7FFF' ALLOCATED TO ddname indicate that ddname is not allocated to a Virtual I/O device, but is instead allocated to a real device whose unit address is X'3FFF' or X'7FFF' respectively.
0	0	TIVDEVC	1	binary	Device class.
1	1	TIVUTYP	1	binary	Unit type.
2	2	TIVCUAD	2	binary	Device number.
4	4	TIVNEXCP	4	binary	Execute channel program (EXCP) count. See offset 102 — TIVRIN.

Accounting Section

Offsets		Name	Length	Format	Description
0	0	TIVVARA	1	binary	Length of accounting section (excluding this field).
1	1	TIVCPUTM	3		Step CPU time under task control blocks (TCB), in hundredths of a second. This field includes the CPU time for all tasks that are dispatched via TCBs below the level of RCT. CPU time is not expected to be constant between different runs of the same job step. (See Chapter 11, “CPU Time.”)
4	4	TIVNBRAC	1	binary	Number of accounting fields.
5	5	TIVACFLD	*variable*	EBCDIC	Accounting fields. Each entry for an accounting field contains the length of the field (one byte, binary) followed by the field (EBCDIC). A zero indicates an omitted field.

Relocate Section

Offsets		Name	Length	Format	Description
0	0	TIVPGIN	4	binary	Number of non-VIO (virtual input/output) page-ins for this step. This field includes page-ins required through page faults, specific page requests, and page fixes. It does not include page reclaims, page-ins for VIO data sets, and page-ins for the common area.

Offsets		Name	Length	Format	Description
4	4	TIVPGOUT	4	binary	Number of non-VIO (virtual input/output) page-outs for this step. This field includes page-outs required through specific page requests as well as those pages “stolen” by the paging supervisor through infrequent use. It does not include page-outs for VIO data sets, and page-outs for the common area.
8	8	TIVRGNS	4	binary	Number of address space swap sequences. A swap sequence consists of a swap-out and swap-in of an address space.
12	C	TIVSIN	4	binary	Number of pages swapped in. This field includes: local system queue area (LSQA), fixed pages, and those pages that the real storage manager determined to be active when the address space was swapped out. It does not include page reclaims nor pages found in storage during the swap-in process (such as pages brought in via SRBs started after completion of swap-in Stage 1 processing).
16	10	TIVSOUT	4	binary	Number of pages swapped out. This field includes: local system queue area (LSQA), private area fixed pages, and private area non-fixed changed pages.
20	14	TIVVPI	4	binary	Number of virtual input/output (VIO) page-ins for this step. This field includes page-ins resulting from page faults or specific page requests on a VIO window. It does not include VIO swap-ins or page-ins for the common area.
24	18	TIVVPO	4	binary	Number of virtual input/output (VIO) page-outs for this step. This field includes page-outs resulting from specific page requests on a VIO window, as well as those pages “stolen” by the paging supervisor through infrequent use. It does not include VIO swap-outs or page-outs for the common area.
28	1C	TIVSST	4	binary	Step service, in service units. This field is calculated as total job service minus the accumulated job service before this step’s initialization.
32	20	TIVACT (TIVTAT)	4	binary	Step transaction active time, in 1024-microsecond units. Calculated as total job transaction active time minus the accumulated transaction active time before this step’s initialization.
36	24	TIVPGNO	2	binary	Beginning with z/OS V1R3, this field is always zero.
38	26	TIVTRANT	4	binary	Step transaction residency time, in 1024-microsecond units. That is the amount of time the transaction was in real storage.
42	2A	TIVCPM	4	binary	Number of attempts to read data from an ESO hiperspace that were not satisfied because the data has been deleted.
46	2E	TIVRCLAM	4	binary	Number of virtual input/output (VIO) reclaims for this step.
50	32	TIVCPGIN	4	binary	Number of common area page-ins for this step (link pack area (LPA) + CSA).
54	36	TIVHSPI	4	binary	Number of hiperspace page-ins from auxiliary to processor storage.
58	3A	TIVPGSTL	4	binary	Number of pages “stolen” from the storage for this step.
62	3E	TIVPGSEC	8	binary	Number of page seconds for this step, in page millisecond units. Calculated as: the number of pages used by this step times the processing time it held that number of pages.
70	46	TIVLPAI	4	binary	Number of link pack area (LPA) page-ins for the step.
74	4A	TIVHSPO	4	binary	Number of hiperspace page-outs from processor to auxiliary storage.
78	4E	TIVCPUS	4	binary	Step CPU service, in service units.
82	52	TIVIOCS	4	binary	Step I/O service, in service units.
86	56	TIVMSOS	4	binary	Step main storage service, in service units.
90	5A	TIVSRBS	4	binary	Step SRB service, in service units.

Offsets		Name	Length	Format	Description
94	5E	TIVTSN	8	EBCDIC	Terminal symbolic name.

Record Type 35 (23) — LOGOFF

Reference books

For information on service, transaction active time and performance group number, see *z/OS MVS Initialization and Tuning Guide*.

For information on ABEND codes, see *z/OS MVS System Codes*.

Record type 35 is written when a TSO logoff process is completed.

Note: IBM recommends that you use record type 30 rather than record types 4, 5, 20, 34, 35, and 40. Use of this record may cause missing key workload indicators.

This record identifies the job by job name, logoff time and date, logon time and date, user identification, and performance group number. If accounting numbers (which can be alphameric) were specified on the JOB card, they are included.

This record contains operating information such as number of TPUTs issued, number of TGETs satisfied, termination status, storage protect key, job service, transaction active time, number of transactions, and job CPU time. For more information on CPU time, see Chapter 11, “CPU Time.”

Note: If the terminal I/O controller (TIOC) does not attempt to send output (for example, a message) to a terminal whose line has been disconnected, it will not detect a line disconnect. To SMF, a terminal session interrupted by a line disconnect is considered to be executing and a type 35 record will not be issued until:

- The disconnect situation is detected, the reconnect time limit expires, and the system cancels the session (with a completion code of 622); or
- The disconnect situation is detected, the user reconnects, and subsequently issues a LOGOFF command.

Record Environment

The following conditions exist for the generation of this record:

Macro SMFEWTM(1), BRANCH=YES (record exit: IEFU84)

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	TLGRLEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	TLGRSEG	2	binary	Segment descriptor.

Offsets		Name	Length	Format	Description
4	4	TLGRFLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See "Standard SMF Record Header" on page 13-1 for a detailed description.
5	5	TLGRCDTY	1	binary	Record type 35 (X'23').
6	6	TLGRCDTS	4	binary	Time since midnight, in hundredths of a second, that the record was moved to the SMF writer. This is the logoff time.
10	A	TLGRCDTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description. This is the logoff date.
14	E	TLGPUID	4	EBCDIC	System identification (taken from SID parameter).
18	12	TLGUIF	8	EBCDIC	Job name.
26	1A	TLGONTME	4	binary	Logon time, in hundredths of a second.
30	1E	TLGONDTE	4	packed	Logon date, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
34	22	TLGUDATA	8	EBCDIC	User-defined identification field (taken from common exit parameter area, not from USER=parameter on job statement).
42	2A	TLGSTPCT	1	binary	Number of steps in session. (This field always equals 1.)
43	2B	TLGCRTME	4		Reserved.
47	2F	TLGOUTCT	4	binary	Number of lines of terminal output, that is, number of TPUTs issued.
51	33	TLGINCT	4	binary	Number of lines of terminal input, that is, number of TGETs satisfied.
55	37	TLGSTAT	2	binary	Job completion code: X'0ccc' indicates system ABEND where ccc is the system (See *z/OS MVS System Codes*.) X'8ccc' indicates user ABEND where ccc is the user ABEND code. X'nnnn' indicates normal completion where nnnn is the contents of the two low-order bytes in register 15 at termination. X'0000' indicates normal job completion with return code of 0. Use this field in conjunction with the job termination indicator field (offset 66).
57	39	TLGPRI	1	binary	Logon priority. This field normally equals the user-assigned priority of 0-13, but if the job fails while being scheduled, this field equals 14 (taken from the PRTY parameter on the JOB card). If no value is specified for the PRTY parameter on the JOB card, this field contains: • For JES3, the default priority specified on the JES3 STANDARDS initialization card • For JES2, a zero JES2 does not use the priority value reported in this field. (The JES2 job selection priority is requested via the JES2 /*PRIORITY control statement.)
58	3A	TLGNQTME	4	binary	Logon enqueue time, in hundredths of a second.

Offsets		Name	Length	Format	Description
62	3E	TLGNQDTE	4	packed	Logon enqueue date, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
66	42	TLGTRMI	1	binary	Job termination indicator **Bit** **Meaning When Set** **0** Reserved **1** Canceled at exit IEFUJV **2** Canceled at exit IEFUJI **3** Canceled at exit IEFUSI **4-5** Reserved **6** If 0, normal completion. If 1, abnormal termination **7** Reserved
67	43	TLGOUTCL	1		Reserved.
68	44	TLGTRANT	4	binary	Job transaction residency time, in 1024-microsecond units. That is the total amount of time all transactions were in central storage.
72	48	TLGRVC	4		Reserved.
76	4C	TLGSPK	1	binary	Storage protect key, in the form xxxx0000 where xxxx is the key.
77	4D	TLGSRBT	3	binary	Job CPU time under SRBs, in hundredths of a second. This field includes the CPU time for various supervisory routines that are dispatched via SRB: locking routines, page resolution, swap control, cross-memory communications (WAIT, POST, I/O POST), and TQE scheduling. CPU time may not be constant between different runs of the same job.
80	50	TLGTJS	4	binary	Job service, in service units.
84	54	TLGTTAT	4	binary	Job transaction active time, in 1024-microsecond units.
88	58	TLGNTSN	4	binary	Number of transactions.
92	5C	TLGPGNO	2	binary	Beginning with z/OS V1R3, this field is always zero.
94	5E	TLGRV2	2		Reserved.
96	60	TLGVAR	1	binary	Length of rest of record, excluding this field.
97	61	TLGRVB	20		Reserved.
117	75	TLGCPUTM	3	binary	Job CPU time under TCBs, in hundredths of a second. This field includes the CPU time for all tasks that are dispatched via TCBs below the level of RCT.
120	78	TLGNBRAC	1	binary	Number of accounting fields.
121	79	TLGACFLD	VARIABLE	EBCDIC	Accounting fields. Each entry for an accounting field contains the length of the field (one byte, binary) followed by the field (EBCDIC). A zero indicates an omitted field.

Relocate Section

Offsets		Name	Length	Format	Description
0		TLGCPUS	4	binary	Job CPU service, in service units.
4	4	TLGIOCS	4	binary	Job I/O service, in service units.
8	8	TLGMSOS	4	binary	Job main storage service, in service units.
12	12	TLGSRBS	4	binary	Job SRB service, in service units.
16	10	TLGTSN	8	EBCDIC	Terminal symbolic name.

Record Type 36 (24) — Integrated Catalog Facility Catalog

Record type 36 is partially built when an integrated catalog facility catalog is exported; it is then compiled and written. The record contains information to identify the catalog being exported, the time of export, and information necessary to allocate the portable data set for subsequent import. It identifies the job-by-job log identification and user identification.

The SMF record is only written upon successful completion of the EXPORT command. The record contains the standard header and is formatted for the product and data sections.

Macro to Symbolically Address Record Type 36: The SMF record mapping macro for record types 36, 60, 61, 65, and 66 is IFASMFI6. The mapping macro, IFASMF16, resides in SYS1.MACLIB.

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF36LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	SMF36SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF36SYS	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See “Standard SMF Record Header” on page 13-1 for a detailed description.
5	5	SMF36RTY	1	binary	Record type 36 (X'24').
6	6	SMF36TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.
10	A	SMF36DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
14	E	SMF36CPU	4	EBCDIC	System identification.
18	12	SMF36SBS	4	EBCDIC	Subsystem identification.
22	16	SMF36SUB	2	EBCDIC	Record subtype ‘00’ — Export integrated catalog facility catalog.
24	18	SMF36NOT	2	binary	Number of triplets.
26	1A		2		Reserved.
28	1C	SMF36POF	4	binary	Offset to product section.
32	20	SMF36PLN	2	binary	Length of product section.
34	22	SMF36PNO	2	binary	Number of product sections.
36	24	SMF36DOF	4	binary	Offset to data section.
40	28	SMF36DLN	2	binary	Length of data section.
42	2A	SMF36DNO	2	binary	Number of data sections.

Product Section

Offsets		Name	Length	Format	Description
44	2C	SMF36PVN	2	EBCDIC	Product version.
46	2E	SMF36PNM	8	EBCDIC	Product name.
54	36	SMF36PRL	2	EBCDIC	Record type 36 level.

Data Section

Offsets		Name	Length	Format	Description
56	38	SMF36JNM	8	EBCDIC	Job name.
64	40	SMF36RST	4	binary	Time from midnight, in hundredths of a second, that the reader recognized the JOB card (for this job).
68	44	SMF36RDT	4	packed	Date when the reader recognized the JOB card (for this job), in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
72	48	SMF36UID	8	EBCDIC	User-defined identification field (taken from common exit parameter area, not from USER=parameter on job statement).
80	50	SMF36PGM	8	EBCDIC	Program name.
88	58	SMF36CNM	44	EBCDIC	Integrated catalog facility catalog name.
132	84	SMF36CVS	6	EBCDIC	Catalog volume serial, if available.
138	8A	SMF36CDT	4	binary	Catalog UCB device type, if available.
142	8E	SMF36EDT	8	EBCDIC	Date of export (*mm/dd/yy*).
150	96	SMF36ETM	8	EBCDIC	Time of export (*hh*:*mm*:*ss*).
158	9E	SMF36PDS	44	EBCDIC	Portable data set name.
202	CA	SMF36PVS	6	EBCDIC	Portable data set volume.
208	D0	SMF36PDT	4	binary	Portable data set UCB device type (associated with the first/only volume), if available.
212	D4	SMF36EIN	2	EBCDIC	Export Indicator. 'AE' — Aliases were exported. 'NE' — No aliases exported.

Record Type 37 (25) — NetView Hardware Monitor

Record type 37 is written by NetView whenever the NPDA REPORTS option is invoked and each time a NetView Problem Determination Application (NPDA) input record passes the NPDA recording filters.

Reference book

For more information, see *NetView Administration Reference*.

Record Type 39 (27) — NetView (NLDM) Response Time

Record type 39 is written by NetView's network logical data manager (NLDM) component. NLDM writes to the external log if the response time data function (RTM) or the network accounting and availability measurement function is active.

The response time data function writes record type 39 when the COLLECT command with the LOG parameter is issued or at session end for an logical unit (LU) attached to a 3274 with the RTM feature.

The network accounting and availability measurement data function writes record type 39 when a session is started, a session ends, or when a RECORD command with the SESSTATS parameter is issued.

Reference book

For more information, see *NetView Administration Reference*.

Record Type 40 (28) — Dynamic DD

Note

IBM recommends that you use record type 30 rather than record types 4, 5, 20, 34, 35, and 40.

Record type 40 is written when an unallocation, concatenation, or deconcatenation request is processed. For an unallocation request, this record contains a device entry only for the data set unallocated. For a concatenation or deconcatenation request, this record contains a device entry for each DD entry.

Record type 40 contains the job log identification, user identification, step number, functional indicator, and device entries. Each device entry consists of the device class, unit type, device number, and execute channel program (EXCP) count for the data set.

For more information on EXCP count and CPU time, see Chapter 10, “EXCP Count” and Chapter 11, “CPU Time” respectively.

Record Environment

The following conditions exist for the generation of this record:

Macro SMFWTM (record exit: IEFU83)

Mode Task

Storage Residency 24-bit

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	TDDRLEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	TDDRSEG	2	binary	Segment descriptor (see record length field).

Offsets		Name	Length	Format	Description
4	4	TDDRFLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See “Standard SMF Record Header” on page 13-1 for a detailed description.
5	5	TDDRCDTY	1	binary	Record type 40 (X'28').
6	6	TDDRCDTS	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.
10	A	TDDRCDTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
14	E	TDDCPUID	4	EBCDIC	System identification (from the SID parameter).
18	12	TDDUIF	8	EBCDIC	Job name.
26	1A	TDDONTME	4	binary	Logon time, in hundredths of a second. (If a background job, this field contains the time the reader recognized the JOB card.)
30	1E	TDDONDTE	4	packed	Logon date, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description. (If a background job, this field contains the date the reader recognized the JOB card.)
34	22	TDDUDATA	8	EBCDIC	User-defined identification field (taken from common exit parameter area, not from USER=parameter on job statement).
42	29	TDDINVSQ	1	binary	Step number (first step = 1, etc).
43	2B	TDDFLG	1	binary	Functional indicator **Value** **Meaning** **2** Unallocation **3** Concatenation **4** Deconcatenation.
44	2C	TDDRIN	2	binary	Record indicator **Bit** **Meaning When Set** **0-6** Reserved **7** EXCP count may be wrong **8-15** Reserved.
46	2E	TDDRCIND	2	binary	Index of record in sequence of records. **Note:** In releases prior to 4.2.2, this field is zero.
48	30	TDDRCTOT	2	binary	Total number of records in sequence of records. **Note:** In releases prior to 4.2.2, this field is zero.
50	32	TDDRVA	14		Reserved.
64	40	TDDVAR	2	binary	Length of device entry portion of this record. Calculated as: (8 times the number of devices) + 2.

Execute Channel Program (EXCP) Section

For each device, there is an eight-byte entry with the following format:

Offsets		Name	Length	Format	Description
0	0	TDDEXCP	8	Structure	Data set access information. **Note:** Virtual I/O devices are identified by the following: Device Class 0 Unit Type 0 Device Number X'7FFF' It is important to understand the following: Allocation messages for VIO data sets will show VIO ALLOCATED TO ddname. SMF records will show VIO unit addresses as X'7FFF'. The actual in-storage UCB built for VIO will show address X'3FFF'. For example, the messages: • IEF237I X'3FFF' ALLOCATED TO ddname • IEF237I X'7FFF' ALLOCATED TO ddname indicate that ddname is not allocated to a Virtual I/O device, but is instead allocated to a real device whose unit address is X'3FFF' or X'7FFF' respectively.
0	0	TDDDEVC	1	binary	Device class.
1	1	TDDUTYP	1	binary	Unit type.
2	2	TDDCUAD	2	binary	Device number.
4	4	TDDNEXCP	4	binary	EXCP count (see offset 44).

Record Type 41 (29) — DIV Objects and VLF Statistics

Reference book

COFVLF*xx* parmlib member is described in *z/OS MVS Initialization and Tuning Reference*.

Record type 41 provides resource usage information regarding data-in-virtual (DIV) objects and VLF statistics. This record is written when a DIV object is accessed, and when the object is unaccessed.

Note: ACCESS and UNACCESS is similar to OPEN and CLOSE. This record is also written to record VLF statistics.

Record type 41 has the following subtypes; each contains a common section with header and product information portions, and a subtype section unique for each record. The subtypes are:

- **Subtype 1** — ACCESS record. The ACCESS data section is written when a DIV object is accessed.
- **Subtype 2** — UNACCESS record. The counts for the I/O Activity Section are accumulated by data-in-virtual while the object is in use and are reported at the time of the UNACCESS request. The subtype 2 record is written whenever a data-in-virtual object is unaccessed.
- **Subtype 3** — collects virtual lookaside facility (VLF) statistics. It is written every 15 minutes. The data is repeated for each VLF class defined in the COFVLF*xx* parmlib member.

Record Environment

The following conditions exist for the generation of each of the subtypes of this record:

Macro SMFEWTM, BRANCH=YES (record exit: IEFU84)

Mode

Subtype	Mode
1,2	Task

Storage Residency 24-bit

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF41LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	SMF41SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF41FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0** Subsystem identification follows system identification **1** Subtypes used **2** Reserved **3-6** Version indicators* **7** Reserved. *See “Standard SMF Record Header” on page 13-1 for a detailed description.
5	5	SMF41RTY	1	binary	Record type 41 (X'29').
6	6	SMF41TME	4	binary	Time since midnight, in hundredths of a second, when the record was written.
10	A	SMF41DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
14	E	SMF41SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF41SSI	4	EBCDIC	Subsystem identification (EBCDIC blanks).
22	16	SMF41STY	2	binary	Record subtype **Value** **Meaning** **1** ACCESS **2** UNACCESS **3** VLF statistics.
24	18	SMF41TRP	2	binary	Number of triplets. A triplet is a set of offset/length/number values that defines a section of the record.
26	1A	SMF41*xxx*	2		Reserved.
28	1C	SMF41OPD	4	binary	Offset to product section.
32	20	SMF41LPD	2	binary	Length of product section.
34	22	SMF41NPD	2	binary	Number of product sections.
36	24	SMF41OD1	4	binary	Offset of object ACCESS data section.

Offsets		Name	Length	Format	Description
40	28	SMF41LD1	2	binary	Length of object ACCESS data section.
42	2A	SMF41ND1	2	binary	Number of object ACCESS data sections.
44	2C	SMF41OD2	4	binary	Offset of object UNACCESS data section.
48	30	SMF41LD2	2	binary	Length of object UNACCESS data section.
50	32	SMF41ND2	2	binary	Number of object UNACCESS data sections.
52	34	SMF41OD3	4	binary	Offset of I/O activity section.
56	38	SMF41LD3	2	binary	Length of I/O activity section.
58	3A	SMF41ND3	2	binary	Number of I/O activity sections.
60	3C	SMF41OD4	4	binary	Offset to the VLF statistics section.
64	40	SMF41LD4	2	binary	Length of the VLF statistics section.
66	42	SMF41ND4	2	binary	Number of VLF statistics sections.

Product Section

Offsets		Name	Length	Format	Description
0	0	SMF41PL	8	EBCDIC	Product level.
8	2	SMF41PN	16	EBCDIC	Product name (‘DATA-IN-VIRTUAL’).

Object ACCESS Data Section

This section is present for record subtypes 1 and 2 only.

Offsets		Name	Length	Format	Description
0	0	SMF41DDA	8	EBCDIC	Object data definition name (ddname).
8	8	SMF41AZA	4	binary	Object size, in units of blocks, when accessed.
12	C	SMF41ATA	4	binary	Time since midnight, in seconds, when the object was accessed.
16	10	SMF41TYA	1	binary	Object type **Code** **Meaning** **1** DA.
17	11	SMF41AMA	1	binary	ACCESS mode **Code** **Meaning** **1** Read **2** Update.
18	12	SMF41JBN	8	EBCDIC	Job name (initiator or started task).

Object UNACCESS Data Section

This section is present for record subtype 2 only.

Offsets		Name	Length	Format	Description
0	0	SMF41UZU	4	binary	Object size, in units of blocks, when unaccessed.
4	4	SMF41UTU	4	binary	Time since midnight, in seconds, when the object was unaccessed.

Object I/O Activity Section

This section is present for record subtype 2 only.

Offsets		Name	Length	Format	Description
0	0	SMF41BRD	4	binary	Total reads, including re-reads (number of blocks read from object).

Offsets		Name	Length	Format	Description
4	4	SMF41BWR	4	binary	Total writes (number of blocks written to object).
8	8	SMF41BRR	4	binary	Total re-reads (number of blocks re-read from object).
12	C	SMF41NC	4	binary	Total I/O calls for reads.
16	10	SMF41OUC	4	binary	Total I/O calls for writes.

VLF Statistics Section

This section is present for record subtype 3 only.

Offsets		Name	Length	Format	Description
0	0	SMF41CLS	8	EBCDIC	Class name.
8	8	SMF41MVT	4	binary	MAXVIRT specified, in 4K blocks. MAXVIRT is a VLF parameter specified in the COFVLF*xx* parmlib member.
12	C	SMF41USD	4	binary	Amount of virtual storage currently being used, in 4K blocks.
16	10	SMF41SRC	4	binary	Number of times the cache was searched in this interval.
20	14	SMF41FND	4	binary	Number of objects found in the cache in this interval.
24	18	SMF41ADD	4	binary	Number of objects added to the cache in this interval.
28	1C	SMF41DEL	4	binary	Number of objects deleted from the cache in this interval.
32	20	SMF41TRM	4	binary	Number of objects trimmed from the cache in this interval.
36	24	SMF41LRG	4	binary	Largest object attempted to put in the cache.

Record Type 42 (2A) — DFSMS Statistics and Configuration

Reference books

For information about the IGDSMS*xx* parmlib member, see *z/OS MVS Initialization and Tuning Reference*.

For information about the SETSMS and VARY SMS commands, see *z/OS MVS System Commands*.

Record type 42 contains the following subtype information:

- **Subtype 1** — is created on a timed interval to collect device statistics. The time interval is specified in the IGDSMS*xx* parmlib member. Subtype 1 summarizes, on a storage-class basis, the buffer manager 'hits' (number of page-read requests handled by the buffer manager). A Buffer Manager Facility (BMF) totals section (64 bytes) enables analysis of overall BMF performance. There is one storage-class summary section (64 bytes) for each storage class.
- **Subtype 2** — has one section (88 bytes) for each cache control unit (Model 3990-3) having at least one Storage Management Subsystem- (SMS-) managed device attached. There is one section (16 bytes) for each SMS-managed volume attached to such a control unit.
- **Subtype 3** — is written each time the SMS configuration is changed. The following events cause subtype 3 to be generated:
  - The operator issued a VARY SMS command.
  - An 'ACTIVATE' occurred, either by issuing an ACTIVATE command in ISMF or a SETSMS command on the console.
  - An event notification facility (ENF) event occurred, because the operator issued a VARY command to an SMS-managed volume.

  - The status of a LIBRARY or DRIVE has been UPDATED by the Object Access Method (OAC).
- **Subtype 4** — is written to collect System Data Mover session statistics for a concurrent copy session or for an extended sequential data set when interfacing with the backup program. Concurrent copy records contain the identifier ‘CC’; extended sequential data set records contain ‘EXT’.
  - The CC SMF record is issued when the concurrent copy session completes.
  - The EXT SMF record is issued at the close of the processing for the extended sequential data set as follows:
    - If the backup program requested that the extended sequential data set be dumped to tape, one EXT SMF record is issued for reading the entire extended sequential data set.
    - If the backup program requested that the extended sequential data set be copied to DASD, one EXT SMF record is issued for reading the entire extended sequential data set and one EXT SMF record is issued for writing the entire extended sequential data set to DASD.
    - If the backup program requested that the extended sequential data set be processed using a concurrent copy session, then the CC SMF record contains the statistics for reading the extended sequential data set(s) and no EXT SMF record(s) is issued for reading the extended sequential data set(s). If the concurrent copy session was for a copy to DASD, one EXT SMF record is issued for writing each extended sequential data set to DASD.

For additional information about SMF record 42 subtype 4, see *Implementing Concurrent Copy*.

- **Subtype 5** — includes storage class VTOC and VVDS I/O statistics. Subtype 5 is written when the global SMF interval expires. The global SMF interval is specified via the INTVAL parameter in the SMF parmlib member.

  Note: Record type 30 records may also be synchronized to the global interval. See “Performing interval accounting” on page 4-3 for more information on the use of record type 30.
- **Subtype 6** — records DASD data set level I/O statistics. There are two events that cause subtype 6 to be generated:
  - Close, or
  - Immediately after the recording of the type 30 interval record. There is one type 42 subtype 6 record for each type 30 interval record.
- **Subtype 7** — used by Network File System (NFS). See *z/OS Network File System Guide and Reference* for additional information.
- **Subtype 8** — used by Network File System (NFS). See *z/OS Network File System Guide and Reference* for additional information.
- **Subtype 9** — is written each time a B37/D37/E37 abend is issued. It includes information about the data set, UCB, JFCB and job that is abending.
- **Subtype 10** — is written at the time of volume selection failure because of insufficient space when allocating a data set.
- **Subtype 11** — is written for extended remote copy (XRC) session statistics whenever the SMF timer interval ends.
- **Subtype 14** — is written to report ADSTAR Distributed Storage Manager (ADSM) accounting for server resources used during a session.

- **Subtype 15** — can be created on a timed interval or whenever the SMF timer ends to collect data about VSAM record-level sharing (RLS) storage class response time. This data includes information for each system and a sysplex-wide summary.
- **Subtype 16** — can be created on a timed interval or whenever the SMF timer ends to collect data about VSAM RLS data set response time. This data includes information for each system and a sysplex-wide summary.
- **Subtype 17** — can be created on a timed interval or whenever the SMF timer ends to collect data about VSAM RLS coupling facility (CF) lock structure usage. This data includes information for each system and a sysplex-wide summary.
- **Subtype 18** — can be created on a timed interval or whenever the SMF timer ends to collect data about VSAM RLS CF cache partition usage. This data includes information for each system and a sysplex-wide summary.
- **Subtype 19** — can be created on a timed interval or whenever the SMF timer ends to collect data about VSAM RLS Local Buffer Manager LRU Statistics Summary. This data includes information for each system and a sysplex-wide summary.

For **Subtypes 15, 16, 17, 18 and 19,** specify the time interval in the IGDSMSxx parmlib member and activate recording on one system in the sysplex. Because data is collected across the sysplex, it is unnecessary to merge SMF records from all the systems in the sysplex.

- **Subtype 20** is written when STOW INITIALIZE is used to delete all the members from a PDSE to indicate who or what (job, started task, or TSO user) issued the STOW INITIALIZE. It contains the name of the data set and the volume serial of the volume on which it resided.
- **Subtype 21** is written when a member is deleted from a PDS or a PDSE to indicate who or what (job, started task, or TSO user) deleted the member. It contains the name of the data set and the volume serial of the volume on which it resided, as well as all the aliases of the member that will fit in the SMF record.

Record Environment

Macro SMFEWTM (2),WRKAREA=(3),BRANCH=YES (record exit: IEFU84)

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF42RCL	2	binary	Record length. This field and the next field (total of four bytes) form the record descriptor word (RDW). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	SMF42SGD	2	binary	Segment descriptor (see record length field). This is zero, if the record is not spanned.

Offsets		Name	Length	Format	Description
4	4	SMF42FLG	1	binary	System indicator flags **Bit** **Meaning When Set** **0** Subsystem identification follows system identification. **1** Subtypes are used **2** Reserved **3-6** Version indicators* **7** Reserved. *See "Standard SMF Record Header" on page 13-1 for a detailed description.
5	5	SMF42RTY	1	binary	Record type 42 (X'2A').
6	6	SMF42TME	4	binary	Time since midnight, in hundredths of a second, when the record was moved into the SMF buffer.
10	A	SMF42DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0c*yydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
14	E	SMF42SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF42SSI	4	EBCDIC	Subsystem identification.
22	16	SMF42STY	2	binary	Record subtype. **Value** **Meaning** **1** BMF cache summary **2** Cache control units having SMS-managed device(s) attached. **3** SMS configuration changed **4** System Data Mover session statistics **5** Storage class VTOC and VVDS I/O statistics **6** Data set level I/O statistics **9** B37/D37/E37 abend information **10** Volume Selection Failure **11** Extended remote copy session statistics **14** ADSM session resource usage **15** VSAM RLS CF storage class response time **16** VSAM RLS CF data set response time **17** VSAM RLS CF lock structure usage **18** VSAM RLS CF cache partition usage **19** VSAM RLS Buffer Manager LRU Activity **20** STOW Initialize **21** Member Delete
24	18	SMF42NT	2	binary	Number of triplets in record. A triplet is a set of offset/length/number values that defines a section of the record.
26	1A		2		Reserved.
Product section triplet:					
28	1C	SMF42OPS	4	binary	Offset to product section from start of record, including record descriptor word (RDW).
32	20	SMF42LPS	2	binary	Length of product section.
34	22	SMF42NPS	2	binary	Number of product sections.
36	24	SMF42END	0	character	Force header end on word boundary.
The following six fields are only included with subtype 1:					
36	24	SMF42BMO	4	binary	Offset to BMF totals section from start of record, including record descriptor word (RDW).
40	28	SMF42BML	2	binary	Length of BMF totals section.
42	2A	SMF42BMN	2	binary	Number of BMF totals sections.
44	2C	SMF42SCO	4	binary	Offset to storage class summary section from start of record, including record descriptor word (RDW).

Offsets		Name	Length	Format	Description
48	30	SMF42SCL	2	binary	Length of storage class summary section.
50	32	SMF42SCN	2	binary	Number of storage class summary sections.
The following six fields are only included with subtype 2:					
36	24	SMF42CUO	4	binary	Offset to control unit cache section from start of record, including record descriptor word (RDW).
40	28	SMF42CUL	2	binary	Length of control unit cache section.
42	2A	SMF42CUN	2	binary	Number of control unit cache sections.
44	2C	SMF42VLO	4	binary	Offset to volume section from start of record, including record descriptor word (RDW).
48	30	SMF42VLL	2	binary	Total length of all volume sections. (Number of volume sections multiplied by the length of one volume section.)
50	32	SMF42VLN	2	binary	Number of volume sections.
The following three fields are only included with subtype 3:					
36	24	SMF42EAO	4	binary	Offset to event audit section from start of record, including record descriptor word (RDW).
40	28	SMF42EAL	2	binary	Length of event audit section.
42	2A	SMF42EAN	2	binary	Number of event audit sections.
The following six fields are only included with subtype 4:					
36	24	SMF42CCO	4	binary	Offset to CC statistics.
40	28	SMF42CCL	2	binary	Length of CC statistics.
42	2A	SMF42CCN	2	binary	Number of CC sessions.
44	2C	SMF42EXO	4	binary	Offset to EXT statistics.
48	30	SMF42EXL	2	binary	Length of EXT statistics.
50	32	SMF42EXN	2	binary	Number of EXT data sets.
The following six fields are only included with subtype 5:					
36	24	SMF42SRO	4	binary	Offset to storage class response time section from start of record, including record descriptor word (RDW).
40	28	SMF42SRL	2	binary	Length of storage class response time section.
42	2A	SMF42SRN	2	binary	Number of storage class response time sections.
44	2C	SMF42VHO	4	binary	Offset to volume header section from start of record, including read descriptor word (RDW).
48	30	SMF42VHL	2	binary	Length of volume header section.
50	32	SMF42VHN	2	binary	Number of volume header sections.
The following three fields are only included with subtype 6:					
36	24	SMF42JHO	4	binary	Offset to job header section from start of record, including record descriptor word (RDW).
40	28	SMF42JHL	2	binary	Length of job header section.
42	2A	SMF42JHN	2	binary	Number of job header sections.
The following six fields are only included with subtype 9:					
36	24	SMF42ABO	4	binary	Offset to X37 abend data section.
40	28	SMF42ABL	2	binary	Length of X37 abend data section.
42	2A	SMF42ABN	2	binary	Number of X37 abend sections (always 1).
44	2C	SMF42SMO	4	binary	Offset to SMS data section (0 if data set is not SMS managed).
48	30	SMF42SML	2	binary	Length of SMS data section (0 if data set is not SMS managed).
50	32	SMF42SMN	2	binary	Number of SMS sections (always 1 if data set is SMS managed. Otherwise, 0).
The following three fields are only included with subtype 10:					

Offsets		Name	Length	Format	Description
36	24	SMF42VSF	4	binary	Offset to volume selection failure record.
40	28	SMF42VSL	4	binary	Length of volume selection failure record.
42	2A	SMF42VSN	2	binary	Number of volume selection failure records.
The following three fields are only included with subtype 11:					
36	24	SMF42XRO	4	binary	Offset to XRC service.
40	28	SMF42XRL	2	binary	Length of XRC service.
42	2A	SMF42XRN	2	binary	Number of XRC sessions.
The following three fields are only included with subtype 14:					
36	24	SMF42T14	4	binary	Offset to ADSM section.
40	28		2	binary	Length of ADSM section.
42	2A		2	binary	Number of ADSM sections, 1.
The following six fields are only included with subtype 15:					
36	24	SMF42FC1	4	binary	Offset to sysplex-wide storage class (SC) summary data section.
40	28	SMF42FC2	2	binary	Length of sysplex-wide SC summary data section.
42	2A	SMF42FC3	2	binary	Number of sysplex-wide SC summary data sections.
44	2C	SMF42FC4	4	binary	Offset to SC, CF, SYS summary section.
48	30	SMF42FC5	2	binary	Length of SC, CF, SYS summary section.
50	32	SMF42FC6	2	binary	Number of SC, CF, SYS summary sections.
The following six fields are only included with subtype 16:					
36	24	SMF42GD1	4	binary	Offset to sysplex-wide data set summary section.
40	28	SMF42GD2	2	binary	Length of sysplex-wide data set summary section.
42	2A	SMF42GD3	2	binary	Number of sysplex-wide data set summary sections.
44	2C	SMF42GD4	4	binary	Offset to data set, CF, SYS summary section.
48	30	SMF42GD5	2	binary	Total length of all data set, CF, SYS summary sections.
50	32	SMF42GD6	2	binary	Number of data set, CF, SYS summary sections.
The following six fields are only included with subtype 17:					
36	24	SMF42HL1	4	binary	Offset to MVS system CF lock structure activity totals section.
40	28	SMF42HL2	2	binary	Length of MVS system CF lock structure activity totals section.
42	2A	SMF42HL3	2	binary	Number of MVS system CF lock structure activity totals sections.
44	2C	SMF42HL4	4	binary	Offset to lock structure summary section.
48	30	SMF42HL5	2	binary	Length of lock structure summary section.
40	32	SMF42HL6	2	binary	Number of lock structure summary sections.
The following nine fields are only included with subtype 18:					
36	24	SMF42IM1	4	binary	Offset to CF cache partition activity totals section.
40	28	SMF42IM2	2	binary	Length of CF cache partition activity totals section.
42	2A	SMF42IM3	2	binary	Number of CF cache partition activity totals sections.
44	2C	SMF42IM4	4	binary	Offset to single CF cache partition summary section.
48	30	SMF42IM5	2	binary	Length of single CF cache partition summary section.
50	32	SMF42IM6	2	binary	Number of single CF cache partition summary sections.
52	34	SMF42IM7	4	binary	Offset to directory/element ratio data sections.
56	38	SMF42IM8	2	binary	Length of directory/element ratio data sections.
58	3A	SMF42IM9	2	binary	Number of directory/element ratio data sections.
The following six fields are only included with subtype 19:					

Offsets		Name	Length	Format	Description
36	24	SMF42JN1	4	binary	Offset to Sysplex Buffer Manager LRU activity totals section.
40	28	SMF42JN2	2	binary	Length of Sysplex Buffer Manager LRU activity totals section.
42	2A	SMF42JN3	2	binary	Number of Sysplex Buffer Manager LRU activity totals sections.
44	2C	SMF42JN4	4	binary	Offset to Local Buffer Manager LRU activity section.
48	30	SMF42JN5	2	binary	Length of Local Buffer Manager LRU activity section.
50	32	SMF42JN6	2	binary	Number of Local Buffer Manager LRU activity sections.
The following three fields are only included with subtype 20:					
36	24	SMF42KN1	4	binary	Offset to STOW Initialize section.
40	28	SMF42KN2	2	binary	Length of STOW Initialize section.
42	2A	SMF42KN3	2	binary	Number of STOW Initialize sections.
The following six fields are only included with subtype 21:					
36	24	SMF42LN1	4	binary	Offset to Member Delete section.
40	28	SMF42LN2	2	binary	Length of Member Delete section.
42	2A	SMF42LN3	2	binary	Number of Member Delete sections.
44	2C	SMF42LN4	4	binary	Offset to Deleted Alias Names section.
48	30	SMF42LN5	2	binary	Length of Deleted Alias Names section.
50	32	SMF42LN6	2	binary	Number of Deleted Alias Names sections.

Product Section

Offsets		Name	Length	Format	Description
0	0	SMF42PDL	8	EBCDIC	Product level.
8	8	SMF42PDN	10	EBCDIC	Product name.
18	12	SMF42PSV	1	binary	Subtype version number **0** Volume header section does not exist **1** Volume header section exists.
19	13	*	1		Reserved.
20	14	SMF42PTS	8	binary	Interval Start or OPEN time of day. This is zero if not available. These values are in time-of-day (TOD) clock format, and reflect GMT time, not local time.
28	1C	SMF42PTE	8	binary	Interval End or CLOSE time of day. This is zero if not available. These values are in time-of-day (TOD) clock format, and reflect GMT time, not local time.
36	24	*	4	EBCDIC	Reserved.

Subtype 1

BMF Totals Section

Offsets		Name	Length	Format	Description
0	0	SMF42TNA	4	binary	Total number of storage classes.
4	4	SMF42TMT	4	binary	Interval length. This is the elapsed time of the measurement period in seconds.
8	8	SMF42TRT	4	binary	Total number of member data page reads.
12	C	SMF42TRH	4	binary	Total number of member data page read hits handled by BMF.
16	10	SMF42TDT	4	binary	Total number of directory data page reads.

Offsets		Name	Length	Format	Description
20	14	SMF42TDH	4	binary	Total number of directory data page read hits handled by BMF.
24	18		4		Reserved.

Storage Class Summary Section

Offsets		Name	Length	Format	Description
0	0	SMF42PNL	2	binary	Length of storage class name.
2	2	SMF42PNN	30	EBCDIC	Storage class name.
32	20	SMF42SRT	4	binary	Total number of member data page reads.
36	24	SMF42SRH	4	binary	Total number of member data page read hits handled by BMF.
40	28	SMF42SDT	4	binary	Total number of directory data page reads.
44	2C	SMF42SDH	4	binary	Total number of directory data page read hits handled by BMF.

Subtype 2

Control Unit Cache Section

Offsets		Name	Length	Format	Description
0	0	SMF42SCS	1	binary	Storage director caching status **Format** / **Meaning** 000*xxxxx* Caching is active. 001*xxxxx* Caching is pending active. 010*xxxxx* Internal subsystem error. Caching has ended. 100*xxxxx* Caching deactivated due to explicit host system request. 110*xxxxx* Pending off is in progress. Command to deactivate cache received, but de-stage is still in progress. 111*xxxxx* Pending off destage has failed. *xxx*1*xxxx* Subsystem storage disabled for maintenance. *xxxx*XX*xx* Reserved. *xxxxxx*1*x* IML device is not available. *xxxxxxx*1 Non-retentive data is deactivated.
1	1	SMF42NCS	1	binary	Subsystem non-volatile storage status **Format** / **Meaning** 00*xxxxxx* Non-volatile cache is active. 01*xxxxxx* Internal subsystem error. Non-volatile cache availability is ended. 10*xxxxxx* Non-volatile cache has been deactivated due to explicit host system request. 11*xxxxxx* Pending non-volatile unavailable has been received, but destage is still in progress. *xxXxxXXX* Reserved. *xxx*1*xxxx* Non-volatile storage disabled for maintenance. *xxxx*1*xxx* Non-volatile storage disabled due to error.
2	2	SMF42CID	2	binary	Subsystem identifier.
4	4	SMF42CSS	4	binary	Configured subsystem storage capacity, in bytes. F‘1’ means the capacity could not be determined.

Offsets		Name	Length	Format	Description
8	8	SMF42SSA	4	binary	Subsystem storage available, in bytes, for allocation as cache space.
12	C	SMF42SAP	4	binary	Subsystem storage allocated, in bytes, for pinned data.
16	10	SMF42SSU	4	binary	Subsystem storage unavailable, in bytes, due to subsystem failures.
20	14	SMF42NSZ	4	binary	Configured non-volatile cache capacity, in bytes. F'1' means the capacity could not be determined.
24	18	SMF42SPR	4	binary	Non-volatile cache allocated, in bytes, for pinned data.
28	1C		4		Reserved.
Statistics gathered from last update period:					
32	20	SMF42LCT	4	binary	I/O count for the subsystem.
36	24	SMF42LFW	4	binary	Fast write bypass count.
40	28	SMF42LRH	4	binary	Cache normal read hit percent, between 0 and 100.
44	2C	SMF42LWM	4	binary	Fast write bypasses per minute (an integer).
48	30	SMF42LYY	2	binary	Year, in the form 0*cyy*, where *c* is 0 for 19xx and 1 for 20xx, and *yy* is the current year (0-99).
50	32	SMF42LDD	2	binary	Day of year, in the form *dddF*, where *ddd* is the current day (1-366), and *F* is the sign.
52	34	SMF42LTM	4	binary	Time since midnight, in seconds.
Statistics gathered from current update period:					
56	38	SMF42CCT	4	binary	I/O count for the subsystem.
60	3C	SMF42CFW	4	binary	Fast write bypass count.
64	40	SMF42CRH	4	binary	Cache normal read hit percent, between 0 and 100.
68	44	SMF42CWM	4	binary	Fast write bypasses per minute (an integer).
72	48	SMF42CYY	2	binary	Year, in the form 0*cyy*, where *c* is 0 for 19xx and 1 for 20xx, and *yy* is the current year (0-99).
74	4A	SMF42CDD	2	binary	Day of year, in the form *dddF*, where *ddd* is the current day (1-366), and *F* is the sign.
76	4C	SMF42CTM	4	binary	Time since midnight, in seconds.
Statistical averages:					
80	50	SMF42IHR	2	binary	Average hit ratio, between 0 and 100.
82	52	SMF42IFW	2	binary	Average fast-write bypasses per minute (an integer).
84	54		4	EBCDIC	Reserved.

Volume Status Section

Offsets		Name	Length	Format	Description
0	0	SMF42VOL	6	EBCDIC	Volume serial number.
6	6		2		Reserved.
8	8	SMF42DEV	4	binary	Device number.

Offsets		Name	Length	Format	Description
12	C	SMF42DB1	1	binary	Device status flags, byte 1 **Bit** **Indicates** **0-1** Device cache status **Format** / **Meaning** 00*xxxxxx* Caching is activated. 01*xxxxxx* Unused. 10*xxxxxx* Deactivate pending by explicit host system request. Transfer of modified data to DASD has failed. 11*xxxxxx* Caching deactivated is unavailable. **2-3** Fast write status **Format** / **Meaning** *xx*00*xxxx* Fast write is activated. *xx*01*xxxx* Unused. *xx*10*xxxx* Fast-write deactivate pending. Transfer of data to DASD has failed. *xx*11*xxxx* Fast write deactivated. **4-7** Duplex pair flags **Format** / **Meaning** *xxxx*1*xxx* Primary of duplex pair. *xxxxx*1*xx* Secondary of duplex pair. *xxxxxx*00 Duplex pair available. *xxxxxx*01 Duplex pair is pending (copy to establish duplex pair is in progress or failed). *xxxxxx*10 Failed duplex by command. *xxxxxx*11 Failed duplex by subsystem.
13	D	SMF42DB2	1	binary	Device status flags, byte 2 **Format** / **Meaning** 00*xxxxxx* No pinned data exists for the device, and fast write was not suspended. 01*xxxxxx* Pinned data exists for the device, but fast write was not suspended. 10*xxxxxx* Reserved. 11*xxxxxx* Pinned data exists for the device, and fast write was suspended. *xxXXXXXX* Channel connect address for other device in duplex pair.
14	E		2		Reserved.

Subtype 3

Event Audit Section

Offsets		Name	Length	Format	Description
0	0	SMF42EAC	8	EBCDIC	The action that caused the record to be created, ACTIVATE, ENF, or VARY SMS.
8	8	SMF42ERC	4	binary	Return code from resulting event.
12	C	SMF42ERS	4	binary	Reason code from resulting event.
Fields filled in for ENF event:					
16	10	SMF42EUA	4	binary	UCB address for the device.
20	14	SMF42EVO	6	EBCDIC	VOLSER for device is online.

Offsets		Name	Length	Format	Description
26	1A		2		Reserved.
28	1C	SMF42EOS	1	binary	Old MVS volume status. **Value** **Meaning** **1** Online. **2** Offline. **3** Pending offline. **4** Boxed. **5** Not ready.
29	1D	SMF42ENS	1	binary	New MVS volume status.
30	1E		2		Reserved.
Fields filled in for VARY SMS command:					
32	20	SMF42ETY	8	EBCDIC	Type of VARY or UPDATE request: STORGRP, LIBRARY, DRIVE or VOLUME.
40	28	SMF42ESL	2	binary	Name length.
42	2A	SMF42ENM	30	EBCDIC	STORAGE name or LIBRARY name or DRIVE name.
72	48	SMF42EVL	6	EBCDIC	Volume serial.
78	4E		2		Reserved.
80	50	SMF42ESY	8	EBCDIC	System name (up to 8 systems, separated by commas) or ‘(ALL)’.
88	58	SMF42EST	12	EBCDIC	Resulting status: ENABLE or ENABLE,NEW or QUIESCE or QUIESCE,NEW or DISABLE or DISABLE,NEW.
100	64		4		Reserved.
Fields filled in for ACTIVATE command:					
104	68	SMF42ESD	44	EBCDIC	Source control data set name.
148	94	SMF42EAD	44	EBCDIC	Active control data set name.

Subtype 4

Concurrent Copy Session Section

Offsets		Name	Length	Format	Description
0	0	S42CCID	4	binary	Logical session ID.
4	4	S42CCRQS	2	EBCDIC	Request type: ‘CC’ = Concurrent Copy.
6	6	S42CCTS	1	EBCDIC	Termination status: ‘N’ = normal ‘A’ = abnormal.
7	7	*	1		Reserved.
8	8	S42CCJNM	8	EBCDIC	Invoking jobname.
16	10	S42CCJNO	8	EBCDIC	Invoking job number.
24	18	S42CCSST	8	binary	Session start TOD.
32	20	S42CCEIT	8	binary	Initialization end TOD.
40	28	S42CCSET	8	binary	Session end TOD.
48	30	S42CCSSO	4	binary	Offset to first SSID (storage subsystem identifier) header.
52	34	S42CCSSN	2	binary	Number of SSIDs for session.
54	36	S42CCSSL	2	binary	Length of SSID header.
56	38	*	8		Reserved.

Concurrent Copy SSID Header Section

Offsets		Name	Length	Format	Description
0	0	S42CSNXT	4	binary	Offset to next SSID header (0 if last SSID).
4	4	S42CSID	2	binary	SSID.
6	6	S42CSIDP	1	binary	Controller session ID.
7	7	*	1		Reserved.
8	8	S42CSMSF	4	binary	Maximum track threshold reached in storage control buffers.
12	C	S42CSVLO	4	binary	Offset to first volume section for this SSID.
16	10	S42CSVLN	2	binary	Number of volume sections.
18	12	S42CSVLL	2	binary	Length of each volume section.
20	14	*	4		Reserved.

Concurrent Copy Volume Section

Offsets		Name	Length	Format	Description
0	0	S42CVLNX	4	binary	Offset to next volume (0 if last volume).
4	4	S42CVLSR	6	EBCDIC	Volume serial number.
10	A		2	*	Reserved.
12	C	S42CVLDV	1	binary	Device type.
13	D	S42CVLUA	3	EBCDIC	Unit address.
16	10	S42CVLTK	4	binary	Number of tracks to be processed on the volume.
20	14	S42CVLRD	4	binary	Number of tracks read directly from DASD.
24	18	S42CVLRS	4	binary	Number of tracks read from the storage control buffers.
28	1C	S42CVLEP	4	binary	Number of concurrent copy I/Os for the volume for the session.
32	20	*	4		Reserved.

Extended Format Data Set Section

Offsets		Name	Length	Format	Description
0	0	S42EXID	4	binary	Logical ID.
4	4	S42EXRQS	3	EBCDIC	Request type: 'EXT' = Extended format data set.
7	7		1	*	Reserved.
8	8	S42EXJNM	8	EBCDIC	Invoking jobname.
16	10	S42EXJNO	8	EBCDIC	Invoking job number.
24	18	S42EXSTM	8	binary	Start TOD.
32	20	S42EXETM	8	binary	End TOD.
40	28	S42EXTS	1	EBCDIC	Termination status: 'N' = normal 'A' = abnormal
41	29		3	*	Reserved.
44	2C	S42EVLRT	8	binary	Number of tracks read.
52	34	S42EVLWT	8	binary	Number of tracks written.
60	3C		12	*	Reserved.

Subtype 5

Storage Class Response Time Section

I/O response and service time components are recorded in multiples of 128 micro-seconds.

Offsets		Name	Length	Format	Description
0	0	S42SCRNL	2	binary	Storage class name length.
2	2	S42SCRNN	30	EBCDIC	Storage class name.
32	20	S42SCIOR	4	binary	Response time.
36	24	S42SCIOC	4	binary	Average I/O connect time.
40	28	S42SCIOP	4	binary	Average I/O pending time.
44	2C	S42SCIOD	4	binary	Average I/O disconnect time.
48	30	S42SCIOQ	4	binary	Average control unit queue time.
52	34	S42SCION	4	binary	Total number of I/Os.
3990 Control Unit Cache Statistics:					
56	38	S42SCCND	4	binary	Number of cache candidates.
60	3C	S42SCHIT	4	binary	Number of cache hits.
64	40	S42SCWCN	4	binary	Number of write candidates.
68	44	S42SCWHI	4	binary	Number of write hits.
72	48	S42SCSEQ	4	binary	Number of sequential I/O operations.
76	4C	S42SCRLC	4	binary	Number of record level cache I/O operations.
80	50	S42SCICL	4	binary	Number of inhibit cache load I/O operations.
84	54	S42SCDA0	4	binary	Average I/O device-active-only time.

Volume Header Section

Offsets to the volume component sections are zero if there are no statistics available to the component.

Offsets		Name	Length	Format	Description
0	0	S42VTNXT	4	binary	Offset to next volume header section from start of record, including record descriptor word (RDW).
4	4	S42VTSER	6	EBCDIC	Volume serial identification.
10	A	S42VTADR	2	binary	Binary device number.
12	C	S42VTFL1	1	binary	Device descriptor flags.
		S42VTONL S42VTSMS			**Bit** / **Meaning** 1... .... Device is online .1.. .... Device is SMS managed ..xx xxxx Reserved
13	D		7	EBCDIC	Reserved.
20	14	S42TUNC	4	binary	Count of I/O not captured by the VTOC or VVDS component statistics.
24	18	S42VTVDO	4	binary	Offset to VTOC Data component section.
28	1C	S42VTVDL	2	binary	Length of VTOC Data component section.
30	1E	*	2	EBCDIC	Reserved.
32	20	S42VTVXO	4	binary	Offset to VTOC Index component section.
36	24	S42VTVXL	2	binary	Length of VTOC Index component section.
38	26	*	2	EBCDIC	Reserved.
40	28	S42VTVVO	4	binary	Offset to VVDS component section.
44	2C	S42VTVVL	2	binary	Length of VVDS component section.

Offsets		Name	Length	Format	Description
42	2E	*	2	EBCDIC	Reserved.

Volume Header Section - VTOC Data component I/O statistics

I/O response and service time components are recorded in multiples of 128 micro-seconds.

Offsets		Name	Length	Format	Description
0	0	S42VDIOR	4	binary	Response time.
4	4	S42VDIOC	4	binary	Average I/O connect time.
8	8	S42VDIOP	4	binary	Average I/O pending time.
12	C	S42VDIOD	4	binary	Average I/O disconnect time
16	10	S42VDIOQ	4	binary	Average control unit queue time.
20	14	S42VDION	4	binary	Total number of I/Os.
3990 Control Unit Cache Statistics:					
24	18	S42VDCND	4	binary	Number of cache candidates.
28	1C	S42VDHIT	4	binary	Number of cache hits.
32	20	S42VDWCN	4	binary	Number of write candidates.
36	24	S42VDWHI	4	binary	Number of write hits.
40	28	S42VDSEQ	4	binary	Number of sequential I/O operations.
44	2C	S42VDRLC	4	binary	Number of record level cache I/O operations.
48	30	S42VDICL	4	binary	Number of inhibit cache load I/O operations.
52	34	S42VDDA0	4	binary	Average I/O device-active-only time.

Volume Header Section - VTOC Index Component I/O Statistics

I/O response and service time components are recorded in multiples of 128 micro-seconds.

Offsets		Name	Length	Format	Description
0	0	S42VXIOR	4	binary	Response time.
4	4	S42VXIOC	4	binary	Average I/O connect time.
8	8	S42VXIOP	4	binary	Average I/O pending time.
12	C	S42VXIOD	4	binary	Average I/O disconnect time.
16	10	S42VXIOQ	4	binary	Average control unit queue time.
20	14	S42VXION	4	binary	Total number of I/Os.
3990 Control Unit Cache Statistics:					
24	18	S42VXCND	4	binary	Number of cache candidates.
28	1C	S42VXHIT	4	binary	Number of cache hits.
32	20	S42VXWCN	4	binary	Number of write candidates.
36	24	S42VXWHI	4	binary	Number of write hits.
40	28	S42VXSEQ	4	binary	Number of sequential I/O operations.
44	2C	S42VXRLC	4	binary	Number of record level cache I/O operations.
48	30	S42VXICL	4	binary	Number of inhibit cache load I/O operations.
52	34	S42VXDA0	4	binary	Average I/O device-active-only time.

Volume Header Section - VVDS Component I/O Statistics

I/O response and service time components are recorded in multiples of 128 micro-seconds

Offsets		Name	Length	Format	Description
0	0	S42VVIOR	4	binary	Response time.
4	4	S42VVIOC	4	binary	Average I/O connect time.
8	8	S42VVIOP	4	binary	Average I/O pending time.
12	C	S42VVIOD	4	binary	Average I/O disconnect time.
16	10	S42VVIOQ	4	binary	Average control unit queue time.
20	14	S42VVION	4	binary	Total number of I/Os
3990 Control Unit Cache Statistics:					
24	18	S42VVCND	4	binary	Number of cache candidates.
28	1C	S42VVHIT	4	binary	Number of cache hits.
32	20	S42VVWCN	4	binary	Number of write candidates.
36	24	S42VVWHI	4	binary	Number of write hits.
40	28	S42VVSEQ	4	binary	Number of sequential I/O operations.
44	2C	S42VVRLC	4	binary	Number of record level cache I/O operations.
48	30	S42VVICL	4	binary	Number of inhibit cache load I/O operations.
52	34	S42VVDA0	4	binary	Average I/O device-active-only time.

Subtype 6

Job Header Section (data set statistics)

Offsets		Name	Length	Format	Description
0	0	S42JDJNM	8	EBCDIC	Job name.
8	8	S42JDRST	4	binary	Time since midnight, in hundreds of a second, reader recognized the JOB card for this job.
12	0C	S42JDRSD	4	packed	Date reader recognized the JOB card for this job, in the form 0*cyyddd*F.
16	10	S42JDUID	8	EBCDIC	User-defined identification field (taken from common exit parameter area, not from USER=parameter on job statement).
24	18	S42JDDSO	4	binary	Offset to first data set header section.
28	1C	S42JDDSL	2	binary	Length of data set header section.
30	1E	S42JDCOD	1	binary	0=Close, 1=Interval record.
31	1F	*			Reserved.
32	20	S42JDPGN	2	binary	Job performance group number.
34	22	S42JDIOL	2	binary	Length of data set I/O statistics section.
36	24	S42JDAML	2	binary	Length of access method statistics section.
38	26	*	2	EBCDIC	Reserved.
40	28	S42JDGMO	4	binary	Greenwich Mean Time (GMT) offset represented in 1.048576 seconds.
44	2C	S42JDWSC	8	EBCDIC	Workload Manager (WLM) Service Class Name.
52	32	S42JDWLD	8	EBCDIC	Workload Manager (WLM) workload name.
60	3C	*	4	EBCDIC	Reserved.

Data Set Header Section

Offsets		Name	Length	Format	Description
0	0	S42DSNXT	4	binary	Offset to the next data set header section (0 if the last data set).

Offsets		Name	Length	Format	Description
4	4	S42DSN	44	EBCDIC	Data set name.
48	30	S42DSTYP	1	binary	Data set type. **Value** **Meaning** **0** Other **1** Physical sequential **2** PDS **3** PDSE **4** Direct access **5** ISAM **6** EXCP **7** Extended format data set **10** HFS **16** KSDS data component **17** KSDS index component **18** Variable RRDS data component **19** Variable RRDS index component **20** Fixed length RRDS **21** Linear data set **22** ESDS
49	31	S42DSCOD S42FIRST *	1	binary	Entry descriptor flag **Bit** **Meaning** 1... .... First data set entry since Open. .xxx xxxx Reserved.
50	32	S42DSFL1 S42DSGSR S42DSLSR S42DSRLS S42DSNSR S42DSEXC S42DSFXD S42DSPL S42DSEF S42DSEFC	1	binary	Data set descriptor flags **Bit** **Meaning** 11xx xxxx VSAM buffer flags 11.. .... GSR 10.. .... LSR 01.. .... RLS 00.. .... NSR ..x. .... Reserved ....1 .... Open for EXCP processing ..... 1... Non-VSAM fixed length records ..... .1.. Program library ....1. Extended format ....1 Compressed format
51	33	*	1	EBCDIC	Reserved.
52	34	S42DSIOO	4	binary	Offset to data set I/O statistics section.
56	38	S42DSAMO	4	binary	Offset to access method statistics section.
60	3C	S42DSVOL	6	EBCDIC	Volume serial number.
66	42	S42DSDEV	2	binary	Device number.
68	44	S42DSSC	8	EBCDIC	Storage class name.
76	4C	S42DSBSZ	4	binary	Block size.
80	50	S42DSTRP	2	binary	Number of stripes
82	52	*	6	EBCDIC	Reserved.

Data Set I/O Statistics Section

Note: I/O response and service time components are recorded in multiples of 128 micro-seconds.

Offsets		Name	Length	Format	Description
0	0	S42DSIOR	4	binary	Average response time.
4	4	S42DSIOC	4	binary	Average I/O connect time.
8	8	S42DSIOP	4	binary	Average I/O pending time.

Offsets		Name	Length	Format	Description
12	C	S42DSIOD	4	binary	Average I/O disconnect time.
16	10	S42DSIOQ	4	binary	Average control unit queue time.
20	14	S42DSION	4	binary	Total number of I/Os.
24	18	S42DSCND	4	binary	Number of cache candidates.
28	1C	S42DSSHTS	4	binary	Number of cache hits.
32	20	S42DSWCN	4	binary	Number of write candidates.
36	24	S42DSWHI	4	binary	Number of write hits.
40	28	S42DSSEQ	4	binary	Number of sequential I/O operations. Operations counted here are not accumulated in S42DSCND and S42DSWCN.
44	2C	S42DSRLC	4	binary	Number of record level cache I/O operations.
48	30	S42DSICL	4	binary	Number of inhibit cache load I/O operations.
52	34	S42DSDA0	4	binary	Average I/O device-active-only time.
56	38	S42DSMXR	4	binary	Maximum data set I/O response time.
60	3C	S42DSMXS	4	binary	Maximum data set service time.

Access Method Statistics Section

Offsets		Name	Length	Format	Description
0	0	S42AMSRB	4	binary	Sequential read: number of blocks.
4	4	S42AMSRR	4	binary	Sequential read: input/output delay.
8	8	S42AMSWB	4	binary	Sequential write: number of blocks.
12	0C	S42AMSWR	4	binary	Sequential write: input/output delay.
16	10	S42AMDRB	4	binary	Direct read: number of blocks.
20	14	S42AMDRR	4	binary	Direct read: total input/output delay.
24	18	S42AMDWB	4	binary	Direct write: number of blocks.
28	1C	S42AMDWR	4	binary	Direct write: total input/output delay.
32	20	S42AMZRB	4	binary	Number of directory reads.
36	24	S42AMZRR	4	binary	Directory read: input/output delay.
40	28	S42AMZWB	4	binary	Number of directory writes.
44	2C	S42AMZWR	4	binary	Directory write: input/output delay.

Subtype 9

B37/D37/E37 Abend Data Section

Offsets		Name	Length	Format	Description
0	0	S42ASYID	4	EBCDIC	System ID.
4	4	S42JOBN	8	EBCDIC	Job Name.
12	C	S42RDST	4	binary	Reader start time.
16	10	S42RDSD	4	packed	Reader start date (0cyyddf).
20	14	S42AAUID	8	EBCDIC	User identification.
28	1C	S42ASTPN	1	binary	Job step number.
29	1D	S42FLAGS	1	binary	Flags **Bit** **Meaning**
		S42B37			1... .... B37 Abend
		S42D37			..1.. .... D37 Abend
		S42E37			...1. .... E37 Abend
30	1E	*	4		Reserved.

Offsets		Name	Length	Format	Description
34	22	S42DSORG	2	binary	DSORG (data set organization).
36	24	S42ADISP	1	binary	Disposition.
37	25	S42DSNME	44	EBCDIC	Data set name.
81	51	S42VOLSR	6	EBCDIC	Volume serial number of current volume.
87	57	S42UCBTP	4	binary	UCB type information.
91	5B	S42NEXT	1	binary	Number of extends on the current volume for this data set.
92	5C	S42TNTRK	4	binary	Total number of tracks for data set on this volume.
96	60	S42ASSAT	4	binary	Secondary allocation amount from the JFCB.
100	64	S42ADRLH	3	binary	Average block length if specified.
103	67	*	5		Reserved.

SMS Data Section

Offsets		Name	Length	Format	Description
0	0	S42MCNME	30	EBCDIC	Management class name.
30	1E	S42SCNME	30	EBCDIC	Storage class name.
60	3C	S42DCNME	30	EBCDIC	Data class name.

Subtype 10

Volume Selection Failure Section

Offsets		Name	Length	Format	Description
0	0	SMF42JBN	8	EBCDIC	Job name.
8	8	SMF42PGN	8	EBCDIC	Program name.
16	10	SMF42STN	8	EBCDIC	Step name
24	18	SMF42DDN	8	EBCDIC	DD name.
32	20	SMF42DSN	44	EBCDIC	Data set name.
76	4C	SMF42RSP	4	binary	Requested space quantity.
80	50	SMF42UNT	2	EBCDIC	Unit of space quantity.
82	52	SMF42DCL	4	binary	Length of data class.
86	56	SMF42DCN	30	EBCDIC	Data class name.
116	74	SMF42MCL	2	binary	Length of management class.
118	76	SMF42MCN	30	EBCDIC	Management class name.
148	94	SMF42SLN	2	binary	Length of storage class.
150	96	SMF42SNM	30	EBCDIC	Storage class name.
180	B4	SMF42SGL	2	binary	Length of storage group.
182	B6	SMF42SGN	30	EBCDIC	Storage group name.

Subtype 11

Extended Remote Copy (XRC) Session Section

Offsets		Name	Length	Format	Description
0	0	S42XRID	8	EBCDIC	Logical session ID.
8	8	S42XRTYP	8	EBCDIC	Session type ‘XRC’ = Extended Remote Copy

Offsets		Name	Length	Format	Description
16	10	S42XRSSO	4	binary	Offset to first storage subsystem identifier (SSID) data section.
20	14	S42XRSSN	2	binary	Number of SSIDs in the XRC session.
22	16	S42XRSSL	2	binary	Length of SSID data section.
24	18		8		Reserved.

XRC SSID Data Section

Offsets		Name	Length	Format	Description
0	0	S42XRSNX	4	binary	Offset to next SSID data section (0 if last SSID).
4	4	S42XRSID	2	binary	SSID.
6	6	S42XRIDP	1	binary	Controller session ID.
7	7	*	1		Reserved.
8	8	S42XRVSH	4	binary	Number of volumes being shadowed for this SSID that are still active in the XRC session at the end of the SMF interval.
12	C	S42XRTPR	4	binary	Total number of primary data mover reads.
16	10	S42XRNWD	4	binary	Number of data mover reads with data.
20	14	S42XRNND	4	binary	Number of data mover reads with no data.
24	18	S42XRNLR	4	binary	Number of data mover reads left to be read.
28	1C	S42XRNFW	4	binary	Number of format writes.
32	20	S42XRNUW	4	binary	Number of update writes.
36	24	S42XRARS	4	binary	Average record size.
40	28	*	4		Reserved.

Subtype 14

ADSTAR Distributed Storage Manager (ADSM) Accounting Section

Offsets		Name	Length	Format	Description
0	0	SMF42T14	2	EBCDIC	Product level.
2	2		8	EBCDIC	Product name, ADSM.
10	A		2	N/A	Reserved.
12	C		30	EBCDIC	Node name of ADSM client. If the node name does not fit completely within 30 characters, the client node name is listed as: `first...last` where *first* is the first 17 characters of the node name and *last* is the last 10 characters of the node name.
42	2A		14	EBCDIC	Data and time of accounting (yyyymmddhhmmss).
56	38		4	binary	Duraction of session, in seconds.
60	3C		4	binary	Number of archive database objects inserted during session.
64	40		4	binary	Number of backup database objects inserted during session.
68	44		4	binary	Amount of archived files, in kilobytes, sent by the client to the server.
72	48		4	binary	Amount of backed up files, in kilobytes, sent by the client to the server

Offsets		Name	Length	Format	Description
76	4C		4	binary	Amount of data, in kilobytes, communicated between a client node and the server during this session.
80	50		8	EBCDIC	Client owner name (UNIX).
88	58		8	EBCDIC	Node type.
96	60		8	EBCDIC	Communication method used for session.
104	68		4	binary	Number of archive database objects retrieved during session.
108	6C		4	binary	Number of backup database objects retrieved during session.
112	70		4	binary	Amount of space, in kilobytes, retrieved by archived objects.
116	74		4	binary	Amount of space, in kilobytes, retrieved by backed up objects.
120	78		4	binary	Amount of Idle Wait time, in seconds, during the session.
124	7C		4	binary	Amount of Communications Wait time, in seconds, during the session.
128	80		4	binary	Amount of Media Wait time, in seconds, during the session.
132	84		4	binary	Amount of CPU time, in seconds, used by the server for basic client activity. This amount includes CPU time to send or receive data from the client but does not include CPU time to place data on, or retrieve it from database storage.
136	88		1	binary	Authentication method used.
137	89		1	binary	Normal termination indicator (Normal=X’01’).
138	8A		2	N/A	Reserved.
140	8C		4	binary	Number of space managed database objects inserted during session.
144	90		4	binary	Amount of space managed data, in kilobytes, sent by the client to the server.
148	94		4	binary	Number of space managed database objects retrieved during session.
152	98		4	binary	Amount of space, in kilobytes, retrieved by space managed objects.

Subtype 15 — VSAM RLS Storage Class Response Time Summary

Sysplex-Wide Storage Class Summary Data Section

Offsets		Name	Length	Format	Description
0	0	SMF42FAA	4	binary	Interval length. This is the total length, in seconds, of the measurement period.
4	4	SMF42F00	12	EBCDIC	Indicates if DFSMS greater than 4K CF caching is active. Value is GT4KACTIVE or GT4KNOTACT.
16	10	SMF42FAB	2	binary	Length of the storage class name.
18	12	SMF42FAC	30	EBCDIC	Storage class name.
48	30	SMF42F01	2	binary	Length of DFSMS cache set name.
50	32	SMF42FAD	30	EBCDIC	DFSMS cache set name.
80	50	SMF42FAE	4	binary	Number of lock requests processed.
84	54	SMF42FAF	4	binary	Number of true contention lock requests.
88	58	SMF42FAG	4	binary	Number of false contention lock requests.
92	5C	SMF42F02	2	binary	DFSMS direct weight
94	5E	SMF42F12	2	binary	DFSMS sequential weight
96	60	SMF42FAH	16	EBCDIC	Reserved.

Offsets		Name	Length	Format	Description
Sysplex-Wide Direct Access Summary Section:					
112	70	SMF42FCA	4	binary	Coupling facility cache partition number.
116	74	SMF42FCB	4	binary	Total number of direct access requests.
120	78	SMF42FCC	4	binary	Total number of Read requests - no read integrity.
124	7C	SMF42FCD	4	binary	Total number of Read Requests - Consistent reads.
128	80	SMF42FCE	4	binary	Total number of Write requests.
132	84	SMF42FCF	4	binary	Number of direct access BMF requests.
136	88	SMF42FCG	4	binary	Number of direct access BMF Read Requests.
140	8C	SMF42FCH	4	binary	Number of direct access BMF Write requests.
144	90	SMF42FCI	4	binary	Number of direct access BMF Read hits.
148	94	SMF42FCJ	4	binary	Number of BMF valid Read hits.
152	98	SMF42FCK	4	binary	Number of BMF false invalids.
156	9C	SMF42FCL	4	binary	Number of requests processed by the sysplex cache manager.
160	A0	SMF42FCM	4	binary	Number of CF Read requests.
164	A4	SMF42FCN	4	binary	Number of CF Write requests.
168	A8	SMF42FCO	4	binary	Number of CF Read hits
172	AC	SMF42FCP	4	binary	Number of Read castins
176	B0	SMF42FCQ	8	binary	Number of bytes transferred into the DFSMS cache structure.
184	B8	SMF42FCR	4	binary	Number of READ real I/O requests to DASD.
188	BC	SMF42FCS	4	binary	Number of WRITE real I/O requests to DASD.
192	C0	SMF42FCT	8	binary	Total number of bytes transferred for all direct access requests where the data was retrieved from DASD.
200	C8	SMF42FCU	8	binary	Number of DASD for the write requests.
208	D0	SMF42FCV	16	EBCDIC	Reserved.
224	E0	SMF42FCW	8	binary	Total amount of time, in milli seconds, for all the direct access requests in this interval.
232	E8	SMF42FCX	4	binary	Average response time for all of the requests in this interval (total time/number of requests).
236	EC	SMF42FCY	4	binary	Normalized response time for all of the requests in this interval (total time/number of bytes transferred/4K).
240	F0	SMF42FCZ	8	EBCDIC	Reserved.
248	F8	SMF42FC7	32	EBCDIC	Reserved.
Sysplex-Wide Direct Access Record Merge (RE-DO) Summary Section:					
280	118	SMF42FDA	4	binary	Coupling facility Cache partition number (RE-DO).
284	11C	SMF42FDB	4	binary	Total number of requests to DASD (RE-DO).
288	120	SMF42FDC	4	binary	Number of read requests - NRI protocol (No Read Integrity) (RE-DO).
292	124	SMF42FDD	4	binary	Number of read requests - Consistent read protocol (RE-DO).
296	128	SMF42FDE	4	binary	Number of WRITE requests (RE-DO).
300	12C	SMF42FDF	4	binary	Number of direct access BMF requests (RE-DO).
304	130	SMF42FDG	4	binary	Number of direct access BMF Read requests (RE-DO).
308	134	SMF42FDH	4	binary	Number of direct access BMF Write requests (RE-DO).
312	138	SMF42FDI	4	binary	Number of direct access BMF read hits (RE-DO).
316	13C	SMF42FDJ	4	binary	Number of direct access BMF valid read hits (RE-DO).
320	140	SMF42FDK	4	binary	Number of BMF false invalids (RE-DO).

Offsets		Name	Length	Format	Description
324	144	SMF42FDL	4	binary	Number of requests processed by the Sysplex Cache Manager
328	148	SMF42FDM	4	binary	Number of CF cache structure Read requests (RE-DO).
332	14C	SMF42FDN	4	binary	Number of CF cache structure Write requests (RE-DO).
336	150	SMF42FDO	4	binary	Number of CF cache structure read hits (RE-DO).
340	154	SMF42FDP	4	binary	Number of CF cache structure read castins (RE-DO).
344	158	SMF42FDQ	8	binary	Number of bytes transferred into DFSMS cache structure (RE-DO).
352	160	SMF42FDR	4	binary	Number of READ real I/O direct requests to DASD (RE-DO).
356	164	SMF42FDS	4	binary	Number of WRITE real I/O direct requests to DASD (RE-DO).
360	168	SMF42FDT	8	binary	Total number of bytes transferred to DASD for the read requests.
368	170	SMF42FDU	8	binary	Total number of bytes transferred to DASD for the write requests.
376	178	SMF42FDV	16	EBCDIC	Reserved. (RE-DO)
392	188	SMF42FDW	8	binary	Total amount of time, in milli seconds, for all direct access requests in this interval (RE-DO).
400	190	SMF42FDX	4	binary	Average response time for all of the direct access requests in this interval (total time/number of requests) (RE-DO).
404	194	SMF42FDY	4	binary	Normalized response time for all of the requests in this interval (total time/number of bytes transferred/4K) (RE-DO).
408	198	SMF42FDZ	8	EBCDIC	Reserved.
416	1A0	SMF42FD7	32	EBCDIC	Reserved.
Sysplex-Wide Sequential Access Summary Section:					
448	1C0	SMF42FEA	4	binary	Coupling facility cache partition number.
452	1C4	SMF42FEB	4	binary	Total number of requests.
456	1C8	SMF42FEC	4	binary	Total number of read requests - NRI protocol (No Read Integrity).
460	1CC	SMF42FED	4	binary	Total number of read requests - Consistent read protocol.
464	1D0	SMF42FEE	4	binary	Total number of WRITE requests.
468	1D4	SMF42FEF	4	binary	Number of sequential access BMF requests.
472	1D8	SMF42FEG	4	binary	Total number of sequential access BMF Read requests.
476	1DC	SMF42FEH	4	binary	Total number of sequential access BMF Write requests.
480	1E0	SMF42FEI	4	binary	Number of sequential access BMF read hits.
484	1E4	SMF42FEJ	4	binary	Number of sequential access BMF valid read hits.
488	1E8	SMF42FEK	4	binary	Number of sequential access BMF false invalids.
492	1EC	SMF42FEL	4	binary	Number of sequential access requests processed by the Sysplex Cache Manager
496	1F0	SMF42FEM	4	binary	Number of sequential access CF cache structure read requests.
500	1F4	SMF42FEN	4	binary	Number of sequential access CF cache structure Write requests.
504	1F8	SMF42FEO	4	binary	Number of sequential access CF cache structure read hits.
508	1FC	SMF42FEP	4	binary	Number of sequential access CF cache structure read castins.
512	200	SMF42FEQ	8	binary	Number of bytes transferred into the DFSMS CF cache structure.
520	208	SMF42FER	4	binary	Number of READ real I/O sequential requests to DASD.
524	20C	SMF42FES	4	binary	Number of WRITE real I/O sequential requests to DASD.

Offsets		Name	Length	Format	Description
528	210	SMF42FET	8	binary	Total number of bytes transferred to DASD for the read requests.
536	218	SMF42FEU	8	binary	Total number of bytes transferred to DASD for the write requests.
544	220	SMF42FEV	16	EBCDIC	Reserved.
560	230	SMF42FEW	8	binary	Total amount of time, in milli seconds, for all sequential access requests in this interval.
568	238	SMF42FEX	4	binary	Average response time for all of the sequential access requests in this interval (total time/number of requests).
572	23C	SMF42FEY	4	binary	Normalized response time for all of the requests in this interval (total time/number of bytes transferred/4K).
576	240	SMF42FEZ	8	EBCDIC	Reserved.
584	248	SMF42FE7	32	EBCDIC	Reserved.
Sysplex-Wide Sequential Access Record Merge (RE-DO) Summary Section:					
616	268	SMF42FFA	4	binary	Coupling facility cache partition number.
620	26C	SMF42FFB	4	binary	Total number of sequential access requests. (RE-DO)
624	270	SMF42FFC	4	binary	Number of read requests - NRI protocol (No Read Integrity) (RE-DO).
628	274	SMF42FFD	4	binary	Number of read requests - Consistent read protocol. (RE-DO)
632	278	SMF42FFE	4	binary	Number of sequential access Write requests. (RE-DO)
636	27C	SMF42FFF	4	binary	Number of sequential access BMF requests. (RE-DO)
640	280	SMF42FFG	4	binary	Number of sequential access BMF Read requests. (RE-DO)
644	284	SMF42FFH	4	binary	Number of sequential access BMF Write requests. (RE-DO)
648	288	SMF42FFI	4	binary	Number of sequential access BMF read hits. (RE-DO)
652	28C	SMF42FFJ	4	binary	Number of sequential access BMF valid read hits. (RE-DO)
656	290	SMF42FFK	4	binary	Number of sequential access BMF false invalids. (RE-DO)
660	294	SMF42FFL	4	binary	Number of sequential access requests processed by the Sysplex Cache Manager. (RE-DO)
664	298	SMF42FFM	4	binary	Number of sequential access CF cache structure Read requests. (RE-DO)
668	29C	SMF42FFN	4	binary	Number of sequential access CF cache structure Write requests. (RE-DO)
672	2A0	SMF42FFO	4	binary	Number of sequential access CF cache structure read hits. (RE-DO)
676	2A4	SMF42FFP	4	binary	Number of sequential access CF cache structure read castins. (RE-DO)
680	2A8	SMF42FFQ	8	binary	Number of bytes transferred into the DFSMS cache structure (RE-DO).
688	2BO	SMF42FFR	4	binary	Total number of READ real I/O sequential requests to DASD. (RE-DO)
692	2B4	SMF42FFS	4	binary	Total number of WRITE real I/O sequential requests to DASD. (RE-DO)
696	2B8	SMF42FFT	8	binary	Total number of bytes transferred to DASD for the read requests.
704	2C0	SMF42FFU	8	binary	Total number of bytes transferred to DASD for the write requests.
712	2C8	SMF42FFV	16	EBCDIC	Reserved.
728	2D8	SMF42FFW	8	binary	Total amount of time, in milli seconds, for all sequential access (RE-DO) requests in this interval.

Offsets		Name	Length	Format	Description
736	2E0	SMF42FFX	4	binary	Average response time for all of the sequential access (RE-DO) requests in this interval (total time/number of requests).
740	2E4	SMF42FFY	4	binary	Normalized response time for all of the requests in this interval (total time/number of bytes transferred/4K). (RE-DO)
744	2E8	SMF42FFZ	8	EBCDIC	Reserved.
752	2F0	SMF42FF7	32	EBCDIC	Reserved.
Sysplex-Wide Sequential Access Read Ahead Summary Section:					
784	310	SMF42FGA	4	binary	Coupling facility cache partition number.
788	314	SMF42FGB	4	binary	Total number of real I/O sequential requests to DASD. (read ahead)
792	318	SMF42FGC	4	binary	Number of read requests - NRI protocol (No Read Integrity) (READ-AHEAD).
796	31C	SMF42FGD	4	binary	Number of read requests - Consistent read protocol (READ-AHEAD).
800	320	SMF42FGE	4	binary	Number of Write requests. (READ-AHEAD)
804	324	SMF42FGF	4	binary	Number of sequential access BMF requests. (READ-AHEAD)
808	328	SMF42FGG	4	binary	Number of sequential access BMF Read requests. (READ-AHEAD)
812	32C	SMF42FGH	4	binary	Number of sequential access BMF Write requests. (READ-AHEAD)
816	330	SMF42FGI	4	binary	Number of sequential access BMF read hits. (read ahead)
820	334	SMF42FGJ	4	binary	Number of sequential access BMF valid read hits. (read ahead)
824	338	SMF42FGK	4	binary	Number of BMF false invalids. (read ahead)
828	33C	SMF42FGL	4	binary	Number of requests processed by the sysplex cache manager. (read ahead)
832	340	SMF42FGM	4	binary	Number of sequential access CF cache structure Read requests. (read ahead)
836	344	SMF42FGN	4	binary	Number of sequential access CF cache structure Write requests. (read ahead)
840	348	SMF42FGO	4	binary	Number of sequential access CF cache structure read hits. (read ahead)
844	34C	SMF42FGP	4	binary	Number of sequential access CF cache structure read castins. (read ahead)
848	350	SMF42FGQ	8	binary	Total number of bytes transferred into the DFSMS cache structure for all sequential access requests. (read ahead)
856	358	SMF42FGR	4	binary	Total number of READ real I/O sequential requests to DASD (READ-AHEAD).
860	35C	SMF42FGS	4	binary	Total number of WRITE real I/O sequential requests to DASD (READ-AHEAD).
864	360	SMF42FGT	8	binary	Total number of bytes transferred to DASD for the read requests.
868	368	SMF42FGU	8	binary	Total number of bytes transferred to DASD for the write requests.
880	370	SMF42FGV	16	EBCDIC	Reserved.
896	380	SMF42FGW	8	binary	Total amount of time, in milli seconds, for all sequential access (read ahead) requests in this interval.
904	388	SMF42FGX	4	binary	Average response time for all of the sequential access (read ahead) requests in this interval. (total time/number of requests)

Offsets		Name	Length	Format	Description
908	38C	SMF42FGY	4	binary	Normalized response time for all of the requests in this interval (total time/number of bytes transferred/4K). (read ahead)
912	390	SMF42FGZ	8	EBCDIC	Reserved.
920	398	SMF42FG7	32	EBCDIC	Reserved.
Sysplex-Wide Sequential Access Pre-format Summary Section:					
952	3B8	SMF42FHA	4	binary	Coupling facility cache partition number.
956	3BC	SMF42FHB	4	binary	Total number of real I/O sequential requests to DASD. (pre-format)
960	3C0	SMF42FHC	4	binary	Number of read requests - NRI protocol (No Read Integrity) (PRE-FORMAT).
964	3C4	SMF42FHD	4	binary	Number of read requests - Consistent read protocol (PRE-FORMAT).
968	3C8	SMF42FHE	4	binary	Number of Write requests. (PRE-FORMAT)
972	3CC	SMF42FHF	4	binary	Number of sequential access BMF requests. (PRE-FORMAT)
976	3D0	SMF42FHG	4	binary	Number of sequential access BMF Read requests. (PRE-FORMAT)
980	3D4	SMF42FHH	4	binary	Number of sequential access BMF Write requests. (PRE-FORMAT)
984	3D8	SMF42FHI	4	binary	Number of sequential access BMF read hits. (pre-format)
988	3DC	SMF42FHJ	4	binary	Number of sequential access BMF valid read hits. (pre-format)
992	3E0	SMF42FHK	4	binary	Number of BMF false invalids. (pre-format)
996	3E4	SMF42FHL	4	binary	Number of sequential access CF Cache structure Requests. (pre-format)
1000	3E8	SMF42FHM	4	binary	Number of sequential access CF Cache structure Read Requests. (pre-format)
1004	3EC	SMF42FHN	4	binary	Number of sequential access CF Cache structure Write Requests. (pre-format)
1008	3F0	SMF42FHO	4	binary	Number of sequential access CF cache structure read hits. (pre-format)
1012	3F4	SMF42FHP	4	binary	Number of sequential access CF cache structure read castins. (pre-format)
1016	3F8	SMF42FHQ	8	binary	Number of sequential access CF cache structure bytes transferred. (pre-format)
1024	400	SMF42FHR	4	binary	Total number of READ real I/O sequential requests to DASD. (pre-format)
1028	404	SMF42FHS	4	binary	Total number of WRITE real I/O sequential requests to DASD. (pre-format)
1032	408	SMF42FHT	8	binary	Total number of bytes transferred to DASD for the read requests.
1040	410	SMF42FHU	8	binary	Total number of bytes transferred to DASD for the write requests.
1048	418	SMF42FHV	16	EBCDIC	Reserved.
1064	428	SMF42FHW	8	binary	Total amount of time, in milli seconds, for all sequential access (pre-format) requests in this interval.
1072	430	SMF42FHX	4	binary	Average response time for all of the sequential access (pre-format) requests in this interval (total time/number of requests).
1076	434	SMF42FHY	4	binary	Normalized response time for all of the requests in this interval (total time/number of bytes transferred/4K). (pre-format)

Offsets		Name	Length	Format	Description
1080	438	SMF42FHZ	8	EBCDIC	Reserved.
1088	440	SMF42FH7	32	EBCDIC	Reserved.
1120	460	SMF42FOA	4	binary	Number of record lock requests (obtain/alter/promote).
1124	464	SMF42FOB	4	binary	Number of record lock requests that cause true contention.
1128	468	SMF42FOC	4	binary	Number of record lock requests that cause false contention.
1132	46C	SMF42FOD	4	binary	Number of record lock release requests.
1136	470	SMF42FOE	4	binary	Number of component_1 type lock requests.
1140	474	SMF42FOF	4	binary	Number of component_1 type release lock requests.
1144	478	SMF42FOG	8	EBCDIC	Reserved.
1152	480	SMF42FOH	4	binary	Number of component_1 class_1 (DIWA) locks (obtain/alter/promote).
1156	484	SMF42FOI	4	binary	Number of component_1 class_1 (DIWA) locks that cause true contention.
1160	488	SMF42FOJ	4	binary	Number of component_1 class_1 (DIWA) locks that cause false contention.
1164	48C	SMF42FOK	4	binary	Number of component_1 class_1 (DIWA) release lock requests.
1168	490	SMF42FOL	4	binary	Number of component_1 class_2 (UPGRADE) locks (obtain/alter/promote).
1172	494	SMF42FOM	4	binary	Number of component_1 class_2 (UPGRADE) locks that cause true contention.
1176	498	SMF42FON	4	binary	Number of component_1 class_2 (UPGRADE) locks that cause false contention.
1180	49C	SMF42FOO	4	binary	Number of component_1 class_2 (UPGRADE) release lock requests.
1184	4A0	SMF42FOP	4	binary	Number of component_1 class_3 (PREFORMAT) locks (obtain/alter/promote).
1188	4A4	SMF42FOQ	4	binary	Number of component_1 class_3 (PREFORMAT) locks that cause true contention.
1192	4A8	SMF42FOR	4	binary	Number of component_1 class_3 (PREFORMAT) locks that cause false contention.
1196	4AC	SMF42FOS	4	binary	Number of component_1 class_3 (PREFORMAT) release lock requests.
1200	4B0	SMF42FOT	4	binary	Number of component_2 lock requests (obtain/alter/promote).
1204	4B4	SMF42FOU	4	binary	Number of component_2 locks that cause true contention.
1208	4B8	SMF42FOV	4	binary	Number of component_2 locks that cause false contention.
1212	4BC	SMF42FOW	4	binary	Number of component_2 release lock requests.
1216	4C0	SMF42FOX	32	EBCDIC	Reserved.
1248	4E0	SMF42FPR	8	EBCDIC	Total time all thread requests.
1256	4E8	SMF42FPS	4	binary	Total number of all thread requests.
1256	4EC	SMF42FPT	4	binary	Reserved.
1260	4F0	SMF42FPU	4	binary	Average response time for all of the thread requests in the interval. (Total time/number of thread requests).
1264	4F4	SMF42FPV	4	binary	Normalized response time for all of the thread requests in the interval. (Total time/number of bytes transferred/4K).
1268	4F8	SMF42FPW	8	EBCDIC	Reserved.

SC, CF, SYS Summary Section

Offsets		Name	Length	Format	Description
0	0	SMF42FBA	4	binary	Interval length. This is the total length, in seconds, of the measurement period.
4	4	SMF42F03	12	EBCDIC	Indicates if DFSMS greater than 4K CF caching is active. Value is GT4KACTIVE or GT4KNOTACT.
16	10	SMF42FBB	2	binary	Length of the storage class name.
18	12	SMF42FBC	30	EBCDIC	Storage class name.
48	30	SMF42F04	2	binary	Cache Set Name Length
50	32	SMF42FBD	30	EBCDIC	DFSMS Cache Set name.
80	50	SMF42FBE	8	EBCDIC	MVS system name.
88	58	SMF42F05	8	EBCDIC	Reserved.
96	60	SMF42FBF	2	EBCDIC	Reserved.
98	62	SMF42FBG	30	EBCDIC	DFP CF cache structure name.
128	80	SMF42FBH	4	binary	Number of lock requests processed.
132	84	SMF42FBI	4	binary	Number of true contention lock requests.
136	88	SMF42FBJ	4	binary	Number of false contention lock requests.
140	8C	SMF42FB2	2	binary	SMS Direct Weight
142	8E	SMF42FB3	2	binary	SMS Sequential Weight
144	90	SMF42FBL	16	EBCDIC	Reserved.
Direct Access Section:					
160	A0	SMF42FIA	4	binary	Coupling facility cache partition number.
164	A4	SMF42FIB	4	binary	Number of direct requests.
168	A8	SMF42FIC	4	binary	Number of read requests - NRI protocol (No Read Integrity).
172	AC	SMF42FID	4	binary	Number of read requests - Consistent read protocol.
176	B0	SMF42FIE	4	binary	Number of Write requests.
180	B4	SMF42FIF	4	binary	Number of direct access BMF requests.
184	B8	SMF42FIG	4	binary	Number of direct access BMF Read requests.
188	BC	SMF42FIH	4	binary	Number of direct access BMF Write requests.
192	C0	SMF42FII	4	binary	Number of direct access BMF read hits.
196	C4	SMF42FIJ	4	binary	Number of direct access BMF valid read hits.
200	C8	SMF42FIK	4	binary	Number of BMF false invalids.
204	CC	SMF42FIL	4	binary	Number of direct access CF Cache structure requests.
208	D0	SMF42FIM	4	binary	Number of direct access CF cache structure Read requests.
212	D4	SMF42FIN	4	binary	Number of direct access CF cache structure Write requests.
216	D8	SMF42FIO	4	binary	Number of direct access CF cache structure read hits.
220	DC	SMF42FIP	4	binary	Number of direct access CF cache structure read castins.
224	E0	SMF42FIQ	8	binary	Number of direct access CF cache structure bytes transferred.
232	E8	SMF42FIR	4	binary	Number of READ real I/O direct requests to DASD.
236	EC	SMF42FIS	4	binary	Number of WRITE real I/O direct requests to DASD.
240	F0	SMF42FIT	8	binary	Total number of bytes transferred to DASD for the read requests.
248	F8	SMF42FIU	8	binary	Total number of bytes transferred to DASD for the write requests.
256	100	SMF42FIV	16	EBCDIC	Reserved.
272	110	SMF42FIW	8	binary	Total amount of time, in milli seconds, for all the direct access requests in this interval.

Offsets		Name	Length	Format	Description
280	118	SMF42FIX	4	binary	Average response time for all of the requests in this interval (total time/number of requests).
284	11C	SMF42FIY	4	binary	Normalized response time for all of the requests in this interval (total time/number of bytes transferred/4K).
288	120	SMF42FIZ	8	EBCDIC	Reserved.
296	128	SMF42FI7	32	EBCDIC	Reserved.
Direct Access Record Merge (RE-DO) Summary Section:					
328	148	SMF42FJA	4	binary	Coupling facility cache partition number.
332	14C	SMF42FJB	4	binary	Total number of direct access requests. (RE-DO)
336	150	SMF42FJC	4	binary	Number of read requests - NRI protocol (No Read Integrity). (RE-DO)
340	154	SMF42FJD	4	binary	Number of read requests - Consistent read protocol. (RE-DO)
344	158	SMF42FJE	4	binary	Number of Write requests. (RE-DO)
348	15C	SMF42FJF	4	binary	Number of direct access BMF requests. (RE-DO)
352	160	SMF42FJG	4	binary	Number of direct access BMF Read requests. (RE-DO)
356	164	SMF42FJH	4	binary	Number of direct access BMF Write requests. (RE-DO)
360	168	SMF42FJI	4	binary	Number of direct access BMF read hits. (RE-DO)
364	16C	SMF42FJJ	4	binary	Number of direct access BMF valid read hits. (RE-DO)
368	170	SMF42FJK	4	binary	Number of BMF false invalids. (RE-DO)
372	174	SMF42FJL	4	binary	Number of direct access CF cache structure requests. (RE-DO)
376	178	SMF42FJM	4	binary	Number of direct access CF cache structure Read requests. (RE-DO)
380	17C	SMF42FJN	4	binary	Number of direct access CF cache structure Write requests. (RE-DO)
384	180	SMF42FJO	4	binary	Number of direct access CF cache structure read hits. (RE-DO)
388	184	SMF42FJP	4	binary	Number of direct access CF cache structure read castins. (RE-DO)
392	188	SMF42FJQ	8	binary	Number of direct access CF cache structure bytes transferred. (RE-DO)
400	190	SMF42FJR	4	binary	Total number of READ real I/O direct requests to DASD. (RE-DO)
404	194	SMF42FJS	4	binary	Total number of WRITE real I/O direct requests to DASD. (RE-DO)
408	198	SMF42FJT	8	binary	Total number of bytes transferred to DASD for the read requests.
416	1A0	SMF42FJU	8	binary	Total number of bytes transferred to DASD for the write requests.
424	1A8	SMF42FJV	16	EBCDIC	Reserved.
440	1B8	SMF42FJW	8	binary	Total amount of time, in milli seconds, for all direct access. (RE-DO) requests in this interval.
448	1C0	SMF42FJX	4	binary	Average response time for all of the direct access requests in this interval (total time/number of requests). (RE-DO)
452	1C4	SMF42FJY	4	binary	Normalized response time for all of the requests in this interval (total time/number of bytes transferred/4K). (RE-DO)
456	1C8	SMF42FJZ	8	EBCDIC	Reserved.
464	1D0	SMF42FJ7	32	EBCDIC	Reserved.
Sequential Access Section:					
496	1F0	SMF42FKA	4	binary	Coupling facility cache partition number.

Offsets		Name	Length	Format	Description
500	1F4	SMF42FKB	4	binary	Total number of sequential access requests.
504	1F8	SMF42FKC	4	binary	Number of read requests - NRI protocol (No Read Integrity).
508	1FC	SMF42FKD	4	binary	Number of read requests - Consistent read protocol.
512	200	SMF42FKE	4	binary	Number of Write requests.
516	204	SMF42FKF	4	binary	Number of sequential access BMF requests.
520	208	SMF42FKG	4	binary	Number of sequential access BMF Read requests.
524	20C	SMF42FKH	4	binary	Number of sequential access BMF Write requests.
528	210	SMF42FKI	4	binary	Number of sequential access BMF read hits.
532	214	SMF42FKJ	4	binary	Number of sequential access BMF valid read hits.
536	218	SMF42FKK	4	binary	Number of sequential BMF false invalids.
540	21C	SMF42FKL	4	binary	Number of sequential access CF cache structure requests.
544	220	SMF42FKM	4	binary	Number of sequential access CF cache structure Read requests.
548	224	SMF42FKN	4	binary	Number of sequential access CF cache structure Write requests.
552	228	SMF42FKO	4	binary	Number of sequential access CF cache structure read hits.
556	22C	SMF42FKP	4	binary	Number of sequential access CF cache structure read castins.
560	230	SMF42FKQ	8	binary	Number of sequential access CF cache structure bytes transferred.
568	238	SMF42FKR	4	binary	Total number of READ real I/O sequential requests to DASD.
572	23C	SMF42FKS	4	binary	Total number of WRITE real I/O sequential requests to DASD.
576	240	SMF42FKT	8	binary	Total number of bytes transferred to DASD for the read requests.
584	248	SMF42FKU	8	binary	Total number of bytes transferred to DASD for the write requests.
592	250	SMF42FKV	16	EBCDIC	Reserved.
608	260	SMF42FKW	8	binary	Total amount of time, in milli seconds, for all sequential access requests in this interval.
616	268	SMF42FKX	4	binary	Average response time for all of the sequential access requests in this interval (total time/number of requests).
620	26C	SMF42FKY	4	binary	Normalized response time for all of the requests in this interval (total time/number of bytes transferred/4K).
624	270	SMF42FKZ	8	EBCDIC	Reserved.
632	278	SMF42FK7	32	EBCDIC	Reserved.
Sequential Access Record Merge (RE-DO) Summary Section:					
664	298	SMF42FLA	4	binary	Coupling facility cache partition number.
668	29C	SMF42FLB	4	binary	Total number of sequential access requests. (RE-DO)
672	2A0	SMF42FLC	4	binary	Number of read requests - NRI protocol (No Read Integrity). (RE-DO)
676	2A4	SMF42FLD	4	binary	Number of read requests - Consistent read protocol. (RE-DO)
680	2A8	SMF42FLE	4	binary	Number of Write requests. (RE-DO)
684	2AC	SMF42FLF	4	binary	Number of sequential access BMF requests. (RE-DO)
688	2B0	SMF42FL6	4	binary	Number of sequential access BMF Read requests. (RE-DO)
692	2B4	SMF42FLH	4	binary	Number of sequential access BMF Write requests. (RE-DO)
696	2B8	SMF42FLI	4	binary	Number of sequential access BMF read hits. (RE-DO)
700	2BC	SMF42FLJ	4	binary	Number of sequential access BMF valid read hits. (RE-DO)

Offsets		Name	Length	Format	Description
704	2C0	SMF42FLK	4	binary	Number of BMF false invalids. (RE-DO)
708	2C4	SMF42FLL	4	binary	Total number of sequential access requests. (RE-DO)
712	2C8	SMF42FLM	4	binary	Number of sequential access CF cache structure Read requests. (RE-DO)
716	2CC	SMF42FLN	4	binary	Number of sequential access CF cache structure Write requests. (RE-DO)
720	2D0	SMF42FLO	4	binary	Number of sequential access CF cache structure Read hits. (RE-DO)
724	2D4	SMF42FLP	4	binary	Number of sequential access CF cache structure read castins. (RE-DO)
728	2D8	SMF42FLQ	8	binary	Number of sequential access CF cache structure bytes transferred. (RE-DO)
736	2E0	SMF42FLR	4	binary	Total number of READ real I/O sequential requests to DASD. (RE-DO)
740	2E4	SMF42FLS	4	binary	Total number of WRITE real I/O sequential requests to DASD. (RE-DO)
744	2E8	SMF42FLT	8	binary	Total number of bytes transferred to DASD for the read requests.
752	2F0	SMF42FLU	8	binary	Total number of bytes transferred to DASD for the write requests.
760	2F8	SMF42FLV	16	EBCDIC	Reserved.
776	308	SMF42FLW	8	binary	Total amount of time, in milli seconds, for all sequential access (RE-DO) requests in this interval.
784	310	SMF42FLX	4	binary	Average response time for all of the sequential access (RE-DO) requests in this interval (total time/number of requests).
788	314	SMF42FLY	4	binary	Normalized response time for all of the requests in this interval (total time/number of bytes transferred/4K). (RE-DO)
792	318	SMF42FLZ	8	EBCDIC	Reserved.
800	320	SMF42FL7	32	EBCDIC	Reserved.
Sequential Access Read Ahead Summary Section:					
832	340	SMF42FMA	4	binary	Coupling facility cache partition number.
836	344	SMF42FMB	4	binary	Total number of sequential access requests. (read ahead)
840	348	SMF42FMC	4	binary	Number of read requests - NRI protocol (No Read Integrity). (read ahead)
844	34C	SMF42FMD	4	binary	Number of read requests - Consistent read protocol. (read ahead)
848	350	SMF42FME	4	binary	Number of Write requests. (read ahead)
852	354	SMF42FMF	4	binary	Number of sequential access BMF requests. (read ahead)
856	358	SMF42FMG	4	binary	Number of sequential access BMF Read requests. (read ahead)
860	35C	SMF42FMH	4	binary	Number of sequential access BMF Write requests. (read ahead)
864	360	SMF42FMI	4	binary	Number of sequential access BMF read hits. (read ahead)
868	364	SMF42FMJ	4	binary	Number of sequential access BMF valid read hits. (read ahead)
872	368	SMF42FMK	4	binary	Number of BMF false invalids. (read ahead)
876	36C	SMF42FML	4	binary	Number of sequential access CF cache structure requests. (read ahead)
880	370	SMF42FMM	4	binary	Number of sequential access CF cache structure Read requests. (read ahead)

Offsets		Name	Length	Format	Description
884	374	SMF42FMN	4	binary	Number of sequential access CF cache structure Write requests. (read ahead)
888	378	SMF42FMO	4	binary	Number of sequential access CF cache structure read hits. (read ahead)
892	37C	SMF42FMP	4	binary	Number of sequential access CF cache structure read castins. (read ahead)
896	380	SMF42FMQ	8	binary	Number of sequential access CF cache structure bytes transferred. (read ahead)
904	388	SMF42FMR	4	binary	Total number of READ real I/O sequential requests to DASD. (read ahead)
908	38C	SMF42FMS	4	binary	Total number of WRITE real I/O sequential requests to DASD. (read ahead)
912	390	SMF42FMT	8	binary	Total number of bytes transferred to DASD for the read requests.
920	398	SMF42FMU	8	binary	Total number of bytes transferred to DASD for the write requests.
928	3A0	SMF42FMV	16	EBCDIC	Reserved.
944	3B0	SMF42FMW	8	binary	Total amount of time, in milli seconds, for all sequential access (read ahead) requests in this interval.
952	3B8	SMF42FMX	4	binary	Average response time for all of the sequential access (read ahead) requests in this interval (total time/number of requests).
956	3BC	SMF42FMY	4	binary	Normalized response time for all of the requests in this interval (total time/number of bytes transferred/4K). (read ahead)
960	3C0	SMF42FMZ	8	EBCDIC	Reserved.
968	3C8	SMF42FM7	32	EBCDIC	Reserved.
Sequential Access Pre-format Summary Section:					
1000	3E8	SMF42FNA	4	binary	Coupling facility cache partition number.
1004	3EC	SMF42FNB	4	binary	Total number of sequential access requests. (Pre-format)
1008	3F0	SMF42FNC	4	binary	Number of read requests - NRI protocol (No Read Integrity). (Pre-format)
1012	3F4	SMF42FND	4	binary	Number of read requests - Consistent read protocol. (Pre-format)
1016	3F8	SMF42FNE	4	binary	Number of Write requests. (Pre-format)
1020	3FC	SMF42FNF	4	binary	Number of sequential access BMF requests. (Pre-format)
1024	400	SMF42FNG	4	binary	Number of sequential access BMF Read requests. (Pre-format)
1028	404	SMF42FNH	4	binary	Number of sequential access BMF Write requests. (Pre-format)
1032	408	SMF42FNI	4	binary	Number of sequential access BMF read hits. (Pre-format)
1036	40C	SMF42FNJ	4	binary	Number of sequential access BMF valid read hits. (Pre-format)
1040	410	SMF42FNK	4	binary	Number of BMF false invalids. (Pre-format)
1044	414	SMF42FNL	4	binary	Number of sequential access CF cache structure requests. (Pre-format)
1048	418	SMF42FNM	4	binary	Number of sequential access CF cache structure Read requests. (Pre-format)
1052	41C	SMF42FNN	4	binary	Number of sequential access CF cache structure Write requests. (read ahead)
1056	420	SMF42FNO	4	binary	Number of sequential access CF cache structure read hits. (read ahead)

Offsets		Name	Length	Format	Description
1060	424	SMF42FNP	4	binary	Number of sequential access CF cache structure read castins. (Pre-format)
1064	428	SMF42FNQ	8	binary	Number of sequential access CF cache structure bytes transferred. (Pre-format)
1072	430	SMF42FNR	4	binary	Total number of READ real I/O sequential requests to DASD. (Pre-format)
1076	434	SMF42FNS	4	binary	Total number of WRITE real I/O sequential requests to DASD. (pre-format)
1080	438	SMF42FNT	8	binary	Total number of bytes transferred to DASD for the read requests.
1088	440	SMF42FNU	8	binary	Total number of bytes transferred to DASD for the write requests.
1096	448	SMF42FNV	16	EBCDIC	Reserved.
1112	458	SMF42FNW	8	binary	Total amount of time, in milli seconds, for all sequential access (pre-format) requests in this interval.
1120	460	SMF42FNX	4	binary	Average response time for all of the sequential access (pre-format) requests in this interval (total time/number of requests).
1124	464	SMF42FNY	4	binary	Normalized response time for all of the requests in this interval (total time/number of bytes transferred/4K). (pre-format)
1128	468	SMF42FNZ	8	EBCDIC	Reserved.
1136	470	SMF42FN7	32	EBCDIC	Reserved.
1168	490	SMF42FRA	4	binary	Number of record lock requests (obtain/alter/promote).
1172	494	SMF42FRB	4	binary	Number of record lock requests that cause true contention.
1176	498	SMF42FRC	4	binary	Number of record lock requests that cause false contention.
1180	49C	SMF42FRD	4	binary	Number of record lock release requests.
1184	4A0	SMF42FRE	4	binary	Number of component_1 type lock requests.
1188	4A4	SMF42FRF	4	binary	Number of component_1 type release lock requests.
1192	4A8	SMF42FRG	8	EBCDIC	Reserved.
1200	4B0	SMF42FRH	4	binary	Number of component_1 class_1 (DIWA) locks (obtain/alter/promote).
1204	4B4	SMF42FRI	4	binary	Number of component_1 class_1 (DIWA) locks that cause true contention.
1208	4B8	SMF42FRJ	4	binary	Number of component_1 class_1 (DIWA) locks that cause false contention.
1212	4BC	SMF42FRK	4	binary	Number of component_1 class_1 (DIWA) release lock requests.
1216	4C0	SMF42FRL	4	binary	Number of component_1 class_2 (UPGRADE) locks (obtain/alter/promote).
1220	4C4	SMF42FRM	4	binary	Number of component_1 class_2 (UPGRADE) locks that cause true contention.
1224	4C8	SMF42FRN	4	binary	Number of component_1 class_2 (UPGRADE) locks that cause false contention.
1228	4CC	SMF42FRO	4	binary	Number of component_1 class_2 (UPGRADE) release lock requests.
1232	4D0	SMF42FRP	4	binary	Number of component_1 class_3 (PREFORMAT) locks (obtain/alter/promote).
1236	4D4	SMF42FRQ	4	binary	Number of component_1 class_3 (PREFORMAT) locks that cause true contention.
1240	4D8	SMF42FRR	4	binary	Number of component_1 class_3 (PREFORMAT) locks that cause false contention.

Offsets		Name	Length	Format	Description
1244	4DC	SMF42FRS	4	binary	Number of component_1 class_3 (PREFORMAT) release lock requests.
1248	4E0	SMF42FRT	4	binary	Number of component_2 lock requests (obtain/alter/promote).
1252	4E4	SMF42FRU	4	binary	Number of component_2 locks that cause true contention.
1256	4E8	SMF42FRV	4	binary	Number of component_2 locks that cause false contention.
1260	4EC	SMF42FRW	4	binary	Number of component_2 release lock requests.
1264	4F0	SMF42FRX	32	EBCDIC	Reserved.
1296	510	SMF42FQR	8	EBCDIC	Total time all thread requests.
1304	518	SMF42FQS	4	binary	Total number of all thread requests.
1308	51C	SMF42FQT	4	binary	Reserved.
1312	520	SMF42FQU	4	binary	Average response time for all of the thread requests in the interval. (Total time/number of thread requests)
1316	524	SMF42FQV	4	binary	Normalized response time for all of the thread requests in the interval. (Total time/number of bytes transferred/4K)
1320	528	SMF42FQW	8	EBCDIC	Reserved.

Subtype 16 — VSAM RLS Data Set Response Time Summary

Sysplex-Wide Data Set Summary Section

Offsets		Name	Length	Format	Description
0	0	SMF42GAA	4	binary	Interval length. This is the total time, in seconds, of the measurement period.
4	4	SMF42A00	12	EBCDIC	Reserved.
16	10	SMF42GAB	44	EBCDIC	Data set name
60	3C	SMF42A01	4	binary	Reserved.
64	40	SMF42GAC	44	EBCDIC	VSAM sphere name.
108	6C	SMF42A02	4	binary	Reserved.
112	70	SMF42GAD	2	binary	Length of the storage class name.
114	72	SMF42GAE	30	EBCDIC	Storage class name.
144	90	SMF42A03	2	binary	Length of DFSMS CacheSet name.
146	92	SMF42GAF	30	EBCDIC	DFSMS CacheSet name.
176	B0	SMF42GAG	2	EBCDIC	Reserved.
178	B2	SMF42GAH	30	EBCDIC	DFP CF cache structure name.
208	D0	SMF42GAI	4	binary	Indicator of component being processed. **Bit** **Meaning When Set** **0** Data component **1** Index component **2-31** Reserved.
212	D4	SMF42GAJ	12	EBCDIC	Indicates DFSMS greater than 4K CF caching status. Value is ALL, NONE, UPDATESONLY, or GT4KNOTACT.
224	E0	SMF42GAK	4	binary	Number of lock requests processed.
228	E4	SMF42GAL	4	binary	Number of true contention lock requests.
232	E8	SMF42GAM	4	binary	Number of false contention lock requests
236	EC	SMF42GZ1	2	binary	SMS Direct Weight
240	EE	SMF42GZ2	2	binary	SMS Sequential Weight
240	F0	SMF42GAN	8	EBCDIC	In DFSMS 1.4 WLM Server class name
248	F8	SMF42GAO	8	EBCDIC	In DFSMS 1.4 WLM report class name

Offsets		Name	Length	Format	Description
256	100	SMF42GAP	16	EBCDIC	SMS data class name
Sysplex-Wide Direct Access Summary Section:					
272	110	SMF42GCA	4	binary	Coupling facility cache partition number.
276	114	SMF42GCB	4	binary	Total number of direct access requests.
280	118	SMF42GCC	4	binary	Number of read requests - NRI protocol (No Read Integrity).
284	11C	SMF42GCD	4	binary	Number of read requests - Consistent read protocol.
288	120	SMF42GCE	4	binary	Number of Write requests.
292	124	SMF42CGF	4	binary	Number of direct access BMF requests.
296	128	SMF42GCG	4	binary	Number of direct access BMF Read requests.
300	12C	SMF42GCH	4	binary	Number of direct access BMF Write requests.
304	130	SMF42GCI	4	binary	Number of direct access BMF read hits.
308	134	SMF42GCJ	4	binary	Number of direct access BMF valid read hits.
312	138	SMF42GCK	4	binary	Number of BMF false invalids.
316	13C	SMF42GCL	4	binary	Number of direct access CF cache structure requests.
320	140	SMF42GCM	4	binary	Number of direct access CF cache structure Read requests.
324	144	SMF42GCN	4	binary	Number of direct access CF cache structure Write requests.
328	148	SMF42GCO	4	binary	Number of direct access CF cache structure read hits.
332	14C	SMF42GCP	4	binary	Number of direct access CF cache structure read castins.
336	150	SMF42GCQ	8	binary	Number of bytes transferred into the DFSMS cache structure.
344	158	SMF42GCR	4	binary	Total number READ of real I/O direct requests to DASD.
348	15C	SMF42GCS	4	binary	Total number WRITE of real I/O direct requests to DASD.
352	160	SMF42GCT	8	binary	Total number of bytes transferred to DASD for the read requests.
360	168	SMF42GCU	8	binary	Total number of bytes transferred to DASD for the write requests.
368	170	SMF42GCV	16	EBCDIC	Reserve
384	180	SMF42GCW	8	binary	Total amount of time, in milli seconds, for all the direct access requests in this interval.
392	188	SMF42GCX	4	binary	Average response time for all of the requests in this interval (total time/number of requests).
396	18C	SMF42GCY	4	binary	Normalized response time for all of the requests in this interval (total time/number of bytes transferred/4K).
400	190	SMF42GCZ	8	EBCDIC	Reserved.
408	198	SMF42GC7	32	EBCDIC	Reserved.
Sysplex-Wide Direct Access Record Merge (RE-DO) Summary Section:					
440	1B8	SMF42GDA	4	binary	Coupling facility cache partition number.
444	1BC	SMF42GDB	4	binary	Total number of direct access requests. (RE-DO)
448	1C0	SMF42GDC	4	binary	Number of read requests - NRI protocol (No Read Integrity). (RE-DO)
452	1C4	SMF42GDD	4	binary	Number of read requests - Consistent read protocol. (RE-DO)
456	1C8	SMF42GDE	4	binary	Number of Write requests. (RE-DO)
460	1CC	SMF42GDF	4	binary	Number of direct access BMF requests. (RE-DO)
464	1D0	SMF42GDG	4	binary	Number of direct access BMF Read requests. (RE-DO)
468	1D4	SMF42GDH	4	binary	Number of direct access BMF Write requests. (RE-DO)
472	1D8	SMF42GDI	4	binary	Number of direct access BMF read hits. (RE-DO)
476	1DC	SMF42GDJ	4	binary	Number of direct access BMF valid read hits. (RE-DO)

Offsets		Name	Length	Format	Description
480	1E0	SMF42GDK	4	binary	Number of BMF false invalids. (RE-DO)
484	1E4	SMF42GDL	4	binary	Number of direct access CF cache structure requests. (RE-DO)
488	1E8	SMF42GDM	4	binary	Number of direct access CF cache structure Read requests. (RE-DO)
492	1EC	SMF42GDN	4	binary	Number of direct access CF cache structure Write requests. (RE-DO)
496	1F0	SMF42GDO	4	binary	Number of direct access CF cache structure read hits. (RE-DO)
500	1F4	SMF42GDP	4	binary	Number of direct access CF cache structure read castins. (RE-DO)
504	1F8	SMF42GDQ	8	binary	Number of direct access CF cache structure byte transferred. (RE-DO)
512	200	SMF42GDR	4	binary	Total number of READ real I/O direct requests to DASD. (RE-DO)
516	204	SMF42GDS	4	binary	Total number of WRITE real I/O direct requests to DASD. (RE-DO)
520	208	SMF42GDT	8	binary	Total number of bytes transferred to DASD for the read requests.
528	210	SMF42GDU	8	binary	Total number of bytes transferred to DASD for the write requests.
536	218	SMF42GDV	16	EBCDIC	Reserved.
552	228	SMF42GDW	8	binary	Total amount of time, in milli seconds, for all direct access (RE-DO) requests in this interval.
560	230	SMF42GDX	4	binary	Average response time for all of the direct access (RE-DO) requests in this interval (total time/number of requests).
564	234	SMF42GDY	4	binary	Normalized response time for all of the requests in this interval (total time/number of bytes transferred/4K). (RE-DO)
568	238	SMF42GDZ	8	EBCDIC	Reserved.
576	240	SMF42GD7	32	EBCDIC	Reserved.
Sysplex-Wide Sequential Access Summary Section:					
608	260	SMF42GEA	4	binary	Coupling facility cache partition number.
612	264	SMF42GEB	4	binary	Total number of sequential access requests.
616	268	SMF42GDC	4	binary	Number of read requests - NRI protocol (No Read Integrity).
620	26C	SMF42GED	4	binary	Number of read requests - Consistent read protocol.
624	270	SMF42GEE	4	binary	Number of Write requests.
628	274	SMF42GEF	4	binary	Number of direct access BMF requests.
632	278	SMF42GEG	4	binary	Number of direct access BMF Read requests.
636	27C	SMF42GEH	4	binary	Number of direct access BMF Write requests.
640	280	SMF42GEI	4	binary	Number of direct access BMF read hits.
644	284	SMF42GEJ	4	binary	Number of direct access BMF valid read hits.
648	288	SMF42GEK	4	binary	Number of BMF false invalids.
652	28C	SMF42GEL	4	binary	Number of direct access CF cache structure requests.
656	290	SMF42GEM	4	binary	Number of direct access CF cache structure Read requests.
660	294	SMF42GEN	4	binary	Number of direct access CF cache structure Write requests.
664	298	SMF42GEO	4	binary	Number of direct access CF cache structure read hits.
668	29C	SMF42GEP	4	binary	Number of direct access CF cache structure read castins.
672	2A0	SMF42GEQ	8	binary	Number of direct access CF cache structure byte transferred.
680	2A8	SMF42GER	4	binary	Total number of READ real I/O sequential requests to DASD.

Offsets		Name	Length	Format	Description
684	2AC	SMF42GES	4	binary	Total number of WRITE real I/O sequential requests to DASD.
688	2B0	SMF42GET	8	binary	Total number of bytes transferred to DASD for the read requests.
696	2B8	SMF42GEU	8	binary	Total number of bytes transferred to DASD for the write requests.
704	2C0	SMF42GEV	16	EBCDIC	Reserved.
720	2D0	SMF42GEW	8	binary	Total amount of time, in milli seconds, for all sequential access requests in this interval.
728	2D8	SMF42GEX	4	binary	Average response time for all of the sequential access requests in this interval (total time/number of requests).
732	2DC	SMF42GEY	4	binary	Normalized response time for all of the requests in this interval (total time/number of bytes transferred/4K).
736	2E0	SMF42GEZ	8	EBCDIC	Reserved.
744	2E8	SMF42GE7	32	EBCDIC	Reserved.
Sysplex-Wide Sequential Access Record Merge (RE-DO) Summary Section:					
776	308	SMF42GFA	4	binary	Coupling facility cache partition number.
780	30C	SMF42GFB	4	binary	Total number of direct access requests. (RE-DO)
784	310	SMF42GFC	4	binary	Number of read requests - NRI protocol (No Read Integrity). (RE-DO)
788	314	SMF42GFD	4	binary	Number of read requests - Consistent read protocol. (RE-DO)
792	318	SMF42GFE	4	binary	Number of Write requests.(RE-DO)
796	31C	SMF42GFF	4	binary	Number of direct access BMF requests. (RE-DO)
800	320	SMF42GFG	4	binary	Number of direct access BMF Read requests. (RE-DO)
804	324	SMF42GFH	4	binary	Number of direct access BMF Write requests. (RE-DO)
808	328	SMF42GFI	4	binary	Number of direct access BMF read hits. (RE-DO)
812	32C	SMF42GFJ	4	binary	Number of direct access BMF valid read hits. (RE-DO)
816	330	SMF42GFK	4	binary	Number of BMF false invalids. (RE-DO)
820	334	SMF42GFL	4	binary	Number of direct access CF cache structure requests. (RE-DO)
824	338	SMF42GFM	4	binary	Number of direct access CF cache structure Read requests. (RE-DO)
828	33C	SMF42GFN	4	binary	Number of direct access CF cache structure Write requests. (RE-DO)
832	340	SMF42GFO	4	binary	Number of direct access CF cache structure read hits. (RE-DO)
836	344	SMF42GFP	4	binary	Number of direct access CF cache structure read castins. (RE-DO)
840	348	SMF42GFQ	8	binary	Number of direct access CF cache structure byte transferred. (RE-DO)
848	350	SMF42GFR	4	binary	Total number of real READ I/O sequential requests to DASD. (RE-DO)
852	354	SMF42GFS	4	binary	Total number of real WRITE I/O sequential requests to DASD. (RE-DO)
856	358	SMF42GFT	8	binary	Total number of bytes transferred to DASD for the read requests.
864	360	SMF42GFU	8	binary	Total number of bytes transferred to DASD for the write requests.
872	368	SMF42GFV	16	EBCDIC	Reserved.
888	378	SMF42GFW	8	binary	Total amount of time, in milli seconds, for all sequential access (RE-DO) requests in this interval.

Offsets		Name	Length	Format	Description
896	380	SMF42GFX	4	binary	Average response time for all of the sequential access (RE-DO) requests in this interval (total time/number of requests).
900	384	SMF42GFY	4	binary	Normalized response time for all of the requests in this interval (total time/number of bytes transferred/4K). (RE-DO)
904	388	SMF42GFZ	8	EBCDIC	Reserved.
912	390	SMF42GF7	32	EBCDIC	Reserved.
Sysplex-Wide Sequential Access Read Ahead Summary Section:					
944	3B0	SMF42GGA	4	binary	Coupling facility cache partition number.
948	3B4	SMF42GGB	4	binary	Total number of sequential access requests. (read ahead)
952	3B8	SMF42GGC	4	binary	Number of read requests - NRI protocol (No Read Integrity).(read ahead)
956	3BC	SMF42GGD	4	binary	Number of read requests - Consistent read protocol. (read ahead)
960	3C0	SMF42GGE	4	binary	Number of Write requests.(read ahead)
964	3C4	SMF42GGF	4	binary	Number of direct access BMF requests. (read ahead)
968	3C8	SMF42GGG	4	binary	Number of direct access BMF Read requests. (read ahead)
972	3CC	SMF42GGH	4	binary	Number of direct access BMF Write requests. (read ahead)
976	3D0	SMF42GGI	4	binary	Number of direct access BMF read hits. (read ahead)
980	3D4	SMF42GGJ	4	binary	Number of direct access BMF valid read hits. (read ahead)
984	3D8	SMF42GGK	4	binary	Number of BMF false invalids. (RE-DO)
988	3DC	SMF42GGL	4	binary	Number of direct access CF cache structure requests. (read ahead)
992	3E0	SMF42GGM	4	binary	Number of direct access CF cache structure Read requests. (read ahead)
996	3E4	SMF42GGN	4	binary	Number of direct access CF cache structure Write requests. (read ahead)
1000	3E8	SMF42GGO	4	binary	Number of direct access CF cache structure read hits. (read ahead)
1004	3EC	SMF42GGP	4	binary	Number of direct access CF cache structure read castins. (read ahead)
1008	3F0	SMF42GGQ	8	binary	Number of direct access CF cache structure byte transferred. (read ahead)
1016	3F8	SMF42GGR	4	binary	Total number of READ real I/O sequential requests to DASD. (read ahead)
1020	3FC	SMF42GGS	4	binary	Total number of WRITE real I/O sequential requests to DASD. (read ahead)
1024	400	SMF42GGT	8	binary	Total number of bytes transferred to DASD for the read requests.
1032	408	SMF42GGU	8	binary	Total number of bytes transferred to DASD for the write requests.
1040	410	SMF42GGV	16	EBCDIC	Reserved.
1056	420	SMF42GGW	8	binary	Total amount of time, in milli seconds, for all sequential access (read ahead) requests in this interval.
1064	428	SMF42GGX	4	binary	Average response time for all of the sequential access (read ahead) requests in this interval (total time/number of requests).
1068	42C	SMF42GGY	4	binary	Normalized response time for all of the requests in this interval (total time/number of bytes transferred/4K). (read ahead)
1072	430	SMF42GGZ	8	EBCDIC	Reserved.
1080	438	SMF42GG7	32	EBCDIC	Reserved.

Offsets		Name	Length	Format	Description
Sysplex-Wide Sequential Access Pre-format Summary Section:					
1112	458	SMF42GHA	4	binary	Coupling facility cache partition number.
1116	45C	SMF42GHB	4	binary	Total number of sequential access requests. (pre-format)
1120	460	SMF42GHC	4	binary	Number of read requests - NRI protocol (No Read Integrity). (pre-format)
1124	464	SMF42GHD	4	binary	Number of read requests - Consistent read protocol. (pre-format)
1128	468	SMF42GHE	4	binary	Number of Write requests. (pre-format)
1132	46C	SMF42GHF	4	binary	Number of direct access BMF requests. (pre-format)
1136	470	SMF42GHG	4	binary	Number of direct access BMF Read requests. (pre-format)
1140	474	SMF42GHH	4	binary	Number of direct access BMF Write requests. (pre-format)
1144	478	SMF42GHI	4	binary	Number of direct access BMF read hits. (pre-format)
1148	47C	SMF42GHJ	4	binary	Number of direct access BMF valid read hits. (pre-format)
1152	480	SMF42GHK	4	binary	Number of BMF false invalids. (pre-format)
1156	484	SMF42GHL	4	binary	Number of direct access CF cache structure requests. (pre-format)
1160	488	SMF42GHM	4	binary	Number of direct access CF cache structure Read requests. (pre-format)
1164	48C	SMF42GHN	4	binary	Number of direct access CF cache structure Write requests. (pre-format)
1168	490	SMF42GHO	4	binary	Number of direct access CF cache structure read hits. (pre-format)
1172	494	SMF42GHP	4	binary	Number of direct access CF cache structure read castins. (pre-format)
1176	498	SMF42GHQ	8	binary	Number of direct access CF cache structure byte transferred. (pre-format)
1184	4A0	SMF42GHR	4	binary	Total number of READ real I/O sequential requests to DASD. (pre-format)
1188	4A4	SMF42GHS	4	binary	Total number of WRITE real I/O sequential requests to DASD. (pre-format)
1192	4A8	SMF42GHT	8	binary	Total number of bytes transferred to DASD for the read requests.
1200	4B0	SMF42GHU	8	binary	Total number of bytes transferred to DASD for the write requests.
1208	4B8	SMF42GHV	16	EBCDIC	Reserved.
1224	4C8	SMF42GHW	8	binary	Total amount of time, in milli seconds, for all sequential access (pre-format) requests in this interval.
1232	4D0	SMF42GHX	4	binary	Average response time for all of the sequential access (pre-format) requests in this interval (total time/number of requests).
1236	4D4	SMF42GHY	4	binary	Normalized response time for all of the requests in this interval (total time/number of bytes transferred/4K). (pre-format)
1240	4D8	SMF42GHZ	8	EBCDIC	Reserved.
1248	4E0	SMF42GH7	32	EBCDIC	Reserved.
1280	500	SMF42GPA	4	binary	Number of record lock requests (obtain/alter/promote)
1284	504	SMF42GPB	4	binary	Number of record lock requests that cause true contention.
1288	508	SMF42GPC	4	binary	Number of record lock requests that cause false contention.
1292	50C	SMF42GPD	4	binary	Number of record lock release requests.
1296	510	SMF42GPE	4	binary	Number of component_1 type lock requests.
1300	514	SMF42GPF	4	binary	Number of component_1 type release lock requests.

Offsets		Name	Length	Format	Description
1304	518	SMF42GPG	8	EBCDIC	Reserved
1312	520	SMF42GPH	4	binary	Number of component_1 class_1 (DIWA) locks (obtain/alter/promote).
1316	524	SMF42GPI	4	binary	Number of component_1 class_1 (DIWA) locks that cause true contention.
1320	528	SMF42GPJ	4	binary	Number of component_1 class_1 (DIWA) locks that cause false contention.
1324	52C	SMF42GPK	4	binary	Number of component_1 class_1 (DIWA) release lock requests.
1328	530	SMF42GPL	4	binary	Number of component_1 class_2 (UPGRADE) locks (obtain/alter/promote).
1332	534	SMF42GPM	4	binary	Number of component_1 class_2 (UPGRADE) locks that cause true contention.
1336	538	SMF42GPN	4	binary	Number of component_1 class_2 (UPGRADE) locks that cause false contention.
1340	53C	SMF42GPO	4	binary	Number of component_1 class_2 (UPGRADE) release lock requests.
1344	540	SMF42GPP	4	binary	Number of component_1 class_3 (PREFORMAT) locks (obtain/alter/promote).
1348	544	SMF42GPQ	4	binary	Number of component_1 class_3 (PREFORMAT) locks that cause true contention.
1352	548	SMF42GPR	4	binary	Number of component_1 class_3 (PREFORMAT) locks that cause false contention.
1356	54C	SMF42GPS	4	binary	Number of component_1 class_3 (PREFORMAT) release lock requests.
1360	550	SMF42GPT	4	binary	Number of component_2 lock requests (obtain/alter/promote).
1364	554	SMF42GPU	4	binary	Number of component_2 locks that cause true contention.
1368	558	SMF42GPV	4	binary	Number of component_2 locks that cause false contention.
1372	55C	SMF42GPW	4	binary	Number of component_2 release lock requests.
1376	560	SMF42GPX	32	EBCDIC	Reserved.
1408	580	SMF42GRA	4	binary	Number of RE-DO's.
1412	584	SMF42GRB	4	binary	Number of recursive RE-DO's.
1416	588	SMF42GRC	4	binary	Number of BMF writes.
1420	58C	SMF42GRD	4	binary	Number of SCM read requests.
1424	590	SMF42GRE	4	binary	Number of SCM read requests that encountered castout lock contention.
1428	594	SMF42GRG	4	binary	RE-DO percentage.
1432	598	SMF42GRH	4	binary	Recursive RE-DO percentage.
1436	59C	SMF42GRI	4	binary	SCM castout lock percentage.
1440	5A0	SMF42GRF	12	EBCDIC	Reserved.
1452	5AC	SMF42GRJ	4	EBCDIC	Reserved.
1456	5B0	SMF42GRK	16	EBCDIC	Reserved.

Data Set, CF, SYS Summary Section

Offsets		Name	Length	Format	Description
0	0	SMF42GBA	4	binary	Interval length. This is the total length, in seconds, of the measurement period.
4	4	SMF42A05	12	EBCDIC	Reserved.
16	10	SMF42GBB	44	EBCDIC	Data set name.

Offsets		Name	Length	Format	Description
60	3C	SMF42A06	4	binary	Reserved.
64	40	SMF42GBC	44	EBCDIC	VSAM sphere name.
108	6C	SMF42A07	4	binary	Reserved.
112	70	SMF42GBD	2	binary	Length of storage class name.
114	72	SMF42GBE	30	EBCDIC	Storage class name.
144	90	SMF42A08	2	binary	Length of cache set name.
146	92	SMF42GBF	30	EBCDIC	Cache set name.
176	B0	SMF42A12	2	binary	Reserved.
178	B2	SMF42GBG	30	EBCDIC	Cache structure name.
208	D0	SMF42GBH	8	EBCDIC	MVS system name.
216	D8	SMF42A11	8	EBCDIC	Reserved.
224	E0	SMF42GBI	4	binary	Indicator of component being processed **Bit** **Meaning When Set** **0** Data component **1** Index component **2-31** Reserved.
228	E4	SMF42A09	12	EBCDIC	Indicates DFSMS greater than 4K CF caching status. Value is ALL, NONE, UPDATESONLY, or GT4KNOTACT.
240	F0	SMF42GBK	4	binary	Number of lock requests processed by this MVS system.
244	F4	SMF42GBL	4	binary	Number of true contention lock requests.
248	F8	SMF42GBM	4	binary	Number of false contention lock requests.
252	FC	SMF42GZ8	2	binary	SMS DIRECT WEIGHT
254	FE	SMF42GZ9	2	binary	SMS SEQUENTIAL WEIGHT
256	100	SMF42GBN	8	EBCDIC	In DFSMS 1.4, WLM SERV Class Name
264	108	SMF42GBO	8	EBCDIC	In DFSMS 1.4, WLM Report Class Name
272	110	SMF42GBP	16	EBCDIC	SMS data class name.
Direct Access Section:					
288	120	SMF42GIA	4	binary	Coupling facility cache partition number.
292	124	SMF42GIB	4	binary	Total number of direct access requests.
296	128	SMF42GIC	4	binary	Number of read requests - NRI protocol (No Read Integrity). (pre-format)
300	12C	SMF42GID	4	binary	Number of read requests - Consistent read protocol.
304	130	SMF42GIE	4	binary	Number of Write requests.
308	134	SMF42GIF	4	binary	Number of direct access BMF requests.
312	138	SMF42GIG	4	binary	Number of direct access BMF Read requests.
316	13C	SMF42GIH	4	binary	Number of direct access BMF Write requests.
320	140	SMF42GII	4	binary	Number of direct access BMF read hits.
324	144	SMF42GIJ	4	binary	Number of direct access BMF valid read hits.
328	148	SMF42GIK	4	binary	Number of BMF false invalids.
332	14C	SMF42GIL	4	binary	Number of direct access CF cache structure requests.
336	150	SMF42GIM	4	binary	Number of direct access CF cache structure Read requests.
340	154	SMF42GIN	4	binary	Number of direct access CF cache structure Write requests.
344	158	SMF42GIO	4	binary	Number of direct access CF cache structure read hits.
348	15C	SMF42GIP	4	binary	Number of direct access CF cache structure read castins.
352	160	SMF42GIQ	8	binary	Number of direct access CF cache structure byte transferred.
360	168	SMF42GIR	4	binary	Total number of real READ I/O direct requests to DASD.

Offsets		Name	Length	Format	Description
364	16C	SMF42GIS	4	binary	Total number of real WRITE I/O direct requests to DASD.
368	170	SMF42GIT	8	binary	Total number of bytes transferred to DASD for the read requests.
376	178	SMF42GIU	8	binary	Total number of bytes transferred to DASD for the write requests.
384	180	SMF42GIV	16	EBCDIC	Reserved.
400	190	SMF42GIW	8	binary	Total amount of time, in milli seconds, for all the direct access requests in this interval.
408	198	SMF42GIX	4	binary	Average response time for all of the requests in this interval (total time/number of requests).
412	19C	SMF42GIY	4	binary	Normalized response time for all of the requests in this interval (total time/number of bytes transferred/4K).
416	1A0	SMF42GIZ	8	EBCDIC	Reserved.
424	1A8	SMF42GI7	32	EBCDIC	Reserved.
Direct Access Record Merge (RE-DO) Summary Section:					
456	1C8	SMF42GJA	4	binary	Coupling facility cache partition number.
460	1CC	SMF42GJB	4	binary	Total number of direct access requests. (RE-DO)
464	1D0	SMF42GJC	4	binary	Number of read requests - NRI protocol (No Read Integrity). (RE-DO)
468	1D4	SMF42GJD	4	binary	Number of read requests - Consistent read protocol. (RE-DO)
472	1D8	SMF42GJE	4	binary	Number of Write requests. (RE-DO)
476	1DC	SMF42GJF	4	binary	Number of direct access BMF requests. (RE-DO)
480	1E0	SMF42GJG	4	binary	Number of direct access BMF Read requests. (RE-DO)
484	1E4	SMF42GJH	4	binary	Number of direct access BMF Write requests. (RE-DO)
488	1E8	SMF42GJI	4	binary	Number of direct access BMF read hits. (RE-DO)
492	1EC	SMF42GJJ	4	binary	Number of direct access BMF valid read hits. (RE-DO)
496	1F0	SMF42GJK	4	binary	Number of BMF false invalids. (RE-DO)
500	1F4	SMF42GJL	4	binary	Number of direct access CF cache structure requests. (RE-DO)
504	1F8	SMF42GJM	4	binary	Number of direct access CF cache structure Read requests. (RE-DO)
508	1FC	SMF42GJN	4	binary	Number of direct access CF cache structure Write requests. (RE-DO)
512	200	SMF42GJO	4	binary	Number of direct access CF cache structure read hits. (RE-DO)
516	204	SMF42GJP	4	binary	Number of direct access CF cache structure read castins.
520	208	SMF42GJQ	8	binary	Number of direct access CF cache structure bytes transferred.
528	210	SMF42GJR	4	binary	Total number of READ real I/O direct requests to DASD. (RE-DO)
532	214	SMF42GJS	4	binary	Total number of WRITE real I/O direct requests to DASD. (RE-DO)
536	218	SMF42GJT	8	binary	Total number of bytes transferred to DASD for the read requests.
544	220	SMF42GJU	8	binary	Total number of bytes transferred to DASD for the write requests.
552	228	SMF42GJV	16	EBCDIC	Reserved.
568	238	SMF42GJW	8	binary	Total amount of time, in milli seconds, for all direct access (RE-DO) requests in this interval.

Offsets		Name	Length	Format	Description
576	240	SMF42GJX	4	binary	Average response time for all of the direct access (RE-DO) requests in this interval (total time/number of requests).
580	244	SMF42GJY	4	binary	Normalized response time for all of the requests in this interval (total time/number of bytes transferred/4K). (RE-DO)
584	248	SMF42GJZ	8	EBCDIC	Reserved.
592	250	SMF42GJ7	32	EBCDIC	Reserved.
Sequential Access Section:					
624	270	SMF42GKA	4	binary	Coupling facility cache partition number.
628	274	SMF42GKB	4	binary	Total number of sequential access requests.
632	278	SMF42GKC	4	binary	Number of read requests - NRI protocol (No Read Integrity).
636	27C	SMF42GKD	4	binary	Number of read requests - Consistent read protocol.
640	280	SMF42GKE	4	binary	Number of Write requests.
644	284	SMF42GKF	4	binary	Number of direct access BMF requests.
648	288	SMF42GKG	4	binary	Number of direct access BMF Read requests.
652	28C	SMF42GKH	4	binary	Number of direct access BMF Write requests.
656	290	SMF42GKI	4	binary	Number of direct access BMF read hits.
660	294	SMF42GKJ	4	binary	Number of direct access BMF valid read hits.
664	298	SMF42GKK	4	binary	Number of BMF false invalids.
668	29C	SMF42GKL	4	binary	Number of direct access CF cache structure requests.
672	2A0	SMF42GKM	4	binary	Number of direct access CF cache structure Read requests.
676	2A4	SMF42GKN	4	binary	Number of direct access CF cache structure Write requests.
680	2A8	SMF42GKO	4	binary	Number of direct access CF cache structure read hits.
684	2AC	SMF42GKP	4	binary	Number of direct access CF cache structure read castins.
688	2B0	SMF42GKQ	8	binary	Number of direct access CF cache structure byte transferred.
696	2B8	SMF42GKR	4	binary	Total number of READ real I/O sequential requests to DASD.
700	2BC	SMF42GKS	4	binary	Total number of WRITE real I/O sequential requests to DASD.
704	2C0	SMF42GKT	8	binary	Total number of bytes transferred for all sequential access requests where the data was retrieved from DASD. (real I/O DASD)
712	2C8	SMF42GKU	8	binary	Total number of bytes transferred for all sequential access requests where the data was retrieved from DASD or a coupling facility cache structure. (real I/O DASD)
720	2D0	SMF42GKV	16	EBCDIC	Reserved.
736	2E0	SMF42GKW	8	binary	Total amount of time, in milli seconds, for all sequential access requests in this interval.
744	2E8	SMF42GKX	4	binary	Average response time for all of the sequential access requests in this interval (total time/number of requests).
748	2EC	SMF42GKY	4	binary	Normalized response time for all of the requests in this interval (total time/number of bytes transferred/4K).
752	2F0	SMF42GKZ	8	EBCDIC	Reserved.
760	2F8	SMF42GK7	32	EBCDIC	Reserved.
Sequential Access Record Merge (RE-DO) Summary Section:					
792	318	SMF42GLA	4	binary	Coupling facility cache partition number.
796	31C	SMF42GLB	4	binary	Total number of sequential access requests. (RE-DO)
800	320	SMF42GLC	4	binary	Number of read requests - NRI protocol (No Read Integrity). (RE-DO)
804	324	SMF42GLD	4	binary	Number of read requests - Consistent read protocol. (RE-DO)

Offsets		Name	Length	Format	Description
808	328	SMF42GLE	4	binary	Number of Write requests. (RE-DO)
812	32C	SMF42GLF	4	binary	Number of direct access BMF requests. (RE-DO)
816	330	SMF42GLG	4	binary	Number of direct access BMF Read requests.
820	334	SMF42GLH	4	binary	Number of direct access BMF Write requests.
824	338	SMF42GLI	4	binary	Number of direct access BMF read hits.
828	33C	SMF42GLJ	4	binary	Number of direct access BMF valid read hits.
832	340	SMF42GLK	4	binary	Number of BMF false invalids. (RE-DO)
836	344	SMF42GLL	4	binary	Number of direct access CF cache structure requests.
840	348	SMF42GLM	4	binary	Number of direct access CF cache structure Read requests.
844	34C	SMF42GLN	4	binary	Number of direct access CF cache structure Write requests.
848	350	SMF42GLO	4	binary	Number of direct access CF cache structure read hits. (RE-DO)
852	354	SMF42GLP	4	binary	Number of direct access CF cache structure read castins.
856	358	SMF42GLQ	8	binary	Number of direct access CF cache structure bytes transferred.
864	360	SMF42GLR	4	binary	Total number of READ real I/O sequential requests to DASD. (RE-DO)
868	364	SMF42GLS	4	binary	Total number of WRITE real I/O sequential requests to DASD. (RE-DO)
872	368	SMF42GLT	8	binary	Total number of bytes transferred to DASD for the read requests.
880	370	SMF42GLU	8	binary	Total number of bytes transferred to DASD for the write requests.
888	378	SMF42GLV	16	EBCDIC	Reserved.
904	388	SMF42GLW	8	binary	Total amount of time, in milli seconds, for all sequential access (RE-DO) requests in this interval.
912	390	SMF42GLX	4	binary	Average response time for all of the sequential access (RE-DO) requests in this interval (total time/number of requests).
916	394	SMF42GLY	4	binary	Normalized response time for all of the requests in this interval (total time/number of bytes transferred/4K). (RE-DO)
920	398	SMF42GLZ	8	EBCDIC	Reserved.
928	3A0	SMF42GL7	32	EBCDIC	Reserved.
Sequential Access Read Ahead Summary Section:					
960	3C0	SMF42GMA	4	binary	Coupling facility cache partition number.
964	3C4	SMF42GMB	4	binary	Total number of sequential access requests. (read ahead)
968	3C8	SMF42GMC	4	binary	Number of read requests - NRI protocol (No Read Integrity). (read-ahead)
972	3CC	SMF42GMD	4	binary	Number of read requests - Consistent read protocol. (read-ahead)
976	3D0	SMF42GME	4	binary	Number of Write requests. (read-ahead)
980	3D4	SMF42GMF	4	binary	Number of direct access BMF requests. (read-ahead)
984	3D8	SMF42GMG	4	binary	Number of direct access BMF Read requests.
988	3DC	SMF42GMH	4	binary	Number of direct access BMF Write requests.
992	3E0	SMF42GMI	4	binary	Number of direct access BMF read hits.
996	3E4	SMF42GMJ	4	binary	Number of direct access BMF valid read hits.
1000	3E8	SMF42GMK	4	binary	Number of BMF false invalids. (read-ahead)
1004	3EC	SMF42GML	4	binary	Number of direct access CF cache structure requests.
1008	3F0	SMF42GMM	4	binary	Number of direct access CF cache structure Read requests.

Offsets		Name	Length	Format	Description
1012	3F4	SMF42GMN	4	binary	Number of direct access CF cache structure Write requests.
1016	3F8	SMF42GMO	4	binary	Number of direct access CF cache structure read hits. (read-ahead)
1020	3FC	SMF42GMP	4	binary	Number of direct access CF cache structure read castins.
1024	400	SMF42GMQ	8	binary	Number of direct access CF cache structure byte transferred.
1032	408	SMF42GMR	4	binary	Total number of real READ I/O sequential requests to DASD. (read ahead)
1036	40C	SMF42GMS	4	binary	Total number of real WRITE I/O sequential requests to DASD. (read ahead)
1040	410	SMF42GMT	8	binary	Total number of bytes transferred to DASD for the read requests.
1048	418	SMF42GMU	8	binary	Total number of bytes transferred to DASD for the write requests.
1056	420	SMF42GMV	16	EBCDIC	Reserved.
1072	430	SMF42GMW	8	binary	Total amount of time, in milli seconds, for all sequential access (read ahead) requests in this interval.
1080	438	SMF42GMX	4	binary	Average response time for all of the sequential access (read ahead) requests in this interval (total time/number of requests).
1084	43C	SMF42GMY	4	binary	Normalized response time for all of the requests in this interval (total time/number of bytes transferred/4K). (read ahead)
1088	440	SMF42GMZ	8	EBCDIC	Reserved.
1096	448	SMF42GM7	32	EBCDIC	Reserved.
Sequential Access Pre-format Summary Section:					
1128	468	SMF42GNA	4	binary	Coupling facility cache partition number.
1132	46C	SMF42GNB	4	binary	Total number of sequential access requests. (pre-format)
1136	470	SMF42GNC	4	binary	Number of read requests - NRI protocol (No Read Integrity). (pre-format)
1140	474	SMF42GND	4	binary	Number of read requests - Consistent read protocol. (pre-format)
1144	478	SMF42GNE	4	binary	Number of Write requests. (pre-format)
1148	47C	SMF42GNF	4	binary	Number of direct access BMF requests. (pre-format)
1152	480	SMF42GNG	4	binary	Number of direct access BMF Read requests.
1156	484	SMF42GNH	4	binary	Number of direct access BMF Write requests.
1160	488	SMF42GNI	4	binary	Number of direct access BMF read hits.
1164	48C	SMF42GNJ	4	binary	Number of direct access BMF valid read hits.
1168	490	SMF42GNK	4	binary	Number of BMF false invalids. (pre-format)
1172	494	SMF42GNL	4	binary	Number of direct access CF cache structure requests.
1176	498	SMF42GNM	4	binary	Number of direct access CF cache structure Read requests.
1180	49C	SMF42GNN	4	binary	Number of direct access CF cache structure Write requests.
1184	4A0	SMF42GNO	4	binary	Number of direct access CF cache structure read hits. (pre-format)
1188	4A4	SMF42GNP	4	binary	Number of direct access CF cache structure read castins.
1192	4A8	SMF42GNQ	8	binary	Number of direct access CF cache structure byte transferred.
1200	4B0	SMF42GNR	4	binary	Total number of READ real I/O sequential requests to DASD. (pre-format)
1204	4B4	SMF42GNS	4	binary	Total number of WRITE real I/O sequential requests to DASD. (pre-format)

Offsets		Name	Length	Format	Description
1208	4B8	SMF42GNT	8	binary	Total number of bytes transferred to DASD for the read requests.
1216	4C0	SMF42GNU	8	binary	Total number of bytes transferred to DASD for the write requests.
1224	4C8	SMF42GNV	16	EBCDIC	Reserved.
1240	4D8	SMF42GNW	8	binary	Total amount of time, in milli seconds, for all sequential access. (pre-format) requests in this interval.
1248	4E0	SMF42GNX	4	binary	Average response time for all of the sequential access (pre-format) requests in this interval (total time/number of requests).
1252	4E4	SMF42GNY	4	binary	Normalized response time for all of the requests in this interval (total time/number of bytes transferred/4K). (pre-format)
1256	4E8	SMF42GNZ	8	EBCDIC	Reserved.
1264	4F0	SMF42GN7	32	EBCDIC	Reserved.
1296	510	SMF42GQA	4	binary	Number of record lock requests (obtain/alter/promote)
1300	514	SMF42GQB	4	binary	Number of record lock requests that cause true contention.
1304	518	SMF42GQC	4	binary	Number of record lock requests that cause false contention.
1308	51C	SMF42GQD	4	binary	Number of record lock release requests.
1312	520	SMF42GQE	4	binary	Number of component_1 type lock requests.
1316	524	SMF42GQF	4	binary	Number of component_1 type release lock requests.
1320	528	SMF42GQG	8	EBCDIC	Reserved.
1328	530	SMF42GQH	4	binary	Number of component_1 class_1 (DIWA) locks (obtain/alter/promote).
1332	534	SMF42GQI	4	binary	Number of component_1 class_1 (DIWA) locks that cause true contention.
1336	538	SMF42GQJ	4	binary	Number of component_1 class_1 (DIWA) locks that cause false contention.
1340	53C	SMF42GQK	4	binary	Number of component_1 class_1 (DIWA) release lock requests.
1344	540	SMF42GQL	4	binary	Number of component_1 class_2 (UPGRADE) locks (obtain/alter/promote).
1348	544	SMF42GQM	4	binary	Number of component_1 class_2 (UPGRADE) locks that cause true contention.
1352	548	SMF42GQN	4	binary	Number of component_1 class_2 (UPGRADE) locks that cause false contention.
1356	54C	SMF42GQO	4	binary	Number of component_1 class_2 (UPGRADE) release lock requests.
1360	550	SMF42GQP	4	binary	Number of component_1 class_3 (PREFORMAT) locks (obtain/alter/promote).
1364	554	SMF42GQQ	4	binary	Number of component_1 class_3 (PREFORMAT) locks that cause true contention.
1368	558	SMF42GQR	4	binary	Number of component_1 class_3 (PREFORMAT) locks that cause false contention.
1372	55C	SMF42GQS	4	binary	Number of component_1 class_3 (PREFORMAT) release lock requests.
1376	560	SMF42GQT	4	binary	Number of component_2 lock requests (obtain/alter/promote).
1380	564	SMF42GQU	4	binary	Number of component_2 locks that cause true contention.
1384	568	SMF42GQV	4	binary	Number of component_2 locks that cause false contention.
1388	56C	SMF42GQW	4	binary	Number of component_2 release lock requests.
1392	570	SMF42GQX	32	EBCDIC	Reserved.

Offsets		Name	Length	Format	Description
1424	590	SMF42GRL	4	binary	Number of RE-DO's.
1428	594	SMF42GRM	4	binary	Number of recursive RE-DO's.
1432	598	SMF42GRN	4	binary	Number of BMF writes.
1436	59C	SMF42GRO	4	binary	Number of SCM read requests.
1440	5A0	SMF42GRP	4	binary	Number of SCM read requests that encountered castout lock contention.
1444	5A4	SMF42GRR	4	binary	RE-DO percentage.
1448	5A8	SMF42GRS	4	binary	Recursive RE-DO percentage.
1452	5AC	SMF42GRT	4	binary	SCM castout lock percentage.
1456	5B0	SMF42GRQ	12	EBCDIC	Reserved.
1468	5BC	SMF42GRU	4	EBCDIC	Reserved.
1472	5B0	SMF42GRV	16	EBCDIC	Reserved.

Subtype 17 — VSAM RLS Coupling Facility Lock Structure Usage

MVS System CF Lock Structure Activity Totals Section

Offsets		Name	Length	Format	Description
0	0	SMF42HAA	4	binary	Interval length. This is the total length, in seconds, of the measurement period.
4	4	SMF42H00	12	EBCDIC	Reserved.
16	10	SMF42HAB	16	EBCDIC	DFSMS lock table name.
32	20	SMF42H01	16	EBCDIC	Reserved.
48	30	SMF42HAC	4	binary	Total number of lock requests (VSAM RLS mainline path).
52	34	SMF42HAD	4	binary	Total number of true contention lock requests (VSAM RLS mainline path).
56	38	SMF42HAE	4	binary	Total number of false contention lock requests (VSAM RLS mainline path).
60	3C	SMF42HAF	4	binary	Reserved.
64	40	SMF42HAG	32	EBCDIC	Reserved.
96	60	SMF42HAH	4	binary	Total number of lock requests (VSAM RLS exception path).
100	64	SMF42HAI	4	binary	Total Number of true contention lock requests (VSAM RLS exception path).
104	68	SMF42HAJ	4	binary	Total number of false contention lock requests (VSAM/RLS exception path).
108	6C	SMF42HAK	4	binary	Reserved.
112	70	SMF42HAL	32	EBCDIC	Reserved.
144	90	SMF42HCA	4	binary	Number of record lock requests (obtain/alter/promote).
148	94	SMF42HCB	4	binary	Number of record lock requests that cause true contention.
152	98	SMF42HCC	4	binary	Number of record lock requests that cause false contention.
156	9C	SMF42HCD	4	binary	Number of record lock release requests.
160	A0	SMF42HCE	4	binary	Number of component_1 type lock requests.
164	A4	SMF42HCF	4	binary	Number of component_1 type release lock requests.
168	A8	SMF42HCG	8	EBCDIC	Reserved.
176	B0	SMF42HCH	4	binary	Number of component_1 class_1 (DIWA) locks (obtain/alter/promote).
180	B4	SMF42HCI	4	binary	Number of component_1 class_1 (DIWA) locks that cause true contention.

Offsets		Name	Length	Format	Description
184	B8	SMF42HCJ	4	binary	Number of component_1 class_1 (DIWA) locks that cause false contention.
188	BC	SMF42HCK	4	binary	Number of component_1 class_1 (DIWA) release lock requests.
192	C0	SMF42HCL	4	binary	Number of component_1 class_2 (UPGRADE) locks (obtain/alter/promote).
196	C4	SMF42HCM	4	binary	Number of component_1 class_2 (UPGRADE) locks that cause true contention.
200	C8	SMF42HCN	4	binary	Number of component_1 class_2 (UPGRADE) locks that cause false contention.
204	CC	SMF42HCO	4	binary	Number of component_1 class_2 (UPGRADE) release lock requests.
208	D0	SMF42HCP	4	binary	Number of component_1 class_3 (PREFORMAT) locks (obtain/alter/promote).
212	D4	SMF42HCQ	4	binary	Number of component_1 class_3 (PREFORMAT) locks that cause true contention.
216	D8	SMF42HCR	4	binary	Number of component_1 class_3 (PREFORMAT) locks that cause false contention.
220	DC	SMF42HCS	4	binary	Number of component_1 class_3 (PREFORMAT) release lock requests.
224	E0	SMF42HCT	4	binary	Number of component_2 lock requests (obtain/alter/promote).
228	E4	SMF42HCU	4	binary	Number of component_2 locks that cause true contention.
232	E8	SMF42HCV	4	binary	Number of component_2 locks that cause false contention.
236	EC	SMF42HCW	4	binary	Number of component_2 release lock requests.
240	F0	SMF42HCX	4	binary	Number of special lock requests.
244	F4	SMF42HCY	12	EBCDIC	Reserved.
256	100	SMF42HCZ	32	EBCDIC	Reserved.

Lock Structure Summary Section

Offsets		Name	Length	Format	Description
0	0	SMF42HBA	4	binary	Interval length. This is the total length, in seconds, of the measurement period.
4	4	SMF42H02	12	EBCDIC	Reserved.
16	10	SMF42HBB	16	EBCDIC	DFSMS lock table name.
32	20	SMF42HBC	8	EBCDIC	MVS system name.
40	28	SMF42H03	8	EBCDIC	Reserved.
48	30	SMF42HBD	4	binary	Total number of lock requests (VSAM RLS mainline path).
52	34	SMF42HBE	4	binary	Total Number of true contention lock requests (VSAM RLS mainline path).
56	38	SMF42HBF	4	binary	Total number of false contention lock requests (VSAM RLS mainline path).
60	3C	SMF42HBG	4	binary	Reserved.
64	40	SMF42HBH	32	EBCDIC	Reserved.
96	60	SMF42HBI	4	binary	Total number of lock requests (VSAM RLS exception path).
100	64	SMF42HBJ	4	binary	Total number of true contention lock requests (VSAM RLS exception path).
104	68	SMF42HBK	4	binary	Total number of false contention lock requests (VSAM RLS exception path).
108	6C	SMF42HBL	4	binary	Reserved.

Offsets		Name	Length	Format	Description
112	70	SMF42HBM	32	EBCDIC	Reserved.
144	90	SMF42HDA	4	binary	Number of record lock requests (obtain/alter/promote)
148	94	SMF42HDB	4	binary	Number of record lock requests that cause true contention.
152	98	SMF42HDC	4	binary	Number of record lock requests that cause false contention.
156	9C	SMF42HDD	4	binary	Number of record lock release requests.
160	A0	SMF42HDE	4	binary	Number of component_1 type lock requests.
164	A4	SMF42HDF	4	binary	Number of component_1 type release lock requests.
168	A8	SMF42HDG	8	EBCDIC	Reserved.
176	B0	SMF42HDH	4	binary	Number of component_1 class_1 (DIWA) locks (obtain/alter/promote).
180	B4	SMF42HDI	4	binary	Number of component_1 class_1 (DIWA) locks that cause true contention.
184	B8	SMF42HDJ	4	binary	Number of component_1 class_1 (DIWA) locks that cause false contention.
188	BC	SMF42HDK	4	binary	Number of component_1 class_1 (DIWA) release lock requests.
192	C0	SMF42HDL	4	binary	Number of component_1 class_2 (UPGRADE) locks (obtain/alter/promote).
196	C4	SMF42HDM	4	binary	Number of component_1 class_2 (UPGRADE) locks that cause true contention.
200	C8	SMF42HDN	4	binary	Number of component_1 class_2 (UPGRADE) locks that cause false contention.
204	CC	SMF42HDO	4	binary	Number of component_1 class_2 (UPGRADE) release lock requests.
208	D0	SMF42HDP	4	binary	Number of component_1 class_3 (PREFORMAT) locks (obtain/alter/promote).
212	D4	SMF42HDQ	4	binary	Number of component_1 class_3 (PREFORMAT) locks that cause true contention.
216	D8	SMF42HDR	4	binary	Number of component_1 class_3 (PREFORMAT) locks that cause false contention.
220	DC	SMF42HDS	4	binary	Number of component_1 class_3 (PREFORMAT) release lock requests.
224	E0	SMF42HDT	4	binary	Number of component_2 lock requests (obtain/alter/promote).
228	E4	SMF42HDU	4	binary	Number of component_2 locks that cause true contention.
232	E8	SMF42HDV	4	binary	Number of component_2 locks that cause false contention.
236	EC	SMF42HDW	4	binary	Number of component_2 release lock requests.
240	F0	SMF42HDX	4	binary	Number of special lock requests.
244	F4	SMF42HDY	12	EBCDIC	Reserved.
256	100	SMF42HDZ	32	EBCDIC	Reserved.

Subtype 18 — VSAM RLS CF Cache Partition Usage

For additional information about the fields in this subtype, see the “IXLCACHE Storage Class Statistics Description” in *z/OS MVS Programming: Sysplex Services Guide*.

CF Cache Partition Activity Totals Section

Offsets		Name	Length	Format	Description
0	0	SMF42IAA	4	binary	Interval length. This is the total length, in seconds, of the measurement period.

Offsets		Name	Length	Format	Description
4	4	SMF42I00	12	EBCDIC	Reserved.
16	10	SMF42IAB	32	EBCDIC	Reserved.
48	30	SMF42IBG	16	EBCDIC	Partition type (sequential, direct, or combined).
64	40	SMF42IBH	4	binary	DFSMS specified cache weight.
68	44	SMF42I01	12	EBCDIC	Partition name.
80	50	SMF42IAD	4	binary	Coupling facility cache partition number.
84	54	SMF42IAE	4	binary	Status conditions.
88	58	SMF42IAF	4	binary	Read-hit counter.
92	5C	SMF42IAG	4	binary	Read-miss directory-hit counter.
96	60	SMF42IAH	4	binary	Read-miss assignment-suppressed counter.
100	64	SMF42IAI	4	binary	Read-miss name-assigned counter.
104	68	SMF42IAJ	4	binary	Read-miss target storage class full counter.
108	6C	SMF42IAK	4	binary	Write-hit change bit 0 counter.
112	70	SMF42IAL	4	binary	Write-hit change bit 1 counter.
116	74	SMF42IAM	4	binary	Write-miss not-registered counter.
120	78	SMF42IAN	4	binary	Write-miss invalid state counter.
124	7C	SMF42IAO	4	binary	Write-miss target storage class full counter.
128	80	SMF42IAP	4	binary	Directory entry reclaim counter.
132	84	SMF42IAQ	4	binary	Data table entry reclaim counter.
136	88	SMF42IAR	4	binary	Cross invalidate (XI) for directory reclaim counter.
140	8C	SMF42IAS	4	binary	XI for write counter.
144	90	SMF42IAT	4	binary	XI for name invalidation counter.
148	94	SMF42IAU	4	binary	XI for complement invalidation counter.
152	98	SMF42IAV	4	binary	Cast-out counter.
156	9C	SMF42IAW	4	binary	Reference signal miss counter.
160	A0	SMF42IAX	4	binary	Target storage class full counter.
164	A4	SMF42IAY	4	binary	Directory entry counter.
168	A8	SMF42IAZ	4	binary	Data area element counter.
172	AC	SMF42IBA	4	binary	Total changed counter.
176	B0	SMF42IBB	4	binary	Data area counter.
180	B4	SMF42IBC	4	binary	Completed reference lists counter.
184	B8	SMF42IBD	4	binary	Partially completed reference lists counter.
188	BC	SMF42IBE	4	binary	XI for local cache vector entry replacement counter.
192	C0	SMF42IBF	4	binary	Write unchanged with XI counter.

CF Cache Partition Summary Section

Offsets		Name	Length	Format	Description
0	0	SMF42ICA	4	binary	Interval length. This is the total length, in seconds, of the measurement period.
4	4	SMF42I02	12	EBCDIC	Reserved.
16	10	SMF42I04	2	binary	Reserved.
18	12	SMF42ICB	30	EBCDIC	DFSMS cache structure name.
48	30	SMF42IDG	16	EBCDIC	Partition type (sequential, direct, or combined).
64	40	SMF42IDH	4	binary	DFSMS specified cache weight.
68	44	SMF42I03	12	EBCDIC	Reserved.

Offsets		Name	Length	Format	Description
80	50	SMF42ICD	4	binary	Coupling facility cache partition number.
84	54	SMF42ICE	4	binary	Status conditions.
88	58	SMF42ICF	4	binary	Read-hit counter.
92	5C	SMF42ICG	4	binary	Read-miss directory-hit counter.
96	60	SMF42ICH	4	binary	Read-miss assignment suppressed counter.
100	64	SMF42ICI	4	binary	Read-miss name assigned counter.
104	68	SMF42ICJ	4	binary	Read-miss target storage class full counter.
108	6C	SMF42ICK	4	binary	Write-hit change bit 0 counter.
112	70	SMF42ICL	4	binary	Write-hit change bit 1 counter.
116	74	SMF42ICM	4	binary	Write-miss not-registered counter.
120	78	SMF42ICN	4	binary	Write-miss invalid state counter.
124	7C	SMF42ICO	4	binary	Write-miss target storage class full counter.
128	80	SMF42ICP	4	binary	Directory entry reclaim counter.
132	84	SMF42ICQ	4	binary	Data table entry reclaim counter.
136	88	SMF42ICR	4	binary	XI for directory reclaim counter.
140	8C	SMF42ICS	4	binary	XI for write counter.
144	90	SMF42ICT	4	binary	XI for name invalidation counter.
148	94	SMF42ICU	4	binary	XI for complement invalidation counter.
152	98	SMF42ICV	4	binary	Cast-out counter.
156	9C	SMF42ICW	4	binary	Reference signal miss counter.
160	A0	SMF42ICX	4	binary	Target storage class full counter.
164	A4	SMF42ICY	4	binary	Directory entry counter.
168	A8	SMF42ICZ	4	binary	Data area element counter.
172	AC	SMF42IDA	4	binary	Total changed counter.
176	B0	SMF42IDB	4	binary	Data area counter.
180	B4	SMF42IDC	4	binary	Completed reference lists counter.
184	B8	SMF42IDD	4	binary	Partially completed reference lists counter.
188	BC	SMF42IDE	4	binary	XI for local cache vector entry replacement counter.
192	C0	SMF42IDF	4	binary	Write unchanged with XI counter.

CF Cache Partition Summary Section, Directory/Element Ratio Data

Offsets		Name	Length	Format	Description
0	0	SMF42IEA	4	binary	Interval length. This is the total length, in seconds, of the measurement period.
4	4	SMF42I06	12	EBCDIC	Reserved.
16	10	SMF42I07	2	EBCDIC	Reserved.
18	12	SMF42IEB	30	EBCDIC	DFSMS cache structure name.
48	30	SMF42IEC	4	binary	Number of changes to directory portion of directory/element ratio.
52	34	SMF42IED	4	binary	Number of changes to element portion of directory/element ratio.
56	38	SMF42IEE	4	binary	Low ratio value for directory portion of directory/element ratio.
60	3C	SMF42IEF	4	binary	Low ratio value for element portion of directory/element ratio.

Offsets		Name	Length	Format	Description
64	40	SMF42IEG	4	binary	High ratio value for directory portion of directory/element ratio.
68	44	SMF42IEH	4	binary	High ratio value for element portion of directory/element ratio.
72	48	SMF42IEI	4	binary	Current ratio value for directory portion of directory/element ratio.
76	4C	SMF42IEJ	4	binary	Current ratio value for element portion of directory/element ratio.

Subtype 19 — VSAM RLS Local Buffer Manager LRU Statistics Summary

Sysplex Totals Local Buffer Manager LRU Statistics Summary

Offsets		Name	Length	Format	Description
0	0	SMF42JNA	4	binary	Interval length. This is the total length, in seconds, of the measurement period.
4	4	SMF42J00	12	EBCDIC	Reserved.
16	10	SMF42JNB	16	EBCDIC	Reserved.
32	20	SMF42JND	8	EBCDIC	Reserved.
40	28	SMF42JNE	8	EBCDIC	Average CPU time for all systems in sysplex (in milli-seconds).
48	30	SMF42JNF	8	EBCDIC	Total CPU time for this record (in milli-seconds).
56	38	SMF42JN0	4	EBCDIC	Reserved.
60	3C	SMF42JN7	4	binary	Total number of write requests (sysplex totals).
64	40	SMF42JNG	4	binary	Average number of Buffer Manager LRU intervals processed (sysplex totals).
68	44	SMF42JNH	4	binary	Total number of Buffer Manager LRU intervals processed (across sysplex).
72	48	SMF42JNI	4	binary	Average number of Buffer Manager LRU intervals where BMF was over the goal, and normal algorithms were bypassed to reclaim buffers.
76	4C	SMF42JNJ	4	binary	Total number of Buffer Manager LRU intervals where BMF was over the goal, and normal algorithms were bypassed to reclaim buffers (across sysplex).
80	50	SMF42JNK	4	binary	Average number of times that BMF was called in this interval.
84	54	SMF42JNL	4	binary	Total number of times that BMF was called in this interval (across sysplex).
88	58	SMF42JNM	4	binary	Average number of Buffer Manager ‘hits’ during this interval.
92	5C	SMF42JNN	4	binary	Total number of Buffer Manager ‘hits’ during this interval.
96	60	SMF42JNO	4	binary	Buffer Manager ‘hits’ current percentage during this interval.
100	64	SMF42JNP	4	binary	Buffer Manager ‘hits’ low percentage during this interval.
104	68	SMF42JNQ	4	binary	Buffer Manager ‘hits’ high percentage during this interval.
108	6C	SMF42JNR	4	binary	Buffer Manager average ‘hits’ during this interval.
112	70	SMF42JNS	4	binary	Average Sysplex Cache manager number of ‘hits’ during this interval.
116	74	SMF42JNT	4	binary	Total Sysplex Cache manager number of ‘hits’ during this interval.
120	78	SMF42JNU	4	binary	Sysplex Cache manager number of ‘hits’ current percentage during this interval.

Offsets		Name	Length	Format	Description
124	7C	SMF42JNV	4	binary	Sysplex Cache manager number of ‘hits’ low percentage during this interval.
128	80	SMF42JNW	4	binary	Sysplex Cache manager number of ‘hits’ high percentage during this interval.
132	84	SMF42JNX	4	binary	Sysplex Cache manager number of ‘hits’ average percentage during this interval.
136	88	SMF42JNY	4	binary	Average DASD number of ‘hits’ during this interval.
140	8C	SMF42JNZ	4	binary	Total DASD number of ‘hits’ during this interval.
144	90	SMF42JOA	4	binary	DASD ‘hits’ current percentage during this interval.
148	94	SMF42JOB	4	binary	DASD ‘hits’ low percentage during this interval.
152	98	SMF42JOC	4	binary	DASD ‘hits’ high percentage during this interval.
156	9C	SMF42JOD	4	binary	DASD average ‘hits’ during this interval.
160	A0	SMF42JOE	512	EBCDIC	Sysplex Average Buffer Pool Count array. This is a 16 bit entry array with each entry 32 bytes long. The first entry is the 2K storage pool, the second entry is for the 4K storage pool... See “Sysplex Average Buffer Pool Count Array” on page 13-222.
672	2A0	SMF42JRI	512	EBCDIC	Sysplex Wide Totals Buffer Pool Count array. This is a 16 bit entry array with each entry 32 bytes long. The first entry is the 2K storage pool, the second entry is for the 4K storage pool... See “Sysplex Wide Totals Buffer Pool Count Array” on page 13-222.
1184	4A0	SMF42JON	4	binary	Average buffer size goal (in megabytes) - low value.
1188	4A4	SMF42JOO	4	binary	Total Buffer size goal (in megabytes) - Low value.
1192	4A8	SMF42JOP	4	binary	Average Buffer size goal (in megabytes) - high value.
1196	4AC	SMF42JOQ	4	binary	Total Buffer size goal (in megabytes) - high value.
1200	4B0	SMF42JOR	4	binary	Average Buffer size goal (in megabytes) - current value.
1204	4B4	SMF42JOS	4	binary	Total Buffer size goal (in megabytes) - current value.
1208	4B8	SMF42JOT	4	binary	Total Buffer size goal (in megabytes) - average value.
1212	4BC	SMF42JOU	4	binary	Reserved.
1216	4C0	SMF42JOV	4	binary	Average Buffer size Calculated (in megabytes) - low value.
1220	4C4	SMF42JOW	4	binary	Total Buffer size Calculated (in megabytes) - low value.
1224	4C8	SMF42JOX	4	binary	Average Buffer size Calculated (in megabytes) - high value.
1228	4CC	SMF42JOY	4	binary	Total Buffer size Calculated (in megabytes) - high value.
1232	4D0	SMF42JOZ	4	binary	Average Buffer size Calculated (in megabytes) - current value.
1236	4D4	SMF42JRA	4	binary	Total Buffer size Calculated (in megabytes) - current value.
1240	4D8	SMF42JRB	4	binary	Total Buffer size Calculated (in megabytes) - Average value.
1244	4DC	SMF42JRC	4	binary	Reserved.
1248	4E0	SMF42JRD	8	EBCDIC	Reserved.
1252	4E4	SMF42JRE	64	EBCDIC	Average calculated megabytes distribution array. This is a 16 entry array which contains the number of times the calculated value occurred within a 100MB span. Entry 1 = 0-99m, entry 2 = 100-199m,... entry 16 > 150m. See “Average Buffer Manager Calculated Distribution Array” on page 13-222.
1316	524	SMF42JRG	64	EBCDIC	Total calculated megabytes distribution array. This is a 16 entry array which contains the number of times the calculated value occurred within a 100MB span. Entry 1 = 0-99m, entry 2 = 100-199m,... entry 16 > 150m. See “Total Buffer Manager Calculated Distribution Array” on page 13-222.

Offsets		Name	Length	Format	Description
1380	564	SMF42JTA	4	binary	Average number of SCM read requests which encountered castout lock contention during this interval (across the sysplex).
1384	568	SMF42JTB	4	binary	Total number of SCM read requests which encountered castout lock contention during this interval (across the sysplex).
1388	56C	SMF42JTC	4	binary	Average number of SCM read requests during this interval (across the sysplex).
1392	570	SMF42JTD	4	binary	Total number of SCM read requests during this interval (across the sysplex).
1396	574	SMF42JTE	4	binary	Current percentage of SCM read requests which encountered castout lock contention during this interval (across the sysplex).
1400	578	SMF42JTF	4	binary	Low percentage of SCM read requests which encountered castout lock contention during this interval (across the sysplex).
1404	57C	SMF42JTG	4	binary	High percentage of SCM read requests which encountered castout lock contention during this interval (across the sysplex).
1408	580	SMF42JTH	4	binary	Average percentage of SCM read requests which encountered castout lock contention during this interval (across the sysplex).
1412	584	SMF42JTI	4	binary	Average number of RE-DO's during this interval (across the sysplex).
1416	588	SMF42JTJ	4	binary	Total number of RE-DO's during this interval (across the sysplex).
1420	58C	SMF42JTK	4	binary	Average number of recursive RE-DO's during this interval (across the sysplex).
1424	590	SMF42JTL	4	binary	Total number of recursive redo during this interval (across the sysplex).
1428	594	SMF42JTM	4	binary	Current percentage of RE-DO's during this interval (across the sysplex).
1432	598	SMF42JTN	4	binary	Low percentage of RE-DO's during this interval (across the sysplex).
1436	59C	SMF42JTO	4	binary	High percentage of RE-DO's during this interval (across the sysplex).
1440	5A0	SMF42JTP	4	binary	Average percentage of RE-DO's during this interval (across the sysplex).
1444	5A4	SMF42JTQ	4	binary	Current percentage of Recursive RE-DO's during this interval (across the sysplex).
1448	5A8	SMF42JTR	4	binary	Low percentage of Recursive RE-DO's during this interval (across the sysplex).
1452	5AC	SMF42JTS	4	binary	High percentage of Recursive RE-DO's during this interval (across the sysplex).
1456	5B0	SMF42JTT	4	binary	Average percentage of Recursive RE-DO's during this interval (across the sysplex).
1460	5B4	SMF42JUA	4	binary	Average number of buffer manager LRU intervals processed, where BMF was over the goal accelerated the aging, but did not go into panic mode (across the sysplex).
1464	5B8	SMF42JUB	4	binary	Total number of buffer manager LRU intervals processed, where BMF was over the goal accelerated the aging, but did not go into panic mode (across the sysplex).

Sysplex Average Buffer Pool Count Array

Offsets		Name	Length	Format	Description
0	0	SMF42JOF	4	binary	Average low value of the number of BMF buffers for this pool during this interval.
4	4	SMF42JOG	4	binary	Average high value of the number of BMF buffers for this pool during this interval.
8	8	SMF42JOH	4	binary	Average current value of the number of BMF buffers for this pool during this interval.
12	C	SMF42JOI	4	binary	Reserved.
16	10	SMF42JOJ	4	binary	Average low value of the number of extents for this pool during this interval.
20	14	SMF42JOK	4	binary	Average high value of the number of extents for this pool during this interval.
24	18	SMF42JOL	4	binary	Average current value of the number of extents for this pool during this interval.
28	1C	SMF42JOM	4	binary	Reserved.

Sysplex Wide Totals Buffer Pool Count Array

Offsets		Name	Length	Format	Description
0	0	SMF42JRJ	4	binary	Low value of the number of BMF buffers for this pool during this interval.
4	4	SMF42JRK	4	binary	High value of the number of BMF buffers for this pool during this interval.
8	8	SMF42JRL	4	binary	Value of the number of BMF buffers for this pool during this interval.
12	C	SMF42JRM	4	binary	Reserved.
16	10	SMF42JRN	4	binary	Low value of the number of extents for this pool during this interval.
20	14	SMF42JRO	4	binary	High value of the number of extents for this pool during this interval.
24	18	SMF42JRP	4	binary	Current value of the number of extents for this pool during this interval.
28	1C	SMF42JRQ	4	binary	Reserved.

Average Buffer Manager Calculated Distribution Array

Offsets		Name	Length	Format	Description
0	0	SMF42JRF	4	binary	Average number of times calculated value was within this range (across the sysplex).

Total Buffer Manager Calculated Distribution Array

Offsets		Name	Length	Format	Description
0	0	SMF42JRH	4	binary	Total number of times calculated value was within this range (across the sysplex).

System Local Buffer Manager LRU Statistics Summary

Offsets		Name	Length	Format	Description
0	0	SMF42JPA	4	binary	Interval length. This is the total length, in seconds, of the measurement period.
4	4	SMF42J01	12	EBCDIC	Reserved.

Offsets		Name	Length	Format	Description
16	10	SMF42JPB	8	EBCDIC	MVS system name.
24	18	SMF42JPC	8	EBCDIC	Reserved.
32	20	SMF42JPD	8	EBCDIC	Reserved.
40	28	SMF42JPE	8	EBCDIC	Average CPU time for all systems in sysplex (in milli-seconds).
48	30	SMF42JPF	8	EBCDIC	Total CPU time for this record (in milli-seconds).
56	38	SMF42JP1	12	EBCDIC	Reserved.
68	44	SMF42JP6	4	binary	Total number of write requests.
72	48	SMF42JPG	4	binary	Number of Buffer Manager LRU intervals processed.
76	4C	SMF42JPH	4	binary	Number of Buffer Manager LRU intervals where BMF was over the goal, and normal algorithms were bypassed to reclaim buffers
80	50	SMF42JPI	4	binary	Total number of times that BMF was called in this interval.
84	54	SMF42JP2	4	binary	Number of buffer manager LRU intervals processed, where BMF was over the goal, accelerated the aging, but did not go into panic mode.
88	58	SMF42JPJ	4	binary	Buffer Manager number of 'hits' during this interval.
92	5C	SMF42JPK	4	binary	Buffer Manager number of 'hits' current percentage during this interval.
96	60	SMF42JPL	4	binary	Buffer Manager number of 'hits' low percentage during this interval.
100	64	SMF42JPM	4	binary	Buffer Manager number of 'hits' high percentage during this interval.
104	68	SMF42JPN	4	binary	Buffer Manager average 'hits' during this interval.
108	6C	SMF42JP3	12	EBCDIC	Reserved.
120	78	SMF42JPO	4	binary	Sysplex Cache manager number of 'hits' during this interval.
124	7C	SMF42JPP	4	binary	Sysplex Cache manager number of 'hits' current percentage during this interval.
128	80	SMF42JPQ	4	binary	Sysplex Cache manager number of 'hits' low percentage during this interval.
132	84	SMF42JPR	4	binary	Sysplex Cache manager number of 'hits' high percentage during this interval.
136	88	SMF42JPS	4	binary	Sysplex Cache manager number of 'hits' average percentage during this interval.
140	8C	SMF42JP4	12	EBCDIC	Reserved.
152	98	SMF42JPT	4	binary	DASD number of 'hits' during this interval.
156	9C	SMF42JPU	4	binary	DASD 'hits' current percentage during this interval.
160	A0	SMF42JPV	4	binary	DASD 'hits' low percentage during this interval.
164	A4	SMF42JPW	4	binary	DASD 'hits' high percentage during this interval.
168	A8	SMF42JPX	4	binary	DASD average 'hits' during this interval.
172	AC	SMF42JP5	12	EBCDIC	Reserved.
184	B8	SMF42JPY	512	EBCDIC	Sysplex Average Buffer Pool Count array. This is a 16 bit entry array with each entry 32 bytes long. The first entry is the 2K storage pool, the second entry is for the 4K storage pool... See "Sysplex Average Buffer Pool Count Array" on page 13-224.
696	2B8	SMF42JQG	4	binary	Buffer size goal (in megabytes) - low value.
700	2BC	SMF42JQH	4	binary	Buffer size goal (in megabytes) - high value.
704	2C0	SMF42JQI	4	binary	Buffer size goal (in megabytes) - current value.
708	2C4	SMF42JQJ	4	binary	Buffer size goal (in megabytes) - average value.
712	2C8	SMF42JQK	4	binary	Buffer size Calculated (in megabytes) - low value.

Offsets		Name	Length	Format	Description
716	2CC	SMF42JQL	4	binary	Buffer size Calculated (in megabytes) - high value.
720	2D0	SMF42JQM	4	binary	Buffer size Calculated (in megabytes) - current value.
724	2D4	SMF42JQN	4	binary	Buffer size Calculated (in megabytes) - Average value.
728	2D8	SMF42JQ3	8	EBCDIC	Reserved.
736	2E0	SMF42JQO	64	EBCDIC	Calculated megabytes distribution array. This is a 16 entry array which contains the number of times the calculated value occurred within a 100MB span. Entry 1 = 0-99m, entry 2 = 100-199m,... entry 16 > 150m. See “Calculated Megabytes Distribution Array” on page 13-225
800	320	SMF42JSA	4	binary	Number of SCM read requests which encountered castout contention during this interval.
804	324	SMF42JSB	4	binary	Number of SCM read requests during this interval.
808	328	SMF42JSC	4	binary	Current percentage of SCM read requests which encountered cast contention during this interval. (Value is for the last LRU cycle before the SMF record was processed.)
812	32C	SMF42JSD	4	binary	Low percentage during this interval for SMF42JSC.
816	330	SMF42JSE	4	binary	High percentage during this interval for SMF42JSC.
820	334	SMF42JSF	4	binary	Average percentage during this interval for SMF42JSC.
824	338	SMF42JSG	4	binary	Number of RE-DO’s during this interval.
828	33C	SMF42JSH	4	binary	Current percentage of RE-DO’s during this interval. (Value is for the last LRU cycle before the SMF record was processed.)
832	340	SMF42JSI	4	binary	Low percentage during this interval for SMF42JSH.
836	344	SMF42JSJ	4	binary	High percentage during this interval for SMF42JSH.
840	348	SMF42JSK	4	binary	Average percentage during this interval for SMF42JSH.
844	34C	SMF42JSL	4	binary	Number of recursive RE-DO’s during this interval.
848	350	SMF42JSM	4	binary	Current percentage of recursive RE-DO’s during this interval. (Value is for the last LRU cycle before the SMF record was processed.)
852	354	SMF42JSN	4	binary	Low percentage during this interval for SMF42JSM.
856	358	SMF42JSO	4	binary	High percentage during this interval for SMF42JSM.
860	35C	SMF42JSP	4	binary	Average percentage during this interval for SMF42JSM.

Sysplex Average Buffer Pool Count Array

Offsets		Name	Length	Format	Description
0	0	SMF42JPZ	4	binary	Low value of the number of BMF buffers for this pool during this interval.
4	4	SMF42JQA	4	binary	High value of the number of BMF buffers for this pool during this interval.
8	8	SMF42JQB	4	binary	Current value of the number of BMF buffers for this pool during this interval.
12	C	SMF42JQ6	4	binary	Reserved.
16	10	SMF42JQC	4	binary	Low value of the number of extents for this pool during this interval.
20	14	SMF42JQD	4	binary	High value of the number of extents for this pool during this interval.
24	18	SMF42JQF	4	binary	Current value of the number of extents for this pool during this interval.
28	1C	SMF42JQ7	4	binary	Reserved.

Calculated Megabytes Distribution Array

Offsets		Name	Length	Format	Description
0	0	SMF42JQP	4	binary	For a single system, number of times calculated value was within this range.

Subtype 20 — STOW Initialize

Job and Data Set Information

Offsets		Name	Length	Format	Description
0	0	SMF42KJB	8	EBCDIC	Job name, started task control, or time sharing user who issued the STOW Initialize.
8	8	SMF42KST	8	EBCDIC	Step name.
16	10	SMF42KPR	8	EBCDIC	Proc name (or blanks).
24	18	SMF42KDS	44	EBCDIC	Data set name.
68	44	SMF42KVS	6	EBCDIC	VOLSER.

Subtype 21 — Member Delete

Job and Data Set Information

Offsets		Name	Length	Format	Description
0	0	SMF42LJB	8	EBCDIC	Job name, started task control, or time sharing user who issued the STOW or DESERV delete.
8	8	SMF42LST	8	EBCDIC	Step name.
16	10	SMF42LPR	8	EBCDIC	Proc name (or blanks).
24	18	SMF42LDS	44	EBCDIC	Data set name.
68	44	SMF42LVS	6	EBCDIC	VOLSER.
74	4A	SMF42LNL	2	binary	Length of the member name that was deleted (SMF42LMN).
76	4C	SMF42LFL	4	binary	Flags **Bit** **Meaning When Set** **0** Some aliases were excluded from the record because the record length would have exceeded the maximum **1-31** Reserved.
80	50	SMF42LMN	VAR	EBCDIC	Member name that was deleted. Actual length used is determined by SMF42LNL. (Maximum length is 63.)

Alias Names Deleted in Sympathy

Offsets		Name	Length	Format	Description
0	0	SMF42LNA	2	binary	Number of alias names that were also deleted because SMF42LMN is a PDSE primary member name.
2	2	SMF42LAA	VAR	EBCDIC	Alias name list array, contains SMF42LNA number of entries. See “Alias Name List Array.”

Alias Name List Array

Offsets		Name	Length	Format	Description
0	0	SMF42LAL	2	binary	Length of the alias name that was deleted in sympathy.
2	2	SMF42LAN	VAR	EBCDIC	Alias name deleted in sympathy. (Length is SMF42LAL.)

Record Type 43 (2B) — JES2 Start

Record type 43 is written when the operator issues an S JES2 command (to start JES2) or a $E SYS command (to reclaim the job processing that was being done on the named system in a multi-access spool configuration). This record contains a warm start indicator, JES2 start options, and the identification of the system whose job processing is to be reclaimed.

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF43LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See "Standard SMF Record Header" on page 13-1 for a detailed description.
2	2	SMF43SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF43FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See "Standard SMF Record Header" on page 13-1 for a detailed description.
5	5	SMF43RTY	1	binary	Record type 43 (X'2B').
6	6	SMF43TME	4	binary	Time since midnight, in hundredths of second, when the record was moved into the SMF buffer.
10	10	SMF43DTE	4	packed	Date record was moved into SMF buffer, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
14	E	SMF43SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF43SBS	2	binary	Subsystem identification — X'0002' signifies JES2.
20	14	SMF43RSV	2		Reserved.
22	16	SMF43LRR	2	binary	Length of rest of record, excluding this field.
24	18	SMF43RV1	2		Reserved.
26	1A	SMF43RST	1	binary	Warm start indicator **Bit** **Meaning When Set** **0** If 0, record written for $S JES2 command If 1, record written for $E SYS command **1-7** Reserved.

Offsets		Name	Length	Format	Description
27	1B	SMF43OPT	1	binary	JES2 start options. (This field is zero for $E SYS command.) See *z/OS JES2 Initialization and Tuning Guide* for more detailed information. **Bit** **Meaning When Set** **0** Format the spool **1** Cold start **2** REQ option was specified **3** LIST option was specified **4** LOG option was specified **5** RECONFIG option was specified **6** CONSOLE option was specified **7** JES2 determined that it could perform a quick start.
28	1C	SMF43EID	4	EBCDIC	If $E SYS command, identification of system whose job processing is to be reclaimed. If S JES2 command, zero.

Record Type 43 (2B) — JES3 Start

Record type 43 is written during JES3 and the converter/interpreter functional subsystem (C/I FSS) initialization. This record contains an indicator for the type of JES3 start, JES3 initialization deck origin type and contents, and JES3 procedure name.

Record Environment

The following conditions exist for the generation of this record:

Macro SMFEWTM, BRANCH=NO (record exit: IEFU83)

Storage Residency 24-bit

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF43LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See "Standard SMF Record Header" on page 13-1 for a detailed description.
2	2	SMF43SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF43FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See "Standard SMF Record Header" on page 13-1 for a detailed description.
5	5	SMF43RTY	1	binary	Record type 43 (X'2B').
6	6	SMF43TME	4	binary	Time since midnight, in hundredths of second, that the record moved into the SMF buffer.

Offsets		Name	Length	Format	Description
10	A	SMF43DTE	4	packed	Date when record was moved into SMF buffer, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
14	E	SMF43SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF43SBS	2	binary	Subsystem identification — X'0005' signifies JES3.
20	14	SMF43RSV	2		Reserved.
22	16	SMF43LRR	2	binary	Length of rest of record, excluding this field.
24	18	SMF43RV1	2		Reserved.
26	1A	SMF43RST	1	binary	JES3 start record indicator (taken from operator’s response to WTOR macro) **Bit** **Meaning When Set** **0** Cold start **1** Warm start **2** Hot start **3** Start is with JES3 queue analysis **4** JES3 global processor. This bit is always set if start is a cold start or warm start. **5** JES3 local processor. This bit is always set if start is a hot start. **6** Reserved **7** Dynamic system interchange (DSI) was invoked by operator to convert a local processor to the global processor. Bits 2 and 4 will also be set.
27	18	SMF43RV2	1		Reserved.
28	1C	SMF43US1	1	binary	User flags.
29	1D	SMF43NMU	1	EBCDIC	JES3 initialization deck origin type (taken from operator’s response to WTOR macro).

30	1E	SMF43ORG	8	EBCDIC	JES3 initialization deck origin location (taken from operator’s response to WTOR macro)
					`Type  Contents      Location`
					`N     Member name   JCL in JES3 procedure`
					`M     Member name   Dataset in JES3 procedure`
					`U     Unit address  3- or 4-digit unit at specified address (stored in 4-digit format).`

38	26	SMF43PJ3	4	EBCDIC	JES3 procedure name.
42	2A	SMF43RVJ	8		Reserved for JES3.
50	32	SMF43RVU	4		Reserved for user.

Record Type 45 (2D) — JES2 Withdrawal

Record type 45 is written when a $P JES2 command (to withdraw JES2 from the system) is issued. It is written at the abnormal termination of JES2 if JES2 retains control long enough to write the record. This record contains a termination indicator and the JES2 completion code.

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF45LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	SMF45SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF45FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See “Standard SMF Record Header” on page 13-1 for a detailed description.
5	5	SMF45RTY	1	binary	Record type 45 (X'2B').
6	6	SMF45TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.
10	A	SMF45DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
14	E	SMF45SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF45SBS	2	binary	Subsystem identification — X'0002' signifies JES2.
20	14	SMF45RSV	2		Reserved.
22	16	SMF45LRR	2	binary	Length of rest of record, excluding this field.
24	18	SMF45IND	2	binary	Termination indicator **Bit** **Meaning When Set** **0** If 0, record written for $P JES2 command (JES2 withdrawal) If 1, record written for abnormal JES2 termination **1-15** Reserved.
26	1A	SMF45JCC	2	binary	JES2 completion code.

Record Type 45 (2D) — JES3 Stop

Record type 45 is written during JES3 and the converter/interpreter functional subsystem (C/I FSS) termination. This record contains an indicator for the type of JES3 stop, and JES3 completion code.

Record Environment

The following conditions exist for the generation of this record:

Macro SMFEWTM, BRANCH=NO (record exit: IEFU83)

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Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF45LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	SMF45SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF45FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See “Standard SMF Record Header” on page 13-1 for a detailed description.
5	5	SMF45RTY	1	binary	Record type 45 (X'2D').
6	6	SMF45TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.
10	A	SMF45DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
14	E	SMF45SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF45SBS	2	binary	Subsystem identification — X'0005' signifies JES3.
20	14	SMF45RSV	2		Reserved.
22	16	SMF45LRR	2	binary	Length of rest of record, excluding this field.
24	18	SMF45FG1	1	binary	JES3 stop record indicator **Bit** **Meaning When Set** **0** JES3 or the C/I FSS abnormally terminated (taken from completion code in ECB) **1** Dynamic system interchange was invoked by operator to convert a local processor to the global processor **2-7** Reserved.
25	19	SMF45J3C	3	binary	JES3 completion code (taken from completion code in ECB) where bits 0-11 represent a system code and bits 12-23 represent a user code. Note that the JES3 completion code, as recorded on the operator’s console, is always S 2FB.
28	1C	SMF45RV1	1		Reserved.
29	1D	SMF45US1	1	binary	User flags.
30	1E	SMF45RVJ	8		Reserved for JES3.
38	26	SMF45RVU	4		Reserved for user.

Record Type 47 (2F) — JES2 SIGNON/Start Line (BSC only)

Record type 47 is written when:

- A $S LINE(*n*) command (to start a line) is issued,
- A $E LINE(*n*) command (to restart a line) is issued, or
- When a remote user signs on.

This record contains a record indicator, remote name, line name, password, and message text.

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF47LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See "Standard SMF Record Header" on page 13-1 for a detailed description.
2	2	SMF47SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF47FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See "Standard SMF Record Header" on page 13-1 for a detailed description.
5	5	SMF47RTY	1	binary	Record type 47 (X'2F').
6	6	SMF47TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.
10	A	SMF47DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
14	E	SMF47SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF47SBS	2	binary	Subsystem identification — X'0002' signifies JES2.
20	14	SMF47RSV	2		Reserved.
22	16	SMF47LRR	2	binary	Length of rest of record, excluding this field.
24	18	SMF47EVT	2	binary	Record indicator **Bit** **Meaning When Set** **0-13** Reserved **14** Record written for $S LNE*n* command **15** Record written for SIGNON.

General Section

Offsets		Name	Length	Format	Description
26	1A	SMF47LN1	2	binary	Length of general section, including this field.
28	1C	SMF47RMT	8	EBCDIC	Remote name as defined in JESPARMS. (This field is filled in only if a remote terminal is connected to this line.)
36	24	SMF47LIN	8	EBCDIC	Line name as defined in JESPARMS.
44	2C	SMF47PSW	8	EBCDIC	Password as defined in JESPARMS.

Message Section

The following fields apply when a remote user signs on:

Offsets		Name	Length	Format	Description
52	34	SMF47LN2	2	binary	Length of rest of record, including this field.
54	36	SMF47MSG	36	EBCDIC	Message text. This field includes columns 45-70 of the SIGNON card image.

Record Type 47 (2F) — JES3 SIGNON/Start Line/LOGON

Record type 47 is written when a system network architecture (SNA) remote user logs on or when a binary synchronous communication (BSC) remote line is started or a BSC remote user signs on.

For SNA, the record contains a record indicator, a work station name, a logical unit (LU) name, and a password. The record length for an SNA LOGON is 52 bytes. For BSC, the record contains a record indicator, a remote name, a line name, a password, and, for a remote SIGNON, a message text. The record length is 52 bytes for a started line or 102 bytes for a SIGNON.

Record Environment

The following conditions exist for the generation of this record:

Macro	SMFEWTM, BRANCH=NO (record exit: IEFU83)
Storage Residency	31-bit

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF47LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	SMF47SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF47FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See “Standard SMF Record Header” on page 13-1 for a detailed description.
5	5	SMF47RTY	1	binary	Record type 47 (X'2F').
6	6	SMF47TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.
10	A	SMF47DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
14	E	SMF47SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF47SBS	2	binary	Subsystem identification — X'0005' signifies JES3.
20	14	SMF47RSV	2		Reserved.
22	16	SMF47LRR	2	binary	Length of rest of record, excluding this field.
24	18	SMF47EVT	2	binary	Record indicator **Bit** **Meaning When Set** **0-12** Reserved **13** Record written for SNA LOGON **14** Record written for BSC started line **15** Record written for BSC SIGNON.

General Section

Offsets		Name	Length	Format	Description
26	1A	SMF47LN1	2	binary	Length of general section, including this field.
28	1C	SMF47RMT	8	EBCDIC	Remote name as defined in JESPARMS. (This field is filled in only if a remote terminal is connected to this line.)
36	24	SMF47LIN	8	EBCDIC	Line name as defined in JESPARMS.
44	2C	SMF47PSW	8	EBCDIC	Password as defined in JESPARMS.

Message Section

This section contains the fields that apply when a BSC remote user signs on.

Offsets		Name	Length	Format	Description
52	34	SMF47LN2	2	binary	Length of rest of message section, including this field.
54	36	SMF47MSG	36	EBCDIC	Message text. This field includes columns 35-70 of the SIGNON card image.
90	5A	SMF47RVJ	8		Reserved for JES3.
98	62	SMF47RVU	4		Reserved for user.

Record Type 48 (30) — JES2 SIGNOFF/Stop Line (BSC only)

Record type 48 is written when:
- A $P LNE*n* command (to stop a line) is issued
- A $E LNE*n* command (to restart a line) is issued, and
- When a remote user signs off.

This record contains:
- A record indicator
- A remote name
- A line name
- A password
- A line adapter address
- The number of execute channel programs (EXCP)
- Negative acknowledgements to write text
- Data checks to read text
- Time outs to read text.

The field names beginning with MDCTS are for SIGNOFF and contain session totals; the other fields are for $P LNE*n* commands and contain connection totals.

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF48LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See "Standard SMF Record Header" on page 13-1 for a detailed description.
2	2	SMF48SEG	2	binary	Segment descriptor (see record length field).

Offsets		Name	Length	Format	Description
4	4	SMF48FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See “Standard SMF Record Header” on page 13-1 for a detailed description.
5	5	SMF48RTY	1	binary	Record type 48 (X'30').
6	6	SMF48TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.
10	A	SMF48DTE	4	packed	Date when the record was moved into SMF buffer, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
14	E	SMF48SID	4	EBCDIC	System identification (from the MEMBER statement).
18	12	SMF48SBS	2	binary	Subsystem identification — X'0002' signifies JES2.
20	14	SMF48RSV	2		Reserved.
22	16	SMF48LRR	2	binary	Length of rest of record, excluding this field.
24	18	SMF48EVT	2	binary	Record indicator **Bit** **Meaning When Set** **0-13** Reserved **14** Record written for $P LNE*n* command. **15** Record written for SIGNOFF.
26	1A	SMF48RV1	2		Reserved.
28	1C	SMF48RMT	8	EBCDIC	Remote name as defined in JESPARMS. (This field is filled in only if a remote terminal is connected to this line.)
36	24	SMF48LIN	8	EBCDIC	Line name as defined in JESPARMS.
44	2C	SMF48PSW	8	EBCDIC	Password as defined in JESPARMS.
52	34	SMF48IO	4	binary	Number of EXCPs for this line.
56	36	SMF48NAK	4	binary	Number of negative acknowledgements to write text.
60	3C	SMF48DCK	4	binary	Number of data checks to read text.
64	40	SMF48OUT	4	binary	Number of time outs to read text.
68	44	SMF48ERR	4	binary	Sum of all other line errors.
72	48	SMF48LAA	3	EBCDIC	3-digit hexadecimal device number.
75	4B	SMF48LA4	4	EBCDIC	4-digit hexadecimal device number.

Record Type 48 (30) — JES3 SIGNOFF/Stop Line/LOGOFF

Record type 48 is written when a system network architecture (SNA) remote user logs off or if a binary synchronous communication (BSC) remote line is stopped. This record is also written when a BSC remote user signs off.

For SNA, the record contains a record indicator, a work station name, a logical unit (LU) name, a password, and a line I/O count. For BSC, the record contains a record indicator, a remote name, a line name, a password, a line adapter address, and line I/O counts.

Note: For BSC, the statistics in this record are accumulated for the line from SIGNON/LOGON to SIGNOFF/LOGOFF.

Record Environment

The following conditions exist for the generation of this record:

Macro SMFEWTM, BRANCH=NO (record exit: IEFU83)

Storage Residency 31-bit

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF48LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	SMF48SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF48FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See “Standard SMF Record Header” on page 13-1 for a detailed description.
5	5	SMF48RTY	1	binary	Record type 48 (X'30').
6	6	SMF48TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.
10	A	SMF48DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
14	E	SMF48SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF48SBS	2	binary	Subsystem identification — X'0005' signifies JES3.
20	14	SMF48RSV	2		Reserved.
22	16	SMF48LRR	2	binary	Length of rest of record, excluding this field.
24	18	SMF48EVT	2	binary	Record indicator **Bit** **Meaning When Set** **0-12** Reserved **13** Record written for SNA LOGOFF **14** Record written for BSC stopped line **15** Record written for BSC SIGNOFF.
26	1A	SMF48RV1	2		Reserved.
28	1C	SMF48RMT	8	EBCDIC	Remote name as defined in JESPARMS. (This field is filled in only if a remote terminal is connected to this line.) Work station name.
36	24	SMF48LIN	8	EBCDIC	Line name as defined in JESPARMS.
44	26	SMF48PSW	8	EBCDIC	Password as defined in JESPARMS.
52	34	SMF48TRN	4	binary	Number of transmissions.
56	38	SMF48ERS	4	binary	Number of line errors.
60	3C	SMF48TOT	2	binary	Number of time outs to read text.
62	3E	SMF48NKS	2	binary	Number of negative acknowledgements to write text.
64	40	SMF48SO	1	binary	Number of command rejects.

Offsets		Name	Length	Format	Description
65	41	SMF48S1	1	binary	Number of interventions required.
66	42	SMF48S2	1	binary	Number of bus-out checks.
67	43	SMF38S3	1	binary	Number of equipment checks.
The following fields apply only to BSC:					
68	44	SMF48S4	1	binary	Number of data checks.
69	45	SMF48S5	1	binary	Number of data overruns.
70	46	SMF48S6	1	binary	Number of lost data(s).
71	47	SMF48USR	9		Reserved.
80	50	SMF48ADP	3	EBCDIC	3-digit line adapter number.
83	53	SMF48RVJ	8		Reserved for JES3.
91	5B	SMF48RVU	4		Reserved for user.
95	5F	SMF48AD4	4	EBCDIC	4-digit line adapter number.

For SNA, adjust offsets to account for the increased length.

66	42	SMF48S1
67	43	SMF48S2
69	45	SMF48S3

Record Type 49 (31) — JES2 Integrity (BSC only)

Record type 49 is written when a remote user attempts to sign on with an incorrect password. This record is the same as record type 47 except the password is incorrect. It contains a record indicator, remote name, line name, incorrect password, and message text.

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF49LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	SMF49SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF49FLG	1	binary	System indicator: **Bit** Meaning When Set **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See “Standard SMF Record Header” on page 13-1 for a detailed description.
5	5	SMF49RTY	1	binary	Record type 49 (X'31').
6	6	SMF49TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.

Offsets		Name	Length	Format	Description
10	A	SMF49DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
14	E	SMF49SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF49SBS	2	binary	Subsystem identification — X'0002' signifies JES2.
20	14	SMF49RSV	2		Reserved.
22	16	SMF49LRR	2	binary	Length of rest of record, excluding this field.
24	18	SMF49EVT	2	binary	Record indicator **Bit** **Meaning When Set** **0-13** Reserved **14** Started line **15** Record written for SIGNON.
Identification Section:					
26	1A	SMF49LN1	2	binary	Length of identification section, including this field.
28	1C	SMF49RMT	8	EBCDIC	Remote name as defined in JESPARMS. (This field is filled in only if a remote terminal is connected to this line.)
36	24	SMF49LIN	8	EBCDIC	Line name as defined in JESPARMS.
44	2C	SMF49PSW	8	EBCDIC	Incorrect password.
Message Section:					
52	34	SMF49LN2	2	binary	Length of rest of record, including this field.
54	36	SMF49MSG	36	EBCDIC	Message text. This field includes columns 35-70 of the SIGNON card image.

Record Type 49 (31) — JES3 Integrity

Record type 49 is written when a system network architecture (SNA) remote user attempts to log on with an incorrect password or a binary synchronous communication (BSC) remote line user attempts to sign on with an incorrect password.

For SNA, the record contains a record indicator, a work station name, a logical unit (LU) name, and an incorrect password. For BSC, the record contains a record indicator, a remote name, a line name, an incorrect password, and, for a remote sign on, a message text.

Record Environment

The following conditions exist for the generation of this record:

Macro SMFEWTM, BRANCH=NO (record exit: IEFU83)

Storage Residency 31-bit

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF49LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.

Offsets		Name	Length	Format	Description
2	2	SMF49SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF49FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See "Standard SMF Record Header" on page 13-1 for a detailed description.
5	5	SMF49RTY	1	binary	Record type 49 (X'31').
6	6	SMF49TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.
10	A	SMF49DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
14	E	SMF49SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF49SBS	2	binary	Subsystem identification — X'0005' signifies JES3.
20	14	SMF49RSV	2		Reserved.
22	16	SMF49LRR	2	binary	Length of rest of record, excluding this field.
24	18	SMF49EVT	2	binary	Record indicator **Value** **Meaning** **1** Terminal not defined (BSC) **2** Security failure (BSC) **4** Line already signed on (BSC) **8** Terminal already signed on (BSC) **5** Session limit exceeded (SNA) **6** Work station undefined (SNA) **7** Security failure (SNA) **8** Bind failure (SNA).
Identification Section:					
26	1A	SMF49LN1	2	binary	Length of identification section, including this field.
28	1C	SMF49RMT	8	EBCDIC	Remote name as defined in JESPARMS. (This field is filled in only if a remote terminal is connected to this line.)
36	24	SMF49LIN	8	EBCDIC	Line name as defined in JESPARMS.
44	2C	SMF49PSW	8	EBCDIC	Incorrect password.
Message Section: The following fields apply only to BSC.					
52	34	SMF49LN2	2	binary	Length of message section, including this field.
54	36	SMF49MSG	36	EBCDIC	Message text. This field includes columns 35-70 of the SIGNON card image.

Record Type 50 (32) — VTAM Tuning Statistics

VTAM writes type 50 records to collect statistics about tuning when a user-specified time interval expires.

Reference book

For more information about tuning statistics, see *z/OS Communications Server: SNA Network Implementation Guide*.

Record Type 52 (34) — JES2 LOGON/Start Line (SNA only)

Record type 52 is written when:
- A $S LNE*n* command (to start a line) is issued
- A $E LNE*n* command (to restart a line) is issued, and
- When a remote user signs on.

This record contains a record indicator, remote name, line name, password, and message text.

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF52LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See "Standard SMF Record Header" on page 13-1 for a detailed description.
2	2	SMF52SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF52FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See "Standard SMF Record Header" on page 13-1 for a detailed description.
5	5	SMF52RTY	1	binary	Record type 52 (X'34').
6	6	SMF52TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.
10	A	SMF52DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
14	E	SMF52SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF52POF	2	binary	Offset to product section from start of record, including record descriptor word (RDW).
20	14	SMF52PRL	2	binary	Length of product section.
22	16	SMF52PRN	2	binary	Number of product section.
24	18	SMF52IDO	2	binary	Offset to identification section from start of record, including record descriptor word (RDW).
26	1A	SMF52IDL	2	binary	Length of identification section.
28	1C	SMF52IDN	2	binary	Number of identification section.
Product Section:					
30	1E	SMF52SUB	2	binary	Subtype ID 1 = Record written for LOGON 2 = Record written for $S LNE*n*.
32	20	SMF52VER	2	EBCDIC	Record version number.
34	22	SMF52SYS	4	EBCDIC	Subsystem name, 'JES2' when JES2 creates the record, 'PPCC' when PSF creates the record.
Identification Section:					

Offsets		Name	Length	Format	Description
38	26	SMF52RMT	8	EBCDIC	Remote name as defined in JESPARMS (only for Subtype ID = 1).
46	2E	SMF52LIN	8	EBCDIC	Line name as defined in JESPARMS.
54	36	SMF52PSW	8	EBCDIC	Line password as defined in JESPARMS.

Record Type 53 (35) — JES2 LOGOFF/Stop Line (SNA only)

Record type 53 is written when:
- A $P LNE*n* command (to stop a line) is issued
- A $E LNE*n* command (to restart a line) is issued
- When a remote user signs off.

This record contains:
- A record indicator
- A remote name
- A line name
- A password
- A line adapter address
- The number of execute channel programs (EXCP)
- Negative acknowledgements to write text
- Data checks to read text
- Time outs to read text.

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF53LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See "Standard SMF Record Header" on page 13-1 for a detailed description.
2	2	SMF53SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF53FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See "Standard SMF Record Header" on page 13-1 for a detailed description.
5	5	SMF53RTY	1	binary	Record type 53 (X'35').
6	6	SMF53TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.
10	A	SMF53DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
14	E	SMF53SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF53PRD	2	binary	Offset to product section from start of record, including record descriptor word (RDW).
20	14	SMF53PRL	2	binary	Length of product section.

Offsets		Name	Length	Format	Description
22	16	SMF53PRN	2	binary	Number of product section.
24	18	SMF53IDO	2	binary	Offset to identification section from start of record, including record descriptor word (RDW).
26	1A	SMF53IDL	2	binary	Length of identification section.
28	1C	SMF53IDN	2	binary	Number of identification section.
Product Section:					
30	1E	SMF53SUB	2	binary	Subtype ID 1 = Record written for LOGOFF 2 = Record written for $P LNE*n*.
32	20	SMF53VER	2	EBCDIC	Record version number.
34	22	SMF53SYS	4	EBCDIC	Subsystem name, 'JES2'.
Identification Section:					
38	26	SMF53RMT	8	EBCDIC	Remote name as defined in JESPARMS.
46	2E	SMF53LIN	8	EBCDIC	Line name as defined in JESPARMS.
54	36	SMF53PSW	8	EBCDIC	Line password as defined in JESPARMS.
62	3E	SMF53CTR	4	binary	Number of VTAM requests processed.
66	42	SMF53CTR +4	4	binary	Number of exception responses.
70	46	SMF53CTR +8	4	binary	Number of LUSTATs received.
74	4A	SMF53CTR +12	4	binary	Number of bid rejects.
78	4E	SMF53CTR +16	4	binary	Number of temporary errors.
82	52	SMF53ADP	3	EBCDIC	Line identifier, 'SNA'.

Record Type 54 (36) — JES2 Integrity (SNA only)

Record type 54 is written when a SNA remote user attempts to sign on with an incorrect password. It contains a record indicator, remote name, line name, invalid password, and message text.

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF54LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See "Standard SMF Record Header" on page 13-1 for a detailed description.
2	2	SMF54SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF54FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See "Standard SMF Record Header" on page 13-1 for a detailed description.
5	5	SMF54RTY	1	binary	Record type 54 (X'36').

Offsets		Name	Length	Format	Description
6	6	SMF54TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.
10	A	SMF54DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
14	E	SMF54SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF54POF	2	binary	Offset to product section from start of record, including record descriptor word (RDW).
20	14	SMF54PRL	2	binary	Length of product section.
22	16	SMF54PRN	2	binary	Number of product section.
24	18	SMF54IDO	2	binary	Offset to identification section from start of record, including record descriptor word (RDW).
26	1A	SMF54IDL	2	binary	Length of identification section.
28	1C	SMF54IDN	2	binary	Number of identification section.
Product Section:					
30	1E	SMF54SUB	2	binary	Subtype ID 1 = Record written for LOGON.
32	20	SMF54VER	2	EBCDIC	Record version number.
34	22	SMF54SYS	4	EBCDIC	Subsystem name, 'JES2'.
Identification Section:					
38	26	SMF54RMT	8	EBCDIC	Remote name as defined in JESPARMS.
46	2E	SMF54RPW	8	EBCDIC	Remote password as defined in JESPARMS.
54	36	SMF54PSW	8	EBCDIC	Line password as defined in JESPARMS.

Record Type 55 (37) — JES2 Network SIGNON

Record type 55 is written at each node when a start networking command is processed. The initial SIGNON is recorded at the node to which the SIGNON was sent; the response SIGNON is recorded at the node that originated the initial SIGNON.

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF55LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See "Standard SMF Record Header" on page 13-1 for a detailed description.
2	2	SMF55SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF55FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See "Standard SMF Record Header" on page 13-1 for a detailed description.

Offsets		Name	Length	Format	Description
5	5	SMF55RTY	1	binary	Record type 55 (X'37').
6	6	SMF55TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.
10	A	SMF55DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
14	E	SMF55SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF55SBS	2	binary	Subsystem identification — X'0002' signifies JES2.
20	14	SMF55SUB	2	binary	Record subtype.
22	16	SMF55LRR	2	binary	Length of rest of record, not including this field.
24	18	SMF55NNM	8	EBCDIC	Node name.
32	20	SMF55MEM	1	binary	Member number.
33	21	SMF55FG1	1	binary	Sign-On Status Flag **Bit** **Meaning When Set** **0** Response sign-on (off = initial sign-on) **1-7** Reserved.
34	22	SMF55LPW	8	EBCDIC	Line password as defined in JESPARMS.
42	2A	SMF55NPW	8	EBCDIC	Node password as defined in JESPARMS.
50	32	SMF55LNM	8	EBCDIC	Line name as defined in JESPARMS.

Record Type 56 (38) — JES2 Network Integrity

Record type 56 is written whenever an attempt to SIGNON contains an incorrect line or node password.

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF56LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	SMF56SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF56FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See “Standard SMF Record Header” on page 13-1 for a detailed description.
5	5	SMF56RTY	1	binary	Record type 56 (X'38').
6	6	SMF56TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.
10	A	SMF56DTE	4	packed	The date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
14	E	SMF56SID	4	EBCDIC	System identification (from the SID parameter).

Offsets		Name	Length	Format	Description
18	12	SMF56SBS	2	binary	Subsystem identification — X'0002' signifies JES2.
20	14	SMF56SUB	2	binary	Record subtype.
22	16	SMF56LRR	2	binary	Length of rest of record, not including this field.
24	18	SMF56NNM	8	EBCDIC	Node name.
32	20	SMF56MEM	1	binary	Member number.
33	21	SMF56FG1	1	binary	Sign-On Status Flag **Bit** **Meaning When Set** **0** Response sign-on (off = initial sign-on) **1-7** Reserved.
34	22	SMF56LPW	8	EBCDIC	Line password.
42	2A	SMF56NPW	8	EBCDIC	Node password.
50	32	SMF56LNM	8	EBCDIC	Line name.

Record Type 57 (39) — JES2 Network SYSOUT Transmission

Record type 57 is written to record JES2 SYSOUT transmission information. This record contains original and current job identifiers, transmitter start and stop times, and a count of the records transmitted.

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF57LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	SMF57SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF57FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See “Standard SMF Record Header” on page 13-1 for a detailed description.
5	5	SMF57RTY	1	binary	Record type 57 (X'39').
6	6	SMF57TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.
10	A	SMF57DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
14	E	SMF57SID	4	EBCDIC	System identifier (from the SID parameter).
18	12	SMF57SBS	2	binary	Subsystem identifier — X'0002' signifies JES2.
20	14	SMF57SUB	2	binary	Record subtype.
22	16	SMF57LRR	2	binary	Length of rest of record, not including this field.
24	18	SMF57JID	8	EBCDIC	Original job identification.
32	20	SMF57CJD	8	EBCDIC	Current job identification.

Offsets		Name	Length	Format	Description
40	28	SMF57ONN	8	EBCDIC	Original node name.
48	30	SMF57ENN	8	EBCDIC	Processing node name.
56	38	SMF57NNN	8	EBCDIC	Next node name.
64	40	SMF57DVN	8	EBCDIC	SYSOUT transmitter device name.
72	48	SMF57TSS	4	binary	SYSOUT transmitter start time.
76	4C	SMF57DSS	4	packed	SYSOUT transmitter start date.
80	50	SMF57TPS	4	binary	SYSOUT transmitter stop time.
84	54	SMF57DPS	4	packed	SYSOUT transmitter stop date.
88	58	SMF57ACN	8	EBCDIC	Network account number.
96	60	SMF57TSI	4	EBCDIC	SYSOUT transmitter system identification.
100	64	SMF57CNT	4	binary	Count of logical TP records.
104	68	SMF57NTR	2	binary	Number of triplets in record. A triplet is a set of offset/length/number values that defines a section of the record.
106	6A		2		Reserved.
108	6C	SMF57OSW	4	binary	Offset to Enhanced SYSOUT Support (ESS) section.
112	70	SMF57LSW	4	binary	Length of Enhanced SYSOUT Support (ESS) section.
116	74	SMF57NSW	4	binary	Number of Enhanced SYSOUT Support (ESS) sections.

Enhanced SYSOUT Support (ESS) Section

This section contains the output descriptor (if any) for first offloaded data set in this record.

Offsets		Name	Length	Format	Description
0	0	SMF57LN5	2	binary	Length of ESS section (including this field).
2	2	SMF57SGT	4	binary	Segment identifier.
6	6	SMF57IND	1	binary	Section indicator **Bit** **Meaning When Set** **0** Error obtaining scheduler JCL facility (SJF) information. Scheduler work block text unit (SWBTU) data area is not present. **1-7** Reserved.
7	7		1		Reserved.
8	8	SMF57JDT	8	EBCDIC	JCL definition table (JDT) name in JCL definition vector table (JDTV).
16	10	SMF57TUL	2	binary	Text unit (SWBTU) data area length.
18	12	SMF57TU	VAR	binary	Text unit (SWBTU) data area. The data area can be processed using the SWBTUREQ macro.

Record Type 57 (39) — JES3 Networking Transmission

Record type 57 is written whenever JES3 completes a network transmission and the connection to the next node is BSC. When the connection is SNA, JES3 does not write the record; BDT writes record type 59 instead. Record type 57 contains original and current job identifiers, accounting information, transmission path, and destination.

Macro to Symbolically Address JES3 Record Type 57: The SMF record mapping macro for JES3 record type 57 is **IATYNSM**.

Record Environment

The following conditions exist for the generation of this record:

Macro SMFEWTM, BRANCH=NO (record exit: IEFU83)

Storage Residency 31-bit

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMFNJLEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	SMFNJDES	2	binary	Segment descriptor (see record length field).
4	4	SMFNJFLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See “Standard SMF Record Header” on page 13-1 for a detailed description.
5	5	SMFNJRTY	1	binary	Record type 57 (X'39').
6	6	SMFNJTME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.
10	A	SMFNJDTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
14	E	SMFSYSID	4	EBCDIC	System identifier (from the SID parameter).
18	12	SMFSUBID	2	binary	Subsystem identifier — X'0005' signifies JES3.
20	14		2		Reserved.
22	16	SMFNJLRR	2	binary	Length of the record following this field.
24	18	SMFNJETM	4	binary	Transmission start time, in hundredths of a second.
28	1C	SMFNJEDT	4	packed	Transmission start date, in packed decimal form.
32	20	SMFNJIND	2	EBCDIC	Job type indicator JB — indicates data is a job stream OP — indicates data is a SYSOUT data stream.
34	22	SMFNJNAM	8	EBCDIC	Job name, or transaction name (for APPC output).
42	2A	SMFNJNUM	4	EBCDIC	Current JES3-assigned job number if less than 10,000. If the job number is equal to or greater than 10,000, this field contains character zeroes, and the job number appears in SMFNJJID.
46	2E	SMFNJONM	2	binary	Original job number (from submitting node), or transaction ID (for APPC output).
48	30		2		Reserved.
50	32	SMFNJPGM	20	EBCDIC	Programmer name.
70	46	SMFNJUSR	8	EBCDIC	Origin or notify user identifier.
78	4E	SMFNJACT	8	EBCDIC	Networking account number.
86	56	SMFNJDPT	8	EBCDIC	Department number.
94	5E	SMFNJBLD	8	EBCDIC	Building number.

Offsets		Name	Length	Format	Description
102	66	SMFNJLOC	8	EBCDIC	Location number.
110	6E	SMFNJORG	8	EBCDIC	Job origin.
118	76	SMFNJRMT	8	EBCDIC	Secondary job origin.
126	7E	SMFNJXEQ	8	EBCDIC	Processing node name.
134	86	SMFNJEXU	8	EBCDIC	Processing user identifier, or user associated with the transaction (for APPC output).
142	8E	SMFNJDST	8	EBCDIC	Destination node name.
150	96	SMFNJPTH	8	EBCDIC	Transmission path node name.
158	9E	SMFNJRCT	4	binary	Record count.
162	A2	SMFNJCNT	4	binary	Compressed byte count.
166	A6	SMFNJTRN	4	binary	Transmission buffer count.
170	AA	SMFNJJID	8	EBCDIC	JES3-assigned job number in JOB*xxxxx* format.

Record Type 58 (3A) — JES2 Network SIGNOFF

Record type 58 is written at each node when a networking session is terminated. The record contains the node name, member number, and line name.

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF58LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	SMF58SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF58FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See “Standard SMF Record Header” on page 13-1 for a detailed description.
5	5	SMF58RTY	1	binary	Record type 58 (X'3A').
6	6	SMF58TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.
10	A	SMF58DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
14	E	SMF58SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF58SBS	2	binary	Subsystem identification — X'0002' signifies JES2.
20	14	SMF58SUB	2	binary	Record subtype.
22	16	SMF58LRR	2	binary	Length of rest of record, not including this field.
24	18	SMF58NNM	8	EBCDIC	Node name.
32	20	SMF58MEM	1	binary	Member number.
33	21	SMF58RVI	1		Reserved.

Offsets		Name	Length	Format	Description
34	22	SMF58LNM	8	EBCDIC	Line name.

Record Type 59 (3B) — MVS/BDT File-to-File Transmission

Record type 59 is written when MVS/Bulk Data Transfer (MVS/BDT) completes a file-to-file transmission, and the connection to the next node is SNA. When the connection is BSC, BDT does not write the record; JES3 writes record type 57 instead. MVS/BDT writes record type 59 from the global node where the transaction is queued; it produces a record whether the transmission successfully completes.

The record contains sections for:
- MVS/BDT product information
- Transaction identification
- File-to-file (FTF) information (transaction type section)
- Network information (transaction type section)
- Transaction data information (optional)
- Transaction accounting information (optional)
- Transmission information.

There are two 40-byte fields for user information at SMF59US1 (transaction data section) and SMF59US2 (transmission data section).

Macro to Symbolically Address JES3 Record Type 59: IFASMFR uses BDTDSMF, and MVS/BDT macro instructions to generate the mapping. If you want the record type 59 mapping, make sure that both IFASMFR and BDTDSMF reside on the same macro library. BDTDSMF is written in assembler language and is supplied on SYS1.AMODGEN.

MVS/BDT invokes the optional installation exit BDTUX24 before writing the record.

Record Environment

The following conditions exist for the generation of this record:

Macro	SMFEWTM, BRANCH=NO (record exit: IEFU84)
Mode	Task
Storage Residency	24-bit

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF59LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	SMF59SEG	2	binary	Segment descriptor (see record length field).

Offsets		Name	Length	Format	Description
4	4	SMF59FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See “Standard SMF Record Header” on page 13-1 for a detailed description.
5	5	SMF59RTY	1	binary	Record type 59 (X'3B').
6	6	SMF59TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.
10	A	SMF59DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
14	E	SMF59SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF59SSI	4	EBCDIC	Subsystem identification (‘BDT’).
22	16	SMF59VER	2	EBCDIC	Version number.
24	18	SMF59OPD	4	binary	Offset to MVS/BDT product section.
28	1C	SMF59LPD	2	binary	Length of MVS/BDT product section.
30	1E	SMF59NPD	2	binary	Number of MVS/BDT product sections.
32	20	SMF59OTI	4	binary	Offset to transaction identifier section.
36	24	SMF59LTI	2	binary	Length of transaction identifier section.
38	26	SMF59NTI	2	binary	Number of transaction identifier sections.
40	28	SMF59OTT	4	binary	Offset to transaction type section.
44	2C	SMF59LTT	2	binary	Length of transaction type section.
46	2E	SMF59NTT	2	binary	Number of transaction type sections.
48	30	SMF59OTD	4	binary	Offset to transaction data section.
52	34	SMF59LTD	2	binary	Length of transaction data section.
54	36	SMF59NTD	2	binary	Number of transaction data sections.
56	38	SMF59OTS	4	binary	Offset to transmission section.
60	3C	SMF59LTS	2	binary	Length of transmission section.
62	3E	SMF59NTS	2	binary	Number of transmission sections.
64	40	SMF59OTA	4	binary	Offset to transaction accounting section (an optional section).
68	44	SMF59LTA	2	binary	Length of transaction accounting section (if present).
70	46	SMF59NTA	2	binary	Number of transaction accounting sections (if any).

MVS/BDT Product Section

Offsets		Name	Length	Format	Description
0	0	SMF59RCD	2	EBCDIC	MVS/BDT version number.
2	2	SMF59BDT	8	EBCDIC	Product name ‘MVS-BDT’.
10	A	SMF59SSN	8	EBCDIC	MVS/BDT node name.
18	12	SMF59TID	2	EBCDIC	Transaction type identifier — “FF” for FTF, “NJ” for NJE.

Transaction Identifier Section

Offsets		Name	Length	Format	Description
0	0	SMF59TNU	4	EBCDIC	MVS/BDT job number.
4	4	SMF59TI1	8		Reserved.

Offsets		Name	Length	Format	Description
12	C	SMF59T12	8		Reserved.
20	14	SMF59TQS	8	EBCDIC	MVS/BDT transaction queuing node.
28	1C	SMF59T13	8		Reserved.
36	24	SMF59TSP	8	EBCDIC	Transaction source processor name.
44	2C	SMF59TSS	8	EBCDIC	MVS/BDT transaction source node.
52	34	SMF59TUT	2	EBCDIC	Transaction source user ID type: J3 JES3 (for NJE) T TSO/E user J JES console B Batch job M MCS console.
54	36	SMF59T15	2		Reserved.
56	38	SMF59TSU	8	EBCDIC	Transaction source user ID: NJE Blank TSO/E Userid JES Console DD name Batch Job name MCS Console identified.

Transaction Type Section for FTF

Offsets		Name	Length	Format	Description
0	0	SMF59ONN	8	EBCDIC	MVS/BDT origin node name.
8	8	SMF59OFN	44	EBCDIC	Origin file name if specified in transaction.
52	34	SMF59OMN	8	EBCDIC	PDS member name of origin file if specified in SEQ transaction.
60	3C	SMF59OVI	6	EBCDIC	First volume serial number for origin file if specified in transaction.
66	42	SMF59OFG	1	EBCDIC	Origin file flag: ‘D’ — DUMMY specified.
67	43	SMF59TTI	3		Reserved.
70	46	SMF59DNN	8	EBCDIC	MVS/BDT destination node name.
78	48	SMF59DFN	44	EBCDIC	Destination file name if specified in transaction.
122	7A	SMF59DMN	8	EBCDIC	PDS member name of destination file is specified in SEQ transaction.
130	82	SMF59DVI	6	EBCDIC	First volume serial number for destination file is specified in transaction.
136	88	SMF59DFG	1	EBCDIC	Destination file flag: ‘D’ — DUMMY specified, ‘I’ — INTRDR specified.
137	89	SMF59TT2	3		Reserved.

Transaction Type Section for NJE

Offsets		Name	Length	Format	Description
0	0	SMF59NJT	2	EBCDIC	Job type JB data is a job stream OP data is a complete SYSOUT.
2	2	SMF59NUM	2	binary	Original job number (NJHGJID).
4	4	SMF59NR1	2	binary	Reserved.
6	6	SMF59NAN	8	EBCDIC	Network account number.
14	E	SMF59NAM	8	EBCDIC	Original job name (NJHGJNAM).
22	16	SMF59JID	8	EBCDIC	JES3 job ID.
30	1E	SMF59NUI	8	EBCDIC	Notify user ID (NJHGUSID).

Offsets		Name	Length	Format	Description
38	26	SMF59NDT	8	binary	Job entry date/time stamp on origin node (NJHGETS).
46	2E	SMF59XQN	8	EBCDIC	Processing node name (NJHGEXQN).
54	36	SMF59XQU	8	EBCDIC	Processing user ID (NJHGUSID).
62	3E	SMF59NPN	20	EBCDIC	Programmer’s name (NJHGPRGN).
82	52	SMF59NPR	8	EBCDIC	Programmer’s room number (NJHGDEPT).
90	5A	SMF59NP#	8	EBCDIC	Programmer’s department number (NJHGDEPT).
98	62	SMF59NPB	8	EBCDIC	Programmer’s building number (NJHFBLDG).
106	6A	SMF59NR2	8		Reserved.
114	72	SMF59NR3	8		Reserved.
122	7A	SMF59NR4	8		Reserved.
130	82	SMF59NR5	10		Reserved.

Transaction Data Section

Offsets		Name	Length	Format	Description
0	0	SMF59TTQ	4	binary	Time since midnight, in hundredths of a second, that the transaction was queued (GMT).
4	4	SMF59DTQ	4	packed	Date when the transaction was queued, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
8	8	SMF59TTC	4	binary	Time since midnight, in hundredths of a second, that the transaction was completed (GMT).
12	C	SMF59DTC	4	packed	Date when the transaction was completed, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
16	10	SMF59BJN	8	EBCDIC	MVS/BDT job name.
24	18	SMF59PNM	20	EBCDIC	Programmer name.
44	2C	SMF59TPR	2	EBCDIC	Transaction priority.
46	2E	SMF59TCM	2	EBCDIC	Transaction completion code ‘00’ normal ‘04’ operator cancelled ‘08’ abnormal.
48	30	SMF59BTC	8	EBCDIC	MVS/BDT transaction code X'51' — NJE transaction Q — self-defining transaction GMJD member name.
56	38	SMF59TD1	4		Reserved.
60	3C	SMF59BCT	8	binary	Number of bytes transferred.
68	44	SMF59US1	40	EBCDIC	User area (initialized with blanks).

Transmission Section

Offsets		Name	Length	Format	Description
0	0	SMF59X01	8		Reserved.
8	8	SMF59X02	8		Reserved.
16	10	SMF59SNN	8	EBCDIC	MVS/BDT sender node.
24	18	SMF59X03	8		Reserved.
32	20	SMF59X04	8		Reserved.
40	28	SMF59X05	8		Reserved.
48	30	SMF59RCN	8	EBCDIC	MVS/BDT receiver node.
56	38	SMF59X06	8		Reserved.

Offsets		Name	Length	Format	Description
64	40	SMF59XST	4	binary	Time since midnight, in hundredths of a second, that the transmission started (GMT).
68	44	SMF59XSD	4	packed	Date when the transmission started, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
72	48	SMF59XPT	4	binary	Time since midnight, in hundredths of a second, that the transmission stopped (GMT).
76	4C	SMF59XPD	4	packed	Date when the transmission stopped, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
80	50	SMF59X08	8		Reserved.
88	58	SMF59X09	4		Reserved.
92	5C	SMF59XOC	5	EBCDIC	Transmission origin completion code.
97	61	SMF59XDC	5	EBCDIC	Transmission destination completion code.
102	66	SMF59X10	2		Reserved.
104	68	SMF59US2	40	EBCDIC	User area (initialized with blanks).

Transaction Accounting Section

This section is optional.

Offsets		Name	Length	Format	Description
0	0	SMF59ACT	variable	EBCDIC	User accounting data from ACCT parameter.

Record Type 60 (3C) — VSAM Volume Data Set Updated

Note

Field SMF60CRC is **NOT** part of the programming interface.

Record type 60 is written when a VSAM Volume Record (VVR) or a Non-VSAM Volume Record (NVR) is inserted, updated, or deleted from a VSAM Volume Data Set (VVDS); for example, when a VSAM cluster is defined, closed, or deleted. One type 60 record is written for each VVR or NVR written or deleted.

Record type 60 identifies the VVDS in which the VVR or NVR is written or deleted and gives the new, updated, or deleted VVR or NVR. It identifies the job by job log and user identifiers.

Macro to Symbolically Address Record Type 60: The SMF record mapping macro for record types 36, 60, 61, 65, and 66 is IFASMFI6. The syntax is as follows:

IFASMFI6 *nn*

nn identifies the type of the record you want to map. The mapping macro resides in SYS1.MACLIB.

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF60LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	SMF60SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF60SYS	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See “Standard SMF Record Header” on page 13-1 for a detailed description.
5	5	SMF60RTY	1	binary	Record type 60 (X'3C').
6	6	SMF60TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.
10	A	SMF60DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
14	E	SMF60CPU	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF60SBS	4		Reserved.
22	16	SMF60SUB	2	EBCDIC	Indicates that the VVR is updated, deleted, or inserted in the VVDS: **Contents** **Meaning** **UP** Updated **DE** Deleted **IN** Inserted
24	18	SMF60POF	4	binary	Offset of product section from start of record, including the record descriptor word (RDW).
28	1C	SMF60PLN	2	binary	Length of product section.
30	1E	SMF60PNO	2	binary	Number of product sections.
32	20	SMF60DOF	4	binary	Offset of data section from start of record, including the record descriptor word (RDW).
36	24	SMF60DLN	2	binary	Length of data section.
38	26	SMF60DNO	2	binary	Number of data sections.
Product and data section:					
40	28	SMF60VER	2	EBCDIC	Version of the type 60 records.
42	2A	SMF60PNM	8	EBCDIC	Catalog management product identifier.
50	32	SMF60JNM	8	EBCDIC	Job name. The job log identification consists of the job name, time, and date that the reader recognized the JOB card (for this job).
58	3A	SMF60RST	4	binary	Time since midnight, in hundredths of a second, that the reader recognized the JOB card (for this job).
62	3E	SMF60RDT	4	packed	Date when the reader recognized the JOB card for this job, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
66	42	SMF60UID	8	EBCDIC	User-defined identification field (taken from common exit parameter area, not from USER=parameter on job statement).
74	4A	SMF60FNC	1		Reserved.
75	4B	SMF60CNM	44	EBCDIC	Name of VSAM volume data set (VVDS) in which entry is made.

Offsets		Name	Length	Format	Description
119	77	SMF60TYP	1	EBCDIC	Entry type identifier. **Bit** **Meaning When Set** **C'A'** NonVSAM data set **C'B'** Generation data group (GDG) base **C'C'** Cluster **C'D'** Data set **C'E'** VSAM extension record **C'F'** Free space **C'G'** Alternate index **C'H'** Active generation data set (GDS) entry in GDG base **C'I'** Index **C'J'** CDG extension record **C'K'** VSAM volume record (VVR) **C'L'** Library control system library record **C'M'** Master catalog **C'N'** NonVSAM record header **C'O'** Object Access Method (OAM) nonVSAM record **C'P'** Page space **C'Q'** VVR header (secondary) **C'R'** Path **C'T'** True name record **C'U'** User catalog **C'V'** Volume **C'W'** Library control system volume **C'X'** Alias record **C'Y'** Upgrade **C'Z'** VVR header (primary) **X'00'** Normal nonVsam record **X'01'** JES3 record.
120	78	SMF60ENM	44	EBCDIC	Entry name.
164	A4	SMF60NNM	44		Reserved.
208	D0	SMF60CRC	*variable*	binary	VVR or NVR (the length of the VVR or NVR is contained in the first two bytes of this field).

Record Type 61 (3D) — Integrated Catalog Facility Define Activity

Record type 61 is written during any processing that results in a DEFINE request to Catalog Management Services, such as:

IDCAMS DEFINE

IEHPROGM CATLG

One type 61 record is written for each record inserted or updated in a catalog.

Record type 61 identifies the entry being defined and the catalog in which the catalog record is written and gives the new or updated catalog record. It identifies the job by job log and user identifiers.

Macro to Symbolically Address Record Type 61: The SMF record mapping macro for record types 36, 60, 61, 65 and 66 is IFASMFI6. The syntax is as follows:

IFASMFI6 *nn*

nn identifies the type of the record you want to map. The mapping macro resides in SYS1.MACLIB.

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF61LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See "Standard SMF Record Header" on page 13-1 for a detailed description.
2	2	SMF61SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF61SYS	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See "Standard SMF Record Header" on page 13-1 for a detailed description.
5	5	SMF61RTY	1	binary	Record type 61 (X'3D').
6	6	SMF61TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.
10	A	SMF61DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
14	E	SMF61CPU	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF61SBS	4		Reserved.
22	16	SMF61SUB	2	EBCDIC	The action taken on the catalog entry; valid values are: **IN** (INSERT) **DE** (DELETE) **UP** (UPDATE)
24	18	SMF61POF	4	binary	Offset of product section from start of record, including record descriptor word (RDW).
28	1C	SMF61PLN	2	binary	Length of product section.
30	1E	SMF61PNO	2	binary	Number of product sections.
32	20	SMF61DOF	4	binary	Offset of data section from start of record, including record descriptor word (RDW).
36	24	SMF61DLN	2	binary	Length of data section.
38	26	SMF61DNO	2	binary	Number of data sections.
Product and Data Section:					
40	28	SMF61VER	2	EBCDIC	Version of the type 61 records.
42	2A	SMF61PNM	8	EBCDIC	Catalog management product identifier.
50	32	SMF61JNM	8	EBCDIC	Job name. The job log identification consists of the job name, time, and date that the reader recognized for the JOB card (for this job). If a system task caused the record to be written, the job name and user identification fields contain blanks and the time and date fields contain zeros.
58	3A	SMF61RST	4	binary	Time since midnight, in hundredths of a second, the reader recognized the JOB card (for this job).
62	3E	SMF61RDT	4	packed	Date reader recognized the JOB card for this job, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
66	42	SMF61UID	8	EBCDIC	User-defined identification field (taken from common exit parameter area, not from USER=parameter on job statement).

Offsets		Name	Length	Format	Description
74	4A	SMF61FNC	1		Reserved.
75	4B	SMF61CNM	44	EBCDIC	Name of catalog in which entry is defined.
119	77	SMF61TYP	1	EBCDIC	Entry type identifier. For a description of this field, see the SMF60TYP field on page 13-254.
120	78	SMF61ENM	44	EBCDIC	Entry name.
164	A4	SMF61NNM	44		Reserved.
208	D0	SMF61CRC	*variable*	binary	New catalog record for defined entry (the length of this record is contained in the first two bytes of this field).

Record Type 62 (3E) — VSAM Component or Cluster Opened

Record type 62 is written at the successful or unsuccessful opening of a VSAM component or cluster.

Record type 62 identifies the VSAM component or cluster and indicates whether it was successfully opened. It names the VSAM catalog in which the object is defined and the volumes on which the catalog and object are stored. It identifies the job that issued the OPEN macro by job log identification and user identification. The job name and the time and date that the reader recognized the JOB card for this job constitute the job log identification.

Note: This record is not generated when a system task issues the OPEN macro.

Record Environment

The following conditions exist for the generation of each of the subtypes of this record:

Macro SMFWTM(1) (record exit: IEFU83)

Storage Residency 24-bit

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF62LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	SMF62SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF62FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See “Standard SMF Record Header” on page 13-1 for a detailed description.
5	5	SMF62RTY	1	binary	Record type 62 (X'3E').
6	6	SMF62TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.

Offsets		Name	Length	Format	Description
10	A	SMF62DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
14	E	SMF62SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF62JBN	8	EBCDIC	Job name. The job name, time, and date that the reader recognized the JOB card (for this job) constitute the job log identification, or transaction name (for APPC output).
26	1A	SMF62RST	4	binary	Time since midnight, in hundredths of a second, that the reader recognized the JOB card (for this job).
30	1E	SMF62RSD	4	packed	Date when the reader recognized the JOB card for this job, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
34	22	SMF62UIF	8	EBCDIC	User-defined identification field (taken from common exit parameter area, not from USER=parameter on job statement).
42	2A	SMF62IND	4	binary	Open status indicator. **Bit** **Meaning When Set** **0** Component or cluster was successfully opened **1** Security violation, that is, incorrect password **2** Record is a catalog or catalog recovery area (CRA) record **3** Record is for a VSAM volume data set (VVDS) or ICF catalog being opened or closed as a data set. If this bit is set, the catalog name field and the cluster name field may be set to zeroes. **4-31** Reserved.
46	2E	SMF62CNM	44	EBCDIC	Name of the catalog in which the component or cluster is defined.
90	5A	SMF62CVS	6	EBCDIC	Volume serial number of the volume containing the catalog.
96	60	SMF62DNM	44	EBCDIC	Name of the component or cluster being opened.
140	8C	SMF62VCT	2	binary	Number of online volumes containing the component or cluster. (This field is also the number of ten-byte fields that list the volumes.)
For each online volume, there is a ten-byte entry with the following format:					
0	0	SMF62VSR	6	EBCDIC	Volume serial number of the volume containing the component or cluster.
6	6	SMF62DTY	4	binary	Unit type of the volume containing the component or cluster.
After the volume entries, three fields define SMS class information:					
0	0	SMF62MGT	8	binary	SMS management class.
8	8	SMF62STR	8	binary	SMS storage class.
16	10	SMF62DAT	8	binary	SMS data class.

Statistics Section

Offsets		Name	Length	Format	Description
0	0	SMF62TIM	4	binary	Time data set was opened (in hundredths of a second since midnight).
4	4	SMF62DT	4	packed	Date data set was opened, in the form of 0cyydddF (where c is 0 for 19xx and 1 for 20xx, yy is the current year (0-99), ddd is the current day (1-356), and F is the sign).

Offsets		Name	Length	Format	Description
8	8	SMF62MC1	1	binary	First ACB MACRF flag byte: **Bit** **Meaning When Set** **0** Record is identified by a key **1** Record is identified by a relative byte address (RBA) **2** Control-Interval processing **3** Sequential processing **4** Direct processing **5** Input processing **6** Output processing **7** User-supplied buffer space
9	9	SMF62MC2	1	binary	Second ACB MACRF flag byte: **Bit** **Meaning When Set** **0** Defined only when output and JES format. The system is to ensure that the logical record length will be the same when the data is read. This bit is not defined for input. **1** Control character type **2** Eligible for backup-while-open **3** Skip sequential processing **4** VTAM LOGON indicator **5** Set data set to empty state **6** Shared control blocks **7** Alternate index of the path
10	A	SMF62MC3	1	binary	Third ACB MACRF flag byte: **Bit** **Meaning When Set** **0** No LSR exclusive control **1** Local shared resources **2** Global shared resources **3** Improved control-interval processing **4** Deferred write **5** Sequential insert strategy **6** Control blocks are fixed in real storage **7** VSAM 31-bit addressing mode I/O buffers
11	B	SMF62MC4	1	binary	Fourth ACB MACRF flag byte: **Bit** **Meaning When Set** **0** RLS Processing **1** SNP Option **2-7** Reserved.

Record Type 63 (3F) — VSAM Catalog Entry Defined

Note

Field SMF63NCR is **NOT** part of the programming interface.

Note that since VSAM catalogs are no longer supported (and no longer exist) record type 63 is no longer created.

Record type 63 is written when an entry (a component, cluster, catalog, alternate index, path, or non-VSAM data set) in a VSAM catalog is defined by the DEFINE access method services command and when that definition is altered. For example, when an entry in a VSAM catalog is altered with new space allocation information (that is, when the VSAM End-Of-Volume (EOV) routine extends the entire object) or, if the entry is changed by the Alter Access Method Services command. One record type 63 is written for each newly created or altered entry. This record is **not** written when a VSAM catalog is renamed. In that case record type 68 is written.

The record's length includes the length of the catalog records required to describe the entry. The total length can be from 1000 to 4000 bytes or more, depending upon the sizes of the new and old catalog records (offsets 44 and 46 respectively). If you write this record to the SMF data set, you must include the sizes of these catalog records when estimating the additional storage required for the SMF buffer and the SMF data sets.

Record type 63 identifies the catalog in which the object is defined, gives the catalog record for the newly defined object, and, for an alteration, gives the parts of the old catalog record before they were altered. It identifies the job by job log identification and user identification. The job name and the time and date that the reader recognized the JOB card for this job constitute the job log identification. If a system task caused the record to be written, the job-name and the user-identification fields contain blanks and the time and date fields contain zeros.

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF63LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See "Standard SMF Record Header" on page 13-1 for a detailed description.
2	2	SMF63SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF63FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See "Standard SMF Record Header" on page 13-1 for a detailed description.
5	5	SMF63RTY	1	binary	Record type 63 (X'3F').
6	6	SMF63TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.
10	A	SMF63DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
14	E	SMF63SID	2	EBCDIC	System identification (from the SID parameter).
16	10	SMF63SMI	2	EBCDIC	System model identifier.
18	12	SMF63JBN	8	EBCDIC	Job name. If a system task caused the record to be written, the job name and user identification fields contain blanks and the time and date fields contain zeros. The job name, time, and date that the reader recognized the JOB card (for this job) constitute the job log identification, or transaction name (for APPC output).
26	1A	SMF63RST	4	binary	Time since midnight, in hundredths of a second, that the reader recognized the JOB card (for this job).
30	1E	SMF63RSD	4	packed	Date when the reader recognized the JOB card (for this job), in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.

Offsets		Name	Length	Format	Description
34	22	SMF63UIF	8	EBCDIC	User-defined identification field (taken from common exit parameter area, not from USER=parameter on job statement).
42	2A	SMF63FDT	1	binary	Record creator/entry type indicator **Bit** **Meaning When Set** **0** New definition **1** Altered definition **2-5** Reserved **6** Path defined or altered **7** Alternate index defined or altered.
43	2B	SMF63TYP	1	binary	Entry type indicator **Bit** **Meaning When Set** **0** VSAM cluster **1** VSAM data component **2** VSAM index component **3** VSAM catalog **4** Non-VSAM data set **5** Generation data group **6** Alias **7** Reserved.
44	2C	SMF63NSZ	2	binary	Size of new catalog record. Include the contents of this field when estimating the additional storage required by SMF. A VSAM catalog record is contained in one or more physical catalog records. This field with offset 46 are the sums of the sizes of the physical catalog records that constitute the total logical VSAM catalog record.
46	2E	SMF63OSZ	2	binary	Size of old catalog record. This field contains the size of the old records before they were altered. Include the contents of this field when estimating the additional storage required by SMF.
48	30	SMF63CNM	44	EBCDIC	Name of catalog in which the entry is defined.
92	5C	SMF63ENM	44	EBCDIC	Entry name.
136	88	SMF63NCR	*variable*	binary	New catalog record followed by old catalog record. For the new catalog record, the complete new entry is recorded. For the old catalog record, this field contains only those old records that were altered; it shows what these records were before they were altered.

Record Type 64 (40) — VSAM Component or Cluster Status

Record type 64 is written when:

1. A VSAM component or cluster is closed,
2. VSAM must switch to another volume to continue to read or write,
3. There is no more space available for VSAM to continue processing.

If a cluster is closed, one record is written for each component in the cluster.

Record type 64 indicates why the record was created (a component was closed, another volume was switched to, or no additional space was available). It describes the device and volume(s) on which the object is stored, and gives the extents of the object on the volume(s). It gives statistics about various processing events that have occurred since the object was defined, such as the number of records in the data component, the number of records that were inserted, and the number of control intervals that were split.

This record identifies the job by job log identification and user identification. The job name, time, and date that the reader recognized the JOB card (for this job) constitute the job log identification.

Record Environment

The following conditions exist for the generation of each of the subtypes of this record:

Macro SMFWTM(1) (record exit: IEFU83)

Storage Residency 24-bit

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF64LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	SMF64SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF64FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See “Standard SMF Record Header” on page 13-1 for a detailed description.
5	5	SMF64RTY	1	binary	Record type 64 (X'40').
6	6	SMF64TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.
10	A	SMF64DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
14	E	SMF64SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF64JBN	8	EBCDIC	Job name. The job name, time, and date that the reader recognized the JOB card (for this job) constitute the job log identification, or transaction name (for APPC output). consists of the job name, time, and date that the reader recognized the JOB card (for this job).
26	1A	SMF64RST	4	binary	Time since midnight, in hundredths of a second, that the reader recognized the JOB card (for this job).
30	1E	SMF64RSD	4	packed	Date when the reader recognized the JOB card (for this job), in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
34	22	SMF64UIF	8	EBCDIC	User-defined identification field (taken from common exit parameter area, not from USER=parameter on job statement).

Offsets		Name	Length	Format	Description
42	2A	SMF64RIN	1	binary	Situation indicator **Bit** **Meaning When Set** **0** Component closed **1** Volume switched (see note 1, below) **2** No space available **3** Record is a catalog or CRA record **4** Component closed, TYPE=T **5** Record written during ABEND processing **6** Record is for a VVDS or ICF catalog being opened or closed as a data set. If this bit is set, the catalog name field and the cluster name field may be set to zeroes. **7** Reserved.
43	2B	SMF64DTY	1	binary	Indicator of component being processed. **Bit** **Meaning When Set** **0** Data set **1** Index **2** Extended format **3** Compressed **4** RLS is in effect **5** RLS is in effect, measurement management facility is disabled **6** Extended addressable data set **7** Reserved.
44	2C	SMF64CNM	44	EBCDIC	Name of the catalog in which the component is defined.
88	58	SMF64DNM	44	EBCDIC	Name of the component or cluster being processed. For a CRA record, this field does not contain meaningful information. For a catalog record, this field contains the catalog or cluster name.
132	84	SMF64NTR	2	binary	Number of tracks that were requested but could not be allocated.
134	86	SMF64CHR	4	EBCDIC	Highest used relative byte address (RBA) of the component. See also SMF64CHC following.
134	86	SMF64CHC	4	EBCDIC	Highest used control interval (CI) of the component. CI is used in place of RBA for an extended format data set capable of extended addressability.
138	8A	SMF64ESL	2	binary	Length of extent entry portion of record, excluding this field. (See note 1, below.)

Note:

1. If SMF64RIN=X'01', there will be **no** extended information written for this record (SMF64ESL). For more information, please review APAR OW56162 (for hdz11f0 and hdz11g0 users). For diagnostic purposes, VSAM EOV writes an SMF64 record when there is a record management catalog update request.

Extent Information Section

| This section contains the last extent with the high allocated CI for:

| • a non-striped component

| • each stripe of a striped component

Offsets		Name	Length	Format	Description
0	0	SMF64FCC	4	binary	Beginning cylinder and track, in the form *CCHH* where *CC* is the cylinder number and *HH* is the track number.
4	4	SMF64TCC	4	binary	Ending cylinder and track, in the form *CCHH* where *CC* is the cylinder number and *HH* is the track number.

Offsets		Name	Length	Format	Description
8	8	SMF64VSN	6	EBCDIC	Volume serial number of the volume containing the extent.
14	E	SMF64CUU	2	binary	Device number.
16	10	SMF64IND	2	EBCDIC	Spindle identification.
18	12	SMF64UTY	4	binary	Unit type.
22	16	SMF64RV1	4		Reserved.

The statistics section contains:
- Accumulative statistics from creation until the current OPEN
- Change in statistics from OPEN to time of EOV and CLOSE
- Data set characteristics
- Hiperbatch I/O statistics
- Compressed data statistics
- CF Cache structure statistics

The statistics section includes information on the number of execute channel programs (EXCP). For more information about how EXCP count is determined see Chapter 10, “EXCP Count.”

Statistics Section at OPEN Time

Offsets		Name	Length	Format	Description
0	0	SMF64SLN	4	binary	Length of the statistics section, including this field.
4	4	SMF64NIL	4	binary	Number of levels in the index.
8	8	SMF64NEX	4	binary	Number of extents.
12	C	SMF64NLR	4	binary	Number of logical records in the component.
16	10	SMF64NDE	4	binary	Number of records that were deleted from the component.
20	14	SMF64NIN	4	binary	Number of records that were inserted into the component.
24	18	SMF64NUP	4	binary	Number of records that were updated in the component.
28	1C	SMF64NRE	4	binary	Number of records that were retrieved from the component.
32	20	SMF64NFS	4	binary	Number of unused control intervals in the component. This value is multiplied by the control interval size when the component is not an extended addressable data set.
36	24	SMF64NCS	4	binary	Number of control intervals that were split in the component.
40	28	SMF64NAS	4	binary	Number of control areas that were split in the component.
44	2C	SMF64NEP	4	binary	Number of execute channel programs (EXCPs). When MACRF=RLS, this field contains the number of buffer manager requests.
Change in Statistics from OPEN to time of EOV and CLOSE:					
48	30	SMF64DIL	4	binary	Change in number of levels in the index.
52	34	SMF64DEX	4	binary	Change in number of extents.
56	38	SMF64DLR	4	binary	Change in number of logical records in the component. This field may be negative.
60	3C	SMF64DDE	4	binary	Change in number of records that were deleted from the component. When MACRF=RLS, this field contains the total number of deletes performed by this access-method control block.
64	40	SMF64DIN	4	binary	Change in number of records that were inserted into the component. When MACRF=RLS, this field contains the total number of inserts performed by this access-method control block.

Offsets		Name	Length	Format	Description
68	44	SMF64DUP	4	binary	Change in number of records that were updated in the component. When MACRF=RLS, this field contains the total number of updates performed by this access-method control block.
72	48	SMF64DRE	4	binary	Change in number of records that were retrieved from the component. When MACRF=RLS, this field contains the total number of retrieves performed by this access-method control block.
76	4C	SMF64DFS	4	binary	Change in number of unused control intervals in the component. This value is multiplied by the control interval size when the component is not an extended addressable data set. This value may be negative.
80	50	SMF64DCS	4	binary	Change in number of control intervals that were split in the component. When MACRF=RLS, this field contains the total number of CI splits performed for this access-method control block.
84	54	SMF64DAS	4	binary	Change in number of control areas that were split in the component. When MACRF=RLS, this field contains the total number of CA splits performed for this access-method control block.
88	58	SMF64DEP	4	binary	Change in number of execute channel programs (EXCPs) for the data set. When MACRF=RLS, this field contains the total number of buffer manager calls performed for this access-method control block.
Data Set Characteristics Section:					
92	5C	SMF64DBS	4	binary	Physical block size.
96	60	SMF64DCI	4	binary	Control interval size.
100	64	SMF64DLS	4	binary	Maximum logical record size.
104	68	SMF64DKL	2	binary	Key length.
106	6A	SMF64DDN	8	EBCDIC	DD name. When the record is written for a VSAM catalog or catalog recovery area, this field may contain zeros. When the record is written for a volume switch or no space available condition, and the volume is associated with a concatenated TIOT entry, this field contains blanks.
114	72	SMF64STR	1	binary	The number of strings requested by the user. This field may or may not contain the same number as SMF64PLH. It all depends on the data set activity (VSAM will dynamically add strings when necessary).
115	73	SMF64BNO	1	binary	Actual number of buffers requested by the user. VSAM may override the number of data buffers requested by the user based on such things as the amount of buffer space specified at define time. This number may also vary based on whether the data set is using an LSR/GSR buffer pool, and whether or not separate data and index pools were established. When MACRF=RLS, this field is not applicable and it is set to 0.
116	74	SMF64BSP	4	binary	Buffer space. When MACRF=RLS, this field is ignored.
120	78	SMF64BFD	2	binary	The number of data buffers requested by the user. When MACRF=RLS, this field is ignored.

Offsets		Name	Length	Format	Description
122	7A	SMF64BFI	2	binary	The number of index buffers requested by the user. When MACRF=RLS, this field is ignored.
124	7C	SMF64CLN	44	EBCDIC	Cluster name from JCL.
168	A8	SMF64PLH	2	binary	Actual number of concurrent strings (requested by the user) used. When MACRF=RLS, this field is set to 0.
170	AA	SMF64MAC	3	binary	ACB MACRF fields.
170	AA	SMF64MC1	1	binary	First ACB MACRF flag byte **Bit** **Meaning When Set** **0** Record is identified by a key **1** Record is identified by a relative byte address (RBA) **2** Control-interval processing **3** Sequential processing **4** Direct processing **5** Input processing **6** Output processing **7** User-supplied buffer space.
171	AB	SMF64MC2	1	binary	Second ACB MACRF flag byte **Bit** **Meaning When Set** **0** Defined only when output and JES format. The system is to ensure that the logical record length will be the same when the data is read. This bit is not defined for input. **1** Control character type **2** Reserved **3** Skip sequential processing **4** VTAM LOGON indicator **5** Set data set to empty state **6** Shared control blocks **7** Alternate index of the path.
172	AC	SMF64MC3	1	binary	Third ACB MACRF flag byte **Bit** **Meaning When Set** **0** Reserved **1** Local shared resource **2** Global shared resource **3** Improved control-interval processing **4** Deferred write **5** Sequential insert strategy **6** Control blocks are fixed in real storage **7** VSAM 31-bit addressing mode I/O buffers.
173	AD	SMF64MC4	1	binary	Fourth ACB MACRF flag byte **Bit** **Meaning When Set** **0** RLS Processing **1** SNP Option **2-7** Reserved

Offsets		Name	Length	Format	Description
174	AE	SMF64SMB	1	binary	SMB ACCESS BIAS Information **Bit** **Meaning When Set** **0** User specified AMP ACCBIAS through JCL (ACCBIAS=DOISOIDWISW) **1** User requested through JCL or DATACLAS that SMB is to determine ACCBIAS **2** BIAS=DO used **3** BIAS=SO used **4** BIAS=SW used **5** BIAS=DW used **6** BIAS=CO used **7** BIAS=CR used
175	AF	SMF64RSC	1	binary	SMB Information **Bit** **Meaning When Set** **0** DO with USER specified SMBVSP **1** DO with USER specified SMBHWT **2** REMODE31=BUFF used **3** RMODE31=CB used **4** Insufficient virtual storage for DO **5-7** Reserved
Hiperbatch I/O Statistics Section:					
176	B0	SMF64SIO	4	binary	Number of requests for I/O issued by the access method for this data set for which Hiperbatch attempted to find the requested data in its buffers (see SMF64HIT and SMF64MIS). When MACRF=RLS, this field is not applicable and it is set to 0.
180	B4	SMF64HIT	4	binary	Number of requests for I/O issued by the access method for this data set satisfied by moving data from Hiperbatch buffers. When MACRF=RLS, this field is not applicable and it is set to 0.
184	B8	SMF64WTS	4	binary	Number of times Hiperbatch temporarily suspended this requester because another user was already reading some or all of the requested data. When MACRF=RLS, this field is not applicable and it is set to 0.
188	BC	SMF64MIS	4	binary	Number of requests for I/O issued by the access method for this data set satisfied by performing DASD I/O. Note that the sum of SMF64HIT and SMF64MIS should equal SMF64SIO. When MACRF=RLS, this field is not applicable and it is set to 0.
192	C0	SMF64IOS	4	binary	Number of DASD I/Os (as recorded in SMF64MIS) for which Hiperbatch copied the data into its buffers. Note that random reads from DASD do not populate the Hiperbatch buffers. When MACRF=RLS, this field is not applicable and it is set to 0.
Compressed Data Statistics Section:					
196	C4	SMF64SDS	8	binary	Source data set size at open for compressed data set. Valid only if SMF64CMP (in SMF64DTY) is set on.
204	CC	SMF64CDS	8	binary	Compressed data set size at open. Valid only if SMF64CMP (in SMF64DTY) is set on.
212	D4	SMF64CSS	8	binary	Change in source data set size in this open for compressed data set. Valid only if SMF64CMP (in SMF64DTY) is set on.

Offsets		Name	Length	Format	Description
220	DC	SMF64CCS	8	binary	Change in compressed data set size in this open. Valid only if SMF64CMP (in SMF64DTY) is set on.
228	E4	SMF64DTK	36	binary	Dictionary token for compressed data set. Valid only if SMF64CMP (in SMF64DTY) is set on.
264	108	SMF64TRK	4	binary	Number of tracks released during partial release processing.
CF Cache Structure Statistics Section:					
268	10C	SMF64BMH	4	binary	Number of requests where the data was obtained from the local shared buffer pool.
272	110	SMF64CFH	4	binary	Number of requests where the data was obtained from the DFSMS coupling facility cache structure.
276	114	SMF64RIO	4	binary	Number of requests where the data was obtained from DASD.
280	118	SMF64TIM	4	binary	Time data set was opened (in hundredths of a second since midnight).
284	11C	SMF64DT	4	packed	Date data set was opened, in the form of 0cyydddF (where c is 0 for 19xx and 1 for 20xx, yy is the current year (0-99), ddd is the current day (1-356), and F is the sign).
288	120	SMF64FG1	1	binary	Miscellaneous flag 1 **Bit** **Meaning When Set** **0** CHECKPOINT has been issued **1-7** Reserved.
289	131	*	3		Reserved.

Record Type 65 (41) — Integrated Catalog Facility Delete Activity

Record type 65 is written during any processing that results in a DELETE request to Catalog management services, such as:

IDCAMS DELETE

IEHPROGM UNCATLG

One type 65 record is written for each record updated or deleted from a catalog.

Record type 65 identifies the entry being deleted and the catalog in which the catalog record is updated or deleted, and gives the updated or deleted catalog record. It indicates whether a VSAM cluster or non-VSAM data set was scratched (function indicator = ‘S’), or only catalog information was deleted (function indicator = ‘U’). It identifies the job by job log identification and user identification.

The job name, time, and date that the reader recognized the JOB card (for this job) constitutes the job log identification. If a system task caused the record to be written, the job name and user identification fields contain blanks and the time and date fields contain zeros.

Macro to Symbolically Address Record Type 65: The SMF record mapping macro for record types 36, 60, 61, 65 and 66 is IFASMFI6. The syntax is as follows:

IFASMFI6 *nn*

nn identifies the type of the record you want to map. The mapping macro resides in SYS1.MACLIB.

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF65LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See "Standard SMF Record Header" on page 13-1 for a detailed description.
2	2	SMF65SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF65SYS	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See "Standard SMF Record Header" on page 13-1 for a detailed description.
5	5	SMF65RTY	1	binary	Record type 65 (X'41').
6	6	SMF65TME	4	binary	Time since midnight, in hundredths of a second, when the record was moved into the SMF buffer.
10	A	SMF65DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
14	E	SMF65CPU	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF65SBS	4		Reserved.
22	16	SMF65SUB	2	EBCDIC	The action taken on the catalog entry; valid values are: **IN** (INSERT) **DE** (DELETE) **UP** (UPDATE)
24	18	SMF65POF	4	binary	Offset of product section from start of record, including record descriptor word (RDW).
28	1C	SMF65PLN	2	binary	Length of product section.
30	1E	SMF65PNO	2	binary	Number of product sections.
32	20	SMF65DOF	4	binary	Offset of data section from start of record, including record descriptor word (RDW).
36	24	SMF65DLN	2	binary	Length of data section.
38	26	SMF65DNO	2	binary	Number of data sections.
Product and data section:					
40	28	SMF65VER	2	EBCDIC	Version of the type 65 record.
42	2A	SMF65PNM	8	EBCDIC	Catalog management product identifier.
50	32	SMF65JNM	8	EBCDIC	Job name. The job log identification consists of the job name, time, and date that the reader recognized the JOB card (for this job). If a system task caused the record to be written, the job name and user identification fields contain blanks and the time and date fields contain zeros.
58	3A	SMF65RST	4	binary	Time, in hundredths of a second, that the reader recognized the JOB card (for this job).
62	3E	SMF65RDT	4	packed	Date when the reader recognized the JOB card (for this job), in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
66	42	SMF65UID	8	EBCDIC	User-defined identification field (taken from common exit parameter area, not from USER=parameter on job statement).

Offsets		Name	Length	Format	Description
74	4A	SMF65FNC	1	EBCDIC	Contains ‘S’ if a data set was scratched; ‘U’ if only catalog entries were modified.
75	4B	SMF65CNM	44	EBCDIC	Name of the catalog in which record was updated or deleted.
119	77	SMF65TYP	1	EBCDIC	Entry type identifier. For a description of this field, see the SMF60TYP field on page 13-254.
120	78	SMF65ENM	44	EBCDIC	Entry name.
164	A4	SMF65NNM	44		Reserved.
208	D0	SMF65CRC	*variable*	binary	Catalog record for updated or deleted entry (the length of this record is contained in the first two bytes of this field).

Record Type 66 (42) — Integrated Catalog Facility Alter Activity

Record type 66 is written during any processing that results in an ALTER request to Catalog Management Services, such as:

IDCAMS ALTER

One type 66 record is written for each record written or deleted from a catalog.

Record type 66 identifies the entry being altered and the catalog in which the catalog record is written or deleted, and gives the new, updated, or deleted catalog record. It indicates if the entry was renamed (function indicator = ‘R’) and, if so, gives the old and new names of the entry. It identifies the job by job log identification and user identification. The job name, time, and date that the reader recognized the JOB card (for this job) constitutes the job log identification. If a system task caused the record to be written, the job name and user identification fields contain blanks and the time and date fields contain zeros.

Macro to Symbolically Address Record Type 66: The SMF record mapping macro for record types 36, 60, 61, 65 and 66 is IFASMFI6. The syntax is as follows:

IFASMFI6 *nn*

nn identifies the type of the record you want to map. The mapping macro resides in SYS1.MACLIB.

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF66LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	SMF66SEG	2	binary	Record descriptor word descriptor (see record length field).

Offsets		Name	Length	Format	Description
4	4	SMF66SYS	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See “Standard SMF Record Header” on page 13-1 for a detailed description.
5	5	SMF66RTY	1	binary	Record type 66 (X'42').
6	6	SMF66TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.
10	A	SMF66DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
14	E	SMF66CPU	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF66SBS	4		Reserved.
22	16	SMF66SUB	2	EBCDIC	The action taken on the catalog entry; valid values are: **IN** (INSERT) **DE** (DELETE) **UP** (UPDATE)
24	18	SMF66POF	4	binary	Offset of product section from start of record, including record descriptor word (RDW).
28	1C	SMF66PLN	2	binary	Length of product section.
30	1E	SMF66PNO	2	binary	Number of product sections.
32	20	SMF66DOF	4	binary	Offset of data section from start of record, including record descriptor word (RDW).
36	24	SMF66DLN	2	binary	Length of data section.
38	26	SMF66DNO	2	binary	Number of data sections.
Product and data section:					
40	28	SMF66VER	2	EBCDIC	Version of the type 66 record.
42	2A	SMF66PNM	8	EBCDIC	Catalog management product identifier.
50	32	SMF66JNM	8	EBCDIC	Job name. The job log identification consists of the job name, time, and date that the reader recognized the JOB card (for this job). If a system task caused the record to be written, the job name and user identification fields contain blanks and the time and date fields contain zeros.
58	3A	SMF66RST	4	binary	Time since midnight, in hundredths of a second, that the reader recognized the JOB card (for this job).
62	3E	SMF66RDT	4	packed	Date when the reader recognized the JOB card (for this job), in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
66	42	SMF66UID	8	EBCDIC	User-defined identification field (taken from common exit parameter area, not from USER=parameter on job statement).
74	4A	SMF66FNC	1	EBCDIC	Contains “R” if catalog entry is renamed.
75	4B	SMF66CNM	44	EBCDIC	Name of catalog in which record was updated or deleted.
119	77	SMF66TYP	1	EBCDIC	Entry type identifier. For a description of this field, see the SMF60TYP field on page 13-254.
120	78	SMF66ENM	44	EBCDIC	Current entry name.
164	A4	SMF66NNM	44	EBCDIC	New entry name.
208	D0	SMF66CRC	*variable*	binary	Catalog record for updated or deleted entry (the length of this record is contained in the first two bytes of this field).

Record Type 67 (43) — VSAM Catalog Entry Deleted

Note that since VSAM catalogs are no longer supported (and no longer exist) record type 67 is no longer created.

Record type 67 is written when an entry (a component, cluster, catalog, alternate index, path, or non-VSAM data set) in a VSAM catalog is deleted. A type 67 record is written for each entry affected by the DELETE access method services command. For example, three records are written for an indexed cluster: one for the relationship between the components of the cluster, one for the data component, and one for the index component.

Record type 67 identifies the deleted entry, the VSAM catalog in which the entry was defined and the deleted catalog records. A VSAM catalog record is contained in one or more physical catalog records (SMF67CRC). Field SMF67RSZ at offset 132 is the sum of the sizes of the physical catalog records that constitute the total logical VSAM catalog record. The length of this SMF record can be from 1000 to 4000 bytes or more, depending upon the sizes of the catalog records that describe the entry. If you are writing this record to the SMF data set, be sure to include the sizes of these catalog records when estimating the additional storage SMF will need for the buffers and the data sets. It identifies the job by job log identification and user identification.

The job name, time, and date that the reader recognized the JOB card (for this job) constitute the job log identification. If a system task caused the record to be written, the job-name and the user-identification fields contain blanks and the time and date fields contain zeroes.

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF67LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	SMF67SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF67FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See “Standard SMF Record Header” on page 13-1 for a detailed description.
5	5	SMF67RTY	1	binary	Record type 67 (X'43').
6	6	SMF67TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.
10	A	SMF67DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
14	E	SMF67SID	2	EBCDIC	System identification (from the SID parameter).
16	10	SMF67SMI	2	EBCDIC	System model identifier.

Offsets		Name	Length	Format	Description
18	12	SMF67JBN	8	EBCDIC	Job name. If a system task caused the record to be written, the job name and user identification fields contain blanks and the time and date fields contain zeros. The job name, time, and date that the reader recognized the JOB card (for this job) constitute the job log identification, or transaction name (for APPC output).
26	1A	SMF67RST	4	binary	Time since midnight, in hundredths of a second, that the reader recognized the JOB card (for this job).
30	1E	SMF67RSD	4	packed	Date when the reader recognized the JOB card (for this job), in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
34	22	SMF67UIF	8	EBCDIC	User-defined identification field (taken from common exit parameter area, not from USER=parameter on job statement).
42	2A	SMF67FDT	1	binary	Record creator/entry type indicator **Bit** **Meaning When Set** **0** Uncataloged **1** Scratched **2-7** Reserved. The uncataloged and scratched indicators are set for VSAM component or cluster entries. For all other VSAM entries, only the uncataloged bit is set. For non-VSAM entries, the uncataloged bit is always set and the scratched bit is set if the physical non-VSAM space was deleted.
43	2B	SMF67IOD	1	binary	Entry type indicator **Bit** **Meaning When Set** **0** VSAM cluster **1** VSAM data component **2** VSAM index component **3** VSAM catalog **4** Non-VSAM data set **5** Generation data group **6** Alias **7** Reserved. A data or index component can only be deleted as one of the three catalog records deleted when a cluster is deleted.
44	2C	SMF67CNM	44	EBCDIC	Name of catalog in which the entry was defined.
88	58	SMF67DEN	44	EBCDIC	Entry name.
132	84	SMF67RSZ	2	binary	Size of catalog record that defined the entry. A VSAM catalog record is contained in one or more physical catalog records. Offset 132 is the sum of the sizes of the physical catalog records that constitute the total logical VSAM catalog record.
134	86	SMF67CRC	*variable*	binary	Catalog record.

Record Type 68 (44) — VSAM Catalog Entry Renamed

Note that since VSAM catalogs are no longer supported (and no longer exist) record type 68 is no longer created.

Record type 68 is written when an entry (a component, cluster, catalog, alternate index, path, or non-VSAM data set) in a VSAM catalog is renamed using the ALTER access method services command. This record identifies the VSAM catalog in which the object is defined, and gives the old and new names for the object. It identifies the job log identification and user identification. The job name, time, and date that the reader recognized the JOB card (for this job) constitute the job log identification.

If a system task caused the record to be written, the job-name and user-identification fields contain blanks and the time and date fields contain zeros.

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF68LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	SMF68SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF68FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See “Standard SMF Record Header” on page 13-1 for a detailed description.
5	5	SMF68RTY	1	binary	Record type 68 (X'44').
6	6	SMF68TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into SMF buffer.
10	A	SMF68DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
14	E	SMF68SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF68JBN	8	EBCDIC	Job name. If a system task caused the record to be written, the job name and user identification fields contain blanks and the time and date fields contain zeros. The job name, time, and date that the reader recognized the JOB card (for this job) constitute the job log identification, or transaction name (for APPC output).
26	1A	SMF68RST	4	binary	Time since midnight, in hundredths of a second, that the reader recognized the JOB card (for this job).
30	1E	SMF68RSD	4	packed	Date when the reader recognized the JOB card (for this job), in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
34	22	SMF68UIF	8	EBCDIC	User-defined identification field (taken from common exit parameter area, not from USER=parameter on job statement).
42	2A	SMF68CNM	44	EBCDIC	Name of catalog in which the entry is defined.
86	56	SMF68ONM	44	EBCDIC	Old name of the entry (obtained from the ALTER command).
130	82	SMF68NNM	44	EBCDIC	New name of the entry (obtained from the ALTER command).

Record Type 69 (45) — VSAM Data Space Defined, Extended, or Deleted

Note that since VSAM catalogs are no longer supported (and no longer exist) record type 63 is no longer created.

Record type 69 is written when a VSAM data space is defined, extended, or deleted using the DEFINE or DELETE Access Method Services commands. Record type 69 is not written when a catalog or a unique data set is defined or deleted.

This record identifies the catalog in which the VSAM data space is defined and the volume on which it is (or was) allocated. It gives the number of free data space extents and the amount of unallocated space on the affected volume after the definition, extension, or deletion. It identifies the job by job log identification and user identification. The job name, time, and date that the reader recognized the JOB card (for this job) constitute the job log identification.

If a system task caused the record to be written, the job-name and user-identification fields contain blanks and the time and date fields contain zeros.

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF69LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See "Standard SMF Record Header" on page 13-1 for a detailed description.
2	2	SMF69SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF69FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See "Standard SMF Record Header" on page 13-1 for a detailed description.
5	5	SMF69RTY	1	binary	Record type 69 (X'45').
6	6	SMF69TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into SMF buffer.
10	A	SMF69DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
14	E	SMF69SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF69JBN	8	EBCDIC	Job name. If a system task caused the record to be written, the job name and user identification fields contain blanks and the time and date fields contain zeros. The job name, time, and date that the reader recognized the JOB card (for this job) constitute the job log identification, or transaction name (for APPC output).
26	1A	SMF69RST	4	binary	Time since midnight, in hundredths of a second, that the reader recognized the JOB card (for this job).

Offsets		Name	Length	Format	Description
30	1E	SMF69RSD	4	packed	Date when the reader recognized the JOB card (for this job), in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
34	22	SMF69UIF	8	EBCDIC	User-defined identification field (taken from common exit parameter area, not from USER=parameter on job statement).
42	2A	SMF69CUU	2	binary	Device number.
44	2C	SMF69IND	2	binary	Spindle identification.
46	2E	SMF69NDS	2	binary	Number of free data space extents on the affected volume after the data space is defined, extended, or deleted.
48	30	SMF69NUC	2	binary	Number of unallocated cylinders in all of the data spaces on the volume.
50	32	SMF69NUT	2	binary	Number of unallocated tracks in all of the data spaces on the volume in addition to the number of unallocated cylinders.
52	34	SMF69LNC	2	binary	Number of cylinders in the largest continuous unallocated area in any data space on the volume.
54	36	SMF69LNT	2	binary	Number of tracks (in addition to the number of cylinders) in the largest continuous unallocated area in any data space on the volume.
56	38	SMF69CNM	44	EBCDIC	Name of catalog in which the data space is defined.
100	64	SMF69VSR	6	EBCDIC	Volume serial number of the volume on which the data space is defined.

Record Type 70 (46) — RMF Processor Activity

Reference books

For information on using RMF, see *z/OS RMF User's Guide*.

For information on Monitor I and II, see *z/OS RMF Report Analysis*.

Starting with z/OS V1R2, record type 70 has a new **subtype 2** for measurements of cryptographic processors. Therefore, the data of the *traditional* record type 70 is described in this chapter as record type 70 **subtype 1**.

Record type 70 has the following subtypes:

- **Subtype 1** — contains measurement data for general purpose processors, logical partitions, and internal coupling facilities. It has the following sections:

  CPU control section
  : Contains the CPUs by model and version number.

  CPU data section
  : Contains general information on CPU use during the interval.

  ASID data area section
  : Contains address space use during the interval.

  PR/SM partition data section
  : Contains a configured logical partition.

  PR/SM logical processor data section
  : Contains a PR/SM logical processor data block.

CPU identification section
Identifies a CPU type.

- **Subtype 2** — contains measurement data for cryptographic coprocessors and accelerators. It has the following sections:

Cryptographic coprocessor data section
Contains measurement data for cryptographic coprocessors.

Cryptographic accelerator data section
Contains measurement data for cryptographic accelerators.

ICSF Services data section
Contains measurement data of selected Integrated Cryptographic Service Facility (ICSF) activities.

Record type 70 is written for each measurement interval and when the session terminates. As with all SMF records produced by RMF, it contains a header section followed by the RMF product section.

Macro to Symbolically Address Record Type 70: The SMF record mapping macro for all records produced by RMF is ERBSMFR. Its format is ERBSMFR (*n1*,*n2*,...) where *n1*,*n2*, ... are the SMF record types you want to map. Note that the parentheses are required only when two or more record types are specified. The mapping macro resides in SYS1.MACLIB.

Record Environment

The following conditions exist for the generation of this record:

Macro	SMFWTM (record exit: IEFU83)
Mode	Task
Storage Residency	31-bit

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF70LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	SMF70SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF70FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0** New record format **1** Subtypes used **2** Reserved. **3-6** Version indicators* **7** System is running in PR/SM mode. *See “Standard SMF Record Header” on page 13-1 for a detailed description.
5	5	SMF70RTY	1	binary	Record type 70 (X'46').
6	6	SMF70TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.

Offsets		Name	Length	Format	Description
10	A	SMF70DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
14	E	SMF70SID	4	EBCDIC	System identification (from the SMFPRMxx SID parameter).
18	12	SMF70SSI	4	EBCDIC	Subsystem identification ('RMF').
22	16	SMF70STY	2	binary	Record subtype.
24	18	SMF70TRN	2	binary	Number of triplets in this record. A triplet is a set of three SMF fields (offset/length/number values) that defines a section of the record. The offset is the offset from the RDW.
26	1A		2		Reserved.
28	1C	SMF70PRS	4	binary	Offset to RMF product section from the RDW.
32	20	SMF70PRL	2	binary	Length of RMF product section.
34	22	SMF70PRN	2	binary	Number of RMF product sections.
Individual header extension for subtype 1:					
36	24	SMF70CCS	4	binary	Offset to CPU control section from RDW.
40	28	SMF70CCL	2	binary	Length of CPU control section.
42	2A	SMF70CCN	2	binary	Number of CPU control section.
44	2C	SMF70CPS	4	binary	Offset to CPU data section from RDW.
48	30	SMF70CPL	2	binary	Length of CPU data section.
50	32	SMF70CPN	2	binary	Number of CPU data sections in this record.
52	34	SMF70ASS	4	binary	Offset to ASID data section from RDW.
56	38	SMF70ASL	2	binary	Length of ASID data section.
58	3A	SMF70ASN	2	binary	Number of ASID data sections.
60	3C	SMF70BCS	4	binary	Offset to PR/SM partition data section from RDW.
64	40	SMF70BCL	2	binary	Length of PR/SM partition data section.
66	42	SMF70BCN	2	binary	Number of PR/SM partition data sections.
68	44	SMF70BVS	4	binary	Offset to PR/SM logical processor data section from RDW.
72	48	SMF70BVL	2	binary	Length of PR/SM logical processor data section.
74	4A	SMF70BVN	2	binary	Number of PR/SM logical processor data sections.
76	4C	SMF70CNS	4	binary	Offset to CPU-identification name sections.
80	50	SMF70CNL	2	binary	Length of CPU-identification name section.
82	52	SMF70CNN	2	binary	Number of CPU-identification name sections.
Individual header extension for subtype 2:					
36	24	SMF7023S	4	binary	Offset to cryptographic coprocessor data section.
40	28	SMF7023L	2	binary	Length of cryptographic coprocessor data section.
42	2A	SMF7023N	2	binary	Number of cryptographic coprocessor data sections.
44	2C	SMF7024S	4	binary	Offset to cryptographic accelerator data section.
48	30	SMF7024L	2	binary	Length of cryptographic accelerator data section.
50	32	SMF7024N	2	binary	Number of cryptographic accelerator data sections.
52	34	SMF702CS	4	binary	Offset to cryptographic coprocessor facility data section.
56	38	SMF702CL	2	binary	Length of cryptographic coprocessor facility data section.
58	3A	SMF702CN	2	binary	Number of cryptographic coprocessor facility data sections.

RMF Product Section

Offsets		Name	Length	Format	Description
0	0	SMF70MFV	2	packed	RMF version number.

Offsets		Name	Length	Format	Description
2	2	SMF70PRD	8	EBCDIC	Product name (‘RMF’).
10	A	SMF70IST	4	packed	Time that the RMF measurement interval started, in the form 0*hhmmssF*, where *hh* is the hours, *mm* is the minutes, *ss* is the seconds, and *F* is the sign.
14	E	SMF70DAT	4	packed	Date when the RMF measurement interval started, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
18	12	SMF70INT	4	packed	Duration of the RMF measurement interval, in the form *mmsstttF* where *mm* is the minutes, *ss* is the seconds, *ttt* is the milliseconds, and *F* is the sign. (The end of the measurement interval is the sum of the recorded start time and this field.)
22	16		2		Reserved.
24	18	SMF70SAM	4	binary	Number of RMF samples.
28	1C		2		Reserved.
30	1E	SMF70FLA	2	binary	Flags **Bit** **Meaning When Set** **0** Reserved **1** Samples have been skipped **2** Record was written by RMF Monitor III **3** Interval was synchronized with SMF **4-15** Reserved.
32	20		4		Reserved.
36	24	SMF70CYC	4	packed	Sampling cycle length, in the form 000*ttttF*, where *tttt* is the milliseconds and *F* is the sign (taken from CYCLE option). The range of values is 0.050 to 9.999 seconds.
40	28	SMF70MVS	8	EBCDIC	MVS software level (consists of an acronym and the version, release, and modification level - ZV*vvrrmm*).
48	30	SMF70IML	1	binary	Indicates the type of processor complex on which data measurements were taken. **Value** **Meaning** **3** 9672, zSeries
49	31	SMF70PRF	1	binary	Processor flags. **Bit** **Meaning When Set** **0** The system has expanded storage **1** The processor is enabled for ES connection architecture (ESCA) **2** There is an ES connection director in the configuration **3** System is running in z/Architecture mode **4** IFA processors available. **5-7** Reserved.
50	32	SMF70PTN	1	binary	PR/SM partition number of the partition that wrote this record.
51	33	SMF70SRL	1	binary	SMF record level change number (X’4A’ for z/OS V1R7 RMF). This field enables processing of SMF record level changes in an existing release.
52	34	SMF70IET	8	char	Interval expiration time token. This token can be used to identify other than RMF records that belong to the same interval (if interval was synchronized with SMF).
60	3C	SMF70LGO	8	binary	Offset GMT to local time (STCK format).
68	44	SMF70RAO	4	binary	Offset to reassembly area relative to start of RMF product section.

Offsets		Name	Length	Format	Description
72	48	SMF70RAL	2	binary	Length of reassembly area. Area consists of a fixed header and a variable number of information blocks. Length depends on the record type/subtype, but is fixed for a specific type/subtype.
74	4A	SMF70RAN	2	binary	Reassembly area indicator. **Value** **Meaning** **0** Record is not broken. **1** Record is broken. **Note:** This field is used to indicate whether an SMF record is a broken record. Therefore, offset (SMF70RAO) and length (SMF70RAL) are only valid if SMF70RAN = 1. A reassembly area is only present in broken records.
76	4C	SMF70OIL	2	binary	Original interval length as defined in the session or by SMF (in seconds).
78	4E	SMF70SYN	2	binary	SYNC value in seconds.
80	50	SMF70GIE	8	binary	Projected gathering interval end (STCK format) GMT time.
88	58	SMF70XNM	8	EBCDIC	Sysplex name as defined in parmlib member COUPLExx.
96	60	SMF70SNM	8	EBCDIC	System name for current system as defined in parmlib member IEASYSxx SYSNAME parameter.
Reassembly Area:					
0	0	SMF70RBR	2	binary	Total number of broken records built from the original large record.
2	2	SMF70RSQ	2	binary	Sequence number of this broken record. Every broken record built from the same large record must have a unique sequence number, it is in the range from 1 to SMF70RBR.
4	4	SMF70RIO	4	binary	Offset to first reassembly information block relative to start of reassembly area header.
8	8	SMF70RIL	2	binary	Length of reassembly information block.
10	A	SMF70RIN	2	binary	Number of reassembly information blocks (same value as SMF70TRN in header section).
12	C		4		Reserved.
Reassembly Area Information Block:					
0	0	SMF70RNN	2	binary	Total number of sections in the original large record. This field contains information of how many sections of a specific type were contained in the original SMF record. This field is a copy of the number field of the triplet in the original (non broken) record.
2	2	SMF70RPP	2	binary	Position of the first of one or more consecutive sections described by this block as in the original record. Values in the range of 1 to SMF70RNN are valid for correct processing. A value of 0 will skip processing of this information block. This field provides information where the sections that are part of this broken record were placed in the original record before the split took place. The actual number of consecutive sections contained in this record is available from the actual triplet in the header extension.

Subtype 1 — CPU, PR/SM, and ICF Activity

CPU Control Section

This section contains the CPUs by model and version number.

Offsets		Name	Length	Format	Description
0	0	SMF70MOD	2	EBCDIC	CPU processor family.
2	2	SMF70VER	1	binary	CPU version number — meaning varies with model number.

Offsets		Name	Length	Format	Description
3	3	SMF70BNP	1	binary	Number of physical processors assigned for use by PR/SM.
4	4	SMF70INB	1	binary	PR/SM indicator bits **Bit** **Meaning When Set** **0** PR/SM diagnose X'204' failure. **1** Number of physical processors has changed. **2** Dispatch interval time has been changed. **3** An additional partition, that is not included in the count of configured partitions, is presented with a name of "PHYSICAL". This partition includes all of the uncaptured time that was used by the LPAR management time support feature but could not be attributed to a specific logical partition. **4** PR/SM - Diagnose X'204' extended data is supported. **5-7** Reserved.
5	5	SMF70STF	1	binary	Flag **Bit** **Meaning When Set** **0** The STSI facility is available for the CPC. **1** Physical CPU adjustment factor has been changed. **2** Service units available to MVS image have been changed. **3** SMF70LAC is provided for systems running in LPAR mode or as a z/VM guest. The value does no longer include CPU wait times. **4** SMF70MDL is the model-capacity identifier and SMF70HWM is the physical model. If this bit is OFF, SMF70MDL represents both model-capacity and physical model. **5-7** Reserved.
6	6	SMF70GTS	2	binary	Dispatch accumulated interval time in milliseconds. A zero value indicates that the dispatch interval was dynamically determined.
8	8	SMF70MDL	16	EBCDIC	CPC model identifier. See bit 4 of SMF70STF.
24	18	SMF70DSA	2	binary	Number of Diagnose samples.
26	1A	SMF70IFA	2	binary	IFA processors online at the end of the interval.
28	1C	SMF70CPA	4	binary	Physical CPU adjustment factor (will be used for converting processor time to service units).
32	20	SMF70WLA	4	binary	Processor capacity available to MVS image measured in MSUs (millions of service units) per hour. The value takes into account whether or not the image has a defined capacity limit. (For systems running as VM guest, this is the VM capacity).
36	24	SMF70LAC	4	binary	Long-term average of CPU service (millions of service units). Scope of the value depends on bit 3 of SMF70STF.
40	28	SMF70HOF	8	binary	Hypervisor date/time offset in STCK format (aka Sysplex timer offset).
48	30	SMF70HWM	16	EBCDIC	CPC physical model identifier. Valid if bit 4 of SMF70STF is set.

CPU Data Section

This section contains general information on CPU use during the interval. There is no information for processors offline at the end of the interval or that were reconfigured during the interval. There may be old incorrect data in the record, noted by the SMF70VAC field.

Offsets		Name	Length	Format	Description
0	0	SMF70WAT	8	binary	CPU wait time, where bit 51 = 1 microsecond. That is, the amount of time that the CPU is not processing instructions (PSW wait state bit is on). Data could be incorrect if a SET CLOCK occurred during the RMF interval. **Note:** This field is incorrect if MVS is running under VM.
8	8	SMF70CID	2	binary	CPU identification
10	A	SMF70CNF	1	binary	Configuration activity indicator **Bit** **Meaning When Set** **0-3** Reserved **4** Data available for complete interval **5** CPU reconfigured during post processor duration interval **6** CPU reconfigured during the measurement interval (data for this CPU is incorrect) **7** CPU online at end of interval.
11	B		1		Reserved.
12	C	SMF70SER	3	packed	CPU serial number (6 hexadecimal digits).
15	F	SMF70TYP	1	binary	CPU type. **Value** **Meaning** **0** Standard CP processor **1** IFA processor
16	10	SMF70SLH	4	binary	Number of entries to the I/O SLIH; number of I/O interruptions that this processor handled by entry into the I/O interrupt handler.
20	14	SMF70TPI	4	binary	Number of TPI (test pending interrupt) with CC=1; number of I/O interruptions that this processor handled from issuing the TPI instruction.
24	18	SMF70VFS	4	binary	Number of samples when the vector bit in the PSA image was on, which is used to determine the percentage of time vector affinity was on.
28	1C	SMF70V	1	binary	Vector configuration **Bit** **Meaning When Set** **0** Vector was online **1-7** Reserved.
29	1D		3		Reserved.

ASID Data Area Section

This section contains address space use during the interval.

Offsets		Name	Length	Format	Description
0	0	SMF70RMN	2	binary	Ready minimum value over interval.
2	2	SMF70RMM	2	binary	Ready maximum value over interval.
4	4	SMF70RTT	4	binary	Ready total value over interval.
8	8	SMF70R00	4	binary	Count of times ready value was zero.
12	C	SMF70R01	4	binary	Count of times ready value was 1.
16	10	SMF70R02	4	binary	Count of times ready value was 2.
20	14	SMF70R03	4	binary	Count of times ready value was 3.

Offsets		Name	Length	Format	Description
24	18	SMF70R04	4	binary	Count of times ready value was 4.
28	1C	SMF70R05	4	binary	Count of times ready value was 5.
32	20	SMF70R06	4	binary	Count of times ready value was 6.
36	24	SMF70R07	4	binary	Count of times ready value was 7.
40	28	SMF70R08	4	binary	Count of times ready value was 8.
44	2C	SMF70R09	4	binary	Count of times ready value was 9.
48	30	SMF70R10	4	binary	Count of times ready value was 10.
52	34	SMF70R11	4	binary	Count of times ready value was 11.
56	38	SMF70R12	4	binary	Count of times ready value was 12.
60	3C	SMF70R13	4	binary	Count of times ready value was 13.
64	40	SMF70R14	4	binary	Count of times ready value was 14.
68	44	SMF70R15	4	binary	Count of times ready value was 15 or more.
72	48	SMF70IMN	2	binary	IN users minimum over interval.
74	4A	SMF70IMM	2	binary	IN users maximum over interval.
76	4C	SMF70ITT	4	binary	IN users total value over interval.
80	50	SMF70I00	4	binary	Count of times IN users was zero.
80	54	SMF70I01	4	binary	Count of times IN users was 1 or 2.
88	58	SMF70I02	4	binary	Count of times IN users was 3 or 4.
92	5C	SMF70I03	4	binary	Count of times IN users was 5 or 6.
96	60	SMF70I04	4	binary	Count of times IN users was 7 or 8.
100	64	SMF70I05	4	binary	Count of times IN users was 9 or 10.
104	68	SMF70I06	4	binary	Count of times IN users was 11 - 15.
108	6C	SMF70I07	4	binary	Count of times IN users was 16 - 20.
112	70	SMF70I08	4	binary	Count of times IN users was 21 - 25.
116	74	SMF70I09	4	binary	Count of times IN users was 26 - 30.
120	78	SMF70I10	4	binary	Count of times IN users was 31 - 35.
124	7C	SMF70I11	4	binary	Count of times IN users was 36 or more.
128	80	SMF70OMN	2	binary	Out users minimum over interval.
130	82	SMF70OMM	2	binary	Out users maximum over interval.
132	84	SMF70OTT	4	binary	Out users total value over interval.
136	88	SMF70O00	4	binary	Count of times out users was zero.
140	8C	SMF70O01	4	binary	Count of times out users was 1 or 2.
144	90	SMF70O02	4	binary	Count of times out users was 3 or 4.
148	94	SMF70O03	4	binary	Count of times out users was 5 or 6.
152	98	SMF70O04	4	binary	Count of times out users was 7 or 8.
156	9C	SMF70O05	4	binary	Count of times out users was 9 or 10.
160	A0	SMF70O06	4	binary	Count of times out users was 11 - 15.
164	A4	SMF70O07	4	binary	Count of times out users was 16 - 20.
168	A8	SMF70O08	4	binary	Count of times out users was 21 - 25.
172	AC	SMF70O09	4	binary	Count of times out users was 26 - 30.
176	B0	SMF70O10	4	binary	Count of times out users was 31 - 35.
180	B4	SMF70O11	4	binary	Count of times out users was 36 or more.
184	B8	SMF70WMN	2	binary	Wait user minimum over interval.
186	BA	SMF70WMM	2	binary	Wait users maximum over interval.
188	BC	SMF70WTT	4	binary	Wait users total value over interval.
192	C0	SMF70W00	4	binary	Count of times wait users was zero.

Offsets		Name	Length	Format	Description
196	C4	SMF70W01	4	binary	Count of times wait users was 1 or 2.
200	C8	SMF70W02	4	binary	Count of times wait users was 3 or 4.
204	CC	SMF70W03	4	binary	Count of times wait users was 5 or 6.
208	D0	SMF70W04	4	binary	Count of times wait users was 7 or 8.
212	D4	SMF70W05	4	binary	Count of times wait users was 9 or 10.
216	D8	SMF70W06	4	binary	Count of times wait users was 11 - 15.
220	DC	SMF70W07	4	binary	Count of times wait users was 16 - 20.
224	E0	SMF70W08	4	binary	Count of times wait users was 21 - 25.
228	E4	SMF70W09	4	binary	Count of times wait users was 26 - 30.
232	E8	SMF70W10	4	binary	Count of times wait users was 31 - 35.
236	EC	SMF70W11	4	binary	Count of times wait users was 36 or more.
240	F0	SMF70BMN	2	binary	Batch users minimum over interval.
242	F2	SMF70BMM	2	binary	Batch users maximum over interval.
244	F4	SMF70BTT	4	binary	Batch users total value over interval.
248	F8	SMF70B00	4	binary	Count of times batch users was zero.
252	FC	SMF70B01	4	binary	Count of times batch users was 1 or 2.
256	100	SMF70B02	4	binary	Count of times batch users was 3 or 4.
260	104	SMF70B03	4	binary	Count of times batch users was 5 or 6.
264	108	SMF70B04	4	binary	Count of times batch users was 7 or 8.
268	10C	SMF70B05	4	binary	Count of times batch users was 9 or 10
272	110	SMF70B06	4	binary	Count of times batch users was 11 - 15.
276	114	SMF70B07	4	binary	Count of times batch users was 16 - 20.
280	118	SMF70B08	4	binary	Count of times batch users was 21 - 25.
284	11C	SMF70B09	4	binary	Count of times batch users was 26 - 30.
288	120	SMF70B10	4	binary	Count of times batch users was 31 - 35.
292	124	SMF70B11	4	binary	Count of times batch users was 36 or more.
296	128	SMF70SMN	2	binary	Started users minimum over interval.
298	12A	SMF70SMM	2	binary	Started users maximum over interval.
300	12C	SMF70STT	4	binary	Started users total value over interval.
304	130	SMF70S00	4	binary	Count of times users was zero.
308	134	SMF70S01	4	binary	Count of times users was 1 or 2.
312	138	SMF70S02	4	binary	Count of times users was 3 or 4.
316	13C	SMF70S03	4	binary	Count of times users was 5 or 6.
320	140	SMF70S04	4	binary	Count of times users was 7 or 8.
324	144	SMF70S05	4	binary	Count of times users was 9 or 10.
328	148	SMF70S06	4	binary	Count of times users was 11 - 15.
332	14C	SMF70S07	4	binary	Count of times users was 16 - 20.
336	150	SMF70S08	4	binary	Count of times users was 21 - 25.
340	154	SMF70S09	4	binary	Count of times users was 26 - 30.
344	158	SMF70S10	4	binary	Count of times users was 31 - 35.
348	15C	SMF70S11	4	binary	Count of times users was 36 or more.
352	160	SMF70TMN	2	binary	TSO/E users minimum over interval.
354	162	SMF70TMM	2	binary	TSO/E users maximum over interval.
356	164	SMF70TTT	4	binary	TSO/E users total value over interval.
360	168	SMF70T00	4	binary	Count of times TSO/E users was zero.
364	16C	SMF70T01	4	binary	Count of times TSO/E users was 1 or 2.

Offsets		Name	Length	Format	Description
368	170	SMF70T02	4	binary	Count of times TSO/E users was 3 or 4.
372	174	SMF70T03	4	binary	Count of times TSO/E users was 5 or 6.
376	178	SMF70T04	4	binary	Count of times TSO/E users was 7 or 8.
380	17C	SMF70T05	4	binary	Count of times TSO/E users was 9 or 10.
384	180	SMF70T06	4	binary	Count of times TSO/E users was 11 - 15.
388	184	SMF70T07	4	binary	Count of times TSO/E users was 16 - 20.
392	188	SMF70T08	4	binary	Count of times TSO/E users was 21 - 25.
396	18C	SMF70T09	4	binary	Count of times TSO/E users was 26 - 30.
400	190	SMF70T10	4	binary	Count of times TSO/E users was 31 - 35.
404	194	SMF70T11	4	binary	Count of times TSO/E users was 36 or more.
408	198	SMF70LMN	2	binary	Logical ready users minimum over interval.
410	19A	SMF70LMM	2	binary	Logical ready users maximum over interval.
412	19C	SMF70LTT	4	binary	Logical ready users total value over interval.
416	1A0	SMF70L00	4	binary	Count of times the number of logical ready users was zero.
420	1A4	SMF70L01	4	binary	Count of times the number of logical ready users was 1 or 2.
424	1A8	SMF70L02	4	binary	Count of times the number of logical ready users was 3 or 4.
428	1AC	SMF70L03	4	binary	Count of times the number of logical ready users was 5 or 6.
432	1B0	SMF70L04	4	binary	Count of times the number of logical ready users was 7 or 8.
436	1B4	SMF70L05	4	binary	Count of times the number of logical ready users was 9 or 10.
440	1B8	SMF70L06	4	binary	Count of times the number of logical ready users was 11 - 15.
444	1BC	SMF70L07	4	binary	Count of times the number of logical ready users was 16 - 20.
448	1C0	SMF70L08	4	binary	Count of times the number of logical ready users was 21 - 25.
452	1C4	SMF70L09	4	binary	Count of times the number of logical ready users was 26 - 30.
456	1C8	SMF70L10	4	binary	Count of times the number of logical ready users was 31 - 35.
460	1CC	SMF70L11	4	binary	Count of times the number of logical ready users was 36 or more.
464	1D0	SMF70AMN	2	binary	Logical wait users minimum over interval.
466	1D2	SMF70AMM	2	binary	Logical wait users maximum over interval.
468	1D4	SMF70ATT	4	binary	Logical wait users total value over interval.
472	1D8	SMF70A00	4	binary	Count of times the number of logical wait users was zero.
476	1DC	SMF70A01	4	binary	Count of times the number of logical wait users was 1 or 2.
480	1E0	SMF70A02	4	binary	Count of times the number of logical wait users was 3 or 4.
484	1E4	SMF70A03	4	binary	Count of times the number of logical wait users was 5 or 6.
488	1E8	SMF70A04	4	binary	Count of times the number of logical wait users was 7 or 8.
492	1EC	SMF70A05	4	binary	Count of times the number of logical wait users was 9 or 10.
496	1F0	SMF70A06	4	binary	Count of times the number of logical wait users was 11 - 15.
500	1F4	SMF70A07	4	binary	Count of times the number of logical wait users was 16 - 20.
504	1F8	SMF70A08	4	binary	Count of times the number of logical wait users was 21 - 25.
508	1FC	SMF70A09	4	binary	Count of times the number of logical wait users was 26 - 30.
512	200	SMF70A10	4	binary	Count of times the number of logical wait users was 31 - 35.
516	204	SMF70A11	4	binary	Count of times the number of logical wait users was 36 or more.

Offsets		Name	Length	Format	Description
520	208	SMF70PMN	2	binary	Minimum number of ASCH address spaces. An ASCH address space is scheduled by the APPC/MVS transaction scheduler.
522	20A	SMF70PMM	2	binary	Maximum number of ASCH address spaces.
524	20C	SMF70PTT	4	binary	Total number of ASCH address spaces.
528	210	SMF70P00	4	binary	Number of times when 0 ASCH address spaces were found.
532	214	SMF70P01	4	binary	Number of times when 1 - 2 ASCH address spaces were found.
536	218	SMF70P02	4	binary	Number of times when 3 - 4 ASCH address spaces were found.
540	21C	SMF70P03	4	binary	Number of times when 5 - 6 ASCH address spaces were found.
544	220	SMF70P04	4	binary	Number of times when 7 - 8 ASCH address spaces were found.
548	224	SMF70P05	4	binary	Number of times when 9 - 10 ASCH address spaces were found.
552	228	SMF70P06	4	binary	Number of times when 11 - 15 ASCH address spaces were found.
556	22A	SMF70P07	4	binary	Number of times when 16 - 20 ASCH address spaces were found.
560	230	SMF70P08	4	binary	Number of times when 21 - 25 ASCH address spaces were found.
564	234	SMF70P09	4	binary	Number of times when 26 - 30 ASCH address spaces were found.
568	238	SMF70P10	4	binary	Number of times when 31 - 35 ASCH address spaces were found.
572	23A	SMF70P11	4	binary	Number of times when 36 or more ASCH address spaces were found.
576	240	SMF70XMN	2	binary	Minimum number of OMVS address spaces.
578	242	SMF70XMM	2	binary	Maximum number of OMVS address spaces.
580	244	SMF70XTT	4	binary	Total number of OMVS address spaces.
584	248	SMF70X00	4	binary	Number of times when zero OMVS address spaces were found.
588	24C	SMF70X01	4	binary	Number of times when 1 - 2 OMVS address spaces were found.
592	250	SMF70X02	4	binary	Number of times when 3 - 4 OMVS address spaces were found.
596	254	SMF70X03	4	binary	Number of times when 5 - 6 OMVS address spaces were found.
600	258	SMF70X04	4	binary	Number of times when 7 - 8 OMVS address spaces were found.
604	25C	SMF70X05	4	binary	Number of times when 9 - 10 OMVS address spaces were found.
608	260	SMF70X06	4	binary	Number of times when 11 - 15 OMVS address spaces were found.
612	264	SMF70X07	4	binary	Number of times when 16 - 20 OMVS address spaces were found.
616	268	SMF70X08	4	binary	Number of times when 21 - 25 OMVS address spaces were found.
620	26C	SMF70X09	4	binary	Number of times when 26 - 30 OMVS address spaces were found.
624	270	SMF70X10	4	binary	Number of times when 31 - 35 OMVS address spaces were found.

Offsets		Name	Length	Format	Description
628	274	SMF70X11	4	binary	Number of times when 36 or more OMVS address spaces were found.
Fields SMF70Q00 to SMF70Q12 count the In Ready users based on the number **N** of CPs being online when the sample was taken.					
632	278	SMF70Q00	4	binary	Count of times In Ready users was less or equal N.
636	27C	SMF70Q01	4	binary	Count of times In Ready users was N+1.
640	280	SMF70Q02	4	binary	Count of times In Ready users was N+2.
644	284	SMF70Q03	4	binary	Count of times In Ready users was N+3.
648	288	SMF70Q04	4	binary	Count of times In Ready users was N+4 or N+5.
652	28C	SMF70Q05	4	binary	Count of times In Ready users was N+6 to N+10.
656	290	SMF70Q06	4	binary	Count of times In Ready users was N+11 to N+15.
660	294	SMF70Q07	4	binary	Count of times In Ready users was N+16 to N+20.
664	298	SMF70Q08	4	binary	Count of times In Ready users was N+21 to N+30.
668	29C	SMF70Q09	4	binary	Count of times In Ready users was N+31 to N+40.
672	2A0	SMF70Q10	4	binary	Count of times In Ready users was N+41 to N+60.
676	2A4	SMF70Q11	4	binary	Count of times In Ready users was N+61 or N+80.
680	2A8	SMF70Q12	4	binary	Count of times In Ready users was greater than N+80.

PR/SM Partition Data Section

This section contains a configured logical partition. There is one for each logical partition.

Offsets		Name	Length	Format	Description
0	0	SMF70LPM	8	EBCDIC	Logical partition name.
8	8	SMF70LPN	1	binary	Logical partition number.
9	9	SMF70PFG	1	binary	Partition flags **Bit** **Meaning When Set** **0** Partition has changed from activated to deactivated, or vice versa, during interval **1** Number of logical processors in partition has changed **2** Number of dedicated processors in partition has changed **3** Number of shared processors in partition has changed **4** WLM LPAR management is active for this partition. **5** Wait time field (SMF70WST) is defined. **6** Defined capacity limit has been changed. **7** Reserved.
10	A	SMF70BDN	2	binary	Number of logical CPUs assigned to this partition. This count matches the number of subsequent PR/SM data sections. Starting with z900 processors, SMF70BDN has a different meaning if bit 5 of SMF70PFG is set. It then contains the maximum logical processors defined as shown at the HMC. Active logical processors have an online time SMF70ONT greater than zero.
12	C	SMF70BDS	4	binary	The PR/SM logical processor data blocks for all partitions are grouped together in the record. PR/SM logical processor data blocks for a given partition are grouped together. To get to the first logical processor data block associated with this partition, skip over the number of logical processor data blocks specified by this field, starting at the first logical processor data block in the record.

Offsets		Name	Length	Format	Description
16	10	SMF70BDA	4	binary	Accumulated number of active logical processors at a WLM partition. This value is updated at each measurement cycle. It does not cover the logical processors for a non WLM managed partition. (A partition is WLM managed, when flag SMF70WLM = ON.) To get the average number of logical CPUs, this value has to be divided by the number of Diagnose samples (field SMF70DSA in the CPU control section).
20	14	SMF70SPN	8	EBCDIC	LPAR cluster name. For z/OS, the LPAR cluster name is the sysplex name. For any other logical partition, the LPAR cluster name is the name provided in the HMC definition of this logical partition. Blank, if partition is not a cluster member.
28	1C	SMF70STN	8	EBCDIC	System name. Blank, if not provided or supported by the operating system in the logical partition.
36	24		4		Reserved.
40	28	SMF70CSF	4	binary	Number of megabytes of central storage currently online to this partition.
44	2C		4		Reserved.
48	30	SMF70ESF	4	binary	Number of megabytes of expanded storage currently online to this partition.
52	34	SMF70MSU	4	binary	Defined capacity limit (in millions of service units).
56	38		16		Reserved.

PR/SM Logical Processor Data Section

This section contains a PR/SM logical processor data block. There is one for each logical processor in each configured partition.

Offsets		Name	Length	Format	Description
0	0	SMF70PDT	8	binary	Logical processor dispatch time, in microseconds. This is the number of microseconds that were accumulated during the measurement interval (during which, a physical CPU was assigned to this logical CPU). When associated with partition name “PHYSICAL”, this field contains the accumulated number of microseconds during which a physical CPU was assigned LPAR management time. This is time which was used by LPAR but could not be attributed to a specific logical partition.
8	8	SMF70VPA	2	binary	Logical processor address.
10	A	SMF70BPS	2	binary	Partition processor resource weight factor. If the value is X‘FFFF’, then the partition has been assigned dedicated processors.
12	C	SMF70VPF	1	binary	Logical processor flags **Bit** **Meaning When Set** **0** Wait completion is enabled **1** Wait completion status has changed during interval **2** Weight has changed during interval **3** Partition capping is enabled **4** Partition capping status has changed during the interval **5** Logical processor varied online during the measurement interval **6-7** Reserved.
13	D		1		Reserved.

Offsets		Name	Length	Format	Description
14	E	SMF70CIX	2	binary	Index to the CPU-identification name section that contains the EBCDIC name corresponding to the CPU type of the logical processor. This field is zero if there is no information available.
16	10	SMF70EDT	8	binary	Logical processor effective dispatch time, in microseconds. The number of microseconds that were accumulated during the measurement interval (excluding LPAR management time), during which, a physical CPU was assigned to this logical CPU.
24	18	SMF70ACS	4	binary	Accumulated processor actual share. To get the average processor actual share, this value has to be divided by the number of Diagnose samples (field SMF70DSA in the CPU control section).
28	1C	SMF70MIS	2	binary	Processor minimum share.
30	1E	SMF70MAS	2	binary	Processor maximum share.
32	20	SMF70NSI	4	binary	Number of samples within 10% of the specified minimum.
36	24	SMF70NSA	4	binary	Number of samples within 10% of the specified maximum.
40	28	SMF70ONT	8	binary	Logical processor online time.
48	30	SMF70WST	8	binary	Logical processor wait state time.
56	38	SMF70PMA	4	binary	Average adjustment weight for pricing management.
60	3C	SMF70NSW	4	binary	Number of samples when WLM capped partition.
64	40		16		Reserved.

CPU Identification Section

There is one section per EBCDIC name that identifies a CPU type. ’CP’ and ’ICF’, with appropriate trailing blanks, are examples of EBCDIC names describing a General Purpose CPU and an Internal Coupling Facility CPU, respectively.

Offsets		Name	Length	Format	Description
0	0	SMF70CIN	16	EBCDIC	CPU-identification name.

Subtype 2 — Cryptographic Hardware Activity

Cryptographic Coprocessor Data Section

There is one section per cryptographic coprocessor.

Offsets		Name	Length	Format	Description
0	0	R7023AX	1	binary	Crypto processor index.
1	1	R7023CT	1	binary	Crypto processor type.
2	2		6		Reserved.
8	8	R7023SF	8	floating	Scaling factor for this cryptographic coprocessor. Execution times in this data section have to be multiplied by this scaling factor to achieve a value in seconds.
16	10	R7023T0	8	floating	Execution time of all operations on the specified cryptographic coprocessor.
24	18	R7023C0	8	floating	Number of all operations on the specified cryptographic coprocessor.
32	20		8		Reserved.
40	28	R7023C1	8	floating	Number of all RSA-key-generation operations.

Cryptographic Accelerator Data Section

There is one section per cryptographic accelerator.

Offsets		Name	Length	Format	Description
0	0	R7024AX	1	binary	Crypto processor index.
1	1	R7024CT	1	binary	Crypto processor type.
2	2		2		Reserved.
4	4	R7024EN	4	binary	Number of engines on the Crypto accelerator card. Specifies the number of valid entries in the R7024TC array.
8	8	R7024SF	8	floating	Scaling factor for this cryptographic accelerator. Execution times in this data section have to be multiplied by this scaling factor to achieve a value in seconds.
The following block of data (R7024TC) exists for a maximum number of five engines of a cryptographic accelerator.					
16	10	R7021MET	8	floating	Execution time for all operations in 1024-bit-ME format.
24	18	R7021MEC	8	floating	Number of all operations in 1024-bit-ME format.
32	20	R7022MET	8	floating	Execution time for all operations in 2048-bit-ME format.
40	28	R7022MEC	8	floating	Number of all operations in 2048-bit-ME format.
48	30	R7021CRT	8	floating	Execution time for all operations in 1024-bit-CRT format.
56	38	R7021CRC	8	floating	Number of all operations in 1024-bit-CRT format.
64	40	R7022CRT	8	floating	Execution time for all operations in 2048-bit-CRT format.
72	48	R7022CRC	8	floating	Number of all operations in 2048-bit-CRT format.

ICSF Services Data Section

There is either one or no section containing measurement data of selected Integrated Cryptographic Service Facility (ICSF) activities.

Offsets		Name	Length	Format	Description
0	0	R702SNEC	8	floating	Single DES: Number of calls to encipher the data.
8	8	R702SNEB	8	floating	Single DES: Number of bytes of data enciphered.
16	10	R702SNEI	8	floating	Single DES: Number of instructions used to encipher the data.
24	18	R702TNEC	8	floating	Triple DES: Number of calls to encipher the data.
32	20	R702TNEB	8	floating	Triple DES: Number of bytes of data enciphered.
40	28	R702TNEI	8	floating	Triple DES: Number of instructions used to encipher the data.
48	30	R702SNDC	8	floating	Single DES: Number of calls to decipher the data.
56	38	R702SNDB	8	floating	Single DES: Number of bytes of data deciphered.
64	40	R702SNDI	8	floating	Single DES: Number of instructions used to decipher the data.
72	48	R702TNDC	8	floating	Triple DES: Number of calls to decipher the data.
80	50	R702TNDB	8	floating	Triple DES: Number of bytes of data deciphered.
88	58	R702TNDI	8	floating	Triple DES: Number of instructions used to decipher the data.
96	60	R702NMGC	8	floating	Number of calls to generate the message authentication code (MAC).
104	68	R702NMGB	8	floating	Number of bytes of data for which the MAC was generated.
112	70	R702NMGI	8	floating	Number of PCMF instructions used to generate the MAC.
120	78	R702NMVC	8	floating	Number of calls to verify the MAC.
128	80	R702NMVB	8	floating	Number of bytes of data for which the MAC was verified.
136	88	R702NMVI	8	floating	Number of PCMF instructions used to verify the MAC.

Offsets		Name	Length	Format	Description
144	90	R702NHAC	8	floating	For SHA-1 hashing: Number of calls to hash the data.
152	98	R702NHAB	8	floating	For SHA-1 hashing: Number of bytes of data which was hashed.
160	A0	R702NHAI	8	floating	For SHA-1 hashing: Number of PCMF instructions used to hash the data.
168	A8	R702NPTC	8	floating	Number of calls to translate the PIN.
176	B0	R702NPVC	8	floating	Number of calls to verify the PIN.
184	B8	R702NH2C	8	floating	For SHA-256 hashing: Number of calls to hash the data.
192	C0	R702NH2B	8	floating	For SHA-256 hashing: Number of bytes of data which was hashed.
200	C8	R702NH2I	8	floating	For SHA-256 hashing: Number of PCMF instructions used to hash the data.

Record Type 71 (47) — RMF Paging Activity

Reference books

For information on using RMF, see *z/OS RMF User's Guide*.

For information on Monitor I and II, see *z/OS RMF Report Analysis*.

Record type 71 is written for each measurement interval and when the session is terminated. Record type 71 contains information about the demands made on the system paging facilities and the utilization of central storage, expanded storage, and external page storage during the reporting interval.

As with all the SMF records RMF produces, it contains a header section followed by the RMF product section. These are followed by:

Paging Data Section
Includes information on central storage pages and expanded storage pages for SQA, SPA, CSA, LSQA and REGIONS+SWA.

Swap Placement Sections
There is one swap placement section for each swap reason. If there were no swaps for a particular reason, its data fields contain zeroes. The sections are ordered as follows:

1. Terminal output wait
2. Terminal input wait
3. Long wait
4. Auxiliary storage shortage
5. Central pageable storage shortage
6. Detected wait
7. Request swap
8. Enqueue exchange
9. Exchange on recommendation value
10. Unilateral
11. Transition to non-swappable
12. Improve central storage usage
13. Improve system paging rate
14. Make room to swap in a user who has been swapped out too long
15. APPC WAIT

16. OMVS input wait
17. OMVS output wait.
18. In-Real swap.

Macro to Symbolically Address Record Type 71: The SMF record mapping macro for all records produced by RMF is ERBSMFR. Its format is ERBSMFR (*n1*,*n2*,...) where *n1*,*n2*, ... are the SMF record types you want to map. Note that the parentheses are required only when two or more record types are specified. The mapping macro resides in SYS1.MACLIB.

Record Environment

The following conditions exist for the generation of this record:

Macro	SMFWTM (record exit: IEFU83)
Mode	Task
Storage Residency	31-bit

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF71LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See "Standard SMF Record Header" on page 13-1 for a detailed description.
2	2	SMF71SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF71FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0** New record format **1** Subtypes used **2** Reserved **3-6** Version indicators* **7** System is running in PR/SM mode. *See "Standard SMF Record Header" on page 13-1 for a detailed description.
5	5	SMF71RTY	1	binary	Record type 71 (X'47').
6	6	SMF71TME	4	binary	Time since midnight, in hundredths of a second, when the record was moved into the SMF buffer.
10	A	SMF71DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
14	E	SMF71SID	4	EBCDIC	System identification (from the SMFPRMxx SID parameter).
18	12	SMF71SSI	4	EBCDIC	Subsystem identification ('RMF').
22	16	SMF71STY	2	binary	Record subtype=1.
24	18	SMF71TRN	2	binary	Number of triplets in this record. A triplet is a set of three SMF fields (offset/length/number values) that defines a section of the record.
26	1A		2		Reserved.
28	1C	SMF71PRS	4	binary	Offset to RMF product section.
32	20	SMF71PRL	2	binary	Length of RMF product section.
34	22	SMF71PRN	2	binary	Number of RMF product sections.

Offsets		Name	Length	Format	Description
36	24	SMF71PDS	4	binary	Offset to paging data sections.
40	28	SMF71PDL	2	binary	Length of paging data section.
42	2A	SMF71PDN	2	binary	Number of paging data section.
44	2C	SMF71SWS	4	binary	Offset to swap placement data section.
48	30	SMF71SWL	2	binary	Length of swap placement data section.
50	32	SMF71SWN	2	binary	Number of swap placement data sections.

RMF Product Section

Offsets		Name	Length	Format	Description
0	0	SMF71MFV	2	packed	RMF version number.
2	2	SMF71PRD	8	EBCDIC	Product name (‘RMF’).
10	A	SMF71IST	4	packed	Time that the RMF measurement interval started, in the form 0*hhmmssF*, where *hh* is the hours, *mm* is the minutes, *ss* is the seconds, and *F* is the sign.
14	E	SMF71DAT	4	packed	Date when the RMF measurement interval started, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
18	12	SMF71INT	4	packed	Duration of RMF measurement interval, in the form *mmsstttF* where *mm* is the minutes, *ss* is the seconds, *ttt* is the milliseconds, and *F* is the sign. The end of the measurement interval is the sum of the record start time (and this field).
22	16		2		Reserved.
24	18	SMF71SAM	4	binary	Number of RMF samples.
28	1C		2		Reserved.
30	1E	SMF71FLA	2	binary	Flags **Bit** **Meaning When Set** **0** Reserved **1** Samples have been skipped **2** Record was written by RMF Monitor III **3** Interval was synchronized with SMF **4-15** Reserved.
32	20		4		Reserved.
36	24	SMF71CYC	4	packed	Sampling cycle length, in the form 000*ttttF*, where *tttt* is the milliseconds and *F* is the sign (taken from CYCLE option). The range of values is 0.050 to 9.999 seconds.
40	28	SMF71MVS	8	EBCDIC	MVS software level (consists of an acronym and the version, release, and modification level - ZV*vvrrmm*).
48	30	SMF71IML	1	binary	Indicates the type of processor complex on which data measurements were taken. **Value** **Meaning** **3** 9672, zSeries
49	31	SMF71PRF	1	binary	Processor flags. **Bit** **Meaning When Set** **0** The system has expanded storage **1** The processor is enabled for ES connection architecture (ESCA) **2** There is an ES connection director in the configuration **3** System is running in z/Architecture mode **4** IFA processors available. **5-7** Reserved.
50	32	SMF71PTN	1	binary	PR/SM partition number of the partition that wrote this record.

Offsets		Name	Length	Format	Description
51	33	SMF71SRL	1	binary	SMF record level change number (X'4A' for z/OS V1R7 RMF). This field enables processing of SMF record level changes in an existing release.
52	34	SMF71IET	8	char	Interval expiration time token. This token can be used to identify other than RMF records that belong to the same interval (if interval was synchronized with SMF).
60	3C	SMF71LGO	8	binary	Offset GMT to local time (STCK format).
68	44	SMF71RAO	4	binary	Offset to reassembly area relative to start of RMF product section.
72	48	SMF71RAL	2	binary	Length of reassembly area. Area consists of a fixed header and a variable number of information blocks. Length depends on the record type/subtype, but is fixed for a specific type/subtype.
74	4A	SMF71RAN	2	binary	Reassembly area indicator. **Value** **Meaning** **0** Record is not broken. **1** Record is broken. **Note:** This field is used to indicate whether an SMF record is a broken record. Therefore, offset (SMF71RAO) and length (SMF71RAL) are only valid if SMF71RAN = 1. A reassembly area is only present in broken records.
76	4C	SMF71OIL	2	binary	Original interval length as defined in the session or by SMF (in seconds).
78	4E	SMF71SYN	2	binary	SYNC value in seconds.
80	50	SMF71GIE	8	binary	Projected gathering interval end (STCK format) GMT time.
88	58	SMF71XNM	8	EBCDIC	Sysplex name as defined in parmlib member COUPLExx.
96	60	SMF71SNM	8	EBCDIC	System name for current system as defined in parmlib member IEASYSxx SYSNAME parameter.
Reassembly Area:					
0	0	SMF71RBR	2	binary	Total number of broken records built from the original large record.
2	2	SMF71RSQ	2	binary	Sequence number of this broken record. Every broken record built from the same large record must have a unique sequence number, it is in the range from 1 to SMF71RBR.
4	4	SMF71RIO	4	binary	Offset to first reassembly information block relative to start of reassembly area header.
8	8	SMF71RIL	2	binary	Length of reassembly information block.
10	A	SMF71RIN	2	binary	Number of reassembly information blocks (same value as SMF71TRN in header section).
12	C		4		Reserved.
Reassembly Area Information Block:					
0	0	SMF71RNN	2	binary	Total number of sections in the original large record. This field contains information of how many sections of a specific type were contained in the original SMF record. This field is a copy of the number field of the triplet in the original (non broken) record.
2	2	SMF71RPP	2	binary	Position of the first of one or more consecutive sections described by this block as in the original record. Values in the range of 1 to SMF71RNN are valid for correct processing. A value of 0 will skip processing of this information block. This field provides information where the sections that are part of this broken record were placed in the original record before the split took place. The actual number of consecutive sections contained in this record is available from the actual triplet in the header extension.

Paging Data Section

Offsets		Name	Length	Format	Description
0	0	SMF71PIN	4	binary	Number of non-VIO page-ins from auxiliary to central storage. This field includes page-ins required through page faults, specific page requests, and page fixes. It does not include page reclaims or page-ins for VIO data sets.
4	4	SMF71POT	4	binary	Number of non-VIO page-outs from central to auxiliary storage. This field includes page-outs required through specific page requests as well as those pages stolen by the paging supervisor through infrequent use. It does not include page-outs for VIO data sets.
8	8		4		Reserved.
12	C	SMF71SSQ	4	binary	Number of address space swap sequences. (A swap sequence consists of an address space swap-out and swap-in.)
16	10	SMF71SIN	4	binary	Number of pages swapped in. This field includes: LSQA, fixed pages, and those pages that the real storage manager determined to be active when the address space was swapped in. It does not include page reclaims.
20	14	SMF71SOT	4	binary	Number of pages swapped out. This field includes: LSQA, private area fixed pages, and private area non-fixed changed pages.
24	18	SMF71VIN	4	binary	Number of VIO page-ins from auxiliary to central storage. This field includes page-ins resulting from page faults or specific page requests on a VIO window. It does not include VIO swap-ins or page-ins for the common area.
28	1C	SMF71VOT	4	binary	Number of VIO page-outs from central to auxiliary storage. This field includes page-outs resulting from specific page requests on a VIO window as well as those pages stolen by the paging supervisor through infrequent use. It does not include VIO swap-outs or page-outs for the common area.
32	20		4		Reserved.
36	24	SMF71SNI	4	binary	Number of non-VIO page-ins (from auxiliary to central storage) performed in common area (LPA/CSA).
40	28	SMF71SNO	4	binary	Number of non-VIO page-outs (from central to auxiliary storage) performed in common area (LPA/CSA).
44	2C		4		Reserved.
48	30	SMF71LNI	4	binary	Number of non-VIO page-ins performed in LPA.
52	34		4		Reserved.
56	38	SMF71AFC	4	binary	End-of-interval snapshot value of the number of unused central storage page frames.
60	3C	SMF71TFC	4	binary	Number of page frames defined in central storage. (This field does not include frames occupied by the nucleus, frames marked as bad or offline, or frames used by HSA or PR/SM.)
64	40	SMF71TSC	4	binary	Total number of local page data set slots.
68	44	SMF71DSC	4	binary	Number of local page data set slots allocated to VIO private area pages.
72	48	SMF71VSC	4	binary	Number of local page data set slots allocated to non-VIO private area pages.
76	4C	SMF71NSC	4	binary	Number of usable local page data set slots that have not been allocated.
80	50	SMF71FIN	4	binary	Number of central storage frames in nucleus.
84	54	SMF71MNF	4	binary	Minimum number of unused central storage page frames.
88	58	SMF71MXF	4	binary	Maximum number of unused central storage page frames.
92	5C	SMF71AVF	4	binary	Average number of unused central storage page frames.
96	60	SMF71MNP	4	binary	Minimum number of CSA central storage frames used.

Offsets		Name	Length	Format	Description
100	64	SMF71MXP	4	binary	Maximum number of CSA central storage frames used.
104	68	SMF71AVP	4	binary	Average number of CSA central storage frames used.
108	6C	SMF71MNS	4	binary	Minimum number of pageable address space central storage frames in the private address space.
112	70	SMF71MXS	4	binary	Maximum number of pageable address space central storage frames in the private address space.
116	74	SMF71AVS	4	binary	Average number of pageable address space central storage frames in the private address space.
120	78	SMF71MNT	4	binary	Minimum total number of central storage frames used.
124	7C	SMF71MXT	4	binary	Maximum total number of central storage frames used.
128	80	SMF71AVT	4	binary	Average total number of central storage frames used.
132	84	SMF71MNQ	4	binary	Minimum number of SQA fixed frames in central storage.
136	88	SMF71MXQ	4	binary	Maximum number of SQA fixed frames in central storage.
140	8C	SMF71AVQ	4	binary	Average number of SQA fixed frames in central storage.
144	90	SMF71MNC	4	binary	Minimum number of CSA fixed frames in central storage.
148	94	SMF71MXC	4	binary	Maximum number of CSA fixed frames in central storage.
152	98	SMF71AVC	4	binary	Average number of CSA fixed frames in central storage.
156	9C	SMF71MNR	4	binary	Minimum number of non-LSQA fixed central storage frames in the private address space.
160	A0	SMF71MXR	4	binary	Maximum number of non-LSQA fixed central storage frames in the private address space.
164	A4	SMF71AVR	4	binary	Average number of non-LSQA fixed central storage frames in the private address space.
168	A8	SMF71MNX	4	binary	Minimum total number of fixed central storage frames used.
172	AC	SMF71MXX	4	binary	Maximum total number of fixed central storage frames used.
176	B0	SMF71AVX	4	binary	Average total number of fixed central storage frames used.
180	B4	SMF71MNU	4	binary	Minimum number of usable local page data set slots that have not been allocated.
184	B8	SMF71MXU	4	binary	Maximum number of usable local page data set slots that have not been allocated.
188	BC	SMF71AVU	4	binary	Average number of usable local page data set slots that have not been allocated.
192	C0	SMF71MNV	4	binary	Minimum number of local page data set slots allocated to VIO private area pages.
196	C4	SMF71MXV	4	binary	Maximum number of local page data set slots allocated to VIO private area pages.
200	C8	SMF71AVV	4	binary	Average number of local page data set slots allocated to VIO private area pages.
204	CC	SMF71MNM	4	binary	Minimum number of local page data set slots allocated to non-VIO private area pages.
208	D0	SMF71MXM	4	binary	Maximum number of local page data set slots allocated to non-VIO private area pages.
212	D4	SMF71AVM	4	binary	Average number of local page data set slots allocated to non-VIO private area pages.
216	D8	SMF71MNB	4	binary	Minimum number of unusable local page data set slots.
220	DC	SMF71MXB	4	binary	Maximum number of unusable local page data set slots.
224	E0	SMF71AVB	4	binary	Average number of unusable local page data set slots.
228	E4	SMF71MNA	4	binary	Minimum total number of local page data set slots.
232	E8	SMF71MXA	4	binary	Maximum total number of local page data set slots.

Offsets		Name	Length	Format	Description
236	EC	SMF71IS1	2	binary	Number of samples skipped due to invalid fixed frame counts. Fields affected are SMF71MNC, MXC, AVC, MNR, MXR and AVR.
238	EE	SMF71IS2	2	binary	Number of incorrect samples resulting from negative calculations. Fields affected are the same as SMF71IS1.
240	F0	SMF71VME	4	binary	Total VIO pages written to expanded storage from central storage.
244	F4	SMF71VMG	4	binary	Total VIO pages migrated from expanded storage to auxiliary storage.
248	F8	SMF71VRE	4	binary	Total VIO pages read from expanded storage to central storage.
252	FC	SMF71MVE	4	binary	Minimum number of VIO pages in expanded storage.
256	100	SMF71XVE	4	binary	Maximum number of VIO pages in expanded storage.
260	104	SMF71AVE	4	binary	Average number of VIO pages in expanded storage.
264	108		36		Reserved.
300	12C	SMF71NLP	4	binary	Minimum number of LPA frames in central storage.
304	130	SMF71XLP	4	binary	Maximum number of LPA frames in central storage.
308	134	SMF71ALP	4	binary	Average number of LPA frames in central storage.
312	138	SMF71NLF	4	binary	Minimum number of LPA fixed frames in central storage.
316	13C	SMF71XLF	4	binary	Maximum number of LPA fixed frames in central storage.
320	140	SMF71ALF	4	binary	Average number of LPA fixed frames in central storage.
324	144	SMF71NLS	4	binary	Minimum number of LSQA fixed frames in central storage.
328	148	SMF71XLS	4	binary	Maximum number of LSQA fixed frames in central storage.
332	14C	SMF71ALS	4	binary	Average number of LSQA fixed frames in central storage.
336	150	SMF71MNL	4	binary	Minimum number of fixed frames in central storage (less than 16 megabytes).
340	154	SMF71MXL	4	binary	Maximum number of fixed frames in central storage (less than 16 megabytes).
344	158	SMF71AVL	4	binary	Average number of fixed frames in central storage (less than 16 megabytes).
348	15C	SMF71PMV	4	binary	Total number of pages moved within central storage.
352	160	SMF71OPT	8	EBCDIC	SRM opt member name.
360	168	SMF71PES	4	binary	Total number of pages moved to expanded storage equals the sum of all variables recording expanded storage page moves. This includes those involving Hiperspaces and VIO data sets.
364	16C	SMF71PEA	4	binary	Total number of pages migrated from expanded storage to auxiliary storage.
368	170	SMF71AMN	4	binary	Minimum number of available expanded storage frames used.
372	174	SMF71AMX	4	binary	Maximum number of available expanded storage frames used.
376	178	SMF71ASA	4	binary	Average number of available expanded storage frames used.
380	17C	SMF71LIC	4	binary	Minimum high UIC. A value from 0 to 2540 that indicates the age (in seconds) of the oldest unreferenced frame in central storage.
384	180	SMF71HIC	4	binary	Maximum high UIC. A value from 0 to 2540 that indicates the age (in seconds) of the oldest unreferenced frame in central storage.
388	184	SMF71ACA	4	binary	Average high UIC (scale factor= -1). Scale factor -1 means the field has been multiplied by 10 to give a result in tenths and must be multiplied by 10^{-1} to get the correct value.

Offsets		Name	Length	Format	Description
392	188	SMF71LMA	4	binary	Minimum migration age; the time an unreferenced page remains in expanded storage before migrating to auxiliary storage.
396	18C	SMF71HMA	4	binary	Maximum migration age; the time an unreferenced page remains in expanded storage before migrating to auxiliary storage.
400	190	SMF71AMA	4	binary	Average migration age: the time an unreferenced page remains in expanded storage before migrating to auxiliary storage (scale factor= -1). Scale factor -1 means the field has been multiplied by 10 to give a result in tenths and must be multiplied by 10^{-1} to get the correct value.
404	194	SMF71CF	4	binary	Number of installed expanded storage frames used.
408	198	SMF71OLE	4	binary	Number of online expanded storage frames used.
412	19C	SMF71RES	4	binary	Total number of pages read from expanded storage to central storage equals the sum of all variables recording expanded storage reads. This includes those involving Hiperspaces and VIO data sets.
416	1A0	SMF71MSR	4	binary	Minimum number SQA pages in central storage.
420	1A4	SMF71XSR	4	binary	Maximum number SQA pages in central storage.
424	1A8	SMF71ASR	4	binary	Average number of SQA pages in central storage.
428	1AC	SMF71MSE	4	binary	Minimum number SQA pages in expanded storage.
432	1B0	SMF71XSE	4	binary	Maximum number SQA pages in expanded storage.
436	1B4	SMF71ASE	4	binary	Average number of SQA pages in expanded storage.
440	1B8	SMF71LME	4	binary	Minimum LPA pages in expanded storage.
444	1BC	SMF71LXE	4	binary	Maximum number of LPA pages in expanded storage.
448	1C0	SMF71LAE	4	binary	Average number of LPA pages in expanded storage.
452	1C4	SMF71CME	4	binary	Minimum number CSA pages in expanded storage.
456	1C8	SMF71CXE	4	binary	Maximum number of CSA pages in expanded storage.
460	1CC	SMF71CAE	4	binary	Average number of CSA pages in expanded storage.
464	1D0	SMF71MLR	4	binary	Minimum number of LSQA pages in central storage.
468	1D4	SMF71XLR	4	binary	Maximum number of LSQA pages in central storage.
472	1D8	SMF71ALR	4	binary	Average number of LSQA pages in central storage.
476	1DC	SMF71MLE	4	binary	Minimum number of LSQA pages in expanded storage.
480	1E0	SMF71XLE	4	binary	Maximum number of LSQA pages in expanded storage.
484	1E4	SMF71ALE	4	binary	Average number of LSQA pages in expanded storage.
488	1E8	SMF71RME	4	binary	Minimum REG region (private) + SWA pages in expanded storage.
492	1EC	SMF71RXE	4	binary	Maximum REG region (private) + SWA pages in expanded storage.
496	1F0	SMF71RAE	4	binary	Average REG region (private) + SWA pages in expanded storage.
500	1F4	SMF71ISC	4	binary	Number of incorrect samples returned from collector service.
504	1F8	SMF71HME	4	binary	Total hiperspace pages written to expanded storage from central storage.
508	1FC	SMF71HRE	4	binary	Total hiperspace pages read from expanded storage to central storage.
512	200	SMF71HMG	4	binary	Total hiperspace pages migrated from expanded storage to auxiliary storage.
516	204	SMF71HOT	4	binary	Number of hiperspace page-outs from central to auxiliary storage.
520	208	SMF71HIN	4	binary	Number of hiperspace page-ins from auxiliary to central storage.

Offsets		Name	Length	Format	Description
524	20C	SMF71MHE	4	binary	Minimum number of hiperspace pages in expanded storage.
528	210	SMF71XHE	4	binary	Maximum number of hiperspace pages in expanded storage.
532	214	SMF71AHE	4	binary	Average number of hiperspace pages in expanded storage.
536	218	SMF71BLP	4	binary	Number of blocked pages paged in (this does not include VIO or hiperspace pages).
540	21C	SMF71BLK	4	binary	Number of blocks paged in.
544	220	SMF71PWS	4	binary	Number of primary working-set pages migrated from expanded storage.
548	224	SMF71FNM	4	binary	Number of expanded storage frames freed without migration.
552	228	SMF71PMT	8	binary	Steal timer - the elapsed time spent in a preferred steal in CPU-timer units. The interval of CPU time needed to steal the page includes the time to move the contents of the stolen page, but not the time to move the new contents into the page.
560	230	SMF71SBI	4	binary	Number of system pageable areas block page ins.
564	234	SMF71LBI	4	binary	Number of LPA block page ins.
568	238	SMF71ASI	8	floating	Number of page-ins from auxiliary storage for shared page groups.
576	240	SMF71ASO	8	floating	Number of page-outs to auxiliary storage for shared page groups.
584	248	SMF71ESI	8	floating	Number of page-ins from expanded storage for shared page groups.
592	250	SMF71ESO	8	floating	Number of page-outs to expanded storage for shared page groups.
600	258	SMF71MGT	8	floating	Minimum number of shared page groups in the system.
608	260	SMF71XGT	8	floating	Maximum number of shared page groups in the system.
616	268	SMF71AGT	8	floating	Average number of shared page groups in the system.
624	270	SMF71MGC	8	floating	Minimum number of shared page groups in the central storage.
632	278	SMF71XGC	8	floating	Maximum number of shared page groups in the central storage.
640	280	SMF71AGC	8	floating	Average number of shared page groups in the central storage.
648	288	SMF71MGE	8	floating	Minimum number of shared page groups in the expanded storage.
656	290	SMF71XGE	8	floating	Maximum number of shared page groups in the expanded storage.
664	298	SMF71AGE	8	floating	Average number of shared page groups in the expanded storage.
672	2A0	SMF71MGA	8	floating	Minimum number of auxiliary slots in use for shared page groups.
680	2A8	SMF71XGA	8	floating	Maximum number of auxiliary slots in use for shared page groups.
688	2B0	SMF71AGA	8	floating	Average number of auxiliary slots in use for shared page groups.
696	2B8	SMF71MGF	8	floating	Minimum number of shared page groups fixed in the system.
704	2C0	SMF71XGF	8	floating	Maximum number of shared page groups fixed in the system.
712	2C8	SMF71AGF	8	floating	Average number of shared page groups fixed in the system.
720	2D0	SMF71MGB	8	floating	Minimum number of shared page groups fixed below 16 MB in the system.
728	2D8	SMF71XGB	8	floating	Maximum number of shared page groups fixed below 16 MB in the system.

Offsets		Name	Length	Format	Description
736	2E0	SMF71AGB	8	floating	Average number of shared page groups fixed below 16 MB in the system.
744	2E8	SMF71CAM	8	floating	Minimum number of available central storage frames.
752	2F0	SMF71CAX	8	floating	Maximum number of available central storage frames.
760	2F8	SMF71CAA	8	floating	Average number of available central storage frames.
768	300	SMF71CLM	8	floating	Minimum number of low-impact central storage frames.
776	308	SMF71CLX	8	floating	Maximum number of low-impact central storage frames.
784	310	SMF71CLA	8	floating	Average number of low-impact central storage frames.
792	318	SMF71CMM	8	floating	Minimum number of medium-impact central storage frames.
800	320	SMF71CMX	8	floating	Maximum number of medium-impact central storage frames.
808	328	SMF71CMA	8	floating	Average number of medium-impact central storage frames.
816	330	SMF71CHM	8	floating	Minimum number of high-impact central storage frames.
824	338	SMF71CHX	8	floating	Maximum number of high-impact central storage frames.
832	340	SMF71CHA	8	floating	Average number of high-impact central storage frames.
840	348	SMF71EAM	8	floating	Minimum number of available expanded storage frames.
848	350	SMF71EAX	8	floating	Maximum number of available expanded storage frames.
856	358	SMF71EAA	8	floating	Average number of available expanded storage frames.
864	360	SMF71ELM	8	floating	Minimum number of low-impact expanded storage frames.
872	368	SMF71ELX	8	floating	Maximum number of low-impact expanded storage frames.
880	370	SMF71ELA	8	floating	Average number of low-impact expanded storage frames.
888	378	SMF71EMM	8	floating	Minimum number of medium-impact expanded storage frames.
896	380	SMF71EMX	8	floating	Maximum number of medium-impact expanded storage frames.
904	388	SMF71EMA	8	floating	Average number of medium-impact expanded storage frames.
912	390	SMF71EHM	8	floating	Minimum number of high-impact expanded storage frames.
920	398	SMF71EHX	8	floating	Maximum number of high-impact expanded storage frames.
928	3A0	SMF71EHA	8	floating	Average number of high-impact expanded storage frames.
936	3A8	SMF71MVI	8	floating	Minimum number of VIO pages in real storage (z/Architecture mode).
944	3B0	SMF71XVI	8	floating	Maximum number of VIO pages in real storage (z/Architecture mode).
952	3B8	SMF71AVI	8	floating	Average number of VIO pages in real storage (z/Architecture mode).
960	3C0	SMF71MHI	8	floating	Minimum number of hiperspace pages in real storage (z/Architecture mode).
968	3C8	SMF71XHI	8	floating	Maximum number of hiperspace pages in real storage (z/Architecture mode).
976	3D0	SMF71AHI	8	floating	Average number of hiperspace pages in real storage (z/Architecture mode).
984	3D8	SMF71VWS	8	floating	Number of VIO pages written to real storage (z/Architecture mode).
992	3E0	SMF71VRS	8	floating	Number of VIO pages read from real storage (z/Architecture mode).
1000	3E8	SMF71HWS	8	floating	Number of hiperspace pages written to real storage (z/Architecture mode).
1008	3F0	SMF71HRS	8	floating	Number of hiperspace pages read from real storage (z/Architecture mode).

Offsets		Name	Length	Format	Description
1016	3F8	SMF71MFB	8	floating	Minimum number of pages fixed between 16M and 2G (z/Architecture mode).
1024	400	SMF71XFB	8	floating	Maximum number of pages fixed between 16M and 2G (z/Architecture mode).
1032	408	SMF71AFB	8	floating	Average number of pages fixed between 16M and 2G (z/Architecture mode).

Swap Placement Section

This section contains one per swap reason, located by SMF71SWS.

Offsets		Name	Length	Format	Description
0	0	SMF71TOT	4	binary	Total number of swap candidates.
4	4	SMF71AXD	4	binary	Number of physical swaps directed to auxiliary storage from central storage.
8	8	SMF71LES	4	binary	Number of logical swaps to expanded storage after failing a logical swap.
12	C	SMF71LAX	4	binary	Number of logical swaps to auxiliary storage after failing a logical swap.
16	10	SMF71ESD	4	binary	Number of physical swaps directed to expanded storage from central storage.
20	14	SMF71MIG	4	binary	Total number of physical swaps that migrated from expanded storage to auxiliary storage.

Record Type 72 (48) — RMF Workload Activity and Storage Data

Reference books

For information on using RMF, see *z/OS RMF User's Guide*.

For information on Monitor I, II, and III, see *z/OS RMF Report Analysis*.

For more information on performance groups and service units, see *z/OS MVS Initialization and Tuning Guide*.

For information on the MVS workload manager, see *z/OS MVS Planning: Workload Management* and *z/OS MVS Programming: Workload Management Services*.

Important

Beginning with z/OS V1R3, WLM compatibility mode is no longer available. Accordingly, subtypes 1 and 2 of record type 72 are no longer valid. The information has been left here for reference purposes, and for use on backlevel systems.

Record type 72 has the following subtypes:

- **Subtype 1** — is written for a system running in compatibility mode for each performance group (PG) defined in the installation performance specification (IPS) and is also written for report performance groups as defined in the installation control specification (ICS).

The performance group gives information on the amount of service. Type 72 records are generated in the order of low to high PG number. Each record contains data on each PG period for a PG number. There can be from one to eight PG periods for each performance group and one for each performance group.

Workload control section
Identifies the installation performance specification and performance group number, name of class, user identifier and other information.

Period data section
Contains the workload level, service units, and other data for all transactions.

- **Subtype 2** — includes information from the Monitor III Data Gatherer. It includes storage data, grouped by domain and control performance groups.

  The data is summarized for each interval, by performance group, using the Monitor I interval specified. If you use the synchronization options correctly, the intervals should match fairly closely other than for differentials caused by system delays which may be several seconds. If either monitor is restarted due to errors or operator commands however, there could be a considerable mismatch. If Monitor I is not active, the data gathering interval will be set to a default of one-half hour, synchronized on the hour. This default cannot be changed by the installation.

  Workload control section
  Identifies the number of records and data sections in the interval and the name of the IPS.

  Data section
  Identifies the performance group by number and includes information relating to that performance group.

  Swap reason section
  Contains swap related information.

- **Subtype 3** — is written for each service or report class defined in the active service policy. It includes the goals and the actual measured values for this class.

  Workload control section
  Identifies the policy, workload and service/report class name and contains workload data.

  Service class served data section
  Contains information about the service classes being served.

  Resource group data section
  Contains information about the resource group to which the service class belongs.

  Service/Report class period data section
  Contains goals and actual measured values for each service and report class period. In addition, there are pointers to the corresponding response time distribution data section and work/resource manager state section.

  Response time distribution data section
  Contains the response time distribution map and count tables for each service class period with a response time goal.

  Work/resource manager state section
  Contains the subsystem work manager delay array with two entries for each subsystem.

- **Subtype 4** — is written from the Monitor III data gatherer for each service class period of each service class defined in the active service policy.

  Service class period data section
  Contains Monitor III specific using and delay counts and storage frame counts for each service class period.

  Swap reason data section
  Contains swap reason information.

Each subtype contains a header section followed by the RMF product section.

Macro to Symbolically Address Record Type 72: The SMF record mapping macro for all records produced by RMF is ERBSMFR. Its format is ERBSMFR (*n1*,*n2*,...) where *n1*,*n2*, ... are the SMF record types you want to map. Note that the parentheses are required only when two or more record types are specified. The mapping macro resides in SYS1.MACLIB.

Record Environment

The following conditions exist for the generation of this record:

Macro	SMFWTM (record exit: IEFU83)
Mode	Task
Storage Residency	31-bit

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF72LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	SMF72SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF72FLG	1	binary	System indicator: **Bit** Meaning When Set **0** New SMF record format **1** Subtypes used **2** Reserved **3-6** Version indicators* **7** System is running in PR/SM mode *See “Standard SMF Record Header” on page 13-1 for a detailed description.
5	5	SMF72RTY	1	binary	Record type 72(X'48').
6	6	SMF72TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.
10	A	SMF72DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
14	E	SMF72SID	4	EBCDIC	System identification (from the SMFPRMxx SID parameter).
18	12	SMF72SSI	4	EBCDIC	Subsystem identification (‘RMF’).
22	16	SMF72STY	2	binary	Record subtype.

Offsets		Name	Length	Format	Description
24	18	SMF72TRN	2	binary	Number of triplets in this record. A triplet is a set of three SMF fields (offset/length/number values) that defines a section of the record. The offset is the offset from the RDW.
26	1A		2		Reserved.
28	1C	SMF72PRS	4	binary	Offset to RMF product section from RDW.
32	20	SMF72PRL	2	binary	Length of RMF product section.
34	22	SMF72PRN	2	binary	Number of RMF product sections.
Individual header extension for subtypes 1 and 2:					
36	24	SMF72WLS	4	binary	Offset to workload control section from RDW.
40	28	SMF72WLL	2	binary	Length of workload control section.
42	2A	SMF72WLN	2	binary	Number of workload control sections.
44	2C	SMF72PGS	4	binary	Offset to performance group period data section from RDW.
48	30	SMF72PGL	2	binary	Length of performance group period data section.
50	32	SMF72PGN	2	binary	Number of performance group period data sections.
52	34	SMF72SWS	4	binary	Offset to swap reason data section (only for subtype 2).
56	38	SMF72SWL	2	binary	Length of swap reason data section (only for subtype 2).
58	3A	SMF72SWN	2	binary	Number of swap reason data sections (only for subtype 2).
Individual header extension for subtype 3:					
36	24	SMF72WMS	4	binary	Offset to workload manager control section.
40	28	SMF72WML	2	binary	Length of workload manager control section.
42	2A	SMF72WMN	2	binary	Number of workload manager control sections.
44	2C	SMF72SSS	4	binary	Offset to service class served data section.
48	30	SMF72SSL	2	binary	Length of service class served data section.
50	32	SMF72SSN	2	binary	Number of service class served data sections.
52	34	SMF72RGS	4	binary	Offset to resource group data section.
56	38	SMF72RGL	2	binary	Length of resource group data section.
58	3A	SMF72RGN	2	binary	Number of resource group data sections.
60	3C	SMF72SCS	4	binary	Offset to service/report class period data section.
64	40	SMF72SCL	2	binary	Length of service/report class period data section.
66	42	SMF72SCN	2	binary	Number of service/report class period data sections.
68	44	SMF72RTS	4	binary	Offset to response time distribution data section.
72	48	SMF72RTL	2	binary	Length of response time distribution data section.
74	4A	SMF72RTN	2	binary	Number of response time distribution data sections.
76	4C	SMF72WRS	4	binary	Offset to work/resource manager state section.
80	50	SMF72WRL	2	binary	Length of work/resource manager state section.
82	52	SMF72WRN	2	binary	Number of work/resource manager state sections.
Individual header extension for subtype 4:					
36	24	SMF72CPS	4	binary	Offset to service class period data section.
40	28	SMF72CPL	2	binary	Length of service class period data section.
42	2A	SMF72CPN	2	binary	Number of service class period data sections.
44	2C	SMF72SPS	4	binary	Offset to swap reason data section.
48	30	SMF72SPL	2	binary	Length of swap reason data section.
50	32	SMF72SPN	2	binary	Number of swap reason data sections.

RMF Product Section

Offsets		Name	Length	Format	Description
0	0	SMF72MFV	2	EBCDIC/ packed	RMF version number.
2	2	SMF72PRD	8	EBCDIC	Product name ('RMF').
10	A	SMF72IST	4	packed	Time that the RMF measurement interval started, in the form 0*hhmmssF*, where *hh* is the hours, *mm* is the minutes, *ss* is the seconds, and *F* is the sign.
14	E	SMF72DAT	4	packed	Date when the RMF measurement interval started, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
18	12	SMF72INT	4	packed	Duration of the RMF measurement interval, in the form *mmsstttF* where *mm* is the minutes, *ss* is the seconds, *ttt* is the milliseconds, and *F* is the sign. The end of the measurement interval is the sum of the recorded start time (and this field.)
22	16		2		Reserved.
24	18	SMF72SAM	4	binary	Number of RMF samples.
28	1C		2		Reserved.
30	1E	SMF72FLA	2	binary	Flags **Bit** **Meaning When Set** **0** Reserved **1** Samples have been skipped **2** Record was written by RMF Monitor III **3** Interval was synchronized with SMF **4-15** Reserved.
32	20		4		Reserved.
36	24	SMF72CYC	4	packed	Sampling cycle length, in the form 000*ttttF*, where *tttt* is the milliseconds and *F* is the sign (taken from CYCLE option). The range of values is 0.050 to 9.999 seconds.
40	28	SMF72MVS	8	EBCDIC	MVS software level (consists of an acronym and the version, release, and modification level - ZV*vvrrmm*).
48	30	SMF72IML	1	binary	Indicates the type of processor complex on which data measurements were taken. **Value** **Meaning** **3** 9672, zSeries
49	31	SMF72PRF	1	binary	Processor flags. **Bit** **Meaning When Set** **0** The system has expanded storage **1** The processor is enabled for ES connection architecture (ESCA) **2** There is an ES connection director in the configuration **3** System is running in z/Architecture mode **4** IFA processors available. **5-7** Reserved.
50	32	SMF72PTN	1	binary	PR/SM partition number of the partition that wrote this record.
51	33	SMF72SRL	1	binary	SMF record level change number (X'4A' for z/OS V1R7 RMF). This field enables processing of SMF record level changes in an existing release.
52	34	SMF72IET	8	char	Interval expiration time token. This token can be used to identify other than RMF records that belong to the same interval (if interval was synchronized with SMF).
60	3C	SMF72LGO	8	binary	Offset GMT to local time (STCK format).

Offsets		Name	Length	Format	Description
68	44	SMF72RAO	4	binary	Offset to reassembly area relative to start of RMF product section.
72	48	SMF72RAL	2	binary	Length of reassembly area. Area consists of a fixed header and a variable number of information blocks. Length depends on the record type/subtype, but is fixed for a specific type/subtype.
74	4A	SMF72RAN	2	binary	Reassembly area indicator. **Value** **Meaning** **0** Record is not broken. **1** Record is broken. **Note:** This field is used to indicate whether an SMF record is a broken record. Therefore, offset (SMF72RAO) and length (SMF72RAL) are only valid if SMF72RAN = 1. A reassembly area is only present in broken records.
76	4C	SMF72OIL	2	binary	Original interval length as defined in the session or by SMF (in seconds).
78	4E	SMF72SYN	2	binary	SYNC value in seconds.
80	50	SMF72GIE	8	binary	Projected gathering interval end (STCK format) GMT time.
88	58	SMF72XNM	8	EBCDIC	Sysplex name as defined in parmlib member COUPLExx.
96	60	SMF72SNM	8	EBCDIC	System name for current system as defined in parmlib member IEASYSxx SYSNAME parameter.
Reassembly Area:					
0	0	SMF72RBR	2	binary	Total number of broken records built from the original large record.
2	2	SMF72RSQ	2	binary	Sequence number of this broken record. Every broken record built from the same large record must have a unique sequence number, it is in the range from 1 to SMF72RBR.
4	4	SMF72RIO	4	binary	Offset to first reassembly information block relative to start of reassembly area header.
8	8	SMF72RIL	2	binary	Length of reassembly information block.
10	A	SMF72RIN	2	binary	Number of reassembly information blocks (same value as SMF72TRN in header section).
12	C		4		Reserved.
Reassembly Area Information Block:					
0	0	SMF72RNN	2	binary	Total number of sections in the original large record. This field contains information of how many sections of a specific type were contained in the original SMF record. This field is a copy of the number field of the triplet in the original (non broken) record.
2	2	SMF72RPP	2	binary	Position of the first of one or more consecutive sections described by this block as in the original record. Values in the range of 1 to SMF72RNN are valid for correct processing. A value of 0 will skip processing of this information block. This field provides information where the sections that are part of this broken record were placed in the original record before the split took place. The actual number of consecutive sections contained in this record is available from the actual triplet in the header extension.

Subtype 1 — Workload Activity (Compatibility Mode)

Important

Beginning with z/OS V1R3, WLM compatibility mode is no longer available. Accordingly, subtype 1 of record type 72 is no longer valid. The information has been left here for reference purposes, and for use on backlevel systems.

Workload Control Section

Offsets		Name	Length	Format	Description
0	0	SMF72FG1	1	binary	Flags **Bit** **Meaning When Set** **0-2** Reserved **3** WLM I/O priority management **4** RCAA data not available, RC=8/RSN=831 from IWMRCOLL interface **5** Account information used **6** Report class **7** Change to performance sensitive variable was made.
1	1		1		Reserved.
2	2	SMF72SUB	2	binary	Subcategory code, control or report performance group (PG) number.
4	4	SMF72HPG	2	binary	Highest PG number defined in installation performance specification (IPS) or installation control specification (ICS).
6	6	SMF72IPS	8	EBCDIC	Name of IPS.
14	E		6		Reserved.
20	14	SMF72ERF	6	EBCDIC	Enqueue residency value (ERV) resource manager coefficient.
26	1A	SMF72ISD	4	EBCDIC	Input output controller (IOC) service definition coefficient.
30	1E	SMF72CSD	4	EBCDIC	CPU service definition coefficient.
34	22		4		Reserved.
38	26	SMF72SSD	4	EBCDIC	SRB service definition coefficient.
42	2A	SMF72OPT	8	EBCDIC	Name of IEAOPT*xx* parmlib member (which is described in *z/OS MVS Initialization and Tuning Reference*).
50	32	SMF72ICS	8	EBCDIC	Name of IEAICS*xx* parmlib member (which is described in *z/OS MVS Initialization and Tuning Reference*).
58	3A	SMF72SYS	4	EBCDIC	Name of subsystem associated with this PGN (performance group number). These names are specified in the IAEICS*xx* parmlib member (which is described in *z/OS MVS Initialization and Tuning Reference*).
62	3E	SMF72CLS	10	EBCDIC	Name of class associated with this PGN.
72	48	SMF72USR	10	EBCDIC	User identifier associated with this PGN.
82	52	SMF72NAM	10	EBCDIC	Name of transaction associated with this PGN.
92	5C	SMF72ADJ	4	binary	CPU time per service unit (in microseconds), multiplied by 16. RMF uses this field to derive the number of service units per CPU second.
96	60	SMF72MSD	8	EBCDIC	Main storage origin (MSO) service definition coefficient.
104	68	SMF72SRV	10	EBCDIC	Service class name.
114	72		2		Reserved.

Performance Group Period Data Section

There is one section per period.

Offsets		Name	Length	Format	Description
0	0	SMF72TTX	4	binary	Number of transactions terminated during this period.
4	4	SMF72ACT	4	binary	Active time of all transactions, in 1024-microsecond units. This field includes the total time that each transaction was in central storage plus any swapped-out time that the transactions were *not* in a long “wait” state. It does not include time between job steps for batch transactions.
8	8	SMF72SER	4	binary	Service used in all transactions. This is the sum of central storage, CPU, I/O, and SRB service units.
12	C	SMF72TTM	4	binary	Elapsed time accumulated by all transactions that terminated in this PG period, in 1024-microsecond units.
16	10		4		Reserved.
20	14	SMF72MTS	4	binary	Main storage total service units.
24	18	SMF72ITS	4	binary	I/O total service units.
28	1C	SMF72CTS	4	binary	CPU total service units.
32	20	SMF72TAT	4	binary	Transaction residency time, in 1024-microsecond units. This field does not include time between job steps for batch transactions. **Note:** This is swapped-time only.
36	24	SMF72SPP	4	binary	Number of swap sequences in period.
40	28	SMF72CDN	2	binary	Domain number. Ignored for report PGs.
42	2A		1		Reserved.
43	2B	SMF72TSG	1	binary	Time slice group number. Ignored for report PGs.
44	2C	SMF72STS	4	binary	SRB total service units.
48	30	SMF72ET1	4	binary	The first four bytes of the sum of the squares of the elapsed times accumulated by all ended transactions; this field is used to calculate standard deviation.
52	34	SMF72ET2	4	binary	The second four bytes of the sum of the squares.
56	38	SMF72PIN	4	binary	Number of page-ins.
60	3C	SMF72FT1	4	binary	The first four bytes of the active frame-time in 1024-microsecond units.
64	40	SMF72FT2	4	binary	The second four bytes of the active frame-time in 1024-microsecond units.
68	44	SMF72HIN	4	binary	Number of page-ins of hiperspaces per CPU second from auxiliary to central storage.
72	48	SMF72HRM	4	binary	Number of ESO hiperspace read misses (a read miss is an attempt to read a frame that is not in expanded storage).
76	4C	SMF72BPI	4	binary	Number of blocked pages paged-in.
80	50	SMF72PIE	4	binary	Total number of unblocked pages paged in from expanded storage. This includes the first page of each block.
84	54	SMF72BPE	4	binary	Number of blocked pages paged in from expanded storage. This does not include the first page of each block.
88	58	SMF72BKA	4	binary	Number of blocks paged in from auxiliary storage.
92	5C	SMF72BKE	4	binary	Total number of blocks paged in from expanded storage.
96	60	SMF72ER1	4	binary	The first four bytes of the expanded storage frame residency time in 1024-microsecond units.
100	64	SMF72ER2	4	binary	The second four bytes of the expanded storage frame residency time in 1024-microsecond units.
104	68	SMF72RCT	4	binary	Region control task (RCT) time in microseconds.
108	6C	SMF72IIT	4	binary	I/O interrupt processing time in microseconds.
112	70	SMF72HST	4	binary	Hiperspace service time in microseconds.

Offsets		Name	Length	Format	Description
116	74	SMF72TST	4	binary	Total system transaction time of ended transactions. This time, in 1024-microsecond units, is measured from the point of entry to the point of termination.
120	78	SMF72CUS	4	binary	CPU using samples.
124	7C	SMF72TOT	4	binary	Total delay samples used in the SRM execution velocity calculation. With WLM I/O support, this also includes I/O delay samples.
128	80	SMF72SRS	8	floating	Total shared page residency time in 1024-microsecond units (not included in SMF72FT1 and SMF72FT2).
136	88	SMF72SPA	8	floating	Total shared page-ins from auxiliary storage (not included in SMF72BKA). **Note:** Each shared page-in is reflected only once: for that workload that caused the page-in.
144	90	SMF72SPE	8	floating	Total shared page-ins from expanded storage (not included in SMF72BPE).
152	98	SMF72ICT	8	floating	Total non-paging DASD connect time in 128-microsecond units.
160	A0	SMF72IWT	8	floating	Total non-paging DASD wait time (control unit queue time plus pending time) in 128-microsecond units. This field does not include IOS queue time.
168	A8	SMF72IDT	8	floating	Total non-paging DASD disconnect time in 128-microsecond units.
176	B0	SMF72IRC	4	binary	Total non-paging DASD I/O start subchannel count.
180	B4	SMF72TOU	4	binary	Total using samples. Velocity should be calculated as SMF72TOU divided by the sum of SMF72TOU and SMF72TOT.
184	B8	SMF72IOU	4	binary	Total I/O using samples. These are included in SMF72TOU. Only non-paging DASD I/O can contribute to I/O using.
188	BC	SMF72NDI	4	binary	Non-DASD I/O using or delay samples.
192	C0	SMF72IOD	4	binary	Total I/O delays.
196	C4	SMF72TSA	8	floating	Total execution samples. It is the sum of RCAETOTU, RCAETOTD, RCAEUNKN, and RCAEIDLE. Also always includes I/O using/delay samples whether or not I/O samples are included in RCAETOTU or RCAETOTD, respectively.
204	CC	SMF72IOT	8	floating	Total DASD IOS queue time in 128-microsecond units.
212	D4	SMF72QDT	4	binary	Total queue delay time 1024-microsecond units. For batch jobs, this is the time jobs spent on the job queue while eligible to run on some system. It represents the time the jobs spent waiting for an initiator. For TSO users, this time can be a portion of the LOGON process. For APPC, this is the time an APPC request spent on an APPC queue.
The following three values only apply to batch jobs, they are zero for other work types:					
216	D8	SMF72ADT	4	binary	Total time (in 1024-microsecond units) batch jobs were ineligible to run because a resource that the job had affinity to was unavailable.
220	DC	SMF72CVT	4	binary	Total time (in 1024-microsecond units) batch jobs spent in JCL conversion.
224	E0	SMF72IQT	4	binary	Total time (in 1024-microsecond units) batch jobs spent on job queue (after JCL conversion) while ineligible to run on any system for reasons other than resource affinities. Batch jobs were ineligible to run because a resource that the job had affinity to was unavailable.
228	E4	SMF72IEA	4	binary	Independent enclave total transaction active time (in 1024-microsecond units) for enclaves that originated on this system.

Offsets		Name	Length	Format	Description
232	E8	SMF72XEA	4	binary	Exported enclave total transaction active time (in 1024-microsecond units).
236	EC	SMF72FEA	4	binary	Foreign enclave total transaction active time (in 1024-microsecond units).

Subtype 2 — Storage Data (Compatibility Mode)

Important
Beginning with z/OS V1R3, WLM compatibility mode is no longer available. Accordingly, subtype 2 of record type 72 is no longer valid. The information has been left here for reference purposes, and for use on backlevel systems.

Workload Control Section

Offsets		Name	Length	Format	Description
0	0	R722TSR	2	binary	Number of small records written during interval.
2	2		2		Reserved.
4	4	R722TOT	4	binary	Total number of data sections recorded during interval.
8	8	R722NXT	4	binary	Number of data sections in following records.
12	C	R722IPS	8	EBCDIC	Name of IPS.

Performance Group Data Section

There is one section per performance group or domain.

Offsets		Name	Length	Format	Description
0	0	R722PG	2	binary	Performance group number.
2	2	R722DMN	2	binary	Domain number.
4	4	R722USER	4	binary	Average number of users in this performance group/domain for the interval.
8	8	R722ACTV	4	binary	Average number of active users found in this performance group/domain for the interval. Includes all using and delayed users, including those that are out and ready.
12	C	R722PAGE	4	binary	Sum of all paging-delay samples. Includes all page-in delays, including VIO. Divide by SMF72SAM to get the average number of delayed users.
16	10	R722SWAP	4	binary	Sum of all swap-in delay samples. Divide by SMF72SAM to get the average number of delayed users.
20	14	R722OUTR	4	binary	Sum of all out and ready delay samples. Divide by SMF72SAM to get the average number of delayed users.
24	18	R722ACTF	4	binary	Sum of all frames held by active users, for all samples. Divide by R722ACTS to get the average number of active frames (working set) for each user in the group. Divide by SMF72SAM to get the average number of frames held by active users for the entire group. **Note:** Numbers are stored as fullword data. This might cause overrun situations for long measurement intervals. In case of an overrun the value of the field is given as X'7FFFFFFF'. See field R72ACFF.
28	1C	R722ACTS	4	binary	Sum of sample counts for all active users (except OUTR).

Offsets		Name	Length	Format	Description
32	20	R722IDLE	4	binary	Sum of all frames held by idle users, for all samples. Divide by R722IDLS to get the average number of idle frames for each user in the group. Divide by SMF72SAM to get the average number of frames held by idle users for the entire group. **Note:** Numbers are stored as fullword data. This might cause overrun situations for long measurement intervals. In case of an overrun the value of the field is given as X'7FFFFFFF'. See field R72IDLE.
36	24	R722IDLS	4	binary	Sum of sample counts for all idle users.
40	28	R722PGIN	4	binary	Sum of all page-ins. Divide by the interval length to get the page-in rate for the group.
44	2C	R722SLOT	4	binary	Sum of all auxiliary-storage paging slots used by the group, at every sample. Divide by SMF72SAM to get the average number of slots used by the group. Divide that result by R722USER to get the average number of slots per user. **Note:** Numbers are stored as fullword data. This might cause overrun situations for long measurement intervals. In case of an overrun the value of the field is given as X'7FFFFFFF'. See field R72SLTF.
48	30	R722DIV	4	binary	Sum of all data-in-virtual frames used by the group, at every data-in-virtual sample. Divide by R722DIVS to get the average number of data-in-virtual frames per data-in-virtual user. **Note:** Numbers are stored as fullword data. This might cause overrun situations for long measurement intervals. In case of an overrun the value of the field is given as X'7FFFFFFF'. See field R72DIVF.
52	34	R722DIVS	4	binary	Sum of all data-in-virtual samples taken for all data-in-virtual users in the group.
56	38	R722FIX	4	binary	Sum of all fixed frames held by users in the group. Divide by SMF72SAM to get the average number of fixed frames used by the group. **Note:** Numbers are stored as fullword data. This might cause overrun situations for long measurement intervals. In case of an overrun the value of the field is given as X'7FFFFFFF'. See field R72FIXF.
60	3C	R722ET	8	binary	Total elapsed time (in 1024-microsecond units) for all ended transactions in the group. Queued time is not included.
68	44	R722QT	8	binary	Total time (in 1024-microsecond units) spent on JES or APPC queues by all ended transactions in the group.
76	4C	R722END	4	binary	The number of ended transactions in the group.
80	50	R722UPRO	4	binary	Total processor using samples for the group.
84	54	R722UDEV	4	binary	Total device using samples for the group.
88	58	R722DPRO	4	binary	Total processor delay samples for the group.
92	5C	R722DDEV	4	binary	Total device delay samples for the group.
96	60	R722DSTO	4	binary	Total storage delay samples for the group.
100	64	R722DJES	4	binary	Total JES delay samples for the group.
104	68	R722DHSM	4	binary	Total HSM delay samples for the group.
108	6C	R722DXCF	4	binary	Total XCF delay samples for the group.
112	70	R722DENQ	4	binary	Total ENQ delay samples for the group.
116	74	R722DMNT	4	binary	Total mount delay samples for the group.
120	78	R722DMSG	4	binary	Total message delay samples for the group.
124	7C	R722UNKN	4	binary	Total unknown state samples for the group.
128	80	R722VALD	4	binary	Total valid samples for the group. This includes the sum of all using, delay, idle and unknown single-state samples.

Offsets		Name	Length	Format	Description
132	84	R722LSCT	4	binary	Count of ‘long’ logical swaps for the group.
136	88	R722ESCT	4	binary	Count of ‘long’ swaps to expanded storage for the group.
140	8C	R722PSCT	4	binary	Count of ‘long’ physical swaps for the group.
144	90	R722LSCF	4	floating	Sum of all central frames for all logically swapped users at all samples.
148	94	R722LSEF	4	floating	Sum of all expanded frames for all logically swapped users at all samples.
152	98	R722LSSA	4	binary	Total logically swapped samples for the group.
156	9C	R722PSEF	4	floating	Sum of all expanded frames for all swapped users (excluding logically swapped users) at all samples.
160	A0	R722PSSA	4	binary	Total swapped samples (excluding logically swapped samples) for the group.
164	A4	R722VECT	4	binary	Total vector utilization time (in units of milliseconds) for the group.
168	A8	R722ACFF	4	floating	The sum, stored as floating point data, contains the correct value of all active frames.
172	AC	R722IDLF	4	floating	The sum, stored as floating point data, contains the correct value of all idle frames.
176	B0	R722SLTF	4	floating	The sum, stored as floating point data, contains the correct value of all slots used.
180	B4	R722DIVF	4	floating	The sum, stored as floating point data, contains the correct value of all data-in-virtual frames.
184	B8	R722FIXF	4	floating	The sum, stored as floating point data, contains the correct value of all fixed frames.
188	BC	R722TSV	8	floating	Sum of shared page views.
196	C4	R722VIN	8	floating	Sum of shared pages in central storage, that are valid.
204	CC	R722VLC	8	floating	Sum of shared page validations.
212	D4	R722GPI	8	floating	Sum of shared page-ins from auxiliary storage.

Swap Reason Section

Offsets		Name	Length	Format	Description
0	0	R722OR1	4	binary	STOR/OUTR delay samples for terminal output wait (swap reason in 1).
4	4	R722OR2	4	binary	STOR/OUTR delay samples for terminal input wait (swap reason in 2).
8	8	R722OR3	4	binary	STOR/OUTR delay samples for long wait (swap reason in 3).
12	C	R722OR4	4	binary	STOR/OUTR delay samples for auxiliary storage shortage (swap reason in 4).
16	10	R722OR5	4	binary	STOR/OUTR delay samples for real storage shortage (swap reason in 5).
20	14	R722OR6	4	binary	STOR/OUTR delay samples for detected long wait (swap reason in 6).
24	18	R722OR7	4	binary	STOR/OUTR delay samples for requested swap (swap reason in 7).
28	1C	R722OR8	4	binary	STOR/OUTR delay samples for enqueue exchange swap (swap reason in 8).
32	20	R722OR9	4	binary	STOR/OUTR delay samples for exchange swap (swap reason in 9).
36	24	R722OR10	4	binary	STOR/OUTR delay samples for unilateral swap (swap reason in 10).

Offsets		Name	Length	Format	Description
40	28	R722OR11	4	binary	STOR/OUTR delay samples for transition swap (swap reason in 11).
44	2C	R722OR12	4	binary	STOR/OUTR delay samples for improved central storage usage (swap reason in 12).
48	30	R722OR13	4	binary	STOR/OUTR delay samples for improved system paging rate (swap reason in 13).
52	34	R722OR14	4	binary	STOR/OUTR delay samples for making room for an out-too-long user (swap reason in 14).
56	38	R722OR15	4	binary	STOR/OUTR delay samples for APPC wait (swap reason in 15).
60	3C	R722OR16	4	binary	STOR/OUTR delay samples for OMVS input wait (swap reason in 16).
64	40	R722OR17	4	binary	STOR/OUTR delay samples for OMVS output wait (swap reason in 17).
68	44	R722OR18	4	binary	STOR/OUTR delay samples for in-real swap (swap reason in 18).

Subtype 3 — Workload Activity

Workload Manager Control Section

Offsets		Name	Length	Format	Description
0	0	R723MSCF	1	binary	Service/Report class flags. **Bit** **Meaning When Set** **0** This is a report class **1** Workload activity data not available **2** Policy data not available **3** Execution velocity includes I/O delays **4** Indicator for CPU protection **5** Indicator for storage protection **6** Indicator for dynamic alias tuning **7** Reserved.
1	1	R723MFLG	1	binary	Flags. **Bit** **Meaning When Set** **0** Indicator for IFA crossover **1** Indicator for IFA honour priority **2-7** Reserved.
2	2		2		Reserved.
4	4	R723MNSP	8	EBCDIC	Policy name.
12	C	R723MDSP	32	EBCDIC	Policy description.
44	2C	R723MTPA	8	binary	Local time/date of policy activation (STCK format).
52	34	R723MCPU	4	binary	CPU service coefficient * 10,000
56	38	R723MIOC	4	binary	I/O service coefficient * 10,000
60	3C	R723MMSO	4	binary	Storage service coefficient * 10,000. When being used in calculations, apply the following scaling: R723MMSO/10000*4096/50+1. For details see *z/OS MVS Planning: Workload Management*, *Chapter 11. Defining Service Coefficients and Options*.
64	40	R723MSRB	4	binary	SRB service coefficient * 10,000
68	44	R723MTVL	4	binary	WLM sample interval (in milliseconds).
72	48	R723MTV#	4	binary	Number of times when WLM sampling code ran.
76	4C	R723MOPT	2	EBCDIC	Suffix of the IEAOPTxx parmlib member.
78	4E		2		Reserved.

Offsets		Name	Length	Format	Description
80	50	R723MWNM	8	EBCDIC	Workload name.
88	58	R723MWDE	32	EBCDIC	Workload description.
120	78	R723MCNM	8	EBCDIC	Service/Report class name.
128	80	R723MCDE	32	EBCDIC	Service/Report class description.
160	A0	R723MCPG	2	binary	Number of periods belonging to this service or report class.
162	A2	R723MSUB	1	binary	Number of entries in the work/resource manager state section belonging to a subsystem.
163	A3		3		Reserved.
166	A6	R723MERF	6	EBCDIC	Enqueue residency CPU service factor.
172	AC	R723MADJ	4	binary	Adjustment factor for CPU rate.
176	B0	R723MIDN	8	EBCDIC	Service definition name.
184	B8	R723MIDD	32	EBCDIC	Service definition description.
216	D8	R723MTDI	8	binary	Local time/date the service definition was installed (STCK format).
224	E0	R723MIDU	8	EBCDIC	Userid that installed the service definition.
232	E8	R723CLSC	8	EBCDIC	Service class that last contributed to this report class. Blank if this is a service class.
240	F0	R723NFFI	4	binary	Normalization factor for IFA service time. Used to convert between real IFA times and ″normalized″ IFA times, that is, the equivalent time on a standard CP. Multiply R723IFAT by this value and divide by 256 to calculate the normalized IFA time.

Service Class Served Data Section

Offsets		Name	Length	Format	Description
0	0	R723SCSN	8	EBCDIC	Name of service class being served (by one or more address spaces in service class R723MCNM).
8	8	R723SCS#	4	binary	Number of times an address space running in service class R723MCNM was observed serving the served service class R723SCSN.

Resource Group Data Section

Offsets		Name	Length	Format	Description
0	0	R723GGNM	8	EBCDIC	Resource group name.
8	8	R723GGDE	32	EBCDIC	Resource group description.
40	28	R723GGLT	1	binary	Resource group flags. **Bit** **Meaning When Set** **0** Maximum capacity was specified **1** Minimum capacity was specified **2-7** Reserved.
41	29		3		Reserved.
44	2C	R723GGMN	4	binary	If R723GMNS = ON, minimum sysplex capacity strived for in unweighted TCB+SRB service units per seconds, otherwise 0.
48	30	R723GGMX	4	binary	If R723GMXS = ON, maximum sysplex capacity allowed in unweighted TCB+SRB service units per seconds, otherwise 0.

Service/Report Class Period Data Section

There is one section per service or report class period.

Offsets		Name	Length	Format	Description
0	0	R723CRTX	2	binary	Index into the response time distribution count table in the response time distribution data section. These buckets exist only for periods with a response time goal. Example: If the service class has six service class periods, and the periods 1, 3, and 5 have a response time goal, then this index has the following values: **Period** **Index into Response Time Distribution Count Table** **1** 1 **2** 0 **3** 2 **4** 0 **5** 3 **6** 0
2	2	R723CWMX	2	binary	Index into the work/resource manager states area.
4	4	R723CWMN	2	binary	Number of entries in the work/resource manager states area associated with this period (R723CWMX points to the first entry).
6	6	R723CRS1	1	binary	Report class period flags. **Bit** **Meaning When Set** **0** This report class period is heterogeneous. **1-7** Reserved.
7	7	R723CADF	1	binary	Data flags - they indicate the availability of actual measured data in one of the subsections being a part of this section. **Bit** **Meaning When Set** **0** Resource consumption data available **1** Response time data available **2** General execution delay data available **3-7** Reserved.
Goals: For a report class period, these are the goals of the service class period that last contributed to this report class period. For a homogeneous report class period, this goal has to be used to format the response time distribution.					
8	8	R723CPER	1	binary	Service or report class period number.
9	9	R723CRTF	1	binary	Response time flags (indicates units for R723CVAL). **Bit** **Meaning When Set** **0** Response time specified in milliseconds. **1** Response time specified in seconds. **2** Response time specified in minutes. **3** Response time specified in hours. **4-7** Reserved.
10	A	R723CRGF	1	binary	Response time goal flags. **Bit** **Meaning When Set** **0** Percentile response time goal. **1** Average response time goal. **2** Execution velocity goal. **3** Discretionary goal. **4** System specified goal. **5-7** Reserved.
11	B		1		Reserved.
12	C	R723CVAL	4	binary	Response time or execution velocity goal - or zero if discretionary or system goal. Units are defined in R723CRTF.
16	10	R723CPCT	2	binary	Goal percentile value (in percentage).

Offsets		Name	Length	Format	Description
18	12	R723CIMP	2	binary	Importance of the goal to be achieved for this period (1=highest, 5=lowest). The value is zero for a discretionary or system goal.
20	14	R723CDUR	4	binary	Period duration in weighted service units, or zero for the last period.
Resource Consumption Data - Actual measured values: All service units are weighted by the coefficients in the active service policy.					
24	18	R723CSRV	8	floating	Total service units.
32	20	R723CCPU	8	floating	Total TCB service units.
40	28	R723CIOC	8	floating	Total IOC service units.
48	30	R723CMSO	8	floating	Total central storage service units.
56	38	R723CSRB	8	floating	Total SRB service units.
64	40	R723CPIR	8	floating	Total page-in count.
72	48	R723CHPI	8	floating	Total hiperspace page-in count. This value includes only those hiperspace pages that were moved by the Real Storage Manager and not by the MVPG instruction.
80	50	R723CBPI	8	floating	Total block page-in from auxiliary count.
88	58	R723CPIE	8	floating	Total page-in from expanded count.
96	60	R723CBPE	8	floating	Total block page-in from expanded count.
104	68	R723CBKA	8	floating	Total auxiliary blocks paged in.
112	70	R723CBKE	8	floating	Total expanded blocks paged in.
120	78	R723CPRS	8	floating	Total page residency time (1024-microsecond units).
128	80	R723CERS	8	floating	Total expanded page residency time (1024-microsecond units).
136	88	R723CTRR	8	floating	Total in storage residency time (1024-microsecond units).
144	90	R723CTAT	8	floating	Total transaction active time (1024-microsecond units).
152	98	R723CRCT	8	floating	Total RCT time (microseconds).
160	A0	R723CIIT	8	floating	Total I/O interrupt time (microseconds).
168	A8	R723CHST	8	floating	Total hiperspace service time (microseconds).
176	B0	R723CSWC	4	binary	Total swap count.
180	B4	R723CCRM	4	binary	Total hiperspace ESO read miss count.
Response Time Data - Actual measured values:					
184	B8	R723CRCP	4	binary	Count of transaction completions for this period. This field includes transaction completions reported by subsystem work managers via the IWMRPT service.
188	BC	R723CARC	4	binary	Count of transactions that completed abnormally as reported by subsystem work manager. This value is not part of R723CRCP and should not be used for response time calculations.
192	C0	R723CNCP	4	binary	Count of transactions that completed their execution phase as reported by subsystem work managers via the IWMNTFY service.
196	C4	R723CANC	4	binary	Count of transactions that completed their execution phase abnormally as reported by subsystem work Manager. This value is not part of R723CNCP and should not be used for execution response time calculations.
200	C8	R723CTET	8	floating	Total transaction elapsed time (1024-microsecond units).
208	D0	R723CXET	8	floating	Total transaction execution time (1024-microsecond units).
216	D8	R723CETS	8	floating	Sum of transaction elapsed times squared (1024-microsecond units).
General Execution Delay Data - Actual measured values:					

Offsets		Name	Length	Format	Description
224	E0	R723CCUS	4	binary	CPU using samples. These are included in R723CTOU.
228	E4	R723CTOT	4	binary	Total general execution delay samples used in WLM's execution velocity calculation. For the velocity formula, see *z/OS MVS Planning: Workload Management*.
The following categories of samples represent general execution delays that are included in R723CTOT. Each counter was incremented by one every time the WLM sampler found the appropriate condition.					
232	E8	R723CCDE	4	binary	CPU delay. A TCB or SRB is waiting to be dispatched or a TCB is waiting for local lock.
236	EC	R723CCCA	4	binary	CPU capping delay. A TCB or SRB is marked non-dispatchable because a resource group maximum is being enforced. Note that R723CCCA is NOT a subset of R723CCDE.
240	F0	R723CSWI	4	binary	Swap-in delay. Swap-in has started, but not completed.
244	F4	R723CMPL	4	binary	MPL delay. Ready but swap-in has not started.
248	F8	R723CAPR	4	binary	Auxiliary page from private.
252	FC	R723CACO	4	binary	Auxiliary page from common.
256	100	R723CAXM	4	binary	Auxiliary page from cross memory.
260	104	R723CVIO	4	binary	Auxiliary page from VIO.
264	108	R723CHSP	4	binary	Auxiliary page from standard hiperspaces.
268	10C	R723CCHS	4	binary	Auxiliary page from ESO hiperspaces.
The following categories of samples are not included in R723CTOT:					
272	110	R723CUNK	4	binary	Unknown. Address space or enclave is waiting, but none of the above general execution delays apply.
276	114	R723CIDL	4	binary	Idle. Address space or enclave is in STIMER wait, TSO terminal wait, APPC wait, or an initiator waiting for work.
280	118	R723CPDE	4	binary	Resource group capping count. Group maximum is being enforced for work in this class.
284	11C	R723CPQU	4	binary	Quiesce count. Some work in this service class has been reset via the RESET xxx, QUIESCE command.
Additional General Execution Delay Data - Actuals:					
288	120	R723CSAC	4	binary	Sampled address space count. Number of address spaces that contributed delay and using samples to this class.
292	124	R723CSRS	8	floating	Total shared page residency time in 1024-microsecond units.
The following categories of samples represent general execution delays that are included in R723CTOT. Each counter was incremented by one every time the WLM sampler found the appropriate condition.					
300	12C	R723CSPA	8	floating	Total shared page-ins from auxiliary storage.
308	134	R723CSPE	8	floating	Total shared page-ins from expanded storage.
Additional Resource Consumption Data:					
316	13C	R723CICT	8	floating	Total non-paging DASD connect time in 128-microsecond units.
324	144	R723CIWT	8	floating	Total non-paging DASD wait time (queue time + pending time) in 128-microsecond units.
332	14C	R723CIDT	8	floating	Total non-paging DASD disconnect time in 128-microsecond units. This does not include IOS queue time.
340	154	R723CIRC	4	binary	Total non-paging DASD I/O start subchannel count. This can be used with the above fields (R723CICT, R723CIWT, and R723CIDT) to determine the average DASD response time for the period.
Additional General Execution Delay Data – Actuals:					
344	158	R723CTOU	4	binary	Total using samples. For the velocity formula, see *z/OS MVS Planning: Workload Management*.

Offsets		Name	Length	Format	Description
348	15C	R723CIOU	4	binary	DASD using samples. Only non-paging DASD I/O can contribute to I/O using samples.
The following categories of samples represent general execution delays. Each counter was incremented by one every time the WLM sampler found the appropriate condition.					
352	160	R723CIOD	4	binary	DASD delay samples.
356	164	R723CQ	4	binary	Queue delay samples, work is waiting for a server.
360	168	R723CSPV	4	binary	Server private area paging delay samples.
364	16C	R723CSVI	4	binary	Server space VIO paging delay samples.
368	170	R723CSHS	4	binary	Server hiperspace paging delay samples.
372	174	R723CSMP	4	binary	Server MPL delay samples.
376	178	R723CSSW	4	binary	Server swap-in delay samples.
Non-DASD I/O Using or Delay Samples:					
380	17C	R723CNDI	4	binary	Non-DASD I/O using or delay samples.
384	180	R723CTDQ	4	binary	Total delay samples always including batch queue delay. For service classes that contain batch jobs that were not run in WLM managed initiators the batch queue delay samples are derived from the measured batch queue delay time. For service classes that contain jobs that ran in WLM managed initiators this value is the same as RCEATOTD. RCAETOTDQ can be used as a migration aid to determine what a batch service class period's velocity will be if its jobs are run in WLM managed initiators.
388	184	R723CTSA	8	floating	Total execution samples. It is the sum of RCAETOTU, RCAETOTD, RCAEUNKN, RCAEIDLE.
396	18C	R723CIOT	8	floating	Total DASD IOS queue time in 128-microsecond units.
404	194	R723CQDT	8	floating	Total queue delay time in 1024-microsecond units. For batch jobs, this is the time jobs spent on the job queue while eligible to run on some system. It represents the time the jobs spent waiting for an initiator. For TSO users, this time can be a portion of the LOGON process. For APPC, this is the time an APPC request spent on an APPC queue.
The following three values only apply to batch jobs, they are zero for other work types:					
412	19C	R723CADT	8	floating	Total time (in 1024-microsecond units) batch jobs were ineligible to run because a resource that the job had affinity to was unavailable.
420	1A4	R723CCVT	8	floating	Total time (in 1024-microsecond units) batch jobs spent in JCL conversion.
428	1AC	R723CIQT	8	floating	Total time (in 1024-microsecond units) batch jobs spent on job queue (after JCL conversion) while ineligible to run on any system for reasons other than resource affinities.
436	1B4	R723CIEA	8	floating	Independent enclave total transaction active time (in 1024-microsecond units) for enclaves that originated on this system.
444	1BC	R723CXEA	8	floating	Exported enclave total transaction active time (in 1024-microsecond units).
452	1C4	R723CFEA	8	floating	Foreign enclave total transaction active time (in 1024-microsecond units).
Crypto Using and Delay Samples:					
460	1CC	R723CAMU	4	binary	CAM crypto using samples: a TCB was found executing on a cryptographic asynchronous message processor.
464	1D0	R723CAMD	4	binary	CAM crypto delay samples: a TCB was found waiting for a cryptographic asynchronous message processor.

Offsets		Name	Length	Format	Description
468	1D4	R723APU	4	binary	AP crypto using samples: a TCB was found executing on a cryptographic assist processor.
472	1D8	R723APD	4	binary	AP crypto delay samples: a TCB was found waiting for a cryptographic assist processor.
476	1DC	R723FQD	4	binary	Feature queue delay samples: a TCB was found waiting on a processor feature queue associated with a CPU. This is a subset of R723CCDE. **Note:** R723CCUS includes feature queue using samples.
Report Class Period Data:					
480	1E0	R723PLSC	8	EBCDIC	Service class that last contributed to this report class period during this interval. Blank if this is a service class period.
488	1E8	R723RCOD	4	binary	Contention delay sample count. One sample is accumulated for each held resource which is reported to WLM by the resource manager via IWMCNTN.
492	1EC	R723RCOU	4	binary	Contention using sample count. One sample is accumulated for each resource in use which is reported to WLM by the resource manager via IWMCNTN.
496	1F0	R723ECTC	8	floating	CPU time consumed for an address space or enclave while dispatching priority was temporarily raised because the work held a resource that other work needed (in 1024 microsecond units).
504	1F8	R723IFAU	4	binary	IFA using samples.
508	1FC	R723IFCU	4	binary	IFA on CP using samples. If IFA honor-priority is set, these are included in R723CCUS. If not set, these are included in R723IFAU.
512	200	R723IFAD	4	binary	IFA delay samples.
516	204	R723IFAT	8	floating	IFA sevice time in microseconds (long floating point format). Multiply with R723NFFI and divide by 256 to calculate the equivalent time on a standard CP.
524	20C	R723IFCT	8	floating	IFA service time spent on CPs in microseconds (long floating point format).

Response Time Distribution Data Section

This section defines up to 9 arrays, each one represents 14 response time distribution buckets.

This section is available for each service or report class period with a response time goal.

Offsets		Name	Length	Format	Description
Response Time Distribution Map:					
0	0	R723TRDB	4	binary	50 Each map entry defines a maximum percentage of a goal. When used in conjunction with an entry in the response time distribution count table, it shows the number of transactions that completed in a percentage of a goal. The value of 50 means: 50% of the response time goal.
4	4		4	binary	60 - this value means: 60% of the goal response time.
8	8		4	binary	70 - this value means: 70% of the goal response time.
12	C		4	binary	80 - this value means: 80% of the goal response time.
16	10		4	binary	90 - this value means: 90% of the goal response time.
20	14		4	binary	100 - this value means: 100% of the goal response time.
24	18		4	binary	110 - this value means: 110% of the goal response time.

Offsets		Name	Length	Format	Description
28	1C		4	binary	120 - this value means: 120% of the goal response time.
32	20		4	binary	130 - this value means: 130% of the goal response time.
36	24		4	binary	140 - this value means: 140% of the goal response time.
40	28		4	binary	150 - this value means: 150% of the goal response time.
44	2C		4	binary	200 - this value means: 200% of the goal response time.
48	30		4	binary	400 - this value means: 400% of the goal response time.
52	34		4	binary	X'FFFFFFFF' - last entry : >400% of the goal response time.
Response Time Distribution Count Table: Arrays 1 - 8 (max number of periods) contain the counts for an associated period and are addressed by an index from the service/report class period data section (R723CRTX). Each entry contains the number of transactions that completed in the time period represented by that entry.					
0	0		4	binary	Count of completed transactions with: Response time ≤ 50% of the goal.
4	4		4	binary	Count of completed transactions with: Response time > 50% of the goal. Response time ≤ 60% of the goal.
8	8		4	binary	Count of completed transactions with: Response time > 60% of the goal. Response time ≤ 70% of the goal.
12	C		4	binary	Count of completed transactions with: Response time > 70% of the goal. Response time ≤ 80% of the goal.
16	10		4	binary	Count of completed transactions with: Response time > 80% of the goal. Response time ≤ 90% of the goal.
20	14		4	binary	Count of completed transactions with: Response time > 90% of the goal. Response time ≤ 100% of the goal.
24	18		4	binary	Count of completed transactions with: Response time > 100% of the goal. Response time ≤ 110% of the goal.
28	1C		4	binary	Count of completed transactions with: Response time > 110% of the goal. Response time ≤ 120% of the goal.
32	20		4	binary	Count of completed transactions with: Response time > 120% of the goal. Response time ≤ 130% of the goal.

Offsets		Name	Length	Format	Description
36	24		4	binary	Count of completed transactions with: Response time > 130% of the goal. Response time ≤ 140% of the goal.
40	28		4	binary	Count of completed transactions with: Response time > 140% of the goal. Response time ≤ 150% of the goal.
44	2C		4	binary	Count of completed transactions with: Response time > 150% of the goal. Response time ≤ 200% of the goal.
48	30	binary	4	binary	Count of completed transactions with: Response time > 200% of the goal. Response time ≤ 400% of the goal.
52	34		4	binary	Count of completed transactions with: Response time > 400% of the goal.

Work Manager/Resource Manager State Section

This section defines subsystem work manager delay arrays per service class period. Value R723CWMN in the service class period data section gives the number of entries in this section per service class period.

Entry in the subsystem work manager delay array.

There are always two entries for a subsystem:

- One for the begin_to_end phase
- One for the execution phase

The begin_to_end entry is always the first one.

Offsets		Name	Length	Format	Description
0	0	R723RTYP	4	EBCDIC	Subsystem type, as used in the classification rules specified in the WLM administrative application. The subsystem's documentation should explain the meaning that the product attributes to the various states.
4	4	R723RFLG	1	binary	Work/Resource manager flags. **Bit** **Meaning When Set** **0** States sampled in the begin_to_end phase of a transaction. **1** States sampled in the execution phase of a transaction. **2-7** Reserved.
5	5		3		Reserved.
8	8	R723RESS	4	binary	Total number of transaction states sampled in the phase specified by R723RFLG.
12	C	R723RACT	4	binary	Total number of active state samples. Active indicates that there is a program executing on behalf of the work request, from the perspective of the work manager. This does not mean that the program is active from the base control program's perspective.

Offsets		Name	Length	Format	Description
16	10	R723RRDY	4	binary	Total number of ready state samples. Ready indicates that there is a program ready to execute on behalf of the work request described by the monitoring environment, but the work manager has given priority to another work request.
20	14	R723RIDL	4	binary	Total number of idle state samples. Idle indicates that no work request is available to the work manager that is allowed to run.
24	18	R723RWLO	4	binary	Total number of waiting for lock state samples.
28	1C	R723RWIO	4	binary	Total number of waiting for I/O state samples. Waiting for I/O indicates that the work manager is waiting for an activity related to an I/O request. This may be an actual I/O operation or some other function associated with the I/O request.
32	20	R723RWCO	4	binary	Total number of waiting for conversation state samples. Waiting for conversation may have been used in conjunction with the WLM service IWMMSWCH to identify where the recipient of the conversation is located. In this case, only the switched state will be recorded.
36	24	R723RWDS	4	binary	Total number of waiting for distributed request state samples. Waiting for distributed request indicates a high level that some function or data must be routed prior to resumption of the work request. This is to be contrasted with waiting for conversation, which is a low level view of the precise resource that is needed. A distributed request could involve waiting on a conversation as part of its processing.
40	28	R723RWSL	4	binary	Total number of waiting for a session to be established locally samples. Waiting for a session to be established locally, i.e. on the current MVS image.
44	2C	R723RWSN	4	binary	Total number of waiting for a session to be established somewhere in the network samples.
48	30	R723RWSS	4	binary	Total number of waiting for a session to be established somewhere in the sysplex samples.
52	34	R723RWTM	4	binary	Total number of waiting for a timer samples.
56	38	R723RWO	4	binary	Total number of waiting for another product samples.
60	3C	R723RWMS	4	binary	Total number of waiting for unidentified resource samples. Waiting for unidentified resource, possibly among another more specific category, but which may not be readily determined.
64	40	R723RSSL	4	binary	Number of states representing transactions for which there are logical continuations on this MVS image. Subsystem work managers might set this state when they function ship a transaction to another component within the same MVS image.
68	44	R723RSSS	4	binary	Number of states representing transactions for which there are logical continuations on another MVS image in the sysplex. Subsystem work managers might set this state when they function ship a transaction to another component on another MVS image within the sysplex.

Offsets		Name	Length	Format	Description
72	48	R723RSSN	4	binary	Number of states representing transactions for which there are logical continuations somewhere within the network. Subsystem work managers might set this state when they function ship a transaction to another component within the network.
76	4C	R723RWST	4	binary	Total number of waiting for SSL thread samples.
80	50	R723RWRT	4	binary	Total number of waiting for regular thread samples.
84	54	R723RWWR	4	binary	Total number of waiting for work table registration samples.
88	58	R723RAPP	4	binary	Total number of active application state samples.
92	5C	R723RWNL	4	binary	Total number of state samples reflecting waiting for new latch.
96	60	R723RW01	4	binary	For future use.
100	64	R723RW02	4	binary	For future use.
104	68	R723RW03	4	binary	For future use.
108	6C	R723RW04	4	binary	For future use.
112	70	R723RW05	4	binary	For future use.
116	74		40		Reserved

Subtype 4 — Storage Data

Service Class Period Data Section

Offsets		Name	Length	Format	Description
0	0	R724PNAM	8	EBCDIC	Name of active service policy.
8	8	R724PTM	8	binary	Local time/date of policy activation (STCK format).
16	10	R724LCNM	8	EBCDIC	Service class name.
24	18	R724PER#	1	binary	Service class period number.
25	19		3		Reserved.
28	1C	R724USER	4	binary	Number of users found.
32	20	R724ACTV	4	binary	Number of active users found.
36	24	R724ACTS	4	binary	Number of active samples (except OUTR).
40	28	R724IDLS	4	binary	Number of idle samples.
44	2C	R724PAGE	4	binary	Number of users delayed for paging at all samples.
48	30	R724SWAP	4	binary	Number of users delayed for swapping at all samples.
52	34	R724OUTR	4	binary	Number of out and ready users at all samples.
56	38	R724PGIN	4	binary	Number of page-ins.
60	3C	R724DIVS	4	binary	Number of DIV samples.
64	40	R724LSSA	4	binary	Total logically swapped samples for the group.
68	44	R724PSSA	4	binary	Total swapped samples for the group (except logical).
72	48	R724UPRO	4	binary	Total processor using samples for the group.
76	4C	R724UDEV	4	binary	Total device using samples for the group.
80	50	R724DPRO	4	binary	Total processor delay samples for the group.
84	54	R724DDEV	4	binary	Total device delay samples for the group.
88	58	R724DSTO	4	binary	Total storage delay samples for the group.
92	5C	R724DJES	4	binary	Total JES delay samples for the group.
96	60	R724DHSM	4	binary	Total HSM delay samples for the group.
100	64	R724DXCF	4	binary	Total XCF delay samples for the group.
104	68	R724DENQ	4	binary	Total ENQ delay samples for the group.

Offsets		Name	Length	Format	Description
108	6C	R724DMNT	4	binary	Total mount delay samples for the group.
112	70	R724DMSG	4	binary	Total message delay samples for the group.
116	74	R724UNKN	4	binary	Total unknown state samples for the group.
120	78	R724VALD	4	binary	Total valid samples for the group (single state sum of all using, delay, idle, and unknown).
124	7C	R724LSCT	4	binary	Count of “long” logical swaps for the group.
128	80	R724ESCT	4	binary	Count of “long” swaps to expanded storage for the group.
132	84	R724PSCT	4	binary	Count of “long” physical swaps for the group.
136	88	R724ACTF	8	floating	Number of active frames.
144	90	R724IDLE	8	floating	Number of idle frames.
152	98	R724SLOT	8	floating	Number of slots used.
160	A0	R724DIV	8	floating	Number of DIV frames.
168	A8	R724FIX	8	floating	Number of fixed frames.
176	B0	R724LSCF	8	floating	Number of central frames for all logically swapped users at all samples.
184	B8	R724LSEF	8	floating	Number of expanded frames for all logically swapped users at all samples.
192	C0	R724PSEF	8	floating	Number of expanded frames for all swapped users (except logical) at all samples.
200	C8	R724VECT	8	floating	Total vector utilization time for the group (microseconds).
208	D0	R724ET	8	floating	Total elapsed time for all transactions that ended in the group. Does not include queued time (microseconds).
216	D8	R724QT	8	floating	Total time spent on JES or APPC queues by all transactions that ended in the group (microseconds).
224	E0	R724END	8	floating	Number of transactions that ended in the group (microseconds).
232	E8	R724TSV	8	floating	Sum of shared page views.
240	F0	R724VIN	8	floating	Sum of shared pages in central storage that are valid.
248	F8	R724VLC	8	floating	Sum of shared page validations.
256	100	R724GPI	8	floating	Sum of shared page-ins from auxiliary storage.

Swap Reason Data Section

Offsets		Name	Length	Format	Description
0	0	R724OR1	4	binary	STOR/OUTR delay samples for swap reason 1: Terminal output wait.
4	4	R724OR2	4	binary	STOR/OUTR delay samples for swap reason 2: Terminal input wait.
8	8	R724OR3	4	binary	STOR/OUTR delay samples for swap reason 3: Long wait.
12	C	R724OR4	4	binary	STOR/OUTR delay samples for swap reason 4: Auxiliary storage shortage.
16	10	R724OR5	4	binary	STOR/OUTR delay samples for swap reason 5: Real storage shortage.
20	14	R724OR6	4	binary	STOR/OUTR delay samples for swap reason 6: Detected long wait.
24	18	R724OR7	4	binary	STOR/OUTR delay samples for swap reason 7: Requested swap.
28	1C	R724OR8	4	binary	STOR/OUTR delay samples for swap reason 8: Enqueue exchange swap.
32	20	R724OR9	4	binary	STOR/OUTR delay samples for swap reason 9: Exchange swap.

Offsets		Name	Length	Format	Description
36	24	R724OR10	4	binary	STOR/OUTR delay samples for swap reason 10: Unilateral swap.
40	28	R724OR11	4	binary	STOR/OUTR delay samples for swap reason 11: Transition swap.
44	2C	R724OR12	4	binary	STOR/OUTR delay samples for swap reason 12: Improve central storage usage.
48	30	R724OR13	4	binary	STOR/OUTR delay samples for swap reason 13: Improve system paging rate.
52	34	R724OR14	4	binary	STOR/OUTR delay samples for swap reason 14: Make room for an out too long user.
56	38	R724OR15	4	binary	STOR/OUTR delay samples for swap reason 15: APPC wait.
60	3C	R724OR16	4	binary	STOR/OUTR delay samples for swap reason 16: OMVS input wait.
64	40	R724OR17	4	binary	STOR/OUTR delay samples for swap reason 17: OMVS output wait.
68	44	R724OR18	4	binary	STOR/OUTR delay samples for swap reason 18: In-real swap.

Record Type 73 (49) — RMF Channel Path Activity

Reference books

For information on using RMF, see *z/OS RMF User's Guide*.

For information on Monitor I and II, see *z/OS RMF Report Analysis*.

Record type 73 is written when channel path activity measurement is requested. Entries are created for all 256 theoretical possible channel paths in the system.

As with all records produced by RMF, this record contains a header section followed by the RMF product section. These are followed by:

Channel Path Control Section
Identifies number of times any channel path was busy. The SMF73CFL flag byte indicates (X'08') whether the record might include data sections that are not valid.

Channel Path Data Section
Identifies and gives information on each channel path. The SMF73FG3 flag byte indicates (X'02') whether the channel path is a real entry. This is of relevance only if the channel path control section indicates that invalid entries might occur.

Note: All fields with format *s_float* have the type *short format floating point*.

Macro to Symbolically Address Record Type 73: The SMF record mapping macro for all records produced by RMF is ERBSMFR. Its format is ERBSMFR (*n1*,*n2*,...) where *n1*, *n2*, ... are the SMF record types you want to map. Note that the parentheses are required only when two or more record types are specified. The mapping macro resides in SYS1.MACLIB.

Record Environment

The following conditions exist for the generation of this record:

Macro	SMFWTM (record exit: IEFU83)
Mode	Task
Storage Residency	31-bit

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF73LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	SMF73SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF73FLG	1	binary	System indicator **Bit** **Meaning When Set** **0** New record format **1** Subtypes used **2** Reserved **3-6** Version indicators* **7** System is running in PR/SM mode. *See “Standard SMF Record Header” on page 13-1 for a detailed description.
5	5	SMF73RTY	1	binary	Record type 73 (X'49').
6	6	SMF73TME	4	binary	Time since midnight, in hundredths of a second, when the record was moved into the SMF buffer.
10	A	SMF73DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
14	E	SMF73SID	4	EBCDIC	System identification (from the SMFPRMxx SID parameter).
18	12	SMF73SSI	4	EBCDIC	Subsystem identification (‘RMF’).
22	16	SMF73STY	2	binary	Record subtype=1.
24	18	SMF73TRN	2	binary	Number of triplets in this record. A triplet is a set of three SMF fields (offset/length/number values) that defines a section of the record. The offset is the offset from the RDW.
26	1A		2		Reserved.
28	1C	SMF73PRS	4	binary	Offset to RMF product section from RDW.
32	20	SMF73PRL	2	binary	Length of RMF product section.
34	22	SMF73PRN	2	binary	Number of RMF product sections.
36	24	SMF73HIS	4	binary	Offset to channel path control section from RDW.
40	28	SMF73HIL	2	binary	Length of channel path control section.
42	2A	SMF73HIN	2	binary	Number of channel path control sections.
44	2C	SMF73HPS	4	binary	Offset to channel path data section from RDW.
48	30	SMF73HPL	2	binary	Length of channel path data section.
50	32	SMF73HPN	2	binary	Number of channel path data sections.

RMF Product Section

Offsets		Name	Length	Format	Description
0	0	SMF73MFV	2	packed	RMF version number.

Offsets		Name	Length	Format	Description
2	2	SMF73PRD	8	EBCDIC	Product name ('RMF').
10	A	SMF73IST	4	packed	Time that the RMF measurement interval started, in the form 0*hhmmssF*, where *hh* is the hours, *mm* is the minutes, *ss* is the seconds, and *F* is the sign.
14	E	SMF73DAT	4	packed	Date when the RMF measurement interval started, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
18	12	SMF73INT	4	packed	Duration of the RMF measurement interval, in the form *mmsstttF* where *mm* is the minutes, *ss* is the seconds, *ttt* is the milliseconds, and *F* is the sign. The end of the measurement interval is the sum of the recorded start time (and this field.)
22	16		2		Reserved.
24	18	SMF73SAM	4	binary	Number of RMF samples.
28	1C		2		Reserved.
30	1E	SMF73FLA	2	binary	Flags **Bit** **Meaning When Set** **0** Reserved **1** Samples have been skipped **2** Record was written by RMF Monitor III **3** Interval was synchronized with SMF **4-15** Reserved.
32	20		4		Reserved.
36	24	SMF73CYC	4	packed	Sampling cycle length, in the form 000*ttttF*, where *tttt* is the milliseconds and *F* is the sign (taken from CYCLE option). The range of values is 0.050 to 9.999 seconds.
40	28	SMF73MVS	8	EBCDIC	MVS software level (consists of an acronym and the version, release, and modification level - ZV*vvrrmm*).
48	30	SMF73IML	1	binary	Indicates the type of processor complex on which data measurements were taken. **Value** **Meaning** **3** 9672, zSeries
49	31	SMF73PRF	1	binary	Processor flags. **Bit** **Meaning When Set** **0** The system has expanded storage **1** The processor is enabled for ES connection architecture (ESCA) **2** There is an ES connection director in the configuration **3** System is running in z/Architecture mode **4** IFA processors available. **5-7** Reserved.
50	32	SMF73PTN	1	binary	PR/SM partition number of the partition that wrote this record.
51	33	SMF73SRL	1	binary	SMF record level change number (X'4A' for z/OS V1R7 RMF). This field enables processing of SMF record level changes in an existing release.
52	34	SMF73IET	8	char	Interval expiration time token. This token can be used to identify other than RMF records that belong to the same interval (if interval was synchronized with SMF).
60	3C	SMF73LGO	8	binary	Offset GMT to local time (STCK format).
68	44	SMF73RAO	4	binary	Offset to reassembly area relative to start of RMF product section.

Offsets		Name	Length	Format	Description
72	48	SMF73RAL	2	binary	Length of reassembly area. Area consists of a fixed header and a variable number of information blocks. Length depends on the record type/subtype, but is fixed for a specific type/subtype.
74	4A	SMF73RAN	2	binary	Reassembly area indicator. **Value** **Meaning** **0** Record is not broken. **1** Record is broken. **Note:** This field is used to indicate whether an SMF record is a broken record. Therefore, offset (SMF73RAO) and length (SMF73RAL) are only valid if SMF73RAN = 1. A reassembly area is only present in broken records.
76	4C	SMF73OIL	2	binary	Original interval length as defined in the session or by SMF (in seconds).
78	4E	SMF73SYN	2	binary	SYNC value in seconds.
80	50	SMF73GIE	8	binary	Projected gathering interval end (STCK format) GMT time.
88	58	SMF73XNM	8	EBCDIC	Sysplex name as defined in parmlib member COUPLExx.
96	60	SMF73SNM	8	EBCDIC	System name for current system as defined in parmlib member IEASYSxx SYSNAME parameter.
Reassembly Area:					
0	0	SMF73RBR	2	binary	Total number of broken records built from the original large record.
2	2	SMF73RSQ	2	binary	Sequence number of this broken record. Every broken record built from the same large record must have a unique sequence number, it is in the range from 1 to SMF73RBR.
4	4	SMF73RIO	4	binary	Offset to first reassembly information block relative to start of reassembly area header.
8	8	SMF73RIL	2	binary	Length of reassembly information block.
10	A	SMF73RIN	2	binary	Number of reassembly information blocks (same value as SMF73TRN in header section).
12	C		4		Reserved.
Reassembly Area Information Block:					
0	0	SMF73RNN	2	binary	Total number of sections in the original large record. This field contains information of how many sections of a specific type were contained in the original SMF record. This field is a copy of the number field of the triplet in the original (non broken) record.
2	2	SMF73RPP	2	binary	Position of the first of one or more consecutive sections described by this block as in the original record. Values in the range of 1 to SMF73RNN are valid for correct processing. A value of 0 will skip processing of this information block. This field provides information where the sections that are part of this broken record were placed in the original record before the split took place. The actual number of consecutive sections contained in this record is available from the actual triplet in the header extension.

Channel Path Control Section

There is one section per record.

Offsets		Name	Length	Format	Description
0	0	SMF73SMP	4	binary	This field contains the number of samples while the busy count is stored in field SMF73BSY. Only valid if bit 2 of SMF73SFL is not set.

Offsets		Name	Length	Format	Description
4	4	SMF73CFL	1	binary	Configuration change flags **Bit** **Meaning When Set** **0** Configuration changed. Used to decide whether to provide the text "POR" or "ACTIVATE" on reports. Also used to check whether data can be combined in a duration report. **1** Configuration change since power-on-reset (POR). **2** POR using IODF data set that supports dynamic configuration change (contains I/O token). **3** I/O token is valid. **4** Record may include data sections that are not valid. **5** CPMF (channel path measurement facility) available. **6** Reserved. **7** CPMF mode has changed.
5	5	SMF73SFL	1	binary	Status flags. **Bit** **Meaning When Set** **0** DCM supported by hardware. **1** Configuration contains DCM managed channels. **2** Hardware allows multiple logical channel subsystems. **3-7** Reserved.
6	6		2		Reserved.
8	8	SMF73TNM	44	EBCDIC	IODF name.
52	34	SMF73TSF	2	EBCDIC	IODF name suffix.
54	36		2		Reserved.
56	38	SMF73TOK	16	EBCDIC	Partial token information.
56	38	SMF73TDT	8	EBCDIC	IODF creation date, in the form *mm/dd/yy*.
64	40	SMF73TTM	8	EBCDIC	IODF creation time, in the form *hh.mm.ss*.
72	48	SMF73CRC	4	binary	CPMF (channel path measurement facility) restart count
76	4C	SMF73CSC	4	binary	Last CPMF (channel path measurement facility) sample count
80	50	SMF73TDY	10	EBCDIC	IODF creation date, in the form *mm/dd/yyyy*.
90	5A	SMF73CMI	1	binary	CPMF mode. **Value** **Meaning** **0** CPMF is not active **1** Compatibility mode **2** Extended mode
91	5B	SMF73CSS	1	binary	Channel subsystem ID. Only valid if bit 2 of SMF73SFL is set.

Channel Path Data Section

There is one section per channel path.

Offsets		Name	Length	Format	Description
0	0	SMF73PID	1	binary	Channel path identification. The range of values is X'0' to X'FF'. Support for dynamic I/0. There are always X'FF' path data sections in record type 73, even though there might not be X'FF' CHPIDs defined in the system. These 'dummy' data sections in the SMF records contain only the channel path id; the rest is hexadecimal zeroes.

Offsets		Name	Length	Format	Description
1	1	SMF73FG2	1	binary	Channel flags **Bit** **Meaning When Set** **0-1** Reserved **2** Block multiplexor **3** Byte multiplexor **4** Reserved **5** Only partial statistics available **6** Data recorded is incorrect because channel path was reconfigured during interval **7** Channel path is currently online.
2	2	SMF73FG3	1	binary	Channel flags extension **Bit** **Meaning When Set** **0** ES connection channel **1** ES connection director attached to channel path **2** ES connection converter attached to this channel **3** Channel path modified **4** Channel path deleted **5** Channel path added **6** Valid path **7** Channel path is shared between logical partitions
3	3	SMF73FG4	1	binary	Channel path flags **Bit** **Meaning When Set** **0** CPMB (channel path measurement block) entry not valid **1** Channel path is CTC defined **2** Channel conversion 3090 **3** Reserved **4** Channel path is DCM managed **5** Channel characteristics changed during interval **6-7** Reserved.
4	4	SMF73BSY	4	binary	Count of store channel path status (STCPS) samples taken by SRM in which the channel path related to this entry was found busy. This count is normalized (broken down into the simplest expression).
8	8	SMF73PBY	4	binary	Partition's channel-path-busy-time since last RMF interval, in units of 1024 microseconds.
12	C	SMF73PTI	4	binary	Partition's channel-path measurement interval, in units of 1024 microseconds.
16	10	SMF73CPD	1	binary	Channel path description. For an explanation, you can issue the command `D M=CHP`.
17	11	SMF73ACR	5	EBCDIC	Channel path acronym.
22	16	SMF73CMG	1	binary	CPMF Channel measurement group.
23	17	SMF73FG5	1	binary	CPMF validation flags - each bit (if on) indicates that the corresponding measurement data is available and valid. This refers to the first five words of the channel measurement data in field SMF73CCM. **Bit** **Measurement Data** **0** Channel measurement data — word 1 **1** Channel measurement data — word 2 **2** Channel measurement data — word 3 **3** Channel measurement data — word 4 **4** Channel measurement data — word 5 **5-7** Reserved.
24	18	SMF73CCM	48	*	CPMF Channel measurement data (extended mode). The contents of this field is different for each measurement group, as described in the following tables.
72	48	SMF73CPP	1	binary	Channel path parameter.

Offsets		Name	Length	Format	Description
73	49	SMF73GEN	1	binary	Channel type generation.
74	4A		2		Reserved.

SMF73CCM — CPMF Channel Measurement Data (Measurement Group 1):

Offsets		Name	Length	Format	Description
0	0	SMF73TUT	4	s_float	Total channel path busy time (in units of 128 microseconds).
4	4	SMF73PUT	4	s_float	LPAR channel path busy time (in units of 128 microseconds).
8	8		40		Reserved.

SMF73CCM — CPMF Channel Measurement Data (Measurement Group 2):

Offsets		Name	Length	Format	Description
0	0	SMF73MBC	4	s_float	Maximum bus cycles per second.
4	4	SMF73MCU	4	s_float	Maximum channel work units per second.
8	8	SMF73MWU	4	s_float	Maximum WRITE data units per second.
12	C	SMF73MRU	4	s_float	Maximum READ data units per second.
16	10	SMF73US	4	s_float	Data unit size (in bytes).
20	14	SMF73TBC	4	s_float	Total bus cycles count.
24	18	SMF73TUC	4	s_float	Total channel work unit count.
28	1C	SMF73PUC	4	s_float	LPAR channel work units count.
32	20	SMF73TWU	4	s_float	Total WRITE data units count.
36	24	SMF73PWU	4	s_float	LPAR WRITE data units count.
40	28	SMF73TRU	4	s_float	Total READ data units count.
44	2C	SMF73PRU	4	s_float	LPAR READ data units count.

SMF73CCM — CPMF Channel Measurement Data (Measurement Group 3):

Offsets		Name	Length	Format	Description
0	0	SMF73PDU	4	s_float	LPAR data unit size (in bytes).
4	4	SMF73TDU	4	s_float	Total data unit size (in bytes).
8	8	SMF73PUM	4	s_float	LPAR message sent unit size (in bytes)
12	C	SMF73TUM	4	s_float	Total message sent unit size (in bytes)
16	10		4		Reserved.
20	14	SMF73PMS	4	s_float	LPAR count of message sent units.
24	18	SMF73TMS	4	s_float	Total count of message sent units.
28	1C	SMF73PUS	4	s_float	LPAR count of unsuccessful attempts to send messages.
32	20	SMF73PUB	4	s_float	LPAR count of unsuccessful attempts to receive messages due to unavailable buffers.
36	24	SMF73TUB	4	s_float	Total count of unsuccessful attempts to receive messages due to unavailable buffers.
40	28	SMF73PDS	4	s_float	LPAR count of data units sent.
44	2C	SMF73TDS	4	s_float	Total count of data units sent.

Record Type 74 (4A) — RMF Activity of Several Resources

Reference books

For information on using RMF, see *z/OS RMF User's Guide*.

For information on Monitor I, II, and III, see *z/OS RMF Report Analysis*.

Record type 74 has the following subtypes:

- **Subtype 1** — Device Activity

  The record is written for all devices specified in the DEVICE option for a Monitor I session. It contains entries for all devices that have been online at least once since RMF was started. The entry for any device that was offline at the end of the reporting interval, or for any device that was taken offline during the interval, does not contain data.

  Device control data section
  Contains general information on the number of devices and types.

  Device data section
  Contains the volume serial number for tape and direct access devices, number of requests on the device, total active, pending and connect time to service those requests, the number of requests enqueued for the device and the device number, class and type and other data collected about the device. RMF produces one or more type 74 records for the classes requested by the installation, and one device data section for each device.

- **Subtype 2** — XCF Activity

  Monitor III Cross-System Coupling Facility (XCF) measurement writes this subtype, only if the Monitor III data gatherer is on.

  Control data section
  Contains control information for splitting and reassembling of the XCF records.

  System data section
  Describes the message traffic between the local system (where RMF is running) and the remote systems on a system level.

  Path data section
  Describes the message traffic broken down by signalling paths connecting the local system with the remote systems.

  Member data section
  Describes the message traffic on a member basis for members on the local system and members communicating with the local system.

- **Subtype 3** — OMVS Kernel Activity

  Monitor III Data Gatherer collects z/OS UNIX System Services measurement data that are input for the RMF Postprocessor to create the OMVS Kernel Activity report.

  Control data section
  Contains various z/OS UNIX System Services measurement data.

- **Subtype 4** — Coupling Facility Activity

One record is written for each coupling facility by each member in the sysplex.

Local coupling facility data section
: One per record; contains path and subchannel data collected from each local system.

Connectivity data section
: One per sysplex member connected to the coupling facility. This member list is used by the Postprocessor to verify that it has a complete set of SMF records for creating sysplex-level reports for this coupling facility.

  This section is gathered on only one system in the sysplex (RMF's sysplex master gathering) and is available only if the status flag R744FFLG in the local coupling facility data section indicates that the coupling facility was connected to the system at the end of the interval.

Storage coupling facility data section
: One per record; contains global data that is only collected once for the sysplex.

Structure data section
: One for each structure allocated in this facility, whether or not the facility has an active connection.

  This section is gathered on only one system in the sysplex (RMF's sysplex master gathering) and is available only if the status flag R744FFLG in the local coupling facility data section indicates that the coupling facility was connected to the system at the end of the interval.

Request data section
: One for each structure in this facility that has had an active connection at some time during the interval.

Processor utilization data section
: One for each processor (CP, not IOP) within the respective coupling facility.

Cache data section
: Several sections for each request data section are possible, depending on applications using the coupling facility.

Remote facility data section
: One section for each duplexing coupling facility with various signal counters.

Note: Except where otherwise indicated, the coupling facility values are snapshots at the end of the recording interval.

- **Subtype 5** — Cache Subsystem Device Activity

  One or several records (depending on the number of devices attached to the control unit) are written for each cache subsystem. The header section of each record contains an individual header extension for subtype 5.

  Cache control section
  : Contains control information and return codes from interfaces.

  Cache device data section
  : Contains cache statistics for each device.

Cache device data extension section
This extension applies only to control unit types 3990-03 and 3990-06. It is collected by RMF to provide the same data as in the corresponding CRR record.

Cache control unit status data section
Contains cache statistics for the control unit.

| **RAID rank/extent pool data section**
| Contains RAID rank statistics for a 2105 device or extent pool
| statistics for a 2107 device.

- **Subtype 6** — HFS Statistics

HFS global data section
Contains global statistics and return codes from interfaces.

HFS global buffer section
Contains buffer statistics, there is one section for each buffer in the buffer pool.

HFS file system section
Contains file system statistics, there is one section for each mounted file system for which data gathering was activated.

- **Subtype 7** — FICON Director Statistics

FCD global data section
Contains IODF configuration data.

FCD switch data section
Contains switch configuration data.

FCD port data section
Contains port statistics.

FCD connector data section
Contains configuration data for additional control units.

- **Subtype 8** — Enterprise disk system statistics

Control data section
Contains control information and control unit information concerning the storage server.

Link statistics section
Contains link performance statistics for each active adapter.

| **Extent pool statistics section**
| Contains capacity information of allocated disk space and
| performance statistics for an extent pool.

| **Rank statistics section**
| Contains activity statistics about read and write operations in the
| ranks of an extent pool.

| **Rank array data section**
| Contains information about array characteristics of a rank.

Notes:

1. All fields with format *s_float* have the type *short format floating point*.
2. All fields with format *l_float* have the type *long format floating point*.

Each subtype contains a header section, the individual header extension (which contains offset/length/number triplets to address record parts following the RMF product section) and the RMF product section.

Macro to Symbolically Address Record Type 74: The SMF record mapping macro for all records produced by RMF is ERBSMFR. Its format is ERBSMFR (*n1*,*n2*,...) where *n1*,*n2*, ... are the SMF record types you want to map. Note that the parentheses are required only when two or more record types are specified. The mapping macro resides in SYS1.MACLIB.

Record Environment

The following conditions exist for the generation of this record:

Macro	SMFWTM (record exit: IEFU83)
Mode	Task
Storage Residency	31-bit

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF74LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See "Standard SMF Record Header" on page 13-1 for a detailed description.
2	2	SMF74SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF74FLG	1	binary	System indicator **Bit** **Meaning When Set** **0** New record format **1** Subtypes used **2** Reserved. **3-6** Version indicators* **7** System is running in PR/SM mode. *See "Standard SMF Record Header" on page 13-1 for a detailed description.
5	5	SMF74RTY	1	binary	Record type 74 (X'4A').
6	6	SMF74TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.
10	A	SMF74DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
14	E	SMF74SID	4	EBCDIC	System identification (from the SMFPRMxx SID parameter).
18	12	SMF74SSI	4	EBCDIC	Subsystem identification ('RMF').
22	16	SMF74STY	2	binary	Record subtype.
24	18	SMF74TRN	2	binary	Number of triplets in this record. A triplet is a set of three SMF fields (offset/length/number values) that defines a section of the record. The offset is the offset from the RDW.
26	1A		2		Reserved.
28	1C	SMF74PRS	4	binary	Offset to RMF product section from RDW.
32	20	SMF74PRL	2	binary	Length of RMF product section.
34	22	SMF74PRN	2	binary	Number of RMF product sections.

Offsets		Name	Length	Format	Description
Individual header extension for subtype 1:					
36	24	SMF74DCS	4	binary	Offset to device control data section from RDW.
40	28	SMF74DCL	2	binary	Length of device control data section.
42	2A	SMF74DCN	2	binary	Number of device control data sections.
44	2C	SMF74DDS	4	binary	Offset to device data section from RDW.
48	30	SMF74DDL	2	binary	Length of device data section.
50	32	SMF74DDN	2	binary	Number of device data sections.
Individual header extension for subtype 2:					
36	24	SMF742CO	4	binary	Offset to control data section from RDW.
40	28	SMF742CL	2	binary	Length of control data section.
42	2A	SMF742CN	2	binary	Number of control data sections.
44	2C	SMF742SO	4	binary	Offset to system data section from RDW.
48	30	SMF742SL	2	binary	Length of system data section.
50	32	SMF742SN	2	binary	Number of system data sections.
52	34	SMF742PO	4	binary	Offset to path data section.
56	38	SMF742PL	2	binary	Length of path data section.
58	3A	SMF742PN	2	binary	Number of path data sections.
60	3C	SMF742MO	4	binary	Offset to member data section from RDW.
64	40	SMF742ML	2	binary	Length of member data section.
66	42	SMF742MN	2	binary	Number of member data sections.
Individual header extension for subtype 3:					
36	24	SMF743PO	4	binary	Offset to OMVS control data section.
40	28	SMF743PL	2	binary	Length of OMVS control data section.
42	2A	SMF743PN	2	binary	Number of OMVS control data sections.
Individual header extension for subtype 4:					
36	24	SMF744FO	4	binary	Offset to local coupling facility data section.
40	28	SMF744FL	2	binary	Length of local coupling facility data section.
42	2A	SMF744FN	2	binary	Number of local coupling facility data sections.
44	2C	SMF744XO	4	binary	Offset to connectivity data section.
48	30	SMF744XL	2	binary	Length of connectivity data section.
50	32	SMF744XN	2	binary	Number of connectivity data sections.
52	34	SMF744GO	4	binary	Offset to storage data section.
56	38	SMF744GL	2	binary	Length of storage data section.
58	3A	SMF744GN	2	binary	Number of storage data sections.
60	3C	SMF744QO	4	binary	Offset to structure data section.
64	40	SMF744QL	2	binary	Length of structure data section.
66	42	SMF744QN	2	binary	Number of structure data sections.
68	44	SMF744SO	4	binary	Offset to request data section.
72	48	SMF744SL	2	binary	Length of request data section.
74	4A	SMF744SN	2	binary	Number of request data sections.
76	4C	SMF744PO	4	binary	Offset to processor data section.
80	50	SMF744PL	2	binary	Length of processor data section.
82	52	SMF744PN	2	binary	Number of processor data sections.
84	54	SMF744CO	4	binary	Offset to cache data section.
88	58	SMF744CL	2	binary	Length of cache data section.
90	5A	SMF744CN	2	binary	Number of cache data sections.

Offsets		Name	Length	Format	Description
92	5C	SMF744RO	4	binary	Offset to remote facility data section.
96	60	SMF744RL	2	binary	Length of remote facility data section.
98	62	SMF744RN	2	binary	Number of remote facility data sections.
Individual header extension for subtype 5:					
36	24	SMF745CO	4	binary	Offset to control section.
40	28	SMF745CL	2	binary	Length of control section.
42	2A	SMF745CN	2	binary	Number of control sections.
44	2C	SMF745DO	4	binary	Offset to cache device data section.
48	30	SMF745DL	2	binary	Length of cache device data section.
50	32	SMF745DN	2	binary	Number of cache device data sections.
52	34	SMF745XO	4	binary	Offset to cache device data section extension.
56	38	SMF745XL	2	binary	Length of cache device data section extension.
58	3A	SMF745XN	2	binary	Number of cache device data section extensions.
60	3C	SMF745SO	4	binary	Offset to cache status data section.
64	40	SMF745SL	2	binary	Length of cache status data section.
66	42	SMF745SN	2	binary	Number of cache status data sections.
68	44	SMF7451O	4	binary	Offset to RAID rank data sections.
72	48	SMF7451L	2	binary	Length of RAID rank data section.
74	4A	SMF7451N	2	binary	Number of RAID rank data sections.
Individual header extension for subtype 6:					
36	24	SMF746DO	4	binary	Offset to HFS global data section.
40	28	SMF746DL	2	binary	Length of HFS global data section.
42	2A	SMF746DN	2	binary	Number of HFS global data sections.
44	2C	SMF746BO	4	binary	Offset to HFS global buffer section.
48	30	SMF746BL	2	binary	Length of HFS global buffer section.
50	32	SMF746BN	2	binary	Number of HFS global buffer sections.
52	34	SMF746FO	4	binary	Offset to HFS file system section.
56	38	SMF746FL	2	binary	Length of HFS file system section.
58	3A	SMF746FN	2	binary	Number of HFS file system sections.
Individual header extension for subtype 7:					
36	24	SMF747GO	4	binary	Offset to global data section.
40	28	SMF747GL	2	binary	Length of global data section.
42	2A	SMF747GN	2	binary	Number of global data sections.
44	2C	SMF747SO	4	binary	Offset to switch data section.
48	30	SMF747SL	2	binary	Length of switch data section.
50	32	SMF747SN	2	binary	Number of switch data sections.
52	34	SMF747PO	4	binary	Offset to port data section.
56	38	SMF747PL	2	binary	Length of port data section.
58	3A	SMF747PN	2	binary	Number of port data sections.
60	3C	SMF747CO	4	binary	Offset to connector data section.
64	40	SMF747CL	2	binary	Length of connector data section.
66	42	SMF747CN	2	binary	Number of connector data sections.
Individual header extension for subtype 8:					
36	24	SMF748CO	4	binary	Offset to control data section.
40	28	SMF748CL	2	binary	Length of control data section.
42	2A	SMF748CN	2	binary	Number of control data sections.

Offsets		Name	Length	Format	Description
44	2C	SMF748LO	4	binary	Offset to link statistics section.
48	30	SMF748LL	2	binary	Length of link statistics section.
50	32	SMF748LN	2	binary	Number of link statistics sections.
52	34	SMF748XO	4	binary	Offset to extent pool statistics section.
56	38	SMF748XL	2	binary	Length of extent pool statistics section.
58	3A	SMF748XN	2	binary	Number of extent pool statistics sections.
60	3C	SMF748RO	4	binary	Offset to rank statistics section.
64	40	SMF748RL	2	binary	Length of rank statistics section.
66	42	SMF748RN	2	binary	Number of rank statistics sections.
68	44	SMF748AO	4	binary	Offset to rank array data section.
72	48	SMF748AL	2	binary	Length of rank array data section.
74	4A	SMF748AN	2	binary	Number of rank array data sections.

RMF Product Section

Offsets		Name	Length	Format	Description
0	0	SMF74MFV	2	EBCDIC/ packed	RMF version number.
2	2	SMF74PRD	8	EBCDIC	Product name (‘RMF’).
10	A	SMF74IST	4	packed	Time that the RMF measurement interval started, in the form 0*hhmmssF*, where *hh* is the hours, *mm* is the minutes, *ss* is the seconds, and *F* is the sign.
14	E	SMF74DAT	4	packed	Date when the RMF measurement interval started, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
18	12	SMF74INT	4	packed	Duration of RMF measurement interval, in the form *mmsstttF* where *mm* is the minutes, *ss* is the seconds, *ttt* is the milliseconds, and *F* is the sign. The end of the measurement interval is the sum of the recorded start time and this field.
22	16		2		Reserved.
24	18	SMF74SAM	4	binary	Number of RMF samples.
28	1C		2		Reserved.
30	1E	SMF74FLA	2	binary	Flags **Bit** **Meaning When Set** **0** Reserved. **1** Samples have been skipped **2** Record was written by RMF Monitor III **3** Interval was synchronized with SMF **4-15** Reserved.
32	20		4		Reserved.
36	24	SMF74CYC	4	packed	Sampling cycle length, in the form 000*ttttF*, where *tttt* is the milliseconds and *F* is the sign (taken from CYCLE option). The range of values is 0.050 to 9.999 seconds.
40	28	SMF74MVS	8	EBCDIC	MVS software level (consists of an acronym and the version, release, and modification level - ZV*vvrrmm*).
48	30	SMF74IML	1	binary	Indicates the type of processor complex on which data measurements were taken. **Value** **Meaning** **3** 9672, zSeries

Offsets		Name	Length	Format	Description
49	31	SMF74PRF	1	binary	Processor flags. **Bit** **Meaning When Set** **0** The system has expanded storage **1** The processor is enabled for ES connection architecture (ESCA) **2** There is an ES connection director in the configuration **3** System is running in z/Architecture mode **4** IFA processors available. **5-7** Reserved.
50	32	SMF74PTN	1	binary	PR/SM partition number of the partition that wrote this record.
51	33	SMF74SRL	1	binary	SMF record level change number (X'4A' for z/OS V1R7 RMF). This field enables processing of SMF record level changes in an existing release.
52	34	SMF74IET	8	char	Interval expiration time token. This token can be used to identify other than RMF records that belong to the same interval (if interval was synchronized with SMF).
60	3C	SMF74LGO	8	binary	Offset GMT to local time (STCK format).
68	44	SMF74RAO	4	binary	Offset to reassembly area relative to start of RMF product section.
72	48	SMF74RAL	2	binary	Length of reassembly area. Area consists of a fixed header and a variable number of information blocks. Length depends on the record type/subtype, but is fixed for a specific type/subtype.
74	4A	SMF74RAN	2	binary	Reassembly area indicator. **Value** **Meaning** **0** Record is not broken. **1** Record is broken. **Note:** This field is used to indicate whether an SMF record is a broken record. Therefore, offset (SMF74RAO) and length (SMF74RAL) are only valid if SMF74RAN = 1. A reassembly area is only present in broken records.
76	4C	SMF74OIL	2	binary	Original interval length as defined in the session or by SMF (in seconds).
78	4E	SMF74SYN	2	binary	SYNC value in seconds.
80	50	SMF74GIE	8	binary	Projected gathering interval end (STCK format) GMT time.
88	58	SMF74XNM	8	EBCDIC	Sysplex name as defined in parmlib member COUPLExx.
96	60	SMF74SNM	8	EBCDIC	System name for current system as defined in parmlib member IEASYSxx SYSNAME parameter.
Reassembly Area:					
0	0	SMF74RBR	2	binary	Total number of broken records built from the original large record.
2	2	SMF74RSQ	2	binary	Sequence number of this broken record. Every broken record built from the same large record must have a unique sequence number, it is in the range from 1 to SMF74RBR.
4	4	SMF74RIO	4	binary	Offset to first reassembly information block relative to start of reassembly area header.
8	8	SMF74RIL	2	binary	Length of reassembly information block.
10	A	SMF74RIN	2	binary	Number of reassembly information blocks (same value as SMF74TRN in header section).
12	C		4		Reserved.
Reassembly Area Information Block:					

Offsets		Name	Length	Format	Description
0	0	SMF74RNN	2	binary	Total number of sections in the original large record. This field contains information of how many sections of a specific type were contained in the original SMF record. This field is a copy of the number field of the triplet in the original (non broken) record.
2	2	SMF74RPP	2	binary	Position of the first of one or more consecutive sections described by this block as in the original record. Values in the range of 1 to SMF74RNN are valid for correct processing. A value of 0 will skip processing of this information block. This field provides information where the sections that are part of this broken record were placed in the original record before the split took place. The actual number of consecutive sections contained in this record is available from the actual triplet in the header extension.

Subtype 1 — Device Activity

Device Control Data Section

There is one section per device class.

Offsets		Name	Length	Format	Description
0	0	SMF74NXT	2	binary	Number of device data sections in following records for this class.
2	2	SMF74TOT	2	binary	Total number of device data sections in all records for this class.
4	4	SMF74GEN	2	binary	Total number of devices specified for all classes at system installation.
6	6	SMF74SUB	2	binary	Device class code: **Bit Configuration** **Meaning** **‘0080’X** Magnetic tape device **‘0040’X** Communication equipment **‘0020’X** Direct access devices **‘0010’X** Graphics devices **‘0008’X** Unit record devices **‘0004’X** Character reader devices.
8	8	SMF74DCF	1	binary	Flags for DASD class **Bit** **Meaning When Set** **0** Both sections of report requested **1** Sort by storage group **2-7** Reserved.
9	9	SMF74DMS	1	binary	Message flag for DASD class **Bit** **Meaning When Set** **0** Message issued that SMS not available **1** SMS interface error **2-7** Reserved.
10	A	binary	1	SMF74ENF	Flags for environment. **Bit** **Meaning When Set** **0** Extended CMB **1** Model-dependent data not available by STSCH **2** Initial command response time valid (SMF74CMR) **3-7** Reserved
11	B		1		Reserved.
12	C	SMF74S15	4	binary	Contents of register 15 after SMS interface call, zero if normal return.
16	10	SMF74SRC	4	binary	Return code from SMS interface, zero if normal return.

Offsets		Name	Length	Format	Description
20	14	SMF74SRS	4	binary	Reason code from SMS interface, zero if normal return.
24	18	SMF74TSR	2	binary	Total number of small SMF records.
26	1A	SMF74CFL	1	binary	Configuration change flags **Bit** **Meaning When Set** **0** Configuration changed. Used to decide whether to provide the text "POR" or "ACTIVATE" on reports. Also used to check whether data can be combined in a duration report. **1** Configuration change since power-on-reset (POR). **2** POR using IOC data set that contains a token. **3** Configuration token is valid. **4-7** Reserved.
27	1B		3		Reserved.
30	1E	SMF74TNM	44	EBCDIC	IODF name suffix.
74	4A	SMF74TSF	2	EBCDIC	IODF name suffix.
76	4C		2		Reserved.
78	4E	SMF74TOK	16	EBCDIC	Partial token information.
78	4E	SMF74TDT	8	EBCDIC	IODF creation date, in the form *mm/dd/yy*.
86	56	SMF74TTM	8	EBCDIC	IODF creation time, in the form *hh.mm.ss*.
94	5E		2		Reserved.
96	60	SMF74MCT	4	binary	Maximum number of allocated tape devices. This field is zero for devices other than tape.
100	64	SMF74TDY	10	EBCDIC	IODF creation date, in the form *mm/dd/yyyy*.
110	6E		2		Reserved.

Device Data Section

There is one section per device.

Offsets		Name	Length	Format	Description
0	0	SMF74NUM	2	binary	Device number, in the range X'0000' to X'FFFF'.
2	2	SMF74LCU	2	binary	Logical control unit number, in the range X'0000' to X'FFFF'.
4	4		1		Reserved.
5	5	SMF74CNF	1	binary	Device indicator **Bit** **Meaning When Set** **0** IOS queue length is incorrect **1** No logical control unit information **2** Data contained in fields SMF74SSC through SMF74DIS is incorrect **3** Device has been deleted **4** Only partial statistics are available **5** Reserved. **6** Data recorded is incorrect because device was configured during interval **7** Device is currently online.
6	6	SMF74SER	6	EBCDIC	Volume serial of the volume mounted on this device (tape or direct access device only).
12	C	SMF74TYP	4	binary	Unit type.
16	10	SMF74NUX	4	binary	Number of unit control blocks (UCBs) for a parallel access volume.
20	14	SMF74SSC	4	binary	Start subchannel count. This is the number of physical requests to the device and includes SSCH and RSSCH instructions.

Offsets		Name	Length	Format	Description
24	18	SMF74MEC	4	binary	Measurement event count (number of SSCH instructions for which connect, pending, and active times were stored).
28	1C	SMF74CNN	4	binary	Device connect time (in 128-microsecond units).
32	20	SMF74PEN	4	binary	Device pending time (in 128-microsecond units).
36	24	SMF74ATV	4	binary	Device active time (in 128-microsecond units).
40	28	SMF74DIS	4	binary	Device disconnect time (in 128-microsecond units).
44	2C	SMF74QUE	4	binary	Number of requests queued in IOS for this device.
48	30	SMF74UTL	4	binary	Number of samples when the device was reserved but an SSCH instruction had not been issued to the device.
52	34	SMF74RSV	4	binary	Number of samples taken when the device was reserved.
56	38		4		Reserved.
60	3C	SMF74ALC	4	binary	Number of samples taken that indicated that the device was allocated.
64	40	SMF74MTP	4	binary	Number of samples taken that indicated a mount pending condition.
68	44	SMF74NRD	4	binary	Number of samples taken that indicated that the device was not ready.
72	48	SMF74COF	2	binary	Number of requests that had hardware timer overflow for connect time measurement.
74	4A	SMF74ICT	2	binary	Number of incorrect samples.
76	4C	SMF74DVB	4	binary	Device busy delay time, from subchannel information block (SCHIB) (in 128-microsecond units).
80	50		4		Reserved
84	54	SMF74CLF	1	binary	DASD report control flag **Bit** **Meaning When Set** **0** Number option active indicator **1** Storage group option active indicator **2** Storage group name changed during the interval **3** Mount pending condition exists at the start of the interval. **4** Mount pending condition exists at end of the interval. **5** Reserved. **6** CTC with special protocol. **7** Reserved.
85	55		3		Reserved.
88	58	SMF74SGN	8	EBCDIC	Storage group name as defined by DFSMS.
96	60	SMF74NDA	4	binary	Total number of allocations in effect for the device.
100	64	SMF74DEV	8	EBCDIC	Device model name. This field is blank if device name cannot be determined.
108	6C	SMF74CU	8	EBCDIC	Control unit name. Blank if control unit name cannot be determined.
116	74		4		Reserved.
120	78	SMF74CNX	1	binary	Device flag extensions **Bit** **Meaning When Set** **0** Device dynamically changed **1** Device disconnect time is not valid **2** Base exposure of a parallel access volume. **3** Number of alias exposures has changed. **4** Timing facility not active. **5-7** Reserved.
121	79		1		Reserved.

Offsets		Name	Length	Format	Description
122	7A	SMF74MTC	2	binary	Number of tape mounts detected against the device during the interval.
124	7C	SMF74DTS	1	binary	Shared Device report control flag **Bit** **Meaning When Set** **0** Valid node descriptor ID retrieved **1** No valid node descriptor ID retrieved **2** Reserved. **3** SMF74SHR is valid. **4** Device is shared/assigned to multiple systems. **5–7** Reserved.
125	7D	SMF74DCT	28	EBCDIC	Node descriptor ID for selfdescribing devices (if bit 0 of SMF74SRD on). 4-byte device number in EBCDIC format left justified with trailing blanks (if bit 1 of SMF74DTS is on).
153	99		7		Reserved.
160	A0	SMF74PCT	4	binary	Number of unsuccessful PAV counts.
164	A4	SMF74CMR	4	binary	Command response time in units of 128 microseconds.

Subtype 2 — XCF Activity

Control Data Section

Offsets		Name	Length	Format	Description
0	0	R742TSR	2	binary	Total number of type 74 subtype 2 records written during this interval.
2	2		2		Reserved.
4	4	R742STOT	4	binary	Total number of system data sections in all SMF records.
8	8	R742SNXT	4	binary	Number of system data sections in records written after this record.
12	C	R742PTOT	4	binary	Total number of path data sections in all SMF records.
16	10	R742PNXT	4	binary	Number of path data sections in records written after this record.
20	14	R742MTOT	4	binary	Total number of member data sections in all SMF records.
24	18	R742MNXT	4	binary	Number of member data sections in records written after this record.

System Data Section

Offsets		Name	Length	Format	Description
0	0	R742SNME	8	EBCDIC	System name as defined in parmlib member IEASYSxx SYSNAME parameter.
8	8	R742SSTF	1	binary	Status flags **Bit** **Meaning When Set** **0** System became active during this interval **1** System became inactive during this interval **2** Counts reset by XCF during this interval **3** Reserved. **4** Reserved. **5-7** Reserved.

Offsets		Name	Length	Format	Description
9	9	R742SDIR	1	binary	Direction of the message traffic **Bit** **Meaning When Set** **0** Inbound. The R742SNME system sent messages to the local system. **1** Outbound. The R742SNME system receives messages from the local system. **2** Local. This means that the message traffic is within the local system. **3-7** Reserved.
10	A		2		Reserved.
12	C	R742SPTH	4	binary	Current number of signalling paths in service (zero for local entry). If outbound entry, count is for the indicated transport class.
16	10	R742SBSY	4	binary	Number of no buffer conditions. For local or outbound entry, count is for the indicated transport class.
20	14	R742SNOP	4	binary	Number of no path conditions (zero for local entry). For outbound entry, count is for the indicated transport class.
24	18	R742SMXB	4	binary	Maximum 1K blocks of message buffer space. For local or outbound entry, count is for the indicated transport class.
28	1C	R742SBIG	4	binary	Number of big message conditions (zero for inbound entry).
32	20	R742SFIT	4	binary	Number of message fit conditions (zero for inbound entry).
36	24	R742SSML	4	binary	Number of small message conditions (zero for inbound entry).
40	28	R742SOVR	4	binary	Number of big messages that exceeded the message length for which XCF was optimized (zero for inbound entry).
44	2C	R742STCL	4	binary	Message length for transport class (zero for inbound entry).
48	30	R742STCN	8	EBCDIC	Transport class name (blanks for inbound entry).

Path Data Section

Offsets		Name	Length	Format	Description
0	0	R742PNME	8	EBCDIC	System name as defined in parmlib member IEASYSxx SYSNAME parameter.
8	8	R742PDEV	4	EBCDIC	Device number.
12	C	R742PSTF	1	binary	Status flags **Bit** **Meaning When Set** **0** Path became active during this interval **1** Path became inactive during this interval. **2** Counts reset by XCF during this interval. **3-7** Reserved.
13	D	R742PDIR	1	binary	Direction path **Bit** **Meaning When Set** **0** Inbound path **1** Outbound path **2-7** Reserved.
14	E	R742PTYP	1	binary	Path type indicator. **Value** **Meaning** **1** CTC **3** List structure.
15	F		1		Reserved.
16	10	R742PONA	8	EBCDIC	Name of system on other end if known, otherwise blanks.
24	18	R742PODV	4	EBCDIC	Device number on other end if known, otherwise blanks.

Offsets		Name	Length	Format	Description
28	1C	R742PSTA	1	binary	Path status **Bit** **Meaning When Set** **0** Starting **1** Restarting **2** Working **3** Stopping **4** Waiting for completion communication link **5** Not operational **6** Stop failed **7** Rebuilding.
29	1D		3		Reserved.
32	20	R742PRET	4	binary	Path retry limit.
36	24	R742PRST	4	binary	Number of restarts.
40	28	R742PMXM	4	binary	Maximum number of 1K blocks of message buffer space.
44	2C	R742PSIG	4	binary	Number of outbound (inbound) signals sent (received) over path.
48	30	R742PQLN	4	binary	Number of outbound signals pending transfer on path.
52	34	R742PIBR	4	binary	Number of inbound signals refused due to maximum message limit.
56	38	R742PSUS	4	binary	Number of times this signalling path was **not** busy when it was selected to transfer a message.
60	3C	R742PAPP	4	binary	Number of times this signalling path was busy when it was selected to transfer a message.
64	40	R742PTCN	8	EBCDIC	Transport class name (blanks for an inbound path).
72	48	R742PSTR	16	EBCDIC	Name of XES list structure being used as a path, blank for CTCs.
88	58	R742PIOT	4	binary	For inbound paths: Average I/O transfer time (microseconds) for the most recently received signals, or X'FFFFFFFF' (if time > 35 minutes). For outbound paths, the field is zero.

For each path which has been added during the measurement interval, only fields R742PNME, R742PDIR, R742PONA, and R742PQLN contain data, all other fields are blank or contain X'00'.

Member Data Section

Offsets		Name	Length	Format	Description
0	0	R742MSYS	8	EBCDIC	System name (as defined in parmlib member IEASYSxx SYSNAME parameter) where the member resides.
8	8	R742MGRP	8	EBCDIC	Group name.
16	10	R742MMEM	16	EBCDIC	Member name.
32	20	R742MSTF	1	binary	Status flags **Bit** **Meaning When Set** **0** Member became active during this interval **1** Member became inactive during this interval **2** Counts reset by XCF during this interval **3-7** Reserved.
33	21		3		Reserved.
36	24	R742MSNT	4	binary	Number of signals sent by member.
40	28	R742MRCV	4	binary	Number of signals received by member.

Subtype 3 — OMVS Kernel Activity

Control Data Section

Offsets		Name	Length	Format	Description
0	0	R743CYCU	4	binary	The number of cycle units elapsed between first and last measured sample.
4	4	R743CYCT	4	binary	The cycle time value obtained from Monitor III options (in milliseconds).
8	8	R743FLG	4	binary	Processing Flags **Bit** **Meaning When Set** **0** Kernel address space is terminated or reinstated this interval. **1** Maximum number of processes changed during reporting interval. **2** Maximum number of users changed during reporting interval. **3** Maximum number of processes per user changed during reporting interval. **4** Maximum number of message queue ids changed during reporting interval when set. **5** Maximum number of semaphore ids changed during reporting interval when set. **6** Maximum number of shared memory ids changed during reporting interval when set. **7** Maximum number of shared memory pages changed during reporting interval when set. **8** Maximum number of memory map storage pages changed during reporting interval when set. **9** Maximum number of shared storage pages changed during reporting interval when set. **10** Maximum size of shared library region changed during reporting interval when set. **11** Maximum number of queued signals per process changed during reporting interval when set. **12-31** Reserved.
12	C	R743SYSC	4	s_float	The total number of kernel callable services invoked during the interval.
16	10	R743SCMN	4	binary	The minimum number of kernel callable services invoked during one cycle.
20	14	R743SCMX	4	binary	The maximum number of kernel callable services invoked during one cycle.
24	18	R743CPU	4	s_float	Total CPU time spent processing callable services in the kernel address space during the interval (in 10-millisecond units).
28	1C	R743CTMN	4	binary	Minimum CPU time spent processing callable services in the kernel address space during one cycle (in 10-millisecond units).
32	20	R743CTMX	4	binary	Maximum CPU time spent processing callable services in the kernel address space during one cycle (in 10-millisecond units).
36	24	R743OPR	4	s_float	Count of times fork() or dub failed because the maximum number of processes was exceeded during the interval.
40	28	R743OPMN	4	binary	Minimum number of times fork() or dub failed because the maximum number of processes was exceeded during one cycle.
44	2C	R743OPMX	4	binary	Maximum number of times fork() or dub failed because the maximum number of processes was exceeded during one cycle.

Offsets		Name	Length	Format	Description
48	30	R743OUS	4	s_float	Count of times fork() or dub failed because the maximum number of users was exceeded during the interval.
52	34	R743OUMN	4	binary	Minimum number of times fork() or dub failed because the maximum number of users was exceeded during one cycle.
56	38	R743OUMX	4	binary	Maximum number of times fork() or dub failed because the maximum number of users was exceeded during one cycle.
60	3C	R743OPRU	4	s_float	Count of times fork() or dub failed because the maximum number of processes per user was exceeded during the interval.
64	40	R743ORMN	4	binary	Minimum number of times fork() or dub failed because the maximum number of processes per user was exceeded during one cycle.
68	44	R743ORMX	4	binary	Maximum number of times fork() or dub failed because the maximum number of processes per user was exceeded during one cycle.
72	48	R743MAXP	2	binary	Maximum number of processes.
74	4A	R743MAXU	2	binary	Maximum number of users.
76	4C	R743MXPU	2	binary	Maximum number of processes per user.
78	4E	R743RSV1	2	binary	Reserved.
80	50	R743CURP	4	s_float	Accumulated number of processes during the interval.
84	54	R743CPMN	2	binary	Minimum number of processes during one cycle.
86	56	R743CPMX	2	binary	Maximum number of processes during one cycle.
88	58	R743CURU	4	s_float	Accumulated number of users during the interval.
92	5C	R743CUMN	2	binary	Minimum number of users during one cycle.
94	5E	R743CUMX	2	binary	Maximum number of users during one cycle.
96	60	R743MMSG	4	binary	Maximum number of message queue IDs (constant).
100	64	R743MSEM	4	binary	Maximum number of semaphore IDs (constant).
104	68	R743MSHM	4	binary	Maximum number of shared memory IDs (constant).
108	6C	R743MSPG	4	binary	Maximum number of shared memory pages (constant).
112	70	R743CMSG	4	s_float	Accumulated number of message queue IDs during one interval.
116	74	R743CMMN	4	binary	Minimum number of message queue IDs per cycle.
120	78	R743CMMX	4	binary	Maximum number of message queue IDs per cycle.
124	7C	R743CSEM	4	s_float	Accumulated number of semaphore IDs during one interval.
128	80	R743CSMN	4	binary	Minimum number of semaphore IDs per cycle.
132	84	R743CSMX	4	binary	Maximum number of semaphore IDs per cycle.
136	88	R743CSHM	4	s_float	Accumulated number of shared memory IDs during one interval.
140	8C	R743CHMN	4	binary	Minimum number of shared memory IDs per cycle.
144	90	R743CHMX	4	binary	Maximum number of shared memory IDs per cycle.
148	94	R743CSPG	4	s_float	Accumulated number of shared memory pages during one interval.
152	98	R743CGMN	4	binary	Minimum number of shared memory pages per cycle.
156	9C	R743CGMX	4	binary	Maximum number of shared memory pages per cycle.
160	A0	R743OMSG	4	s_float	Accumulated number of attempts to exceed maximum number of message queue IDs during one interval.
164	A4	R743OMMN	4	binary	Minimum number of attempts to exceed maximum number of message queue IDs per cycle.
168	A8	R743OMMX	4	binary	Maximum number of attempts to exceed maximum number of message queue IDs per cycle.

Offsets		Name	Length	Format	Description
172	AC	R743OSEM	4	s_float	Accumulated number of attempts to exceed maximum number of semaphore IDs during one interval.
176	B0	R743OSMN	4	binary	Minimum number of attempts to exceed maximum number of semaphore IDs per cycle.
180	B4	R743OSMX	4	binary	Maximum number of attempts to exceed maximum number of semaphore IDs per cycle.
184	B8	R743OSHM	4	s_float	Accumulated number of attempts to exceed maximum number of shared memory IDs during one interval.
188	BC	R743OHMN	4	binary	Minimum number of attempts to exceed maximum number of shared memory IDs per cycle.
192	C0	R743OHMX	4	binary	Maximum number of attempts to exceed maximum number of shared memory IDs per cycle.
196	C4	R743OSPG	4	s_float	Accumulated number of attempts to exceed maximum number of shared memory pages during one interval.
200	C8	R743OGMN	4	binary	Minimum number of attempts to exceed maximum number of shared memory pages per cycle.
204	CC	R743OGMX	4	binary	Maximum number of attempts to exceed maximum number of shared memory pages per cycle.
208	D0	R743MMAP	4	binary	Maximum number of memory map storage pages (constant).
212	D4	R743CMAP	4	s_float	Accumulated number of memory map storage pages during one interval.
216	D8	R743CAMN	4	binary	Minimum number of memory map storage pages per cycle.
220	DC	R743CAMX	4	binary	Maximum number of memory map storage pages per cycle.
224	E0	R743OMAP	4	s_float	Accumulated number of attempts to exceed maximum number of memory map storage pages during one interval.
228	E4	R743OAMN	4	binary	Minimum number of attempts to exceed maximum number of memory map storage pages per cycle.
232	E8	R743OAMX	4	binary	Maximum number of attempts to exceed maximum number of memory map storage pages per cycle.
236	EC	R743MPAG	4	binary	Maximum number of shared storage pages (constant).
240	F0	R743CPAG	4	s_float	Accumulated number of shared storage pages during one interval.
244	F4	R743CXMN	4	binary	Minimum number of shared storage pages per cycle.
248	F8	R743CXMX	4	binary	Maximum number of shared storage pages per cycle.
252	FC	R743OPAG	4	s_float	Accumulated number of attempts to exceed maximum number of shared storage pages during one interval.
256	100	R743OXMN	4	binary	Minimum number of attempts to exceed maximum number of shared storage pages per cycle.
260	104	R743OXMX	4	binary	Maximum number of attempts to exceed maximum number of shared storage pages per cycle.
264	108	R743MSLR	4	binary	Maximum amount of storage (MB) available for shared library region.
268	10C	R743CSLR	4	s_float	Accumulated amount of shared library storage (MB) allocated in one interval.
272	110	R743CLMN	4	binary	Minimum amount of shared library storage (MB) allocated per cycle.
276	114	R743CLMX	4	binary	Maximum number of shared library storage (MB) allocated per cycle.
280	118	R743OSLR	4	s_float	Accumulated number of attempts to exceed maximum amount of shared library region size during one interval.
284	11C	R743OLMN	4	binary	Minimum number of attempts to exceed maximum amount of shared library region per cycle.

Offsets		Name	Length	Format	Description
288	120	R743OLMX	4	binary	Maximum number of attempts to exceed maximum amount of shared library region per cycle.
292	124	R743MQDS	4	binary	Maximum amount of queued signals allowed per process.
296	128	R743OQDS	4	s_float	Accumulated number of attempts to exceed maximum amount of queued signals per interval.
300	12C	R743OQMN	4	binary	Minimum number of attempts to exceed maximum amount of queued signals per cycle.
304	130	R743OQMX	4	binary	Maximum number of attempts to exceed maximum amount of queued signals per cycle.

Subtype 4 — Coupling Facility Activity

Local Coupling Facility Data Section

One per record

Offsets		Name	Length	Format	Description
0	0	R744FNAM	8	EBCDIC	Name of coupling facility as defined in parmlib member COUPLExx.
8	8	R744FSYS	8	EBCDIC	Name of this system (from IEASYSxx parmlib member, SYSNAME parameter).
16	10	R744FFLG	1	binary	Status Flags. **Bit** **Meaning When Set** **0** Coupling facility was connected to the system at the end of the interval **1** Coupling facility became active during the interval **2** Permanent error in cycle gatherer during the complete interval **3-7** Reserved.
17	11	R744FFLC	1	binary	Informational Flags. **Bit** **Meaning When Set** **0** CHPIDs set offline during the interval **1-7** Reserved.
18	12		1		Reserved.
19	13	R744FAMV	1	binary	IXLYAMDA Version.
20	14	R744FPAM	4	binary	Number of paths available to the coupling facility.
24	18	R744FPBC	8	l_float	Number of times coupling facility requests fail due to path busy.
32	20	R744FSCG	4	binary	Number of subchannels defined.
36	24	R744FSCU	4	binary	Number of subchannels currently in use.
40	28	R744FSCL	4	binary	Number of subchannels that can be used (limit).
44	2C	R744FSCC	8	l_float	Subchannel contention count (all subchannel busy).
52	34	R744FTOR	8	l_float	Total number of requests from this system.
60	3C	R744FAIL	8	l_float	Number of unsuccessful requests from this system.
68	44	R744FTIM	8	l_float	Total service time for unsuccessful requests in microseconds.
76	4C	R744FSQU	8	l_float	Total squares of service time for unsuccessful requests (in square-microseconds).
84	54	R744FCTM	8	l_float	Total contention time (microseconds) for waiting for subchannels to become free for synchronous immediate operations.
92	5C	R744FCSQ	8	l_float	Total squares of contention time for waiting for subchannels to become free for synchronous immediate operations.

Offsets		Name	Length	Format	Description
100	64	R744FMOD	6	EBCDIC	Coupling facility model (including leading zeros, for example ’009672’).
106	6A	R744FVER	3	EBCDIC	Coupling facility version (for example ’C01’).
109	6D		3		Reserved.
112	70	R744FLVL	4	binary	Coupling facility level.
116	74	R744FPAS	1	binary	Path-available mask for CF links.
117	75	R744FPIS	1	binary	Path-installed mask for CF links.
118	76	R744FPCM	1	binary	Composite-path mask: paths that have a physical or logical connection to the facility or that are connected to the facility in the active policy.
119	77		1		Reserved.
The following field is available eight times for eight possible channel paths.					
120	78	R744FTAP	5	EBCDIC	Channel path type acronym.

Connectivity Data Section

One per sysplex member

Offsets		Name	Length	Format	Description
0	0	R744XSYS	8	EBCDIC	Name of remote system also reporting on this coupling facility (from IEASYSxx parmlib member, SYSNAME parameter).

Storage Data Section

One per record

Offsets		Name	Length	Format	Description
0	0	R744GCSD	4	binary	Total amount of control storage defined (4K-block units).
4	4	R744GCSF	4	binary	Amount of free control storage (4K-block units).
8	8	R744GTSD	4	binary	Total amount of coupling facility storage defined (4K-block units).
12	C	R744GTSF	4	binary	Amount of free coupling facility storage (4K-block units).
16	10	R744GDSA	4	binary	Amount of dump space allocated (4K-block units).
20	14	R744GDSF	4	binary	Amount of free dump space free dump space (4K-block units).
24	18	R744GDSR	4	binary	Maximum amount of dump space requested (4K-block units).

Structure Data Section

One for each structure

Offsets		Name	Length	Format	Description
0	0	R744QSTR	16	EBCDIC	Name of structure allocated in this coupling facility.
16	10	R744QSIZ	4	binary	Structure size requested to be allocated (4K-block units).
20	14	R744QVER	8	binary	Structure version number.

Offsets		Name	Length	Format	Description
28	1C	R744QFLG	1	binary	Status Flags. **Bit** **Meaning When Set** **0** Active instance of structure (normal case). **1** New instance during rebuild. **2** Old instance during rebuild. **3** Instance is just being added or deleted (in transition). **4** Instance in hold, deletion could not be finished. **5** Dump was initiated for this structure. **6** Structure rebuild in progress. **7** The in-progress rebuild is a duplexing rebuild.
29	1D		3		Reserved.

Request Data Section

One for each structure

Offsets		Name	Length	Format	Description
0	0	R744SNAM	16	EBCDIC	Name of connected structure in this coupling facility.
16	10	R744SVER	8	binary	Structure version number.
24	18	R744STYP	1	binary	Structure type identifier. **Value** **Meaning** **1** Unserialized List structure **2** Serialized List structure **3** Lock structure **4** Cache structure
25	19	R744SFLG	1	binary	Status Flags. **Bit** **Meaning When Set** **0** Structure was connected to the system at the end of the interval **1** Structure became active during the interval **2-7** Reserved.
26	1A		1		Reserved.
27	1B	R744SLEC	1	binary	Lock structure only: lock table entry characteristic.
28	1C	R744SLEL	4	binary	List structure only: limit on number of list entries.
32	20	R744SLEM	4	binary	List structure only: Current number of list entries in use.
36	24	R744SLTL	4	binary	Lock structure only: limit on number of lock table entries.
40	28	R744SLTM	4	binary	Lock structure only: Current number of lock table entries in use.
44	2C	R744SSTA	8	l_float	The number of list or cache requests that were to be executed asynchronously at the coupling facility but which could not be due to lack of resources. Always zero for lock structures,
52	34	R744STRC	8	l_float	The total number of IXLLIST, IXLCACHE, or IXLLOCK requests made. This field will not necessarily equal the sum or R744SSRC, R744SARC, and R744SSTA due to internal processing. Use of the batch unlock function can produce large discrepancies because R744STRC is incremented for each lock being released, but only one coupling facility operation is executed.
60	3C	R744STAC	8	l_float	The total number of IXLLOCK requests that could not be satisfied immediately because of lock contention.
68	44	R744SARC	8	l_float	The total number of operations executed asynchronously at the coupling facility.
76	4C	R744SATM	8	binary	Summed service time for asynchronous requests in microseconds.

Offsets		Name	Length	Format	Description
84	54	R744SASQ	8	binary	Summed squares of service time for asynchronous requests.
92	5C	R744SSRC	8	l_float	Count of number of times for synchronous requests.
100	64	R744SSTM	8	binary	Summed service time for synchronous requests in microseconds.
108	6C	R744SSSQ	8	binary	Summed squares of service time for synchronous requests.
116	74	R744SQRC	8	l_float	Count of number of times for queued requests.
124	7C	R744SQTM	8	binary	Summed queue delay time in microseconds.
132	84	R744SQSQ	8	binary	Summed squares of delay time for queued requests.
140	8C	R744SDRC	8	l_float	Number of times a request was found delayed in case of dump serialization.
148	94	R744SDTM	8	binary	Summed dump delay time in microseconds.
156	9C	R744SDSQ	8	binary	Summed squares of dump delay time.
164	A4	R744SDMP	8	l_float	Number of times dump serialization was found for this structure (list and cache structures only).
172	AC	R744SHTO	8	l_float	Total number of requests waiting on the high priority queue.
180	B4	R744SHMN	4	binary	Minimum number of requests waiting on the high priority queue during this interval.
184	B8	R744SHMX	4	binary	Maximum number of requests waiting on the high priority queue during this interval.
188	BC	R744SLTO	8	l_float	Total number of requests waiting on the low priority queue.
196	C4	R744SLMN	4	binary	Minimum number of requests waiting on the low priority queue during this interval.
200	C8	R744SLMX	4	binary	Maximum number of requests waiting on the low priority queue during this interval.
204	CC	R744SDTO	8	l_float	Total number of requests delayed because dump serialization is in progress.
212	D4	R744SDMN	4	binary	Minimum number of requests delayed because dump serialization is in progress during this interval.
216	D8	R744SDMX	4	binary	Maximum number of requests delayed because dump serialization is in progress during this interval.
220	DC	R744SCN	8	l_float	Lock structure only: number of times any request encountered lock contention.
228	E4	R744SFCN	8	l_float	Lock structure only: number of times any request encountered false lock contention (storage contention within the structure).
236	EC	R744SSIZ	4	binary	Allocated size of structure (units = 4K byte blocks).
240	F0	R744SMAS	4	binary	Maximum structure size.
244	F4	R744SMIS	4	binary	Minimum structure size.
248	F8	R744SDEC	4	binary	Cache structure only: Total directory entry count.
252	FC	R744SDEL	4	binary	Cache structure only: Total data element count.
256	100	R744SNLH	4	binary	List structure only: Number of list headers.
260	104	R744SMAE	4	binary	List structure only: Maximum number of elements.
264	108	R744SCUE	4	binary	List structure only: Current number of elements in use.
268	10C	R744CDSI	2	binary	Index to first cache data section.
270	10E	R744CDNE	2	binary	Number of cache data section entries.
272	110	R744SPLN	8	l_float	Count of peer-link-not-available conditions.
280	118	R744SPES	8	l_float	Count of execution-suppressed conditions.
288	120	R744SPTC	8	l_float	Count of waiting-for-peer-subchannel conditions.
296	128	R744SPST	8	l_float	Total peer-subchannel-wait time (microseconds).

Offsets		Name	Length	Format	Description
304	130	R744SPSS	8	l_float	Square of total peer-subchannel-wait time (microseconds squared).
312	138	R744SRTC	8	l_float	Count of condition 'waiting for peer subchannel with reserve held'.
320	140	R744SRST	8	l_float	Total peer-subchannel-wait-with-reserve time (microseconds).
328	148	R744SRSS	8	l_float	Square of total peer-subchannel-wait-with-reserve time (microseconds squared).
336	150	R744SCTC	8	l_float	Count of condition 'waiting for peer completion'.
344	158	R744SCST	8	l_float	Total waiting-for-peer-completion time (microseconds).
352	160	R744SCSS	8	l_float	Square of total waiting-for-peer-completion time (microseconds squared).
360	168	R744SLSV	8	binary	Logical structure version number.

Processor Utilization Data Section

One for each processor

Offsets		Name	Length	Format	Description
0	0	R744PNUM	4	binary	CPU number.
4	4	R744PBSY	4	binary	Busy time (in microseconds).
8	8	R744PWAI	4	binary	Wait time (in microseconds).

Cache Data Section

Several sections for each request section are possible, depending on applications using the coupling facility.

Offsets		Name	Length	Format	Description
0	0	R744CRHC	8	l_float	Read hit counter.
8	8	R744CRMD	8	l_float	Read miss, directory hit counter.
16	10	R744CRMA	8	l_float	Read miss, assignment suppressed counter.
24	18	R744CRMN	8	l_float	Read miss, name assigned counter.
32	20	R744CRMT	8	l_float	Read miss, target storage class full.
40	28	R744CWH0	8	l_float	Write hit change bit 0 - number of times unchanged data was written.
48	30	R744CWH1	8	l_float	Write hit change bit 1 - number of times changed data was written.
56	38	R744CWMN	8	l_float	Write miss not registered counter.
64	40	R744CWMI	8	l_float	Write miss invalid state counter.
72	48	R744CWMT	8	l_float	Write miss storage class full counter.
80	50	R744CDER	8	l_float	Directory entry reclaim counter.
88	58	R744CDTR	8	l_float	Data entry reclaim counter.
96	60	R744CXDR	8	l_float	XI directory reclaim counter.
104	68	R744CXFW	8	l_float	XI write counter.
112	70	R744CXNI	8	l_float	XI name invalidation counter.
120	78	R744CXCI	8	l_float	XI complement invalidation counter.
128	80	R744CCOC	8	l_float	Castout counter.
136	88	R744CRSM	8	l_float	Reference signal miss counter.
144	90	R744CTSF	8	l_float	Target storage class full counter.
152	98	R744CDEC	4	binary	Directory entry counter snapshot.

Offsets		Name	Length	Format	Description
156	9C	R744CDAC	4	binary	Data element counter snapshot.
160	A0	R744CTCC	4	binary	Total changed counter.
164	A4	R744CDTA	4	binary	Data area counter.
168	A8	R744CRLC	8	l_float	Completed reference list counter.
176	B0	R744CPRL	8	l_float	Partially completed reference list counter.
184	B8	R744CXRL	8	l_float	XI for local cache vector index replacement.
192	C0	R744CWUC	8	l_float	Write unchanged counter.

Remote Facility Data Section

One section for each duplexing coupling facility.

Offsets		Name	Length	Format	Description
0	0	R744RNDE	32	EBCDIC	Hardware node descriptor for the remotely connected CF.
32	20	R744RSYS	8	EBCDIC	System identification value for the remotely connected CF.
40	28	R744RNAM	8	EBCDIC	CF name (if applicable, else X'0').
48	30	R744RPGS	1	binary	Path group size.
49	31		3		Reserved.
52	34	R744RRES	4	binary	Ready-to-execute signal counter.
56	38	R744RRCS	4	binary	Ready-to-complete signal counter.
60	3C	R744RHES	4	binary	Halt-execution signal counter.
64	40	R744RRSS	4	binary	Request-for-suppression signal counter.
68	44	R744RRSA	4	binary	Request-for-suppression-accepted signal counter.
72	48	R744RSST	4	binary	Unused. Value is now in R744RSSE.
76	4C	R744RSSS	8	binary	Total squares of signal service times.
84	54	R744RDSC	4	binary	Delayed signal counter.
88	58	R744RSDT	4	binary	Total signal delay times in microseconds.
92	5C	R744RSSD	8	binary	Total squares of signal times.
100	64	R744RSRS	4	binary	Signal-redrives signal counter.
The following field is available eight times for eight possible channel paths.					
104	68	R744RTAP	5	EBCDIC	Channel path type acronym. A CHPID type is provided for each active message path in the path group. The number of valid entries is equal to the path group size.
144	90	R744RSSE	8	binary	Sum of signal service times in microseconds.

Subtype 5 — Cache Subsystem Activity

Cache Control Section

There is one section per record.

Offsets		Name	Length	Format	Description
0	0	R745CLVL	1	binary	Gatherer level.
1	1	R745CMDL	1	binary	Caching subsystem model.
2	2	R745CCNT	1	binary	Record sequence number.
3	3	R745CUID	1	EBCDIC	Real control unit ID.

Offsets		Name	Length	Format	Description
4	4	R745CSC	1	binary	Status code. **Value** **Meaning** **0** Successful processed. **4** IOS return code R745CIOC ¬= 0. **8** IDCSS01 return code R745CRTN ¬= 0. **98** SYSTEM or USER ABEND R745CEA ¬= 0.
5	5	R745CAE	3	binary	ABEND CODE (SDWACMPC): First 12 bits = System completion code. Second 12 bits = User completion code.
8	8	R745CRTN	2	binary	IDCSS01 return code. If not zero, record has no device data sections (SMF745DN=0).
10	A	R745CIOC	1	binary	IOS return code. If not zero, record has no device data sections (SMF745DN = 0).
11	B		1		Reserved.
12	C	R745CINT	4	binary	Number of seconds since subsystem statistics last collected.
16	10	R745CCMT	28	EBCDIC	Hardware type and model of the control unit.

Cache Device Data Section

There is one section per device.

Offsets		Name	Length	Format	Description
0	0	R745DVOL	6	EBCDIC	Volume serial of device.
6	6	R745DFL4	1	binary	Flags **Bit** **Meaning When Set** **0** 4-digit device address. **1-7** Reserved.
7	7	R745DCID	1	EBCDIC	Real control unit type code.
7	7	R745DCCU	1	EBCDIC	Configured control unit type code if R745CMDL = 1.
8	8	R745DUNT	3	binary	Unit address for sense command.
11	B		1		Reserved.
12	C	R745DEVN	2	binary	Device number.
14	E		2		Reserved.
16	10	R745DFLG	1	binary	Flags **Bit** **Meaning When Set** **0** Subsystem storage not available. **1-3** Reserved. **4-7** Format of data returned: B'0000' = 40 bytes sense. B'1111' = 44 bytes sense.
17	11	R745DVID	1	binary	Device address.

Offsets		Name	Length	Format	Description
18	12	R745DVS1	1	binary	Addressed device status flag # 1: **Bit** **Meaning** **0-1** Device caching status: B'00' = Caching activated. B'01' = Not used. B'10' = Deactivate pending. B'11' = Caching deactivated. **2-3** DASD fast write device status: B'00' = DFW allowed B'01' = DFW not used B'10' = DFW deactivate pending B'11' = DFW deactivate **4** Primary of duplex pair. **5** Secondary of duplex pair. **6-7** Duplex pair status: B'00' = Duplex pair available. B'01' = Duplex pair pending. B'10' = Failed duplex primary. B'11' = Failed duplex not primary.
19	13	R745DVS2	1	binary	Addressed device status flag # 2. **Bit** **Meaning** **0** Device is failed duplex. **1** Pinned data exits for device. **2-7** Other device in duplex pair.
20	14	R745DRCR	4	s_float	Search read caching requests.
24	18	R745DCRH	4	s_float	Search read caching hits.
28	1C	R745DWRC	4	s_float	Write caching requests.
32	20	R745DWCH	4	s_float	Write caching request hits.
36	24	R745DRSR	4	s_float	Read sequential requests.
40	28	R745DRSH	4	s_float	Read sequential request hits.
44	2C	R745DWSR	4	s_float	Write sequential requests.
48	30	R745DWSH	4	s_float	Write sequential request hits.
52	34	R745DRNR	4	s_float	Search read non-retentive requests.
56	38	R745DNRH	4	s_float	Search read non-retentive request hits.
60	3C	R745DWNR	4	s_float	Write non-retentive requests.
64	40	R745DWNH	4	s_float	Write non-retentive hits.
68	44	R745DICL	4	s_float	Inhibit cache load requests.
72	48	R745DBCR	4	s_float	Bypass cache requests.
76	4C	R745DTC	4	s_float	Sequential DASD to cache XFRs.
80	50	R745DNTD	4	s_float	Normal cache requests DASD to cache XFRs.
84	54	R745DCTD	4	s_float	Cache to DASD XFRs.
88	58	R745DFWB	4	s_float.	Fast write bypass count.
92	5C	R745DFWC	4	s_float	Fast write caching requests.
96	60	R745DFWS	4	s_float	Fast write sequential requests.
100	64	R745DCRM	4	s_float	Record cache read misses.

Offsets		Name	Length	Format	Description
104	68	R745DSG2	1	binary	Device status group 2. **Bit** **Meaning** **0-1** Record cache optimization level: B'00' = Full adapt rec cache B'01' = Adapt rec. cache writes B'10' = Rec cache on def ext B'11' = Track mode **2** Data exits in failed NVS. **3** Defective battery, destage pending. **4-5** Volume state: B'00' = Non spare. B'01' = Reserved. B'10' = Spare. B'11' = Broken spare. **6-7** Pinned data: B'00' = No pinned data and FW. B'01' = Pinned data and not FW suspend. B'10' = Reserved. B'11' = Pinned data and FW suspend.
105	69	R745INCR	1	binary	Status code. **0** Transfer statistics not valid. **1** Transfer statistics valid. Bytes in units of 128K. Times in units of 16 milliseconds.
106	6A	R745DSID	2	binary	Subsystem ID.
108	6C	R745DCWP	4	s_float	RCD cache write promotions.
112	70	R745DKDW	4	s_float	CKD writes, collected for 3990-03/06 and 2105.
116	74	R745DKDH	4	s_float	CKD write hits, collected for 3990-03/06 and 2105.
120	78	R745DFWR	4	s_float	CFW bypass, collected for 3990-03/06 and 2105.
124	7C	R745BYTR	4	s_float	Bytes read. See R745INCR.
128	80	R745BYTW	4	s_float	Bytes written. See R745INCR.
132	84	R745RTIR	4	s_float	Response time to read bytes. See R745INCR.
136	88	R745RTIW	4	s_float	Response time to write bytes. See R745INCR.

Cache Device Data Section Extension

There is one section per device.

This extension applies only to control unit types 3990-03/06. It is collected by RMF to provide the same data as in the corresponding CRR record.

Offsets		Name	Length	Format	Description
0	0	R745XDVN	2	binary	Device number.
2	2		2		Reserved.
4	4	R745XRSV	4	s_float	Lower interface I/O response time (in milliseconds).
8	8	R745XCTC	4	s_float	Not used by RMF.
12	C	R745XCTR	4	s_float	Not used by RMF.
16	10	R745XVRD	4	s_float	Not used by RMF.
20	14	R745XVRH	4	s_float	Not used by RMF.
24	18	R745XVWR	4	s_float	Not used by RMF.
28	1C	R745XVWH	4	s_float	Not used by RMF.

Offsets		Name	Length	Format	Description
32	20	R745XSRR	4	s_float	Not used by RMF.
36	24	R745XFRD	4	s_float	Not used by RMF.
40	28	R745XWCC	4	s_float	Not used by RMF.
44	2C	R745XPRC	4	s_float	Not used by RMF.
48	30	R745XCT1	4	s_float	Not used by RMF.
52	34	R745XCT2	4	s_float	Not used by RMF.
56	38	R745XCT3	4	s_float	Not used by RMF.
60	3C	R745XCT4	4	s_float	Not used by RMF.
64	40	R745XCT5	4	s_float	Not used by RMF.
68	44	R745XCT6	4	s_float	Not used by RMF.
72	48	R745XCT7	4	s_float	Not used by RMF.
76	4C	R745XCT8	4	s_float	Not used by RMF.
80	50	R745XCT9	4	s_float	Not used by RMF.
84	54	R745XCTA	4	s_float	Not used by RMF.

Cache Control Unit Status Data Section

There is one section per record.

Offsets		Name	Length	Format	Description
0	0	R745SVOL	6	EBCDIC	Volume serial of device.
6	6		2		Reserved.
8	8	R745SUNT	3	binary	Unit address for sense command.
11	B		1		Reserved.
12	C	R745SDEV	2	binary	Device number.
14	E	R745SLN	2	binary	Length of data section.
16	10	R745SFT	1	binary	Status data format. **Bit** **Meaning** **0-3** Reserved. **4-7** Format of data returned: B'....0000' = 40 bytes sense. B'....1111' = 44 bytes sense.
17	11	R745SDID	1	binary	Device ID.
18	12	R745SNAD	1	binary	Number of attached devices.
19	13	R745SNSS	1	binary	Number of statistic sets.
20	14	R745SCS	1	binary	Caching status. **Bit** **Meaning** **0-2** Overall caching status: B'000' = Caching active. B'001' = Pending active. B'010' = Subsystem error. B'011' = Reserved. B'100' = Host or support facility deactivated. B'101' = Cache suspended. B'110' = Pending off in process. B'111' = Pending off failure. **3** Disabled for maintenance. **4-5** Reserved. **6** IML device not available. **7** Non-retentive deactivated.

Offsets		Name	Length	Format	Description
21	15	R745SVSS	1	binary	Non-volatile storage status. **Bit** **Meaning** **0** Host termination. **1** Problem termination. **2** Reserved. **3** Disabled for maintenance. **4** Pending due to problem. **5-7** Reserved.
22	16	R745SCLN	2	binary	Length of subsystem count area.
24	18		2		Reserved.
26	1A	R745SCNF	4	binary	Configured subsystem storage.
30	1E	R745SAVL	4	binary	Available subsystem storage.
34	22	R745SPIN	4	binary	Pinned subsystem storage, collected for 3990-03/06 and 2105 only.
38	26	R745SOFF	4	binary	Offline subsystem storage, collected for 3990-03/06 and 2105 only.
42	2A	R745SDS1	1	binary	Addressed device status 1. **Bit** **Meaning** **0-1** Device caching status: B'00' = Activated. B'01' = Not used. B'10' = Deactivate pending. B'11' = Deactivated. **2-3** DASD fast write status: B'00' = DFW allowed. B'01' = Not used. B'10' = Deactivate pending. B'11' = Deactivated. **4** Primary duplex pair. **5** Secondary duplex pair. **6-7** Duplex pair status: B'00' = Available. B'01' = Pending. B'10' = Failed primary. B'11' = Failed not primary.
43	2B	R745SDS2	1	binary	Addressed device status 2. **Bit** **Meaning** **0** Device is failed duplex. **1** Pinned data. **2-7** Other device in duplex.
44	2C	R745SCNV	4	binary	Configured non-volatile cache, collected for 3990-03/06 and 2105 only.
48	30	R745SPND	4	binary	Pinned non-volatile cache, collected for 3990-03/06 and 2105 only.

Offsets		Name	Length	Format	Description
52	34	R745SG2	1	binary	Device status group 2. **Bit** **Meaning** **0-1** Cache optimization level: B'00' = Rec full adapt. B'01' = Write rec adapt. B'10' = Def ext record. B'11' = Track mode. **2** Data on failed NVS. **3** Defective battery destage pending. **4-5** Volume state: B'00' = Non spare. B'01' = Reserved. B'10' = Spare. B'11' = Broken spare. **6-7** Pinned data: B'00' = Not pinned and FW. B'01' = Pinned and not FW suspended. B'10' = Reserved. B'11' = Pinned and FW suspended.
53	35	R745SGL	1	binary	Global status. **Bit** **Meaning** **0** CFW and DFW suspended. **1-7** Reserved.
54	36	R745SSID	2	binary	Subsystem ID.
56	38		1		Reserved.
57	39		1		Reserved.
58	3A		1		Reserved.
59	3B		1		Reserved.
60	3C		12		Reserved.

RAID Rank/Extent Pool Data Section

There is one section per device.

Offsets		Name	Length	Format	Description
0	0	R7451DVN	2	binary	Device number (binary).
2	2	R7451INC	1	binary	Flag **Bit** **Meaning When Set** **0-4** Reserved. **5-6** Measurement units: B'00' = Bytes in units of 128K and times in units of 16 milliseconds. B'01', B'10', B'11' = Reserved. **7** B'1'= Transfer statistics R7451XFR are valid.
3	3		1		Reserved.
4	4	R7451RSV	4	s_float	Lower interface I/O response time (in milliseconds).
8	8	R7451FLG	1	binary	Flag. **Value** **Meaning** **0** No additional information **1** RAID rank data. **2** Extent pool and physical storage data.
9	9	R7451AID	1	binary	Device adapter ID. Only valid with RAID rank data.

Offsets		Name	Length	Format	Description
10	A	R7451RID(2)	2	binary	RAID rank ID.
10	A	R7451XID(3)	2	binary	Extent pool ID.
12	C	R7451HDD(1)(2)	1	binary	Number of HDDs in RAID rank.
12	C	R7452XTY(3)	1	binary	Extent type: **Value** **Meaning** **X'04'** FB 1Gb **X'84'** CKD 1Gb
13	D	R7451RTY(2)	1	binary	RAID rank type. **Value** **Type** **0** RAID-5 **1** JBOD **2** RAID-10
13	D	R7452XFL(3)	1	binary	Extent pool flag: **Bit** **Meaning When Set** **0** Dynamic extent allocation **1** Data sharing **2** Migrating/migration state **3-7** Reserved.
14	E	R7451HSS(1)	2	binary	HDD sector size.
16	10	R7451RRQ(1)(2)	4	s_float	RAID rank read requests.
16	10	R7452PRO(3)	4	s_float	Physical storage read operations.
20	14	R7451WRQ(1)(2)	4	s_float	RAID rank write requests.
20	14	R7452PWO(3)	4	s_float	Physical storage write operations.
24	18	R7451SR(1)(2)	4	s_float	RAID rank FB sectors read.
24	18	R7452PBR(3)	4	s_float	Physical storage bytes read. Units in R7451UNT.
28	1C	R7451SW(1)(2)	4	s_float	RAID rank FB sectors written.
28	1C	R7452PBW(3)	4	s_float	Physical storage bytes written. Units in R7451UNT.
32	20	R7451RMR	4	s_float	Record mode read request.
36	24	R7451XSF	4	s_float	Extended-Remote-Copy(XRC) or Concurrent-Copy(CC) sidefile read request.
40	28	R7451XCW	4	s_float	XRC or CC contaminated writes.
44	2C	R7451TSP	4	s_float	Number of tracks transferred to secondary Peer-to-Peer-Remote-Copy(PPRC) volume.
48	30	R7451NVS	4	s_float	NVS space allocation.
52	34	R7451RRT(1)(2)	4	s_float	RAID rank read response time (in milliseconds).
52	34	R7452PRT(3)	4	s_float	Physical storage read response time. Units in R7451UNT.
56	38	R7451WRT(1)(2)	4	s_float	RAID rank write response time (in milliseconds).
56	38	R7452PWT(3)	4	s_float	Physical storage write response time. Units in R7451UNT.
60	3C	R7451CT1	4	s_float	Bytes read. Units in R7451UNT.
64	40	R7451CT2	4	s_float	Bytes written. Units in R7451UNT.
68	44	R7451CT3	4	s_float	Read response time. Units in R7451UNT.
72	48	R7451CT4	4	s_float	Write response time. Units in R7451UNT.
76	4C		4		Reserved.
80	50		4		Reserved.
84	54		4		Reserved.

Offsets		Name	Length	Format	Description
Notes:					
(1) The information in this field is available only for one device belonging to the rank, as indicated by flag R7451FLG.					
(2) This field is valid if R7451FLG is set to 1.					
(3) This field is valid if R7451FLG is set to 2.					

Subtype 6 — Hierarchical File System Statistics

HFS Global Data Section

Offsets		Name	Length	Format	Description
0	0	R746GMXV	4	binary	Value of VIRTUAL(MAX) (in MB).
4	4	R746GUSV	4	binary	Total amount (in pages) of virtual storage in use.
8	8	R746GMNF	4	binary	Value of FIXED(MIN) (in MB).
12	C	R746GUSF	4	binary	Total amount (in pages) of permanently fixed storage in use.
16	10	R746GMC	8	l_float	Number of times the metadata for a file was found in virtual storage (cache) during file lookup.
24	18	R746GMNC	8	l_float	Number of times the metadata for a file was not found in virtual storage (cache) during file lookup and an index call was necessary which may result in an I/O.
32	20	R746G1C	8	l_float	Number of times the first page of a data file was requested and found in virtual storage (cache).
40	28	R746G1NC	8	l_float	Number of times the first page of a data file was requested and not found in virtual storage (cache) and an I/O was necessary.
48	30	R746GLRC	4	binary	Return code from OMVS BPX1PCT for DisplayBufferLimits command.
52	34	R746GLRS	4	binary	Reason code from OMVS BPX1PCT for DisplayBufferLimits command.
56	38	R746GSRC	4	binary	Return code from OMVS BPX1PCT for DisplayGlobalStats command.
60	3C	R746GSRS	4	binary	Reason code from OMVS BPX1PCT for DisplayGlobalStats command.
64	40	R746GSFL	1	binary	Status flags. **Bit** **Meaning When Set** **0** OMVS kernel not ready **1** No buffer limit data **2** No global data **3** Partial global data **4-7** Reserved.
65	41		7		Reserved.

HFS Global Buffer Section

Offsets		Name	Length	Format	Description
0	0	R746GSB	2	binary	Size of buffers in buffer pool (in pages).
2	2	R746GNDS	2	binary	Number of data spaces for buffer pool.
4	4	R746GSBP	4	binary	Size of buffer pool (in pages).
8	8	R746GSBF	4	binary	Size of permanently fixed buffers in buffer pool (in pages).
12	C		4		Reserved.

Offsets		Name	Length	Format	Description
16	10	R746GBF	8	l_float	Number of times a buffer was already fixed prior to an I/O request in buffer pool.
24	18	R746GBNF	8	l_float	Number of times a buffer was not already fixed prior to an I/O request in buffer pool.

HFS File System Section

Offsets		Name	Length	Format	Description
0	0	R746FSNM	44	EBCDIC	File system name (cataloged dataset name).
44	2C	R746FSNL	1	binary	Length of file system name.
45	2D	R746FSFL	1	binary	Status flags. **Bit** **Meaning When Set** **0** No HFS file system statistics. **1** Mount time changed. **2** File system now mounted. **3-7** Reserved.
46	2E		2		Reserved.
48	30	R746FCTM	8	EBCDIC	Current time stamp (when was data obtained).
56	38	R746FMTM	8	EBCDIC	Mount time stamp.
64	40	R746FSF	4	binary	Size of file system (in pages).
68	44	R746FPF	4	binary	Number of pages internally used by HFS.
72	48	R746FPD	4	binary	Number of pages used for the attribute directory.
76	4C	R746FPC	4	binary	Number of data buffer pages cached by this file system.
80	50	R746FSFI	8	l_float	Number of sequential file data I/O requests issued.
88	58	R746FRFI	8	l_float	Number of random file data I/O requests issued.
96	60	R746FMC	8	l_float	Number of times the metadata for a file was found in virtual storage (cache) during file lookup.
104	68	R746FMNC	8	l_float	Number of times the metadata for a file was not found in virtual storage (cache) during file lookup and an index call was necessary which may result in an I/O.
112	70	R746F1C	8	l_float	Number of times the first page of a data file was requested and found in virtual storage (cache).
120	78	R746F1NC	8	l_float	Number of times the first page of a data file was requested and not found in virtual storage (cache) and an I/O was necessary.
128	80	R746FINT	8	l_float	Number of index new tops.
136	88	R746FIS	8	l_float	Number of index splits.
144	90	R746FIJ	8	l_float	Number of index joins.
152	98	R746FIRH	8	l_float	Number of index page read hits.
160	A0	R746FIRM	8	l_float	Number of index page read misses.
168	A8	R746FIWH	8	l_float	Number of index page write hits.
176	B0	R746FIWM	8	l_float	Number of index page write misses.
184	B8	R746FSRC	4	binary	Return code from OMVS BPX1PCT for DisplayFSStats command.
188	BC	R746FSRS	4	binary	Reason code from OMVS BPX1PCT for DisplayFSStats command.

Subtype 7 — FICON Director Statistics

FCD Global Data Section

Offsets		Name	Length	Format	Description
0	0	R747GCFL	1	binary	Configuration change flags. **Bit** **Meaning When Set** **0** Configuration changed during interval. **1** Configuration changed since IPL. **2** System IPLed via IODF. **3** I/O configuration token is valid. **4-7** Reserved.
1	1		1		Reserved.
2	2	R747GNFD	2	binary	Number of installed FCD switches.
4	4	R747GINM	44	EBCDIC	IODF name.
48	30	R747GISF	2	EBCDIC	Suffix of IODF name.
50	32	R747GICI	18	EBCDIC	IODF creation information.
50	32	R747GICD	10	EBCDIC	IODF creation date (mm/dd/yyyy).
60	3C	R747GICT	8	EBCDIC	IODF creation time (hh.mm.ss).
68	44		12		Reserved.

FCD Switch Data Section

Offsets		Name	Length	Format	Description
0	0	R747SDEV	2	binary	Switch device number.
2	2	R747SLSN	1	binary	Logical switch number.
3	3	R747SPFL	1	binary	Switch processing flags. **Bit** **Meaning When Set** **0** Status of switch has changed. **1** Number of ports has changed. **2-7** Reserved.
4	4	R747SND	32	EBCDIC	ND associated with switch device.
36	24	R747SNSP	2	binary	Number of supported ports for this switch.
38	26	R747SNIP	2	binary	Number of installed ports for this switch.
40	28		8		Reserved.

FCD Port Data Section

Offsets		Name	Length	Format	Description
0	0	R747PNUM	1	EBCDIC	Port number.
1	1	R747PADR	1	EBCDIC	Port address.
2	2	R747PTFL	1	binary	Port type flags. **Bit** **Meaning When Set** **0** Port type is single CU. **1** Port type is multiple CU. **2** Port type is CHPID. **3-7** Reserved.

Offsets		Name	Length	Format	Description
3	3	R747PSFL	1	binary	Status flags. **Bit** **Meaning When Set** **0** Port type is not unique. **1** Id is not unique or not known. **2-3** Reserved. **4** Port status changed. **5** Port has been removed. **6** Port has been activated. **7** No measurement data available for this port.
4	4	R747PCU	2	binary	Connector id (CU) or channel path. **Note:** In case of a channel path, the CHPID can also be addressed as a one-byte field R747PCP at offset 5.
6	6	R747PCUN	1	binary	Number of connector CUs.
7	7	R747PNPC	1	binary	Number of connector sections.
8	8	R747PXPC	2	binary	Index of first connector section.
10	A		6		Reserved.
16	10	R747PFPT	8	l_float	Frame pacing time (in units of 2.5 microseconds).
24	18	R747PNWR	8	l_float	Number of words received.
32	20	R747PNWT	8	l_float	Number of words transmitted.
40	28	R747PNFR	8	l_float	Number of frames received.
48	30	R747PNFT	8	l_float	Number of frames transmitted.
56	38	R747PNER	8	l_float	Number of errors.
64	40		8		Reserved.

FCD Connector Data Section

Offsets		Name	Length	Format	Description
0	0	R747CNUM	1	EBCDIC	Port number.
1	1	R747CADR	1	EBCDIC	Port address.
2	2	R747CTFL	1	binary	Port type flags. **Bit** **Meaning When Set** **0** Port type is single CU. **1** Port type is multiple CU. **2** Port type is CHPID. **3-7** Reserved.
3	3	R747CSFL	1	binary	Status flags. **Bit** **Meaning When Set** **0** Port type is not unique. **1** ID is not unique or not known. **2-3** Reserved. **4** Port status changed. **5** Port has been removed. **6** Port has been activated. **7** No measurement data available for this port.
4	4	R747CCU	2	binary	Connector id (CU).
6	6	R747CCUN	1	binary	Number of connector CUs.
7	7		1		Reserved.

Subtype 8 — Enterprise Disk System Statistics

There is one section per record.

Control Data Section

Offsets		Name	Length	Format	Description
0	0	R748CLVL	1	binary	Gatherer level.
1	1	R748CTYP	6	EBCDIC	Control unit type.
7	7	R748CMDL	3	EBCDIC	Control unit model.
10	A	R748CSER	10	EBCDIC	Primary control unit serial number.
20	14	R748CVSN	1	binary	Version of link statistics definition.
21	15	R748CAE	3	binary	Abend code (SDWACMPC) with: First 12 bits = System completion code. Second 12 bits = User completion code.
24	18	R748CRTN	2	binary	IDCSS01 return code.
26	1A	R748CSC	1	binary	Status code: **00** successfully processed. **04** IOS return code. R748CIOC ¬= 0. **08** IDCSS01 return code. R748CRTN ¬= 0. **98** SYSTEM or USER ABEND. R748CAE ¬= 0.
27	1B	R748CIOC	1	binary	IOS return code. If this field is not zero, no link statistic data sections are available.
28	1C	R748CFDV	2	binary	Failing device.
30	1E	R748CVOL	6	EBCDIC	Volume serial of the device from which statistics are measured.
36	24	R748CDEV	2	EBCDIC	Device number of the device from which statistics are measured.
38	26	R748CFLG	1	binary	Flags **Bit** **Meaning When Set** **0** Extent pool statistics valid **1-7** Reserved.
39	27		1		Reserved.
40	28	R748CINT	4	binary	Number of seconds that passed since the link statistics have been collected for the last time.
44	2C	R748CFTM	4	EBCDIC	Time when first record was written. Reserved for duration processing.
48	30	R748CFDT	4	EBCDIC	Date when first record was written. Reserved for duration processing.
52	34	R748CFCI	4	EBCDIC	Interval length of first record. Reserved for duration processing.

Link Statistics Section

There is one section per adapter.

Offsets		Name	Length	Format	Description
0	0	R748LAID	2	binary	Adapter ID.
2	2	R748LTYP	1	binary	Link Type: **1** ESCON **2** Fibre Channel 1 Gbit/s. **3** Fibre Channel 2 Gbit/s. **4** Fibre Channel 4 Gbit/s. **5** Fibre Channel 10 Gbit/s.

Offsets		Name	Length	Format	Description
3	3	R748LFLG	1	binary	Flags. **Bit** **Meaning When Set** **0** Units of bytes indeterminable. Byte values incorrect. **1** Units of time indeterminable. Time values incorrect.
4	4		4		Reserved.
8	8	R748LERB	8	l_float	ECKD read activity in units of 128KB.
16	10	R748LEWB	8	l_float	ECKD write activity in units of 128KB.
24	18	R748LERO	8	l_float	Number of ECKD read operations. For ESCON ports, one count is added per chain which transfers customer data (no administration data) to the host. For FICON ports, one count is added per command which transfers customer data to the host.
32	20	R748LEWO	8	l_float	Number of ECKD write operations. For ESCON ports, one count is added per chain which transfers customer data (no administration data) from the host. For FICON ports, one count is added per command which transfers customer data from the host.
40	28	R748LERT	8	l_float	Accumulated time for ECKD read activity on the channel in milliseconds. The active processing time for each command is accumulated.
48	30	R748LEWT	8	l_float	Accumulated time for ECKD write activity on the channel in milliseconds. The active processing time for each command is accumulated.
56	38	R748LPSB	8	l_float	PPRC send activity in units of 128KB.
64	40	R748LPRB	8	l_float	PPRC received activity in units of 128KB.
72	48	R748LPSO	8	l_float	PPRC send operations. Each PPRC write command sent by the PPRC primary is counted.
80	50	R748LPRO	8	l_float	PPRC received operations. Each PPRC write command received by the PPRC secondary is counted.
88	58	R748LPST	8	l_float	Accumulated time for PPRC send activity in milliseconds.
96	60	R748LPRT	8	l_float	Accumulated time for PPRC received activity in milliseconds.
104	68	R748LSRB	8	l_float	SCSI read activity in units of 128KB.
112	70	R748LSWB	8	l_float	SCSI write activity in units of 128KB.
120	78	R748LSRO	8	l_float	SCSI read operations. Each read operation is counted.
128	80	R748LSWO	8	l_float	SCSI write operations. Each write operation is counted.
136	88	R748LSRT	8	l_float	Accumulated time for SCSI read operations on the channel in milliseconds.
144	90	R748LSWT	8	l_float	Accumulated time for SCSI write operations on the channel in milliseconds.

Extent Pool Statistics Section

There is one section per extent pool.

Offsets		Name	Length	Format	Description
0	0	R748XPID	2	binary	Extent pool identifier.
2	2	R748XPLT	1	binary	Extent type: **Value** **Meaning** **0-3** Reserved **4** FIBRE 1Gb **5-131** Reserved **132** CKD 1Gb **133-255** Reserved.

Offsets		Name	Length	Format	Description
3	3		1		Reserved.
4	4	R748XRCP	4	binary	Real extent pool capacity in GB.
8	8	R748XRNS	4	binary	Number of real extents in extent pool.
12	C	R748XRNA	4	binary	Number of allocated real extents in extent pool.
16	10	R748XRSC	4	binary	Real extent conversions. Valid if bit 0 of R748CFLG is set.
20	14	R748XVCP	4	binary	Virtual extent pool capacity in GB. Valid if bit 0 of R748CFLG is set.
24	18	R748XVNS	4	binary	Number of virtual extents in extent pool. Valid if bit 0 of R748CFLG is set.
28	1C	R748XVSC	4	binary	Virtual extent conversions. Valid if bit 0 of R748CFLG is set.
32	20	R748XSDY	4	binary	Number of extents that were sources of dynamic extent relocations. Valid if bit 0 of R748CFLG is set.
36	24	R748XTDY	4	binary	Number of extents that were targets of dynamic extent relocations. Valid if bit 0 of R748CFLG is set.

Rank Statistics Section

There is one section per rank in a extent pool.

Offsets		Name	Length	Format	Description
0	0	R748RRID	2	binary	Rank identifier.
2	2	R748RPNM	2	binary	Extent pool number.
4	4	R748RCNT	2	binary	Count of arrays in rank.
6	6	R748RAIX	2	binary	Index to first array section of rank.
8	8	R748RBYR	8	l_float	Rank 128 KB read.
16	10	R748RBYW	8	l_float	Rank 128 KB write.
24	18	R748RROP	8	l_float	Rank read operations.
32	20	R748RWOP	8	l_float	Rank write operations.
40	28	R748RKRT	8	l_float	Rank read response time in units of 16 milliseconds.
48	30	R748RKWT	8	l_float	Rank write response time in units of 16 milliseconds.

Rank Array Data Section

There is one section per rank in a extent pool.

Offsets		Name	Length	Format	Description
0	0	R748AAID	2	binary	Rank array identifier.
2	2	R748ARID	2	binary	Rank identfier.
4	4	R748AEBC	16	EBCDIC	Description of array type, for example: RAID-10.
20	14	R748ATYP	1	binary	Array type: **Value** **Meaning** **1** RAID-5 **2** RAID-10 **3** RAID-6
21	15	R748AASP	1	binary	Array speed in 1000 RPM.
22	16	R748AAWD	2	binary	Array width.
24	18	R748AACP	4	binary	Array capacity in GB.

Record Type 75 (4B) — RMF Page Data Set Activity

Reference books

For information on using RMF, see *z/OS RMF User's Guide*.

For information on Monitor I and II, see *z/OS RMF Report Analysis*.

Record type 75 is written at the end of each RMF measurement interval. One record is written for each page data set monitored during the interval.

As with all SMF records RMF produces, record type 75 contains a header section and RMF product section. These are followed by:

Page Data Set Data Section
Provides information on the use of auxiliary storage page slots and the use of the page data set by the auxiliary storage manager (ASM).

Macro to Symbolically Address Record Type 75: The SMF record mapping macro for all records produced by RMF is ERBSMFR. Its format is ERBSMFR (*n1*,*n2*,...) where *n1*,*n2*, ... are the SMF record types you want to map. Note that the parentheses are required only when two or more record types are specified. The mapping macro resides in SYS1.MACLIB.

Record Environment

The following conditions exist for the generation of this record:

Macro	SMFWTM (record exit: IEFU83)
Mode	Task
Storage Residency	31-bit

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF75LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See "Standard SMF Record Header" on page 13-1 for a detailed description.
2	2	SMF75SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF75FLG	1	binary	System indicator **Bit** **Meaning When Set** **0** New record format **1** Subtypes used **2** Reserved. **3-6** Version indicators* **7** System is running in PR/SM mode. *See "Standard SMF Record Header" on page 13-1 for a detailed description.

Offsets		Name	Length	Format	Description
5	5	SMF75RTY	1	binary	Record type 75 (X'4B').
6	6	SMF75TME	4	binary	Time since midnight, in hundredths of a second, when the record was moved into the SMF buffer.
10	A	SMF75DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
14	E	SMF75SID	4	EBCDIC	System identification (from the SMFPRMxx SID parameter).
18	12	SMF75SSI	4	EBCDIC	Subsystem identification ('RMF').
22	16	SMF75STY	2	binary	Record subtype=1.
24	18	SMF75TRN	2	binary	Number of triplets in this record. A triplet is a set of three SMF fields (offset/length/number values) that defines a section of the record. The offset is the offset from the RDW.
26	1A		2		Reserved.
28	1C	SMF75PRS	4	binary	Offset to RMF product section from RDW.
32	20	SMF75PRL	2	binary	Length of RMF product section.
34	22	SMF75PRN	2	binary	Number of RMF product sections.
36	24	SMF75PSS	4	binary	Offset to page data set data section from RDW.
40	28	SMF75PSL	2	binary	Length of page data set data section.
42	2A	SMF75PSN	2	binary	Number of page data set data sections.

RMF Product Section

Offsets		Name	Length	Format	Description
0	0	SMF75MFV	2	packed	RMF version number.
2	2	SMF75PRD	8	EBCDIC	Product name ('RMF').
10	A	SMF75IST	4	packed	Time that the RMF measurement interval started, in the form 0*hhmmssF*, where *hh* is the hours, *mm* is the minutes, *ss* is the seconds, and *F* is the sign.
14	E	SMF75DAT	4	packed	Date when the RMF measurement interval started, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
18	12	SMF75INT	4	packed	Duration of the RMF measurement interval, in the form *mmsstttF* where *mm* is the minutes, *ss* is the seconds, *ttt* is the milliseconds, and *F* is the sign. The end of the measurement interval is the sum of the recorded start time (and this field.)
22	16		2		Reserved.
24	18	SMF75SAM	4	binary	Number of RMF samples.
28	1C		2		Reserved.
30	1E	SMF75FLA	2	binary	Flags **Bit** **Meaning When Set** **0** Reserved **1** Samples have been skipped **2** Record was written by RMF Monitor III **3** Interval was synchronized with SMF **4-15** Reserved.
32	20		4		Reserved.
36	24	SMF75CYC	4	packed	Sampling cycle length, in the form 000*ttttF*, where *tttt* is the milliseconds and *F* is the sign (taken from CYCLE option). The range of values is 0.050 to 9.999 seconds.
40	28	SMF75MVS	8	EBCDIC	MVS software level (consists of an acronym and the version, release, and modification level - ZV*vvrrmm*).

Offsets		Name	Length	Format	Description
48	30	SMF75IML	1	binary	Indicates the type of processor complex on which data measurements were taken. **Value** **Meaning** **3** 9672, zSeries
49	31	SMF75PRF	1	binary	Processor flags. **Bit** **Meaning When Set** **0** The system has expanded storage **1** The processor is enabled for ES connection architecture (ESCA) **2** There is an ES connection director in the configuration **3** System is running in z/Architecture mode **4** IFA processors available. **5-7** Reserved.
50	32	SMF75PTN	1	binary	PR/SM partition number of the partition that wrote this record.
51	33	SMF75SRL	1	binary	SMF record level change number (X'4A' for z/OS V1R7 RMF). This field enables processing of SMF record level changes in an existing release.
52	34	SMF75IET	8	char	Interval expiration time token. This token can be used to identify other than RMF records that belong to the same interval (if interval was synchronized with SMF).
60	3C	SMF75LGO	8	binary	Offset GMT to local time (STCK format).
68	44	SMF75RAO	4	binary	Offset to reassembly area relative to start of RMF product section.
72	48	SMF75RAL	2	binary	Length of reassembly area. Area consists of a fixed header and a variable number of information blocks. Length depends on the record type/subtype, but is fixed for a specific type/subtype.
74	4A	SMF75RAN	2	binary	Reassembly area indicator. **Value** **Meaning** **0** Record is not broken **1** Record is broken. **Note:** This field is used to indicate whether an SMF record is a broken record. Therefore, offset (SMF75RAO) and length (SMF75RAL) are only valid if SMF75RAN = 1. A reassembly area is only present in broken records.
76	4C	SMF75OIL	2	binary	Original interval length as defined in the session or by SMF (in seconds).
78	4E	SMF75SYN	2	binary	SYNC value in seconds.
80	50	SMF75GIE	8	binary	Projected gathering interval end (STCK format) GMT time.
88	58	SMF75XNM	8	EBCDIC	Sysplex name as defined in parmlib member COUPLExx.
96	60	SMF75SNM	8	EBCDIC	System name for current system as defined in parmlib member IEASYSxx SYSNAME parameter.
Reassembly Area:					
0	0	SMF75RBR	2	binary	Total number of broken records built from the original large record.
2	2	SMF75RSQ	2	binary	Sequence number of this broken record. Every broken record built from the same large record must have a unique sequence number, it is in the range from 1 to SMF75RBR.
4	4	SMF75RIO	4	binary	Offset to first reassembly information block relative to start of reassembly area header.
8	8	SMF75RIL	2	binary	Length of reassembly information block.
10	A	SMF75RIN	2	binary	Number of reassembly information blocks (same value as SMF75TRN in header section).

Offsets		Name	Length	Format	Description
12	C		4		Reserved.
Reassembly Area Information Block:					
0	0	SMF75RNN	2	binary	Total number of sections in the original large record. This field contains information of how many sections of a specific type were contained in the original SMF record. This field is a copy of the number field of the triplet in the original (non broken) record.
2	2	SMF75RPP	2	binary	Position of the first of one or more consecutive sections described by this block as in the original record. Values in the range of 1 to SMF75RNN are valid for correct processing. A value of 0 will skip processing of this information block. This field provides information where the sections that are part of this broken record were placed in the original record before the split took place. The actual number of consecutive sections contained in this record is available from the actual triplet in the header extension.

Page Data Set Data Section

Offsets		Name	Length	Format	Description
0	0	SMF75DSN	44	EBCDIC	Page data set name.
44	2C	SMF75PST	1	binary	Page space type **Bit** **Meaning When Set** **0** PLPA **1** COMMON **2** Reserved **3** LOCAL **4** Reserved **5** Data set unusable **6** Data set brought online during interval **7** Data set taken offline during interval.
45	2D	SMF75FL2	1	binary	Flags **Bit** **Meaning When Set** **0** Data set accepts VIO pages **1** Reserved **2** Data set is on a device with an alternate control unit **3** SMF75DEV contains a valid device name **4-7** Reserved.
46	2E		1		Reserved.
47	2F	SMF75TYP	4	binary	Unit type.
51	33	SMF75CHA	2	binary	Device number in the form *hhhh* (hex digits).
53	35	SMF75VOL	6	EBCDIC	Volume serial number.
59	3B		5		Reserved.
64	40	SMF75SLA	4	binary	Total number of slots contained within the page swap data set.
68	44	SMF75MXU	4	binary	Maximum number of slots used.
72	48	SMF75MNU	4	binary	Minimum number of slots used.
76	4C	SMF75AVU	4	binary	Average number of slots used.
80	50	SMF75BDS	4	binary	Number of unusable slots.
84	54	SMF75USE	4	binary	Number of samples indicating data set was being used by ASM.
88	5A	SMF75REQ	4	binary	The value is the same as SMF75USE.
92	5C	SMF75SIO	4	binary	Number of I/O requests for the data set.

Offsets		Name	Length	Format	Description
96	60	SMF75PGX	4	binary	Number of pages transferred to or from page data set.
100	64	SMF75DEV	8	EBCDIC	Device name (blank if device name cannot be determined).
108	6C	SMF75CU	8	EBCDIC	Control unit name (blank if control unit name cannot be determined).

Record Type 76 (4C) — RMF Trace Activity

Reference books

For information on using RMF, see *z/OS RMF User's Guide*.

For information on Monitor I and II, see *z/OS RMF Report Analysis*.

Record type 76 is written at the end of each measurement interval. One record is written for each field name sampled during the interval.

As with all SMF records produced by RMF, record type 76 contains a header section and RMF product section. These are followed by:

Trace Control Section
Contains the number of sample sets in the trace.

Trace Data Section
Contains information on the minimum value of the field, the maximum value of the field, the sum of the squared values of the field, and the final value sampled from the field.

Variable Trace Data Section
Contains the trace values collected for each set grouped at the end of the record.

Macro to Symbolically Address Record Type 76: The SMF record mapping macro for all records produced by RMF is ERBSMFR. Its format is ERBSMFR (*n1*,*n2*,...) where *n1*,*n2*, ... are the SMF record types you want to map. Note that the parentheses are required only when two or more record types are specified. The mapping macro resides in SYS1.MACLIB.

Record Environment

The following conditions exist for the generation of this record:

Macro	SMFWTM (record exit: IEFU83)
Mode	Task
Storage Residency	31-bit

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF76LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description. This field and the next are collectively referred at as the RDW. (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	SMF76SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF76FLG	1	binary	System indicator **Bit** **Meaning When Set** **0** New record format **1** Subtypes used **2** Reserved. **3-6** Version indicators* **7** System is running in PR/SM mode. *See “Standard SMF Record Header” on page 13-1 for a detailed description.
5	5	SMF76RTY	1	binary	Record type 76 (X'4C').
6	6	SMF76TME	4	binary	Time since midnight, in hundredths of a second, when the record was moved into the SMF buffer.
10	A	SMF76DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
14	E	SMF76SID	4	EBCDIC	System identification (from the SMFPRMxx SID parameter).
18	12	SMF76SSI	4	EBCDIC	Subsystem identification (‘RMF’).
22	16	SMF76STY	2	binary	Record subtype=1.
24	18	SMF76TRN	2	binary	Number of triplets in this record. A triplet is a set of three SMF fields (offset/length/number values) that defines a section of the record. The offset is the offset from the RDW.
26	1A		2		Reserved.
28	1C	SMF76PRS	4	binary	Offset to RMF product section from start of record, including record descriptor word (RDW).
32	20	SMF76PRL	2	binary	Length of RMF product section.
34	22	SMF76PRN	2	binary	Number of RMF product sections.
36	24	SMF76TCS	4	binary	Offset to trace control section from start of record, including record descriptor word (RDW).
40	28	SMF76TCL	2	binary	Length of trace control section.
42	2A	SMF76TCN	2	binary	Number of trace control sections.
44	2C	SMF76TDS	4	binary	Offset to trace data entry section from start of record, including record descriptor word (RDW).
48	30	SMF76TDL	2	binary	Length of trace data entry section.
50	32	SMF76TDN	2	binary	Number of trace data entry sections.
52	34	SMF76VFS	4	binary	Offset to variable format set from start of record, including record descriptor word (RDW).
56	38	SMF76VFL	2	binary	Length of variable format set.
58	3A	SMF76VFN	4	binary	Number of variable format sets.

RMF Product Section

Offsets		Name	Length	Format	Description
0	0	SMF76MFV	2	packed	RMF version number.
2	2	SMF76PRD	8	EBCDIC	Product name (‘RMF’).

Offsets		Name	Length	Format	Description
10	A	SMF76IST	4	packed	Time that the RMF measurement interval started, in the form 0*hhmmssF*, where *hh* is the hours, *mm* is the minutes, *ss* is the seconds, and *F* is the sign.
14	E	SMF76DAT	4	packed	Date when the RMF measurement interval started, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
18	12	SMF76INT	4	packed	Duration of the RMF measurement interval, in the form *mmsstttF* where *mm* is the minutes, *ss* is the seconds, *ttt* is the milliseconds, and *F* is the sign. (The end of the measurement interval is the sum of the recorded start time and this field.)
22	16		2		Reserved.
24	18	SMF76SAM	4	binary	Number of RMF samples.
28	1C		2		Reserved.
30	1E	SMF76FLA	2	binary	Flags **Bit** **Meaning When Set** **0** Reserved **1** Samples have been skipped **2** Record was written by RMF Monitor III **3** Interval was synchronized with SMF **4-15** Reserved.
32	20		4		Reserved.
36	24	SMF76CYC	4	packed	Sampling cycle length, in the form 000*ttttF*, where *tttt* is the milliseconds and *F* is the sign (taken from CYCLE option). The range of values is 0.050 to 9.999 seconds.
40	28	SMF76MVS	8	EBCDIC	MVS software level (consists of an acronym and the version, release, and modification level - ZV*vvrrmm*).
48	30	SMF76IML	1	binary	Indicates the type of processor complex on which data measurements were taken. **Value** **Meaning** **3** 9672, zSeries
49	31	SMF76PRF	1	binary	Processor flags. **Bit** **Meaning When Set** **0** The system has expanded storage **1** The processor is enabled for ES connection architecture (ESCA) **2** There is an ES connection director in the configuration **3** System is running in z/Architecture mode **4** IFA processors available. **5-7** Reserved.
50	32	SMF76PTN	1	binary	PR/SM partition number of the partition that wrote this record.
51	33	SMF76SRL	1	binary	SMF record level change number (X'4A' for z/OS V1R7 RMF). This field enables processing of SMF record level changes in an existing release.
52	34	SMF76IET	8	char	Interval expiration time token. This token can be used to identify other than RMF records that belong to the same interval (if interval was synchronized with SMF).
60	3C	SMF76LGO	8	binary	Offset GMT to local time (STCK format).
68	44	SMF76RAO	4	binary	Offset to reassembly area relative to start of RMF product section.
72	48	SMF76RAL	2	binary	Length of reassembly area. Area consists of a fixed header and a variable number of information blocks. Length depends on the record type/subtype, but is fixed for a specific type/subtype.

Offsets		Name	Length	Format	Description
74	4A	SMF76RAN	2	binary	Reassembly area indicator. **Value** **Meaning** **0** Record is not broken **1** Record is broken. **Note:** This field is used to indicate whether an SMF record is a broken record. Therefore, offset (SMF76RAO) and length (SMF76RAL) are only valid if SMF76RAN = 1. A reassembly area is only present in broken records.
76	4C	SMF76OIL	2	binary	Original interval length as defined in the session or by SMF (in seconds).
78	4E	SMF76SYN	2	binary	SYNC value in seconds.
80	50	SMF76GIE	8	binary	Projected gathering interval end (STCK format) GMT time.
88	58	SMF76XNM	8	EBCDIC	Sysplex name as defined in parmlib member COUPLExx.
96	60	SMF76SNM	8	EBCDIC	System name for current system as defined in parmlib member IEASYSxx SYSNAME parameter.
Reassembly Area:					
0	0	SMF76RBR	2	binary	Total number of broken records built from the original large record.
2	2	SMF76RSQ	2	binary	Sequence number of this broken record. Every broken record built from the same large record must have a unique sequence number, it is in the range from 1 to SMF76RBR.
4	4	SMF76RIO	4	binary	Offset to first reassembly information block relative to start of reassembly area header.
8	8	SMF76RIL	2	binary	Length of reassembly information block.
10	A	SMF76RIN	2	binary	Number of reassembly information blocks (same value as SMF76TRN in header section).
12	C		4		Reserved.
Reassembly Area Information Block:					
0	0	SMF76RNN	2	binary	Total number of sections in the original large record. This field contains information of how many sections of a specific type were contained in the original SMF record. This field is a copy of the number field of the triplet in the original (non broken) record.
2	2	SMF76RPP	2	binary	Position of the first of one or more consecutive sections described by this block as in the original record. Values in the range of 1 to SMF76RNN are valid for correct processing. A value of 0 will skip processing of this information block. This field provides information where the sections that are part of this broken record were placed in the original record before the split took place. The actual number of consecutive sections contained in this record is available from the actual triplet in the header extension.

Trace Control Section

Offsets		Name	Length	Format	Description
0	0	SMF76NUM	2	binary	Number of sample sets (lines of data) in the trace.
2	2		2		Reserved.

Trace Data Section

Offsets		Name	Length	Format	Description
0	0	SMF76NAM	8	EBCDIC	Field name.

Offsets		Name	Length	Format	Description
8	8	SMF76OPT	1	binary	Trace options **Bit** **Meaning When Set** **0** Minimum value of the field is contained in the SMF record **1** Maximum value of the field is contained in the SMF record **2** The sum of the values required to calculate the average of the field is contained in the SMF record **3** The sum of the squared values required to calculate the standard deviation of the field is contained in the SMF record **4** End value of the field is contained in the SMF record **5** All options selected **6** Domain tracing terminated **7** This entry is a domain field.
9	9	SMF76OP1	1	binary	Trace options **Bit** **Meaning When Set** **0** LPB trace requested **1** LPB trace request ended **2** Traced data in record is valid **3-7** Reserved.
10	A	SMF76SLN	1	binary	Length of a set.
11	B	SMF76DLN	1	binary	Length of a field sampled.
12	C	SMF76SSS	2	binary	Standard samples per set used.
14	E	SMF76SSL	2	binary	Samples per set.
16	10	SMF76MIN	4	binary	Minimum value during interval.
20	14	SMF76MAX	4	binary	Maximum value during interval.
24	18	SMF76AVG	8	binary	Accumulated value used to compute the average.
32	20	SMF76STD	12	binary	Sum of squares (used to compute standard deviation).
44	2C	SMF76ENV	4	binary	End value of field.

Variable Trace Data Section

Offsets		Name	Length	Format	Description
0	0	SMF76C or SMF76D	4	binary	Trace values collected for each set, stored in an array of either fullwords or halfwords, depending on the length of the field being sampled (SMF76C if fullwords; SMF76D if halfwords). There will be one group of values for each sample set (line of data) in the trace.

Record Type 77 (4D) — RMF Enqueue Activity

Reference books

For information on using RMF, see *z/OS RMF User's Guide*.

For information on Monitor I and II, see *z/OS RMF Report Analysis*.

Record type 77 is written at the end of each measurement interval and when the session is terminated. As with all SMF records RMF produces, it contains a header section followed by the RMF product section. These are followed by:

Enqueue Control Section
Contains the status indicator.

Enqueue Data Section
Identifies the resources for which ENQ/DEQ contention occurred during the measurement interval and describes any contention that occurred.

Macro to Symbolically Address Record Type 77: The SMF record mapping macro for all records produced by RMF is ERBSMFR. Its format is ERBSMFR (*n1*,*n2*,...) where *n1*,*n2*, ... are the SMF record types you want to map. Note that the parentheses are required only when two or more record types are specified. The mapping macro resides in SYS1.MACLIB.

Record Environment

The following conditions exist for the generation of this record:

Macro	SMFWTM (record exit: IEFU83)
Mode	Task
Storage Residency	31-bit

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF77LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	SMF77SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF77FLG	1	binary	System indicator **Bit** **Meaning When Set** **0** New record format **1** Subtypes used **2** Reserved. **3-6** Version indicators* **7** System is running in PR/SM mode. *See “Standard SMF Record Header” on page 13-1 for a detailed description.
5	5	SMF77RTY	1	binary	Record type 77 (X'4D').
6	6	SMF77TME	4	binary	Time since midnight, in hundredths of a second, when the record was moved into the SMF buffer.
10	A	SMF77DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
14	E	SMF77SID	4	EBCDIC	System identification (from the SMFPRMxx SID parameter).
18	12	SMF77SSI	4	EBCDIC	Subsystem identification (‘RMF’).
22	16	SMF77STY	2	binary	Record subtype=1.
24	18	SMF77TRN	2	binary	Number of triplets in this record. A triplet is a set of three SMF fields (offset/length/number values) that defines a section of the record.
26	1A		2		Reserved.

Offsets		Name	Length	Format	Description
28	1C	SMF77PRS	4	binary	Offset to RMF product section from start of record, including record descriptor word (RDW).
32	20	SMF77PRL	2	binary	Length of RMF product section from start of record, including record descriptor word (RDW).
34	22	SMF77PRN	2	binary	Number of RMF product sections.
36	24	SMF77EQS	4	binary	Offset to enqueue control section from start of record, including record descriptor word (RDW).
40	28	SMF77EQL	2	binary	Length of enqueue control section.
42	2A	SMF77EQN	2	binary	Number of enqueue control sections.
44	2C	SMF77EDS	4	binary	Offset to enqueue data section from start of record, including record descriptor word (RDW).
48	30	SMF77EDL	2	binary	Length of enqueue data section.
50	32	SMF77EDN	2	binary	Number of enqueue data sections.

RMF Product Section

Offsets		Name	Length	Format	Description
0	0	SMF77MFV	2	packed	RMF version number.
2	2	SMF77PRD	8	EBCDIC	Product name (‘RMF’).
10	A	SMF77IST	4	packed	Time since midnight that the RMF measurement interval started, in the form 0*hhmmssF*, where *hh* is the hours, *mm* is the minutes, *ss* is the seconds, and *F* is the sign.
14	E	SMF77DAT	4	packed	Date when the RMF measurement interval started, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
18	12	SMF77INT	4	packed	Duration of RMF measurement interval, in the form *mmsstttF* where *mm* is the minutes, *ss* is the seconds, *ttt* is the milliseconds, and *F* is the sign. (The end of the measurement interval is the sum of the recorded start time and this field.)
22	16		2		Reserved.
24	18	SMF77SAM	4	binary	Number of RMF samples.
28	1C		2		Reserved.
30	1E	SMF77FLA	2	binary	Flags **Bit** **Meaning When Set** **0** Reserved **1** Samples have been skipped **2** Record was written by RMF Monitor III **3** Interval was synchronized with SMF **4-15** Reserved.
32	20		4		Reserved.
36	24	SMF77CYC	4	packed	Sampling cycle length, in the form 000*ttttF*, where *tttt* is the milliseconds and *F* is the sign (taken from CYCLE option). The range of values is 0.050 to 9.999 seconds.
40	28	SMF77MVS	8	EBCDIC	MVS software level (consists of an acronym and the version, release, and modification level - ZV*vvrrmm*).
48	30	SMF77IML	1	binary	Indicates the type of processor complex on which data measurements were taken. **Value** **Meaning** **3** 9672, zSeries

Offsets		Name	Length	Format	Description
49	31	SMF77PRF	1	binary	Processor flags. **Bit** **Meaning When Set** **0** The system has expanded storage **1** The processor is enabled for ES connection architecture (ESCA) **2** There is an ES connection director in the configuration **3** System is running in z/Architecture mode **4** IFA processors available. **5-7** Reserved.
50	32	SMF77PTN	1	binary	PR/SM partition number of the partition that wrote this record.
51	33	SMF77SRL	1	binary	SMF record level change number (X'4A' for z/OS V1R7 RMF). This field enables processing of SMF record level changes in an existing release.
52	34	SMF77IET	8	char	Interval expiration time token. This token can be used to identify other than RMF records that belong to the same interval (if interval was synchronized with SMF).
60	3C	SMF77LGO	8	binary	Offset GMT to local time (STCK format).
68	44	SMF77RAO	4	binary	Offset to reassembly area relative to start of RMF product section.
72	48	SMF77RAL	2	binary	Length of reassembly area. Area consists of a fixed header and a variable number of information blocks. Length depends on the record type/subtype, but is fixed for a specific type/subtype.
74	4A	SMF77RAN	2	binary	Reassembly area indicator. **Value** **Meaning** **0** Record is not broken **1** Record is broken. **Note:** This field is used to indicate whether an SMF record is a broken record. Therefore, offset (SMF77RAO) and length (SMF77RAL) are only valid if SMF77RAN = 1. A reassembly area is only present in broken records.
76	4C	SMF77OIL	2	binary	Original interval length as defined in the session or by SMF (in seconds).
78	4E	SMF77SYN	2	binary	SYNC value in seconds.
80	50	SMF77GIE	8	binary	Projected gathering interval end (STCK format) GMT time.
88	58	SMF77XNM	8	EBCDIC	Sysplex name as defined in parmlib member COUPLExx.
96	60	SMF77SNM	8	EBCDIC	System name for current system as defined in parmlib member IEASYSxx SYSNAME parameter.
Reassembly Area:					
0	0	SMF77RBR	2	binary	Total number of broken records built from the original large record.
2	2	SMF77RSQ	2	binary	Sequence number of this broken record. Every broken record built from the same large record must have a unique sequence number, it is in the range from 1 to SMF77RBR.
4	4	SMF77RIO	4	binary	Offset to first reassembly information block relative to start of reassembly area header.
8	8	SMF77RIL	2	binary	Length of reassembly information block.
10	A	SMF77RIN	2	binary	Number of reassembly information blocks (same value as SMF77TRN in header section).
12	C		4		Reserved.
Reassembly Area Information Block:					

Offsets		Name	Length	Format	Description
0	0	SMF77RNN	2	binary	Total number of sections in the original large record. This field contains information of how many sections of a specific type were contained in the original SMF record. This field is a copy of the number field of the triplet in the original (non broken) record.
2	2	SMF77RPP	2	binary	Position of the first of one or more consecutive sections described by this block as in the original record. Values in the range of 1 to SMF77RNN are valid for correct processing. A value of 0 will skip processing of this information block. This field provides information where the sections that are part of this broken record were placed in the original record before the split took place. The actual number of consecutive sections contained in this record is available from the actual triplet in the header extension.

Enqueue Control Section

Offsets		Name	Length	Format	Description
0	0	SMF77FG1	1	binary	Enqueue status indicator **Bit** **Meaning** **0** Enqueue summary table full **1** Specified resource had no contention **2** Enqueue had bad CPU clock **3** Enqueue event processing abend **4** On — detail data requested Off — summary data requested **5** On — GRS=NONE (local sysplex) **6** Off — GRS=RING, if bit 5 = '0' **7** On — bits 5 and 6 are valid
1	1	SMF77RF2	1	binary	Second status indicator **Bit** **Meaning** **0** GRS system problems **1** RMF/GRS interface problems **2-7** Reserved.
2	2		2		Reserved.

Enqueue Data Section

Offsets		Name	Length	Format	Description
0	0	SMF77QNM	8	EBCDIC	Major name of resource.
8	8	SMF77RNM	44	EBCDIC	Minor name of resource.
52	34	SMF77WTM	4	binary	Minimum resource contention time, in 1024-microsecond units.
56	38	SMF77WTX	4	binary	Maximum resource contention time, in 1024-microsecond units.
60	3C	SMF77WTT	4	binary	Total resource contention time, in 1024-microsecond units.
64	40		2		Reserved.
66	42	SMF77QL1	2	binary	Counter for queue length of 1.
68	44	SMF77QL2	2	binary	Counter for queue length of 2.
70	46	SMF77QL3	2	binary	Counter for queue length of 3.
72	48	SMF77QL4	2	binary	Counter for queue length of 4 or more.
74	4A		2		Reserved.
76	4C	SMF77EXM	2	binary	Minimum number of exclusive requests waiting.
78	4E	SMF77EXX	2	binary	Maximum number of exclusive requests waiting.

Offsets		Name	Length	Format	Description
80	50	SMF77SHM	2	binary	Minimum number of share requests waiting.
82	52	SMF77SHX	2	binary	Maximum number of share requests waiting.
84	54	SMF77EVT	2	binary	Total number of contention events that occurred during the measurement interval.
86	56	SMF77RLN	1	binary	Minor name length.
87	57	SMF77DFG	1	binary	Current resource detail indicator **Bit** **Meaning When Set** **0** Resource still in contention **1** On — scope of systems Off — scope of system **2** On — owner has exclusive control of the resource Off — owner shares the resource **3** On — first job is waiting for exclusive use Off — first job is waiting for shared use **4** On — second job is waiting for exclusive use Off — second job is waiting for shared use **5** Resource is global **6-7** Reserved.
88	58	SMF77DOW	2	binary	Number of owners using the resource at maximum contention.
90	5A	SMF77DWR	2	binary	Number of jobs waiting for the resource at maximum contention.
92	5C	SMF77DO1	8	EBCDIC	Job name 1 of resource owner during period of maximum contention.
100	64	SMF77DO2	8	EBCDIC	Job name 2 of resource owner during period of maximum contention.
108	6C	SMF77DW1	8	EBCDIC	Job name 1 waiting for the resource owner during period of maximum contention.
116	74	SMF77DW2	8	EBCDIC	Job name 2 waiting for the resource owner during period of maximum contention.
124	7C	SMF77SY1	8	EBCDIC	System identifier of job name 1 (resource owner at maximum contention).
132	84	SMF77SY2	8	EBCDIC	System identifier of job name 2 (resource owner at maximum contention).
140	8C	SMF77SY3	8	EBCDIC	System identifier of job name 1 (waiting for the resource at maximum contention).
148	94	SMF77SY4	8	EBCDIC	System identifier of job name 2 (waiting for the resource at maximum contention).
156	9C	SMF77AQL	4	binary	Total number of waiting requests during the measurement interval.

Record Type 78 (4E) — RMF Virtual Storage and I/O Queuing Activity

Reference books

For information on using RMF, see *z/OS RMF User's Guide*.

For information on Monitor I and II, see *z/OS RMF Report Analysis*.

RMF writes record type 78 during a Monitor I session. It has these subtypes:

- **Subtype 2** — reports virtual storage activity. It contains a common storage data section and may contain one or more private area data sections. The minimum length of subtype 2 is 1836 bytes if no private area is included. Otherwise the length is 112 bytes plus 1724 bytes plus at least 392 bytes for each private area that is monitored.

- **Subtype 3** — reports I/O queuing activity and contains an entry for each logical control unit that had any activity during the interval. The length of subtype 3 is 112 bytes plus 60-96 bytes for each logical control unit.

  Note: Your installation may produce several type 78 subtype 3 records.

Each subtype contains a header section followed by the RMF product section.

Macro to Symbolically Address Record Type 78: The SMF record mapping macro for all records produced by RMF is ERBSMFR. Its format is ERBSMFR (*n1*,*n2*,...) where *n1*,*n2*, ... are the SMF record types you want to map. Note that the parentheses are required only when two or more record types are specified. The mapping macro resides in SYS1.MACLIB.

Record Environment

The following conditions exist for the generation of this record:

Macro	SMFWTM (record exit: IEFU83)
Mode	Task
Storage Residency	31-bit

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF78LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See "Standard SMF Record Header" on page 13-1 for a detailed description.
2	2	SMF78SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF78FLG	1	binary	System indicator **Bit** **Meaning When Set** **0** New record format **1** Subtypes used **2** Reserved. **3-6** Version indicators* **7** System is running in PR/SM mode. *See "Standard SMF Record Header" on page 13-1 for a detailed description.
5	5	SMF78RTY	1	binary	Record type 78 (X'4E').
6	6	SMF78TME	4	binary	Time since midnight, in hundredths of a second, when the record was moved into the SMF buffer.
10	A	SMF78DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
14	E	SMF78SID	4	EBCDIC	System identification (from the SMFPRMxx SID parameter).
18	12	SMF78SSI	4	EBCDIC	Subsystem identification ('RMF').
22	16	SMF78STY	2	binary	Subtype.

Offsets		Name	Length	Format	Description
24	18	SMF78TRN	2	binary	Number of triplets in record. A triplet is a set of three SMF fields (offset/length/number values) that defines a section of the record.
26	1A		2		Reserved.
28	1C	SMF78PRS	4	binary	Offset to RMF product section from start of record, including record descriptor word (RDW).
32	20	SMF78PRL	2	binary	Length of RMF product section.
34	22	SMF78PRN	2	binary	Number of RMF product sections.
Individial header extension for subtype 2:					
36	24	SMF78DCS	4	binary	Offset to virtual storage common storage data section.
40	28	SMF78DCL	2	binary	Length of virtual storage common storage data section.
42	2A	SMF78DCN	2	binary	Number of virtual storage common storage data sections.
44	2C	SMF78ASS	4	binary	Offset to virtual storage private area data section.
48	30	SMF78ASL	2	binary	Length of virtual storage private area data section.
50	32	SMF78ASN	2	binary	Number of virtual storage private area data sections.
52	34	SMF78SPS	4	binary	Offset to private area subpool section.
56	38	SMF78SPL	2	binary	Length of private area subpool section.
58	3A	SMF78SPN	2	binary	Number of private area subpool sections.
Individial header extension for subtype 3:					
36	24	SMF78DCS	4	binary	Offset to queuing control section.
40	28	SMF78DCL	2	binary	Length of queuing control section.
42	2A	SMF78DCN	2	binary	Number of queuing control sections.
44	2C	SMF78ASS	4	binary	Offset to queuing data section.
48	30	SMF78ASL	2	binary	Length of queuing data section.
50	32	SMF78ASN	2	binary	Number of queuing data sections.
52	34	SMF78QDS	4	binary	Offset to I/O queue (IOQ) global section.
56	38	SMF78QDL	2	binary	Length of IOQ global section.
58	3A	SMF78QDN	2	binary	Number of IOQ global sections.

RMF Product Section

Offsets		Name	Length	Format	Description
0	0	SMF78MFV	2	packed	RMF version number.
2	2	SMF78PRD	8	EBCDIC	Product name (‘RMF’).
10	A	SMF78IST	4	packed	Time that the RMF Monitor I measurement interval started, in the form 0*hhmmssF*, where *hh* is the hours, *mm* is the minutes, *ss* is the seconds, and *F* is the sign.
14	E	SMF78DAT	4	packed	Date when the RMF Monitor I measurement interval started, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
18	12	SMF78INT	4	packed	Duration of the RMF Monitor I measurement interval, in the form *mmsstttF* where *mm* is the minutes, *ss* is the seconds, *ttt* is the milliseconds, and *F* is the sign, (The end of the measurement interval is the sum of the recorded start time and this field.)
22	16		2		Reserved.
24	18	SMF78SAM	4	binary	Number of RMF samples.
28	1C		2		Reserved.

Offsets		Name	Length	Format	Description
30	1E	SMF78FLA	2	binary	Flags **Bit** **Meaning When Set** **0** Reserved **1** Samples have been skipped **2** Record was written by RMF Monitor III **3** Interval was synchronized with SMF **4-15** Reserved.
32	20		4		Reserved.
36	24	SMF78CYC	4	packed	Sampling cycle length, in the form 000*tttt*F, where *tttt* is the milliseconds and *F* is the sign (taken from CYCLE option). The range of values is 0.050 to 9.999 seconds.
40	28	SMF78MVS	8	EBCDIC	MVS software level (consists of an acronym and the version, release, and modification level - ZV*vvrrmm*).
48	30	SMF78IML	1	binary	Indicates the type of processor complex on which data measurements were taken. **Value** **Meaning** **3** 9672, zSeries
49	31	SMF78PRF	1	binary	Processor flags. **Bit** **Meaning When Set** **0** The system has expanded storage **1** The processor is enabled for ES connection architecture (ESCA) **2** There is an ES connection director in the configuration **3** System is running in z/Architecture mode **4** IFA processors available. **5-7** Reserved.
50	32	SMF78PTN	1	binary	PR/SM partition number of the partition that wrote this record.
51	33	SMF78SRL	1	binary	SMF record level change number (X'4A' for z/OS V1R7 RMF). This field enables processing of SMF record level changes in an existing release.
52	34	SMF78IET	8	char	Interval expiration time token. This token can be used to identify other than RMF records that belong to the same interval (if interval was synchronized with SMF).
60	3C	SMF78LGO	8	binary	Offset GMT to local time (STCK format).
68	44	SMF78RAO	4	binary	Offset to reassembly area relative to start of RMF product section.
72	48	SMF78RAL	2	binary	Length of reassembly area. Area consists of a fixed header and a variable number of information blocks. Length depends on the record type/subtype, but is fixed for a specific type/subtype.
74	4A	SMF78RAN	2	binary	Reassembly area indicator. **Value** **Meaning** **0** Record is not broken **1** Record is broken. **Note:** This field is used to indicate whether an SMF record is a broken record. Therefore, offset (SMF78RAO) and length (SMF78RAL) are only valid if SMF78RAN = 1. A reassembly area is only present in broken records.
76	4C	SMF78OIL	2	binary	Original interval length as defined in the session or by SMF (in seconds).
78	4E	SMF78SYN	2	binary	SYNC value in seconds.
80	50	SMF78GIE	8	binary	Projected gathering interval end (STCK format) GMT time.
88	58	SMF78XNM	8	EBCDIC	Sysplex name as defined in parmlib member COUPLExx.

Offsets		Name	Length	Format	Description
96	60	SMF78SNM	8	EBCDIC	System name for current system as defined in parmlib member IEASYSxx SYSNAME parameter.
Reassembly Area:					
0	0	SMF78RBR	2	binary	Total number of broken records built from the original large record.
2	2	SMF78RSQ	2	binary	Sequence number of this broken record. Every broken record built from the same large record must have a unique sequence number, it is in the range from 1 to SMF78RBR.
4	4	SMF78RIO	4	binary	Offset to first reassembly information block relative to start of reassembly area header.
8	8	SMF78RIL	2	binary	Length of reassembly information block.
10	A	SMF78RIN	2	binary	Number of reassembly information blocks (same value as SMF78TRN in header section).
12	C		4		Reserved.
Reassembly Area Information Block:					
0	0	SMF78RNN	2	binary	Total number of sections in the original large record. This field contains information of how many sections of a specific type were contained in the original SMF record. This field is a copy of the number field of the triplet in the original (non broken) record.
2	2	SMF78RPP	2	binary	Position of the first of one or more consecutive sections described by this block as in the original record. Values in the range of 1 to SMF78RNN are valid for correct processing. A value of 0 will skip processing of this information block. This field provides information where the sections that are part of this broken record were placed in the original record before the split took place. The actual number of consecutive sections contained in this record is available from the actual triplet in the header extension.

Subtype 2 — Virtual Storage Activity

Virtual Storage Common Storage Data Section

This section describes triplet SMF78DCS.

Offsets		Name	Length	Format	Description
Virtual Storage Common Storage Data Section (described by triplet SMF78DCS):					
0	0	R782PA	4	binary	Private area address below 16 megabytes.
4	4	R782PS	4	binary	Private area size (in bytes) below 16 megabytes.
8	8	R782EPA	4	binary	Private area address above 16 megabytes.
12	C	R782EPS	4	binary	Private area size (in bytes) above 16 megabytes.
16	10	R782CA	4	binary	CSA address below 16 megabytes.
20	14	R782CS	4	binary	CSA size (in bytes) below 16 megabytes.
24	18	R782ECA	4	binary	CSA address above 16 megabytes.
28	1C	R782ECS	4	binary	CSA size (in bytes) above 16 megabytes.
32	20		8		Reserved.
40	28	R782MLA	4	binary	Modified link pack area (MLPA) address below 16 megabytes.
44	2C	R782MLS	4	binary	Modified link pack area (MLPA) size (in bytes) below 16 megabytes.
48	30	R782EMLA	4	binary	Modified link pack area (MLPA) address above 16 megabytes.

Offsets		Name	Length	Format	Description
52	34	R782EMLS	4	binary	Modified link pack area (MLPA) size (in bytes) above 16 megabytes.
56	38	R782FLA	4	binary	Fixed link pack area (FLPA) address below 16 megabytes.
60	3C	R782FLS	4	binary	Fixed link pack area (FLPA) size (in bytes) below 16 megabytes.
64	40	R782EFLA	4	binary	Fixed link pack area (FLPA) address above 16 megabytes.
68	44	R782EFLS	4	binary	Fixed link pack area (FLPA) size (in bytes) above 16 megabytes.
72	48	R782PLA	4	binary	Pageable link pack area (PLPA) address below 16 megabytes.
76	4C	R782PLS	4	binary	Pageable link pack area (PLPA) size (in bytes) below 16 megabytes.
80	50	R782ELPA	4	binary	Pageable link pack area (PLPA) address above 16 megabytes.
84	54	R782ELPS	4	binary	Pageable link pack area (PLPA) size (in bytes) above 16 megabytes.
88	58	R782SA	4	binary	System queue area (SQA) address below 16 megabytes.
92	5C	R782SS	4	binary	System queue area (SQA) size (in bytes) below 16 megabytes.
96	60	R782ESA	4	binary	System queue area (SQA) address above 16 megabytes.
100	64	R782ESS	4	binary	System queue area (SQA) size (in bytes) above 16 megabytes.
104	68	R782NA	4	binary	Nucleus address below 16 megabytes.
108	6C	R782NS	4	binary	Nucleus size (in bytes) below 16 megabytes.
112	70	R782ENA	4	binary	Nucleus address above 16 megabytes.
116	74	R782ENS	4	binary	Nucleus size (in bytes) above 16 megabytes.
120	78	R782NL	4	binary	Pageable link pack area (PLPA) space redundant with MLPA/FLPA below 16 megabytes.
124	7C	R782ENL	4	binary	Pageable link pack area (PLPA) space redundant with MLPA/FLPA above 16 megabytes.
128	80	R782LPAI	4	binary	Intermodule space in Pageable link pack area (PLPA) below 16 megabytes.
132	84	R782ELPI	4	binary	Intermodule space in Pageable link pack area (PLPA) above 16 megabytes.
136	88	R782MR	4	binary	Maximum possible user region below 16 megabytes.
140	8C	R782EMR	4	binary	Maximum possible user region above 16 megabytes.
144	90	R782SQAU	40	Mixed*	System queue area (SQA) usage both above and below 16 megabytes. The description of the format of all fields being marked as 'Mixed*' can be found in "Data collected below 16 megabytes" on page 13-389 and "Data collected above 16 megabytes" on page 13-389.
184	B8	R782CSAU	40	Mixed*	CSA usage both above and below 16 megabytes.
224	E0	R782CSAK	360	Mixed*	CSA used both above and below 16 megabytes by subpool key. 40 bytes for each of 9 keys.
584	248	R782CSAF	40	Mixed*	Free CSA both above and below 16 megabytes.
624	270	R782CSLF	40	Mixed*	Largest free block of CSA both above and below 16 megabytes.
664	298	R782CSAL	40	Mixed*	CSA allocated area size (in bytes) both above and below 16 megabytes.

Offsets		Name	Length	Format	Description
704	2C0	R782SQAF	40	Mixed*	Free system queue area (SQA) both above and below 16 megabytes.
744	2E8	R782SQLF	40	Mixed*	Largest free block of system queue area (SQA) both above and below 16 megabytes.
784	310	R782SQAL	40	Mixed*	System queue area (SQA) allocated area size (in bytes) both above and below 16 megabytes.
824	338	R782SQEX	40	Mixed*	System queue area (SQA) expansion into CSA both above and below 16 megabytes.
864	360	R782227K	200	Mixed*	CSA subpool 227 (below 16 megabytes) by key. The key data appears in the following order: 0, 1, 2, 3, 4, 5, 6, 7, 8-F, ALL. 20 bytes for each of 10 keys.
1064	428	R782228K	200	Mixed*	CSA subpool 228 (below 16 megabytes) by key. The key data appears in the following order: 0, 1, 2, 3, 4, 5, 6, 7, 8-F, ALL. 20 bytes for each of 10 keys.
1264	4F0	R782231K	200	Mixed*	CSA subpool 231 (below 16 megabytes) by key. The key data appears in the following order: 0, 1, 2, 3, 4, 5, 6, 7, 8-F, ALL. 20 bytes for each of 10 keys.
1464	5B8	R782241K	200	Mixed*	CSA subpool 241 (below 16 megabytes) by key. The key data appears in the following order: 0, 1, 2, 3, 4, 5, 6, 7, 8-F, ALL. 20 bytes for each of 10 keys.
1664	680	R782226	20	Mixed*	System queue area (SQA) subpool 226 (below 16 megabytes).
1684	694	R782239	20	Mixed*	System queue area (SQA) subpool 239 (below 16 megabytes).
1704	6A8	R782245	20	Mixed*	System queue area (SQA) subpool 245 (below 16 megabytes).

Virtual Storage Private Area Data Section

This section contains triplet SMF78ASS.

Offsets		Name	Length	Format	Description
0	0	R782JOBN	8	EBCDIC	Name of job being monitored.
8	8	R782RDTM	4	binary	Reader start time.
12	C	R782RDDT	4	packed	Reader start date.
16	10	R782SUBI	2	binary	Index of first subpool entry in the private area subpool section for this job. This field provides the first array element for this job’s private area subpool sections.
18	12	R782SUBN	2	binary	Index of last subpool entry for this job. This field provides the last array element for this job’s private area subpools.
20	14	R782STEP	8	EBCDIC	Name of step active when monitoring began.
28	1C	R782PGMN	8	EBCDIC	Program name (taken from PGM= parameter on EXEC card) of job being monitored.

Offsets		Name	Length	Format	Description
36	24	R782FLGS	2	binary	Flags **Bit** **Meaning When Set** **0** Job active at start of interval **1** Job terminated during interval **2** GETMAIN limit changed during interval **3** Data incorrect because RMF terminated abnormally while sampling **4-15** Reserved.
38	26		2		Reserved.
40	28	R782SAMP	4	binary	Number of samples. This field is used to calculate the averages in the private area data and private area subpool sections.
44	2C	R782REGR	4	binary	Region requested by JCL (in bytes).
48	30	R782RGAB	4	binary	Region below 16 megabytes assigned by exits (in bytes).
52	34	R782RGAA	4	binary	Region above 16 megabytes assigned by exits (in bytes).
56	38	R782GMLB	4	binary	GETMAIN limit below 16 megabytes (in bytes).
60	3C	R782GMLA	4	binary	GETMAIN limit above 16 megabytes (in bytes).
64	40	R782URAB	4	binary	User region address below 16 megabytes.
68	44	R782URAA	4	binary	User region address above 16 megabytes.
72	48	R782LSFP	40	Mixed*	LSQA/SWA/229/230/249 free pages both above and below 16 megabytes.
112	70	R782LSFB	40	Mixed*	LSQA/SWA/229/230/249 largest free block both above and below 16 megabytes.
152	98	R782LSAL	40	Mixed*	LSQA/SWA/229/230/249 allocated area size (in bytes) both above and below 16 megabytes.
192	C0	R782LSPA	40	Mixed*	LSQA/SWA/229/230/249 allocated pages both above and below 16 megabytes.
232	E8	R782USFP	40	Mixed*	User region free pages both above and below 16 megabytes.
272	110	R782USFB	40	Mixed*	User region largest free block both above and below 16 megabytes.
312	138	R782USAL	40	Mixed*	User region allocated area size (in bytes) above 16 megabytes.
352	160	R782USPA	40	Mixed*	User region pages allocated both below and above 16 megabytes.
392	188	R782TOBY	48	Mixed	Number of bytes allocated in storage above the 2-GB-line. These bytes have formats as described in Table 13-3.
440	1B8	R782SHBY	48	Mixed	Number of shared bytes allocated in storage above the 2-GB-line. These bytes have formats as described in Table 13-3.

Table 13-3. Byte Structure in R782TOBY and R782SHBY

Offsets		Name	Length	Format	Description
392	188	VSDGMIN	8	float	Minimum number of bytes allocated above 2GB.
400	190	VSDGNTME	4	binary	Time stamp for minimum value.
404	194		4		Reserved.
408	198	VSDGMAX	8	float	Maximum number of bytes allocated above 2GB.
416	1A0	VSDGXTME	4	binary	Time stamp for maximum value.
420	1A4		4		Reserved.
424	1A8	VSDGTOTL	8	float	Total for all samples above 2GB (used to calculate the average).
432	1B0	VSDGHWM	8	float	Peak number of bytes allocated in storage above 2GB.

Virtual Storage Private Area Subpool Section

This section contains triplet SMF78SPS.

Offsets		Name	Length	Format	Description
0	0	R782SPN	2	binary	Subpool number. Each private area data section occurs one after the other. All private area subpool sections follow all private area data sections. To relate a subpool to a job, see the R782SUBN fields in the private area data section.
2	2		2		Reserved.
4	4	R782SPD	20	Mixed*	Subpool data.

*The format of these bytes follows. For fields containing data from below 16 megabytes, use only the first 20 bytes. For fields containing data from both below and above 16 megabytes, use all 40 bytes.

Data collected below 16 megabytes

Offsets		Name	Length	Format	Description
0	0	VSDBMIN	4	binary	Minimum value for below 16 megabytes.
4	4	VSDBNTME	4	binary	Time stamp for minimum. Format is high-order bytes of time-of-day (TOD) clock.
8	8	VSDBMAX	4	binary	Maximum value for below 16 megabytes.
12	C	VSDBXTME	4	binary	Time stamp for maximum. Format is high-order bytes of time-of-day (TOD) clock.
16	10	VSDBTOTL	4	single precision floating point	Total for all samples below 16 megabytes (used to calculate average). See SMF78SAM to calculate averages for common storage data section fields, and R782SAMP to calculate averages for private area data and private subpool section fields.

Data collected above 16 megabytes

Offsets		Name	Length	Format	Description
20	14	VSDAMIN	4	binary	Minimum value for above 16 megabytes.
24	18	VSDANTME	4	binary	Time stamp for minimum. Format is high-order bytes of time-of-day (TOD) clock.
28	1C	VSDAMAX	4	binary	Maximum value for above 16 megabytes.
32	20	VSDAXTME	4	binary	Time stamp for maximum. Format is high-order bytes of time-of-day (TOD) clock.
36	24	VSDATOTL	4	single precision floating point	Total for all samples above 16 megabytes (used to calculate average).

Subtype 3 — I/O Queuing Activity

Control Section

This section contains triplet SMF78QDS.

Offsets		Name	Length	Format	Description
0	0	R783GFLG	1	binary	IOQ global flags **Bit** **Meaning When Set** **0** Incorrect data because channel measurement facility failed **1** DIAGNOSE interface failed **2** Store Primary Queue Data not supported **3** DCM supported by hardware **4** Configuration contains DCM managed channels **5** IOP utilization data supported **6** Initial command response time measurements supported **7** Reserved.
1	1		1		Reserved.
2	2	R783GNTR	2	binary	Number of descriptor triplets following.
4	4	R783GIDS	4	binary	Offset to I/O processor (IOP) initiative queue data section.
8	8	R783GIDL	2	binary	Length of input output processor (IOP) initiative queue data section.
10	A	R783GIDN	2	binary	Number of input output processor (IOP) initiative queue data sections.
12	C		4		Reserved.
16	10	R783TSR	2	binary	Total number of small records written during interval.
18	12		2		Reserved.
20	14	R783TOT	4	binary	Total number of data sections recorded during the interval.
24	18	R783NXT	4	binary	Total number of data sections in the following record.
28	1C	R783CFL	1	binary	Configuration change flags **Bit** **Meaning When Set** **0** Configuration changed. Used to decide whether to provide the text “POR” or “ACTIVATE” on reports. Also used to check whether data can be combined in a duration report. **1** Configuration change since power on reset (POR). **2** POR using IOC data set that contains a token. **3** I/O token is valid. **4** Hardware allows multiple channel subsystems. **5-7** Reserved.
29	1D	R783CSS	1	binary	Channel Subsystem ID. Only valid if bit 4 of R783CFL is set.
30	1E		2		Reserved.
32	20	R783TNM	44	EBCDIC	IODF name.
76	4C	R783TSF	2	EBCDIC	IODF name suffix.
78	4E		2		Reserved.
80	50	R783TOK	16	EBCDIC	Partial token information.
80	50	R783TDT	8	EBCDIC	IODF creation date, in the form *mm/dd/yy*.
88	58	R783TTM	8	EBCDIC	IODF creation time, in the form *hh.mm.ss*.
96	60	R783TDY	10	EBCDIC	IODF creation date, in the form *mm/dd/yyyy*.
106	6A		2		Reserved.

IOP Initiative Queue and Utilization Data Section

This section contains one per IP described by triplet R783GIDS.

The contents of the fields R783IIPB through R783IDVB are valid if bit 5 of R783GFLG is set.

Offsets		Name	Length	Format	Description
0	0	R783IQID	2	binary	Input output processor (IOP) initiative queue identifier.
2	2	R783IFLG	1	binary	Input output processor (IOP) Flags **Bit** **Meaning When Set** **0** Input output processor (IOP) is installed **1-7** Reserved.
3	3		1		Reserved.
4	4	R783IQSM	4	binary	Accumulator is incremented by the current queue length in the Input output processor (IOP) whenever a request is enqueued.
8	8	R783IQCT	4	binary	Number of elements enqueued on the Input output processor (IOP) initiative queue.
12	C		4		Reserved.
16	10	R783IIPB	8	binary	Number of times the I/O processor was busy.
24	18	R783IIPI	8	binary	Number of times the I/O processor was idle.
32	20	R783IIFS	8	binary	Number of I/O functions initially started.
40	28	R783IPII	8	binary	Number of processed I/O interrupts.
48	30	R783ICPB	8	binary	Number of times an I/O was retried due to channel path busy.
56	38	R783IDPB	8	binary	Number of times an I/O was retried.
64	40	R783ICUB	8	binary	Number of times an I/O was retried due to control unit busy.
72	48	R783IDVB	8	binary	Number of times an I/O was retried due to device busy.

I/O Queuing Configuration Control Section

This section contains one per LCU, described by triplet SMF78DCS.

Offsets		Name	Length	Format	Description
0	0	R783ID1	2	binary	Logical control unit identifier.
2	2	R783NTR	2	binary	Number of triplets following.
4	4	R783CPDS	4	binary	Offset to I/O queuing configuration data section from start of record, including record descriptor word (RDW).
8	8	R783CPDL	2	binary	Length of I/O queuing configuration data section.
10	A	R783CPDN	2	binary	Number of I/O queuing configuration data sections.

I/O Queuing Configuration Data Section

This section contains one per channel path, described by triplet R783CPDS.

Offsets		Name	Length	Format	Description
0	0	R783CPID	1	binary	Channel path identifier.
1	1	R783CPST	1	binary	Channel path status **Bit** **Meaning When Set** **0** Channel path installed **1** Channel path online **2** Channel path varied **3** Channel path offline to all devices of the LCU **4** Channel path connection to all devices of the LCU altered by VARY PATH command during interval **5** Measured channel path data incorrect **6** Channel path is DCM managed **7** CHPID manipulated, requiring data reset
2	2	R783CUN	2	binary	Number of control units attached.
4	4	R783CU1	2	binary	First control unit attached.

Offsets		Name	Length	Format	Description
6	6	R783CU2	2	binary	Second control unit attached.
8	8	R783CU3	2	binary	Third control unit attached.
10	A	R783CU4	2	binary	Fourth control unit attached.
12	C	R783CUB	4	binary	Number of times control unit was busy.
16	10	R783PT	4	binary	Number of times channel path was taken.
20	14		4		Reserved.
24	18	R783DPB	4	binary	Number of times that the Director Port was busy.
28	1C	R783CBT	4	binary	Delay time of an I/O request because the control unit was busy.
32	20	R783CMR	4	binary	Initial command response time until the first command is indicated as accepted by the device.
36	24	R783SBS	4	binary	Switch busy count summation: contains the switch busy counts received for all partitions.
40	28		4		Reserved.
44	2C	R783CPXF	1	binary	Channel path extended flags **Bit** **Meaning When Set** **0** Extended I/O measurement-block data available **1-7** Reserved.
45	2D	R783CPAT	1	binary	Path attributes **Value** **Meaning** **0** Not specified for this path. **1** Preferred path. **2** Non-preferred path.
46	2E		2		Reserved.

I/O Queuing Data Section

This section contains one per LCU, described by triplet SMF78ASS.

Offsets		Name	Length	Format	Description
0	0	R783ID2	2	binary	Logical control unit identifier.
2	2	R783DST	1	binary	Data Status **Bit** **Meaning When Set** **0** No hardware measurements available **1** Dynamically changed **2** Dynamically added **3** Configuration change attempted **4** LCU contains DCM managed channels **5** Path attributes are valid. **6-7** Reserved.
3	3		1		Reserved.
4	4	R783QSM	4	binary	Sum of total length of the CU-HDR queue.
8	8	R783QCT	4	binary	Number of entries on the CU-HDR queue.
12	C	R783MCMN	2	binary	Minimum number of DCM managed channels used.
14	E	R783MCMX	2	binary	Maximum number of DCM managed channels used.
16	10	R783MCDF	2	binary	Defined number of DCM managed channels.
18	12		2		Reserved.
20	14	R783PTM	4	binary	Accumulated path taken count for DCM managed channels.
24	18	R783DPBM	4	binary	Accumulated director port busy count for DCM managed channels.
28	1C	R783CUBM	4	binary	Accumulated control unit busy count for DCM managed channels.

Offsets		Name	Length	Format	Description
32	20	R783CBTM	4	binary	Accumulated delay time for DCM-managed channels because of a busy control unit.
36	24	R783CMRM	4	binary	Accumulated initial command response time for DCM-managed channels.
40	28	R783SBSM	4	binary	Switch busy count summation for DCM-managed channels.
44	2C		8		Reserved.
52	34	R783CSST	4	binary	Channel subsystem wait time in units of 128 microseconds.

Record Type 79 (4F) — RMF Monitor II Activity

Reference books

For information on using RMF, see *z/OS RMF User's Guide*.

For information on Monitor I and II, see *z/OS RMF Report Analysis*.

For more information on performance groups, see *z/OS MVS Initialization and Tuning Guide*.

Record type 79 is written during a Monitor II background session when feedback is requested as SMF records. It is written at each measurement interval and when the session is terminated. It contains a section that is identical for all Monitor II reports and a subtype section that is unique for each report. The subtypes are:

- **Subtype 1** — contains information that describes address space state data (and address space state data by job name) for each address space identifier included.
- **Subtype 2** — contains information that describes address space resource data (and address space resource data by job name) activity. The length depends on the number of devices.
- **Subtype 3** — contains information that describes central storage/processor/SRM activity.
- **Subtype 4** — contains information that describes paging activity.
- **Subtype 5** — contains information that describes address space SRM data (and address space SRM data by job name).
- **Subtype 6** — contains information that describes reserve data.
- **Subtype 7** — contains information that describes enqueue contention data.
- **Subtype 8** — contains information that describes transaction activity.
- **Subtype 9** — contains information that describes device activity. The length depends upon the number of devices.
- **Subtype 10** — contains information that describes domain activity.
- **Subtype 11** — contains information that describes paging data set activity. The length is variable.
- **Subtype 12** — contains information that describes channel path activity. The length is variable.
- **Subtype 14** — contains information that describes I/O queuing activity by logical control unit. The length is variable.

  Note: Your installation may produce several type 79 subtype 14 records.
- **Subtype 15** — contains information about IRLM long locks.

Note: The records of this subtype have no RMF product section (as indicated in field SMF79PRN) and have no Monitor II control section.

Note: All fields with format *s_float* have the type *short format floating point*.

Macro to Symbolically Address Record Type 79: The SMF record mapping macro for all records produced by RMF is ERBSMFR. Its format is ERBSMFR (*n1*,*n2*,...) where *n1*,*n2*, ... are the SMF record types you want to map. Note that the parentheses are required only when two or more record types are specified. The mapping macro resides in SYS1.MACLIB.

Record Environment

The following conditions exist for the generation of this record:

Macro	SMFWTM (record exit: IEFU83)
Mode	Task
Storage Residency	31-bit

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF79LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	SMF79SEG	2	binary	Segment descriptor (see record length field).
4	4	SMG79FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0** New SMF record format **1** Subtypes used **2** Reserved. **3-6** Version indicators* **7** System is running in PR/SM mode. *See “Standard SMF Record Header” on page 13-1 for a detailed description.
5	5	SMF79RTY	1	binary	Record type 79 (X'4F').
6	6	SMF79TME	4	binary	Time since midnight, in hundredths of a second, when the record was moved into the SMF buffer.
10	A	SMF79DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
14	E	SMF79SID	4	EBCDIC	System identification (from the SMFPRMxx SID parameter).
18	12	SMF79SSI	4	EBCDIC	Sub-system identification (‘RMF’).
22	16	SMF79STY	2	binary	Record subtype.
24	18	SMF79TRN	2	binary	Number of triplets in this record. A triplet is a set of three SMF fields (offset/length/number values) that defines a section of the record.
26	1A		2		Reserved.
28	1C	SMF79PRS	4	binary	Offset to RMF product section from start of record, including record descriptor word (RDW).

Offsets		Name	Length	Format	Description
32	20	SMF79PRL	2	binary	Length of RMF product section.
34	22	SMF79PRN	2	binary	Number of RMF product sections.
Individual header extension for subtypes 1 - 14:					
36	24	SMF79MCS	4	binary	Offset to Monitor II control section from start of record, including record descriptor word (RDW).
40	28	SMF79MCL	2	binary	Length of Monitor II control section.
42	2A	SMF79MCN	2	binary	Number of Monitor II control sections.
44	2C	SMF79ASS	4	binary	Offset to data section from start of record, including record descriptor word (RDW).
48	30	SMF79ASL	2	binary	Length of data section.
50	32	SMF79ASN	2	binary	Number of data sections.
The following six fields are not present for all subtypes:					
52	34	SMF79DCS	4	binary	Offset to control section from start of record, including record descriptor word (RDW).
56	38	SMF79DCL	2	binary	Length of control section.
58	3A	SMF79DCN	2	binary	Number of control sections.
60	3C	SMF79QSS	4	binary	Offset to input/output queue (IOQ) queuing control from start of record, including record descriptor word (RDW).
64	40	SMF79QSL	2	binary	Length of input/output queue (IOQ) global section.
66	42	SMF79QSN	2	binary	Number of input/output queue (IOQ) global sections.
Individual header extension for subtype 15:					
36	24	SMF79FPO	4	binary	Offset to IMS long lock data section.
40	28	SMF79FPL	2	binary	Length of IMS long lock data section.
42	2A	SMF79FPN	2	binary	Number of IMS long lock data sections.

RMF Product Section

Offsets		Name	Length	Format	Description
0	0	SMF79MFV	2	packed	RMF version number.
2	2	SMF79PRD	8	EBCDIC	Product name.
10	A	SMF79IST	4	packed	Snap shot time for Monitor II report, in the form 0*hhmmssF*, where *hh* is the hours, *mm* is the minutes, *ss* is the seconds, and *F* is the sign.
14	E	SMF79DAT	4	packed	Snap shot date for Monitor I report, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
18	12	SMF79INT	4	packed	Duration of the RMF Monitor I measurement interval, in the form *mmsstttF* where *mm* is the minutes, *ss* is the seconds, *ttt* is the milliseconds, and *F* is the sign. (The end of the measurement interval is the sum of the recorded start time and this field.)
22	16		2		Reserved.
24	18	SMF79SAM	4	binary	Number of RMF samples.
28	1C		2		Reserved.
30	1E	SMF79FLA	2	binary	Flags **Bit** **Meaning When Set** **0** Reserved **1** Samples have been skipped **2** Record was written by RMF Monitor III **3** Interval was synchronized with SMF **4-15** Reserved.

Offsets		Name	Length	Format	Description
32	20		4		Reserved.
36	24	SMF79CYC	4	packed	Sampling cycle length, in the form 000*tttt**F*, where *tttt* is the milliseconds and *F* is the sign (taken from CYCLE option). The range of values is 0.050 to 9.999 seconds.
40	28	SMF79MVS	8	EBCDIC	MVS software level (consists of an acronym and the version, release, and modification level - ZV*vvrrmm*).
48	30	SMF79IML	1	binary	Indicates the type of processor complex on which data measurements were taken. **Value** **Meaning** **3** 9672, zSeries
49	31	SMF79PRF	1	binary	Processor flags. **Bit** **Meaning When Set** **0** The system has expanded storage **1** The processor is enabled for ES connection architecture (ESCA) **2** There is an ES connection director in the configuration **3** System is running in z/Architecture mode **4** IFA processors available. **5-7** Reserved.
50	32	SMF79PTN	1	binary	PR/SM partition number of the partition that wrote this record.
51	33	SMF79SRL	1	binary	SMF record level change number (X'4A' for z/OS V1R7 RMF). This field enables processing of SMF record level changes in an existing release.
52	34	SMF79IET	8	char	Interval expiration time token. This token can be used to identify other than RMF records that belong to the same interval (if interval was synchronized with SMF). (The value of the field is zero for Monitor II records.)
60	3C	SMF79LGO	8	binary	Offset GMT to local time (STCK format).
68	44	SMF79RAO	4	binary	Offset to reassembly area relative to start of RMF product section.
72	48	SMF79RAL	2	binary	Length of reassembly area. Area consists of a fixed header and a variable number of information blocks. Length depends on the record type/subtype, but is fixed for a specific type/subtype.
74	4A	SMF79RAN	2	binary	Reassembly area indicator. **Value** **Meaning** **0** Record is not broken. **1** Record is broken. **Note:** This field is used to indicate whether an SMF record is a broken record. Therefore, offset (SMF79RAO) and length (SMF79RAL) are only valid if SMF79RAN = 1. A reassembly area is only present in broken records.
76	4C	SMF79OIL	2	binary	Original interval length as defined in the session or by SMF (in seconds).
78	4E	SMF79SYN	2	binary	SYNC value in seconds.
80	50	SMF79GIE	8	binary	Projected gathering interval end (STCK format) GMT time.
88	58	SMF79XNM	8	EBCDIC	Sysplex name as defined in parmlib member COUPLExx.
96	60	SMF79SNM	8	EBCDIC	System name for current system as defined in parmlib member IEASYSxx SYSNAME parameter.
Reassembly Area:					
0	0	SMF79RBR	2	binary	Total number of broken records built from the original large record.

Offsets		Name	Length	Format	Description
2	2	SMF79RSQ	2	binary	Sequence number of this broken record. Every broken record built from the same large record must have a unique sequence number, it is in the range from 1 to SMF79RBR.
4	4	SMF79RIO	4	binary	Offset to first reassembly information block relative to start of reassembly area header.
8	8	RMF79RIL	2	binary	Length of reassembly information block.
10	A	SMF79RIN	2	binary	Number of reassembly information blocks (same value as SMF79TRN in header section).
12	C		4		Reserved.
Reassembly Area Information Block:					
0	0	SMF79RNN	2	binary	Total number of sections in the original large record. This field contains information of how many sections of a specific type were contained in the original SMF record. This field is a copy of the number field of the triplet in the original (non broken) record.
2	2	SMF79RPP	2	binary	Position of the first of one or more consecutive sections described by this block as in the original record. Values in the range of 1 to SMF79RNN are valid for correct processing. A value of 0 will skip processing of this information block. This field provides information where the sections that are part of this broken record were placed in the original record before the split took place. The actual number of consecutive sections contained in this record is available from the actual triplet in the header extension.

Monitor II Control Section

Offsets		Name	Length	Format	Description
0	0	R79GTOD	4	packed	Time when the call to data gatherer was issued, in the form 0*hhmmssF*, where *hh* is the hours, *mm* is the minutes, *ss* is the seconds, and *F* is the sign.
4	4	R79LF2	1	binary	Flags **Bit** **Meaning When Set** **0** Not enough relocate data sections to complete data gathering **1** Report will be sorted by storage group **2** Incorrect RSM data obtained **3** Reserved. **4** Invalid transaction data **5** SRM mode changed **6** Invalid data from Monitor I (DEV PGSP IOQ). **7** Reserved.
5	5		1		Reserved.
6	6	R79SES	2	EBCDIC	RMF session identifier.
8	8		2		Reserved.
10	A		2		Reserved for user.
12	C	R79RID	8	EBCDIC	Measurement name.
20	14	R79CTXTL	2	binary	Length of command text.
22	16	R79CTEXT	32	EBCDIC	Text of command.
54	36	R79DTXTL	2	binary	Length of data reporter default text.
56	38	R79DTEXT	32	EBCDIC	Default data reporter text.
88	58	R79IST	4	EBCDIC	Monitor I internal start time, in the form 0*hhmmssF*, where *hh* is the hours, *mm* is the minutes, *ss* is the seconds, and *F* is the sign.
92	5C	R79TSR	2	binary	Total number of small records.

Offsets		Name	Length	Format	Description
94	5E		2		Reserved.
96	60	R79TOT	4	binary	Total number of data sections in large record.
100	64	R79NXT	4	binary	Number of data sections in following small records.
104	68	R79IWMTK	8	EBCDIC	Token returned from IWMRCOLL service.

Subtype 1 — Address Space State Data

ASD and ASDJ Data Section

Offsets		Name	Length	Format	Description
0	0	R791ASID	2	binary	Address space identifier.
2	2	R791JBN	8	EBCDIC	Name of job.
10	A	R791DMN	2	binary	Reserved.
12	C	R791NPG	2	binary	Reserved.
14	E	R791PGP	2	binary	Reserved.
16	10	R791TTOD	4	binary	Real time into transaction (milliseconds).
20	14	R791CL	2	EBCDIC	Current location. (Set to IN when all other indicators are off.) **Contents** **Meaning** **DL** Out queue/delayed **IN** In storage **LO** Logically swapped out **NS** Non-swappable **PR** Privileged **OT** Swapped out and ready **WL** Wait queue/long wait **WM** Wait queue/MSO **WO** Wait queue/reasons other than WM, WL, or WT **WT** Wait queue/terminal wait **>>** Transitioning out **<<** Transitioning in.
22	16	R791TAS	2	binary	Type of user **Contents** **Meaning** **0** Batch **1** Started task **2** Mount task **3** TSO/E **4** ASCH **5** OMVS address space.

Offsets		Name	Length	Format	Description
24	18	R791SRC	2	EBCDIC	Reason for last swap-out **Contents** – **Meaning** **TI** – Terminal input **TO** – Terminal output **LW** – Long wait **XS** – Auxiliary storage shortage **RS** – Central storage shortage **DW** – Detected wait **RQ** – Request swap **NQ** – CAP enqueue **EX** – CAP exchange **US** – CAP uni-swap **TS** – Transition swap **IC** – Improve central storage usage **IP** – Improve system paging rate **MR** – Make room for a user who has been swapped out too long **AW** – APPC WAIT (swapped out, because waiting for APPC services) **IW** – OMVS input wait **OW** – OMVS output wait **SR** – In-real swap **00** – Unknown.
26	1A	R791DP	2	binary	Dispatcher priority.
28	1C		6		Reserved.
34	22	R791SWC	2	binary	Transaction swap count.
36	24	R791SWMR	2	binary	SRM work load recommendation value.
38	26		4		Reserved.
42	2A	R791WMS	4	binary	SRM service for the current transaction since the last swap-in.
46	2E	R791TCPU	4	binary	CPU time (TCB + SRB) for current job step, in milliseconds.
50	32		4		Reserved.
54	36	R791ESCT	4	binary	Number of pages on expanded storage frames.
58	3A		2		Reserved.
60	3C	R791PIN	4	binary	Page-in count.
64	40	R791TRTM	4	binary	Transaction residency time, in milliseconds.
68	44	R791FLG	1	binary	**Bit** – **Meaning When Set** **0** – Cross memory address space **1** – Data in R791CTAR is valid **2** – Data in R791VAL is valid **3** – Reserved. **4** – If ON: this address space is a server address space If OFF: goal specified for this address space is being honored by WLM **5** – Address space has been quiesced by a RESET command **6** – Address space matched a classification rule in the active policy which prevents managing the region based on the response time goals of its served transactions **7** – Server has temporal affinity to clients.

Offsets		Name	Length	Format	Description
69	45	R791FLG2	1	binary	Additional bits. **Bit** **Meaning When Set** **0** Service class assigned by classification, or RESET SRVCLASS was designated CPU-critical in the active policy. **1** Address space matched a classification rule in the active policy which was designated storage-critical. **2** Address space is serving transactions which belong to a service class that was designated storage-critical in the active policy's classification rules, or is running in SYSTEM/SYSSTC. **3** CPU protection was assigned either to the address space or to transaction service classes being served by the space. **4** Storage protection was assigned either to the address space or to transaction service classes being served by the space. **5-7** Reserved.
70	46	R791FMCT	4	binary	Number of central storage frames.
74	4A	R791WSS	4	binary	Working set at last swap in.
78	4E	R791TWSS	4	binary	RSM target working set size.
82	52	R791ESHP	4	binary	Number of hiperspace expanded storage pages used by job.
86	56	R791ESVI	4	binary	Number of VIO expanded storage pages used by job.
90	5A	R791HIN	4	binary	Number of ESO hiperspace page-ins by block.
94	5E	R791HRMS	4	binary	Number of ESO hiperspace read misses by job (a read miss is an attempt to read a frame that is not in expanded storage).
98	62	R791BPIN	4	binary	Number of blocked pages brought in from DASD.
102	66	R791PINE	4	binary	Number of pages brought in from expanded storage.
106	6A	R791BPNE	4	binary	Number of blocked pages brought in from expanded storage.
110	6E	R791CTAR	4	binary	Central storage target number of frames.
114	72	R791VAL	4	binary	Recommendation value for working-set-managed address spaces.
118	76	R791SCL	8	EBCDIC	Service class name.
126	7E	R791SCP	2	binary	Service class period.
128	80	R791WKLD	8	EBCDIC	Workload name.
136	88	R791RGRP	8	EBCDIC	Resource group name.
144	90	R791SPI	4	binary	Number of page-ins from auxiliary storage for shared page groups.
148	94	R791CMNI	4	binary	Number of common pages for current transaction.
152	98	R791PNV	4	binary	Number of non-VIO pages for current transaction.
156	9C	R791PVIO	4	binary	Number of VIO pages for current transaction.
160	A0	R791EXCT	4	binary	EXCP count for this step.
164	A4	R791TCPC	4	binary	Total CPU time consumed in this address space, in milliseconds.
168	A8	R791ASST	4	binary	CPU time consumed by preemptible-class SRBs running on behalf of this address space, in milliseconds.
172	AC	R791PHTM	4	binary	CPU time consumed by preemptible-class SRBs running in this address space, in milliseconds.
176	B0	R791RCL	8	EBCDIC	Report class name.
184	B8	R791MLIM	8	binary	Address space memory limit, in megabytes.
192	C0	R791TIFA	4	binary	IFA service time in milliseconds.

Offsets		Name	Length	Format	Description
196	C4	R791TCP	4	binary	CPU time spent on standard CPs in milliseconds. Only valid if IFAs are in configuration.
200	C8	R791TIFC	4	binary	IFA service time spent on standard CPs in milliseconds.
204	CC	R791NFFI	4	binary	Normalization factor for IFA time. Used to convert between real IFA times and ″normalized″ IFA times, that is, the equivalent time on a standard CP. Multiply R791TIFA by this value and divide by 256 to calculate the normalized IFA time.

Subtype 2 — Address Space Resource Data

ARD and ARDJ Data Section

Offsets		Name	Length	Format	Description
0	0	R792ASID	2	binary	Address space identifier.
2	2	R792JBN	8	EBCDIC	Name of job.
10	A	R792DMN	2	binary	Reserved.
12	C	R792NPG	2	binary	Reserved.
14	E	R792CL	2	EBCDIC	Current location **Contents** **Meaning** **DL** Out queue/delayed **IN** In storage **LO** Logically swapped out **NS** Non-swappable **PR** Privileged **OT** Swapped out and ready **WL** Wait queue/long wait **WM** Wait queue/MSO **WO** Wait queue/reasons other than WM, WL, or WT **WT** Wait queue/terminal wait **>>** Transitioning out **<<** Transitioning in.
16	10	R792TAS	2	binary	Type of user **Contents** **Meaning** **0** Batch **1** Started task **2** Mount task **3** TSO/E **4** ASCH **5** OMVS address space.
18	12	R792TRC	2	binary	Transaction count.
20	14	R792TTOD	4	binary	Transaction elapsed time, in milliseconds.
24	18	R792PRFX	4	binary	Number of private fixed frames.
28	1C		2		Reserved.
30	1E	R792SVAR	4	binary	SRM service absorption rate for step.
34	22	R792TCPU	4	binary	Total TCB time for step, in milliseconds.
38	26	R792PSS1	4	binary	High order word - CPU page seconds, in milliseconds. One page in storage for one second is one page second.
42	2A	R792PSS2	4	binary	Low order word - step product of frame, in milliseconds. One page in storage for one second is one page second.
46	2E	R792EJST	4	binary	Total processor time (TCB+SRB), in milliseconds.
50	32	R792TSRM	4	binary	Total SRM service for job or session.
54	36	R792RTM	4	binary	Resident time for step, in milliseconds.

Offsets		Name	Length	Format	Description
58	3A	R792EXCP	2	binary	EXCP count for step.
60	3C	R792CMNI	4	binary	Number of common pages for current transaction.
64	40	R792PNV	4	binary	Number of non-VIO pages for current transaction.
68	44	R792PVIO	4	binary	Number of VIO pages for current transaction.
72	48	R792FXBL	4	binary	Number of fixed frames below 16 megabytes.
76	4C	R792PSWP	4	binary	Number of pages swapped in and out for current transaction.
80	50	R792LPAI	4	binary	Number of link pack area (LPA) pages paged in for current transaction.
84	54	R792CSAI	4	binary	Number of CSA pages paged in for current transaction.
88	58	R792LSQA	4	binary	Number of fixed local system queue area (LSQA) fixed frames.
92	5C	R792NLQF	4	binary	Number of non-local system queue area (LSQA) fixed frames.
96	5E	R792TDEV	4	binary	Total device connect time in milliseconds.
100	64		2		Reserved.
102	66	R792PIN	4	binary	Page-in count.
106	6A	R792TRTM	4	binary	Transaction residency time.
110	6E	R792FLG	1	binary	Flags **Bit** **Meaning When Set** **0** Cross-memory address space **1** Incorrect RSM data obtained for address space **2** Reserved **3** Reserved **4** If ON: this address space is a server address space If OFF: goal specified for this address space is being honored by WLM **5** Address space has been quiesced by a RESET command **6** Address space matched a classification rule in the active policy which prevents managing the region based on the response time goals of its served transactions **7** Server has temporal affinity to clients.
111	6F	R792FLG2	1	binary	Additional bits. **Bit** **Meaning When Set** **0** Service class assigned by classification, or RESET SRVCLASS was designated CPU-critical in the active policy. **1** Address space matched a classification rule in the active policy which was designated storage-critical. **2** Address space is serving transactions which belong to a service class that was designated storage-critical in the active policy's classification rules, or is running in SYSTEM/SYSSTC. **3** CPU protection was assigned either to the address space or to transaction service classes being served by the space. **4** Storage protection was assigned either to the address space or to transaction service classes being served by the space. **5-7** Reserved.
112	70	R792LSQR	4	binary	Local system queue area (LSQA) pages in central storage.
116	74	R792LSQE	4	binary	Local system queue area (LSQA) pages in expanded storage.

Offsets		Name	Length	Format	Description
120	78	R792ARS	4	binary	Average number of real frames for step.
124	7C	R792TWSS	4	binary	SRM target working set size for this job.
128	80	R792PHSP	4	binary	Number of hiperspace pages for the current transaction.
132	84	R792EXCT	4	binary	EXCP count for step.
136	88	R792SCL	8	EBCDIC	Service class name.
144	90	R792SCP	2	binary	Service class period.
146	92	R792WKLD	8	EBCDIC	Workload name.
154	9A	R792RGRP	8	EBCDIC	Resource group name.
162	A2		2		Reserved.
164	A4	R792TCPC	4	binary	Total CPU time consumed in this address space, in milliseconds.
168	A8	R792ASST	4	binary	CPU time consumed by preemptible-class SRBs running on behalf of this address space, in milliseconds.
172	AC	R792PHTM	4	binary	CPU time consumed by preemptible-class SRBs running in this address space, in milliseconds.
176	B0	R792FXAB	4	binary	Number of fixed frames between 16M and 2G (z/Architecture mode).
180	B4	R792TIFA	4	binary	IFA service time in milliseconds.
184	B8	R792TCP	4	binary	CPU time spent on standard CPs in milliseconds. Only valid if IFAs are in configuration.
188	BC	R792TIFC	4	binary	IFA service time spent on standard CPs in milliseconds.
192	C0	R792NFFI	4	binary	Normalization factor for IFA time. Used to convert between real IFA times and ″normalized″ IFA times, that is, the equivalent time on a standard CP. Multiply R792TIFA by this value and divide by 256 to calculate the normalized IFA time.

Subtype 3 — Storage/Processor Data

SRCS Data Section

Offsets		Name	Length	Format	Description
0	0		2		Reserved.
2	2	R793CRI	2	binary	Highest UIC count.
4	4	R793SQA	2	binary	Number of system queue area (SQA) frames (replaced by R793SQA4).
6	6	R793CMNF	2	binary	Number of frames allocated to the common area (replaced by R793CMN4).
8	8	R793CMFF	2	binary	Number of common (LPA + CSA) fixed frames (replaced by R793CMF4).
10	A	R793PRFX	2	binary	Number of private fixed frames (local system queue area (LSQA) + non-LSQA) (replaced by R793PFX4).
12	C	R793CPUU	2	binary	LPAR utilization, if in LPAR mode and RMF Monitor I is active. X'7FFF' indicates no value available in PR/SM environment.
14	E	R793DQ	2	binary	Length of out wait queue.
16	10	R793INC	2	binary	Number of address spaces swapped in storage (SRM in queue).
18	12	R793OUTU	2	binary	Number of address spaces swapped out of storage (SRM out queue).
20	14		4		Reserved.

Offsets		Name	Length	Format	Description
24	18	R793LPAF	2	binary	Number of link pack area (LPA) pageable frames (replaced by R793LPF4).
26	1A	R793CSAF	2	binary	Number of CSA pageable frames (replaced by R793CSF4).
28	1C	R793LPFX	2	binary	Number of link pack area (LPA) fixed frames (replaced by R793LFX4)..
30	1E	R793CSFX	2	binary	Number of CSA fixed frames (replaced by R793CFX4)..
32	20	R793LSQA	2	binary	Number of local system queue area (LSQA) frames (replaced by R793LSQ4)..
34	22	R793NLQF	2	binary	Number of private non-local system queue area (LSQA) fixed frames (replaced by R793NLF4)..
36	24	R793LOUT	2	binary	Number of address spaces logically swapped out.
38	26	R793SQR	4	binary	System queue area (SQA) pages in central storage.
42	2A	R793SQE	4	binary	System queue area (SQA) pages in expanded storage.
46	2E	R793LSQR	4	binary	Local system queue area (LSQA) pages in central storage.
50	32	R793LSQE	4	binary	Local system queue area (LSQA) pages in expanded storage.
54	36	R793AFC	4	binary	Number of available frames.
58	3A	R793CUT	4	binary	MVS utilization, that is, MVS non-wait time as a percentage of the interval length. For systems not running in LPAR mode in a PR/SM environment, this field is identical to R793CPUU. For details, see *z/OS RMF Report Analysis*.
62	3E	R793SQA4	4	unsigned binary	Number of fixed system queue area (SQA) frames (replaces R793SQA).
66	42	R793CMN4	4	unsigned binary	Number of common (LPA+CSA) pageable and fixed frames (replaces R793CMNF).
70	46	R793CMF4	4	unsigned binary	Number of common (LPA+CSA) fixed frames (replaces R793CMFF).
74	4A	R793PFX4	4	unsigned binary	Number of private fixed frames (LSQA+NON-LSQA) (replaces R793PRFX).
78	4E	R793LPF4	4	unsigned binary	Number of total link pack area (LPA) frames (replaces R793LPAF).
82	52	R793CSF4	4	unsigned binary	Number of total CSA frames (replaces R793CSAF).
86	56	R793LFX4	4	unsigned binary	Number of link pack area (LPA) fixed frames (replaces R793LPFX).
90	5A	R793CFX4	4	unsigned binary	Number of CSA fixed frames (replaces R793CSFX).
94	5E	R793LSQ4	4	unsigned binary	Number of fixed local system queue area (LSQA) frames (replaces R793LSQA).
98	62	R793NLF4	4	unsigned binary	Number of private NON-LSQA fixed frames (replaces R793NLQF).

Subtype 4 — Paging Activity

SPAG Data Section

Offsets		Name	Length	Format	Description
0	0	R794CMNI	4	binary	System common (LPA + CSA) pages in to central storage from auxiliary storage.
4	4	R794CMNO	4	binary	System common (CSA) pages out from central storage to auxiliary storage.
8	8		4		Reserved.

Offsets		Name	Length	Format	Description
12	C	R794SWPO	4	binary	Number of swap-outs between central storage and auxiliary storage.
16	10	R794PSPI	4	binary	Number of pages swapped in to central storage from auxiliary storage.
20	14	R794PSPO	4	binary	Number of pages swapped out from central storage to auxiliary storage.
24	18	R794PRVI	4	binary	Number of private pages (VIO + non-VIO) swapped in to central storage from auxiliary storage.
28	1C	R794PRVO	4	binary	Number of private pages (VIO + non-VIO) swapped out from central storage to auxiliary storage.
32	20		4		Reserved.
36	24	R794VIO	4	binary	Number of VIO pages (in + out) between central storage and auxiliary storage.
40	28		2		Reserved.
42	2A	R794CRI	2	binary	Highest UIC count.
44	2C		4		Reserved.
48	30	R794LPAI	4	binary	System link pack area (LPA) pages in to central storage from auxiliary storage.
52	34	R794CSAI	4	binary	System CSA pages out from central storage to auxiliary storage.
56	38		12		Reserved.
68	44	R794ERTE	4	binary	Number of pages sent from central storage to expanded storage.
72	48	R794EVAL	4	binary	Number of available expanded storage frames not in use.
76	4C		4		Reserved.
80	50	R794MRTE	4	binary	Number of pages migrated from expanded storage to auxiliary storage.
84	54	R794MAGE	4	binary	Migration age.
88	58	R794AFC	4	binary	Number of available frames.
92	5C	R794TWSS	4	binary	Target working set size for the common area.
96	60	R794HSP	4	binary	Number of hiperspace pages (in + out) between central storage and auxiliary storage.
100	64	R794PPIA	4	binary	Number of blocked pages paged in from private auxiliary storage.
104	68	R794LPIA	4	binary	Number of blocks paged in from private auxiliary storage.

Subtype 5 — Address Space SRM Data

ASRM and ASRMJ Data Section

Offsets		Name	Length	Format	Description
0	0	R795ASID	2	binary	Address space identifier.
2	2	R795JBN	8	EBCDIC	Name of job.
10	A	R795DMN	2	binary	Reserved.
12	C	R795NPG	2	binary	Reserved.
14	E	R795PGP	2	binary	Reserved.
16	10	R795TTOD	4	binary	Real time into transaction.

Offsets		Name	Length	Format	Description
20	14	R795CL	2	EBCDIC	Current location (set to IN when all other indicators are off) **Contents** / **Meaning** **DL** Out queue/delayed **IN** In storage **LO** Logically swapped out **NS** Non-swappable **PR** Privileged **OT** Swapped out and ready **WL** Wait queue/long wait **WM** Wait queue/MSO **WO** Wait queue/reasons other than WM, WL, or WT **WT** Wait queue/terminal wait **>>** Transitioning out **<<** Transitioning in.
22	16	R795TAS	2	binary	Type of user **Contents** / **Meaning** **0** Batch **1** Started task **2** Mount task **3** TSO/E **4** ASCH **5** OMVS address space.
24	18	R795TROD	4	binary	Transaction resident time.
28	1C	R795TCNT	2	binary	Transaction count.
30	1E	R795SWC	2	binary	Transaction swap count.
32	20	R795CPUS	4	binary	Total processor service units for transaction (zeroes when ASID is out of storage).
36	24	R795MSOS	4	binary	Total main storage origin (MSO) service units for transaction (zeroes when ASID is out of storage).
40	28	R795IOCS	4	binary	Total IOC service units for transaction (zeroes when ASID is out of storage).
44	2C	R795WMS	4	binary	Total service units for transaction (zeroes when ASID is out of storage).
48	30	R795TOTL	4	binary	Total service units for job or TSO/E session (zeroes when ASID is out of storage).
52	34	R795TOT	4	binary	Total service units for transaction since last swap-in.
56	38	R795SRBS	4	binary	Total SRB service units for transaction (zeros when ASID is out of storage).
60	3C	R795FLG	1	binary	Flags. **Bit** / **Meaning When Set** **0-2** Reserved **3** Reserved **4** If ON: this address space is a server address space If OFF: goal specified for this address space is being honored by WLM **5** Address space has been quiesced by a RESET command **6-7** Reserved.
61	3D	R795SCL	8	EBCDIC	Service class name.
69	45	R795SCP	2	binary	Service class period.
71	47	R795WKLD	8	EBCDIC	Workload name.
79	4F	R795RGRP	8	EBCDIC	Resource group name.

Subtype 6 — Reserve Data

SENQR Data Section

Offsets		Name	Length	Format	Description
0	0	R796ASID	2	binary	Address space ID of the job that issued the RESERVE.
2	2	R796MAJ	8	EBCDIC	Major name of the resource.
10	A	R796MIN	44	EBCDIC	Minor name of the resource.
54	36	R796JBN	8	EBCDIC	Name of the job that issued the RESERVE.
62	3E	R796VOLS	6	EBCDIC	Volume serial of the volume against which the RESERVE was issued.
68	44	R796UCB	3	EBCDIC	Device number or ’UCB’ for 4-digit device numbers.
71	47	R796REQ	2	EBCDIC	Type and status of request for the resource.
73	49	R796MINL	2	binary	Length of the minor name field (used for reporting).
75	4B	R796FLG	1	binary	Reserve flag byte **Bit** **Meaning When Set** **0** Device reserved by this processor **1** Minor name truncated **2** Global resource **3** Reserve request converted to global enqueue **4-7** Reserved.
76	4C	R796SID	8	EBCDIC	System identifier of the job that issued the RESERVE.
84	54	R796DVN	2	binary	Device number (binary).

Subtype 7 — Enqueue Contention Data

SENQ Data Section

Offsets		Name	Length	Format	Description
0	0	R797MAJ	8	EBCDIC	Major name of resource.
8	8	R797MIN	44	EBCDIC	Minor name of resource.
52	34	R797FLG	1	binary	Data type flags **Bit** **Meaning When Set** **0** ON=detail data OFF=summary data **1** ON=major name specified **2** ON=minor name specified **3** ON=minor name truncated **4** Global resource **5** Data is for all resources held by a specified system in a global resource serialization complex. **6** Data is for all resources held exclusively by a specified system in a global resource serialization complex. **7** Reserved.
53	35	R797MINL	4	binary	Length of the minor name field (used for reporting).
57	39	R797OWN	2	binary	Count of requestors that own the resource.
59	3B	R797EXCW	2	binary	Count of requestors waiting for exclusive use of a resource.
61	3D	R797SHRW	2	binary	Count of requestors waiting for shared use of a resource.
63	3F	R797REQ	2	EBCDIC	Type and status of request for a resource (‘SO’, ‘SW’, ‘EO’, or ‘EW’).
65	41	R797JBN	8	EBCDIC	Name of the job that issued the ENQ.
73	49	R797ASID	2	binary	Address space ID of the job that issued the ENQ.
75	4B	R797SCOP	4	EBCDIC	Scope of the resource (‘SYS’, ‘SYSS’, or ‘STEP’).

Offsets		Name	Length	Format	Description
79	4F		2		Reserved.
81	51	R797SID	8	EBCDIC	System identifier of the job that issued the ENQ.
89	59		3		Reserved.

Subtype 8 — Transaction Activity

Important

Beginning with z/OS V1R3, WLM compatibility mode is no longer available. Accordingly, the TRX Data Section of subtype 8 of record 79 is no longer valid. The information has been left here for reference purposes, and for use on backlevel systems.

TRX Data Section

Offsets		Name	Length	Format	Description
0	0	R798ICSI	2	EBCDIC	Identifier of IEAICS*xx* parmlib member (which is described in *z/OS MVS Initialization and Tuning Reference*).
2	2	R798IPSI	2	EBCDIC	Identifier of IEAIPS*xx* parmlib member (which is described in *z/OS MVS Initialization and Tuning Reference*).
4	4	R798PGN	2	binary	Performance group number.
6	6	R798PGP	2	binary	Performance group period.
8	8	R798SYS	4	EBCDIC	Name of subsystem associated with the PGN (performance group number). These names are specified in the IAEICS*xx* parmlib member (which is described in *z/OS MVS Initialization and Tuning Reference*).
12	C	R798TTX	4	binary	Number of ended transactions for the performance group period.
16	10	R798TTM	4	binary	Elapsed time (in 1024-microsecond units) for all ended transactions in the performance group period.
20	24	R798CLS	10	EBCDIC	Transaction class name associated with the performance group.
30	2E	R798USR	10	EBCDIC	User identifier associated with the performance group.
40	28	R798NAM	10	EBCDIC	Transaction name associated with the performance group.
50	32	R798FL1	1	binary	Data type flags **Bit** **Meaning When Set** **0** ON - performance group is a report performance group OFF - performance group is a control performance group **1** Account information used as basis of performance group **2-7** Reserved.
51	33		5		Reserved.
56	38	R798TET1	4	binary	First word: elapsed time of ended transactions for PGP (in 1024-microsecond units).
60	3C	R798TET2	4	binary	Second word: elapsed time of ended transactions for PGP (in 1024-microsecond units).

Subtype 9 — Device Activity

Device Data Section

This section contains one per device.

Offsets		Name	Length	Format	Description
0	0	R799NUM	2	packed	Device number.
2	2	R799LCU	2	binary	Logical control unit number X'00' to X'FF'.
4	4		1		Reserved.
5	5	R799CNF	1	binary	Device flags **Bit** **Meaning When Set** **0** IOS queue-length incorrect **1** No logical control unit information **2** Data contained in fields R799SSC through R799DIS is incorrect **3** Connect, pending, or disconnect time for device is not valid **4-5** Reserved **6** Device was reconfigured or DDR activity was detected through Monitor I interval **7** Device is currently online.
6	6	R799SER	6	EBCDIC	Volume serial number of the volume mounted on this device.
12	C	R799TYP	4	binary	Device type.
16	10	R799NUX	4	binary	Number of base and alias devices if a parallel access volume (PAV). This field will be a 1 for a non-PAV device.
20	14	R799SSC	4	binary	Start subchannel (SSCH) count.
24	18	R799MEC	4	binary	Measurement event count; number of SSCH instructions for which connect, pending, and active times were stored.
28	1C	R799CNN	4	binary	Device connect time.
32	20	R799PEN	4	binary	Function pending time.
36	24	R799ATV	4	binary	Function active time.
40	28	R799DIS	4	binary	Device disconnect time.
44	2C	R799QUE	4	binary	Number of requests queued in IOS for this device.
48	30	R799UTL	4	binary	Number of samples when the device was reserved but an SSCH had not been issued to the device.
52	34	R799RSV	4	binary	Number of samples taken during the measurement interval that indicated that the device was reserved.
56	38		4		Reserved.
60	3C	R799ALC	4	binary	Number of samples taken during the measurement interval that indicated that the device was allocated.
64	40	R799DVB	4	binary	Device busy delay time.
68	44	R799CUB	4	binary	Shows control unit busy delay time if bit 4 in R799CNX is set off.
72	48	R799ICT	2	binary	Incorrect sample count.
74	4A	R799CNX	1	binary	Device flag extensions. **Bit** **Meaning When Set** **0** Base exposure of a parallel access volume **1** Number of alias exposures has changed **2** Timing facility not active **3** Extended CMB mode **4** Model-dependant data not available by STSCH **5** Initial command response time available **6-7** Reserved.
75	4B		1		Reserved.
76	4C	R799SGN	8	EBCDIC	Storage group name.
84	54	R799NDA	4	binary	Total number of allocations in effect for the device.
88	58	R799DPB	4	binary	Shows the amount of time during the measurement interval that I/O requests to a device were delayed because a director port was busy if bit 4 of field R799CNX is set to off.

Offsets		Name	Length	Format	Description
92	5C	R799CMR	4	unsigned binary	Shows initial command response time in units of 128 microseconds if bit 5 in R799CNX is set on.
96	60	R799PCT	4	binary	Number of unsuccessful PAV counts.

Subtype 10 — Domain Activity

Important

Beginning with z/OS V1R3, WLM compatibility mode is no longer available. Accordingly, the DDMN Data Section of subtype 10 of record 79 is no longer valid. The information has been left here for reference purposes, and for use on backlevel systems.

DDMN Data Section

Offsets		Name	Length	Format	Description
0	0	R79ATWSR	4	binary	Time-weighted average service rate for this domain.
4	4		2		Reserved.
4	4		2		Reserved.
6	6	R79ARUA	2	binary	Average number of ready users.
8	8		2		Reserved.
10	A	R79ACMPL	2	binary	Current MPL value.
12	C	R79AOUTU	2	binary	Average number of users swapped out.
14	E	R79AINCU	2	binary	Average number of swapped-in users.
16	10		2		Reserved.
18	12	R79ACIDX	2	binary	Contention index. The value of this field is 100 times the actual value.
20	14	R79ANSW	2	binary	Number of non-swappable user.
22	16	R79ADMNO	1	binary	Domain number.
23	17		3		Reserved.
26	1A	R79AIPS	2	EBCDIC	Current IEAIPS*xx* member.
28	1C	R79ACPU	4	EBCDIC	CPU service coefficient.
32	20	R79AIOS	4	EBCDIC	I/O service coefficient.
36	24		4		Reserved.
40	28	R79ASRB	4	EBCDIC	SRB service coefficient.
44	2C	R79ATWET	4	binary	Average first period TSO/E transaction response time, in 1024-microsecond units.
48	30	R79ADMLO	2	binary	Minimum multiprogramming level (MPL).
50	32	R79ADMHI	2	binary	Maximum multiprogramming level (MPL).
52	34	R79AMSO	8	EBCDIC	MSO service coefficient.
60	3C	R79AIMPL	2	binary	IN MPL target.
62	3E	R79AOMPL	2	binary	OUT MPL target.

Subtype 11 — Page Data Set Activity

PGSP Control Section

This section contains one control section followed by a data set section for each data set in the report.

Offsets		Name	Length	Format	Description
0	0	R79BETYP	1	EBCDIC	Type of data that follows: P — PAGE data sets
1	1		3		Reserved.
PGSP Data Set Section:					
0	0	R79BSALC	4	binary	Number of slots/sets in this data set.
4	4	R79BSAVL	4	binary	Number of slots/sets available.
8	8	R79BSLBD	4	binary	Number of bad slots/sets.
12	C	R79BSUSE	4	binary	Number of samples that indicate ASM is using the data set.
16	10	R79BSIOS	4	binary	Number of SSCH instructions issued for the data set.
20	14	R79BREQS	4	binary	Number of pages transferred to/from the data set.
24	18	R79BFLG	1	binary	Flags **Bit** **Meaning When Set** **0** Indicates that the data set is bad **1** Indicates a pageable link pack area (PLPA) data set **2** Indicates a common data set **3** Reserved **4** Indicates a local page data set **5** Indicates a paging data **6** Reserved **7** Indicates that the data set accepts VIO pages.
25	19	R79BDEV	1	binary	Device type.
26	1A	R79BDADR	3	EBCDIC	Device number or 'UCB' for 4-digit device numbers.
29	1D	R79BVSER	6	EBCDIC	Volume serial number.
35	23	R79BDSN	44	EBCDIC	Data set name.
79	4F	R79BFL2	1	binary	Flags **Bit** **Meaning When Set** **0** Reserved **1** Alternate control unit device **2** R79BDEVN contains a valid device name **3-7** Reserved.
80	50	R79BDEVN	8	EBCDIC	Device name (blank if device name cannot be determined).
88	58	R79BCU	8	EBCDIC	Control unit name (blank if control unit name cannot be determined).
96	60	R79BDVN	2	binary	Device number (binary).

Subtype 12 — Channel Path Activity

Channel Path Control Section

This section contains one per record.

Offsets		Name	Length	Format	Description
0	0	R79CSMP	4	binary	Number of samples as weighted by SRM. Only valid if bit 5 of R79CFLG1 is not set.

Offsets		Name	Length	Format	Description
4	4	R79CFLG1	1	binary	Flags. **Bit** **Meaning When Set** **0** CPMF (channel path measurement facility) available **1** Configuration change **2** DCM supported by hardware **3** Configuration contains DCM managed channels **4** RMF address space not active **5** Hardware allows multiple logical channel subsystems **6-7** Reserved.
5	5	R79CCMI	1	binary	CPMF mode. **Value** **Meaning** **0** CPMF is not active **1** Compatibility mode **2** Extended mode
6	6		2		Reserved.
8	8	R79CCFRC	4	binary	CPMF (channel path measurement facility) restart count.
12	12	R79CCFSC	4	binary	CPMF (channel path measurement facility) sample count.
16	10	R79CCSS	1	binary	Channel subsystem ID. Only valid if bit 5 of R79CFLG1 is set.
17	11		3		Reserved.

Channel Path Data Section

This section contains one per channel path.

Offsets		Name	Length	Format	Description
0	0	R79CCPID	1	binary	Channel path identification. The range of values is X'00' to X'FF'.
1	1	R79CFG2	1	binary	Channel flags **Bit** **Meaning When Set** **0-1** Reserved **2** Block multiplexor **3** Byte multiplexor **4** ES conversion channel **5** ES connection channel **6** ES connection director attached to channel path **7** CTC adapter.
2	2	R79CFG3	1	binary	Channel flags **Bit** **Meaning When Set** **0** Channel path is shared between logical partitions **1** CPMF (channel path measurement facility) indicator, this entry is not valid **2** Reserved **3** Channel converter 3090 **4** Channel path is DCM managed **5** Channel characteristics changed **6-7** Reserved.
3	3	R79CCPD	1	binary	Channel path description. For an explanation, you can issue the command `D M=CHP`.
4	4	R79CBSY	4	binary	Number of samples in which the channel path was busy, weighted by SRM.
8	8	R79CPBY	4	binary	Channel-path-busy time of the partition since the last interval in units of 128 microseconds.
12	C		1		Reserved.

Offsets		Name	Length	Format	Description
13	D	R79CCPTS	3	binary	Last CPMB (channel path measurement block) entry time stamp in units of 128 microseconds. This value wraps approximately every 35.79 minutes.
16	10	R79CACR	5	EBCDIC	Channel path acronym.
21	15	R79CCMG	1	binary	CPMF Channel measurement group.
22	16	R79CFG4	1	binary	CPMF validation flags - each bit (if on) indicates that the corresponding measurement data is available and valid. This refers to the first five words of the channel measurement data in field R79CCCM. **Bit** **Measurement Data** **0** Channel measurement data — word 1 **1** Channel measurement data — word 2 **2** Channel measurement data — word 3 **3** Channel measurement data — word 4 **4** Channel measurement data — word 5 **5-7** Reserved.
23	17	R79CCPP	1	binary	Channel path parameter.
24	18	R79CCCM	48	*	CPMF Channel measurement data (extended mode). The contents of this field is different for each measurement group, as described in the following tables.
72	48	R79CGEN	1	binary	Channel type generation.
73	49		3		Reserved.

R79CCCM - CPMF Channel Measurement Data (Measurement Group 1):

Offsets		Name	Length	Format	Description
0	0	R79CTUT	4	binary	Total channel path busy time (in units of 128 microseconds).
4	4	R79CPUT	4	binary	LPAR channel path busy time (in units of 128 microseconds).
8	8		40		Reserved.

R79CCCM - CPMF Channel Measurement Data (Measurement Group 2):

Offsets		Name	Length	Format	Description
0	0	R79CMBC	4	binary	Maximum bus cycles per second.
4	4	R79CMCU	4	binary	Maximum channel work units per second.
8	8	R79CMWU	4	binary	Maximum WRITE data units per second.
12	C	R79CMRU	4	binary	Maximum READ data units per second.
16	10	R79CUS	4	binary	Data unit size (in bytes).
20	14	R79CTBC	4	binary	Total bus cycles count.
24	18	R79CTUC	4	binary	Total channel work unit count.
28	1C	R79CPUC	4	binary	LPAR channel work units count.
32	20	R79CTWU	4	binary	Total WRITE data units count.
36	24	R79CPWU	4	binary	LPAR WRITE data units count.
40	28	R79CTRU	4	binary	Total READ data units count.
44	2C	R79CPRU	4	binary	LPAR READ data units count.

R79CCCM - CPMF Channel Measurement Data (Measurement Group 3):

Offsets		Name	Length	Format	Description
0	0	R79CPDU	4	binary	LPAR data unit size (in bytes).
4	4	R79CTDU	4	binary	Total data unit size (in bytes).
8	8	R79CPUM	4	binary	LPAR message sent unit size (in bytes)
12	C	R79CTUM	4	binary	Total message sent unit size (in bytes)
16	10		4		Reserved.
20	14	R79CPMS	4	binary	LPAR count of message sent units.
24	18	R79CTMS	4	binary	Total count of message sent units.
28	1C	R79CPUS	4	binary	LPAR count of unsuccessful attempts to send messages.
32	20	R79CPUB	4	binary	LPAR count of unsuccessful attempts to receive messages due to unavailable buffers.
36	24	R79CTUB	4	binary	Total count of unsuccessful attempts to receive messages due to unavailable buffers.
40	28	R79CPDS	4	binary	LPAR count of data units sent.
44	2C	R79CTDS	4	binary	Total count of data units sent.

Subtype 14 — I/O Queuing Activity

I/O Queuing Control Section

This section contains processors described by triplet SMF79QSS.

Offsets		Name	Length	Format	Description
0	0	R79EGFLG	1	binary	Global input/output queue (IOQ) status **Bit** **Meaning When Set** **0** Data is invalid due to failure of the channel measurement facility **1** Diagnose interface failure **2** ESCON director in the configuration **3** CHSC store secondary queue data not supported **4** DCM is supported by hardware **5** Configuration contains DCM managed channels **6** Measurement of initial command response time supported **7** Reserved.
1	1		7		Reserved.

I/O Queuing Configuration Control Section

This section contains one per logical control unit described by SMF79.

Offsets		Name	Length	Format	Description
0	0	R79EID1	2	EBCDIC	Logical control unit identifier.
2	2	R79ENTR	2	binary	Number of triplets following.
4	4	R79ECPDS	4	binary	Offset to I/O queuing configuration data section (relative to beginning of I/O queuing configuration control section).
8	8	R79ECPDL	2	binary	Length of I/O queuing configuration data section.
10	A	R79ECPDN	2	binary	Number of I/O queuing configuration data sections for the LCU.

I/O Queuing Configuration Data Section

This section contains one per channel path within a logical control unit described by triplet R79ECPDS.

Offsets		Name	Length	Format	Description
0	0	R79ECPID	1	binary	Channel path identifier.
1	1	R79ECPST	1	binary	Channel path status **Bit** **Meaning When Set** **0** Channel path installed **1** Channel path online **2** Channel path varied **3** Channel path offline to all devices of the LCU **4** Channel path connection to devices of the LCU altered by VARY PATH processing **5** Reserved. **6** Channel path is DCM managed. **7** CHPID manipulated, requiring data reset.
2	2	R79ECUN	2	binary	Number of control units attached.
4	4	R79ECU1	2	binary	First control unit identifier.
6	6	R79ECU2	2	binary	Second control unit identifier.
8	8	R79ECU3	2	binary	Third control unit identifier.
10	A	R79ECU4	2	binary	Fourth control unit identifier.
12	C	R79ECUB	4	binary	Number of initial selection attempts that were unsuccessful because the control unit was busy.
16	10	R79EPT	4	binary	Number of I/O operations accepted on this channel path.
20	14		4		Reserved.
24	18	R79EDPBC	4	binary	Number of initial selection attempts that were unsuccessful because the director port was busy.
28	1C	R79ECBT	4	binary	Control unit busy delay time.
32	20	R79ECMR	4	binary	Initial command response time.
36	24	R79ESBS	4	binary	Switch busy count summation; contains the switch busy counts received for all partitions.
40	28		4		Reserved.
44	2C	R79ECPXF	1	binary	Channel path extended flags **Bit** **Meaning When Set** **0** Extended I/O measurement block available **1-7** Reserved.
45	2D	R79ECPAT	1	binary	Path attributes **Value** **Meaning** **0** Not specified for this path. **1** Preferred path. **2** Non-preferred path.
46	2E		2		Reserved.

I/O Queuing Data Section

This section contains one per logical control unit, described by triplet SMF79ASS.

Offsets		Name	Length	Format	Description
0	0	R79EID2	2	EBCDIC	Logical control unit identifier.
2	2	R79EDST	1	binary	Data status **Bit** **Meaning When Set** **0** Reserved **1** No hardware measurements available **2-3** Reserved. **4** LCU contains DCM managed channels. **5** Path attributes are valid. **6-7** Reserved.
3	3		1		Reserved.

Offsets		Name	Length	Format	Description
4	4	R79EQSM	4	binary	Accumulated length of CU-HDR queue.
8	8	R79EQCT	4	binary	Number of entries placed on the CU-HDR queue.
12	C	R79EMCMN	2	binary	Minimum number of DCM managed channels used.
14	E	R79EMCMX	2	binary	Maximum number of DCM managed channels used.
16	10	R79EMCDF	2	binary	Defined number of DCM managed channels.
18	12		2		Reserved.
20	14	R79EPTM	4	binary	Accumulated path taken count for DCM managed channels.
24	18	R79EDPBM	4	binary	Accumulated director port busy count for DCM managed channels.
28	1C	R79ECUBM	4	binary	Accumulated control unit busy count for DCM managed channels.
32	20	R79ECBTM	4	binary	Accumulated control unit busy delay time for DCM managed channels.
36	24	R79ECMRM	4	binary	Accumulated initial command response time for DCM managed channels.
40	28	R79ESBSM	4	binary	Accumulated switch busy count summation for DCM managed channels.
44	2C		8		Reserved.
52	34	R79ECSST	4	binary	Channel subsystem wait time.

Subtype 15 — IRLM Long Lock Detection

IMS Long Lock Data Section

Offsets		Name	Length	Format	Description
0	0	R79FISTN	16	EBCDIC	IRLM lock structure name.
16	10	R79FDLKC	4	binary	Dead lock cycle number.
20	14	R79FETYP	1	EBCDIC	'B'=Blocker / 'W'=Waiter.
21	15		3		Reserved.
24	18	R79FIMSI	8	EBCDIC	IMS subsystem ID.
32	20	R79FPSTN	2	EBCDIC	PST number.
34	22	R79FPSBN	8	EBCDIC	PSB name.
42	2A	R79FRGTY	1	EBCDIC	Region type.
43	2B	R79FRCVT	16	EBCDIC	Recovery token.
59	3B	R79FCTID	8	EBCDIC	CICS task ID (if CICS).
67	43	R79FLHTI	8	binary	Scheduled elapsed time (TOD format).
75	4B	R79FLHCN	4	binary	Max lock held.
79	4F	R79FLKNA	16	EBCDIC	Lock name.
95	5F	R79FTRNM	8	EBCDIC	Transaction name / Job name.
103	67	R79FRSNA	8	EBCDIC	Resource (DB/Area) name.

Record Type 80 (50) — Security Product Processing

Record type 80 is produced during Resource Access Control Facility (RACF) processing and Public Key Infrastructure (PKI) Services processing.

RACF writes a record whenever one of the following events is detected:
- Unauthorized attempts to enter the system

- Authorized accesses or unauthorized attempts to access RACF-protected resources
- Authorized or unauthorized attempts to modify profiles on a RACF data base
- Successful or unsuccessful partner LU verification.

PKI Services writes a record for each CRL that is successfully published to LDAP.

Reference book
For information, see *z/OS Security Server RACF Macros and Interfaces*.

Record Type 81 (51) — RACF Initialization

Record type 81 is written at the completion of the initialization of Resource Access Control Facility (RACF).

Reference book
For more information, see *z/OS Security Server RACF Macros and Interfaces*.

Record Type 82 (52) — CUSP Record

Record type 82 is used to record information about the events and operations of the Cryptographic Unit Support Program (CUSP).

Record type 82 is written to the SMF data set at the completion of each of the following cryptography functions:

- **Initialization**:

  The record is written when the Cryptographic Unit Support Program is initialized, either when cryptography is started or as a part of the key generator utility program.
- **Start**:

  The record is written when a START command is issued for cryptography.
- **Stop**:

  The record is written when a STOP command is issued for cryptography.
- **Modify**:

  The record is written when a MODIFY command is issued for cryptography.
- **Unit check**:

  The record is written when the cryptographic unit is switched offline and then brought online again.
- **Generation of an operational key**:

  If specified in the installation options for cryptography, a record is written after processing each GENKEY macro instruction.
- **Transformation of an operational key**:

  If specified in the installation options for cryptography, a record is written after processing each RETKEY macro instruction.
- **Execution of the key generator utility**:

  The record is written after the execution of the key generator utility program, thus providing a record of changes to the cryptographic key data set (CKDS).

Record type 82 consists of a header section and six possible relocate sections. The header section identifies the RACF user ID and group name or the job and step name of the non-RACF cryptography user, the cryptography function when the record describes, and the return code issued by the function. The header section is 45 bytes long.

The six possible variable relocate sections are:

- Key generator utility, which indicates changes made by the utility to the host system master key, the local keys the cross keys, and the remote keys.
- GENKEY function, which indicates the action taken in response to a GENKEY macro instruction.
- RETKEY function, which indicates the action taken in response to a RETKEY macro instruction.
- Cryptography initialization, which describes the SMF recording options in effect at initialization and the cryptography function and key manager user SVC numbers.
- Installation data, which contains any information supplied by an installation exit routine.
- Cryptographic unit data, which indicates the status of the cryptographic unit.

Note: The number of relocate sections depends on the type of action taken. For instance, the record written when the Cryptographic Unit Support Program stops consists only of the header section. The number of relocate sections is indicated in CRY82CVT (offset 41).

Macros to Symbolically Address Record Type 82: The SMF record mapping macros to symbolically address record type 82 are ICUSMF82 and ICUCRY82. ICUSMF82 maps the fields in record type 82 whose name starts with SMF. ICUCRY82 maps the fields in record type 82 whose name starts with CRY. The macros are supplied on SYS1.MACLIB.

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF82LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	SMF82SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF82FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See “Standard SMF Record Header” on page 13-1 for a detailed description.
5	5	SMF82RTY	1	binary	Record type 82 (X'52').
6	6	SMF82TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.

Offsets		Name	Length	Format	Description
10	A	SMF82DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
14	E	SMF82SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF82LNG	4	binary	Length of record header.
22	16	SMF82TID	2	binary	Security product identifier: X'0002' for Cryptographic Unit Support Program.
24	18	CRY82USR	8	EBCDIC	Job name (for RACF users, user ID).
32	20	CRY82GRP	8	EBCDIC	Step-name (for RACF users, RACF group-name).
40	28	CRY82FLG	1	binary	Flags **Bit** **Meaning When Set** **0** Fields CRY82USR and CRY82GRP contain RACF user ID and group name. (When this bit is off, the fields contain the job name and step name). **1-7** Reserved.
41	29	CRY82VCT	2	binary	Number of variable relocate sections.
43	2B	CRY82FTN	1	binary	Function code **Code** **Meaning** **1** Key generator function **2** GENKEY function **3** RETKEY function **4** Start cryptography **5** Stop cryptography **6** Modify cryptography **7** Hardware check.
44	2C	CRY82RTC	1	binary	Return code issued by function or X'FF' if function terminated abnormally.

Key Generator Utility Relocate Section

Offsets		Name	Length	Format	Description
0	0	CRY82DTP	1	binary	Data type indicator: X'01' for key generator utility.
1	1	CRY82DLN	1	binary	Length of the data that follows.
2	2	CRY82SMK	1	binary	Host system master key flags **Bit** **Meaning When Set** **0** Host system master key was successfully changed (this bit is set even if an error occurs in the key generator). **1-7** Reserved.
3	3	CRY82LMK	1	binary	Local key flags **Bit** **Meaning When Set** **0** At least one local key was updated **1** At least one local key was added **2** At least one local key was deleted from the CKDS **3-7** Reserved.
4	4	CRY82CMK	1	binary	Cross key flags **Bit** **Meaning When Set** **0** At least one pair of cross keys was updated **1** At least one pair of cross keys was added **2** At least one pair of cross keys was deleted from the CKDS **3-7** Reserved.

Offsets		Name	Length	Format	Description
5	5	CRY82RMK	1	binary	Remote key flags **Bit** **Meaning When Set** **0** At least one remote key was updated **1** At least one remote key was added **2** At least one remote key was deleted from the CKDS **3-7** Reserved.

GENKEY Function Relocate Section

Offsets		Name	Length	Format	Description
0	0	CRY82DTP	1	binary	Data type indicator: X'02' for GENKEY function.
1	1	CRY82DLN	1	binary	Length of the data that follows.
2	2	CRY82GFG	1	binary	GENKEY activity flags **Bit** **Meaning When Set** **0** ‘LOCKEY’ parameter was in error **1** ‘LOCKEY2’ parameter was in error **2** ‘REMKEY’ parameter was in error **3** ‘OPKEY’ was generated by the key manager. When bit 3 is off, ‘OPKEY’ was supplied to the key manager. **4** Installation data relocate section was omitted from this record because the data supplied by the installation exit exceeded the length of CRY82ID (64 bytes) **5-7** Reserved.
3	3	CRY82LK1	8	EBCDIC	‘LOCKEY’ key name.
11	B	CRY82LK2	8	EBCDIC	‘LOCKEY2’ key name.
19	13	CRY82REM	8	EBCDIC	‘REMKEY’ key name.

RETKEY Function Relocate Section

Offsets		Name	Length	Format	Description
0	0	CRY82DTP	1	binary	Data type indicator: X'03' for RETKEY function.
1	1	CRY82DLN	1	binary	Length of the data that follows.
2	2	CRY82RFG	1	binary	RETKEY activity flags **Bit** **Meaning When Set** **0** Installation data relocate section was omitted from this record because the data supplied by the installation exit exceeded the length of CRY82ID (64 bytes) **1-7** Reserved.
3	3	CRY82RKN	8	EBCDIC	‘REMKEY’ key name.

Cryptography Initialization Relocate Section

Offsets		Name	Length	Format	Description
0	0	CRY82DTP	1	binary	Data type indicator, X'04' for initialization.
1	1	CRY82DLN	1	binary	Length of the data that follows.
2	2	CRY82SMF	1	binary	SMF option flags **Bit** **Meaning When Set** **0** SMF records not written for GENKEY function **1** SMF records not written for RETKEY function **2-7** Reserved.

Offsets		Name	Length	Format	Description
3	3	CRY82SIM	2	binary	Cryptography function user SVC number in the form X'cccc'.
5	5	CRY82KMG	2	binary	Key manager user SVC number in the form X'cccc'.

Installation Data Relocate Section

Offsets		Name	Length	Format	Description
0	0	CRY82DTP	1	binary	Data type indicator: X'05' for installation data.
1	1	CRY82DLN	1	binary	Length of the data that follows.
2	2	CRY82ID	VAR	EBCDIC	Installation data written by an installation exit routine (the maximum length is 64 bytes).

Cryptographic Unit Data Relocate Section

Offsets		Name	Length	Format	Description
0	0	CRY82DTP	1	binary	Data type indicator: X'06' for Cryptographic unit data.
1	1	CRY82DLN	1	binary	Length of the data that follows.
2	2	CRY82CID	1	EBCDIC	Cryptographic unit address.
5	5	CRY82CST	1	binary	Cryptographic unit status **Bit** **Meaning When Set** **0** Unit is online and available **1** Unit is unavailable **2** Unit check-key verification has failed **3** Unit check-key verification was successful **4-7** Reserved.

Record Type 82 (52) — ICSF Record

Reference books

For information about ICSF events and operations, see *z/OS Cryptographic Services ICSF System Programmer's Guide* and *z/OS Cryptographic Services ICSF Administrator's Guide*.

Record type 82 is used to record information about the events and operations of the Integrated Cryptographic Service Facility (ICSF) program product. Record type 82 is written to the SMF data set at the completion of certain cryptographic functions:

- **Subtype 1** — is written whenever ICSF is started.
- **Subtype 3** — is written whenever there is a change in the number of available processors with the cryptographic feature
- **Subtype 4** — is written whenever ICSF handles error conditions for cryptographic feature failure (CC3, Reason Code 1) or cryptographic tampering (CC3 Reason Code 3).
- **Subtype 5** — is written whenever a change to special security mode is detected.
- **Subtype 6 and 7** — are written whenever a key part is entered via the key entry unit (KEU).
- **Subtype 8** — is written whenever the in-storage copy of the CKDS is refreshed.
- **Subtype 9** — is written whenever the CKDS is updated by a dynamic CKDS update service.
- **Subtype 10** — is written when a clear key part is entered for one of the PKA master keys.

- **Subtype 11** — is written when a clear key part is entered for the DES master key.
- **Subtype 12** — is written for each request and reply from calls to the CSFSPKSC service by TKE.
- **Subtype 13** — is written whenever the PKDS is updated by a dynamic PKDS update service.
- **Subtype 14** — is written when a clear key part is entered for any of the PCI Cryptographic Coprocessor master keys.
- **Subtype 15** — is written whenever a PCI Cryptographic Coprocessor retained key is created or deleted.
- **Subtype 16** — is written for each request and reply from calls to the CSFPCI service by TKE.
- **Subtype 17** — is written periodically to provide some indication of PCI Cryptographic Coprocessor usage.
- **Subtype 18** — is written when a PCI Cryptographic Coprocessor, PCI Cryptographic Accelerator, PCI X Cryptographic Coprocessor, Crypto Express2 Coprocessor, or Crypto Express2 Accelerator comes online or offline.
- **Subtype 19** — is written when a PCI X Cryptographic Coprocessor operation begins or ends.
- **Subtype 20** — is written by ICSF to record processing times for PCIXCCs and CEX2Cs.
- **Subtype 21** — is written when ICSF issues IXCJOIN to join the ICSF sysplex group or issues IXCLEAVE to leave the sysplex group.

Macro to Symbolically Address Record Type 82: The SMF record mapping macro for ICSF type 82 record is CSFSMF82.

The mapping macro, CSFSMF82, resides in SYS1.MACLIB.

Record Environment

The following conditions exist for the generation of each of the subtypes of this record:

Macro

Subtype	Macro
1	SMFWTM (record exit: IEFU83)
3,4,5,6,7,8	SMFEWTM,BRANCH=YES,MODE=XMEM (record exit: IEFU85)

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF82LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	SMF82SEG	2	binary	Segment descriptor (see record length field).

Offsets		Name	Length	Format	Description
4	4	SMF82FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See "Standard SMF Record Header" on page 13-1 for a detailed description.
5	5	SMF82RTY	1	binary	Record type 82 (X'52').
6	6	SMF82TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.
10	A	SMF82DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
14	E	SMF82SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF82SSI	4	EBCDIC	Subsystem identification.
22	16	SMF82STY	2	binary	Record subtype.

Subtype 1

Initialization Section

Offsets		Name	Length	Format	Description
0	0	SMF82VES	4	binary	Cryptographic communication vector table extension (CCVE) status bits **Bit** **Meaning When Set** **0** Special security mode allowed **1** Special security mode enabled **2** Reserved **3** Key authentication **4–5** Reserved **6** RACF checking of supervisor-state callers **7-14** Reserved **15** CKT authentication **16–31** Reserved.
4	4	SMF82VTS	1	binary	Cryptographic communication vector table (CCVT) status bits **Bit** **Meaning When Set** **0-3** Reserved **4** Compatible with CUSP and PCF **5-7** Reserved.
5	5	SMF82IDO	1	binary	Current crypto domain index.
6	6		2		Reserved.
8	8	SMF82ITE	4	binary	Number of trace entries.
12	C	SMF82CKD	44	EBCDIC	Name of the cryptographic key data set (CKDS) that was read into storage.
56	38	SMF82IML	4	binary	Maximum length for data.
60	3C	SMF82USR	8	EBCDIC	USERPARM specifies installation use in the installation options data set.
68	44	SMF82PKD	44	EBCDIC	PKDS name.

Subtype 3

Status Change Section

Offsets		Name	Length	Format	Description
0	0	SMF82SNS	4	binary	Number of sections following.
4	4	SMF82SPR	4	binary	Processor number.
8	8	SMF82KSU	4	binary	Key storage unit (KSU) number.
12	C	SMF82SDX	4	binary	Current crypto domain index.
16	10	SMF82VER	4	binary	Current master key version.
20	14	SMF82SSW	4	binary	Zero, if no error condition exists with the processor. Otherwise, the ICSF status word.
24	18	SMF82STI	4	binary	**Bit** **Meaning When Set** **0** Current master key verification pattern valid **1** New master key authentication pattern valid **2** New master key verification pattern valid **3** Old master key verification pattern valid **4-31** Reserved.
28	1C	SMF82CVP	8	EBCDIC	Current master key verification pattern.
36	24	SMF82NAP	8	EBCDIC	New master key authentication pattern.
44	2C	SMF82NVP	8	EBCDIC	New master key verification pattern.
52	34	SMF82OVP	8	EBCDIC	Old master key verification pattern.

Subtype 4

Condition Code Three Section

Offsets		Name	Length	Format	Description
0	0	SMF823SW	4	binary	Status word from CC3.
4	4	SMF823PR	1	binary	Processor number.
5	5	SMF823DX	1	binary	Current crypto domain index.
6	6		2		Reserved.

Subtype 5

Special Security Mode Section

Offsets		Name	Length	Format	Description
0	0	SMF82SSB	8	binary	Special security mode (SSM) bits **Bit** **Meaning When Set** **0** SSM mode is enabled **1-63** Reserved.

Subtype 6

Master Key Part Section

Offsets		Name	Length	Format	Description
0	0	SMF82MKB	4	binary	Master key part (MKPART) bits **Bit** **Meaning When Set** **0** New master key verification pattern valid **1** Old master key verification pattern valid **2-31** Reserved.
4	4	SMF82NMV	8	EBCDIC	New master key verification pattern.
12	C	SMF82OMV	8	EBCDIC	Verification pattern for the key part.
20	14	SMF82MKS	1	binary	KSU number.
21	15	SMF82MDX	1	binary	Current crypto domain index.
22	16		2		Reserved.

Subtype 7

KEU Key Part Entry Section

Offsets		Name	Length	Format	Description
0	0	SMF82KPB	4	binary	Key part (KPART) bits **Bit** **Meaning When Set** **0** Key part verification pattern valid **1-31** Reserved.
4	4	SMF82KV	8	EBCDIC	Key part verification pattern.
12	C	SMF82KKS	1	binary	KSU number.
13	D	SMF82KDX	1	binary	Current crypto domain index.
14	E		2		Reserved.
16	10	SMF82KCK	44	EBCDIC	Name of the CKDS containing the key part.
60	3C	SMF82KCL	72	EBCDIC	CKDS entry being modified.

Subtype 8

Cryptographic Key Data Set Refresh Section

Offsets		Name	Length	Format	Description
0	0	SMF82ROC	44	EBCDIC	Name of the CKDS being replaced.
44	2C	SMF82RNC	44	EBCDIC	Name of the CKDS to replace the current CKDS.

Subtype 9

Dynamic CKDS Update

Offsets		Name	Length	Format	Description
0	0	SMF82UCB	4	binary	Update CKDS bits **Bit** **Meaning When Set** **0** CKDS record added **1** CKDS record changes **2** CKDS record deleted **3-31** Reserved.

Offsets		Name	Length	Format	Description
4	4	SMF82UCN	44	EBCDIC	CKDS name.
48	30	SMF82UCL	72	EBCDIC	CKDS entry being modified.

Subtype 10

PKA Key Part Entry

Offsets		Name	Length	Format	Description
0	0	SMF82PKB	4	binary	PKA part bits **Bit** **Meaning When Set** **0** Key management master key processed **1** Signature master key processed **2** Key part hash pattern valid **3** Master key hash pattern valid **4-31** Reserved.
4	4	SMF82PHP	16	EBCDIC	Master key hash pattern.
20	14	SMF82KPH	16	EBCDIC	Key part hash pattern.
36	24	SMF82PKS	1	binary	KSU number.
37	25	SMF82PKX	1	binary	Current crypto domain index.
38	26		2		Reserved.

Subtype 11

Clear New Master Key Part Entry

Offsets		Name	Length	Format	Description
0	0	SMF82CMB	4	binary	Clear new master key bits **Bit** **Meaning When Set** **0** Clear new master key hash pattern valid **1** Clear new master key verification pattern valid **2** Clear new key part hash pattern valid **3** Clear new key part verification pattern valid.
4	4	SMF82CHP	16	EBCDIC	Clear new master key hash pattern.
20	14	SMF82CNP	8	EBCDIC	Clear new master key verification pattern.
28	1C	SMF82CPH	16	EBCDIC	Key part hash pattern.
44	2C	SMF82CPV	8	EBCDIC	Key part verification pattern.
52	34	SMF82CKS	1	binary	KSU number.
53	35	SMF82CDX	1	binary	Current crypto domain index.
54	36		2		Reserved.

Subtype 12

PKSC Commands

Offsets		Name	Length	Format	Description
0	0	SMF82PSQ	1024	EBCDIC	Request.
1024	400	SMF82PSP	1024	EBCDIC	Response.

Subtype 13

Dynamic PKDS Update

Offsets		Name	Length	Format	Description
0	0	SMF_PKDS_BITS	4	binary	Update PKDS bits **Bit** **Meaning When Set** **0** PKDS record added **1** PKDS record changed **2** PKDS record deleted **3-31** Reserved.
4	4	SMF_PKDS_NAME	44	EBCDIC	PKDS name.
48	30	SMF_PKDS_KEY_LABEL	72	EBCDIC	PKDS entry being modified.

Subtype 14

PCI Cryptographic Coprocessor Clear Master Key Entry

Offsets		Name	Length	Format	Description
0	0	SMF82AAB	4	binary	Flag bytes **Bit** **Meaning When Set** **0** Symmetric-Key NMK verification pattern is valid **1** Asymmetric-Key NMK verification pattern is valid **2** Symmetric-Key Key part verification pattern is valid **3** Asymmetric-Key Key part verification pattern is valid. **4** Coprocessor is *not* a PCI Cryptographic Coprocessor. **5** Coprocessor is a PCI X Cryptographic Coprocessor.
4	4	SMF82ANV	16	EBCDIC	New master key register verification pattern.
20	14	SMF82AKV	16	EBCDIC	Key part verification pattern.
36	24	SMF82APN	1	binary	PCI Cryptographic Processor number.
37	25	SMF82ASN	8	EBCDIC	PCI Cryptographic Processor serial number.
45	2D	SMF82ADM	1	binary	PCI Cryptographic Coprocessor domain.
46	2E		2		Reserved.

Subtype 15

PCI Cryptographic Coprocessor Retained Key Create/Delete

Offsets		Name	Length	Format	Description
0	0	SMF82RKF	4	binary	Flag bytes **Bit** **Meaning When Set** **0** Retained key created **1** Retained key deleted on coprocessor. **2** Retained key deleted from PKDS. **3** Reserved. **4** Coprocessor is *not* a PCI Cryptographic Coprocessor. **5** Coprocessor is a PCI X Cryptographic Coprocessor.
4	4	SMF82RKN	64	EBCDIC	Label of Retained private key.
68	44	SMF82RKP	1	binary	PCI Cryptographic Coprocessor number.

Offsets		Name	Length	Format	Description
69	45	SMF82RKS	8	EBCDIC	PCI Cryptographic Coprocessor serial number.
77	4D	SMF82RDM	1	binary	PCI Cryptographic Coprocessor domain.
78	4E		2		Reserved.

Subtype 16

PCI Cryptographic Coprocessor TKE

Offsets		Name	Length	Format	Description
0	0	SMF82PFL	4	binary	Flag bytes **Bit** **Meaning When Set** **0** Request command **1** Reply response. **2 - 3** Reserved. **4** Coprocessor is *not* a PCI Cryptographic Coprocessor. **5** Coprocessor is a PCI X Cryptographic Coprocessor.
4	4	SMF82PPN	1	binary	PCI Cryptographic Coprocessor number.
5	5	SMF82PSN	8	EBCDIC	PCI Cryptographic Coprocessor serial number.
13	D	SMF82PDM	1	binary	PCI Cryptographic Coprocessor domain.
14	E		2		Reserved.
16	10	SMF82PBL	4	binary	Parameter block length, ″xxx″.
20	14	SMF82PDL	4	binary	Parameter data block length, ″yyy″.
24	18	SMF82PBK			Parameter block of length ″xxx″ followed by parameter data block of length ″yyy″.

Subtype 17

PCI Cryptographic Coprocessor Timing

Offsets		Name	Length	Format	Description
0	0	SMF82CTN	8	EBCDIC	Time just before the PCI Cryptographic Coprocessor operation begins.
8	8	SMF82CTD	8	EBCDIC	Time just after PCI Cryptographic Coprocessor operation ends.
16	10	SMF82CTW	8	EBCDIC	Time just after results have been communicated to caller address space.
20	14	SMF82CTQ	4	binary	Number of processes waiting to submit work to the same PCI Cryptographic Coprocessor and domain, using the same reference number.
24	18	SMF82CTF	2	EBCDIC	Function code of service.
26	1A	SMF82CTX	1	binary	PCI Cryptographic Coprocessor number.
27	1B	SMF82CTS	8	EBCDIC	PCI Cryptographic Coprocessor serial number.
35	23	SMF82CTM	1	binary	PCI Cryptographic Coprocessor domain.
36	24	SMF82CTR	1	binary	PCI Cryptographic Coprocessor reference number.
37	25		3		Reserved.

Subtype 18

Cryptographic Coprocessor Configuration

Offsets		Name	Length	Format	Description
0	0	SMF82CGB	4	binary	Flag bytes **Bit** **Meaning When Set** **0** A Cryptographic Coprocessor has been brought online. **1** A Cryptographic Coprocessor has been taken offline. **2 - 7** Reserved. **8** Coprocessor is *not* a PCI Cryptographic Coprocessor. **9** Coprocessor is a PCI X Cryptographic Coprocessor. **10** Coprocessor is a Crypto Express2 Coprocessor. **11** Coprocessor is a Crypto Express2 Accelator. **12–31** Reserved.
4	4	SMF82CGX	1	binary	Cryptographic Coprocessor number.
5	5	SMF82CGS	8	EBCDIC	Cryptographic Coprocessor serial number.
13	D		3		Reserved.

Subtype 19

PCI X Cryptographic Coprocessor Timing

Offsets		Name	Length	Format	Description
0	0	SMF82XTN	8	EBCDIC	Time just before the PCI X Cryptographic Coprocessor operation begins.
8	8	SMF82XTD	8	EBCDIC	Time just after PCI X Cryptographic Coprocessor operation ends.
16	10	SMF82XTW	8	EBCDIC	Time just after results have been communicated to caller address space.
20	14	SMF82XTQ	4	binary	Number of processes waiting to submit work to the same PCI X Cryptographic Coprocessor and domain, using the same reference number.
24	18	SMF82XTF	2	EBCDIC	Function code of service.
26	1A	SMF82XTX	1	binary	PCI X Cryptographic Coprocessor number.
27	1B	SMF82XTS	8	EBCDIC	PCI X Cryptographic Coprocessor serial number.
35	23	SMF82XTM	1	binary	PCI X Cryptographic Coprocessor domain.
36	24	SMF82XTR	1	binary	PCI X Cryptographic Coprocessor reference number.
37	25		3		Reserved.

Subtype 20

Cryptographic Coprocessor Processing Times

Offsets		Name	Length	Format	Description
0	0	SMF82TFL	4	binary	Flag bytes **Bit** **Meaning When Set** **0** Coprocessor is a PCI X Cryptographic Coprocessor. **1** Coprocessor is a Crypto Express2 Coprocessor. **2** Coprocessor is a Crypto Express2 Accelator. **3–31** Reserved.
4	4	SMF82TNQ	8	EBCDIC	Coprocessor time before NQAP.
12	C	SMF82TDQ	8	EBCDIC	Coprocessor time after DQAP.
20	14	SMF82TWT	8	EBCDIC	Coprocessor time after WAIT.
28	1C	SMF82TQU	4	binary	Coprocessor queue length.
32	20	SMF82TSF	2	EBCDIC	Coprocessor sub function code.
34	22	SMF82TIX	1	binary	Coprocessor index.
35	23	SMF82TSN	8	EBCDIC	Coprocessor serial number.
43	2B	SMF82TDM	1	binary	Domain.
44	2C	SMF82TRN	1	binary	Reference number.
45	2D		3		Reserved.

Subtype 21

ICSF Sysplex Group Change Section

Offsets		Name	Length	Format	Description
0	0	SMF82SXG	8	EBCDIC	Name of ICSF Sysplex group.
8	8	SMF82SXM	8	EBCDIC	Name of sysplex member.
16	F	SMF82SXA	1	binary	ICSF Sysplex member status flags **Bit** **Meaning When Set** **0** Member joined the ICSF sysplex group. **1** Member left the ICSF sysplex group. **2–7** Reserved.
17	11	SMF82SXR	1	binary	ICSF Sysplex member conditions of status flags **Bit** **Meaning When Set** **0** Member joined or left the ICSF sysplex due to normal initialization/termination processing **1** Member left the ICSF sysplex due to error **2–7** Reserved.
18	12		2		Reserved.
20	14	SMF82SXT	8	EBCDIC	Time of ICSF sysplex join/leave index.
28	1C	SMF82SXC	44	EBCDIC	Name of active CKDS.

Record Type 82 (52) — PCF Record

Record type 82 is used to record information about the events and operations of the Programmed Cryptographic Facility (PCF).

Record type 82 is written to the SMF data set at the completion of each of the following cryptography functions:

- **Initialization**:

  The record is written when the Programmed Cryptographic Facility is initialized, either when cryptography is started or as a part of the key generator utility program.
- **Start**:

  The record is written when a START command is issued for cryptography.
- **Stop**:

  The record is written when a STOP command is issued for cryptography.
- **Generation of an operational key**:

  If specified in the initialization options for cryptography, a record is written after processing each GENKEY macro instruction.
- **Transformation of an operational key**:

  If specified in the initialization options for cryptography, a record is written after processing each RETKEY macro instruction.
- **Execution of the key generator utility**:

  The record is written after the execution of the key generator utility program, thus providing a record of changes to the cryptographic key data set (CKDS).

Record type 82 consists of a header section and five possible relocate sections. The header section identifies the RACF user ID and group name or the job and step name of the non-RACF cryptography user, the cryptography function when the record describes, and the return code issued by the function. The header section is 45 bytes long.

The five possible variable relocate sections are:

- Key generator utility, which indicates changes made by the utility to the host system master key, the local keys, the cross keys, and the remote keys.
- GENKEY function, which indicates the action taken in response to a GENKEY macro instruction.
- RETKEY function, which indicates the action taken in response to a RETKEY macro instruction.
- Cryptography initialization, which describes the SMF recording options in effect at initialization and the cryptography function and key manager user SVC numbers.
- Installation data, which contains any information supplied by an installation exit routine.

Note: The number of relocate sections depends on the type of action taken. For instance, the record written when the Programmed Cryptographic Facility stops consists only of the header section. When the Programmed Cryptographic Facility has previously been initialized within the same IPL, the record written when cryptography starts consists of only the header section. The number of relocate sections is indicated in CRY82VCT (offset 37).

Macros to Symbolically Address Record Type 82: The SMF record mapping macros to symbolically address record type 82 are ICTSMF82 and ICTCRY82. ICTSMF82 maps the fields in record type 82 whose name starts with SMF. ICTCRY82 maps the fields in record type 82 whose name starts with CRY. The macros are supplied on SYS1.MACLIB.

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF82LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	SMF82SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF82FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See “Standard SMF Record Header” on page 13-1 for a detailed description.
5	5	SMF82RTY	1	binary	Record type 82 (X'52').
6	6	SMF82TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.
10	A	SMF82DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
14	E	SMF82SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF82LNG	4	binary	Length of record header.
22	16	SMF82TID	2	binary	Security product identifier: X'0001' for Programmed Cryptographic Facility.
24	18	CRY82USR	8	EBCDIC	Job name (for RACF users, user ID).
32	20	CRY82GRP	8	EBCDIC	Step-name (for RACF users, RACF group-name).
40	28	CRY82FLG	1	binary	Flags **Bit** **Meaning When Set** **0** Fields CRY82USR and CRY82GRP contain RACF user ID and group name. (When this bit is off, the fields contain the job name and step name). **1-7** Reserved.
41	29	CRY82VCT	2	binary	Number of variable relocate sections.
43	2B	CRY82FTN	1	binary	Function code **Code** **Meaning** **1** Key generator function **2** GENKEY function **3** RETKEY function **4** Start cryptography **5** Stop cryptography.
44	2C	CRY82RTC	1	binary	Return code issued by function or X'FF' if function terminated abnormally.

Key Generator Utility Relocate Section

Offsets		Name	Length	Format	Description
0	0	CRY82DTP	1	binary	Data type indicator: X'01' for key generator utility.
1	1	CRY82DLN	1	binary	Length of the data that follows.

Offsets		Name	Length	Format	Description
2	2	CRY82SMK	1	binary	Host system master key flags **Bit** **Meaning When Set** **0** Host system master key was successfully changed **1-7** Reserved.
3	3	CRY82LMK	1	binary	Local key flags **Bit** **Meaning When Set** **0** At least one local key was updated **1** At least once local key was added **2** At least one local key was deleted from the CKDS **3-7** Reserved.
4	4	CRY82CMK	1	binary	Cross key flags **Bit** **Meaning When Set** **0** At least one pair of cross keys was updated **1** At least one pair of cross keys was added **2** At least one pair of cross keys was deleted from the CKDS **3-7** Reserved.
5	5	CRY82RMK	1	binary	Remote key flags **Bit** **Meaning When Set** **0** At least one remote key was updated **1** At least one remote key was added **2** At least one remote key was deleted from the CKDS **3-7** Reserved.

GENKEY Function Relocate Section

Offsets		Name	Length	Format	Description
0	0	CRY82DTP	1	binary	Data type indicator: X'02' for GENKEY function.
1	1	CRY82DLN	1	binary	Length of the data that follows.
2	2	CRY82GFG	1	binary	GENKEY activity flags **Bit** **Meaning When Set** **0** ‘LOCKEY’ parameter was in error **1** ‘LOCKEY2’ parameter was in error **2** ‘REMKEY’ parameter was in error **3** ‘OPKEY’ was generated by the key manager. When bit 3 is off, ‘OPKEY’ was supplied to the key manager. **4** Installation data relocate section was omitted from this record because the data supplied by the installation exit exceeded the length of CRY82ID (64 bytes). **5-7** Reserved.
3	3	CRY82LK1	8	EBCDIC	‘LOCKEY’ key name.
11	B	CRY82LK2	8	EBCDIC	‘LOCKEY2’ key name.
19	13	CRY82REM	8	EBCDIC	‘REMKEY’ key name.

RETKEY Function Relocate Section

Offsets		Name	Length	Format	Description
0	0	CRY82DTP	1	binary	Data type indicator: X'03' for RETKEY function.
1	1	CRY82DLN	1	binary	Length of the data that follows.

Offsets		Name	Length	Format	Description
2	2	CRY82RFG	1	binary	RETKEY activity flags **Bit** **Meaning When Set** **0** Installation data relocate section was omitted from this record because the data supplied by the installation exit exceeded the length of CRY82ID (64 bytes) **1-7** Reserved.
3	3	CRY82RKN	8	EBCDIC	‘REMKEY’ key name.

Cryptography Initialization Relocate Section

Offsets		Name	Length	Format	Description
0	0	CRY82DTP	1	binary	Data type indicator, X'04' for initialization.
1	1	CRY82DLN	1	binary	Length of the data that follows.
2	2	CRY82SMF	1	binary	SMF option flags **Bit** **Meaning When Set** **0** SMF records not written for GENKEY function **1** SMF records not written for RETKEY function **2-7** Reserved.
3	3	CRY82SIM	2	binary	Cryptography function user SVC number in the form X'cccc'.
5	5	CRY82KMG	2	binary	Key manager user SVC number in the form X'cccc'.

Installation Data Relocate Section

Offsets		Name	Length	Format	Description
0	0	CRY82DTP	1	binary	Data type indicator: X'05' for installation data.
1	1	CRY82DLN	1	binary	Length of the data that follows.
2	2	CRY82ID	VAR	EBCDIC	Installation data written by an installation exit routine (the maximum length is 64 bytes).

Record Type 83 (53) — RACF Audit Record For Data Sets

Record type 83 is a Resource Access Control Facility (RACF) processing record. Subtype 1 is written in order to audit data sets that are affected by a RACF command (ADDSD, ALTDSD, and DELDSD) that caused the security label associated with a data set to be changed.

Reference book

For more information, see *z/OS Security Server RACF Macros and Interfaces*.

Record Type 84 (54) — JES3 Monitoring Facility (JMF) Data

Reference book

For additional information on producing and using this record, a description of JMF, and how multi-segmented subtypes can be handled, see *z/OS JES3 Diagnosis*.

Record type 84 contains JES3 information collected by the JES3 monitoring facility (JMF). When JMF is called with the SMF option selected, then these records will be generated for each JMF interval. SMF records can be produced on both the global and local processors.

Each record type 84 contains a common section (with header, product, and general information portions) and a subtype section unique for each record. Subtypes 1, 2, 5, and 6 can be multi-segmented due to the large amount of information that is produced. The subtypes are:
- Subtype 1 — FCT (Function Control Table) Analysis
- Subtype 2 — FCT Summary and Highlight
- Subtype 3 — Spool Data Management
- Subtype 4 — Resqueue Cellpool, JCT and Control Block Utilization
- Subtype 5 — Job Analysis
- Subtype 6 — JES3 Hot Spot Analysis
- Subtype 7 — JES3 Internal Reader DSP Analysis
- Subtype 8 — JES3 SSI Response Time Analysis
- Subtype 9 — JES3 SSI Destination Queue Analysis
- Subtype 10 — JES3 Workload Manager Analysis

Macro to Symbolically Address Record Type 84: The mapping macro for SMF type 84 record is IAZSMF84. IAZSMF84 resides in SYS1.MACLIB.

Record Environment

The following conditions exist for the generation of this record:

Macro	SMFEWTM, BRANCH=NO (record exit: IEFU83)
Storage Residency	31-bit

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF84LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1Standard SMF Record Header for a detailed description.
2	2	SMF84SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF84FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See “Standard SMF Record Header” on page 13-1 for a detailed description.
5	5	SMF84RTY	1	binary	Record type 84 (X'54').
6	6	SMF84TME	4	packed	Time since midnight, in hundredths of a second, that the record was written to the SMF buffer.
10	A	SMF84DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
14	E	SMF84SID	4	EBCDIC	System identification (from the SID parameter).

Offsets		Name	Length	Format	Description
18	12	SMF84SBS	2	binary	Subsystem identification — (X'0005' signifies JES3).
20	14	SMF84SGN	2	binary	Segment number.
22	16	SMF84FL1	1	binary	Flag byte **Value** **Meaning** **X'80'** Indicates last SMF segment.
23	17	SMF84VER	1		SMF 84 version number **Value** **Meaning** **X'03'** Indicates OS/390 JES3 2.4.0 level
24	18	SMF84STY	2	binary	Record subtype.
26	1A	SMF84TRN	2	binary	Number of triplets in this record. A triplet is a set of offset/length/number values that defines a section of the record.
28	1C	SMF84PRS	4	binary	Offset to JMF product section.
32	20	SMF84PRL	2	binary	Length of JMF product section.
34	22	SMF84PRN	2	binary	Number of JMF product sections.
36	24	SMF84GNS	4	binary	Offset to JMF general section.
40	28	SMF84GNL	2	binary	Length of JMF general section.
42	2A	SMF84GNN	2	binary	Number of JMF general sections.
44	2C	SMF84J1O	4	binary	Offset to JMF data section.
48	30	SMF84J1L	2	binary	Length of JMF data section.
50	32	SMF84J1N	2	binary	Number of JMF data sections.

Product Section

This section contains information about JES3 and JMF.

Offsets		Name	Length	Format	Description
0	0	R84MFVER	2	binary	JMF version number.
2	2	R84PRDNM	8	EBCDIC	Product name (‘SC1BA’).
10	A	R84INTST	4	packed	Time of day that the JMF measurement interval started, in the form *hhmmsstF*.
14	E	R84SDATE	4	packed	Date when the JMF measurement interval started, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
18	12	R84INTEN	4	packed	Time that the JMF measurement interval ended, in the form *hhmmsstF*.
22	16	R84EDATE	4	packed	Date when the JMF measurement interval ended, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
26	1A	R84INTER	4	packed	Duration of the JMF measurement interval, in seconds.
30	1E	R84MFCYC	4	packed	Sampling cycle length, in the form 00*ssttF*, (where *F* is the sign).
34	22		2		Reserved.
36	24	R84SAMPL	4	binary	Number of JMF samples.
40	28	R84MFCMD	80	EBCDIC	*CALL, JMF command (first 80 characters).
120	78	R84MVSRL	8	EBCDIC	MVS software level (consists of an acronym and the version, release, and modification level numbers).
128	80	R84JESRL	8	EBCDIC	JES3 release level (consists of an acronym and the version, release, and modification level numbers).
136	88	R84CPUM	4	EBCDIC	CPU model number.
140	8C	R84RSTO	4	binary	Central storage size in kilobytes.

Offsets		Name	Length	Format	Description
144	90	R84CPUNM	8	EBCDIC	CPU serial number.
152	98	R84CPUID	4	EBCDIC	JES3 CPU ID.
156	9C	R84MPNAM	8	EBCDIC	Main processor name.
164	A4	R84J3FLG	1		JES3 status indicator **Bit** **Meaning When Set** **X'80'** JES3 local **X'40'** JES3 is in the APG priority level **X'20'** JES3 non-swappable.
165	A5		1		Reserved.
166	A6	R84JPRTY	2	binary	JES3 dispatching priority.
168	A8	R84JMFMN	4	binary	Minimum JMF overhead time, in microseconds.
172	AC	R84JMFMX	4	binary	Maximum JMF overhead time, in microseconds.
176	B0	R84JMFAV	4	binary	Average JMF overhead time, in microseconds. The percentage of JMF interval time is equal to (average JMF overhead time * number of JMF samples) / (JMF interval time, in microseconds * 100).
180	B4	R84MVSMN	4	binary	Minimum MVS overhead time, in microseconds.
184	B8	R84MVSMX	4	binary	Maximum MVS overhead time, in microseconds.
188	BC	R84MVSAV	4	binary	Average MVS overhead time, in microseconds. The percentage of JMF interval time is equal to (average MVS overhead time * number of JMF samples) / (JMF interval time in microseconds * 100).

General Section

This section contains information about primary (nucleus) and auxiliary task activity.

Offsets		Name	Length	Format	Description
0	0	R84CPUSC	4	binary	CPU busy sample count.
4	4	R84NPA	4	binary	JES3 nucleus task posted-active count.
8	8	R84APA	4	binary	JES3 auxiliary task posted-active count.
12	C	R84NPNA	4	binary	JES3 nucleus task posted-not active count.
16	10	R84APNA	4	binary	JES3 auxiliary task posted-not active count.
20	14	R84NNP	4	binary	JES3 nucleus task not-posted count.
24	18	R84ANP	4	binary	JES3 auxiliary task not-posted count.
28	1C	R84NNW	4	binary	JES3 nucleus task non-standard wait count.
32	20	R84ANW	4	binary	JES3 auxiliary task non-standard wait count.
36	24	R84NSLLR	4	binary	JES3 nucleus suspended local lock request count.
40	28	R84ASLLR	4	binary	JES3 auxiliary task suspended local lock request count.
44	2C	R84NSO	4	binary	JES3 nucleus task suspended-other count.
48	30	R84ASO	4	binary	JES3 auxiliary task suspended-other count.

Subtype 1 — FCT Analysis

This subtype consists of a header followed by three sections:

1. JES3 general information section. Contains general information about JES3 program activity including paging, working set sizes, and task information.
2. IRB header section. Contains general information about interruption request blocks (IRBs).

3. FCT and AWAIT analysis section. Contains information about each JES3 function control table (FCT) entry found during the JMF interval. Contains information about each FCT AWAIT entry found during the JMF interval.

Subtype Header Section

Offsets		Name	Length	Format	Description
0	0	R84JES3O	4	binary	Offset to JES3 general information section.
4	4	R84IRBSC	4	binary	Offset to the IRB section.
8	8	R84FCTO	4	binary	Offset to FCT and AWAIT analysis section.
12	C	R84FFLG1	1	binary	Miscellaneous flag **Bit** **Meaning When Set** **X'80'** Record contains JES3 general information section **X'40'** Record contains FCT and AWAIT analysis section **X'20'** Record contains IRB section.
13	D		3		Reserved.

General Information Section

Offsets		Name	Length	Format	Description
0	0	R84FOE	4	binary	Number of fixed pages in thousands.
4	4	R84FOESZ	4	binary	Total size of all fixed pages in thousands.
8	8	R84SLOT	4	binary	Auxiliary slot count.
12	C	R84SLOTS	4	binary	Total size of all auxiliary slots, in thousands.
16	10	R84JPIN	4	binary	JES3 page-ins during JMF monitoring.
20	14	R84JPOUT	4	binary	JES3 page-outs during JMF monitoring.
24	18	R84JPREC	4	binary	JES3 page reclaims during JMF monitoring.
28	1C	R84JPGCT	4	binary	JES3 paging count during JMF monitoring.
32	20	R84SPGCT	4	binary	System paging count (non-swappable, non-VIO) during JMF monitoring.
JES3 working set information:					
36	24	R84WSPLO	4	binary	Low range of working set plot scale, in thousands.
40	28	R84WSPHI	4	binary	High range of working set plot scale, in thousands.
44	2C	R84WSINC	4	binary	Increment for working set plot, in thousands.
48	30	R84WSMIN	4	binary	Minimal working set size, in thousands.
52	34	R84WSMAX	4	binary	Maximum working set size, in thousands.
56	38	R84WSAVG	4	binary	Average working set size, in thousands.
60	3C	R84JMFSZ	4	binary	JMF size included in working set sizes, in thousands.
64	40	R84WSPTN	4	binary	Total number of working set plot counter entries.
68	44	R84WSPTO	4	binary	Offset of first working set plot counter entry.
JES3 subtasks information:					
72	48	R84ONES	4	binary	Number of times there was a single JES3 subtask posted.
76	4C	R84TWOS	4	binary	Number of times there were two JES3 subtasks posted concurrently.
80	50	R84THREE	4	binary	Number of times there were three JES3 subtasks posted concurrently.
84	54	R84FOURS	4	binary	Number of times there were four or more JES3 subtasks posted concurrently.
88	58	R84SUBNM	4	binary	Total number of JES3 subtask entries.
92	5C	R84SUBOF	4	binary	Offset to the first JES3 subtask entry.

Offsets		Name	Length	Format	Description
96	60	R84NNFCT	4	binary	Number of times JES3 nucleus task posted (but no FCT posted).
100	64	R84ANFCT	4	binary	Number of times JES3 auxiliary task posted (but no FCT posted).

JES3 Subtask Entry

This section contains one for each subtask.

Offsets		Name	Length	Format	Description
0	0	R84SSEQN	4	binary	Subtask sequence number.
4	4	R84SNAME	8	EBCDIC	Subtask name.
12	C	R84SPPC	4	binary	Number of times subtask posted.

Working Set Plot Counter Entry

This section contains one for each working set plot counter.

Offsets		Name	Length	Format	Description
0	0	R84WSPTS	4	binary	Working set plot scale.
4	4	R84WSPTC	4	binary	Number of working set sizes for above mentioned scale.

Interruption Request Block Header Section

Offsets		Name	Length	Format	Description
0	0	R84NIRBO	4	binary	Offset of the first nucleus task IRB table entry.
4	4	R84NIRBC	4	binary	Total number of JES3 IRBs in JES3 nucleus task.
8	8	R84NTOTA	4	binary	Total number of active nucleus task IRB entries.
12	C	R84NTOTS	4	binary	Total number of suspended nucleus task IRB entries.
16	10	R84NTOTO	4	binary	Total number of IN-OS-WAIT IRB entries in JES3 nucleus task.
20	14	R84AIRBO	4	binary	Offset of the first auxiliary task IRB table entry.
24	18	R84AIRBC	4	binary	Total number of JES3 IRBs in JES3 auxiliary task.
28	1C	R84ATOTA	4	binary	Total number of active auxiliary task IRB entries.
32	20	R84ATOTS	4	binary	Total number of suspended auxiliary task IRB entries.
36	24	R84ATOTO	4	binary	Total number of IN-OS-WAIT IRB entries in JES3 auxiliary task.
40	28	R84IRBFG	1	binary	Miscellaneous flag for the IRB section **Bit** **Meaning** **X'40'** Nucleus task IRB table has overflowed **X'80'** Auxiliary task IRB table has overflowed.
41	29		3		Reserved.

IRB Table Entry

This section contains one for each nucleus task IRB and auxiliary task IRB.

Offsets		Name	Length	Format	Description
0	0	R84IRBNM	8	EBCDIC	Name or address of the JES3 IRB.
8	8	R84IRBAC	4	binary	Number of times for active JES3 IRB.
12	C	R84IRBSU	4	binary	Number of times for suspended JES3 IRB.
16	10	R84IRBWT	4	binary	Number of times for IN-OS-WAIT JES3 IRB.

FCT and AWAIT Analysis Section

There is a header section for the FCT and AWAIT analysis section of subtype 1. After this header, there is an entry for each FCT. Each FCT is immediately followed by a series of entries, one for each type of AWAIT it incurred.

AWAIT entries have two formats. The format for the first part is the same for every AWAIT entry. The format for the second part depends on what type of AWAIT it is (based on the value of R84AWFL2).

Offsets		Name	Length	Format	Description
0	0	R84FAWLN	4	binary	Length of the FCT and AWAIT section.
4	4	R84NMFMA	4	binary	Number of times multi-function monitor active in JES3 nucleus task.
8	8	R84NMFMS	4	binary	Number of times multi-function monitor suspended in JES3 nucleus task.
12	C	R84NMFMW	4	binary	Number of times multi-function monitor IN-OS-WAIT in JES3 nucleus task.
16	10	R84AMFMA	4	binary	Number of times multi-function monitor active in JES3 auxiliary task.
20	14	R84AMFMS	4	binary	Number of times multi-function monitor suspended in JES3 auxiliary task.
24	18	R84AMFMW	4	binary	Number of times multi-function monitor IN-OS-WAIT JES3 auxiliary task.
28	1C	R84FCTN	2	binary	Total number of FCT entries.
30	1E		2		Reserved.
32	20	R84FCTOF	4	binary	Offset of the first FCT entry.

FCT Entry

This section contains one for each FCT.

Offsets		Name	Length	Format	Description
0	0	R84FSEQN	2	binary	FCT sequence number.
2	2		2		Reserved.
4	4	R84FNEXT	4	binary	Length of next FCT entry.
8	8	R84FNAM	8	EBCDIC	Name of the Dynamic Support Program (DSP) associated with the FCT.
16	10	R84FDEV	8	EBCDIC	Name of the device associated with the FCT.
24	18	R84FPRTY	2	binary	FCT priority.
26	1A	R84FCXOF	2	binary	Offset of FCT entry extension from the start of this FCT entry.
28	1C	R84FFCT	4	binary	Number of times this FCT found on FCT chain.
32	20	R84FNUC	4	binary	Number of times this FCT in JES3 nucleus task.
36	24	R84FAUX	4	binary	Number of times this FCT in JES3 auxiliary task.
40	28	R84FNFPA	4	binary	Number of times FCT found to be the active JES3 FCT in nucleus task.
44	2C	R84FNFNA	4	binary	Number of times the FCT in nucleus task was dispatchable (posted) but not the active JES3 FCT.
48	30	R84FNFNP	4	binary	Number of times in the nucleus task the FCT was found to be not the active JES3 FCT and not posted.
52	34	R84FNFW	4	binary	Number of times in the nucleus task the FCT was IN-OS-WAIT condition.
56	38	R84FNFS	4	binary	Number of times in the nucleus task the FCT was suspended because the local lock was unavailable.

Offsets		Name	Length	Format	Description
60	3C	R84FNFSO	4	binary	Number of times in the nucleus task the FCT was suspended for any reason other than waiting for local lock.
64	40	R84FNENT	2	binary	Total number of FCT AWAIT entries in the JES3 nucleus task.
66	42		2		Reserved.
68	44	R84FNOFF	4	binary	Offset to the first AWAIT entry in the JES3 nucleus task.
72	48	R84FAFPA	4	binary	Number of times FCT posted, active, in auxiliary task.
76	4C	R84FAFNA	4	binary	Number of times FCT posted, but not active, in auxiliary task.
80	50	R84FAFNP	4	binary	Number of times FCT found to be not posted in auxiliary task.
84	54	R84FAFW	4	binary	Number of times FCT was found IN-OS-WAIT condition in auxiliary task.
88	58	R84FAFS	4	binary	Number of times FCT suspended in auxiliary task because local lock unavailable.
92	5C	R84FAFSO	4	binary	Number of times FCT suspended in auxiliary task for any reason other than waiting for local lock.
96	60	R84FAENT	2	binary	Total number of FCT AWAIT entries in JES3 auxiliary task.
98	62		2		Reserved.
100	64	R84FAOFF	4	binary	Offset of the first AWAIT entry in JES3 auxiliary task.

FCT Entry Extension

Offsets		Name	Length	Format	Description
0	0	R84FCXLN	2	binary	Length of extension.
2	2	R84FCXRS	2	binary	Reserved.
4	4	R84MRFRI	4	binary	Number of multi-record file read I/O’s.
8	8	R84MRFWI	4	binary	Number of multi-record file write I/O’s.
12	C	R84SRFRI	4	binary	Number of single record file read I/O’s.
16	10	R84SRFRB	4	binary	Number of single record file buffers read.
20	14	R84SRFWI	4	binary	Number of single record file write I/O’s.
24	18	R84SRFWB	4	binary	Number of single record file buffers written.
28	1C	R84FCXR2	100	binary	Reserved.

FCT AWAIT Entry (JES3)

This section contains one for each JES3 AWAIT entry that waits longer than one cycle.

Offsets		Name	Length	Format	Description
0	0	R84AWFL1	1	binary	FCT AWAIT Flag 1 **Value** **Meaning When Set** **X'80'** AWAIT is for generalized subtask **X'40'** AWAIT is for RJP I/O **X'20'** AWAIT is for specialized rescheduling **X'10'** AWAIT is for catalog locate **X'08'** AWAIT is for generalized subtask to become available **X'04'** AWAIT is for MVS/CI. **X'02'** AWAIT is described by a reason code.

Offsets		Name	Length	Format	Description
1	1	R84AWFL2	1	binary	FCT AWAIT Flag 2 **Value** **Meaning When Set** **X'80'** AWAIT is standard AWAIT **X'40'** AWAIT is for ALOAD of a module **X'20'** AWAIT is for FDB **X'10'** AWAIT is for SDM **X'08'** AWAIT is for AENQ on a resource **X'04'** AWAIT is for console buffers **X'02'** AWAIT is unknown.
2	2	R84AWFL3	1	binary	FCT AWAIT Flag 3 **Value** **Meaning When Set** **1** AWAIT is for locate schedule **2** AWAIT is for catalog setup.
3	3		1		Reserved.
4	4	R84AWUSE	4	binary	Number of times FCT found using this AWAIT.
8	8	R84AWPA	4	binary	Number of times FCT active after waiting on this AWAIT.
12	C	R84AWPNA	4	binary	Number of times FCT waiting on this AWAIT, ECF is posted but FCT is not the active JES3 FCT.
16	10	R84AWNP	4	binary	Number of times FCT waiting on this AWAIT but the ECF not posted.
20	14	R84AWAVG	4	binary	Average AWAIT duration time.
24	18	R84AWTOT	4	binary	Total AWAIT duration time.
28	1C	R84AWMAX	4	binary	Maximum AWAIT duration time.
32	20	R84AWMOD	8	EBCDIC	Name of module with maximum AWAIT duration time.
40	28	R84AWDIS	4	binary	Displacement in module to AWAIT with maximum duration time.
44	2C		8		Reserved.

FCT AWAIT Entry

The information in the AWAIT entry depends on the value of R84AWFL1 or R84AWFL2.

Offsets		Name	Length	Format	Description
For AWAITs described by a reason code (when R84AWFL1 = X'02'):					
52	34	R84AWRSN	2	binary	AWAIT reason code.
53	36	R84AWRSV	1	binary	Reserved.
54	37	R84AWDLN	1	binary	AWAIT data length or zero.
56	38	R84AWDAT	16	EBCDIC	Up to 16 bytes of AWAIT related data or zero.
For STANDARD AWAIT (when R84AWFL2 = X'80'):					
52	34	R84STDAW	8	EBCDIC	Standard AWAIT name.
60	3C		12		Reserved.

Offsets		Name	Length	Format	Description
For ALOAD AWAIT (when R84AWFL2 = X'40'):					
52	34	R84MODNM	8	EBCDIC	Name of module with this AWAIT.
60	3C		12		Reserved.

Offsets		Name	Length	Format	Description
For FDB AWAIT (when R84AWFL2 = X'20'):					

Offsets		Name	Length	Format	Description
52	34	R84FDBIO	6	EBCDIC	Input/output FDB.
58	3A	R84FDBRF	3	EBCDIC	MRF or SRF.
61	3D		1		Reserved.
62	3E	R84FDBTY	3	EBCDIC	Set to 'I/O' or blanks.
65	41		7		Reserved.

Offsets		Name	Length	Format	Description
For SDM AWAIT (when R84AWFL2 = X'10'):					
52	34	R84SDMTY	20	EBCDIC	SDM AWAIT type; buffers or file directory space.

Offsets		Name	Length	Format	Description
For AENQ AWAIT (when R84AWFL2 = X'08'):					
52	34	R84ENQRN	8	EBCDIC	AENQ Resource name.
60	3C		12		Reserved.

Offsets		Name	Length	Format	Description
For CONSOLE BUFFERS AWAIT (when R84AWFL2 = X'04'):					
52	34	R84CNBTY	8	EBCDIC	Console buffers AWAIT type.
60	3C		12		Reserved.

Offsets		Name	Length	Format	Description
For Unknown AWAIT (when R84AWFL2 = X'02'):					
52	34	R84AWMSK	1	binary	AWAIT mask.
53	35		3		Reserved.
56	38	R84AWADR	4	EBCDIC	AWAIT address.
60	3C		12		Reserved.

Subtype 2 — FCT Summary and Highlight

This subtype consists of three sections:

1. FCT summary section. This section summarizes the FCT analysis report. Its length is variable depending on the number of FCT summary entries. It has a general section followed by an entry for each FCT describing nucleus and auxiliary mode activity.
2. FCT and AWAIT highlight section. This section lists FCTs in various categories for both nucleus and auxiliary modes:
   - Five most active FCTs
   - Five most posted and not active FCTs
   - Five most "IN-OS-WAIT" FCTs
   - Ten AWAIT entries with the largest total AWAIT duration time

   The five most active, most posted-not-active, and most "IN-OS-WAIT" FCTs are mapped by a common DSECT. The format follows the FCT and AWAIT highlight section. The ten AWAIT entries with the largest total AWAIT duration time are each mapped by a common DSECT.
3. JES3 WAIT analysis section. This section lists the unexpected OS WAIT SVC occurrences within JES3. Its length is variable depending on the number of WAIT entries.

Subtype 2 Header

Offsets		Name	Length	Format	Description
0	0	R84FCTNM	4	binary	Number of FCT summary entries.
4	4	R84FSMLN	4	binary	Length of the FCT summary section.
8	8	R84FSMOF	4	binary	Offset to the first FCT summary entry.
12	C	R84FAHOF	4	binary	Offset to the FCT and AWAIT highlight section.
16	10	R84WAITO	4	binary	Offset to the JES3 WAIT analysis section.
20	14	R84S2FLG	1	binary	Subtype 2 header flag **Value** **Meaning When Set** **X'80'** FCT summary and highlight segment **X'40'** WAIT analysis segment.
21	15		3		Reserved.

FCT Summary Entry

This section contains one for each FCT.

Offsets		Name	Length	Format	Description
0	0	R84FSNUM	4	binary	FCT sequence number.
4	4	R84FSNAM	8	EBCDIC	DSP name.
12	C	R84DEV	8	EBCDIC	Device.
20	14	R84FSPRT	2	binary	FCT priority.
22	16		2		Reserved.
24	18	R84FCHN	4	binary	Number of times this FCT appeared on FCT chain.
28	1C	R84FSNUC	4	binary	Number of times FCT in JES3 nucleus mode.
32	20	R84FSAUX	4	binary	Number of times FCT in JES3 auxiliary mode.
36	24	R84FNPA	4	binary	Number of times FCT was posted-active in the JES3 nucleus task.
40	28	R84FAPA	4	binary	Number of times FCT was posted-active in the JES3 auxiliary task.
44	2C	R84FNPNA	4	binary	Number of times FCT was posted-not active in the JES3 nucleus task.
48	30	R84FAPNA	4	binary	Number of times FCT was posted-not active in the JES3 auxiliary task.
52	34	R84FNNP	4	binary	Number of times FCT was not posted in the JES3 nucleus task.
56	38	R84FANP	4	binary	Number of times FCT was not posted in JES3 auxiliary task.
60	3C	R84FNSOS	4	binary	Number of times FCT was IN-OS-Wait in the JES3 nucleus task.
64	40	R84FASOS	4	binary	Number of times FCT was IN-OS-WAIT in the JES3 auxiliary task.

FCT and AWAIT Highlight Section

Offsets		Name	Length	Format	Description
0	0	R84FHLNG	4	binary	Length of the FCT and AWAIT highlight data section.
4	4	R84N1MA	20	binary	Most active FCT in the JES3 nucleus.
24	18	R84N2MA	20	binary	Second most active FCT in the JES3 nucleus.
44	2C	R84N3MA	20	binary	Third most active FCT in the JES3 nucleus.
64	40	R84N4MA	20	binary	Fourth most active FCT in the JES3 nucleus.
84	54	R84N5MA	20	binary	Fifth most active FCT in JES3 nucleus.

Offsets		Name	Length	Format	Description
104	68	R84A1MA	20	binary	Most active FCT in JES3 auxiliary task.
124	7C	R84A2MA	20	binary	Second most active FCT in JES3 auxiliary task.
144	90	R84A3MA	20	binary	Third most active FCT in JES3 auxiliary task.
164	A4	R84A4MA	20	binary	Fourth most active FCT in JES3 auxiliary task.
184	B8	R84A5MA	20	binary	Fifth most active FCT in JES3 auxiliary task.
204	CC	R84N1PNA	20	binary	Most posted-not-active FCT in JES3 nucleus.
224	E0	R84N2PNA	20	binary	Second most posted-not-active FCT in JES3 nucleus.
244	F4	R84N3PNA	20	binary	Third most posted-not-active FCT in JES3 nucleus.
264	108	R84N4PNA	20	binary	Fourth most posted-not-active FCT in JES3 nucleus.
284	11C	R84N5PNA	20	binary	Fifth most posted-not-active FCT in JES3 nucleus.
304	130	R84A1PNA	20	binary	Most posted-not-active FCT in JES3 auxiliary task.
324	144	R84A2PNA	20	binary	Second most posted-not-active FCT in JES3 auxiliary task.
344	158	R84A3PNA	20	binary	Third most posted-not-active FCT in JES3 auxiliary task.
364	16C	R84A4PNA	20	binary	Fourth most posted-not-active FCT in JES3 auxiliary task.
384	180	R84A5PNA	20	binary	Fifth most posted-not-active FCT in JES3 auxiliary task.
404	194	R84N1OSW	20	binary	FCT in JES3 nucleus with the most OS WAITs.
424	1A8	R84N2OSW	20	binary	FCT in JES3 nucleus with the second most OS WAITs.
444	1BC	R84N3OSW	20	binary	FCT in JES3 nucleus with the third most OS WAITs.
464	1D0	R84N4OSW	20	binary	FCT in JES3 nucleus with the fourth most OS WAITs.
484	1E4	R84N5OSW	20	binary	FCT in JES3 nucleus with the fifth most OS WAITs.
504	1F8	R84A1OSW	20	binary	FCT in JES3 auxiliary task with the most OS WAITs.
524	20C	R84A2OSW	20	binary	FCT in JES3 auxiliary task with the second most OS WAITs.
544	220	R84A3OSW	20	binary	FCT in JES3 auxiliary task with the third most OS WAITs.
564	234	R84A4OSW	20	binary	FCT in JES3 auxiliary task with the fourth most OS WAITs.
584	248	R84A5OSW	20	binary	FCT in JES3 auxiliary task with the fifth most OS WAITs.
604	25C	R84AW1BN	48	binary	FCT causing the largest JES3 AWAIT delay.
652	28C	R84AW2BN	48	binary	FCT causing the second largest JES3 AWAIT delay.
700	2BC	R84AW3BN	48	binary	FCT causing the third largest JES3 AWAIT delay.
748	2EC	R84AW4BN	48	binary	FCT causing the fourth largest JES3 AWAIT delay.
796	31C	R84AW5BN	48	binary	FCT causing the fifth largest JES3 AWAIT delay.
844	34C	R84AW6BN	48	binary	FCT causing the sixth largest JES3 AWAIT delay.
892	37C	R84AW7BN	48	binary	FCT causing the seventh largest JES3 AWAIT delay.
940	3AC	R84AW8BN	48	binary	FCT causing the eighth largest JES3 AWAIT delay.
988	3DC	R84AW9BN	48	binary	FCT causing the ninth largest JES3 AWAIT delay.
1036	40C	R84AWABN	48	binary	FCT causing the tenth largest JES3 AWAIT delay.
1084	43C	R84DMMXA	4	binary	Maximum number of active DMJA FCTs allowed.
1088	440	R84DMMN	4	binary	Minimum number of active DMJA FCTs.
1092	444	R84DMMX	4	binary	Largest number of active DMJA FCTs.
1096	448	R84DMAV	4	binary	Average number of active DMJA FCTs.

The five most active, most posted-not-active, and five most in “OS WAIT” entries are mapped as follows:

Offsets		Name	Length	Format	Description
0	0	R84FSQNM	4	binary	FCT sequence number.
4	4	R84FNAME	8	EBCDIC	DSP name.

Offsets		Name	Length	Format	Description
12	C	R84TPA	4	binary	Number of times task posted — active.
16	10	R84FPA	4	binary	Number of times FCT posted — active.

Each of the 40-byte entries for the ten largest JES3 AWAIT delays is mapped as follows:

Offsets		Name	Length	Format	Description
0	0	R84BSEQN	4	binary	FCT sequence number.
4	4	R84BNAME	8	EBCDIC	DSP name.
12	C	R84BTSK	8	EBCDIC	Task name.
20	14	R84BADAT	8	EBCDIC	Up to 8 bytes of AWAIT data.
28	1C	R84BRSN	1	binary	Reason for awaiting **Value** **Meaning When Set** **X'80'** AENQ **X'40'** SDM - waiting for file directory **X'20'** SDM - waiting for JSAM buffers **X'10'** JES3 521 - Reserved JES3 511 or prior releases - Waiting for console buffers **X'08'** Waiting for catalog locate **X'04'** Waiting for locate schedule. **X'02'** AWAIT reason code describes the bottleneck.
29	1D	R84BARSN	2	binary	AWAIT reason code.
31	1F	R84BADLN	1	binary	AWAIT data length.
32	20	R84CNNM	8	binary	Reserved.
40	28	R84BTOTD	4	binary	Total AWAIT duration time.
44	2C	R84BMAXD	4	binary	Maximum AWAIT duration time.

JES3 Wait Analysis Section

Offsets		Name	Length	Format	Description
0	0	R84WTLNG	4	binary	Length of the JES3 WAIT analysis data section.
4	4	R84WTNUM	4	binary	Total number of WAIT analysis entries.
8	8	R84WTOFF	4	binary	Offset to the first entry.

WAIT Analysis Entry

This section contains one for each nucleus and auxiliary task WAIT.

Offsets		Name	Length	Format	Description
0	0	R84WTNAM	8	EBCDIC	DSP name.
8	8	R84WTFSN	4	binary	FCT sequence number.
12	C	R84WTTSK	8	EBCDIC	Task name.
20	14	R84WTFOS	4	binary	Number of FCTs IN-OS-WAIT.
24	18	R84WTFLG	1	binary	Type of WAIT: **Value** **Meaning When Set** **X'80'** Page fault **X'40'** SVC WAIT **X'20'** Load WAIT.
25	19		3		Reserved.

Offsets		Name	Length	Format	Description
The following fields apply only to Page fault WAITs:					
28	1C	R84PADR	4	binary	Address of location of page fault.
32	20	R84PNAM	8	EBCDIC	Module name.
40	28	R84PMOF	4	binary	Offset into the module.
44	2C	R84PCNT	4	binary	Number of page faults.
48	30		12		Reserved.

Offsets		Name	Length	Format	Description
The following fields apply only to SVC WAITs:					
28	1C	R84SNUM	4	binary	SVC number.
32	20	R84SNAM	8	EBCDIC	SVC name.
40	28	R84SADR	4	binary	Address of location of SVC WAIT.
44	2C	R84SMNAM	8	EBCDIC	Module name.
52	34	R84SMOFS	4	binary	Offset into the module.
56	38	R84SCNT	4	binary	SVC count.
The following fields apply only to Load WAITs:					
28	1C	R84LMNAM	8	EBCDIC	Name of module being loaded (LOAD).
36	24	R84LCNT	4	binary	Number of times LOAD invoked.
40	28		20		Reserved.

Subtype 3 — Spool Data Management (SDM)

This subtype contains data relating to JES3 spool data management. There subtype consists of eight sections:

1. General spool data management data
2. Spool data set description
3. Spool partition description
4. Spool space utilization snapshot
5. Single track table space allocation snapshot
6. Spool I/O activity
7. Buffers chaining by spool data set
8. Minimal/marginal track condition.

General Spool Data Management Data Section

Offsets		Name	Length	Format	Description
0	0	R84SDMLN	4	binary	Length of the SDM section.
4	4	R84BUFSZ	4	binary	Spool buffer size.
8	8	R84NBFPG	4	binary	Number of buffers per 4K page.
12	C	R84FDENT	4	binary	File directory entries.
16	10	R84SPDSU	4	binary	Number of spool data sets in use.
20	14	R84JSAMB	4	binary	Number of JSAM buffers.
24	18	R84JSAMT	4	binary	JSAM threshold for JSAM minbuf condition.
28	1C	R84PBUFC	4	binary	Number of protected user spool access method (USAM) buffers in common service area.
32	20	R84PBUFA	4	binary	Number of protected user spool access method (USAM) buffers in AUX.
36	24	R84UPBUF	4	binary	Number of unprotected user spool access method (USAM) buffers per open USAM data set.

Offsets		Name	Length	Format	Description
40	28	R84MAXB	4	binary	Maximum data bytes in a user spool access method (USAM) buffer.
44	2C	R84DSENT	4	binary	Total number of spool data set description entries.
48	30	R84DSOFF	4	binary	Offset to the first spool data set description entry.
52	34	R84PRENT	4	binary	Total number of spool partition description entries.
56	38	R84PROFF	4	binary	Offset to the first spool partition description entry.
60	3C	R84SUENT	4	binary	Total number of spool space utilization snapshot entries.
64	40	R84SUOFF	4	binary	Address of the first spool space utilization snapshot entry.
68	44	R84STENT	4	binary	Total number of single track table space allocation snapshot entries.
72	48	R84STOFF	4	binary	Offset to the first single track table space allocation snapshot entry.
76	4C	R84IOENT	4	binary	Total number of spool I/O activity — buffers read and written (entries).
80	50	R84IOOFF	4	binary	Offset to the first spool I/O activity — buffers read and written (entry).
84	54	R84BCENT	4	binary	Total number of buffer chaining by spool data set entries.
88	58	R84BCOFF	4	binary	Offset to the first buffer chaining by spool data set entry.
92	5C	R84JSAMU	4	binary	Number of times JSAM buffers were unavailable.
96	60	R84USAMU	4	binary	Number of times user spool access method (USAM) unavailable buffers occurred.
100	64	R84MMENT	4	binary	Total number of minimal/marginal track condition entries.
104	68	R84MMOFF	4	binary	Offset to the first minimal/marginal track condition entry.
108	6C	R84AWBUF	4	binary	Number of AWAITS of buffers during JMF monitoring.
112	70	R84AWEVR	4	binary	Number of AWAITS of buffers since JES3 initialization.

Spool Data Set Description Section

Offsets		Name	Length	Format	Description
0	0	R84DSDSN	2	binary	Data set number.
2	2	R84DSDDN	8	EBCDIC	Data definition name (DDNAME).
10	A	R84DSPRT	8	EBCDIC	Partition name.
18	12	R84DSFLG	1		Extent status flag **Value** **Meaning When Set** **X'80'** Extent unavailable **X'40'** Extent moved to draining partition **X'20'** Extent held **X'10'** Extent in use.
19	13	R84DSDVA	3	EBCDIC	3-digit device number.
22	16	R84DSVLS	6	EBCDIC	Volume serial (VOLSER).
28	1C	R84DSDVT	7	EBCDIC	Device type.
35	23		1		Reserved.
36	24	R84DSLWC	2	binary	Low cylinder.
38	26	R84DSLWH	2	binary	Low head.
40	28	R84DSHIC	2	binary	High cylinder.
42	2A	R84DSHIH	2	binary	High head.
44	2C	R84DSRT	2	binary	Records per tracks.
46	2E	R84DSRTG	2	binary	Records per track group.
48	30	R84DSBUF	4	binary	Buffer size in bytes.

Offsets		Name	Length	Format	Description
52	34	R84DSDV4	4	EBCDIC	4-digit device number.

Spool Partition Description Section

Offsets		Name	Length	Format	Description
0	0	R84PRPRT	8	EBCDIC	Partition name.
8	8	R84PRMIN	1	binary	Minimal spool threshold percent.
9	9	R84PRMRG	1	binary	Marginal spool threshold percent.
10	A	R84PROVP	8	EBCDIC	Name of overflow partition.
18	12	R84PRFLG	1	binary	Default partition indicator **Value** **Meaning When Set** **X'80'** Default partition.
19	13		1		Reserved.

Spool Space Utilization Snapshot Section

Offsets		Name	Length	Format	Description
0	0	R84SUPRT	8	EBCDIC	Partition name.
8	8	R84SUDDN	8	EBCDIC	Data definition name (DDNAME).
16	10	R84SUDEF	4	binary	Number of track groups defined.
20	14	R84SUALO	4	binary	Track groups allocated.

Single Track Table Space Utilization Section

Offsets		Name	Length	Format	Description
0	0	R84STDSN	2	binary	Data set number.
2	2		2		Reserved.
4	4	R84STDDN	8	EBCDIC	Data definition name (DDNAME).
12	C	R84STLWC	2	binary	Low cylinder.
14	E	R84STLWH	2	binary	Low head.
16	10	R84STHIC	2	binary	High cylinder.
18	12	R84STHIH	2	binary	High head.
20	14	R84STDEF	4	binary	Number of records defined.
24	18	R84STALO	4	binary	Number of records allocated.
28	1C	R84STFLG	1		Single track table flag **Value** **Meaning When Set** **X'80'** Expansion indicator for any or all subsequent STT entries that match data set number.
29	1D		3		Reserved.

Spool I/O Activity Section

Offsets		Name	Length	Format	Description
0	0	R84IOVLS	6	EBCDIC	Volume serial (VOLSER).
6	6	R84IODDN	8	EBCDIC	Data definition name (DDNAME).
14	E		2		Reserved.
16	10	R84IOTOT	4	binary	Total I/O counts.
20	14	R84IOLOC	4	binary	I/O counts for low number cylinders.

Offsets		Name	Length	Format	Description
24	18	R84IO2CY	4	binary	I/O counts for 2 cylinders.
28	1C	R84IO3CY	4	binary	I/O counts for 3 cylinders.
32	20	R84IO4CY	4	binary	I/O counts for 4 cylinders.
36	24	R84IO5CY	4	binary	I/O counts for 5 cylinders.
40	28	R84IO6CY	4	binary	I/O counts for 6 cylinders.
44	2C	R84IO7CY	4	binary	I/O counts for 7 cylinders.
48	30	R84IO8CY	4	binary	I/O counts for 8 cylinders.
52	34	R84IO9CY	4	binary	I/O counts for 9 cylinders.
56	38	R84IOHIC	4	binary	I/O counts for high number cylinders.

Buffers Chaining by Spool Data Set Section

Offsets		Name	Length	Format	Description
0	0	R84BCDSN	2	binary	Data set number.
2	2		2		Reserved.
4	4	R84BCTOT	4	binary	Total number of I/O buffers.
8	8	R84BC1B	4	binary	Count for one chained buffer.
12	C	R84BC2B	4	binary	Count for two chained buffers.
16	10	R84BC3B	4	binary	Count for three chained buffers.
20	14	R84BC4B	4	binary	Count for four chained buffers.
24	18	R84BC5B	4	binary	Count for five chained buffers.
28	1C	R84BC6B	4	binary	Count for six chained buffers.
32	20	R84BC7B	4	binary	Count for seven chained buffers.
36	24	R84BC8B	4	binary	Count for eight chained buffers.
40	28	R84BC9B	4	binary	Count for nine chained buffers.
44	2C	R84BC10B	4	binary	Count for ten chained buffers.
48	40	R84BC11B	4	binary	Count for eleven or more chained buffers.

Minimal/Marginal Track Condition Section

Offsets		Name	Length	Format	Description
0	0	R84MMPRT	8	EBCDIC	Name of partition.
8	8	R84MMMIN	4	binary	Count of samples partition in minimal track condition.
12	C	R84MMMRG	4	binary	Count of samples partition in marginal track condition.

Subtype 4 — Resqueue Cellpool and Control Block Utilization

This subtype has three sections:

1. Resqueue cell pool statistics section
2. JCT access methods statistics section
3. JES3 control block utilization section.

Resqueue Cell Pool Statistics Section

Offsets		Name	Length	Format	Description
0	0	R84JCOFF	4	binary	Offset to JCT access method section.
4	4	R84CBOFF	4	binary	Offset to JES3 control block utilization section.
8	8	R84CIEXT	2	binary	Total number of CI secondary extents in pool.

Offsets		Name	Length	Format	Description
10	A		2		Reserved.
12	C	R84CICEL	4	binary	Total number of CI resqueues in pool.
16	10	R84CIUSE	4	binary	Total number of CI resqueues used in pool.
20	14	R84CIRQP	4	binary	Number of CI resqueues in primary extent.
20	14	R84NCISX	4	binary	Total number of CI resqueue secondary extent entries.
28	1C	R84CISXO	4	binary	Offset to first CI resqueue secondary extent entry.
32	20	R84MNEXT	2	binary	Total number of MAIN secondary extents in pool.
34	22		2		Reserved.
36	24	R84MNCEL	4	binary	Total number of MAIN resqueues in pool.
40	28	R84MNUSE	4	binary	Total number of MAIN resqueues used in pool.
44	2C	R84MNRQP	4	binary	Total number of MAIN resqueues in primary extent.
48	30	R84NMNSX	4	binary	Total number of MAIN resqueue secondary extent entries.
52	34	R84MNSXO	4	binary	Offset to first MAIN resqueue secondary extent.
56	38	R84OSEXT	2	binary	Total number of OUTSERV secondary extents in pool.
58	3A		2		Reserved.
60	3C	R84OSCEL	4	binary	Total number of OUTSERV resqueues in pool.
64	40	R84OSUSE	4	binary	Total number of OUTSERV resqueues used in pool.
68	44	R84OSRQP	4	binary	Number of OUTSERV resqueues in primary extent.
72	48	R84NOSSX	4	binary	Total number of OUTSERV resqueue secondary extent entries.
76	4C	R84OSSXO	4	binary	Offset to first OUTSERV resqueue secondary extent.
80	50	R84CMEXT	2	binary	Total number of COMMON secondary extents in pool.
82	52		2		Reserved.
84	54	R84CMCEL	4	binary	Total number of COMMON resqueues in pool.
88	58	R84CMUSE	4	binary	Total number of COMMON resqueues used in pool.
92	5C	R84CMRQP	4	binary	Total number of COMMON resqueues in primary extent.
96	60	R84NCMSX	4	binary	Total number of COMMON resqueue secondary extent entries.
100	64	R84CMSXO	4	binary	Offset to first COMMON resqueue secondary extent.

Resqueue Secondary Extent Entry

Offsets		Name	Length	Format	Description
0	0	R84RQSXT	4	binary	Number of resqueues for secondary extent.

JCT Access Method Statistics Section

This section contains JCT data set information.

Offsets		Name	Length	Format	Description
0	0	R84SZJCT	4	binary	Size of a JCT (in bytes).
4	4	R84REDIO	4	binary	Number of JCT read I/Os.
8	8	R84WRTIO	4	binary	Number of JCT write I/Os.
12	C	R84JBADD	4	binary	Number of jobs added to the job queue.
16	10	R84JBDEL	4	binary	Number of jobs deleted from the job queue.
JCT data space information:					

Offsets		Name	Length	Format	Description
20	14	R84DSPFL	1	binary	JCT data space flag one **Value** **Meaning When Set** **X'80'** The JCT data space was disabled during some portion of the interval. The remainder of the JCT data space information is zero.
21	15		3		Reserved.
24	18	R84DSPSZ	4	binary	Maximum size of JCT data space, in hundredths of a megabyte.
JCT data space page fault information:					
28	1C	R84RDINS	4	binary	Number of JCT read requests where the corresponding JCT data space page(s) were in central storage.
32	20	R84PRINS	4	binary	Percent of JCT read requests where the corresponding JCT data space page(s) were in central storage, in hundredths of a percent.
36	24	R84RDNIS	4	binary	Number of JCT read requests where the corresponding JCT data space page(s) were not in central storage.
40	28	R84PRNIS	4	binary	Percent of JCT read requests where the corresponding JCT data space page(s) were not in central storage.
44	2C	R84WTINS	4	binary	Number of JCT write requests where the corresponding JCT data space page(s) were in central storage.
48	30	R84PWINS	4	binary	Percent of JCT write requests where the corresponding JCT data space pages were in central storage, in hundredths of a percent.
52	34	R84WTNIS	4	binary	Number of JCT write requests where the corresponding data space page(s) were not in central storage.
56	38	R84PWNIS	4	binary	Percent of JCT write requests where the corresponding JCT data space page(s) were not in central storage, in hundredths of a percent.
JCT data space page usage information:					
60	3C	R84DUSMN	4	binary	Minimum number of JCT data space pages in use.
64	40	R84DUSAV	4	binary	Average number of JCT data space pages in use.
68	44	R84DUSMX	4	binary	Maximum number of JCT data space pages in use.
JCT data space page utilization:					
72	48	R84DUTMN	4	binary	Minimum use of JCT data space pages. This value shows the percentage of the total JCT data space pages that contain allocated JCTs. It is measured in hundredths of a percent.
76	4C	R84DUTAV	4	binary	Average percentage of use of JCT data space pages. This value shows the percentage of the total JCT data space pages that contain allocated JCTs. It is measured in hundredths of a percent.
80	50	R84DUTMX	4	binary	Maximum percentage of use of JCT data space pages. This value shows the percentage of the total JCT data space pages that contain allocated JCTs. It is measured in hundredths of a percent.
84	54	R84PGSRL	4	binary	Number of JCT data space pages released.
Job queue element (JQE) information:					
88	58	R84JQ0SZ	4	binary	JQE0 table size, in hundredths of a kilobyte.
92	5C	R84JQ1SZ	4	binary	JQE1 table size, in hundredths of a kilobyte.
96	60	R84JQ2SZ	4	binary	JQE2 table size in, hundredths of a kilobyte.
100	64	R84JQ3SZ	4	binary	JQE3 table size, in hundredths of a kilobyte.
104	68	R84JQ4SZ	4	binary	JQE4 table size, in hundredths of a kilobyte.
JQE4 storage use information:					

Offsets		Name	Length	Format	Description
108	6C	R84JUSMN	4	binary	Minimum number of JQE4s in use during interval.
112	70	R84JUSAV	4	binary	Average number of JQE4s in use during interval.
116	74	R84JUSMX	4	binary	Maximum number of JQE4s in use during interval.
120	78	R84JUTMN	4	binary	Minimum percentage of total JQE4 pages that contained allocated JQE4s during this interval, in hundredths of a percent.
124	7C	R84JUTAV	4	binary	Average percentage of total JQE4 pages that contained allocated JQE4s during this interval, in hundredths of a percent.
128	80	R84JUTMX	4	binary	Maximum percentage of total JQE4 pages that contained allocated JQE4s during this interval, in hundredths of a percent.

JES3 Control Block Utilization Section

This section contains FCT entry use.

Offsets		Name	Length	Format	Description
0	0	R84FCTPR	4	binary	Total number of preallocated FCTs.
4	4	R84FCTPM	4	binary	Total number of permanent FCTs.
8	8	R84FCTMN	4	binary	Minimum number of FCT entries used.
12	C	R84FCTMX	4	binary	Maximum number of FCT entries used.
16	10	R84FCTAV	4	binary	Average number of FCT entries used.
20	14	R84PCNBF	4	binary	Total number of preallocated console buffers.
24	18	R84PCBPT	4	binary	JES3 521 - Reserved JES3 511 or prior releases Total number of preallocated console buffer pointers.
28	1C	R84PDDBL	4	binary	JES3 521 - Reserved JES3 511 or prior releases Total number of preallocated DOM data blocks.
32	20	R84MNCBU	4	binary	Minimum number of console buffers used.
36	24	R84MNBPU	4	binary	Minimum number of console buffer pointers used.
40	28	R84MNDBU	4	binary	JES3 521 - Reserved JES3 511 or prior releases Minimum number of DOM data blocks used.
44	2C	R84MXCBU	4	binary	Maximum number of console buffers used.
48	30	R84MXBPU	4	binary	JES3 521 - Reserved JES3 511 or prior releases Maximum number of console buffer pointers used.
52	34	R84MXDBU	4	binary	JES3 521 - Reserved JES3 511 or prior releases Maximum number of DOM data blocks used.
56	38	R84AVCBU	4	binary	Average number of console buffers used.
60	3C	R84AVBPU	4	binary	JES3 521 - Reserved JES3 511 or prior releases Average number of console buffer pointers used.
64	40	R84AVDBU	4	binary	JES3 521 - Reserved JES3 511 or prior releases Average number of DOM data blocks used.
68	44	R84SZCPE	4	binary	Size of console buffer primary extent.
72	48	R84SCBSE	4	binary	Size of console buffer secondary extent.
76	4C	R84CBSEL	2	binary	Size of console buffer secondary extent limit.
78	4E		2		Reserved.

Offsets		Name	Length	Format	Description
80	50	R84TNRCB	4	binary	Total number of reserved console buffers.
84	54	R84CBSEU	2	binary	JES3 521 - Reserved JES3 511 or prior releases Number of console buffer secondary extents in use.
86	56	R84BPSEU	2	binary	JES3 521 - Reserved JES3 511 or prior releases Number of buffer pointer secondary extents in use.
88	58	R84DBSEU	2	binary	JES3 521 - Reserved JES3 511 or prior releases Number of DOM data block secondary extents in use.
90	5A	R84SEMAX	2	binary	Maximum number of secondary extents ever used.
92	5C	R84RBMAX	4	binary	Maximum number of reserved buffers ever used.
96	60	R84SCBEE	4	binary	Number of secondary console buffer extents exceeded.
100	64	R84SCBPE	4	binary	Count of secondary console buffer pointer extents exceeded.
104	68	R84SAQPE	4	binary	JES3 521 - Reserved JES3 511 or prior releases Count of secondary action queue pointer extents exceeded.
JSAM buffer use:					
108	6C	R84TOTJB	2	binary	Total defined JSAM buffers.
110	6E		2		Reserved.
112	70	R84MNJBU	4	binary	Minimum JSAM buffers used.
116	74	R84MXJBU	4	binary	Maximum JSAM buffers used.
120	78	R84AVJBU	4	binary	Average JSAM buffers used.
User spool access method (USAM) (protected) buffer use:					
124	7C	R84TOTUB	2	binary	Total defined user spool access method (USAM) buffers.
126	7E		2		Reserved.
128	80	R84MNUBU	4	binary	Minimum user spool access method (USAM) buffers used.
132	84	R84MXUBU	4	binary	Maximum user spool access method (USAM) buffers used.
136	88	R84AVUBU	4	binary	Average user spool access method (USAM) buffers used.
Staging area use:					
140	8C	R84SSAPE	2	binary	JES3 SP511 - Reserved JES3 SP421 or prior releases Size of staging area primary extent, in thousands of bytes
142	8E		2		Reserved.
144	90	R84TNPSA	4	binary	JES3 SP511 - Reserved JES3 SP421 or prior releases Total number of primary staging areas.
148	94	R84SSASE	2	binary	JES3 SP511 - Reserved JES3 SP421 or prior releases Size of staging area secondary extent, in thousands of bytes.
150	96		2		Reserved.
152	98	R84TNSSA	4	binary	JES3 SP511 - Reserved JES3 SP421 or prior releases Total number of secondary staging areas.
156	9C	R84SASEL	2	binary	JES3 SP511 - Reserved JES3 SP421 or prior releases Staging area secondary extent limit.

Offsets		Name	Length	Format	Description
158	9E	R84MNSAL	2	binary	JES3 SP511 - Reserved JES3 SP421 or prior releases Minimum staging area limit.
160	A0	R84SASIZ	4	binary	JES3 SP511 - Reserved JES3 SP421 or prior releases Size of staging area.
164	A4	R84TNSAD	4	binary	JES3 SP511 - Reserved JES3 SP421 or prior releases Total number of staging areas defined.
168	A8	R84MCSAI	4		JES3 SP511 - Reserved JES3 SP421 or prior releases Maximum common service area staging areas for interval.
172	A8	R84MASAI	4		JES3 SP511 - Reserved JES3 SP421 or prior releases Maximum auxiliary staging areas during this interval.
176	B0	R84ASACS	4	binary	Number of active staging areas from SVT.
180	B4	R84ACSCS	4	binary	JES3 SP511 - Reserved JES3 SP421 or prior releases Number of active common service area staging areas from SVT.
184	B8	R84AASCS	4	binary	JES3 SP511 - Reserved JES3 SP421 or prior releases Number of active auxiliary staging areas from SVT.
188	BC	R84MCSAU	4	binary	Maximum number of staging areas ever used.
192	C0	R84MASAU	4	binary	JES3 SP511 - Reserved JES3 SP421 or prior releases Maximum number of auxiliary staging areas ever used.
196	C4	R84PUSAE	4	binary	JES3 SP511 - Reserved JES3 SP421 or prior releases Number of times user memory staging area limit exceeded.
200	C8	R84PMSAE	4	binary	JES3 SP511 - Reserved JES3 SP421 or prior releases Number of times minimal staging area limit was exceeded.
Total active staging areas:					
204	CC	R84MNTSA	4	binary	Minimum number of total active staging areas.
208	D0	R84MXTSA	4	binary	Maximum number of total active staging areas.
212	D4	R84AVTSA	4	binary	Average number of total active staging areas.
216	D8	R84MNCSA	4	binary	JES3 SP511 - Reserved JES3 SP421 or prior releases Minimum number of active common service area staging areas.
220	DC	R84MXCSA	4	binary	JES3 SP511 - Reserved JES3 SP421 or prior releases Maximum number of active common service area staging areas.
224	E0	R84AVCSA	4	binary	JES3 SP511 - Reserved JES3 SP421 or prior releases Average number of active common service area staging areas.

Offsets		Name	Length	Format	Description
228	E4	R84MNASA	4	binary	JES3 SP511 - Reserved JES3 SP421 or prior releases Minimum number of active auxiliary staging areas.
232	E8	R84MXASA	4	binary	JES3 SP511 - Reserved JES3 SP421 or prior releases Maximum number of active auxiliary staging areas.
236	EC	R84AVASA	4	binary	JES3 SP511 - Reserved JES3 SP421 or prior releases Average number of active auxiliary staging areas.
JSAM Buffer Extent Areas:					
240	F0	R84JBPSZ	4	binary	Size of primary extent.
244	F4	R84JBSSZ	4	binary	Size of secondary extent.
248	F48	R84JBLIM	4	binary	The number of secondary extents allowed.

Subtype 5 — Job Analysis

This subtype has four sections:

1. JES3 work-to-do section
2. Job analysis section
3. JES3 function summary section
4. Plot sections.

Subtype Header

Offsets		Name	Length	Format	Description
0	0	R84JBLNG	4	binary	Length of the JES3 Job Analysis section.
4	4	R84JBNUM	4	binary	Total number of JES3 job analysis entries.
8	8	R84WTDO	4	binary	Offset to the work-to-do analysis section.
12	C	R84JBOF	4	binary	Offset to the Job Analysis section.
16	10	R84FSUMO	4	binary	Offset to the JES3 Function Summary section.
20	14	R84PLOTO	4	binary	Offset to the Plot section.
24	18	R84S5FLG	1	binary	Job entry header flag **Bit** **Meaning** **X'80'** There is a job analysis segment **X'40'** There is a function summary segment **X'20'** There is an initiator plot section **X'10'** There is an rqindex plot section segment **X'08'** There is a device class plot section segment **X'04'** There is a setname plot section segment **X'02'** There is a job class plot section segment.
25	19		3		Reserved.

JES3 Work-To-Do Section

Offsets		Name	Length	Format	Description
0	0	R84WKLNG	4	binary	Length of the JSS work-to-do queue section.
4	4	R84RDYMN	4	binary	Minimum length for the JSS ready queue.
8	8	R84RDYMX	4	binary	Maximum length for the JSS ready queue.
12	C	R84RDYAV	4	binary	Average length for the JSS ready queue.
16	10	R84CATMN	4	binary	Minimum length for the CATLG wait queue.
20	14	R84CATMX	4	binary	Maximum length for the CATLG wait queue.

Offsets		Name	Length	Format	Description
24	18	R84CATAV	4	binary	Average length for the CATLG wait queue.
28	1C	R84RSQMN	4	binary	Minimum length for the RQ wait queue.
32	20	R84RSQMX	4	binary	Maximum length for the RQ wait queue.
36	24	R84RSQAV	4	binary	Average length for the RQ wait queue.
40	28	R84PLBMN	4	binary	Minimum length for the proclib wait queue.
44	2C	R84PLBMX	4	binary	Maximum length for the proclib wait queue.
48	30	R84PLBAV	4	binary	Average length for the proclib wait queue.
52	34	R84MCGMN	4	binary	Minimum length for the main wait queue.
56	38	R84MCGMX	4	binary	Maximum length for the main wait queue.
60	3C	R84MCGAV	4	binary	Average queue length for the main wait queue.
64	40	R84DSPMN	4	binary	Minimum length for the DSP wait queue.
68	44	R84DSPMX	4	binary	Maximum length for the DSP wait queue.
72	48	R84DSPAV	4	binary	Average queue length for ISP wait queue.
76	4C	R84MPLMN	4	binary	Minimum length for the MPLOC wait queue.
80	50	R84MPLMX	4	binary	Maximum length for the MPLOC wait queue.
84	54	R84MPLAV	4	binary	Average length for the MPLOC wait queue.
88	58	R84DUPMN	4	binary	Minimum length for duplicate jobname wait queue.
92	5C	R84DUPMX	4	binary	Maximum length for the duplicate jobname wait queue.
96	60	R84DUPAV	4	binary	Average length for the duplicate jobname wait queue.
100	64	R84CIJMN	4	binary	Minimum queue length for C/I JSAM buffer queue.
104	68	R84CIJMX	4	binary	Maximum queue length for C/I JSAM buffer queue.
108	6C	R84CIJAV	4	binary	Average QUEUE length for C/I JSAM buffer queue.

Job Analysis Section

Offsets		Name	Length	Format	Description
0	0	R84JBNAM	8	EBCDIC	Job name. The job name, time, and date that the reader recognized the JOB card (for this job) constitute the job log identification, or transaction name (for APPC output).
8	8	R84JBID	8	EBCDIC	Job ID.
16	10		3		Reserved.
19	13	R84JBRQP	1	binary	Job resqueue priority.
20	14	R84JBCLS	8	EBCDIC	Job class.
28	1C	R84JSGRP	8	EBCDIC	Group name.
36	24	R84NXTJB	4	binary	Offset to next job analysis entry.
40	28	R84JSTAT	4	binary	Total number of JOBSTAT entries.
44	2C	R84JSTOF	4	binary	Offset to the first JOBSTAT entry.
48	30	R84JBGMS	4	binary	Total number of GMS/MDS entries.
52	34	R84JBGOF	4	binary	Offset to the first GMS/MDS entry.

Job Status Entry and GMS/MDS Entry

The format for each job status entry and each GMS/MDS entry follows:

Offsets		Name	Length	Format	Description
0	0	R84JBFNM	33	EBCDIC	Active function, DSP, or procedure name.
33	21		3		Reserved.

Offsets		Name	Length	Format	Description
36	24	R84JBJSR	1	binary	JSTAT reason code (used for MDS/GMS only).
37	25		3		Reserved.
40	28	R84JBFTM	4	binary	Active function time, in seconds.

JES3 Function Summary Section

Offsets		Name	Length	Format	Description
0	0	R84JSLNG	4	binary	Length of the JES3 function summary section.
4	4	R84JSNUM	4	binary	Total number of JES3 function summary entries.
8	8	R84JSOF	4	binary	Offset to the first JES3 function summary entry.
12	C	R84GSNUM	4	binary	Total number of GMS/MDS summary entries.
16	10	R84GSOF	4	binary	Offset to the first GMS/MDS summary entry.
MDS and GMS scheduling analysis summary information:					
20	14	R84ALRET	4	binary	Number of allocation retries during JMF interval.
24	18	R84ARLSK	4	binary	Number of allocation attempts rejected without reading the job summary table (JST) during the JMF interval.
28	1C	R84ATMPT	4	binary	Number of allocation attempts allowed to read the JST during the JMF interval.
32	20	R84ARLF	4	binary	Number of allocation attempts rejected after reading the JST during the JMF interval.
36	24	R84SUCCS	4	binary	Successful allocations during JMF interval.

JES3 Function Summary Entry

This section contains one per JES3 function or DSP.

Offsets		Name	Length	Format	Description
0	0	R84JSNAM	33	EBCDIC	JES3 function name or DSP name.
33	21		3		Reserved.

Offsets		Name	Length	Format	Description
36	24	R84JSJSR	1	binary	Scheduling bypass code **Code** **Meaning** **X'01'** Insufficient storage **X'02'** Tlimit exceeded **X'03'** I/O rate inappropriate **X'04'** No match on RQMAINS **X'05'** Choice inappropriate **X'06'** No match on control program type **X'07'** Job class not enabled **X'08'** LSTOR update pending **X'09'** Class can't run on this main **X'0A'** Mix inappropriate (1) **X'0B'** Fit inappropriate (1) **X'0C'** Fit inappropriate (2) **X'0D'** Mix inappropriate (2) **X'0E'** Job in hold or active **X'0F'** RQINDEX not in select **X'10'** Job is in DJC hold **X'11'** Minpart not available **X'12'** Group disabled on this main **X'13'** Main is offline **X'14'** TDEPTH exceeded **X'7E'** No group initiators started **X'7F'** All group initiators in use **X'80'** Resource update only **X'81'** Job hold status **X'82'** Max region size exceeded **X'83'** Restart job pass only **X'84'** Eligible main not online or IPLed **X'85'** Incorrect control program type **X'86'** GMS group or class not enabled **X'87'** Required resource not available **X'88'** Device pool fence not built **X'89'** Main setup depth exceeded **X'8A'** Job class setup depth exceeded **X'8B'** Failed preallocation scan **X'FF'** Job selected for a main.
37	25		3		Reserved.
40	28	R84JSAV	4	binary	Average function time, in seconds.
44	2C	R84JSCNT	4	binary	Active job count.
48	30	R84JSMIN	4	binary	Minimum function time, in seconds.
52	34	R84JSMAX	4	binary	Maximum function time, in seconds.
56	38	R84JSMNJ	8	EBCDIC	ID of job using minimum function time.
64	40	R84JSMXJ	8	EBCDIC	ID of job using maximum function time.

Plot Section

Each plot counter entry contains two fields: scale and count. The scale field refers to the value along the vertical line on the JMF report. The count field can be used to calculate the points on the horizontal line.

Offsets		Name	Length	Format	Description
0	0	R84PLTLN	4	binary	Length of Plot section.
4	4	R84JOBCG	4	binary	Number of job sample counts.
8	8	R84INITN	4	binary	Number of plots for “jobs being processed by main processor”.
12	C	R84INITO	4	binary	Offset to the first entry of “jobs being processed by main processor”.

Offsets		Name	Length	Format	Description
16	10	R84RQNXN	4	binary	Number of plots for “job queue length by JES3 function”.
20	14	R84RQNXO	4	binary	Offset to first entry of “job queue length by JES3 function”.
24	18	R84DCLSN	4	binary	Number of plots for “Allocated JES3 devices by device class”.
28	1C	R84DCLSO	4	binary	Offset to first entry of “Allocated JES3 devices by device class”.
32	20	R84SETNN	4	binary	Number of plots for “Allocated JES3 devices by setname”.
36	24	R84SETNO	4	binary	Offset to the first entry of “Allocated JES3 devices by setname”.
40	28	R84JCLSN	4	binary	Number of plots for “Jobs being processed by job class group”.
44	2C	R84JCLSO	4	binary	Offset to the first entry of “Jobs being processed by job class group”.

Jobs Being Processed by Main Processor (Initiator Plot)

Offsets		Name	Length	Format	Description
0	0	R84INEXT	4	binary	Offset to next initiator plot entry.
4	4	R84INAME	8	EBCDIC	Processor name.
12	C	R84IFLG	1	binary	Flag 1 **Value** **Meaning When Set** **X'80'** JES3 Global **X'40'** JES3 Local.
13	D		3		Reserved.
16	10	R84IINIT	4	binary	Count for started initiators.
20	14	R84IPLLO	4	binary	Smallest scale for initiator plot.
24	18	R84IPLHI	4	binary	Largest scale for initiator plot.
28	1C	R84IPLIN	4	binary	Increment for plotting initiator plot.
32	20	R84IPTMN	4	binary	Minimum plot value for initiator plot.
36	24	R84IPTMX	4	binary	Maximum plot value for initiator plot.
40	28	R84IPTAV	4	binary	Average plot value for initiator plot.
44	2C	R84IPTN	4	binary	Number of initiator plot counter entries.
48	30	R84IPTO	4	binary	Offset to first initiator plot counter entry.
Initiator plot counter entry:					
0	0	R84IPTS	4	binary	Initiator plot scale.
4	4	R84IPTC	4	binary	Count for initiator plot scale.

Jobs Being Processed by Job Class Group Entry (Job Class Plot)

Offsets		Name	Length	Format	Description
0	0	R84JNEXT	4	binary	Offset to next entry for “jobs being processed by job class group”.
4	4	R84JNAME	8	EBCDIC	Processor name.
12	C	R84JCGRP	8	EBCDIC	Job class group name.
20	14	R84JCSIN	4	binary	Count for started initiators.
24	18	R84JPLLO	4	binary	Smallest scale for job class plot.
28	1C	R84JPLHI	4	binary	Largest scale for job class plot.
32	20	R84JPLIN	4	binary	Increment for plotting job class plot.

Offsets		Name	Length	Format	Description
36	24	R84JPTMN	4	binary	Minimum plot value for job class plot.
40	28	R84JPTMX	4	binary	Maximum plot value for job class plot.
44	2C	R84JPTAV	4	binary	Average plot value for job class plot.
48	30	R84JPTN	4	binary	Number of plot counter entries for job class plot.
52	34	R84JPTO	4	binary	Offset to first plot counter entry for job class plot.

Job Class Group Plot Counter Entry

Offsets		Name	Length	Format	Description
0	0	R84JPTS	4	binary	Job class group plot scale.
4	4	R84JPTC	4	binary	Count for job class group plot scale.

Allocated JES3 Devices by Device Class (Device Plot) Entry

Offsets		Name	Length	Format	Description
0	0	R84DNEXT	4	binary	Offset to next device plot.
4	4	R84DFLG	1	binary	Flag **Value** **Meaning When Set** **X'80'** Tape device **X'40'** Direct access device **X'20'** Unit record device **X'10'** Graphics device.
5	5		1		Reserved.
6	6	R84DNAME	2	EBCDIC	Device name.
8	8	R84DCNT	4	binary	Total number of devices.
12	C	R84DPLLO	4	binary	Smallest scale for device plot.
16	10	R84DPLHI	4	binary	Largest scale for device plot.
20	14	R84DPLIN	4	binary	Increment for plotting device plot.
24	18	R84DPTMN	4	binary	Minimum plot value for device plot.
28	1C	R84DPTMX	4	binary	Maximum plot value for device plot.
32	20	R84DPTAV	4	binary	Average plot value for device plot.
36	24	R84DPTN	4	binary	Number of plot counter entries for device plot.
40	28	R84DPTO	4	binary	Offset to first plot counter entry for device plot.
Device plot counter entry:					
0	0	R84DPTS	4	binary	Device plot scale.
4	4	R84DPTC	4	binary	Count for device plot scale.

Allocated JES3 Devices by Setname (Setname Plot) Entry

There is a common section (decimal offsets 0-40) followed by a section for Setname or J, M and X type devices.

Offsets		Name	Length	Format	Description
0	0	R84SNEXT	4	binary	Offset to next setname plot.
4	4	R84SMPCN	8	EBCDIC	Processor name.
12	C	R84SFLG	1		Flag byte **Value** **Meaning When Set** **X'80'** JES3 global **X'40'** JES3 local.
13	D		3		Reserved.

Offsets		Name	Length	Format	Description
16	10	R84SXTYP	8	EBCDIC	Setname device name.
24	18	R84SXTOT	4	binary	Total number of setname devices.
28	1C	R84SPLLO	4	binary	Smallest scale for setname plot.
32	20	R84SPLHI	4	binary	Largest scale for setname plot.
36	24	R84SPLIN	4	binary	Increment for plotting setname plot.
40	28	R84SPTMN	4	binary	Minimum plot value for setname plot.
44	2C	R84SPTMX	4	binary	Maximum plot value for setname plot.
48	30	R84SPTAV	4	binary	Average plot value for setname plot.
52	34	R84SPTN	4	binary	Number of setname plot counter entries.
56	38	R84SPTO	4	binary	Offset to first setname plot counter entries.
J type device information:					
40	28	R84XJMIN	4	binary	Minimum plot value for J type devices. J type devices are setup devices allocated by JES3.
44	2C	R84XJMAX	4	binary	Maximum plot value for J type devices.
48	30	R84XJAVG	4	binary	Average plot value for J type devices.
52	34	R84XJPTN	4	binary	Number of plot counter entries for J type devices.
56	38	R84XJPTO	4	binary	Offset to first plot counter entry for J type devices.
X type device information:					
60	3C	R84XXMIN	4	binary	Minimum plot value for X type devices. X type devices are setup devices that are being processed on main (Class 1 devices only).
64	40	R84XXMAX	4	binary	Maximum plot value for X type devices.
68	44	R84XXAVG	4	binary	Average plot value for X type devices.
72	48	R84XXPTN	4	binary	Number of plot counter entries for X type devices.
76	4C	R84XXPTO	4	binary	Offset to first plot counter entry for x type devices.
M type device information:					
80	50	R84XMMIN	4	binary	Minimum plot value for M type devices. M type devices are setup that are allocated by MVS.
84	54	R84XMMAX	4	binary	Maximum plot value for M type devices.
88	58	R84XMAVG	4	binary	Average plot value for M type devices.
92	5C	R84XMPTN	4	binary	Number of plot counter entries for M type devices.
96	60	R84XMPTO	4	binary	Offset to first plot counter entry for M type devices.

Entry for each J Type, X Type, and M Type Plot Counter

Offsets		Name	Length	Format	Description
0	0	R84XPTS	4	binary	XTYPE plot scale.
4	4	R84XPTC	4	binary	Count for XTYPE plot scale.

JES3 Queue Length by JES3 Function (RQINDEX Plot) Entry

Offsets		Name	Length	Format	Description
0	0	R84RNEXT	4	binary	Offset to next RQINDEX plot.
4	4	R84RQNAM	33	EBCDIC	Name of RQINDEX.
37	25		3		Reserved.
40	28	R84RPLLO	4	binary	Smallest scale for RQINDEX plot.
44	2C	R84RPLHI	4	binary	Largest scale for RQINDEX plot.
48	30	R84RPLIN	4	binary	Increment for plotting RQINDEX plot.

Offsets		Name	Length	Format	Description
52	34	R84RPTMN	4	binary	Minimum plot value for RQINDEX plot
56	38	R84RPTMX	4	binary	Maximum plot value for RQINDEX plot.
60	3C	R84RPTAV	4	binary	Average plot value for RQINDEX plot.
64	40	R84RPTN	4	binary	Number of plot counter entries for RQINDEX plot.
68	44	R84RPTO	4	binary	Offset to first plot counter entry for RQINDEX plot.

RQINDEX Plot Counter Entry

Offsets		Name	Length	Format	Description
0	0	R84RQPTS	4	binary	RQINDEX plot scale.
4	4	R84RQPTC	4	binary	Count for RQINDEX plot scale.

Subtype 6 — JES3 Hot Spot Analysis

This subtype has one section.

Offsets		Name	Length	Format	Description
0	0	R84SPLNG	4	binary	Length of the JES3 hot spot analysis section.
4	4	R84SPNUM	4	binary	Total number of hot spot entries.
8	8	R84SPOF	4	binary	Offset to the first hot spot entry.
12	C	R84SPOT	8	EBCDIC	SPOT = *value*.
20	14	R84WIDTH	8	EBCDIC	WIDTH = *value*.
28	1C	R84NAME	8	EBCDIC	NAME = *value*.
36	24	R84HFCT	8	EBCDIC	HFCT = *value*.
44	2C	R84HSPFL	1	binary	Hot spot flag **Bit** **Meaning When Set** **X'80'** Hot spot table exceeded flag.
45	2D		3		Reserved.

Hot Spot Entry

Offsets		Name	Length	Format	Description
0	0	R84SCSCT	8	EBCDIC	CSECT name (if there is one).
8	8	R84STYPE	2	EBCDIC	CSECT type **Value** **Meaning** **C** CSA **J** JES3 private **L** Modified link pack area (MLPA) **P** Pageable link pack area (PLPA) **M** MVS nucleus **N** JES3 nucleus **R** IATRJMN **EC** Extended CSA **EJ** Extended JES3 private **EL** Extended modified link pack area (MLPA) **EP** Extended pageable link pack area (PLPA).
10	A		2		Reserved.
12	C	R84SSTRT	4	binary	Starting address or displacement.
16	10	R84SEND	4	binary	Ending address or displacement.
20	14	R84SPCNT	4	binary	CSECT reference count.
24	18	R84SPNRF	4	binary	CSECT reference count in JES3 nucleus task.

Offsets		Name	Length	Format	Description
28	1C	R84SPARF	4	binary	CSECT reference count in JES3 auxiliary task.

Subtype 7 — JES3 Internal Reader DSP Analysis

This subtype has one section.

Offsets		Name	Length	Format	Description
0	0	R84IRLNG	4	binary	Length of JES3 internal reader DSP analysis data section.
4	4	R84IRMN	4	binary	Minimum number of active internal reader DSPs.
8	8	R84IRMX	4	binary	Maximum number of active internal reader DSPs.
12	C	R84IRAV	4	binary	Average number of active internal reader DSPs.
16	10	R84IRIR	4	binary	Average number of idle internal reader DSPs.
20	14	R84IRHWM	4	binary	Internal reader DSP high water mark.
24	18	R84IRATM	4	binary	Active INTRDR-At-Max count.
28	1C	R84IRAT0	4	binary	No-INTRDR-Active count.
32	20	R84IRAVL	4	binary	Average length of the INTRDR queue.
36	24	R84IRMXA	4	binary	Maximum internal reader DSPs allowed; if it is 0000FFFF, there is no limit on the number of INTRDR DSPs allowed.

Subtype 8 — JES3 Subsystem Interface (SSI) Response Time Analysis

This subtype has one section.

Offsets		Name	Length	Format	Description
0	0	R84SILNG	4	binary	Length of the SSI response time section.
4	4	R84SSIN	4	binary	Total number of SSI entries.
8	8	R84SSIO	4	binary	Offset to the first SSI entry.

SSI Entry

Offsets		Name	Length	Format	Description
0	0	R84SIFN	12	EBCDIC	SSI function code name.
12	C	R84SIREQ	4	binary	Number of requests received.
16	10	R84SIRSP	4	binary	Number of responses received.
20	14	R84SIMIN	4	binary	Minimum response time, in microseconds.
24	18	R84SIMAX	4	binary	Maximum response time, in microseconds.
28	1C	R84SIAVG	4	binary	Average response time, in microseconds.

Subtype 9 — JES3 Subsystem Interface (SSI) Destination Queue Analysis

This subtype has one section.

Offsets		Name	Length	Format	Description
0	0	R84DQLNG	4	binary	Length of the SSI destination queue data section.
4	4	R84DQNUM	4	binary	Total number of SSI destination entries.
8	8	R84DQOF	4	binary	Offset to the first SSI destination queue entry.

SSI Destination Entry

Offsets		Name	Length	Format	Description
0	0	R84DQNAM	30	EBCDIC	SSI destination queue name.
30	1E	R84MPCNM	8	EBCDIC	Name of main processor.
38	26	R84DQFLG	1	binary	Dynamic destination queue flag byte **Value** **Meaning When Set** **X'80'** Dynamic destination queue / Global / FSS (Functional Subsystem) entry **X'40'** Dynamic destination queue / Global / FSS/FSA (Functional Subsystem Application) entry **X'20'** Dynamic destination queue / Local / FSS only entry **X'10'** Dynamic destination queue / Local / FSS/FSA entry.
39	27		1		Reserved.
40	28	R84FSSNM	8	EBCDIC	FSS Name (Global/Dynamic Destination Queue).
48	30	R84FSSID	2	binary	FSS ID (Local/Dynamic Destination Queue).
50	32	R84FSANM	8	EBCDIC	FSA Name (Global/Dynamic Destination Queue and FSS/FSA entry).
58	3A	R84FSAID	2	binary	FSA ID (Local/Dynamic Destination Queue).
60	3C	R84DQMAX	4	binary	Maximum destination queue length.
64	40	R84DQMIN	4	binary	Minimum destination queue length.
68	44	R84DQAVG	4	binary	Average destination queue length.

Subtype 10 — Workload Manager Analysis

The Workload Manager (WLM) analysis section consists of the following data sections:

- WLM general section contains offsets to the other sections.
- Service class section - information is collected for each service class that had activity during the sampling interval. The following sections are created for each service class:
  – Service class fixed section contains the service class name and offsets to the other sections.
  – Service class non-system information contains non-system related information such as the number of jobs in MDS, GMS etc.
  – Service class system information - one entry for every system that had activity during the sampling interval.

Offsets		Name	Length	Format	Description
WLM General Section:					
0	0	R84WLMLN	4	binary	Length of the WLM general section.
4	4	R84SRVOF	4	binary	Offset from this section to the first service class section or zero.
8	8	R84WLMGR	80	binary	Reserved.
Service Class Fixed Section:					
0	0	R84 _SRVCLEN	4	binary	Length of this section.
4	4	R84 _SRVCNAME	8	EBCDIC	Service class name.
12	C	R84 _SRVCSMPC	4	binary	Number of samples this service class was found.
16	10	R84 _SRVCNXOF	4	binary	Offset from this section to the next service class fixed section in this buffer.

Offsets		Name	Length	Format	Description
20	14	R84 _SRVNSYOF	4	binary	Offset from this section to the non-system specific information for this service class. This will be zero if this is a continuation buffer for system specific information.
24	18	R84 _SRVSYSOF	4	binary	Offset from this section to the system specific information for this service class in this buffer.
28	1C	R84 _SRVCRSV1	16	binary	Reserved.
Service Class Non-System Specific Section:					
0	0	R84 _NSYSLEN	4	binary	Length of this section.
4	4	R84 _MAINWMIN	4	binary	Main service wait minimum count.
8	8	R84 _MAINWMAX	4	binary	Main service wait maximum count.
12	C	R84 _MAINWAVG	4	binary	Main service wait average count.
16	10	R84 _MDSMIN	4	binary	MDS minimum count.
20	14	R84 _MDSMAX	4	binary	MDS maximum count.
24	18	R84 _MDSAVG	4	binary	MDS average count.
28	1C	R84 _GMSMIN	4	binary	GMS minimum count.
32	20	R84 _GMSMAX	4	binary	GMS maximum count.
36	24	R84 _GMSAVG	4	binary	GMS average count.
40	28	R84 _MOFNCMIN	4	binary	Main offline/not connected minimum count.
44	2C	R84 _MOFNCMAX	4	binary	Main offline/not connected maximum count.
48	30	R84 _MOFNCAVG	4	binary	Main offline/not connected average count.
52	34	R84 _GRPDSMIN	4	binary	Group disabled minimum count.
56	38	R84 _GRPDSMAX	4	binary	Group disabled maximum count.
60	3C	R84 _GRPDSAVG	4	binary	Group disabled average count.
64	40	R84 _JBHLDMIN	4	binary	Job held minimum count.
68	44	R84 _JBHLDMAX	4	binary	Job held maximum count.
72	48	R84 _JBHLDAVG	4	binary	Job held average count.
76	4C	R84 _CLSDSMIN	4	binary	Class disabled minimum count.
80	50	R84 _CLSDSMAX	4	binary	Class disabled maximum count.
84	54	R84 _CLSDSAVG	4	binary	Class disabled average count.
88	58	R84 _SCHENMIN	4	binary	Scheduling environment not available minimum count.
92	5C	R84 _SCHENMAX	4	binary	Scheduling environment not available maximum count.
96	60	R84 _SCHENAVG	4	binary	Scheduling environment not available average count.
100	64	R84 _SPOOLMIN	4	binary	Spool space shortage minimum count.
104	68	R84 _SPOOLMAX	4	binary	Spool space shortage maximum count.
108	6C	R84 _SPOOLAVG	4	binary	Spool space shortage average count.
112	70	R84 _TDEPTMIN	4	binary	TDEPTH reached minimum count.
116	74	R84 _TDEPTMAX	4	binary	TDEPTH reached maximum count.
120	78	R84 _TDEPTAVG	4	binary	TDEPTH reached average count.
124	7C	R84 _TLIMTMIN	4	binary	TLIMIT exceeded minimum count.
128	80	R84 _TLIMTMAX	4	binary	TLIMIT exceeded maximum count.
132	84	R84 _TLIMTAVG	4	binary	TLIMIT exceeded average count.
136	88	R84 _MDEPTMIN	4	binary	MDEPTH reached minimum count.
140	8C	R84 _MDEPTMAX	4	binary	MDEPTH reached maximum count.
144	90	R84 _MDEPTAVG	4	binary	MDEPTH reached average count.
148	94	R84 _MLIMTMIN	4	binary	MLIMIT exceeded minimum count.
152	98	R84 _MLIMTMAX	4	binary	MLIMIT exceeded maximum count.
156	9C	R84 _MLIMTAVG	4	binary	MLIMIT exceeded average count.

Offsets		Name	Length	Format	Description
160	A0	R84 _PLELGMIN	4	binary	Number of jobs eligible to run anywhere in the SYSPLEX - minimum count.
164	A4	R84 _PLELGMAX	4	binary	Number of jobs eligible to run anywhere in the SYSPLEX - maximum count.
168	A8	R84 _PLELGAVG	4	binary	Number of jobs eligible to run anywhere in the SYSPLEX - average count.
172	AC	R84 _PLINEMIN	4	binary	Number of jobs ineligible to run anywhere in the SYSPLEX for reasons other than class limits - minimum count.
176	B0	R84 _PLINEMAX	4	binary	Number of jobs ineligible to run anywhere in the SYSPLEX for reasons other than class limits - maximum count.
180	B4	R84 _PLINEAVG	4	binary	Number of jobs ineligible to run anywhere in the SYSPLEX for reasons other than class limits - average count.
184	B8	R84 _PLLMTMIN	4	binary	Number of jobs ineligible to run anywhere in the SYSPLEX because of class limits - minimum count.
188	BC	R84 _PLLMTMAX	4	binary	Number of jobs ineligible to run anywhere in the SYSPLEX because of class limits - maximum count.
192	C0	R84 _PLLMTAVG	4	binary	Number of jobs ineligible to run anywhere in the SYSPLEX because of class limits - average count.
196	C4	R84 _PLEXEMIN	4	binary	Number of jobs in execution - minimum count.
200	C8	R84 _PLEXEMAX	4	binary	Number of jobs in execution - maximum count.
204	CC	R84 _PLEXEAVG	4	binary	Number of jobs in execution - average count.
208	D0	R84 _NSYSRSV1	24	binary	Reserved.
Service Class System Specific Section:					
0	0	R84 _SYSLEN	4	binary	Length of this section.
4	4	R84 _SYSNXOF	4	binary	Offset of next system specific information for this service class in this buffer.
8	8	R84 _SYSNAME	8	EBCDIC	System name.
16	10	R84 _SYELGMIN	4	binary	Number of jobs eligible to run on this system - minimum count.
20	14	R84 _SYELGMAX	4	binary	Number of jobs eligible to run on this system - maximum count.
24	18	R84 _SYELGAVG	4	binary	Number of jobs eligible to run on this system - average count.
28	1C	R84 _SYINEMIN	4	binary	Number of jobs ineligible to run on this system - minimum count.
32	20	R84 _SYINEMAX	4	binary	Number of jobs ineligible to run on this system - maximum count.
36	24	R84 _SYINEAVG	4	binary	Number of jobs ineligible to run on this system - average count.
40	28	R84 _SYEXEMIN	4	binary	Number of jobs in execution on this system - minimum count.
44	2C	R84 _SYEXEMAX	4	binary	Number of jobs in execution on this system - maximum count.
48	30	R84 _SYEXEAVG	4	binary	Number of jobs in execution on this system - average count.
52	34	R84 _SYSCONMIN	4	binary	Number of jobs that can execute on this system only – minimum count.
56	38	R84 _SYSCONMAX	4	binary	Number of jobs that can execute on this system only – maximum count.
60	3C	R84 _SYSCONAVG	4	binary	Number of jobs that can execute on this system only – average count.
64	40	R84 _SYSRSVD1	12	binary	Reserved.

Record Type 85 (55) — Measuring OAM Transaction Performance Using SMF

OAM writes record type 85 to account for OAM activity.

Reference book

For more information about record type 85, see *z/OS DFSMS OAM Planning, Installation, and Storage Administration Guide for Object Support*.

Record Type 88 (58) — System Logger Data

Record type 88 is produced in response to ENF signal 37, which indicates that the SMF global recording interval has ended. Each record reports system logger activity for one log stream or structure. Record values from multiple systems can be summed to give the sysplex view of system logger activity.

Record type 88 has the following subtypes; each contains a header and product section and sections unique for each record:

- **Subtype 1** - Records log stream activity.

  You can use system logger activity data to identify high or low users of system logger services. System logger event data indicates conditions that cause system logger services to be unavailable, such as the STRUCTURE FULL condition for a coupling facility log stream. You can also use system logger activity data to perform capacity planning or configuration analysis.

  The structure-related data in subtype 1 allows you to analyze input/output to interim storage for a log stream in terms of one input stream and two output streams. The input is the count of bytes written to interim storage (SMF88SWB). The two outputs are the count of the number of bytes deleted from interim storage under two scenarios:
  - Bytes deleted before the data was offloaded to DASD log data sets. (SMF88SIB).
  - Bytes deleted after data was offloaded to DASD log data sets (SMF88SAB).

  If the first output count is high and the second is low, system logger is successfully using interim storage to avoid the I/O incurred by offloading to DASD log data sets.
- **Subtype 11** - Records coupling facility structure alter activity, which is the changes to the entry-to-element ratio made by system logger for coupling facility structures associated with coupling facility log streams. This information allows you to monitor how system logger is managing the entry-to-element ratio for coupling facility structures.

| **Macro to Symbolically Address Record Type 88:** The SMF record mapping
| macro to symbolically address record type 88 is IXGSMF88. The macro is suppled
| in SYS1.MACLIB.

For additional information about system logger see Chapter 9, “System Logger accounting,” on page 9-1.

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number) that locate the other sections on the record.

This triplet information should be checked prior to accessing a section of the record. All three fields being non-zero mean that the section exists on the record; conversely any of the fields being zero indicates that the section does not exist on the record. The ‘number’ triplet field is the primary indication of the existence of the field.

Offsets		Name	Length	Format	Description
0	0	SMF88LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	SMF88SEG	2	binary	Segment descriptor (see record length field)
4	4	SMF88FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See “Standard SMF Record Header” on page 13-1 for a detailed description.
5	5	SMF88RTY	1	binary	Record Type 88 (X'58')
6	6	SMF88TME	4	binary	Time since midnight, in hundredths of a second, that the record was built into the SMF buffer.
10	A	SMF88DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
14	E	SMF88SID	4	EBCDIC	System Identification (from SMFPRMxx SID parameter).
18	12	SMF88WID	4	EBCDIC	Subsystem identifier (STC)
22	16	SMF88STP	2	binary	Record subtype
24	18	SMF88SDL	4	binary	Length of Self-defining Section
28	1C	SMF88POF	4	binary	Offset to Product Section from start of record, including the record descriptor word (RDW).
32	20	SMF88PLN	2	binary	Length of Product Section.
34	22	SMF88PON	2	binary	Number of Product Sections in this record.
36	24	SMF88LOF	4	binary	Offset to Log Stream Section from start of record, including the record descriptor word (RDW).
40	28	SMF88LLN	2	binary	Length of Log Stream Section.
42	2A	SMF88LON	2	binary	Number of Log Stream Sections in this record.
44	2C	SMF88EOF	4	binary	Offset to Event Section from start of record, including the record descriptor word (RDW).
48	30	SMF88ELN	2	binary	Length of Event Section.
50	32	SMF88EON	2	binary	Number of Event Sections in this record.
52	34	SMF88SOF	4	binary	Offset to Structure (Interim Storage) Section from start of record, including the record descriptor word (RDW).
56	38	SMF88SLN	2	binary	Length of Structure (Interim Storage) Section.
58	3A	SMF88SON	2	binary	Number of Structure (Interim Storage) Sections in this record.

Offsets		Name	Length	Format	Description
60	3C	SMF88AOF	4	binary	Offset to Structure Alter Section from start of record, including the record descriptor word (RDW).
64	40	SMF88ALN	2	binary	Length of Structure Alter Section.
66	42	SMF88AON	2	binary	Number of Structure Alter Sections in this record.

Product Section

This section contains general information about system logger and the system at the time the record was generated.

Triplet Information: This section is located on the record using the following triplet fields, which are located in the 'Header/self-defining' section:

Offset SMF88POF
Length SMF88PLN
Number SMF88PON

Offsets		Name	Length	Format	Description
0	0	SMF88TYP	2	binary	Record Subtype 1—Log stream update
2	2	SMF88RVN	2	EBCDIC	Record version number — 01.
4	4	SMF88PNM	8	EBCDIC	Product name — SCLOG.
12	C	SMF88OSL	8	EBCDIC	MVS operating system name.
20	14	SNF88SYN	8	EBCDIC	System name (from SYSNAME parameter in the IEASYSxx parmlib member)

Subtype 1

Log Stream Section

This section identifies the log stream that generated the record and provides general log stream usage statistics.

| Also refer to the SMF88LSD DSECT Section in macro IXGSMF88 in
| SYS1.MACLIB.

Triplet Information: This section is located on the record using the following triplet fields, which are located in the 'Header/self-defining' section:

Offset SMF88LOF
Length SMF88LLN
Number SMF88LON

Offsets		Name	Length	Format	Description
0	0	SMF88LIT	8	EBCDIC	SMF-counter instance token identifies a connection to a log stream. It ties together SMF records for a given instance of a connection to a log stream.
8	8	SMF88LSN	26	EBCDIC	Log stream name.
34	22	SMF88LFL	2	EBCDIC	Log stream flags: **Bit** **Meaning When Set** **0** Reserved **1** This log stream used staging data sets during the expiring SMF interval. **2** When ON, the SMF record has been generated when the log stream disconnected from the system. **3-15** Reserved.

Offsets		Name	Length	Format	Description
36	24	SMF88LTD	8	EBCDIC	TOD-time when SMF global interval expired (from parameter list of ENF event 37, which requested this SMF record from logger). Time is reported in GMT.
44	2C	SMF88LWI	4	binary	IXGWRITE macro invocations for this log stream issued during the expiring SMF interval.
48	30	SMF88LIB	4	binary	Minimum BLOCKLEN value of IXGWRITE seen during the expiring SMF interval. Initialized to X'7FFFFFFF' if no SMF activity occurs within an SMF interval.
52	34	SMF88LAB	4	binary	Maximum BLOCKLEN value of IXGWRITE seen by this log stream during the expiring SMF interval. Initialized to zero if no SMF activity occurs within an SMF interval.
56	38	SMF88LWB	8	EBCDIC	Bytes requested by user application(s) on IXGWRITE macro invocations for this log stream during the expiring SMF interval (FORMAT=LONG FLOATING POINT).
64	40	SMF88LDB	8	EBCDIC	Bytes written to DASD for this log stream during the expiring SMF interval (FORMAT=LONG FLOATING POINT).
72	48	SMF88LIO	4	binary	Number of times a request was made by system logger to write log stream data to DASD during the expiring SMF interval.
76	52	SMF88LIS	4	binary	Number of times system logger had to suspend before writing log stream data to DASD because a previously-initiated write to DASD had not yet completed during the expiring SMF interval.

Events Section

This section contains flags and counters used for unusual events.

| Also refer to the SMF88ESD DSECT Section in macro IXGSMF88 in
| SYS1.MACLIB.

Triplet Information: This section is located on the record using the following triplet fields, which are located in the ‘Header/self-defining’ section:
Offset SMF88EOF
Length SMF88ELN
Number SMF88EON

Offsets		Name	Length	Format	Description
0	0	SMF88EDS	4	binary	Number of log stream DASD shifts initiated by this system during the expiring SMF interval. (FORMAT=32 bits)
4	4	SMF88ERI	4	binary	Number of structure rebuild events initiated for this log stream, as seen by this system. Cumulative from the creation of this SMF-counter instance. (FORMAT=32 bits)
8	8	SMF88ERC	4	binary	Number of structure rebuild events completed for this log stream, as seen by this system. Cumulative from the creation of this SMF-counter instance. (FORMAT=32 bits)
12	C	SMF88ESF	4	binary	Number of times Logger detected structure full conditions for this Logstream on this system during the expiring SMF interval. (FORMAT=32 bits)
16	10	SMF88ETT	4	binary	Number of times system logger detected a Staging Data Set Threshold Hit condition for this log stream on this system during the expiring SMF interval. (FORMAT=32 bits)
20	14	SMF88ETF	4	binary	Number of times system logger detected a Staging Data Set Full condition for this log stream on this system during the expiring SMF interval. (FORMAT=32 bits)

Offsets		Name	Length	Format	Description
24	18	SMF88EO	4	binary	Number of successful offloads (greater than one byte of data) performed for this log stream on this system during the expiring interval. (FORMAT=32 bits)
28	1C	SMF88EFS	4	binary	Number of successful offloads performed for all the log streams connected from this system to the structure due to the structure reaching 90% full during the expiring SMF interval. (FORMAT=32 bits)
32	20	SMF88EDO	4	binary	Number of times an offload was requested via the IXGOFFLD service during the expiring SMF interval. (FORMAT=32 bits)
36	24	SMF88EAF	4	binary	Number of times IXGLOGR detected 'Staging-Dataset-Async-Buffer_Full' condition for this logstream on this system during the expiring SMF interval. (FORMAT=32 bits)
40	28		16	EBCDIC	Reserved.

Structure (Interim Storage) Section

This section contains information related to the interim storage for a log stream. For a coupling facility log stream, interim storage is coupling facility structure space allocated to the log stream. For a dasd only log stream, interim storage is staging data set space.

Also refer to the SMF88SSD DSECT Section in macro IXGSMF88 in SYS1.MACLIB.

Triplet Information: This section is located on the record using the following triplet fields, which are located in the 'Header/self-defining' section:

Offset SMF88SOF
Length SMF88SLN
Number SMF88SON

Offsets		Name	Length	Format	Description
0	0	SMF88STN	16	EBCDIC	Name of the structure used for this log stream. For a dasd only log stream, this field will show *DASDONLY*.
16	10	SMF88SWB	8	EBCDIC	Current written bytes count. Count of bytes written to interim storage during this interval (FORMAT= LONG FLOATING POINT).
24	18	SMF88SIB	8	EBCDIC	Current instead bytes count. Count of bytes deleted from interim storage during this interval, instead of being offloaded (FORMAT=LONG FLOATING POINT). This field is incremented due to either a user invocation of IXGDELET where the data had not been offloaded or system logger internal management of interim storage.
32	20	SMF88SAB	8	EBCDIC	Current after bytes count. Count of bytes deleted from interim storage during this interval, after being offloaded (FORMAT=LONG FLOATING POINT). This field is incremented by system logger's internal management of interim storage.
40	28		4	EBCDIC	Reserved.
44	2C	SMF88SII	4	binary	Current instead invocation count. Count of times a deletion from interim storage for this log stream was performed during this interval, where the data was not first offloaded.
48	30	SMF88SAI	4	binary	Current after invocation count. Count of times a deletion from interim storage was performed during this interval, after being offloaded (occurs due to system logger management of interim storage).

Offsets		Name	Length	Format	Description
52	34	SMF88SC1	4	binary	The count of type-1 completions during the expired SMF interval. The Logstream contents can remain in the primary storage. No need to move data from primary storage to DASD. This field is valid for both coupling facility and DASDONLY Logstreams.
56	38	SMF88SC2	4	binary	The count of type-2 completions during the expired SMF interval. Logstream is filling the primary storage but space is not critical. System Logger begins asynchronous offloading of Logstream data from the primary storage to DASD. This field is valid for both coupling facility and DASDONLY Logstreams.
60	3C	SMF88SC3	4	binary	The count of type-3 completions during the expired SMF interval. Space used in the structure (by this Logstream) is critical but does not exceed 100 percent. This field is only valid for coupling facility based Logstreams.
64	40		4		Reserved

Subtype 11

Structure Alter Section

This section identifies a structure and provides statistics on system logger's management of the structures entry to element ratio.

Triplet Information: This section is located on the record using the following triplet fields, which are located in the 'Header/self-defining' section:

Offset SMF88AOF
Length SMF88ALN
Number SMF88AON

Offsets		Name	Length	Format	Description
0	0	SMF88ANM	16	EBCDIC	Structure Name
16	10	SMF88ATK	8	binary	Alter Token, which is a STCK timestamp, showing last time the element to entry ratio was altered to accommodate the average buffer size being written to the structure.
24	18	SMF88AIT	8	binary	SMF-counter instance token identifies a connection to structure. It ties together SMF records for a given instance of a connection to the structure.
32	20	SMF88AWB	8	binary	Current written bytes count. Count of bytes written to the structure from this system and associated with this alter token, for this interval.
40	28	SMF88AO	4	binary	The number of offloads that occurred on this system associated with this alter token, for this interval.
44	2C	SMF88ACB	4	binary	Current allocated average buffer size, which system logger uses to calculate entry-to-element ratio for the structure.
48	30	SMF88ATB	4	binary	Targeted average buffer size that system logger tried to achieve by altering the element to entry ratio.
52	34	SMF88ASZ	4	binary	Structure size in 4K blocks.
56	38	SMF88ATW	4	binary	Total number of log writes to the structure during the interval.
60	3C	SMF88ALS	4	binary	Total number of log streams connected to the structure on this system at the recording.

Offsets		Name	Length	Format	Description
64	40	SMF88AFG	1	binary	Alter Flags **Bit** **Meaning When Set** **0** When ON, record was generated to report a change in the average buffer size being written to the structure. **1** When ON, record was generated due to the last log stream disconnecting which resulted in the structure being disconnected. **2-7** Reserved.

Record Type 89 (59) — Usage Data

Reference books

SMFPRM*xx* parameters are described in *z/OS MVS Initialization and Tuning Reference*.

The usage reporting program is described in *z/OS MVS Product Management*.

The Register service is described in *MVS Programming: Registration Services*.

The type 89 record provides information about product usage on a particular MVS system. The usage reporting program analyzes the data collected in the type 89 record. For more information see *z/OS MVS Product Management*. The record is generated on a scheduled interval (1 hour maximum).

Record type 89 has two subtypes:

- Subtype 1 — Usage Data

  Contains, for the scheduled interval, summary usage data for all products across the system that have registered to request usage recording. These products must issue the IFAUSAGE macro to specify:
  - Registration information.
  - Level and scope of data collection (task or address space level).
  - Start and end of collection period.

  For more information on the IFAUSAGE macro, see Chapter 12, “IFAUSAGE — Collecting Usage Data,” on page 12-1.
- Subtype 2 — State Data

  Contains, for the scheduled interval, summary state data for all products across the system that have registered to indicate that they are running. These products issue the MVS Register service to indicate that they are running. MVS uses information a product supplies to determine if the product is enabled and to maintain a list of active products.

The installation controls the scheduling of the type 89 record by checking the INTERVAL value specified for the SMF address space. Because SMF is a started task, this is the INTERVAL value for SUBSYS=STC in the SMFPRMxx member. If the INTERVAL value is less than or equal to one hour, then that value is used as the reporting interval for type 89 records. If that value is greater than one hour, or if no INTERVAL value is specified, then one hour is used as the reporting interval for type 89 recording.

There are two sets of interval START and STOP times in the record:
- Usage data interval START/STOP.

- Reporting interval START/STOP.

The usage data interval represents the hourly buckets that the usage reporting program records product usage in. This interval is synchronized to the top of the hour.

The reporting interval represents the increment when the type 89 records are generated and is also synchronized to the top of the hour. For example, if you specified an interval value of 30 minutes, type 89 records would be generated at 9:00, 9:30, 10:00... If you are collecting usage data at the task level, you may want to synchronize interval processing to the top of the hour in your SMFPRMxx member because task level data collection is scheduled by interval processing.

SMF type 89 records are generated on the interval as requested; if no products are registered, then a type 89 record is generated with a product count of 0.

Record Environment

The following conditions exist for the generation of each of the subtypes of this record:

Macro SMFEWTM, BRANCH=YES (record exit: IEFU84)

Mode

Subtype	**Mode**
1	SRB
2	SRB

Storage Residency 31-bit

SUBSYS STC

Record Mapping

Header/Self-defining Section

This section contains the common SMF record header fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF89LEN	2	binary	Record Length. This field along with the next, are referred to as the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	SMF89SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF89FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0** Subsystem identification follows system identification **1** Subtypes used **2** Reserved **3-6** MVS Version Indicators (Set by SMF) **7** Reserved.
5	5	SMF89RTY	1	binary	Record type 89 (X'59').
6	6	SMF89TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved to the SMF buffer.
10	A	SMF89DTE	4	packed	Date that the record was moved to the SMF buffer, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.

Offsets		Name	Length	Format	Description
14	E	SMF89SID	4	EBCDIC	System identification (from the SID parameter in the SMFPRMxx parmlib member).
18	12	SMF89WID	4	EBCDIC	Subsystem identifier for the SMF address space - ‘STC’ for Started Task.
22	16	SMF89STP	2	binary	Record subtype **1** Usage Data Interval Record **2** State Data Interval Record
24	18	SMF89SDL	4	binary	Length of self-defining section - ‘28’

Self-Defining Section

This section contains the triplet fields (offset/length/number) that locate other sections on the record. This triplet information should be checked prior to accessing a section of the record. The ‘number’ triplet field is the primary indication of the existence of the field. This section is an extension of the header and follows it physically in the record.

Offsets		Name	Length	Format	Description
0	0	SMF89PRO	4	binary	Offset to Record Product section from start of record, including the record descriptor word (RDW).
4	4	SMF89PRL	2	binary	Length of Record Product section - ‘36’.
6	6	SMF89PRN	2	binary	Number of Record Product sections - ‘1’.
8	8	SMF89SIO	4	binary	Offset to System ID section from start of record, including the record descriptor word (RDW).
12	0C	SMF89SIL	2	binary	Length of System ID section - ‘76’.
14	0E	SMF89SIN	2	binary	Number of System ID sections on record - ‘1’.
16	10	SMF89UDO	4	binary	Offset to first Usage or State Data section from start of record, including the record descriptor word (RDW).
20	14	SMF89UDL	2	binary	Length of each Usage Data section (‘84’) or State Data section (‘68’).
22	16	SMF89UDN	2	binary	Number of Usage or State Data sections on record (minimum of ‘0’).
24	18	SMF89UDR	4	binary	Number of State Data sections remaining (or ‘0’ for Usage Data section).

Record Product Section

This section provides information about the type 89 record, the system, and the recording interval.

Triplet Information: This section is located in the record using the following triplet fields, which are located in the ‘self-defining’ section:

Offset SMF89PRO

Length SMF89PRL

Number SMF89PRN - This field is always ‘1’ because each type 89 record that is generated has one record product section.

Offsets		Name	Length	Format	Description
0	0	SMF89PNM	8	EBCDIC	Record product name - ‘SMF’.
8	8	SMF89RVN	4	binary	Record version number - ‘1’.
12	0C	SMF89OSL	8	EBCDIC	MVS system level (ie. ‘SP4.3.0’).

Offsets		Name	Length	Format	Description
20	14	SMF89IST	4	binary	Reporting interval START Time (local, hundredths of a second from midnight). This field and SMF89IET define the recording interval. This is different from the usage data interval that is used to collect data into hourly buckets.
24	18	SMF89ISD	4	packed	Reporting interval START Date in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
28	1C	SMF89IET	4	binary	Reporting interval END Time (local, hundredths of a second from midnight). This field and SMF89IST define the recording interval. This is different from the usage data interval that is used to collect data into hourly buckets.
32	20	SMF89IED	4	packed	Reporting interval END Date in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.

System ID Section

This section provides information about the system (both hardware and software) at the time the usage data was collected.

Triplet Information: This section is located on the record using the following triplet fields, which are located in the 'self-defining' section:

Offset SMF89SIO

Length SMF89SIL

Number SMF89SIN - This field is always '1' because each type 89 record that is generated has one system ID section.

Offsets		Name	Length	Format	Description
0	0	SMF89SYN	8	EBCDIC	MVS system name (SYSNAME from IEASYSxx).
8	8	SMF89UST	4	binary	Usage data interval START time (local, hundredths of a second from midnight). This will usually be an hour value (such as 01:00:00.00) except in the case of the first record during an IPL (which will report the "IPL" time). This is different from the recording interval which is used to report on the generation of the usage records. This field and SMF89UET define the hour 'bucket' that the usage data reflects.
12	0C	SMF89USD	4	packed	Usage data interval START Date in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
16	10	SMF89UET	4	binary	Usage data interval END time (local, hundredths of a second from midnight). This will usually be an hour value (such as 01:00:00.00). This field and SMF89UST define the hour 'bucket' that the usage data reflects.
20	14	SMF89UED	4	packed	Usage data interval END date in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
24	18		4	binary	Reserved.
28	1C		4	binary	Reserved.
32	20	SMF89CMN	2	packed	CPU model number.
34	22	SMF89CVN	1	binary	CPU version number.

Offsets		Name	Length	Format	Description
35	23	SMF89LPI	1	binary	LPAR indicators: **Bit** **Meaning When Set** **0** The one digit LPAR ID contained in SMF89LP2 (bit 4) is valid (SMF89LPV) **1** The two digit LPAR ID contained in field SMF89LP3 is valid (SMF89LPM) **2 - 3** reserved **4-7** The one digit LPAR ID (X'0-F') (SMF89LP2) **Notes:** 1. For one digit LPAR IDs (X'0-F'), both SMF89LPV (bit 0) and SMF89LPM (bit 1) will be on and both SMF89LP2 (bits 4-7) and field SMF89LP3 will contain the LPAR ID. 2. For two digit LPAR IDs (greater than X'F'), SMF89LPM (bit 1) will be on, and SMF89LP3 will contain the LPAR ID.
36	24	SMF89SER	1	packed	CPU serial number.
39	27	SMF89LP3	1	binary	LPAR ID.
40	28	SMF89RPP	4	binary	CPU relative processing power indicator
44	2C	SMF89SPN	8	EBCDIC	Sysplex name (from the SYSPLEX parameter in the COUPLExx parmlib member).
52	34	SMF89CPT	6	EBCDIC	CPC type number (blanks if data is not available)
58	3A	SMF89CPM	3	EBCDIC	CPC model number (blanks if data is not available)
61	3D	SMF89CPS	12	EBCDIC	CPC sequence number (blanks if data is not available)
73	49		3		Reserved.
76	4C	SMF89MNF	16	EBCDIC	V1-CPC manufacturer
92	5C	SMF89TID	4	EBCDIC	V1-CPC type
96	60	SMF89MDL	16	EBCDIC	V1-CPC model
112	70	SMF89SQC	16	EBCDIC	V1-CPC sequence code
128	80	SMF89POM	4	EBCDIC	V1-CPC plant of manufacturer
132	84	SMF89CPC	4	binary	CPU capability
136	88	SMF89CCC	2	binary	Configured CPU count
138	8A	SMF89SCC	2	binary	Standby CPU count
140	8C	SMF89MAF	30	binary	Array of multiprocessing CPU capability adjustment factors

Subtype 1 — Usage Data Section

This section contains the product information (specified on the IFAUSAGE REGISTER request) and the usage data that has been collected for the interval specified by the start and end times (SMF89UST and SMF89UET) for that product.

There will be one usage data section for each unique product identification (specified by owner, name, version, qualifier) that is actively registered for any part of that specified interval. The data reported will be accumulated for ALL address spaces that had any interaction with the product.

Triplet Information: This section is located on the record using the following triplet fields, which are located in the ‘self-defining’ section:

Offset SMF89UDO

Length SMF89UDL

Number SMF89UDN

Offsets		Name	Length	Format	Description
0	0	SMF89UPO	16	EBCDIC	Product owner or vendor name (specified on the PRODOWNER option of the IFAUSAGE macro).
16	10	SMF89UPN	16	EBCDIC	Product name (specified on the PRODNAME option of the IFAUSAGE macro).
32	20	SMF89UPV	8	EBCDIC	Product version (specified on the PRODVERS option of the IFAUSAGE macro).
40	28	SMF89UPQ	8	EBCDIC	Product qualifier (specified on the PRODQUAL option of the IFAUSAGE macro).
48	30	SMF89UPI	8	EBCDIC	Product ID number (specified on the PRODID option of the IFAUSAGE macro).
56	38	SMF89UCT	8	long floating point	Product TCB time (in hundredths of a second).
64	40	SMF89USR	8	long floating point	Product SRB time (in hundredths of a second).
72	48	SMF89UFG	1	binary	Usage entry flags **Bit** **Meaning When Set** **0** Unauthorized register **1-7** Unused
73	49		2	binary	Reserved.
75	4B	SMF89URT	1	binary	Data format of value in SMF89URD (specified on the FORMAT option of the IFAUSAGE macro FUNCTIONDATA request). **0** No data specified **1** CPU Time in long floating point (in hundredths of a second). **2** Binary (64-bit) **3** long floating point
76	4C	SMF89URD	8	various	Product specific resource data (specified by the data option of the IFAUSAGE macro FUNCTIONDATA request). SMF89URT identifies the format of the data in this field.

Subtype 2 — State Data Section

This section contains the product information (specified on the MVS Register service or in the IFAPRDxx parmlib member) and the state data that has been collected for the interval specified by the start and end times (SMF89UST and SMF89UET) for that product.

There will be one state data section for each unique product identification (specified by owner, name, feature, version, release, and modification level) registered for any part of the interval.

Triplet Information: This section is located on the record using the following triplet fields, which are located in the 'self-defining' section:

Offset SMF89UDO

Length SMF89UDL

Number SMF89UDN

Offsets		Name	Length	Format	Description
0	0	SMF89T2ProdOwner	16	EBCDIC	Product owner or vendor name (from the prodowner parameter on the Register service or the OWNER field on the PROD statement in IFAPRDxx).
16	10	SMF89T2ProdName	16	EBCDIC	Product name (from the prodname parameter on the Register service or the NAME field on the PROD statement in IFAPRDxx).

Offsets		Name	Length	Format	Description
32	20	SMF89T2FeatureName	16	EBCDIC	Feature name (from the featurename parameter on the Register service or the FEATURENAME field on the PROD statement in IFAPRDxx).
48	30	SMF89T2ProdVers	2	EBCDIC	Product version (from the prodvers parameter on the Register service or the VERSION field on the PROD statement in IFAPRDxx).
50	32	SMF89T2ProdRel	2	EBCDIC	Product release (from the prodrel parameter on the Register service or the RELEASE field on the PROD statement in IFAPRDxx).
52	34	SMF89T2ProdMod	2	EBCDIC	Product modification level (from the prodmod parameter on the Register service or the MOD field on the PROD statement in IFAPRDxx).
54	36	SMF89T2ProdID	8	EBCDIC	Product identifier (from the prodID parameter on the Register service or the ID field on the PROD statement in IFAPRDxx).
62	3E	SMF89T2Flags	1	binary	State entry flags **Bit** **Meaning When Set** **0** Entry is not defined in IFAPRDxx **1** Entry is enabled in IFAPRDxx **2-3** Reserved **4** Register entry **5** State entry **6** 'No Report' entry — registered with Ifaedreg_Type_NoReport **7** Registered with Ifaedreg_Type_LicensedUnderProd
63	3F		1	EBCDIC	Reserved.
64	40	SMF89 T2NumInstances	4	binary	Number of instances of registration for this product.

Record Type 90 (5A) — System Status

Reference books

For information on operator system commands, see *z/OS MVS System Commands*.

For information on SYS1.PARMLIB, see *z/OS MVS Initialization and Tuning Reference*.

Record type 90 is written during initialization processing and whenever certain operator commands are issued. This variable length record is created for operator tracking and reporting of reliability data. It allows the installation to establish availability statistics.

The following events cause the recording of this record during IPL. (See the Product Section for the individual subtype indicator.)

- SET TIME command
- HALT EOD command
- SET DATE command
- SET OPT command
- SETSMF command
- SET SMF command
- SET MPF command
- SWITCH SMF command
- SET DAE command

- SET PFK command
- SET PROG command
- VARY WLM command
- IPL
- RESET command

Subtype 2 is written only if the CLOCK parameter is not specified on the SET DATE command. Any SET DATE command that uses the CLOCK parameter produces a subtype 1 record.

Subtype 8 is written only when the operator responds to message IEE956A, the system prompt for information about the IPL.

Subtype 23 is written each time the workload management service definition is installed on the WLM couple data set. A service definition is installed on the WLM couple data set by a function in the WLM ISPF application.

Subtype 24 is written each time a workload management service policy is activated. A service policy can be activated either by the VARY WLM command, or by a function in the WLM ISPF application.

Subtype 29 is written each time a LNKLST set is activated for the LNKLST concentration. The LNKLST set can be activated at IPL through the ACTIVATE statement in PROGxx, or through the SET PROG and SETPROG LNKLST commands.

Subtype 30 is written each time a RESET operator command completes successfully. The record identifies the job that was reset, the operator who initiated the command, and the change that was requested.For an enclave, the record identifies the name of the owner address space, the user and application that initiated the request, and the change that was requested.

Subtype 31 is written each time a module has been added to or deleted from LPA after IPL through the SETPROG LPA command, the LPA statement of the PROGxx parmlib member via the SET PROG=xx command, or the CSVDYLPA macro.

Subtype 32 is written each time there is a successful policy change.

Record Environment

The following conditions exist for the generation of each of the subtypes of this record:

Subtype	**Macro**
5,6,8,9,13,15	SMFEWTM(1), BRANCH=YES (record exit: IEFU84)
7	SMFWTM(1) (record exit: IEFU83)
Storage Residency	31-bit

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number) that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF90LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See "Standard SMF Record Header" on page 13-1 for a detailed description.
2	2	SMF90SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF90FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved. **3-6** Version indicators* **7** Reserved. *See "Standard SMF Record Header" on page 13-1 for a detailed description.
5	5	SMF90RTY	1	binary	Record type 90 (X'5A').
6	6	SMF90TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.
10	A	SMF90DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
14	E	SMF90SID	4	EBCDIC	System identification (from the SID parameter).
18	12		2		Reserved.
20	14	SMF90POF	4	binary	Offset to product section from start of record, including the record descriptor word (RDW).
24	18	SMF90PLN	2	binary	Length of the product section.
26	1A	SMF90PON	2	binary	Number of product sections.
28	1C	SMF90DOF	4	binary	Offset to subtype data section from start of record, including the record descriptor word (RDW).
32	20	SMF90DLN	2	binary	Length of subtype data section.
34	22	SMF90DON	2	binary	Number of subtype data sections.

Product Section

Offsets		Name	Length	Format	Description
0	0	SMF90TID	2	binary	Sub-type identifier. **1** SET TIME **2** SET DATE **3** SETDMN **4** Reserved. **5** SET SMF **6** SWITCH SMF **7** HALT EOD **8** IPL PROMPT **9** IPL SMF **10** IPL SRM **11** SET OPT **12** Reserved. **13** SETSMF **14** SET MPF **15** SET SMF (to restart SMF) **16** SET DAE **17** SET PFK **18** SET GRSRNL **19** SET APPC **20** SET ASCH **21** SET SCH **22** SET CNGRP **23** IPL WLM **24** VARY WLM **25** MODIFY WLM **26** IPL LOGREC **27** SETXCF START (to enable automatic restart management) **28** SETXCF STOP (to disable automatic restart management) **29** SET PROG (for LNKLST set activation) **30** RESET **31** SET PROG (for LPALST activation) **32** WLM policy change
2		SMF90RVN	2	EBCDIC	Record version number.
4		SMF90PNM	8	EBCDIC	Product name — SMF, SRM, SUP, etc.

Subtypes 1 or 2

SET TIME Section or SET DATE Section

Offsets		Name	Length	Format	Description
0	0	SMF90OTM	4	binary	Time before the SET command was issued, in the form hhmmssth, where hh is hours, mm is minutes, ss is seconds, and th is hundredths of a second.
4	4	SMF90ODT	4	packed	Date before the SET command was issued, in the form 0cyydddF.
8	8	SMF90NTM	4	binary	Time after the SET command was issued, in the form hhmmssth, where hh is hours, mm is minutes, ss is seconds, and th is hundredths of a second.
12	C	SMF90NDT	4	packed	Date after the SET command was issued, in the form 0cyydddF.

Subtypes 5, 9, 13, and 15 only

Self-Defining Section

Offsets		Name	Length	Format	Description
0	0	SMF90OSM	4	binary	Offset to IPL SMF or SET SMF section from start of record, including the record descriptor word (RDW).
4	4	SMF90LSM	2	binary	Length of IPL SMF or SET SMF section.
6	6	SMF90NSM	2	binary	Number of IPL SMF or SET SMF sections.
8	8	SMF90ODA	4	binary	Offset to data set section from the start of record, including the record descriptor word (RDW).
12	C	SMF90LDA	2	binary	Length of the data set section.
14	E	SMF90NDA	2	binary	Number of data set sections. For subtype 9 records, this field will be zero at IPL time, and will be filled in once the MANx data sets are established and known to SMF.
16	10	SMF90OWK	4	binary	Offset to subsystem section from the start of the record, including the record descriptor word (RDW).
20	14	SMF90LWK	2	binary	Length of subsystem section.
22	16	SMF90NWK	2	binary	Number of subsystem sections.
24	18	SMF90OOT	4	binary	Offset to subsystem parameter segment.
28	1C	SMF90LOT	2	binary	Length of subsystem parameter segment.
30	1E	SMF90NOT	2	binary	Number of subsystem parameter segments.

IPL SMF/SET SMF/SETSMF Section

Offsets		Name	Length	Format	Description
0	0	SMF90MAX	4	EBCDIC	Current value for MAXDORM, in the form *mmss*.
4	4	SMF90STA	6	EBCDIC	Current value for STATUS, in the form *hhmmss*.
10	A	SMF90JWT	4	EBCDIC	Current value for JWT, in the form *hhmm*.
14	E	SMF90SYI	4	EBCDIC	System identification.
18	12	SMF90BUF	1		Reserved. (previously the minimum number of buffers)
19	13	SMF90BUM	1		Reserved. (previously the minimum number of buffers)
20	14	SMF90SWT	1	binary	SMF Options **Bit** **Meaning When Set** **0** PROMPT(ALL) **1** PROMPT(LIST) **2** PROMPT(IPLR) **3** NOPROMPT **4** REC(PERM) **5** REC(ALL) **6** LISTDSN **7** NOLISTDSN.
21	15	SMF90SW2	1	binary	SMF Options **Bit** **Meaning When Set** **0** NOBUFFS(MSG) **1** NOBUFFS(HALT) **2** LASTDS(MSG) **3** LASTDS(HALT) **4-7** Reserved.

Offsets		Name	Length	Format	Description
22	16	SMF90SBU	1	binary	SMF Options **Bit** **Meaning When Set** **0** {Default} **1** SID(xxxx) **2** SID(xxxx,ser#[,ser#]...) **3** SID(xxxx,SYSNAME(sysname)) **4** Reserved. **5** SID(xxxx,COMBIN(ser#[,ser#]...)) **6-7** Reserved.
23	17	SMF90RV7	1		Reserved.
24	18	SMF90REL	4	EBCDIC	Operating system release number.
28	1C	SMF90IIT	4	binary	Time since midnight, in hundredths of seconds, of IPL.
32	20	SMF90IDT	4	packed	Date of IPL, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
36	24	SMF90BFM	5	EBCDIC	BUFSIZMAX value (*ddddu*).
41	29	SMF90BFL	2	EBCDIC	BUFUSEWARN value (*dd*).
43	2B	SMF90RV8	5	EBCDIC	Reserved.

SMF Data Set Section

There is a data set section for every SMF recording data set. The first data set is the active data set at IPL or SET SMF time.

For subtype 9 records, this section will not be generated at IPL time. It is created once the MANx data sets are established and known to SMF.

Offsets		Name	Length	Format	Description
0	0	SMF90DSE	44	structure	SMF data set section
0	0	SMF90DSN	44	EBCDIC	SMF data set name.

Subsystem Record Section

There are entries defining sub-options specified for the SYS and each SUBSYS option specified in SMFPRMxx.

Offsets		Name	Length	Format	Description
0	0	SMF90WKN	4	EBCDIC	Name of subsystem.
4	4	SMF90DTL	1	binary	DETAIL recording indicator **Bit** **Meaning When Set** **0** Detail recording on **1-7** Reserved.
5	5	SMF90RS9	3		Reserved.
8	8	SMF90SVL	8	binary	Length of interval, in TOD clock format, between checkpoint SMF records.
16	10	SMF90SYS	32	binary	Bit representation of SMF record types. If the bit is on (1), the record is enabled for recording. If the bit is off (0), the record is not enabled for recording. Bit 0 corresponds to record type 0. Bit 255 corresponds to record type 255.
48	30	SMF90EXN	120	EBCDIC	Names of the active exits for this subsystem. Each sequentially listed exit name is 8-characters long. Up to 15 exits can be specified. If less than 15 exits are specified, the remaining portion of the list is filled with binary zeros.

Subsystem Parameter Section

There is an entry for each subsystem for which a subsystem parameter has been specified.

Offsets		Name	Length	Format	Description
0	0	SMF90ASN	4	EBCDIC	Subsystem name.
4	4	SMF90APM	60	EBCDIC	Accounting parameter.

Subtypes 6 or 7

Switch SMF/Halt EOD Section

Offsets		Name	Length	Format	Description
0	0	SMF90T6	116	structure	Switch SMF/Halt EOD section.
0	0	SMF90SWO	10	EBCDIC	Subtype 6: This field is the old recording data set name. This field will be blank if data is lost through a SWITCH SMF. Subtype 7: This field is blank. **Note:** If the data set name is greater than 10 characters, this field is blank. See SMF90SOD for the complete data set name.
10	A	SMF90SWN	10	EBCDIC	Subtype 6: This field is the new recording data set name. Subtype 7: This field is blank. **Note:** If the data set name is greater than 10 characters, this field is blank. See SMF90SND for the complete data set name.
20	14	SMF90IT	4	binary	Time since midnight, in hundredths of seconds, of IPL.
24	18	SMF90ID	4	packed	Date of the IPL, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.
28	1C	SMF90SOD	44	EBCDIC	Subtype 6: This field is the old recording data set name. This field will be blank if data is lost through a SWITCH SMF. Subtype 7: This field is blank.
72	48	SMF90SND	44	EBCDIC	Subtype 6: This field is the new recording data set name. Subtype 7: This field is blank.

Subtype 8 only

System IPL Prompt Data Section

Offsets		Name	Length	Format	Description
0	0	SMF90DTM	8	EBCDIC	System down time, in the form *hh-mm-ss* or ‘u’.
8	8	SMF90RSN	65	EBCDIC	Reason for the IPL or ‘u’.
73	49	SMF90OPR	20	EBCDIC	Operators name or ‘u’.
93	5D	SMF90ITM	4	binary	Time since midnight, in hundredths of seconds, of IPL.
97	61	SMF90DTT	4	packed	Date of the IPL, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.

Subtype 10

The fields in the second table appear only if SMF90DLN > 32.

IPL SRM Command Section

Offsets		Name	Length	Format	Description
0	0	SMF90IPT	8	binary	Time of IPL.
8	8	SMF90IPS	8	EBCDIC	Reserved.
16	10	SMF90OPT	8	EBCDIC	OPT parmlib member used. IEAOPT-- indicates no OPT.
24	18	SMF90ICS	8	EBCDIC	Reserved.
32	20	SMF90SPN	8	EBCDIC	Active service policy name.
40	28	SMF90SPT	8	binary	Time/date (STCK format) that the active service policy was originally activated.
48	30	SMF90SPU	8	EBCDIC	Userid of the operator or service administrator that activated the service policy.
56	38	SMF90SPS	8	EBCDIC	Name of the system on which the service policy activation was initiated.
64	40	SMF90SDN	8	EBCDIC	Name of the installed service definition at the time the policy was activated.
72	48	SMF90SDT	8	EBCDIC	Time/date (STCK format) that the service definition was installed
80	50	SMF90SDU	8	EBCDIC	Userid of service administrator that installed the service definition.
88	58	SMF90SDS	8	EBCDIC	Name of the system on which the service definition was installed.

Subtype 11

SET OPT Command Section

Offsets		Name	Length	Format	Description
0	0	SMF90TOP	8	binary	Time (in STCK format) of OPT change. STCK format is indicated on the TIME macro.
8	8	SMF90OPO	8	EBCDIC	Old OPT parmlib member. IEAOPT*xx* indicates no OPT.
16	10	SMF90OPN	8	EBCDIC	New OPT parmlib member.

Subtype 14

SET MPF Command Section

Offsets		Name	Length	Format	Description
0	0	SMF90TMP	8	binary	Time and date of change.
8	8	SMF90MPO	8	EBCDIC	Reserved (was name of old parmlib member).
16	10	SMF90MPN	8	EBCDIC	Reserved (was name of new parmlib member, for color).
24	18	SMF90MPC	8	EBCDIC	Reserved (was name of old parmlib member, for color).
32	20	SMF90MCN	8	EBCDIC	Reserved (was name of new parmlib member, for command).
40	28	SMF90MCO	8	EBCDIC	Reserved (was name of old parmlib member, for command).
48	30	SMF90CMP	4	binary	Count of MPF entries.
52	34	SMF9014D	78	EBCDIC	Array of 2-byte suffixes of specified parmlib members (39 maximum).

Subtype 16

SET DAE Command Section

Offsets		Name	Length	Format	Description
0		SMF90DAT	8	binary	Time of date and change.
8		SMF90DAO	8	EBCDIC	Name of the old parmlib member.
16		SMF90DAN	8	EBCDIC	Name of the new parmlib member.

Subtype 17

SET PFK Command Data Section

Offsets		Name	Length	Format	Description
0	0	SMF90TPF	8	binary	Time of SET PFK change.
8	8	SMF90PFO	8	EBCDIC	Old PFK parmlib member (written to object).
16	10	SMF90PFN	8	EBCDIC	New PFK parmlib member.

Subtype 18

SET GRSRNL Command Data Section

Offsets		Name	Length	Format	Description
0	0	SMF90SGT	8	binary	Time that the command was entered.
8	8	SMF90SGS	8	EBCDIC	System that issued the command.
16	10	SMF90SGC	4	binary	Count of suffixes of specified parmlib members. This field contains zeroes if the command was not issued on this system.
20	14	SMF90SGN	78	EBCDIC	Array of two-byte suffixes of specified parmlib members. When SMF90SGC is zero, this array is not valid (and contains zeroes).

Subtype 19

SET APPC Command Data Section

Offsets		Name	Length	Format	Description
0	0	SMF90APT	8	binary	Time and date that the SET APPC command was issued.
8	8	SMF90APC	4	binary	Number of entries that follow.
12	C	SMF90APN	8	EBCDIC	Name of the new parmlib member used to update the APPC/MVS (Advanced Program-to-Program Communication/MVS) configuration. This subtype is repeated.

Subtype 20

SET ASCH Command Data Section

Offsets		Name	Length	Format	Description
0	0	SMF90SCT	8	binary	Time and date of the SET ASCH change.
8	8	SMF90SCC	4	binary	Number of entries that follow.

Offsets		Name	Length	Format	Description
12	C	SMF90SCN	8	EBCDIC	Name of the new parmlib member used to update the APPC/MVS scheduler configuration. This subtype is repeated for each member specified on the command.

Subtype 21

SET SCH Command Data Section

Offsets		Name	Length	Format	Description
0	0	SMF90SHT	8	binary	Time and date of SET SCH change.
8	8	SMF90SHC	4	binary	Number of entries that follow.
12	C	SMF90SHN	8	EBCDIC	Name of the new parmlib member used to update the APPC/MVS scheduler configuration. This subtype is repeated for each member specified on the command.

Subtype 22

SET CNGRP Command Section

Offsets		Name	Length	Format	Description
0	0	SMF90CGT	8	binary	Time and date of SET CNGRP change.
8	8	SMF90CGC	4	binary	Number of entries that follow.
12	C	SMF90CGN	76	EBCDIC	Array of 2-byte suffixes of specified CNGRP parmlib members (38 maximum).

Subtype 23

Install Workload Management Service Definition

Offsets		Name	Length	Format	Description
0	0	SMF90IDN	8	EBCDIC	Service definition name
8	8	SMF90TDI	8	EBCDIC	Time and date (STCK) of installation
16	10	SMF90IDU	8	EBCDIC	Userid of service level administrator that installed this service definition.
24	18	SMF90IDS	8	EBCDIC	Name of the system from which the service definition was installed.

Subtype 24

Subtype 24 contains the workload management service policy, as mapped by the IWMSVPOL macro. It has a size dependency of 32K. If the policy exceeds 32K, additional subtype 24 records are written. Each subtype contains the header information mapped below. You must map the corresponding service policy information as mapped in IWMSVPOL. See *z/OS MVS Data Areas, Vol 3 (IVT-RCWK)* for a mapping of IWMSVPOL.

The field SMF9024N contains the number of subtype 24 records that are written to map the service policy. The field SMF9024P contains the length of the subtype 24.

Mapping a Single Subtype 24 Record

To map the WLM policy when there is one subtype 24 (SMF9024N = 1), base IWMSVPOL on ADDR(SMF90T24) + LENGTH(SMF9024P).

Mapping Multiple Subtype 24 Records

To map the WLM policy when there is more than one subtype 24 written (SMF9024N > 1), follow the steps below:

1. Determine the storage required by multiplying 32K times the number of subtype 24 records.

   ```
   32K * SMF9024N
   ```
2. Obtain a storage block equal to 32K * SMF9024N
3. Read all (SMF9024N) subtype 24 records that have the same unique identifier (SMF9024I).
4. Copy the first subtype 24 record (SMF9024S=1) beginning at SMF9024A for a length of SMF90DLN - LENGTH(SMF9024P) to the start of the obtained storage.
5. Copy the next subtype 24 record (SMF9024S=2) beginning at SMF9024A for a length of SMF90DLN-LENGTH(SMF9024P) to the byte in the obtained storage immediately after the previous record.
6. Repeat the previous step for each additional subtype 24 record.

When you have merged all the subtype 24 records, map the resulting data to the IWMSVPOL mapping macro.

VARY WLM Command Data Section - Service Policy Header

Offsets		Name	Length	Format	Description
		SMF9024P			Prefix area to subtype 24. Allows assembling several records together to map the entire WLM service policy.
0	0	SMF9024S	4	binary	Sequence number. When the service policy is larger than will fit in 1 subtype 24 record, this field describes the order in which individual records must be combined to view the entire service policy.
4	4	SMF9024N	4	binary	Number of subtype 24 records which must be combined to map the policy. When 1 record is enough, both SMF9024S and SMF9024N will be 1.
8	8	SMF9024I	4	binary	Unique id that is used to ensure all “N” records of 1 policy can be combined without mixing data from 2 rapid VARY policy commands.
12	12	SMF9024A	*	EBCDIC	The active service policy. This area is mapped by IWMSVPOL.

Subtype 25

MODIFY WLM Command Data Section

Offsets		Name	Length	Format	Description
0	0	SMF90MOD	1	bitstring	Reserved. **Bit** **Meaning When Set** **0** Reserved. **1** Reserved.
1	1	SMF90MRS	3	binary	Reserved.
4	4	SMF90MTD	8	EBCDIC	Reserved.
12	C	SMF90NSP	8	EBCDIC	Name of the service policy activated by the VARY WLM command.
20	14	SMF90TPA	8	EBCDIC	Time and date (STCK) associated with the initial activation of this service policy.

Offsets		Name	Length	Format	Description
28	1C	SMF90IPU	8	EBCDIC	Userid of the system operator or service level administrator who activated this service policy. A service policy can be activated by the VARY WLM command, or by an option in the WLM ISPF administrative application.
32	20	SMF90SNA	8	EBCDIC	System name (sysname) from which the service policy was activated.
40	28	SMF9025N	8	EBCDIC	Service definition name from which this service policy was activated.
48	30	SMF9025T	8	EBCDIC	Time and date (STCK) of the installation of this service definition.
56	38	SMF9025U	8	EBCDIC	Userid of the service level administrator who installed the service definition.
64	40	SMF9025S	8	EBCDIC	Name of the system from which the service definition was installed.
72	48	SMF90MOU	8	EBCDIC	Reserved.

Subtype 26

IPL Logrec Data Set Section

Offsets		Name	Length	Format	Description
0	0	SMF90LOG	44	EBCDIC	Original logrec data set name or blanks.
44	2C	SMF9026M	10	EBCDIC	Original logrec recording medium: • LOGSTREAM • DATASET • IGNORED
54	36	SMF9026G	26	EBCDIC	Original logrec log stream name or blanks
80	50	SMF9026N	44	EBCDIC	New logrec data set name or blanks
124	7C	SMF9026R	10	EBCDIC	New logrec recording medium: • LOGSTREAM • DATASET • IGNORED
134	86	SMF9026H	26	EBCDIC	New logrec log stream name or blanks

Subtypes 27 and 28

Automatic Restart Management Policy Section

Offsets		Name	Length	Format	Description
0	0	SMF90PN7	8	EBCDIC	Name of policy being processed (blank if no policy specified on start, or if no policy is active on stop).
8	8	SMF90PS7	8	EBCDIC	System name from parmlib member IEASYSxx SYSNAME parameter.

Subtype 29

LNKLST Set Activation

Offsets		Name	Length	Format	Description
0	0	SMF90T29LNKLSTSEQ#	4	binary	Sequence number for the LNKLST set. The sequence number is increased whenever a LNKLST set is activated.

Offsets		Name	Length	Format	Description
4	4	SMF90T29LNKLSTNAME	16	EBCDIC	Name of the LNKLST set activated.
20	14	SMF90T29TIMESTAMP	8	binary	Time and date (STCK) of the LNKLST set activation.
28	1C	SMF90T29CONSID	4	binary	Console id of the console that issued the command for LNKLST activation.
32	20	SMF90T29UTOKEN	80	binary	User token of the issuer of the command for LNKLST activation.

Subtype 30

RESET Command Complete

Offsets		Name	Length	Format	Description
0	0	SMF90T30_JOBNAME	8	EBCDIC	Name of the job that was reset. This field will be blank in the case of an enclave reset request.
8	8	SMF90T30_JOBID	8	EBCDIC	JES Job ID of the reset job. This field will be blank if there is no JSAB associated with the job, or in the case of an enclave reset request.
16	10	SMF90T30_ENTRY_TIME	4	binary	Program entry time, in hundredths of a second since midnight. For a job, this is the program entry time, or zero if no JSAB is associated with the job. For an enclave, this is the time the enclave was created.
20	14	SMF90T30_ENTRY_DATE	4	EBCDIC	Program entry date, in the form 0cyydddF. For a job, this is the program entry date, or zero if no JSAB is associated with the job. For an enclave, this is the date the enclave was created.
24	18	SMF90T30_OPERATOR	8	EBCDIC	Operator ID that issued the RESET command.
32	20	SMF90T30_FLAGS	1	bitstring	Indicators, as follows: **Bit** **Meaning When Set** **0** QUIESCE operand used **1** RESUME operand used **2** SRVCLASS operand used **3** PGN operand used **4** The enclave service class was reset **5** The enclave was quiesced **6** The enclave was resumed **7** Reserved
33	21	SMF90T30_FLAGS2	1	bitstring	Additional characteristics, as follows: **Bit** **Meaning When Set** **0** Original independent enclave **1–7** Reserved
34	22	SMF90T30_RSV	2	EBCDIC	Reserved
36	24	SMF90T30_OLDSRV	8	EBCDIC	Service class name associated with the job or enclave before the RESET was processed. This field is blank if the system was in compatibility mode. The OLD and NEW service classes are the same when the RESET quiesced the address space or enclave.
44	2C	SMF90T30_NEWSRV	8	EBCDIC	Service class name associated with the job or enclave after the RESET was processed. This field is blank if the system was in compatibility mode. The OLD and NEW service classes are the same when the RESET quiesced the address space or enclave.
52	34	SMF90T30_OLDPGN	2	binary	Beginning with z/OS V1R3, this field is always zero.
54	36	SMF90T30_NEWPGN	2	binary	Beginning with z/OS V1R3, this field is always zero.
56	38	SMF90T30_EnclaveOwner	8	EBCDIC	Name of the address space that owns the enclave. This field is blank in the case of a job reset request.

Subtype 31

Dynamic LPA Management Section

Offsets		Name	Length	Format	Description
0	0	SMF90T31ADDORDELETE	1	binary	“0” this record is the result of an ADD to LPA “1” this record is the result of a DELETE from LPA
1	1		3	EBCDIC	Reserved
4	4	SMF90T31NUMMODS	2	binary	Number of modules in this record.
6	6	SMF90T31MODOFFSET	2	binary	Offset from SMF90T31 to start of MODENTRIES. The modentries are contiguous in this area, each mapped by DSECT LPMEA within macro CSVLPRET
8	8	SMF90T31NUMMODS REMAINING	4	binary	Number of module entries to be written in subsequent records.
12	C	SMF90T31REQUESTOR	16	EBCDIC	The requestor ID provided via CSVDYLPA.
28	1C	SMF90T31TIMESTAMP	8	EBCDIC	Time value (from STCK) of the activation.
36	24	SMF90T31CONSID	4	binary	Console ID of issuer of the LPA request. The value is -1 if the request was via the CSVDYLPA macro.
40	28	SMF90T31UTOKEN	80	EBCDIC	Security product user token issuer of the LPA request.

Subtype 32

Subtype 32 contains all the workload management scheduling environment information following a successful policy change. It has a maximum size dependency of 32K. If the information exceeds 32K, additional subtype 32 records are written. Each subtype contains the header information mapped below. You must map the corresponding scheduling environment information as mapped in IWMSVPSE. See *z/OS MVS Data Areas, Vol 3 (IVT-RCWK)* for a mapping of IWMSVPSE.

The field SMF9032N contains the number of subtype 32 records that are written to map the scheduling environment structure. The field SMF9032P contains the length of the subtype 32.

Mapping a Single Subtype 32 Record

To map the WLM scheduling environment structure when there is one subtype 32 (SMF9032N = 1), base IWMSVPSE on ADDR(SMF90T32) + LENGTH(SMF9032P).

Mapping Multiple Subtype 32 Records

To map the WLM scheduling environment structure when there is more than one subtype 32 written (SMF9032N > 1), follow the steps below:

1. Determine the storage required by multiplying 32K times the number of subtype 32 records.

   ```
   32K * SMF9032N
   ```
2. Obtain a storage block equal to 32K * SMF9032N
3. Read all (SMF9032N) subtype 32 records that have the same unique identifier (SMF9032I).
4. Copy the first subtype 32 record (SMF9032S=1) beginning at SMF9032A for a length of SMF90DLN - LENGTH(SMF9032P) to the start of the obtained storage.
5. Copy the next subtype 32 record (SMF9032S=2) beginning at SMF9032A for a length of SMF90DLN-LENGTH(SMF9032P) to the byte in the obtained storage immediately after the previous record.
6. Repeat the previous step for each additional subtype 32 record.

When you have merged all the subtype 32 records, map the resulting data to the IWMSVPSE mapping macro.

Scheduling Environment Information

Offsets		Name	Length	Format	Description
		SMF9032P			Prefix area to subtype 32. Allows assembling several records together to map the entire WLM scheduling environment structure.
0	0	SMF9032S	4	binary	Sequence number. When the scheduling environment structure is larger than will fit in 1 subtype 32 record, this field describes the order in which individual records must be combined to view the entire scheduling environment structure.
4	4	SMF9032N	4	binary	Number of subtype 32 records which must be combined to map the scheduling environment structure. When 1 record is enough, both SMF9032S and SMF9032N will be 1.
8	8	SMF9032I	4	binary	Unique id that is used to ensure all “N” records of 1 policy can be combined without mixing data from 2 rapid VARY policy commands.
12	12	SMF9032A	*	EBCDIC	The active service policy. This area is mapped by IWMSVPSE.

Record Type 91 (5B) — BatchPipes/MVS Statistics

BatchPipes/MVS writes type 91 records to collect statistics about BatchPipes/MVS activities.

Reference book

For more information about record type 91, see *BatchPipes/MVS User’s Guide*.

Record Type 92 (5C) — File System Activity

SMF 92 records are created for z/OS UNIX System Services file system and file activity.

In order to collect information about the activity of a mounted file system, you must be collecting SMF type 92 subtype 5 (unmount) records at the time the file system is mounted and at the time the file system is unmounted.

In order to collect information on the activity of a specific file, you must be collecting SMF type 92 subtype 11 (close) records at the time the file is opened and at the time the file is closed.

The subtypes are:

- **Subtype 1** — contains information written when a file system is mounted.
- **Subtype 2** — contains information written after the file system is quiesced (or “suspended”).
- **Subtype 4** — contains information written after the file system is unquiesced (or “resumed”).
- **Subtype 5** — contains information written when the file system is unmounted.

- **Subtype 6** — contains information written when the file system is remounted.
- **Subtype 7** — contains information written when the file system is moved.
- **Subtype 10** — contains information written when a file is opened.
- **Subtype 11** — contains information written when a file is closed.
- **Subtype 12** — contains MMAP subtype information.
- **Subtype 13** — contains MUNMAP subtype information.

For a description of when open and close records are written, see "Accounting for open() and close()" on page 8-8.

Offsets		Name	Length	Format	Description
Record Header Section:					
0	0	SMF92LEN	2	binary	Record Length.
2	2	SMF92SEG	2	binary	Segment descriptor.
4	4	SMF92FLG	1	binary	Header flag byte. **Bit** **Meaning When Set** **0** Subsystem identification follows system identification **1** Subtypes used **2** Reserved **3-6** Version Indicators* **7** Reserved *See "Standard SMF Record Header" on page 13-1 for a detailed description.
5	5	SMF92RTY	1	binary	Record type: 92 (X'5C').
6	6	SMF92TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.
10	A	SMF92DTE	4	packed	Date when record was written.
14	E	SMF92SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF92WID	4	EBCDIC	Subsystem identification.
22	16	SMF92STP	2	binary	Record subtype.
24	18		2	binary	Reserved.
26	1A	SMF92SDL	2	binary	Length of self-defining section.
Self-Defining Section:					
28	1C	SMF92SOF	4	binary	Offset to subsystem section.
32	20	SMF92SLN	2	binary	Length of subsystem section.
34	22	SMF92SON	2	binary	Number of subsystem sections.
36	24	SMF92IOF	4	binary	Offset of identification section.
40	28	SMF92ILN	2	binary	Length of identification section.
42	2A	SMF92ION	2	binary	Number of identification sections.
44	2C	SMF92DOF	4	binary	Offset of data section.
48	30	SMF92DLN	2	binary	Length of data section.
50	32	SMF92DON	2	binary	Number of data sections.
Subsystem Section:					

Offsets		Name	Length	Format	Description
0	0	SMF92TYP	2	binary	Subtype identification **Value** **Meaning** **1** File system mount **2** File system quiesce **4** File system unquiesce **5** File system unmount **6** File system remount **7** File system move **10** File open **11** File close **12** MMAP **13** MUNMAP
2	2	SMF92RVN	2	EBCDIC	Record version number. **Value** **Meaning** **1** OpenEdition MVS with MVS/ESA SP 4.3 **2** OpenEdition MVS with MVS/ESA SP 5.1 **3** OpenEdition MVS with MVS/ESA SP 5.2.2
4	4	SMF92PNM	8	EBCDIC	Product name (OpenMVS).
12	C	SMF92OSL	8	EBCDIC	MVS product level.
Identification Section:					
0	0	SMF92JBN	8	EBCDIC	Job name.
8	8	SMF92RST	4	binary	Reader start time.
12	C	SMF92RSD	4	packed	Reader start date.
16	10	SMF92STM	8	EBCDIC	Step name.
24	18	SMF92RGD	8	EBCDIC	SAF Group ID.
32	20	SMF92RUD	8	EBCDIC	SAF User ID.
40	28	SMF92UID	4	binary	OpenMVS real user ID.
44	2C	SMF92GID	4	binary	OpenMVS real group ID.
48	30	SMF92PID	4	binary	OpenMVS process ID.
52	34	SMF92PGD	4	binary	OpenMVS process group ID.
56	38	SMF92SSD	4	binary	OpenMVS session ID.
60	3C	SMF92API	4	binary	OpenMVS anchor process ID.
64	40	SMF92APG	4	binary	OpenMVS anchor process group ID.
68	44	SMF92ASG	4	binary	OpenMVS anchor session ID.

Subtype 1

A number of the fields below that describe mountable file systems are defined in the macro BPXYMNTE.

Offsets		Name	Length	Format	Description
File System Mount — Data Section:					
0	0	SMF92MTM	8	binary	Time of mount, STCK format.
8	8	SMF92MPF	4	binary	Offset of path section.
12	C	SMF92MFT	4	binary	File system type from MntEntFSType field of BPXYMNTE.
16	10	SMF92MFM	4	binary	File system mode from MntEntFSMode field of BPXYMNTE.
20	14	SMF92MDN	4	binary	File system device number from MntEntFSDev field of BPXYMNTE.
24	18	SMF92MDD	8	EBCDIC	DDNAME specified on mount from MntEntFSDDName field of BPXYMNTE.

Offsets		Name	Length	Format	Description
32	20	SMF92MTN	8	EBCDIC	File system type name from MntEntFSTName field of BPXYMNTE.
40	28	SMF92MFN	44	EBCDIC	File system name from MntEntFSName field of BPXYMNTE.
84	54	SMF92MBL	4	binary	File system block size.
88	58	SMF92MST	8	binary	Total space in file system in block size units.
96	60	SMF92MSU	8	binary	Allocated space in file system in block size units.
104	68	SMF92MFG	1	binary	Flag byte **Bit** **Meaning When Set** **0** File system mounted by automounter (SMF92MAU) **1** File system mounted asynchronously (SMF92MAS)
105	69	SMF92MF2	1	binary	Second flag byte **Bit** **Meaning When Set** **0** File system mounted locally (SMF92MLU) **1** File system mounted remotely (SMF92MNU) **2** HFS Sysplex client (SMF92MDO) **3** File system owner (SMF92MSN)
Path Section:					
0	0	SMF92PPL	2	binary	Length of pathname for directory.
2	2	SMF92PPN	variable	EBCDIC	Pathname of directory where file system is mounted.

Subtype 2

Offsets		Name	Length	Format	Description
File System Quiesce (Suspend) — Data Section:					
0	0	SMF92STS	8	binary	Time of suspend, STCK format.
8	8	SMF92SFT	4	binary	File system type from MntEntFSType field of BPXYMNTE.
12	C	SMF92SFM	4	binary	File system mode from MntEntFSMode field of BPXYMNTE.
16	10	SMF92SDN	4	binary	File system device number from MntEntFSDev field of BPXYMNTE.
20	14	SMF92SDD	8	EBCDIC	DDNAME specified on mount from MntEntFSDDName field of BPXYMNTE.
28	1C	SMF92STN	8	EBCDIC	File system type name from MntEntFSTName field of BPXYMNTE.
36	24	SMF92SFN	44	EBCDIC	File system name from MntEntFSName field of BPXYMNTE.
80	50	SMF92SFG	1	binary	Flag byte **Bit** **Meaning When Set** **0** File system mounted locally (SMF92SLU) **1** File system mounted remotely (SMF92SNU) **2** HFS Sysplex client (SMF92SDO) **3** File system owner (SMF92SSN)

Subtype 4

Offsets		Name	Length	Format	Description
File System Unquiesce (Resume) — Data Section:					
0	0	SMF92RTS	8	binary	Time of suspend, STCK format.
8	8	SMF92RTR	8	binary	Time of resume, STCK format.
16	10	SMF92RFT	4	binary	File system type from MntEntFSType field of BPXYMNTE.

Offsets		Name	Length	Format	Description
20	14	SMF92RFM	4	binary	File system mode from MntEntFSMode field of BPXYMNTE.
24	18	SMF92RDN	4	binary	File system device number from MntEntFSDev field of BPXYMNTE.
28	1C	SMF92RDD	8	EBCDIC	DDNAME specified on mount from MntEntFSDDName field of BPXYMNTE.
36	24	SMF92RTN	8	EBCDIC	File system type name from MntEntFSTName field of BPXYMNTE.
44	2C	SMF92RFN	44	EBCDIC	File system name from MntEntFSName field of BPXYMNTE.
88	58	SMF92RFG	1	binary	Flag byte **Bit** **Meaning When Set** **0** File system mounted locally (SMF92RLU) **1** File system mounted remotely (SMF92RNU) **2** HFS Sysplex client (SMF92RDO) **3** File system owner (SMF92RSN)

Subtypes 5 and 6

Offsets		Name	Length	Format	Description
File System Unmount and Remount — Data Section:					
0	0	SMF92UTM	8	binary	Time of mount, STCK format.
8	8	SMF92UTU	8	binary	Time of unmount, STCK format.
16	10	SMF92UFT	4	binary	File system type from MntEntFSType field of BPXYMNTE.
20	14	SMF92UFM	4	binary	File system mode from MntEntFSMode field of BPXYMNTE.
24	18	SMF92UDN	4	binary	File system device number from MntEntFSDev field of BPXYMNTE.
28	1C	SMF92UDD	8	EBCDIC	DDNAME specified on mount from MntEntFSDDName field of BPXYMNTE.
36	24	SMF92UTN	8	EBCDIC	File system type name from MntEntFSTName field of BPXYMNTE.
44	2C	SMF92UFN	44	EBCDIC	File system name from MntEntFSName field of BPXYMNTE.
88	58	SMF92UBL	4	binary	File system block size.
92	5C	SMF92UST	8	binary	Total space in file system in block size units.
100	64	SMF92USU	8	binary	Allocated space in file system in block size units.
108	6C	SMF92USR	4	binary	Read calls issued to the mounted file system.
112	70	SMF92USW	4	binary	Write calls issued to the mounted file system.
116	74	SMF92UDI	4	binary	Directory I/O blocks.
120	78	SMF92UIR	4	binary	I/O blocks read.
124	7C	SMF92UIW	4	binary	I/O blocks written
128	80	SMF92UBR	8	binary	Bytes read.
136	88	SMF92UBW	8	binary	Bytes written.
144	90	SMF92UFG	1	binary	Flag byte **Bit** **Meaning When Set** **0** File system unmounted by automounter (SMF92MAU)
145	91	SMF92UF2	1	binary	Second flag byte **Bit** **Meaning When Set** **0** File system mounted locally (SMF92ULU) **1** File system mounted remotely (SMF92UNU) **2** HFS Sysplex client (SMF92UDO) **3** File system owner (SMF92USN)

Subtype 7

Offsets		Name	Length	Format	Description
File System Move — Data Section:					
0	0	SMF92VTV	8	binary	Time of move, STCK format.
8	8	SMF92VTM	8	binary	Time of mount, STCK format.
16	10	SMF92VFT	4	binary	File system type from MntEntFSType field of BPXYMNTE.
20	14	SMF92VFM	4	binary	File system mode from MntEntFSMode field of BPXYMNTE.
24	18	SMF92VDN	4	binary	File system device number from MntEntFSDev field of BPXYMNTE.
28	1C	SMF92VDD	8	EBCDIC	DDNAME specified on mount from MntEntFSDDName field of BPXYMNTE.
36	24	SMF92VTN	8	EBCDIC	File system type name from MntEntFSTName field of BPXYMNTE.
44	2C	SMF92VNM	44	EBCDIC	File system name from MntEntFSName field of BPXYMNTE.
88	58	SMF92VBL	4	binary	File system block size.
92	5C	SMF92VST	8	binary	Total space in file system in block size units.
100	64	SMF92VSU	8	binary	Allocated space in file system in block size units.
108	6C	SMF92VSR	4	binary	Read calls issued to the mounted file system.
112	70	SMF92VSW	4	binary	Write calls issued to the mounted file system.
116	74	SMF92VDI	4	binary	Directory I/O blocks.
120	78	SMF92VIR	4	binary	I/O blocks read.
124	7C	SMF92VIW	4	binary	I/O blocks written
132	84	SMF92VBR	8	binary	Bytes read.
140	8C	SMF92VBW	8	binary	Bytes written.
148	94	SMF92VFG	1	binary	Flag byte (reason for move) **Bit** **Meaning When Set** **0** User-initiated (SMF92VUI) **1** Recovery (SMF92VRI)
149	95	SMF92VOF	1	binary	Flag byte (old status) **Bit** **Meaning When Set** **0** File system mounted locally (SMF92VOL) **1** File system mounted remotely (SMF92VON) **2** HFS Sysplex client (SMF92VOD) **3** File system owner (SMF92VOS)
150	96	SMF92VNF	1	binary	Flag byte (old status) **Bit** **Meaning When Set** **0** File system mounted locally (SMF92VOL) **1** File system mounted remotely (SMF92VON) **2** HFS Sysplex client (SMF92VOD) **3** File system owner (SMF92VOS)

Subtype 10

Offsets		Name	Length	Format	Description
File System Open — Data Section:					
0	0	SMF92OTO	8	binary	Time of open, STCK format.
8	8	SMF92OTY	1	binary	File type as defined in BPXYFTYP.

Offsets		Name	Length	Format	Description
9	9	SMF92OFG	1	binary	Record flag byte. **Bit** **Meaning When Set** **0** Generated by vnode interface service **1** Network socket (0 indicates UNIX domain socket) **2** Client socket (0 indicates server socket)
10	A		2	EBCDIC	Reserved.
12	C	SMF92OTK	4	binary	Open file token (matches token in close data section)
16	10	SMF92OIN	4	binary	File serial number.
20	14	SMF92ODN	4	binary	Unique device number for the file.

Subtype 11

Offsets		Name	Length	Format	Description
0	0	SMF92CTO	8	binary	Time of open, STCK format.
8	8	SMF92CTC	8	binary	Time of close, STCK format.
16	10	SMF92CTY	1	binary	File type as defined in BPXYFTYP.
17	11	SMF92CFG	1	binary	Record flag byte. **Bit** **Meaning When Set** **0** Generated by vnode interface service **1** Network socket (0 indicates UNIX domain socket) **2** Client socket (0 indicates server socket) **3** File was cached **4** File had Deny Read set on it. **5** File had Deny Write set on it.
18	12		2		Reserved.
20	14	SMF92CTK	4	binary	Open file token.
24	18	SMF92CIN	4	binary	File serial number.
28	1C	SMF92CDN	4	binary	Unique device number for the file.
32	20	SMF92CSR	4	binary	Read calls issued to the file.
36	24	SMF92CSW	4	binary	Write calls issued to the file.
40	28	SMF92CDI	4	binary	Directory I/O blocks.
44	2C	SMF92CIR	4	binary	I/O blocks read.
48	30	SMF92CIW	4	binary	I/O blocks written.
52	34	SMF92CBR	8	binary	Bytes read.
60	3C	SMF92CBW	8	binary	Bytes written.
68	44	SMF92CPN	64	EBCDIC	The pathname used at open time, if known. If the name is 64 characters or longer, the last 64 characters of the name. The name is left-justified and padded with blanks. This field is not always present.

Subtype 12

Offsets		Name	Length	Format	Description
MMAP Subtype — Data Section:					
0	0	SMF92MTO	8	binary	Time of mmap, STCK format.
8	8	SMF92MSZ	4	binary	Number of bytes being memory mapped.
12	0C	SMF92MTK	4	binary	mmap file token (matches token in munmap data section).
16	10	SMF92MIN	4	binary	File serial number.
20	14	SMF92MMDN	4	binary	File unique device number.

Subtype 13

Offsets		Name	Length	Format	Description
MUNMAP Subtype — Data Section:					
0	0	SMF92MUTO	8	binary	Time of mmap, STCK format.
8	8	SMF92MUTC	8	binary	Time of munmap, STCK format.
16	10	SMF92MUSZ	4	binary	Number of bytes being memory mapped.
20	14	SMF92MUTK	4	binary	mmap file token (matches token in mmap data section).
24	18	SMF92MUIN	4	binary	File serial number.
28	1C	SMF92MUDN	4	binary	File unique device number.
32	20	SMF92MUIR	4	binary	I/O blocks read.
36	24	SMF92MUIW	4	binary	I/O blocks written.

Record Type 94 (5E) — IBM Tape Library Dataserver Statistics

The system-managed tape library accumulates statistics over the period of one hour. These statistics represent the activity of the IBM Tape Library Dataserver that results from all hosts attached to the library.

At the end of the hour, the system calculates composite statistics about the activity of all devices in the library and writes an SMF type 94 record.

The information in the SMF type 94 record represents:

- Current Information

  Represents the value of the statistic at the point the record is written.
- Summary of the Last Hour Information

  Represents statistics over the most recent hour for which composite statistics have been calculated.

For a VTS library, when microcode level F/C 4001 is installed and Outboard Policy Management is enabled, a new SMF94 record will be recorded. The new record is an SMF94 subtype=2, and will be recorded in addition to the existing SMF94 subtype=1. The SMF94 subtype=2 record is used to record Volume Pool Statistics.

The existing subtype=1 is also changed. When F/C 4001 is installed and Outboard Policy Management is enabled, some existing statistics will not be reported. The unreported fields will contain binary zero. Existing field SMF94HSF in subtype=1 records will contain the value 2 when F/C 4001 is installed and Outboard Policy Management is enabled.

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record. The mapping macro resides in SYS1.MACLIB.

Offsets		Name	Length	Format	Description
0	0	SMF94LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.

Offsets		Name	Length	Format	Description
2	2	SMF94SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF94FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See "Standard SMF Record Header" on page 13-1 for a detailed description.
5	5	SMF94RTY	1	binary	Record type 94 (X'5E').
6	6	SMF94TME	4	binary	Time since midnight, in hundredths of a second, when the record was moved into the SMF buffer.
10	A	SMF94DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
14	E	SMF94SID	4	EBCDIC	System identification (from SMFPRMxx parmlib member).
18	12	SMF94WID	4	EBCDIC	Subsystem identification, worktype indicator.
22	16	SMF94STP	2	binary	Record subtype '01' — 34xx library statistics. '02' — Volume pooling statistics

Self-Defining Section (Subtype 1)

Offsets		Name	Length	Format	Description
24	18	SMF94SDL	4	binary	Self-defining section length.
28	1C	SMF94POF	4	binary	Offset to product section from start of record, including record descriptor word (RDW).
32	20	SMF94PLN	2	binary	Length of product section.
34	22	SMF94PON	2	binary	Number of product sections.
36	24	SMF94HOF	4	binary	Offset to format section from start of record, including record descriptor word (RDW).
40	28	SMF94HLN	2	binary	Length of format section.
42	2A	SMF94HON	2	binary	Number of format sections.
44	2C	SMF94SOF	4	binary	Offset to self-description information section from start of record, including record descriptor word (RDW).
48	30	SMF94SLN	2	binary	Length of self-description information section.
50	32	SMF94SON	2	binary	Number of self-description information sections.
52	34	SMF94LOF	4	binary	Offset to system-managed tape library statistics section from start of record, including record descriptor word (RDW).
56	38	SMF94LLN	2	binary	Length of system-managed tape library statistics section.
58	3A	SMF94LON	2	binary	Number of system-managed tape library statistics sections.
60	3C	SMF94MOF	4	binary	Offset to mount statistics section from start of record, including record descriptor word (RDW).
64	40	SMF94MLN	2	binary	Length of mount statistics section.
66	42	SMF94MON	2	binary	Number of mount statistics sections.
68	44	SMF94DOF	4	binary	Offset to demount statistics section from start of record, including record descriptor word (RDW).
72	48	SMF94DLN	2	binary	Length of demount statistics section.
74	4A	SMF94DON	2	binary	Number of demount statistics sections.

Offsets		Name	Length	Format	Description
76	4C	SMF94EOF	4	binary	Offset to eject statistics section from start of record, including record descriptor word (RDW).
80	50	SMF94ELN	2	binary	Length of eject statistics section.
82	52	SMF94EON	2	binary	Number of eject statistics sections.
84	54	SMF94AOF	4	binary	Offset to audit statistics section from start of record, including record descriptor word (RDW).
88	58	SMF94ALN	2	binary	Length of audit statistics section.
90	5A	SMF94AON	2	binary	Number of audit statistics sections.
92	5C	SMF94IOF	4	binary	Offset to input statistics section from start of record, including record descriptor word (RDW).
96	60	SMF94ILN	2	binary	Length of input statistics section.
98	62	SMF94ION	2	binary	Number of input statistics sections.
100	64	SMF94VOF	4	binary	Offset to VTS statistics
104	68	SMF94VLN	2	binary	Length of VTS statistics
106	6A	SMF94VON	2	binary	Number of VTS statistics
108	6C	SMF94XOF	4	binary	Offset to import/export statistics
112	70	SMF94XLN	2	binary	Length of import/export statistics
114	72	SMF94XON	2	binary	Number of import/export statistics
116	74	SMF942OF	4	binary	Offset to VTS enhanced library statistics
120	78	SMF942LN	2	binary	Length of VTS enhanced library statistics
122	7A	SMF942ON	2	binary	Number of VTS enhanced library statistics

Product Section

Offsets		Name	Length	Format	Description
0	0	SMF94TYP	2	binary	Subtype for type 94 record.
2	2	SMF94RVN	2	EBCDIC	Record version number C'01'.
4	4	SMF94PNM	8	EBCDIC	Product name 'JDZ1110 '.
12	C	SMF94MVS	8	EBCDIC	MVS operating system name.

Format Section

Offsets		Name	Length	Format	Description
0	0	SMF94HSF	1	binary	Statistics format. Always equals zero.
1	1	SMF94HHI	2	binary	Hour index. Incremented every hour. Value ranges from 0 to 23.

Self-Description Information

Offsets		Name	Length	Format	Description
0	0	SMF94SLT	6	EBCDIC	System-managed tape library type number. For example, '003495' represents the IBM 3495 Tape Library Dataserver.
6	6	SMF94SLM	3	EBCDIC	System-managed tape library model number. For example, 'L30' represents model L30.
9	9	SMF94SMA	3	EBCDIC	System-managed tape library manufacturer. Always equals 'IBM'.
12	C	SMF94SPL	2	EBCDIC	System-managed tape library plant of manufacture. For example, '13' represents San Jose, California, and '77' represents Valencia, Spain.

Offsets		Name	Length	Format	Description
14	E	SMF94SNO	12	EBCDIC	System-managed tape library sequence number. Uniquely identifies a system-managed tape library.
26	1A		1		Reserved.

Self-Managed Tape Library Statistics

Offsets		Name	Length	Format	Description
0	0	SMF94LID	2	binary	Number of drives currently installed in a system-managed tape library.
2	2	SMF94LMD	2	binary	Number of drives currently mounted in a system-managed tape library.
4	4	SMF94LM1	2	binary	Maximum number of drives mounted during the last hour.
6	6	SMF94LM2	2	binary	Minimum number of drives mounted during the last hour.
8	8	SMF94LM3	2	binary	Average number of drives mounted during the last hour.
10	A	SMF94LT1	2	binary	Maximum amount of time, in seconds, that a tape volume was mounted on a drive during the last hour. The mount time of a volume is the time when the system completed mounting a volume on a drive until the time when the system-managed tape library receives an order from the host to demount the volume.
12	C	SMF94LT2	2	binary	Minimum amount of time, in seconds, that a tape volume was mounted on a drive during the last hour. The mount time of a volume is the time when the system completed mounting a volume on a drive until the time when the system-managed tape library receives an order from the host to demount the volume.
14	E	SMF94LT3	2	binary	Average amount of time, in seconds, that all tape volumes were mounted on drives during the last hour. The mount time of a volume is the time when the system completed mounting a volume on a drive until the time when the system-managed tape library receives an order from the host to demount the volume.

Mount Statistics

Offsets		Name	Length	Format	Description
0	0	SMF94MPR	2	binary	The total number of mount requests currently pending.
2	2	SMF94MP1	2	binary	Maximum number of mount requests pending during the last hour.
4	4	SMF94MP2	2	binary	Minimum number of mount requests pending during the last hour.
6	6	SMF94MP3	2	binary	Average number of mount requests pending during the last hour.
8	8	SMF94MTO	2	binary	Total number of mounts during the last hour.
10	A	SMF94MIN	2	binary	Index mounts during the last hour. An index mount is a mount accomplished using the automatic cartridge loader of a 3490 tape drive.
12	C	SMF94MPM	2	binary	Pre-mounts during last hour. A single pre-mount operation causes a volume to be added to the automatic cartridge loader of a 3490 tape drive.
14	E	SMF94MT1	2	binary	Maximum amount of time, in seconds, required to perform any single mount operation during the last hour.
16	10	SMF94MT2	2	binary	Minimum amount of time, in seconds, required to perform any single mount operation during the last hour.

Offsets		Name	Length	Format	Description
18	12	SMF94MT3	2	binary	Average amount of time, in seconds, required to perform a single mount operation during the last hour.

Demount Statistics

Offsets		Name	Length	Format	Description
0	0	SMF94DPR	2	binary	The total number of demount requests currently pending.
2	2	SMF94DP1	2	binary	Maximum number of demount requests pending during the last hour.
4	4	SMF94DP2	2	binary	Minimum number of demount requests pending during the last hour.
6	6	SMF94DP3	2	binary	Average number of demount requests pending during the last hour.
8	8	SMF94DTO	2	binary	Total number of demounts during the last hour.
10	A	SMF94DIN	2	binary	Index demounts during the last hour. An index demount moves a volume from the feed station to the output stack of the automatic cartridge loader of a 3490 tape drive.
12	C	SMF94DPM	2	binary	Post-demounts during the last hour. A post-demount operation moves a volume from the output stack of the automatic cartridge loader of a 3490 tape drive.
14	E	SMF94DT1	2	binary	Maximum amount of time, in seconds, required to perform any single demount operation during the last hour.
16	10	SMF94DT2	2	binary	Minimum amount of time, in seconds, required to perform any single demount operation during the last hour.
18	12	SMF94DT3	2	binary	Average amount of time, in seconds, required to perform a single demount operation during the last hour.

Eject Statistics

Offsets		Name	Length	Format	Description
0	0	SMF94EPR	2	binary	The total number of eject requests currently pending. An eject operation moves one volume from the system-managed tape library to an output station for an operator to remove.
2	2	SMF94EP1	2	binary	Maximum number of eject requests pending during the last hour.
4	4	SMF94EP2	2	binary	Minimum number of eject requests pending during the last hour.
6	6	SMF94EP3	2	binary	Average number of eject requests pending during the last hour.
8	8	SMF94ETO	2	binary	Totals number of ejects during the last hour.
10	A	SMF94ET1	2	binary	Maximum amount of time, in seconds, required to perform any single eject operation during the last hour.
12	C	SMF94ET2	2	binary	Minimum amount of time, in seconds, required to perform any single eject operation during the last hour.
14	E	SMF94ET3	2	binary	Average amount of time, in seconds, required to perform a single eject operation during the last hour.

Audit Statistics

Offsets		Name	Length	Format	Description
0	0	SMF94APR	2	binary	The total number of audit requests currently pending. When the host requests an audit operation, the accessor moves to a shelf location and ensures that a volume is present.

Offsets		Name	Length	Format	Description
2	2	SMF94AP1	2	binary	Maximum number of audit requests pending during the last hour.
4	4	SMF94AP2	2	binary	Minimum number of audit requests pending during the last hour.
6	6	SMF94AP3	2	binary	Average number of audit requests pending during the last hour.
8	8	SMF94ATO	2	binary	Total number of audits during the last hour.
10	A	SMF94AT1	2	binary	Maximum amount of time, in seconds, required to perform any single audit operation during the last hour.
12	C	SMF94AT2	2	binary	Minimum amount of time, in seconds, required to perform any single audit operation during the last hour.
14	E	SMF94AT3	2	binary	Average amount of time, in seconds, required to perform a single audit operation during the last hour.

Insert Statistics

Offsets		Name	Length	Format	Description
0	0	SMF94INS	2	binary	Number of insert stores during last hour. This number is the number of volumes moved from an input station to a location inside the system-managed tape library.

VTS Statistics

Offsets		Name	Length	Format	Description
0	0	SMF94VNO	1	binary	Peer-to-Peer VTS reference number. X'01', User interface library. X’02’, secondary library. X’FF’, composite library. X’00’, non-composite library.
1	1	SMF94VLS	5	EBCDIC	Library sequence number for the library segment for which VTS statistics are being reported.
6	6	SMF94VTI	1	binary	Number of underlying physical tape devices currently installed in the VTS subsystem. See Note 1 on page 13-509.
7	7	SMF94VTA	1	binary	Number of underlying physical tape devices currently available for use by the VTS subsystem. See Note 1 on page 13-509.
8	8	SMF94VTX	1	binary	Maximum number of underlying physical tape devices mounted concurrently in this VTS during last hour. See Note 1 on page 13-509.
9	9	SMF94VTN	1	binary	Minimum number of underlying physical tape devices mounted concurrently in this VTS during last hour. See Note 1 on page 13-509.
10	A	SMF94VTV	1	binary	Average number of underlying physical tape devices mounted concurrently in this VTS during last hour. Value is determined by summing number of concurrently mounted physical devices every 10 seconds, and dividing resultant sum by 360 during hourly statistics generation. See Note 1 on page 13-509.
11	B	SMF94VR2	1	binary	Reserved, set to X’00’
12	C	SMF94VMX	2	binary	Maximum time in seconds used by the library to perform a mount request of a physical drive in the VTS in the last hour. Time is accrued from time mount request is accepted until it is completed. Mount time is accredited to the hour that mount is completed. See Note 1 on page 13-509.

Offsets		Name	Length	Format	Description
14	E	SMF94VMN	2	binary	Minimum time in seconds used by the library to perform a mount request for a physical drive in the VTS in the last hour. Time is accrued from time mount request is accepted until it is completed. Mount time is accredited to the hour that mount is completed. See Note 1 on page 13-509.
16	10	SMF94VMV	2	binary	Average time in seconds used by the library to perform a mount request for a physical drive in the VTS in the last hour. Time is accrued from time mount request is accepted until it is completed. Mount time is accredited to the hour that mount is completed. See Note 1 on page 13-509.
18	12	SMF94VPS	2	binary	The number of physical mount requests completed in last hour to satisfy recall mounts. See Note 1 on page 13-509.
20	14	SMF94VPM	2	binary	The number of physical mount requests completed in last hour to satisfy copy requests. See Note 1 on page 13-509.
22	16	SMF94VPR	2	binary	The number of physical mount requests completed in last hour to satisfy reclamation mounts. See Note 1 on page 13-509.
24	18	SMF94VDC	1	binary	The number of virtual devices configured in this VTS at the time request for statistics was received (current). See Note 1 on page 13-509.
25	19	SMF94VDX	1	binary	The maximum number of virtual drives that were concurrently mounted in this VTS during the last hour. See Note 1 on page 13-509.
26	1A	SMF94VDN	1	binary	The minimum number of virtual drives that were concurrently mounted in this VTS during the last hour. See Note 1 on page 13-509.
27	1B	SMF94VDA	1	binary	The average number of virtual drives that were concurrently mounted in this VTS during the last hour. Value is determined by summing number of concurrently mounted virtual devices every 10 seconds, and dividing resultant sum by 360 during hourly statistics generation. See Note 1 on page 13-509.
28	1C	SMF94VVX	2	binary	Maximum time in seconds that a virtual drive was mounted in this VTS during the last hour. Time is accrued from completion of mount until a demount is issued. Mount time is accredited to the hour that demount is issued. See Note 2 on page 13-509.
30	1E	SMF94VVN	2	binary	Minimum time in seconds that a virtual drive was mounted in this VTS during the last hour. Time is accrued from completion of mount until a demount is issued. Mount time is accredited to the hour that demount is issued. See Note 2 on page 13-509.
32	20	SMF94VVA	2	binary	Average time in seconds that a virtual drive was mounted in this VTS during the last hour. Time is accrued from completion of mount until a demount is issued. Mount time is accredited to the hour that demount is issued. See Note 2 on page 13-509.
34	22	SMF94VRX	2	binary	Maximum time in seconds used to complete a mount request on a virtual drive in the last hour. Time is accrued from time mount request is accepted until it is completed. Mount time is accredited to the hour that the mount is completed. See Note 3 on page 13-509.
36	24	SMF94VRN	2	binary	Minimum time in seconds used to complete a mount request on a virtual drive in the last hour. Time is accrued from time it is completed. Mount time is accredited to the hour that the mount is completed. See Note 3 on page 13-509.

Offsets		Name	Length	Format	Description
38	26	SMF94VRA	2	binary	Average time in seconds used to complete a mount request on a virtual drive in the last hour. Time is accrued from time mount request is accepted until it is completed. Mount time is accredited to the hour that the mount is completed. See Note 3 on page 13-509.
40	28	SMF94VFR	2	binary	The number of virtual mounts in last hour using VTS Fast-Ready facility. Fast-Ready is used for mount-from-category request for which the specified category has the Fast-Ready attribute set, or for specific volume requests for which the specified volume is, at the time the mount request is received, assigned to a category that has the Fast-Ready attribute set. See Note 3 on page 13-509.
42	2A	SMF94VMH	2	binary	The number of virtual mounts in the last hour that were completed for specific requested volume found resident in Tape Volume Cache (specific mount hits). See Note 3 on page 13-509.
44	2C	SMF94VMS	2	binary	The number of virtual mounts in last hour that were completed with specific requested logic volume recalled from a physical tape back into Tape Volume Cache. See Note 3 on page 13-509.
46	2E	SMF94VMP	2	binary	The number of virtual volumes for which a copy operation from the Tape Volume Cache to physical tape was completed in the last hour. See Note 3 on page 13-509.
48	30	SMF94VBW	4	binary	The total number of bytes written successfully through host channels to virtual volumes in an integral multiple of 4096 bytes during the last hour. If number of bytes written is not an integer multiple of 4096, the number is rounded up. If the statistics are reported for a distributed library, the number reflects the effect of the VTC’s compression of host data as written to the distributed library. See Note 2 on page 13-509.
52	34	SMF94VBR	4	binary	The total number of bytes read successfully through host channels from virtual volumes in an integral multiple of 4096 bytes during the last hour. If number of bytes read is not an integer multiple of 4096, the number is rounded up. If the statistics are reported for a distributed library, the number reflects the effect of the VTC’s compression of host data as written to the distributed library. See Note 2 on page 13-509.
56	38	SMF94VTW	4	binary	The total number of bytes written successfully by VTS to its attached physical drives in an integral multiple of 4096 bytes during the last hour. If number of bytes written is not an integer multiple of 4096, the number is rounded up. Bytes are accredited to the hour in which the underlying premigrates of virtual volumes complete. See Note 1 on page 13-509 and 3 on page 13-509.
60	3C	SMF94VTR	4	binary	The total number of bytes read successfully by VTS from its attached physical drives in an integral multiple of 4096 bytes during the last hour. If the number of bytes read is not an integer multiple of 4096, the number is rounded up. Bytes are accredited to the hour in which the underlying stage requests complete. See Note 1 on page 13-509 and 3 on page 13-509.
64	40	SMF94VCA	2	binary	The average, in minutes, of the age of last reference of the virtual volumes in the Tape Volume Cache, as determined at the end of the reported hour. See Note 1 on page 13-509 and 3 on page 13-509.
66	42	SMF94VCZ	2	binary	The average size of the virtual volumes in the Tape Volume Cache in an integral multiple of 1,048,576 bytes (1Mbytes), at the end of the reported hour. Virtual volume that contain less than 1 MB are rounded up to 1MB. See Note 1 on page 13-509 and 3 on page 13-509.

Offsets		Name	Length	Format	Description
68	44	SMF94VNM	2	binary	The number of virtual volumes in Tape Volume Cache at the end of reported hour. See Note 1 on page 13-509 and 3 on page 13-509.
70	46	SMF94VR3	2	binary	Reserved, set to X’00’
72	48	SMF94VBA	4	binary	The total number of megabytes of data on the active logical volumes which are on VTS stacked volumes at the end of the reported hour. The number is the integral multiple of 1,048,576 bytes. This is the number of megabytes copied from the Tape Volume Cache to the stacked volumes and may include multiple versions of logical volumes. The obsolete versions will become inactive during the next reconciliation process. See Note 3 on page 13-509.
76	4C	SMF94VLA	4	binary	The total number of active logical volumes which are on VTS stacked volumes at the end of the reported hour. This number may include multiple versions of logical volumes; therefore, the number may exceed the number of defined logical volumes. The obsolete versions will become inactive during the next reconciliation process. See Note 3 on page 13-509.
80	50	SMF94VEC	4	binary	The total estimated amount of storage capacity provided by the empty cartridges managed by the Virtual Tape Server subsystem in an integral multiple of 1,048,576 bytes a (1 MByte) as of last midnight. This value is calculated by multiplying the number of scratch a cartridges for each media type present in the subsystem by the estimated storage capacity of each a media type. The storage capacity of a 3590 cartridge used by the Model B16 VTS with 3590 Model B1A tape drives is estimated by assuming a compression ratio of 2:1 which results in a storage capacity of 20 GBytes for the standard 3590 High Performance Cartridge. The Model B18 VTS uses an actual compression ratio (likely to be 1:1 with the EHPO feature since the data will already be in a compressed format in the Tape Volume Cache) resulting in an estimated storage capacity per J type cartridge of 10 GBytes for 3590 Model B1A tape drives, 20 GBytes for 3590 Model E1A tape drives and 30 GBytes for 3590 Model H1A tape drives. Storage a capacity for K type cartridges is double that for the J type. The Model B10 or B20 VTS uses the actual compression ratio and in addition to 3590 tape drives models and media, supports the 3592 Model J1A tape drives and media. The estimated storage a capacity for the JA type media is 300 GBytes and 60 GBytes for the JJ type media. See Note 3 on page 13-509.

Notes:

1. Contains zero with F/C 4001.
2. This field is a composite of all Virtual Tape Controllers (VTC) when reported for a composite library(SMF94VNO=X'FF').
3. Contains zero when reported for the composite library (SMF94VNO=X’FF’)

Import/Export Statistics

Offsets		Name	Length	Format	Description
0	0	SMF94IM1	2	binary	count of physical volumes processed during import operations that completed in the last hour.
2	2	SMF94EX1	2	binary	count of physical volumes that contain the successfully exported logical volumes exported during the last hour.
4	4	SMF94IM2	4	binary	count of the number of logical volumes successfully imported during import operations that completed during the last hour.

Offsets		Name	Length	Format	Description
8	8	SMF94EX2	4	binary	count of the number of logical volumes successfully exported for export operations that completed during the last hour.
12	C	SMF94IM3	4	binary	megabytes of data imported for import operations that completed in the last hour.
16	10	SMF94EX3	4	binary	megabytes of data exported during export operations that completed in the last hour.
20	14	SMF94IM4	4	binary	megabytes of data that was moved from one physical stacked volume to another as part of the import operations that completed in the last hour.
24	18	SMF94EX4	4	binary	megabytes moved from one physical stacked volume to another as part of the export operations completed in the last hour.
28	1C		8	binary	Reserved, set to X'00'
36	24	SMF94ACA	2	binary	Accessor A mounts. The count of the number of mount operations accessor A completed during the last hour.
38	26	SMF94ACB	2	binary	Accessor B mounts. The count of the number of mount operations accessor B completed during the last hour.
40	28		4	binary	Reserved, set to X'00'

VTS Enhanced Library Statistics

Offsets		Name	Length	Format	Description
0	0	S94BSRAT	2	binary	Backstore compression ratio in hundredths.. See Note 1 on page 13-535.
2	2	S94HARAT	2	binary	Host adapter compression ratio in hundredths.. See Notes 2 on page 13-535 and 4 on page 13-535.
4	2	S94TVCS	2	binary	Tape volume cache size. See Note 1 on page 13-535.
6	6	S94ESCON	1	binary	Number of ESCON channels. See Note 2 on page 13-535.
7	7	S94SCSI	1	binary	Number of SCSI channels. See Note 1 on page 13-535.
8	8	S94NUMBS	4	binary	Channel blocks written. See Note 2 on page 13-535.
12	C	S940KB	1	binary	Percentage of 0 to 2K channel blocks written. See Note 2 on page 13-535.
13	D	S942KB	1	binary	Percentage of greater than 2K to 4K channel blocks written. See Note 2 on page 13-535.
14	E	S944KB	1	binary	Percentage of greater than 4K to 8K channel blocks written. See Note 2 on page 13-535.
15	F	S948KB	1	binary	Percentage of greater than 8K to 16K channel blocks written. See Note 2 on page 13-535.
16	10	S9416KB	1	binary	Percentage of greater than 16K to 32K channel blocks written. See Note 2 on page 13-535.
17	11	S9432KB	1	binary	Percentage of greater than 32K to 64K channel blocks written. See Note 2 on page 13-535.
18	12	S9464KB	1	binary	Percentage of greater than 64K channel blocks written. See Note 2 on page 13-535.
19	13	S94RCPRT	1	binary	Recall predominate throttling percentage. See Note 1 on page 13-535.
20	14	S94WROVT	1	binary	Write overrun predominate throttling percentage. See Note 1 on page 13-535.
21	15		3	binary	Reserved
24	18	S94AVRCT	4	binary	Average recall throttle value. See Note 1 on page 13-535.
28	1C	S94AVWOT	4	binary	Average write overrun throttle value. See Note 1 on page 13-535.
32	20		4	binary	Reserved

Offsets		Name	Length	Format	Description
36	24	S94TOTAT	4	binary	Overall average throttle value. See Note 1 on page 13-535.
40	28	S94MAXFR	2	binary	Maximum fast-ready mount time. See Note 2 on page 13-535.
42	2A	S94MINFR	2	binary	Minimum fast-ready mount time. See Note 2 on page 13-535.
44	2C	S94AVGFR	2	binary	Average fast-ready mount time. See Note 2 on page 13-535.
46	2E	S94MAXCH	2	binary	Maximum cache-hit mount time. See Note 2 on page 13-535.
48	30	S94MINCH	2	binary	Minimum cache-hit mount time. See Note 2 on page 13-535.
50	32	S94AVGCH	2	binary	Average cache-hit mount time. See Note 2 on page 13-535.
52	34	S94MAXRM	2	binary	Maximum recall-mount mount time. See Note 2 on page 13-535.
54	36	S94MINRM	2	binary	Minimum recall-mount mount time. See Note 2 on page 13-535.
56	38	S94AVGRM	2	binary	Average recall-mount mount time. See Note 2 on page 13-535.
58	3A	S94ADV05	2	binary	Number of volumes containing 0 to 5 percent active data. See Note 1 on page 13-535.
60	3C	S94ADV10	2	binary	Number of volumes containing greater than 5 to 10 percent active data. See Note 1 on page 13-535.
62	3E	S94ADV15	2	binary	Number of volumes containing greater than 10 to 15 percent active data. See Note 1 on page 13-535.
64	40	S94ADV20	2	binary	Number of volumes containing greater than 15 to 20 percent active data. See Note 1 on page 13-535.
66	42	S94ADV25	2	binary	Number of volumes containing greater than 20 to 25 percent active data. See Note 1 on page 13-535.
68	44	S94ADV30	2	binary	Number of volumes containing greater than 25 to 30 percent active data. See Note 1 on page 13-535.
70	46	S94ADV35	2	binary	Number of volumes containing greater than 30 to 35 percent active data. See Note 1 on page 13-535.
72	48	S94ADV40	2	binary	Number of volumes containing greater than 35 to 40 percent active data. See Note 1 on page 13-535.
74	4A	S94ADV45	2	binary	Number of volumes containing greater than 40 to 45 percent active data. See Note 1 on page 13-535.
76	4C	S94ADV50	2	binary	Number of volumes containing greater than 45 to 50 percent active data. See Note 1 on page 13-535.
78	4E	S94ADV55	2	binary	Number of volumes containing greater than 50 to 55 percent active data. See Note 1 on page 13-535.
80	50	S94ADV60	2	binary	Number of volumes containing greater than 55 to 60 percent active data. See Note 1 on page 13-535.
82	52	S94ADV65	2	binary	Number of volumes containing greater than 60 to 65 percent active data. See Note 1 on page 13-535.
84	54	S94ADV70	2	binary	Number of volumes containing greater than 65 to 70 percent active data. See Note 1 on page 13-535.
86	56	S94ADV75	2	binary	Number of volumes containing greater than 70 to 75 percent active data. See Note 1 on page 13-535.
88	58	S94ADV80	2	binary	Number of volumes containing greater than 75 to 80 percent active data. See Note 1 on page 13-535.
90	5A	S94ADV85	2	binary	Number of volumes containing greater than 80 to 85 percent active data. See Note 1 on page 13-535.
92	5C	S94ADV90	2	binary	Number of volumes containing greater than 85 to 90 percent active data. See Note 1 on page 13-535.
94	5E	S94ADV95	2	binary	Number of volumes containing greater than 90 to 95 percent active data. See Note 1 on page 13-535.

Offsets		Name	Length	Format	Description
96	60	S94ADV00	2	binary	Number of volumes containing greater than 95 to 100 percent active data. See Note 1 on page 13-535.
98	62	S94THRES	1	binary	Reclaim threshold percentage. See Notes 1 on page 13-535 and5 on page 13-535.
99	63		1	binary	Reserved (set to zero).
100	64	S94SRTCT	2	binary	Scratch stacked volume count. See Note 1 on page 13-535.
102	66	S94PRICT	2	binary	Private stacked volume count. See Note 1 on page 13-535.
104	68	S94MTVCA	4	binary	Maximum tape volume cache age. See Note 1 on page 13-535.
108	6C	S94CMGTS	1	binary	If the request was for a distributed library of a PTP VTS Subsystem or a non-PTP VTS subsystem, this field reports the cache management setting for copy and recalled volumes. Each sub-field reports the cache management preference level set. The defaults are preference level 0 for copies and preference level 1 for recalls. The values for the sub-fields are only valid if bit 0 is active, otherwise the sub-fields are to be ignored. See Note 1 on page 13-535. **Bit(s)** **Description** **0** Fields valid **1-3** Copy volume management preference level (0-7) **4** Reserved (set to B'0') **5–7** Recall volume management preference level (0-7)
109	6D		3	binary	Reserved (set to zero).
112	70	S94LVVCM	2	binary	VTS code Modification value. This two byte hexadecimal field contains the Modification portion for the VTS subsystem code level that generated the statistical record.
114	72	S94LVVCF	2	binary	VTS code fix value. This two byte hexadecimal field contains the Fix portion for the VTS subsystem code level that generated the statistical record.
116	74	S94LVLMV	2	binary	Library manager code version value. This two byte hexadecimal field contains the Version portion for the Library Manager code level that generated the statistical record.
118	76	S94LVLMR	2	binary	Library manager code release value. This two byte hexadecimal field contains the Release portion for the Library Manager code level that generated the statistical record.
120	78		8	binary	Reserved (set to zero).
128	80	S94CLLVC	4	binary	Composite library logical volumes to be copied. See Note 3 on page 13-535.
132	84	S94CLDTC	4	binary	Composite library data yet to be copied. See Note 3 on page 13-535.
136	88	S94CLMT0	2	binary	Composite library mounts completed for VTS-0. See Note 3 on page 13-535.
138	8A	S94CLMT1	2	binary	Composite library mounts completed for VTS-1. See Note 3 on page 13-535.
140	8C		4	binary	Reserved (set to zero).
144	90	S94CLDC0	4	binary	Data copied by VTC number 0. See Note 3 on page 13-535.
148	94	S94CLVC0	4	binary	Volumes copied by VTC number 0. See Note 3 on page 13-535.
152	98	S94CLRD0	4	binary	Read data transferred through VTC number 0. See Note 3 on page 13-535.
156	9C	S94CLWD0	4	binary	Write data transferred through VTC number 0. See Note 3 on page 13-535.
160	A0	S94CLCM0	2	binary	Category mounts for VTC number 0. See Note 3 on page 13-535.

Offsets		Name	Length	Format	Description
162	A2	S94CLSM0	2	binary	Specific cache mounts for VTC number 0. See Note 3 on page 13-535.
164	A4	S94CLRM0	2	binary	Specific recall mounts for VTC number 0. See Note 3 on page 13-535.
166	A6	S94CLCR0	2	binary	Compression ratio of the data that has moved through the host adapters of the VTC to the Tape Volume Cache of the I/O VTSs in the last hour. The granularity of the value reported is in hundredths. If no data has been moved through the host adapters in the last hour, a compression value of zero is reported. See Note 3 on page 13-535.
168	A8	S94CLPF0	1	binary	I/O VTS and master VTS preferences for the VTC. See Note 3 on page 13-535. **Bit(s) Description** **0–3** Preferred I/O. This field indicates if a preferred VTS has been specified for I/O operations. If possible all host I/O operations will be directed to the specified VTS. If bit 0 is not active, then the VTS does not support the reporting of a preferred I/O VTS. **Value Description** **8** VTS 0 **9** VTS 1 **F** No preference Values not defined above are reserved. **4–7** This field indicates if a preferred master VTS has been specified. If the specified VTS is not the current master, the VTC will attempt a master switchover to the preferred VTS, if conditions within the PTP VTS would allow it. If bit 0 is not active, then the VTS does not support the reporting of a preferred master VTS.Values not defined above are reserved. **Value Description** **8** VTS 0 **9** VTS 1 **F** No preference

Offsets		Name	Length	Format	Description
169	A9	S94CLCS0	2	binary	Configured settings. Operational settings configured for the VTC. The reported operational setting are valid only if bit 15 is active. See Note 3 on page 13-535. **Bit(s)** **Description** **0–1** Default copy mode. Reports the copy mode set as the default for the VTC: **Value** **Description** **0** Deferred copy mode **1** Immediate copy mode Values not defined above are reserved. **2** Force Scratch to preferred I/O VTS. If this bit is active, all scratch mounts use the preferred VTS, if available, independent of the data validity on the preferred VTS. **3** Primary I/O. If this bit is active, a PSF-PMC order was accepted that specified a VTS I/O Selection Criteria of Primary. **4–5** Controller Operational Mode This field reports the operational mode. **Value** **Description** **0** Deferred copy mode **1** Immediate copy mode Values not defined above are reserved. **6** Write protect mode. If this bit is active, the Virtual Tape Controllers (VTC) is in write protected mode. All host commands that attempt to change the attributes of a volume or modify/add data to a volume will fail. This mode supersedes the controller operational mode. **7–14** Reserved (set to 0) **15** Fields valid
171	AB	S94CLRL0	1	binary	Relative link speeds. Reports the CE settings for the relative link speeds between the VTC and VTS0 and VTS1. See Note 3 on page 13-535. The following values are defined: **Value** **Description** **0** No support for reporting relative link speeds **1** ESCON < 5 km, FICON < 30 km **2** ESCON < 10 km, FICON < 80 km **3** Channel Ext < 1000 km, ESCON over DWDM < 10 km, FICON < 100 km **4** Channel Ext > 1000 km, ESCON over DWDM < 15 km **5** ESCON over DWDM > 15 km Values not defined above are reserved. **Bit(s)** **Description** **0–3** VTC to VTS0 link speed value **4–7** VTC to VTS1 link speed value
172	AC		4	binary	Reserved (set to zero).
176	B0	S94CLDC1	4	binary	Data copied by AX0 number 1. See Note 3 on page 13-535.
180	B4	S94CLVC1	4	binary	Volumes copied by AX0 number 1. See Note 3 on page 13-535.
184	B8	S94CLRD1	4	binary	Read data transferred through AX0 number 1. See Note 3 on page 13-535.
188	BC	S94CLWD1	4	binary	Write data transferred through AX0 number 1. See Note 3 on page 13-535.
192	C0	S94CLCM1	2	binary	Category mounts for AX0 number 1. See Note 3 on page 13-535.
194	C2	S94CLSM1	2	binary	Specific cache mounts for AX0 number 1. See Note 3 on page 13-535.

Offsets		Name	Length	Format	Description
196	C4	S94CLRM1	2	binary	Specific recall mounts for AX0 number 1. See Note 3 on page 13-535.
198	C6	S94CLCR1	2	binary	Compression ratio of the data that has moved through the host adapters of the VTC to the Tape Volume Cache of the I/O VTSs in the last hour. The granularity of the value reported is in hundredths. If no data has been moved through the host adapters in the last hour, a compression value of zero is reported. See Note 3 on page 13-535.
200	C8	S94CLPF1	1	binary	I/O VTS and master VTS preferences for the VTC. See Note 3 on page 13-535. **Bit(s)** **Description** **0–3** Preferred I/O. This field indicates if a preferred VTS has been specified for I/O operations. If possible all host I/O operations will be directed to the specified VTS. If bit 0 is not active, then the VTS does not support the reporting of a preferred I/O VTS. **Value** **Description** **8** VTS 0 **9** VTS 1 **F** No preference Values not defined above are reserved. **4–7** This field indicates if a preferred master VTS has been specified. If the specified VTS is not the current master, the VTC will attempt a master switchover to the preferred VTS, if conditions within the PTP VTS would allow it. If bit 0 is not active, then the VTS does not support the reporting of a preferred master VTS.Values not defined above are reserved. **Value** **Description** **8** VTS 0 **9** VTS 1 **F** No preference

Offsets		Name	Length	Format	Description
201	C9	S94CLCS1	2	binary	Configured settings. Operational settings configured for the VTC. The reported operational setting are valid only if bit 15 is active. See Note 3 on page 13-535. **Bit(s)** **Description** **0–1** Default copy mode. Reports the copy mode set as the default for the VTC: **Value** **Description** **0** Deferred copy mode **1** Immediate copy mode Values not defined above are reserved. **2** Force Scratch to preferred I/O VTS. If this bit is active, all scratch mounts use the preferred VTS, if available, independent of the data validity on the preferred VTS. **3** Primary I/O. If this bit is active, a PSF-PMC order was accepted that specified a VTS I/O Selection Criteria of Primary. **4–5** Controller Operational Mode This field reports the operational mode. **Value** **Description** **0** Deferred copy mode **1** Immediate copy mode Values not defined above are reserved. **6** Write protect mode. If this bit is active, the Virtual Tape Controllers (VTC) is in write protected mode. All host commands that attempt to change the attributes of a volume or modify/add data to a volume will fail. This mode supersedes the controller operational mode. **7–14** Reserved (set to 0) **15** Fields valid
203	CB	S94CLRL1	1	binary	Relative link speeds. Reports the CE settings for the relative link speeds between the VTC and VTS0 and VTS1. See Note 3 on page 13-535. The following values are defined: **Value** **Description** **0** No support for reporting relative link speeds **1** ESCON < 5 km, FICON < 30 km **2** ESCON < 10 km, FICON < 80 km **3** Channel Ext < 1000 km, ESCON over DWDM < 10 km, FICON < 100 km **4** Channel Ext > 1000 km, ESCON over DWDM < 15 km **5** ESCON over DWDM > 15 km Values not defined above are reserved. **Bit(s)** **Description** **0–3** VTC to VTS0 link speed value **4–7** VTC to VTS1 link speed value
204	CC		4	binary	Reserved (set to zero).
208	D0	S94CLDC2	4	binary	Data copied by AX0 number 2. See Note 3 on page 13-535.
212	D4	S94CLVC2	4	binary	Volumes copied by AX0 number 2. See Note 3 on page 13-535.
216	D8	S94CLRD2	4	binary	Read data transferred through AX0 number 2. See Note 3 on page 13-535.
220	DC	S94CLWD2	4	binary	Write data transferred through AX0 number 2. See Note 3 on page 13-535.
224	E0	S94CLCM2	2	binary	Category mounts for AX0 number 2. See Note 3 on page 13-535.
226	E2	S94CLSM2	2	binary	Specific cache mounts for AX0 number 2. See Note 3 on page 13-535.

Offsets		Name	Length	Format	Description
228	E4	S94CLRM2	2	binary	Specific recall mounts for AX0 number 2. See Note 3 on page 13-535.
230	E6	S94CLCR2	2	binary	Compression ratio of the data that has moved through the host adapters of the VTC to the Tape Volume Cache of the I/O VTSs in the last hour. The granularity of the value reported is in hundredths. If no data has been moved through the host adapters in the last hour, a compression value of zero is reported. See Note 3 on page 13-535.
232	E8	S94CLPF2	1	binary	I/O VTS and master VTS preferences for the VTC. See Note 3 on page 13-535. **Bit(s) Description** **0–3** Preferred I/O. This field indicates if a preferred VTS has been specified for I/O operations. If possible all host I/O operations will be directed to the specified VTS. If bit 0 is not active, then the VTS does not support the reporting of a preferred I/O VTS. **Value Description** **8** VTS 0 **9** VTS 1 **F** No preference Values not defined above are reserved. **4–7** This field indicates if a preferred master VTS has been specified. If the specified VTS is not the current master, the VTC will attempt a master switchover to the preferred VTS, if conditions within the PTP VTS would allow it. If bit 0 is not active, then the VTS does not support the reporting of a preferred master VTS.Values not defined above are reserved. **Value Description** **8** VTS 0 **9** VTS 1 **F** No preference

Offsets		Name	Length	Format	Description
233	E9	S94CLCS2	2	binary	Configured settings. Operational settings configured for the VTC. The reported operational setting are valid only if bit 15 is active. See Note 3 on page 13-535. **Bit(s)** **Description** **0–1** Default copy mode. Reports the copy mode set as the default for the VTC: **Value** **Description** **0** Deferred copy mode **1** Immediate copy mode Values not defined above are reserved. **2** Force Scratch to preferred I/O VTS. If this bit is active, all scratch mounts use the preferred VTS, if available, independent of the data validity on the preferred VTS. **3** Primary I/O. If this bit is active, a PSF-PMC order was accepted that specified a VTS I/O Selection Criteria of Primary. **4–5** Controller Operational Mode This field reports the operational mode. **Value** **Description** **0** Deferred copy mode **1** Immediate copy mode Values not defined above are reserved. **6** Write protect mode. If this bit is active, the Virtual Tape Controllers (VTC) is in write protected mode. All host commands that attempt to change the attributes of a volume or modify/add data to a volume will fail. This mode supersedes the controller operational mode. **7–14** Reserved (set to 0) **15** Fields valid
235	EB	S94CLRL2	1	binary	Relative link speeds. Reports the CE settings for the relative link speeds between the VTC and VTS0 and VTS1. See Note 3 on page 13-535. The following values are defined: **Value** **Description** **0** No support for reporting relative link speeds **1** ESCON < 5 km, FICON < 30 km **2** ESCON < 10 km, FICON < 80 km **3** Channel Ext < 1000 km, ESCON over DWDM < 10 km, FICON < 100 km **4** Channel Ext > 1000 km, ESCON over DWDM < 15 km **5** ESCON over DWDM > 15 km Values not defined above are reserved. **Bit(s)** **Description** **0–3** VTC to VTS0 link speed value **4–7** VTC to VTS1 link speed value
236	EC		4	binary	Reserved (set to zero).
240	F0	S94CLDC3	4	binary	Data copied by AX0 number 3. See Note 3 on page 13-535.
244	F4	S94CLVC3	4	binary	Volumes copied by AX0 number 3. See Note 3 on page 13-535.
248	F8	S94CLRD3	4	binary	Read data transferred through AX0 number 3. See Note 3 on page 13-535.
252	FC	S94CLWD3	4	binary	Write data transferred through AX0 number 3. See Note 3 on page 13-535.
256	100	S94CLCM3	2	binary	Category mounts for AX0 number 3. See Note 3 on page 13-535.
258	102	S94CLSM3	2	binary	Specific cache mounts for AX0 number 3. See Note 3 on page 13-535.

Offsets		Name	Length	Format	Description
260	104	S94CLRM3	2	binary	Specific recall mounts for AX0 number 3. See Note 3 on page 13-535.
262	106	S94CLCR3	2	binary	Compression ratio of the data that has moved through the host adapters of the VTC to the Tape Volume Cache of the I/O VTSs in the last hour. The granularity of the value reported is in hundredths. If no data has been moved through the host adapters in the last hour, a compression value of zero is reported. See Note 3 on page 13-535.
264	108	S94CLPF3	1	binary	I/O VTS and master VTS preferences for the VTC. See Note 3 on page 13-535. **Bit(s)** **Description** **0–3** Preferred I/O. This field indicates if a preferred VTS has been specified for I/O operations. If possible all host I/O operations will be directed to the specified VTS. If bit 0 is not active, then the VTS does not support the reporting of a preferred I/O VTS. **Value** **Description** **8** VTS 0 **9** VTS 1 **F** No preference Values not defined above are reserved. **4–7** This field indicates if a preferred master VTS has been specified. If the specified VTS is not the current master, the VTC will attempt a master switchover to the preferred VTS, if conditions within the PTP VTS would allow it. If bit 0 is not active, then the VTS does not support the reporting of a preferred master VTS.Values not defined above are reserved. **Value** **Description** **8** VTS 0 **9** VTS 1 **F** No preference

Offsets		Name	Length	Format	Description
265	109	S94CLCS3	2	binary	Configured settings. Operational settings configured for the VTC. The reported operational setting are valid only if bit 15 is active. See Note 3 on page 13-535. **Bit(s)** **Description** **0–1** Default copy mode. Reports the copy mode set as the default for the VTC: **Value** **Description** **0** Deferred copy mode **1** Immediate copy mode Values not defined above are reserved. **2** Force Scratch to preferred I/O VTS. If this bit is active, all scratch mounts use the preferred VTS, if available, independent of the data validity on the preferred VTS. **3** Primary I/O. If this bit is active, a PSF-PMC order was accepted that specified a VTS I/O Selection Criteria of Primary. **4–5** Controller Operational Mode This field reports the operational mode. **Value** **Description** **0** Deferred copy mode **1** Immediate copy mode Values not defined above are reserved. **6** Write protect mode. If this bit is active, the Virtual Tape Controllers (VTC) is in write protected mode. All host commands that attempt to change the attributes of a volume or modify/add data to a volume will fail. This mode supersedes the controller operational mode. **7–14** Reserved (set to 0) **15** Fields valid
267	10B	S94CLRL3	1	binary	Relative link speeds. Reports the CE settings for the relative link speeds between the VTC and VTS0 and VTS1. See Note 3 on page 13-535. The following values are defined: **Value** **Description** **0** No support for reporting relative link speeds **1** ESCON < 5 km, FICON < 30 km **2** ESCON < 10 km, FICON < 80 km **3** Channel Ext < 1000 km, ESCON over DWDM < 10 km, FICON < 100 km **4** Channel Ext > 1000 km, ESCON over DWDM < 15 km **5** ESCON over DWDM > 15 km Values not defined above are reserved. **Bit(s)** **Description** **0–3** VTC to VTS0 link speed value **4–7** VTC to VTS1 link speed value
268	10C		4	binary	Reserved (set to zero).
272	110	S94CLDC4	4	binary	Data copied by AX0 number 4. See Note 3 on page 13-535.
276	114	S94CLVC4	4	binary	Volumes copied by AX0 number 4. See Note 3 on page 13-535.
280	118	S94CLRD4	4	binary	Read data transferred through AX0 number 4. See Note 3 on page 13-535.
284	11C	S94CLWD4	4	binary	Write data transferred through AX0 number 4. See Note 3 on page 13-535.
288	120	S94CLCM4	2	binary	Category mounts for AX0 number 4. See Note 3 on page 13-535.
290	122	S94CLSM4	2	binary	Specific cache mounts for AX0 number 4. See Note 3 on page 13-535.

Offsets		Name	Length	Format	Description
292	124	S94CLRM4	2	binary	Specific recall mounts for AX0 number 4. See Note 3 on page 13-535.
294	126	S94CLCR4	2	binary	Compression ratio of the data that has moved through the host adapters of the VTC to the Tape Volume Cache of the I/O VTSs in the last hour. The granularity of the value reported is in hundredths. If no data has been moved through the host adapters in the last hour, a compression value of zero is reported. See Note 3 on page 13-535.
296	128	S94CLPF4	1	binary	I/O VTS and master VTS preferences for the VTC. See Note 3 on page 13-535. **Bit(s) Description** **0–3** Preferred I/O. This field indicates if a preferred VTS has been specified for I/O operations. If possible all host I/O operations will be directed to the specified VTS. If bit 0 is not active, then the VTS does not support the reporting of a preferred I/O VTS. **Value Description** **8** VTS 0 **9** VTS 1 **F** No preference Values not defined above are reserved. **4–7** This field indicates if a preferred master VTS has been specified. If the specified VTS is not the current master, the VTC will attempt a master switchover to the preferred VTS, if conditions within the PTP VTS would allow it. If bit 0 is not active, then the VTS does not support the reporting of a preferred master VTS.Values not defined above are reserved. **Value Description** **8** VTS 0 **9** VTS 1 **F** No preference

Offsets		Name	Length	Format	Description
297	129	S94CLCS4	2	binary	Configured settings. Operational settings configured for the VTC. The reported operational setting are valid only if bit 15 is active. See Note 3 on page 13-535. **Bit(s)** **Description** **0–1** Default copy mode. Reports the copy mode set as the default for the VTC: **Value** **Description** **0** Deferred copy mode **1** Immediate copy mode Values not defined above are reserved. **2** Force Scratch to preferred I/O VTS. If this bit is active, all scratch mounts use the preferred VTS, if available, independent of the data validity on the preferred VTS. **3** Primary I/O. If this bit is active, a PSF-PMC order was accepted that specified a VTS I/O Selection Criteria of Primary. **4–5** Controller Operational Mode This field reports the operational mode. **Value** **Description** **0** Deferred copy mode **1** Immediate copy mode Values not defined above are reserved. **6** Write protect mode. If this bit is active, the Virtual Tape Controllers (VTC) is in write protected mode. All host commands that attempt to change the attributes of a volume or modify/add data to a volume will fail. This mode supersedes the controller operational mode. **7–14** Reserved (set to 0) **15** Fields valid
299	12B	S94CLRL4	1	binary	Relative link speeds. Reports the CE settings for the relative link speeds between the VTC and VTS0 and VTS1. See Note 3 on page 13-535. The following values are defined: **Value** **Description** **0** No support for reporting relative link speeds **1** ESCON < 5 km, FICON < 30 km **2** ESCON < 10 km, FICON < 80 km **3** Channel Ext < 1000 km, ESCON over DWDM < 10 km, FICON < 100 km **4** Channel Ext > 1000 km, ESCON over DWDM < 15 km **5** ESCON over DWDM > 15 km Values not defined above are reserved. **Bit(s)** **Description** **0–3** VTC to VTS0 link speed value **4–7** VTC to VTS1 link speed value
300	12C		4	binary	Reserved (set to zero).
304	130	S94CLDC5	4	binary	Data copied by AX0 number 5. See Note 3 on page 13-535.
308	134	S94CLVC5	4	binary	Volumes copied by AX0 number 5. See Note 3 on page 13-535.
312	138	S94CLRD5	4	binary	Read data transferred through AX0 number 5. See Note 3 on page 13-535.
316	13C	S94CLWD5	4	binary	Write data transferred through AX0 number 5. See Note 3 on page 13-535.
320	140	S94CLCM5	2	binary	Category mounts for AX0 number 5. See Note 3 on page 13-535.
322	142	S94CLSM5	2	binary	Specific cache mounts for AX0 number 5. See Note 3 on page 13-535.

Offsets		Name	Length	Format	Description
324	144	S94CLRM5	2	binary	Specific recall mounts for AX0 number 5. See Note 3 on page 13-535.
326	146	S94CLCR5	2	binary	Compression ratio of the data that has moved through the host adapters of the VTC to the Tape Volume Cache of the I/O VTSs in the last hour. The granularity of the value reported is in hundredths. If no data has been moved through the host adapters in the last hour, a compression value of zero is reported. See Note 3 on page 13-535.
328	148	S94CLPF5	1	binary	I/O VTS and master VTS preferences for the VTC. See Note 3 on page 13-535. **Bit(s) Description** **0–3** Preferred I/O. This field indicates if a preferred VTS has been specified for I/O operations. If possible all host I/O operations will be directed to the specified VTS. If bit 0 is not active, then the VTS does not support the reporting of a preferred I/O VTS. **Value Description** **8** VTS 0 **9** VTS 1 **F** No preference Values not defined above are reserved. **4–7** This field indicates if a preferred master VTS has been specified. If the specified VTS is not the current master, the VTC will attempt a master switchover to the preferred VTS, if conditions within the PTP VTS would allow it. If bit 0 is not active, then the VTS does not support the reporting of a preferred master VTS.Values not defined above are reserved. **Value Description** **8** VTS 0 **9** VTS 1 **F** No preference

Offsets		Name	Length	Format	Description
329	149	S94CLCS5	2	binary	Configured settings. Operational settings configured for the VTC. The reported operational setting are valid only if bit 15 is active. See Note 3 on page 13-535. **Bit(s)** **Description** **0–1** Default copy mode. Reports the copy mode set as the default for the VTC: **Value** **Description** **0** Deferred copy mode **1** Immediate copy mode Values not defined above are reserved. **2** Force Scratch to preferred I/O VTS. If this bit is active, all scratch mounts use the preferred VTS, if available, independent of the data validity on the preferred VTS. **3** Primary I/O. If this bit is active, a PSF-PMC order was accepted that specified a VTS I/O Selection Criteria of Primary. **4–5** Controller Operational Mode This field reports the operational mode. **Value** **Description** **0** Deferred copy mode **1** Immediate copy mode Values not defined above are reserved. **6** Write protect mode. If this bit is active, the Virtual Tape Controllers (VTC) is in write protected mode. All host commands that attempt to change the attributes of a volume or modify/add data to a volume will fail. This mode supersedes the controller operational mode. **7–14** Reserved (set to 0) **15** Fields valid
331	14B	S94CLRL5	1	binary	Relative link speeds. Reports the CE settings for the relative link speeds between the VTC and VTS0 and VTS1. See Note 3 on page 13-535. The following values are defined: **Value** **Description** **0** No support for reporting relative link speeds **1** ESCON < 5 km, FICON < 30 km **2** ESCON < 10 km, FICON < 80 km **3** Channel Ext < 1000 km, ESCON over DWDM < 10 km, FICON < 100 km **4** Channel Ext > 1000 km, ESCON over DWDM < 15 km **5** ESCON over DWDM > 15 km Values not defined above are reserved. **Bit(s)** **Description** **0–3** VTC to VTS0 link speed value **4–7** VTC to VTS1 link speed value
332	14C		4	binary	Reserved (set to zero).
336	150	S94CLDC6	4	binary	Data copied by AX0 number 6. See Note 3 on page 13-535.
340	154	S94CLVC6	4	binary	Volumes copied by AX0 number 6. See Note 3 on page 13-535.
344	158	S94CLRD6	4	binary	Read data transferred through AX0 number 6. See Note 3 on page 13-535.
348	15C	S94CLWD6	4	binary	Write data transferred through AX0 number 6. See Note 3 on page 13-535.
352	160	S94CLCM6	2	binary	Category mounts for AX0 number 6. See Note 3 on page 13-535.
354	162	S94CLSM6	2	binary	Specific cache mounts for AX0 number 6. See Note 3 on page 13-535.

Offsets		Name	Length	Format	Description
356	164	S94CLRM6	2	binary	Specific recall mounts for AX0 number 6. See Note 3 on page 13-535.
358	166	S94CLCR6	2	binary	Compression ratio of the data that has moved through the host adapters of the VTC to the Tape Volume Cache of the I/O VTSs in the last hour. The granularity of the value reported is in hundredths. If no data has been moved through the host adapters in the last hour, a compression value of zero is reported. See Note 3 on page 13-535.
360	168	S94CLPF6	1	binary	I/O VTS and master VTS preferences for the VTC. See Note 3 on page 13-535. **Bit(s) Description** **0–3** Preferred I/O. This field indicates if a preferred VTS has been specified for I/O operations. If possible all host I/O operations will be directed to the specified VTS. If bit 0 is not active, then the VTS does not support the reporting of a preferred I/O VTS. **Value Description** **8** VTS 0 **9** VTS 1 **F** No preference Values not defined above are reserved. **4–7** This field indicates if a preferred master VTS has been specified. If the specified VTS is not the current master, the VTC will attempt a master switchover to the preferred VTS, if conditions within the PTP VTS would allow it. If bit 0 is not active, then the VTS does not support the reporting of a preferred master VTS.Values not defined above are reserved. **Value Description** **8** VTS 0 **9** VTS 1 **F** No preference

Offsets		Name	Length	Format	Description
361	169	S94CLCS6	2	binary	Configured settings. Operational settings configured for the VTC. The reported operational setting are valid only if bit 15 is active. See Note 3 on page 13-535. **Bit(s)** **Description** **0–1** Default copy mode. Reports the copy mode set as the default for the VTC: **Value** **Description** **0** Deferred copy mode **1** Immediate copy mode Values not defined above are reserved. **2** Force Scratch to preferred I/O VTS. If this bit is active, all scratch mounts use the preferred VTS, if available, independent of the data validity on the preferred VTS. **3** Primary I/O. If this bit is active, a PSF-PMC order was accepted that specified a VTS I/O Selection Criteria of Primary. **4–5** Controller Operational Mode This field reports the operational mode. **Value** **Description** **0** Deferred copy mode **1** Immediate copy mode Values not defined above are reserved. **6** Write protect mode. If this bit is active, the Virtual Tape Controllers (VTC) is in write protected mode. All host commands that attempt to change the attributes of a volume or modify/add data to a volume will fail. This mode supersedes the controller operational mode. **7–14** Reserved (set to 0) **15** Fields valid
363	16B	S94CLRL6	1	binary	Relative link speeds. Reports the CE settings for the relative link speeds between the VTC and VTS0 and VTS1. See Note 3 on page 13-535. The following values are defined: **Value** **Description** **0** No support for reporting relative link speeds **1** ESCON < 5 km, FICON < 30 km **2** ESCON < 10 km, FICON < 80 km **3** Channel Ext < 1000 km, ESCON over DWDM < 10 km, FICON < 100 km **4** Channel Ext > 1000 km, ESCON over DWDM < 15 km **5** ESCON over DWDM > 15 km Values not defined above are reserved. **Bit(s)** **Description** **0–3** VTC to VTS0 link speed value **4–7** VTC to VTS1 link speed value
364	16C		4	binary	Reserved (set to zero).
368	170	S94CLDC7	4	binary	Data copied by AX0 number 7. See Note 3 on page 13-535.
372	174	S94CLVC7	4	binary	Volumes copied by AX0 number 7. See Note 3 on page 13-535.
376	178	S94CLRD7	4	binary	Read data transferred through AX0 number 7. See Note 3 on page 13-535.
380	17C	S94CLWD7	4	binary	Write data transferred through AX0 number 7. See Note 3 on page 13-535.
384	180	S94CLCM7	2	binary	Category mounts for AX0 number 7. See Note 3 on page 13-535.
386	182	S94CLSM7	2	binary	Specific cache mounts for AX0 number 7. See Note 3 on page 13-535.

Offsets		Name	Length	Format	Description
388	184	S94CLRM7	2	binary	Specific recall mounts for AX0 number 7. See Note 3 on page 13-535.
390	186	S94CLCR7	2	binary	Compression ratio of the data that has moved through the host adapters of the VTC to the Tape Volume Cache of the I/O VTSs in the last hour. The granularity of the value reported is in hundredths. If no data has been moved through the host adapters in the last hour, a compression value of zero is reported. See Note 3 on page 13-535.
392	188	S94CLPF7	1	binary	I/O VTS and master VTS preferences for the VTC. See Note 3 on page 13-535. **Bit(s) Description** **0–3** Preferred I/O. This field indicates if a preferred VTS has been specified for I/O operations. If possible all host I/O operations will be directed to the specified VTS. If bit 0 is not active, then the VTS does not support the reporting of a preferred I/O VTS. **Value Description** **8** VTS 0 **9** VTS 1 **F** No preference Values not defined above are reserved. **4–7** This field indicates if a preferred master VTS has been specified. If the specified VTS is not the current master, the VTC will attempt a master switchover to the preferred VTS, if conditions within the PTP VTS would allow it. If bit 0 is not active, then the VTS does not support the reporting of a preferred master VTS.Values not defined above are reserved. **Value Description** **8** VTS 0 **9** VTS 1 **F** No preference

Offsets		Name	Length	Format	Description
393	189	S94CLCS7	2	binary	Configured settings. Operational settings configured for the VTC. The reported operational setting are valid only if bit 15 is active. See Note 3 on page 13-535. **Bit(s)** **Description** **0–1** Default copy mode. Reports the copy mode set as the default for the VTC: **Value** **Description** **0** Deferred copy mode **1** Immediate copy mode Values not defined above are reserved. **2** Force Scratch to preferred I/O VTS. If this bit is active, all scratch mounts use the preferred VTS, if available, independent of the data validity on the preferred VTS. **3** Primary I/O. If this bit is active, a PSF-PMC order was accepted that specified a VTS I/O Selection Criteria of Primary. **4–5** Controller Operational Mode This field reports the operational mode. **Value** **Description** **0** Deferred copy mode **1** Immediate copy mode Values not defined above are reserved. **6** Write protect mode. If this bit is active, the Virtual Tape Controllers (VTC) is in write protected mode. All host commands that attempt to change the attributes of a volume or modify/add data to a volume will fail. This mode supersedes the controller operational mode. **7–14** Reserved (set to 0) **15** Fields valid
395	18B	S94CLRL7	1	binary	Relative link speeds. Reports the CE settings for the relative link speeds between the VTC and VTS0 and VTS1. See Note 3 on page 13-535. The following values are defined: **Value** **Description** **0** No support for reporting relative link speeds **1** ESCON < 5 km, FICON < 30 km **2** ESCON < 10 km, FICON < 80 km **3** Channel Ext < 1000 km, ESCON over DWDM < 10 km, FICON < 100 km **4** Channel Ext > 1000 km, ESCON over DWDM < 15 km **5** ESCON over DWDM > 15 km Values not defined above are reserved. **Bit(s)** **Description** **0–3** VTC to VTS0 link speed value **4–7** VTC to VTS1 link speed value
396	18C		4	binary	Reserved (set to zero).
400	190	S94CMV_VTC0	2	binary	VTC 0 code modification value. Contains the modification portion for the VTC code level that is part of the PTP VTS subsystem that generated the statistical record. See Note 3 on page 13-535.
402	192	S94CFV_VTC0	2	binary	VTC 0 code fix value. Contains the Fix portion for the VTC code level that is part of the PTP VTS subsystem that generated the statistical record. See Note 3 on page 13-535.
404	194	S94CMV_VTC1	2	binary	VTC 1 code modification value. Contains the modification portion for the VTC code level that is part of the PTP VTS subsystem that generated the statistical record. See Note 3 on page 13-535.

Offsets		Name	Length	Format	Description
406	194	S94CFV_VTC1	2	binary	VTC 1 code fix value. Contains the Fix portion for the VTC code level that is part of the PTP VTS subsystem that generated the statistical record. See Note 3 on page 13-535.
408	198	S94CMV_VTC2	2	binary	VTC 2 code modification value. Contains the modification portion for the VTC code level that is part of the PTP VTS subsystem that generated the statistical record. See Note 3 on page 13-535.
410	19A	S94CFV_VTC2	2	binary	VTC 2 code fix value. Contains the Fix portion for the VTC code level that is part of the PTP VTS subsystem that generated the statistical record. See Note 3 on page 13-535.
412	19C	S94CMV_VTC3	2	binary	VTC 3 code modification value. Contains the modification portion for the VTC code level that is part of the PTP VTS subsystem that generated the statistical record. See Note 3 on page 13-535.
414	19E	S94CFV_VTC3	2	binary	VTC 3 code fix value. Contains the Fix portion for the VTC code level that is part of the PTP VTS subsystem that generated the statistical record. See Note 3 on page 13-535.
416	1A0	S94CMV_VTC4	2	binary	VTC 4 code modification value. Contains the modification portion for the VTC code level that is part of the PTP VTS subsystem that generated the statistical record. See Note 3 on page 13-535.
418	1A2	S94CFV_VTC4	2	binary	VTC 4 code fix value. Contains the Fix portion for the VTC code level that is part of the PTP VTS subsystem that generated the statistical record. See Note 3 on page 13-535.
420	1A4	S94CMV_VTC5	2	binary	VTC 5 code modification value. Contains the modification portion for the VTC code level that is part of the PTP VTS subsystem that generated the statistical record. See Note 3 on page 13-535.
422	1A6	S94CFV_VTC5	2	binary	VTC 5 code fix value. Contains the Fix portion for the VTC code level that is part of the PTP VTS subsystem that generated the statistical record. See Note 3 on page 13-535.
424	1A8	S94CMV_VTC6	2	binary	VTC 6 code modification value. Contains the modification portion for the VTC code level that is part of the PTP VTS subsystem that generated the statistical record. See Note 3 on page 13-535.
426	1AA	S94CFV_VTC6	2	binary	VTC 6 code fix value. Contains the Fix portion for the VTC code level that is part of the PTP VTS subsystem that generated the statistical record. See Note 3 on page 13-535.
428	1AC	S94CMV_VTC7	2	binary	VTC 7 code modification value. Contains the modification portion for the VTC code level that is part of the PTP VTS subsystem that generated the statistical record. See Note 3 on page 13-535.
430	1AE	S94CFV_VTC7	2	binary	VTC 7 code fix value. Contains the Fix portion for the VTC code level that is part of the PTP VTS subsystem that generated the statistical record. See Note 3 on page 13-535.
432	1B0		96	binary	Reserved (set to zero).
When F/C 4001 is installed and enabled, the following statistics are reported.					
528	210	S94OPM_VDC	2	binary	Virtual Drives Configured (current). This two byte field contains the number of virtual devices configured in the Virtual Tape Server subsystem at the time the request was received. See Note 2 on page 13-535.
530	212	S94OPM_MAXVDM	2	binary	Max virtual drives mounted (last hour). This two byte field contains the maximum number of virtual drives that were concurrently mounted in the Virtual Tape Server subsystem during the last hour. See Note 2 on page 13-535.

Offsets		Name	Length	Format	Description
532	214	S94OPM_MINVDM	2	binary	Min virtual drives mounted (last hour). This two byte field contains the minimum number of virtual drives that were concurrently mounted in the Virtual Tape Server subsystem during the last hour. See Note 2 on page 13-535.
534	216	S94OPM_AVGVDM	2	binary	Avg virtual drives mounted (last hour). This two byte field contains the average number of virtual drives that were concurrently mounted in the Virtual Tape Server subsystem during the last hour. This value is determined by summing the number of concurrently mounted virtual devices every 10 seconds and then, during the hourly generation of the statistics, dividing the resultant value by 360. See Note 2 on page 13-535.
536	218		8	binary	Reserved (set to zero).
When F/C 4001 is installed and enabled, the following array information is included.					
544	220	S94OPM_DCI1	1	binary	Device Class Identifier. This one byte field contains the device class identifier for one of the set of physical tape devices installed in the VTS. See Note 1 on page 13-535. The following are the defined values for this field: **Value** **Description** **X'00'** There is no device class configured. **X'11'** 3590 Model B1A **X'13'** 3590 Model E1A **X'14'** 3590 Model H1A **X'20'** 3592 Model J1A
545	221	S94OPM_PDI1	1	binary	Installed Virtual Tape Server physical devices. This one byte field contains the number of physical tape devices, of the device class indicated, that are installed in the Virtual Tape Server subsystem at the time the request was received. See Note 1 on page 13-535.
546	222	S94OPM_CAFU1	1	binary	Available Virtual Tape Server physical devices. This one byte field contains the number of physical tape devices, of the device class indicated, currently available for use by the Virtual Tape Server subsystem at the time the request was received. See Note 1 on page 13-535.
547	223	S94OPM_MAXCM1	1	binary	Max Virtual Tape Server physical devices mounted. This one byte field contains the maximum number of physical tape devices, of the device class indicated, that were concurrently mounted in the Virtual Tape Server subsystem during the last hour. See Note 1 on page 13-535.
548	224	S94OPM_MINCM1	1	binary	Min Virtual Tape Server physical devices mounted. This one byte field contains the minimum number of physical tape devices, of the device class indicated, that were concurrently mounted in the Virtual Tape Server subsystem during the last hour. See Note 1 on page 13-535.

Offsets		Name	Length	Format	Description
549	225	S94OPM_AVGCM1	1	binary	Avg Virtual Tape Server physical devices mounted (last hour). This one byte field contains the average number of physical tape devices, of the device class indicated, that were concurrently mounted in the Virtual Tape Server subsystem during the last hour. This value is determined by summing the number of concurrently mounted physical devices every 10 seconds and then, during the hourly generation of the statistics, dividing the resultant value by 360. See Note 1 on page 13-535.
550	226	S94OPM_MAXTTM1	2	binary	Max physical mount time (last hour). This two byte field contains the maximum time, in seconds, that the library took to complete the execution of a mount request for a physical tape device, of the device class indicated, in the Virtual Tape Server subsystem. Mount time is accrued from the time the mount request is accepted until the mount is completed. The mount time is accredited to the hour it was completed. See Note 1 on page 13-535.
552	228	S94OPM_MINTTM1	2	binary	Min physical mount time (last hour). This two byte field contains the minimum time, in seconds, that the library took to complete the execution of a mount request for a physical tape device, of the device class indicated, in the Virtual Tape Server subsystem. Mount time is accrued from the time the mount request is accepted until the mount is completed. The mount time is accredited to the hour it was completed. See Note 1 on page 13-535.
554	22A	S94OPM_AVGTTM1	2	binary	Avg physical mount time (last hour). This two byte field contains the average time, in seconds, that the library took to complete the execution of a mount request for a physical tape device, of the device class indicated, in the Virtual Tape Server subsystem. Mount time is accrued from the time the mount request is accepted until the mount is completed. The mount time is accredited to the hour it was completed. See Note 1 on page 13-535.
556	22C	S94OPM_STGMNTS1	2	binary	Physical mounts - stage (last hour). This two byte field contains the number of physical mount requests completed by the library in the last hour to satisfy stage mounts, of the device class indicated. See Note 1 on page 13-535.
558	22E	S94OPM_MIGMNTS1	2	binary	Physical mounts - migrate (last hour). This two byte field contains the number of physical mount requests completed by the library in the last hour to satisfy migration mounts, of the device class indicated. See Note 1 on page 13-535.
560	230	S94OPM_RECMNTS1	2	binary	Physical mounts - reclaim (last hour). This two byte field contains the number of physical mount requests completed by the library in the last hour to satisfy reclamation mounts, of the device class indicated. See Note 1 on page 13-535.
562	232	S94OPM_SDEMNTS1	2	binary	This two byte field contains the number of physical mount requests completed by the library in the last hour to satisfy Secure Data Erase mounts, of the device class indicated.

Offsets		Name	Length	Format	Description
564	234	S94OPM_PPWRITN1	4	binary	Data Written to a Primary Pool (last hour). This four byte field contains the number of MBytes premigrated from the tape volume cache to a primary pool for the device class indicated during the last hour. Only the data for logical volumes that have completed premigration when statistics were calculated at the end of the last hour are included in this value. The value is reset and a new count begins after statistics are calculated. It is accumulated in bytes and reported in an integral multiple of 1,048,576 bytes (1 MByte). See Note 1 on page 13-535.
568	238	S94OPM_SPWRITN1	4	binary	Data Written to a Secondary Pool (last hour). This four byte field contains the number of MBytes premigrated from the tape volume cache to a secondary pool for the device class indicated during the last hour. Only the data for logical volumes that have completed premigration when statistics were calculated at the end of the last hour are included in this value. The value is reset and a new count begins after statistics are calculated. It is accumulated in bytes and reported in an integral multiple of 1,048,576 bytes (1 MByte). See Note 1 on page 13-535.
572	23C		4	binary	Reserved (set to X'00')
576	240	S94OPM_DCI2	1	binary	Device Class Identifier. This one byte field contains the device class identifier for one of the set of physical tape devices installed in the VTS. See Note 1 on page 13-535.The following are the defined values for this field: **Value** **Description** **X'00'** There is no device class configured. **X'11'** 3590 Model B1A **X'13'** 3590 Model E1A **X'14'** 3590 Model H1A **X'20'** 3592 Model J1A
577	241	S94OPM_PDI2	1	binary	Installed Virtual Tape Server physical devices. This one byte field contains the number of physical tape devices, of the device class indicated, that are installed in the Virtual Tape Server subsystem at the time the request was received. See Note 1 on page 13-535.
578	242	S94OPM_CAFU2	1	binary	Available Virtual Tape Server physical devices. This one byte field contains the number of physical tape devices, of the device class indicated, currently available for use by the Virtual Tape Server subsystem at the time the request was received. See Note 1 on page 13-535.
579	243	S94OPM_MAXCM2	1	binary	Max Virtual Tape Server physical devices mounted. This one byte field contains the maximum number of physical tape devices, of the device class indicated, that were concurrently mounted in the Virtual Tape Server subsystem during the last hour. See Note 1 on page 13-535.
580	244	S94OPM_MINCM2	1	binary	Min Virtual Tape Server physical devices mounted. This one byte field contains the minimum number of physical tape devices, of the device class indicated, that were concurrently mounted in the Virtual Tape Server subsystem during the last hour. See Note 1 on page 13-535.

Offsets		Name	Length	Format	Description
581	245	S94OPM_AVGCM2	1	binary	Avg Virtual Tape Server physical devices mounted (last hour). This one byte field contains the average number of physical tape devices, of the device class indicated, that were concurrently mounted in the Virtual Tape Server subsystem during the last hour. This value is determined by summing the number of concurrently mounted physical devices every 10 seconds and then, during the hourly generation of the statistics, dividing the resultant value by 360. See Note 1 on page 13-535.
582	246	S94OPM_MAXTTM2	2	binary	Max physical mount time (last hour). This two byte field contains the maximum time, in seconds, that the library took to complete the execution of a mount request for a physical tape device, of the device class indicated, in the Virtual Tape Server subsystem. Mount time is accrued from the time the mount request is accepted until the mount is completed. The mount time is accredited to the hour it was completed. See Note 1 on page 13-535.
584	248	S94OPM_MINTTM2	2	binary	Min physical mount time (last hour). This two byte field contains the minimum time, in seconds, that the library took to complete the execution of a mount request for a physical tape device, of the device class indicated, in the Virtual Tape Server subsystem. Mount time is accrued from the time the mount request is accepted until the mount is completed. The mount time is accredited to the hour it was completed. See Note 1 on page 13-535.
586	24A	S94OPM_AVGTTM2	2	binary	Avg physical mount time (last hour). This two byte field contains the average time, in seconds, that the library took to complete the execution of a mount request for a physical tape device, of the device class indicated, in the Virtual Tape Server subsystem. Mount time is accrued from the time the mount request is accepted until the mount is completed. The mount time is accredited to the hour it was completed. See Note 1 on page 13-535.
588	24C	S94OPM_STGMNTS2	2	binary	Physical mounts - stage (last hour). This two byte field contains the number of physical mount requests completed by the library in the last hour to satisfy stage mounts, of the device class indicated. See Note 1 on page 13-535.
590	24E	S94OPM_MIGMNTS2	2	binary	Physical mounts - migrate (last hour). This two byte field contains the number of physical mount requests completed by the library in the last hour to satisfy migration mounts, of the device class indicated. See Note 1 on page 13-535.
592	250	S94OPM_RECMNTS2	2	binary	Physical mounts - reclaim (last hour). This two byte field contains the number of physical mount requests completed by the library in the last hour to satisfy reclamation mounts, of the device class indicated. See Note 1 on page 13-535.
594	252	S94OPM_SDEMNTS2	2	binary	This two byte field contains the number of physical mount requests completed by the library in the last hour to satisfy secure data erase mounts, of the device class indicated.

Offsets		Name	Length	Format	Description
596	254	S94OPM_PPWRITN2	4	binary	Data Written to a Primary Pool (last hour). This four byte field contains the number of MBytes premigrated from the tape volume cache to a primary pool for the device class indicated during the last hour. Only the data for logical volumes that have completed premigration when statistics were calculated at the end of the last hour are included in this value. The value is reset and a new count begins after statistics are calculated. It is accumulated in bytes and reported in an integral multiple of 1,048,576 bytes (1 MByte). See Note 1 on page 13-535.
600	258	S94OPM_SPWRITN2	4	binary	Data Written to a Secondary Pool (last hour). This four byte field contains the number of MBytes premigrated from the tape volume cache to a secondary pool for the device class indicated during the last hour. Only the data for logical volumes that have completed premigration when statistics were calculated at the end of the last hour are included in this value. The value is reset and a new count begins after statistics are calculated. It is accumulated in bytes and reported in an integral multiple of 1,048,576 bytes (1 MByte). See Note 1 on page 13-535.
604	25C		4	binary	Reserved (set to X'00')
When F/C 4001 is installed and enabled, the following VTS Cache Usage Information array is included.					
608	260	S94OPM_ARRAY	512	binary	VTS Cache Usage Information Array. Each entry in the array is 64 bytes long and is mapped by S94OPM_ARRAY_ENTRY. Up to eight entries may be present.
1120	460	S94OPM_IARTAFRT	2	binary	IART Average Fast Ready Mount Time. This two byte field contains the average time, in seconds, that the Virtual Tape Server subsystem took to complete the execution of a fast-ready mount request for a virtual device. Mount time is accrued from the time the mount request is accepted until the mount is completed. The mount time is accredited to the hour it was completed.
1122	462	S94OPM_IARTFRM	2	binary	IART Fast-Ready Mounts. This two byte field contains the number of mount requests completed using the Fast-Ready facility by the Virtual Tape Server subsystem in the last hour. The Fast-Ready facility is used for PLF Library Mount orders where a category is specified and the specified category has the Fast-Ready attribute set or a VOLSER is specified and that VOLSER, at the time the mount request was received, is assigned to a category that has the Fast-Ready attribute set.
1124	464	S94OPM_IARTCHMT	2	binary	IART Average Cache Hit Mount Time. This two byte field contains the average time, in seconds, that the Virtual Tape Server subsystem took to complete the execution of a mount request for a virtual device where the requested volume was in the Tape Volume Cache. Mount time is accrued from the time the mount request is accepted until the mount is completed. The mount time is accredited to the hour it was completed.
1126	466	S94OPM_IARTCHM	2	binary	IART Cache Hit Mounts. This two byte field contains the number of mount requests that were completed by the Virtual Tape Server subsystem in the last hour because the required volume was resident in the Tape Volume Cache.

Offsets		Name	Length	Format	Description
1128	468	S94OPM_IARTCMMT	2	binary	IART Average Cache Miss Mount Time. This two byte field contains the average time, in seconds, that the Virtual Tape Server subsystem took to complete the execution of a mount request for a virtual device where the requested volume had to be recalled from a stacked volume. Mount time is accrued from the time the mount request is accepted until the volume has been recalled and the mount completed. The mount time is accredited to the hour it was completed.
1130	46A	S94OPM_IARTCMM	2	binary	IART Cache Miss Mounts. This two byte field contains the number of mount requests that were completed by the Virtual Tape Server subsystem in the last hour that required a logical volume to be recalled from a stacked volume back into the Tape Volume Cache.

Notes:

1. This field will be zero if the statistics are reported for a composite library(SMF94VNO=X'FF').
2. This field is a composite of all AX0's when reported for a composite library(SMF94VNO=X'FF').
3. This field is only valid when reported for a composite library(SMF94VNO=X'FF'). For other than a composite library the field will contain zero.
4. This field will be zero if the statistics are reported for a distributed library (SMF94VNO=X'01' or X'02')
5. This field will contain zero for F/C 4001

Offsets		Name	Length	Format	Description
Start - S94OPM_ARRAY_ENTRY					
0	0	S94OPM_PMC	4	binary	Preference Management Control. This four byte field contains information about how the preference level is managed. **Bit(s)** **Description** **0** Reserved (set to B'0') **1-3** Logical Volume Migration Algorithm **Value** **Description** **0** Least Recently Used (LRU) Managed. The logical volumes in this preference level are removed from the cache based on a least recently used algorithm. **1** Largest Size Managed. The logical volumes in this preference level are removed from the cache based on their size with the largest volumes being removed first. **2-7** Reserved **4-31** Reserved (set to B'0')
4	4	S94OPM_VVIC	4	binary	Virtual volumes in cache. This four byte field contains a count, that is a snapshot taken when statistics are calculated at the end of the hour, of the number of volume assigned to the preference level that are still cache resident. For volumes that are currently mounted and do not have a preference level established (that is done when a volume is unloaded), they are credited to the count for preference level 1.

Offsets		Name	Length	Format	Description
8	8	S94OPM_DRIC	4	binary	Data resident in cache. This four byte field contains a count, that is a snapshot taken when statistics are calculated at the end of the hour, of the amount of cache space used by the volumes assigned to the preference level that are still cache resident. For volumes that are currently mounted and do not have a preference level established (that is done when a volume is unloaded), their size is credited to the count for preference level 1. The cache space is accumulated in bytes and reported in an integral multiple of 1,048,576 bytes (1 MByte).
12	C	S94OPM_TVCA4	4	binary	4 Hour Rolling average tape volume cache age. This four byte field contains a rolling average cache age, in minutes, of the logical volumes that were assigned to the preference level when the volume was migrated from the cache. The rolling average is calculated based on the cache age of the volumes that have been migrated from the cache over the last 4 hours. Cache age is measured from when a volume is first closed after being created or recalled into cache until it has been migrated from cache. Each volume's cache age is rounded up to the nearest minute. The value is calculated at the end of the hour.
16	10	S94OPM_VM4	4	binary	Volumes migrated last 4 hours. Contains the number of logical volumes assigned to the preference level that were migrated from the cache over the last 4 hours.
20	14	S94OPM_TVCA48	4	binary	48 Hour Rolling average tape volume cache age. This four byte field contains a rolling average cache age, in minutes, of the logical volumes that were assigned to the preference level when the volume was migrated from the cache. The rolling average is calculated based on the cache age of the volumes that have been migrated from the cache over the last 48 hours. Cache age is measured from when a volume is first closed after being created or recalled into cache until it has been migrated from cache. Each volume's cache age is rounded up to the nearest minute. The value is calculated at the end of the hour.
24	18	S94OPM_VM48	4	binary	Volumes migrated last 48 hours. Contains the number of logical volumes assigned to the preference level that were migrated from the cache over the last 48 hours.
28	1C	S94OPM_TVCA35	4	binary	35 Day Rolling average tape volume cache age. This four byte field contains a rolling average cache age, in minutes, of the logical volumes that were assigned to the preference level when the volume was migrated from the cache. The rolling average is calculated based on the cache age of the volumes that have been migrated from the cache over the last 35 days. Cache age is measured from when a volume is first closed after being created or recalled into cache until it has been migrated from cache. Each volume's cache age is rounded up to the nearest minute. The value is calculated at the end of the hour.
32	20	S94OPM_VM35	4	binary	Volumes migrated last 35 days. Contains the number of logical volumes assigned to the preference level that were migrated from the cache over the last 35 days.
36	24	S94OPM_FRMT	2	binary	Average Fast Ready Mount Time. This two byte field contains the average time, in seconds, that the Virtual Tape Server subsystem took to complete the execution of a fast-ready mount request for a virtual device. Mount time is accrued from the time the mount request is accepted until the mount is completed. The mount time is accredited to the hour it was completed.

Offsets		Name	Length	Format	Description
38	26	S94OPM_FRMNTS	2	binary	Fast-Ready Mounts. This two byte field contains the number of mount requests completed using the Fast-Ready facility by the Virtual Tape Server subsystem in the last hour. The Fast-Ready facility is used for PLF Library Mount orders where a category is specified and the specified category has the Fast-Ready attribute set or a VOLSER is specified and that VOLSER, at the time the mount request was received, is assigned to a category that has the Fast-Ready attribute set.
40	28	S94OPM_CHTIME	2	binary	Average Cache Hit Mount Time. This two byte field contains the average time, in seconds, that the Virtual Tape Server subsystem took to complete the execution of a mount request for a virtual device where the requested volume was in the Tape Volume Cache. Mount time is accrued from the time the mount request is accepted until the mount is completed. The mount time is accredited to the hour it was completed.
42	2A	S94OPM_CHMNTS	2	binary	Cache Hit Mounts. This two byte field contains the number of mount requests that were completed by the Virtual Tape Server subsystem in the last hour because the required volume was resident in the Tape Volume Cache.
44	2C	S94OPM_CMTIME	2	binary	Average Cache Miss Mount Time. This two byte field contains the average time, in seconds, that the Virtual Tape Server subsystem took to complete the execution of a mount request for a virtual device where the requested volume had to be recalled from a stacked volume. Mount time is accrued from the time the mount request is accepted until the volume has been recalled and the mount completed. The mount time is accredited to the hour it was completed.
46	2E	S94OPM_CMMNTS	2	binary	Cache Miss Mounts. This two byte field contains the number of mount requests that were completed by the Virtual Tape Server subsystem in the last hour that required a logical volume to be recalled from a stacked volume back into the Tape Volume Cache.
48	30		16	binary	Reserved (set to X’00’)
End - S94OPM_ARRAY_ENTRY					

Subtype 2

Header Section

Offsets		Name	Length	Format	Description
0	0	SMF94S2_LEN	2	binary	Record length.
2	2	SMF94S2_SEG	2	binary	Segment descriptor.
4	4	SMF94S2_FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-3** Reserved. **4** Subsystem name follows. **5** Subtypes utilized. **6-7** Reserved.
5	5	SMF94S2_RTY	1	binary	Record type 94 — Subtype 2

Offsets		Name	Length	Format	Description
6	6	SMF94S2_TME	4	binary	Time since midnight, in hundredths of a second, when the record was moved into the SMF buffer.
10	A	SMF94S2_DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*.
14	E	SMF94S2_SID	4	EBCDIC	System identification (from SMFPRMxx parmlib member).
18	12	SMF94S2_WID	4	EBCDIC	Subsystem identification, worktype indicator.
22	16	SMF94S2_STP	2	binary	Record subtype ‘02’ — Volume pooling statistics

Self-defining Section (Subtype 2)

Offsets		Name	Length	Format	Description
24	18	SMF94S2_SDL	4	binary	Self-defining section length
28	1C	SMF94S2_POF	4	binary	Offset to product section
32	20	SMF94S2_PLN	2	binary	Length of product section
34	22	SMF94S2_PON	2	binary	Number of product sections
36	24	SMF94S2_HOF	4	binary	Offset to header section
40	28	SMF94S2_HLN	2	binary	Length of header section
42	2A	SMF94S2_HON	2	binary	Number of header sections
44	2C	SMF94S2_SOF	4	binary	Offset to statistics section
48	30	SMF94S2_SLN	2	binary	Length of statistics section
50	32	SMF94S2_SON	2	binary	Number of statistics sections

Product Section

Offsets		Name	Length	Format	Description
0	0	SMF94S2_TYP	2	binary	Subtype for type 94 record.
2	2	SMF94S2_RVN	2	EBCDIC	Record version number C’01’.
4	4	SMF94S2_PNM	8	EBCDIC	Product name ’fmid ’.
12	C	SMF94S2_MVS	8	EBCDIC	MVS operating system name.

Header Section

Offsets		Name	Length	Format	Description
0	0		32	binary	Reserved (set to zero).

Volume Pool Statistics (VPS) Section

Offsets		Name	Length	Format	Description
0	0		9	binary	VPS Message Header data
9	9	SMF94S2_LIBID	3	binary	Library Sequence Number
12	C		2	binary	Reserved (set to X’00’).
14	E	SMF94S2_HHI	2	binary	Hour Index. The hour index is incremented once each hour by the library manager. It is used to prevent duplicate logged statistics from the same one hour period from being counted twice. The hour index for volume pooling statistics is the same as reported for library statistical data calculated for the same hour.

Offsets		Name	Length	Format	Description
16	10	SMF94S2_LRTD	10	EBCDIC	Last Reconcile Time and Date. This 10 EBCDIC character field contains the last time and date a reconcile was automatically completed by the VTS. Some of the statistical fields are calculated at this point.
26	1A	SMF94S2_MNVP	2	binary	Maximum number of volume pools allowed in the partition This 2 byte hexadecimal field contains the maximum number of volume pools allowed in the partition. The number begins with 1. This field is used by the host to determine if there are more than 16 volume pools which would require additional requests for statistical data.
28	1C		1	binary	Reserved (set to X'00').
29	1D	SMF94S2_VPSET	1	binary	Volume Pool Set. This byte specifies which set of volume pools are being reported, based on the set requested in the preceding request. If the set specified is 0, the first 16 volume pools are reported, if 1, the next 16 and so on.
30	1E		2	binary	Reserved (set to X'00').
32	20		1	binary	Reserved (set to X'00').
33	21	SMF94S2_BPMIO	1	binary	Common Scratch Pool Media Identifier 0. This one byte field contains the identifier for the media type associated with the following common scratch pool volume count. The following are the defined values for this field: **Value** **Description** **X'00'** No media type configured. **X'10'** 3590 'J' media **X'11'** 3590 'K' media **X'20'** 3592 'JA' media **X'21'** Reserved for 3592 JW media **X'22'** 3592 'JJ' media **X'23'** Reserved for 3592 JR media
34	22	SMF94S2_BPSVCO	2	binary	Common Scratch Pool Stacked Volume Count - Media Identifier 0 (Hourly Snapshot) This two byte field contains the number of scratch stacked volumes, of a type identified by Media Identifier 0, assigned to the common volume pool. The number is updated periodically within the VTS and the reported value is the snapshot of that count when statistics are calculated at the end of the last hour. Physical volumes are assigned to the common scratch pool upon entry into the library or when returned from being borrowed by another pool.
36	24		1	binary	Reserved (set to X'00').
37	25	SMF94S2_BPMI1	1	binary	Common Scratch Pool Media Identifier 1 This one byte field contains the identifier for the media type associated with the following common scratch pool volume count. See the Common Scratch Pool Media Identifier 0 field for the values defined for this field.
38	26	SMF94S2_BPSVC1	2	binary	Common Scratch Pool Stacked Volume Count - Media Identifier 1 (Hourly Snapshot) This two byte field contains the number of scratch stacked volumes, of a type identified by Media Identifier 1, assigned to the common volume pool. The number is updated periodically within the VTS and the reported value is the snapshot of that count when statistics are calculated at the end of the last hour. Physical volumes are assigned to the common scratch pool upon entry into the library or when returned from being borrowed by another pool.
40	28		1	binary	Reserved (set to X'00'

Offsets		Name	Length	Format	Description
41	29	SMF94S2_BPMI2	1	binary	Common Scratch Pool Media Identifier 2 This one byte field contains the identifier for the media type associated with the following common scratch pool volume count. See the Common Scratch Pool Media Identifier 0 field for the values defined for this field.
42	2A	SMF94S2_BPSVC2	2	binary	Common Scratch Pool Stacked Volume Count - Media Identifier 2 (Hourly Snapshot) This two byte field contains the number of scratch stacked volumes, of a type identified by Media Identifier 2, assigned to the common volume pool. The number is updated periodically within the VTS and the reported value is the snapshot of that count when statistics are calculated at the end of the last hour. Physical volumes are assigned to the common scratch pool upon entry into the library or when returned from being borrowed by another pool.
44	2C		1	binary	Reserved (set to X'00').
45	2D	SMF94S2_BPMI3	1	binary	Common Scratch Pool Media Identifier 3 This one byte field contains the identifier for the media type associated with the following common scratch pool volume count. See the Common Scratch Pool Media Identifier 0 field for the values defined for this field.
46	2E	SMF94S2_SVC3	2	binary	Common Scratch Pool Stacked Volume Count - Media ID 3 (Hourly Snapshot) This two byte field contains the number of scratch stacked volumes, of a type identified by Media Identifier 3, assigned to the common volume pool. The number is updated periodically within the VTS and the reported value is the snapshot of that count when statistics are calculated at the end of the last hour. Physical volumes are assigned to the common scratch pool upon entry into the library or when returned from being borrowed by another pool.
48	30	SMF92S2_ARRAY	1792	binary	Volume Pool Statistics array. Each entry contains information about the usage and characteristics of a volume pool. Each entry in the array is 112 bytes long and is mapped by SMF94S2_ARRAY_ENTRY. Up to 16 array entries may be present. SMF94S2_MNVP contains the maximum number of pools in the library partition. When there are more than 16 pools, additional Volume Pool Statistics sections will be recorded. The number of Volume Pool Statistics sections is indicated by SMF94S2_SON in the self-defining section.

Volume Pool Statistics (VPS) Array Section

Offsets		Name	Length	Format	Description
Start - SMF94S2_ARRAY_ENTRY					
0	0		1	binary	Reserved (set to X'00'
1	1	SMF94S2_VPN	1	binary	Pool Number. This one byte field contains the volume pool number. Pools are numbered starting with 1.
2	2		2	binary	Reserved (set to X'00'

Offsets		Name	Length	Format	Description
4	4	SMF94S2_ALVIP	4	binary	Active logical volumes in pool (Hourly Snapshot) This four byte field contains the number of logical volume images resident in the volume pool. The number is updated dynamically within the VTS and the reported value is the snapshot of that count when statistics are calculated at the end of the last hour. To be considered resident in a pool, the logical volume must be on one of the physical volumes assigned to the pool. Cache resident only volumes, although assigned to the pool, are not included. Programming Note: This field may indicate a larger number of active logical volumes then is expected in a pool because it contain old versions of a logical volume's image after its been reused, modified, or deleted since the last reconcile was completed. Reconcile removes the database references for old versions of logical volume images so that they are no longer included in the count.
8	8	SMF94S2_ADIVP	4	binary	Active data in volume pool (Hourly Snapshot). This four byte field contains the number of MBytes of logical volume image data managed by the virtual tape server in the volume pool. The number is updated dynamically within the VTS and the reported value is the snapshot of that count when statistics are calculated at the end of the last hour. To be considered resident in a pool, the logical volume must be on one of the physical volumes assigned to the pool. Cache resident only volumes, although assigned to the pool, are not included. It is accumulated in bytes and reported in an integral multiple of 1,048,576 bytes (1 MByte). **Notes:** 1. This field may indicate a larger count of active data then is expected in a pool because it contain old versions of a logical volume's image after its been reused, modified, or deleted since the last reconcile was completed. Reconcile removes the database references for old versions of logical volume images so that their contents are no longer included in the count. 2. This field does not include the volumes that are currently mounted. Only volumes that have been premigrated are included in the count.
12	C	SMF94S2_DWTPLH	4	binary	Data written to the pool in the last hour This four byte field contains the number of MBytes premigrated from the tape volume cache to the pool during the last hour. Only the data for logical volumes that have completed premigration when statistics were calculated at the end of the last hour are included in this value. The value is reset and a new count begins after statistics are calculated. The count is accumulated in bytes and reported in an integral multiple of 1,048,576 bytes (1 MByte).
16	10	SMF94S2_PDCI	1	binary	Pool Device Class Identifier. This one byte field contains the device class identifier for the volume pool. The following are the defined values for this field: **Value** **Description** **X'00'** There is no device class configured. **X'11'** 3590 Model B1A **X'13'** 3590 Model E1A **X'14'** 3590 Model H1A **X'20'** 3592 Model J1A

Offsets		Name	Length	Format	Description
17	11	SMF94S2_MI0	1	binary	Media Identifier 0 This one byte field contains the identifier for one of two media compatible with the device class for the pool. Refer to the definition of the Common Scratch Pool Media Identifier 0 field for the values defined for this field.
18	12	SMF94S2_PSSSVC0	2	binary	Pool Static Scratch Stacked Volume Count - Media Identifier 0 (Hourly Snapshot) This two byte field contains the number of media identifier 0 volumes that were statically assigned to the volume pool and are in scratch status. The number is updated periodically within the VTS and the reported value is the snapshot of that count when statistics are calculated at the end of the last hour.
20	14	SMF94S2_PSPSVC0	2	binary	Pool Static Private Stacked Volume Count - Media Identifier 0 (Hourly Snapshot) This two byte field contains the number of media identifier 0 volumes that are statically assigned to the volume pool and contain active data. This includes volumes that have been marked full or those that are in the process of being filled. The number is updated periodically within the VTS and the reported value is the snapshot of that count when statistics are calculated at the end of the last hour.
22	16	SMF94S2_PBSSVC0	2	binary	Pool Borrowed Scratch Stacked Volume Count - Media Identifier 0 (Hourly Snapshot) This two byte field contains the number of media identifier 0 volumes that were assigned to the volume pool through borrowing and are in scratch status. The number is updated periodically within the VTS and the reported value is the snapshot of that count when statistics are calculated at the end of the last hour.
24	18	SMF94S2_PBPSVC0	2	binary	Pool Borrowed Private Stacked Volume Count - Media Identifier 0 (Hourly Snapshot) This two byte field contains the number of media identifier 0 volumes that are assigned to the volume pool through borrowing that contain active data. This includes volumes that have been marked full or those that are in the process of being filled. The number is updated periodically within the VTS and the reported value is the snapshot of that count when statistics are calculated at the end of the last hour.
26	1A		1	binary	Reserved (set to X'00'
27	1B	SMF94S2_MI1	1	binary	Media Identifier 1. This one byte field contains the identifier for one of two media compatible with the device class for the pool. Refer to the definition of the Common Scratch Pool Media Identifier 0 field for the values defined for this field.
28	1C	SMF94S2_PSSSVC1	2	binary	Pool Static Scratch Stacked Volume Count - Media Identifier 1 (Hourly Snapshot) This two byte field contains the number of media identifier 1 volumes that were statically assigned to the volume pool and are in scratch status. The number is updated periodically within the VTS and the reported value is the snapshot of that count when statistics are calculated at the end of the last hour.

Offsets		Name	Length	Format	Description
30	1E	SMF94S2_PSPSVC1	2	binary	Pool Static Private Stacked Volume Count - Media Identifier 1 (Hourly Snapshot) This two byte field contains the number of media identifier 1 volumes that are statically assigned to the volume pool and contain active data. This includes volumes that have been marked full or those that are in the process of being filled. The number is updated periodically within the VTS and the reported value is the snapshot of that count when statistics are calculated at the end of the last hour.
32	20	SMF94S2_PBSSVC1	2	binary	Pool Borrowed Scratch Stacked Volume Count - Media Identifier 1 (Hourly Snapshot) This two byte field contains the number of media identifier 1 volumes that were assigned to the volume pool through borrowing and are in scratch status. The number is updated periodically within the VTS and the reported value is the snapshot of that count when statistics are calculated at the end of the last hour.
34	22	SMF94S2_PBPSVC1	2	binary	Pool Borrowed Private Stacked Volume Count - Media Identifier 1 (Hourly Snapshot) This two byte field contains the number of media identifier 1 volumes that were assigned to the volume pool through borrowing that contain active data. This includes volumes that have been marked full or those that are in the process of being filled. The number is updated periodically within the VTS and the reported value is the snapshot of that count when statistics are calculated at the end of the last hour.
36	24		4	binary	Reserved (set to X'00'
40	28	SMF94S2_AAORD	2	binary	Average age of residual data (as of the last reconcile). This two byte field contains the average age, in days, of the residual data that resides on the stacked volumes assigned to the pool at the completion of the last reconcile. Statically assigned and borrowed volumes are included in this calculation. A physical volume has residual data on it if it is not full. This value is calculated based on the date a volume transitions to not full and the current date. When a logical volume's image on a physical volume no longer represents the most current version of the volume, after a reconcile, it has been removed from the database that manages the physical volumes and it is considered residual data.
42	2A	SMF94S2_MAORD	2	binary	Maximum age of residual data (as of the last reconcile). This two byte field contains the maximum age, in days, of the residual data that resides on the stacked volumes assigned to the pool at the completion of the last reconcile. Statically assigned and borrowed volumes are included in this calculation. A physical volume has residual data on it if it is not full. This value is calculated based on the date a volume transitions to not full and the current date. When a logical volume's image on a physical volume no longer represents the most current version of the volume, after a reconcile, it has been removed from the database that manages the physical volumes and it is considered residual data.

Offsets		Name	Length	Format	Description
44	2C	SMF94S2_AAOFPSV	2	binary	Average age of the full private stacked volumes (as of the last reconcile). This two byte field contains the average age, in days, of the private stacked volumes in the volume pool at the completion of the last reconcile. Statically assigned and borrowed volumes are included in this calculation. The age of a volume is measured from when the volume is marked as full until it is reclaimed.
46	2E	SMF94S2_MAOFPSV	2	binary	Maximum age of the full private stacked volumes (as of the last reconcile). This two byte field contains the maximum age, in days, of the private stacked volumes in the volume pool at the completion of the last reconcile. Statically assigned and borrowed volumes are included in this calculation. The age of a volume is measured from when the volume is marked as full until it is reclaimed.
48	30		1	binary	Reserved (set to X'00'
49	31	SMF94S2_VPRTP	1	binary	Volume pool reclaim threshold percentage (Current value). This one byte field contains the current reclaim threshold percentage set for the volume pool.
50	32	SMF94S2_ADD00	2	binary	0-5% Active Data Distribution The next twenty, two byte fields report the number of full private stacked volumes in the volume pool that contain active data by the percentage (5% granularity) of active data remaining on the volumes. The numbers are updated periodically within the VTS and the reported value is the snapshot taken when statistics are calculated at the end of the last hour. The percentage of active data is relative to the amount of data on a stacked volume when it was filled.
52	34	SMF94S2_ADD05	2	binary	>5-10% active data
54	36	SMF94S2_ADD10	2	binary	>10-15% active data
56	38	SMF94S2_ADD15	2	binary	>15-20% active data
58	3A	SMF94S2_ADD20	2	binary	>20-25% active data
60	3C	SMF94S2_ADD25	2	binary	>25-30% active data
62	3E	SMF94S2_ADD30	2	binary	>30-35% active data
64	40	SMF94S2_ADD35	2	binary	>35-40% active data
66	42	SMF94S2_ADD40	2	binary	>40-45% active data
68	44	SMF94S2_ADD45	2	binary	>45-50% active data
70	46	SMF94S2_ADD50	2	binary	>50-55% active data
72	48	SMF94S2_ADD55	2	binary	>55-60% active data
74	4A	SMF94S2_ADD60	2	binary	>60-65% active data
76	4C	SMF94S2_ADD65	2	binary	>65-70% active data
78	4E	SMF94S2_ADD70	2	binary	>70-75% active data
80	50	SMF94S2_ADD75	2	binary	>75-80% active data
82	52	SMF94S2_ADD80	2	binary	>80-85% active data
84	54	SMF94S2_ADD85	2	binary	>85-90% active data
86	56	SMF94S2_ADD90	2	binary	>90-95% active data
88	58	SMF94S2_ADD95	2	binary	>95-100% active data

Offsets		Name	Length	Format	Description
90	5A	SMF94S2_PPP	1	binary	Physical Pool Properties. This field contains the current settings of the pool's management controls when statistics were calculated at the end of the last hour. **Bit(s)** **Description** **0** Returns Allowed. This bit is active if borrowed volumes are to be returned to the common scratch pool when scratched. If inactive, borrowed volumes remain in the pool that borrowed them when scratched. This field is ignored if bit 2:7 are set to zero. **1** Reserved. **2-4** First Media Type To Borrow . If this field is non-zero, it specifies the media type that is to be borrowed first if additional physical scratch volumes are needed by the pool. **Value** **Description** **0** NoBorrowing **1** Media Identifier 0. Borrowing of the media identified by the Media Identifier 0 field is allowed. **2** Media Identifier 1. Borrowing of the media identified by the Media Identifier 1 field is allowed. **3** Either Media Identifier. Borrowing of the media identified by either Media Identifier field is allowed. **4–7** Reserved **5-7** Second Media Type To Borrow. If this field is non-zero, it specifies the media type that is to be borrowed if additional physical scratch volumes are needed by the pool and none of the media type specified by the First Media Type To Borrow field are available. **Value** **Description** **0** NoBorrowing **1** Media Identifier 0. Borrowing of the media identified by the Media Identifier 0 field is allowed. **2** Media Identifier 1. Borrowing of the media identified by the Media Identifier 1 field is allowed. **3–7** Reserved.
91	5B		1	binary	Reserved (set to X'00'
92	5C	SMF94S2_RPN	1	binary	Reclamation Pool. Contains the pool number to be used for the target for data that is reclaimed. Pools are numbered starting with 1.
93	5D		1	binary	Reserved (set to X'00'
94	5E	SMF94S2_RPDSLA	2	binary	Reclaim policy - days since last accessed. A physical volume is eligible for reclaim when the number of days contained in this field has elapsed since any data on the volume has been accessed because of a recall. Supported values are 0 to 365. If this field contains a value of 0, it is not used as a criteria a for reclaim.
96	60	SMF94S2_RPDSLW	2	binary	Reclaim policy - days since last written. A physical volume is eligible for reclaim when the number of days contained in this field has elapsed since any data was written to the volume. Supported values are 0 to 365. If this field contains a value of 0, it is not used as a criteria for reclaim.

Offsets		Name	Length	Format	Description
98	62	SMF94S2_RPDSLDI	2	binary	Reclaim policy - days since last data invalidation. A physical volume is eligible for reclaim when the number of days contained in this field has elapsed since any data was invalidated on the volume and the amount of active data on the volume falls below the threshold defined in the Minimum Active Data Percentage (byte 100) field. Supported values are 0 to 365. If this field contains a value of a 0, it is not used as a criteria for reclaim.
100	64	SMF94S2_RPMADP	1	binary	Reclaim policy - minimum active data percentage. This field contains the minimum active data threshold percentage a physical volume's active data must fall below before it can be reclaimed using the days since last data invalidation reclamation policy (non-zero value in bytes 98:99). Supported a values are 5 to 95.
101	65		11	binary	Reserved (set to X'00'
End - SMF94S2_ARRAY_ENTRY					

Record Type 96 (60) — Cross Memory Service Provider Charge Back

Record type 96 is written whenever certain operator commands are issued. The record is created to provide user account information so that it may be sorted with other SMF records associated with the user. For accounting purposes, this record contains the amount of CPU time used by a user.

Note: If available, this time also includes VECTOR time.

The type 96 record can be used with the subtype selectivity function. The subtypes are:
1. Detail records
2. Summary records

The Detail records are produced during consultations with the Integrated Reasoning Shell's subsystem. One of these records is produced each time the subsystem replies or queries the requestor (user).

A Summary record is produced when the requestor issues an "INIT END" command. This record contains counts of the communications that occurred between the subsystem and the requestor, and the totals for CPU and Vector times.

Note: Since Vector times are not available for all systems, the Vector time fields contain zero on those systems not able to provide Vector accounting at the task level.

Offsets		Name	Length	Format	Description
0	0	SMF96LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See "Standard SMF Record Header" on page 13-1 for a detailed description.
02	02	SMF96SEG	2	binary	Segment descriptor (see record length field).

Offsets		Name	Length	Format	Description
4	4	SMF96FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See "Standard SMF Record Header" on page 13-1 for a detailed description.
5	5	SMF96RTY	1	binary	Record type 96 (X'60').
6	6	SMF96TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.
10	0A	SMF96DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See "Standard SMF Record Header" on page 13-1 for a detailed description.
14	0E	SMF96SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF96WID	4	EBCDIC	Subsystem identifier.
22	16	SMF96STP	4	binary	Record subtype.
24	18	SMF96JMR	2	binary	Displacement to the start of the requestor's JMR data. This includes the RDW. This is also the length of the standard SMF header.
28	1C	SMF96JL#	4	binary	Length of the JMR data.
32	20	SMF96PSI	2	binary	Displacement to start of the provider's data section (includes RDW).
36	24	SMF96PI#	2	binary	Length of provider's data.
40	28	SMF96RCS	4	binary	Displacement to start of the subtype data areas (includes RDW).
0	0	SMF96JBN	8	EBCDIC	Requestor's JMRJOB data including the record descriptor word (RDW).
8	8	SMF96RST	4	binary	Requestor's JMRENTRY.
12	0C	SMF96RDS	4	packed	Requestor's JMREDATE.
16	10	SMF96UIF	8	EBCDIC	Requestor's JMUSEID.

Provider's Information Section

This section contains user information.

Offsets		Name	Length	Format	Description
0	0	SMF96PID	8	EBCDIC	"Product" name within subsystem.
8	8	SMF96PNM	4	EBCDIC	Knowledge Application name.
16	10	SMF96TID	8	EBCDIC	User/terminal identifier.
28	1C	SMF96URT	4	EBCDIC	User environment.

Detail Section

Note: Date and Time are in the same format as TIME DEC.

Offsets		Name	Length	Format	Description
0	0	SMF96DL#	4	binary	Length of detail record.
4	4	SMF96CPU	4	binary	CPU time in .01 seconds.
8	8	SMF96DVF	4	binary	Vector time in .01 seconds.
12	0C	SMF96STM	4	binary	Time consultation started.
16	10	SMF96ADT	4	packed	Date consultation started.

Offsets		Name	Length	Format	Description
20	14	SMF96ETM	4	binary	Time consultation ended.
24	18	SMF96EDT	2	packed	Date consultation ended.

Summary Section

Note: Date and Time are in the same format as TIME DEC.

Offsets		Name	Length	Format	Description
0	0	SMF96SL#	4	binary	Length of detail record.
4	4	SMF96TPU	4	binary	CPU time in .01 seconds.
8	8	SMF96SVF	4	binary	Vector time in .01 seconds.
12	0C	SMF96TI	4	binary	Time session started.
16	10	SMF96DI	4	packed	Date session started.
20	14	SMF96TE	4	binary	Time session ended.
24	18	SMF96DE	2	packed	Date session ended.
28	1C	SMF96NOC	4	binary	Number of interactions with requestor during this session.
32	20	SMF96SAC	2	binary	System abend code, if any.
34	22	SMF96UAC	2	binary	User abend code, if any.

Record Type 97 (61) — Foreign Enclave Resource Data

When an enclave is exported to one or more supporting systems, the CPU time consumed in those foreign enclaves is accumulated in SMF type 97 records. There will be one type 97 record on each supporting system that imported the enclave.

Type 97 records are written on an SMF interval basis. The CPU time is broken down by originating system — in other words, there is one section for each originating system that exported one or more enclaves that were then imported by this system during the interval. Note that this section will reflect the total CPU time consumed by all foreign enclaves imported from this one particular originating system.

To identify the specific jobs that consumed CPU time, you need to review the SMF type 30 records on the originating system. Note that for any specific SMF interval, the sum of the type 30 CPU time may not exactly match the type 97 CPU time, as the data for type 30 records is collected asynchronously.

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
Record Header Section:					
0	0	SMF97LEN	2	binary	Record Length.
2	2	SMF97SEG	2	binary	Segment descriptor.

Offsets		Name	Length	Format	Description
4	4	SMF92FLG	1	binary	Header flag byte. **Bit** **Meaning When Set** **0** Subsystem identification follows system identification **1** Subtypes used **2-7** Reserved
5	5	SMF97RTY	1	binary	Record type: 97 (X'61').
6	6	SMF97TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.
10	A	SMF97DTE	4	packed	Date when record was written.
14	E	SMF97SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF97SSI	4	EBCDIC	Subsystem identification – STC.
22	16	SMF97STP	2	binary	Record subtype.
24	18	SMF97SDL	4	binary	Length of self-defining section.
Self-Defining Section:					
28	1C	SMF97POF	4	binary	Offset to product section.
32	20	SMF97PLN	2	binary	Length of product section.
34	22	SMF97PON	2	binary	Number of product sections.
36	24	SMF97EOF	4	binary	Offset of enclave resource data section.
40	28	SMF97ELN	4	binary	Length of enclave resource data section section.
44	2C	SMF97EON	4	binary	Number of enclave resource data sections in this record.
48	30	SMF97EOS	4	binary	Number of enclave resource data sections in subsequent records.

Product Section

Offsets		Name	Length	Format	Description
0	0	SMF97RVN	2	EBCDIC	Record version number – ‘01’
2	2		2	EBCDIC	Reserved
4	4	SMF97PNM	8	EBCDIC	Product name –‘SCWLM’
12	C	SMF97OSL	8	EBCDIC	MVS product level
20	14	SMF97SYN	8	EBCDIC	Local system name (from SYSNAME PARMLIB option)
28	1C	SMF97IST	4	binary	Reporting interval start time (local, hundredths of a second from midnight). First record will report IPL time.
32	20	SMF97ISD	4	EBCDIC	Reporting interval start date in the form 0cyydddF, where F is the sign. First record will report IPL date.
36	24	SMF97IET	4	binary	Reporting interval end time (local, hundredths of a second from midnight).
40	28	SMF97IED	4	EBCDIC	Reporting interval end date in the form 0cyydddF, where F is the sign.
44	2C	SMF97CAF	4	binary	Copy of RmctAdjc when this SMF record was produced, measures the number of sixteenths of one microsecond of CPU time per CPU service unit.

Foreign Enclave Data Section

Offsets		Name	Length	Format	Description
0	0	SMF97FSN	8	EBCDIC	Name of the system that exported the enclaves which used services on the local system.

Offsets		Name	Length	Format	Description
8	8	SMF97FCD	4	binary	CPU time used by foreign dependent enclaves, in hundredths of a second.
12	C	SMF97FCI	4	binary	CPU time used by foreign independent enclaves, in hundredths of a second.

Record Type 99 (63) — System Resource Manager Decisions

Reference books

For information about how to use type 99, see *z/OS MVS Programming: Workload Management Services*.

For information about workload management, see *z/OS MVS Planning: Workload Management*.

This record type is written by the SRM component. The records contain:
- Performance data for each service class period
- Trace codes representing the SRM actions
- The data which SRM used to decide which actions to take
- The controls SRM is using to manage work.

In addition, subtypes 1 and 9 will be written by the SRM component when running in compatibility mode.

The mapping macro, IRASMF99, for this record is supplied in SYS1.AMODGEN.

Record 99 has the following subtypes:

Subtype 1 Contains system level data, the trace of SRM actions, and data about resource groups. The SRM actions are recorded in trace codes. All trace codes are described in *z/OS MVS Programming: Workload Management Services*. A subtype 1 record is written every policy interval.

Subtype 2 Contains data for service classes. A subtype 2 record is written every policy interval for each service class if any period in the service class had recent activity.

Subtype 3 Contains service class period plot data. A subtype 3 record is written every policy interval for each service class if any period in the service class had recent activity and plot data.

Subtype 4 Contains information about a device cluster. A device cluster is a set of service classes that compete to use the same non-paging DASD devices. A subtype 4 record is written every policy interval for each device cluster in the system.

Subtype 5 Contains data about monitored address spaces. A subtype 5 record is written each policy interval for each swapped in monitored address space.

Subtype 6 Contains summary information about each service class period, including the resource control settings for the next policy interval. A subtype 6 record is written each policy interval.

Subtype 7 Contains summary information for the Enterprise Storage Server

(ESS) with Parallel Access Volume (PAV) feature. A subtype 7 record is written every third policy interval.

Subtype 8 Contains summary information for LPAR CPU management. A subtype 8 record is written each policy interval, when in LPAR mode.

Subtype 9 Contains summary information for dynamic channel path management. A subtype 9 record is written each policy interval.

| **Subtype 10** Contains information about dynamic processor speed changes. A subtype 10 record is written for every processor speed change.

Starting SMF Record Type 99

You specify the type 99 record in the SMFPRMxx parmlib member under SUBSYS STC.

Because SMF type 99 records are written approximately every 10 seconds, you should write them only for certain time periods. If you use NOTYPE in your SMFPRMxx parmlib member, you should include type 99 in your NOTYPE list. For example:

```
SUBSYS(STC,NOTYPE(99))
```

If you use TYPE in your SMFPRMxx parmlib member, make sure you add TYPE 99 only when you want this level of detail. For example, add:

```
SUBSYS(STC,TYPE(99))
```

You should have an SMFPRMxx parmlib member for general audit information that does not specify type 99, and another for detailed audit information that specifies type 99. This way, you can set the proper SMFPRMxx member and write SMF type 99 records only when you need them.

Record Mapping

Header/Self-defining Section

This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF99LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word). See “Standard SMF Record Header” on page 13-1 for a detailed description.
2	2	SMF99SEG	2	binary	Segment descriptor (see record length field).
4	4	SMF99FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0-2** Reserved **3-6** Version indicators* **7** Reserved. *See “Standard SMF Record Header” on page 13-1 for a detailed description.
5	5	SMF99RTY	1	binary	Record type 99
6	6	SMF99TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.
10	0A	SMF99DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*. See “Standard SMF Record Header” on page 13-1 for a detailed description.

Offsets		Name	Length	Format	Description
14	0E	SMF99SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF99SSID	4	EBCDIC	Sub system identification
22	16	SMF99TID	2	binary	Record subtype (must be at offset X'16' x).
24	18	SMF99 _SDEF_LEN	4	binary	Length of the self definition section.

Self-Defining Section

Offsets		Name	Length	Format	Description
0	4	SMF99POF	4	binary	Offset to the product section from the beginning of the record (including RDW).
4	4	SMF99PLN	2	binary	Length of the product section.
6	6	SMF99PON	2	binary	Number of the product section.
8	8	SMF99DOF	4	binary	Offset to data section from beginning of the record (including RDW).
12	C	SMF99DLN	2	binary	Length of the data section.
14	E	SMF99DON	2	binary	Number of the data section.

SMF 99 Product Information

Offsets		Name	Length	Format	Description
0	2	SMF99VN2	2	binary	Record sub-version. Use to identify changes to the record in the service stream.
2	2	SMF99RVN	2	binary	Record version number.
4	4	SMF99PNM	8	EBCDIC	Product name - SRM
12	C	SMF99SLV	8	EBCDIC	System level from which record was cut (Copied from CVTPRODN).
20	14	SMF99SNM	8	EBCDIC	System name from which record was cut (Copied from CVTSNAME)
28	1C	SMP99FLG	1	binary	Record Flags: **Bit** **Meaning When Set** **0** Only a subset of the available data was written to avoid that this record gets larger than 32 KByte **1** Only a subset of the available data is written to this record. The rest follows in subsequent records. This record contains a reassembly area. **2–7** Reserved.
29	1D		3	EBCDIC	Reserved.

Subtype 1

Header/Self-defining Section

Offsets		Name	Length	Format	Description
0		SMF99TOF	4	binary	Offset to trace section from beginning of record (including RDW).
4	4	SMF99TLN	2	binary	Length of a trace table entry.
6	6	SMF99TON	2	binary	Number of trace table entries. There is one trace table entry per action or contemplated action.
8	8	SMF99SSOF	4	binary	Offset to system state section from beginning of record (including RDW).
12	C	SMF99SSLN	2	binary	Length of system state section.

Offsets		Name	Length	Format	Description
14	E	SMF99SSON	2	binary	Number of system state sections (always 1).
16	10	SMF99PPOF	4	binary	Offset to paging plot section from beginning of the record (including RDW).
20	14	SMF99PPLN	2	binary	Length of the paging plot section.
22	16	SMF99PPON	2	binary	Number of paging plot sections (always 1).
24	18	SMF99PTOF	4	binary	Offset to priority table entries from beginning of record (including RDW).
28	1C	SMF99PTLN	2	binary	Length of a priority table entry.
30	1E	SMF99PTON	2	binary	Number of priority table entries. There is one priority table entry per dispatching priority.
32	20	SMF99RGOF	4	binary	Offset to resource group entries from beginning of record (including RDW). This field is zero when there are no resource groups defined in the service policy.
36	24	SMF99RGLN	2	binary	Length of a resource group entry. This field is zero when there are no resource groups defined in the service policy.
38	26	SMF99RGON	2	binary	Number of resource group entries. There is one resource group entry per resource group in the service policy. This field is zero when there are no resource groups defined in the service policy.
40	28	SMF99GROF	4	binary	Offset to the generic resource section from the beginning of the record (including RDW).
44	2C	SMF99GRLN	2	binary	Length of the generic resource section.
46	2E	SMF99GRON	2	binary	Number of generic resource sections. There is one generic resource group entry per generic resource group in the service policy. This field is zero when there are no generic resource groups defined in the service policy.
48	30	SMF99SLOF	4	binary	Offset to the software licensing section from the beginning of the record (including RDW)
52	34	SMF99SLLN	2	binary	Length of the software licensing section
54	36	SMF99SLON	2	binary	Number of software licensing sections
56	38	SMF99SLTOF	4	binary	Offset to the software licensing service table section from the beginning of the record (including RDW)
60	3C	SMF99SLTLN	2	binary	Length of the software licensing service table section
62	3E	SMF99SLTON	2	binary	Number of software licensing service table sections

Trace Table Entry Section

Offsets		Name	Length	Format	Description
0		SMF99_TPID	1	binary	Policy adjustment interval identifier
1	1	SMF99_TRID	1	binary	Resource adjustment interval identifier.
2	2	SMF99_TCOD	2	binary	Trace code.
4	4	SMF99_TJOB	8	EBCDIC	Name of the address space affected by the trace code. This field is blank when the trace code does not apply to a specific address space.
12	C	SMF99_TLPI	4	binary	Projected local performance index scaled by 100.
16	10	SMF99_TSPI	4	binary	Projected sysplex performance index scaled by 100.
20	14	SMF99_TGSR	4	binary	Projected resource group service rate in unweighted CPU service units per second.
24	18	SMF99_TDT1	4	binary	Reserved for system use.
28	1C	SMF99_TDT2	4	binary	Reserved for system use.
32	20	SMF99_TDT3	4	binary	Reserved for system use.

Offsets		Name	Length	Format	Description
36	24	SMF99_TRGN	8	EBCDIC	Resource group name. This field is blank if the service class is not assigned to a resource group.
44	2C	SMF99_TCNM	8	EBCDIC	Service class name relating to action.
52	34	SMF99_TPER	2	binary	Service class period number relating to action.
54	36	SMF99_TASID	2	binary	Address space ID.

System State Information Section

Offsets		Name	Length	Format	Description
0		SMF99_CPUA	2	binary	Processor utilization scaled by 16.
2	2	SMF99_UMP	2	binary	Recent unmanaged paging and swap cost percentage scaled by 10.
4	4	SMF99_UIC1	4	binary	Page frames in UIC bucket 1, see SMF99_FRV1 for bucket 1 delimiter.
8	8	SMF99_UIC2	4	binary	Page frames in UIC bucket 2, see SMF99_FRV2 for bucket 2 delimiter.
12	C	SMF99_UIC3	4	binary	Page frames in UIC bucket 3, see SMF99_FRV3 for bucket 3 delimiter.
16	10	SMF99_UIC4	4	binary	Page frames in UIC bucket 4.
20	14	SMF99_EUIC1	4	binary	Expanded storage page frames in expanded UIC bucket 1, see SMF99_ESTB1 for bucket 1 delimiter.
24	18	SMF99_EUIC2	4	binary	Expanded storage page frames in expanded UIC bucket 2. see SMF99_ESTB2 for bucket 2 delimiter.
28	1C	SMF99_EUIC3	4	binary	Page frames in expanded UIC bucket 3. see SMF99_ESTB3 for bucket 3 delimiter.
32	20	SMF99_EUIC4	4	binary	Page frames in expanded UIC bucket 4.
36	24	SMF99_FRV1	2	binary	UIC delimiter value 1. The delimiter is inclusive (<=).
38	26	SMF99_FRV2	2	binary	UIC delimiter value 2. The delimiter is inclusive (<=).
40	28	SMF99_FRV3	2	binary	UIC delimiter value 3. The delimiter is inclusive (<=).
42	2A	SMF99 _ESTB1	2	binary	Expanded storage UIC delimiter value 1. The delimiter is inclusive (<=).
44	2C	SMF99_ESTB2	2	binary	Expanded storage UIC delimiter value 2, The delimiter is inclusive (<=).
46	2E	SMF99_ESTB3	2	binary	Expanded storage UIC delimiter value 3. The delimiter is inclusive (<=).
48	30	SMF99_W2MIG	4	binary	Expanded storage write to migrate percentage.
52	34	SMF99_PTAVAIL	4	binary	Total processor time available, including captured time plus wait time, in unweighted CPU service units per second.
56	38	SMF99_SHORT_FLAGS	1	binary	Shortage flags **Bit** **Meaning When Set** **0** Central storage shortage exists. **1** First level auxiliary storage shortage exists. **2** Critical auxiliary storage shortage exists. **3** First level SQA storage shortage exists. **4** Critical SQA storage shortage exists. **5-7** Reserved.
57	39	SMF99_STATUS_FLAGS	1	binary	Status flags **Bit** **Meaning When Set** **0** Dynamic channel path management is active (in balance mode if next bit is off). **1** Dynamic channel path management goal algorithm is active. **2** COMPAT mode indication. **3-7** Reserved.
58	3A	SMF99_TOTAL_PAG_COST	2	binary	Recent total paging and swap cost percentage, scaled by 10.
60	3C	SMF99_CPPS	4	binary	Common protective processor storage target, measured in frame counts.

Offsets		Name	Length	Format	Description
64	40	SMF99_ILSU_ARRAY	32	binary	Array of importance level service units. The first entry contains service units pertaining to importance level zero, the second entry contains service units pertaining to importance level one, and so on. The last entry contains service units pertaining to unused service.
64	40	SMF99_SUIC1	4	binary	Shared central UIC bucket 1, measured in frame counts.
68	44	SMF99_SUIC2	4	binary	Shared central UIC bucket 2, measured in frame counts.
72	48	SMF99_SUIC3	4	binary	Shared central UIC bucket 3, measured in frame counts.
76	4C	SMF99_SUIC4	4	binary	Shared central UIC bucket 4, measured in frame counts.
80	50	SMF99_SEUC1	4	binary	Shared expanded UIC, bucket 1, measured in frame counts.
84	54	SMF99_SEUC2	4	binary	Shared expanded UIC, bucket 2, measured in frame counts.
88	58	SMF99_SEUC3	4	binary	Shared expanded UIC, bucket 3, measured in frame counts.
92	5C	SMF99_SEUC4	4	binary	Shared expanded UIC, bucket 4, measured in frame counts.
96	60	SMF99_STWSS	4	binary	Shared protective processor storage target, measured in frame counts.
100	64	SMF99_NUM_EXT_SC	4	binary	Number of external service classes.
104	68	SMF99_DEFAULT _IO_VELOCITY	4	binary	Default I/O velocity. Calculated by IOS at the beginning of each measurement interval during data gathering.
108	6C	SMF99_SU _IFACTOR	4	binary	Service unit inflation factor.
110	6E	SMF99_StgCrit_Hsk_Skip_Clock	2	binary	Storage critical housekeeping skip clock counter for each importance level.
112	70	*	2	EBCDIC	Reserved
114	72	SMF99_LS_DISC	4	binary	Frames owned by logically swapped spaces in non-short response time periods that are discretionary.
118	76	SMF99_CAPWS	4	binary	CAP workarea - working set size accumulator
122	7A	SMF99_SECWS	4	binary	Number of secondary working set pages for which swap-ins have been started.
126	7E	SMF99_PGINS	4	binary	Page-ins rate count used for calculating the system paging rate.
130	82	SMF99_IFA_NORMALIZATION	4	binary	Normalization factor for assist processors
132	84	SMF99_CPUS_ONLINE	2	binary	Number of regular CPs online
134	86	SMF99_IFAS_ONLINE	2	binary	Number of online assist processors
136	88	SMF99_IFAA	2	binary	Average utilization of assist processors, scaled by 16
138	8A	SMF99_CPUIFAA	2	binary	Average utilization of regular CPs and assist processors, scaled by 16
140	8C	SMF99_IFA_FLAGS	1	binary	Assist processors related flags: **Bit** **Meaning When Set** **0** Assist processor work may be executed on regular CPs **1** Assist processor work may run on regular CPs at priority **2–7** Reserved.

System Paging Plot Information Section

Offsets		Name	Length	Format	Description
0		SMF99_PAGP_BW	4	binary	Size of each x bucket width. X is the system wide page fault rate in page faults per second.
4	4	SMF99_PAGP_LSTX	4	binary	Last plotted x bucket index.
		*	4	binary	Reserved.
12	C	SMF99_PAGP_POINTS _OF	4	binary	Offset of plot point entries from beginning of the record (including RDW).
16	10	SMF99_PAGP_POINTS _ON	2	binary	Number of plot point entries.
18	12	SMF99_PAGP_POINTS _LN	2	binary	Length of a plot point entry.

Priority Table Entry Section

Offsets		Name	Length	Format	Description
0		SMF99_PTPRTY	2	binary	Dispatching priority, after policy adjustment.
2	2	SMF99_PTNP	2	binary	New dispatching priority, after unbunching.

Offsets		Name	Length	Format	Description
4	4	SMF99_PTIMDP	4	binary	Initial maximum percentage of processor demanded at priority, initial value before any priority moves.
8	8	SMF99_PTPMDP	4	binary	Projected maximum percentage of processor demanded at priority.
12	C	SMF99_PTCPUU	4	binary	CPU using samples at priority found in the last 10 seconds.
16	10	SMF99_PTCPUD	4	binary	CPU delay samples at priority found in the last 10 seconds.
20	14	SMF99_PTW2UR	4	binary	Wait-to-using ratio at priority scaled by 16.
24	18	SMF99_PTAPU	4	binary	Actual measured processor used at priority in unweighted CPU service units per second.
28	1C	SMF99_PTPPU	4	binary	Projected processor time to be used at priority in unweighted CPU service units per second.
32	20	SMF99_PTACMD	4	binary	Achievable cumulative maximum demand percentage scaled by 10.
		*	4	binary	Reserved.
40	28	SMF99_PTIMAXD	4	binary	Initial cumulative maximum demand percentage scaled by 10.
44	2C	SMF99_PTWMAXD	4	binary	Projected cumulative maximum demand percentage scaled by 10.
48	30	SMF99_PTIAMTW	4	binary	Initial average mean time to wait in unweighted CPU service units per second scaled by 1000.
52	34	SMF99_PTWAMTW	4	binary	Projected average mean time to wait in unweighted CPU service units per second scaled by 1000.
56	38	SMF99_PTSCPUU	4	binary	Sample based CPU using samples at priority.
60	3C	SMF99_PTSCPUD	4	binary	Sample based CPU delay samples at priority.

Resource Group Entry Section

Offsets		Name	Length	Format	Description
0		SMF99_RGNAME	8	EBCDIC	Resource group name
8	8	SMF99_MIN_SR	4	binary	Minimum service rate for the resource group in unweighted CPU service units per second. When there is no minimum defined, this field is 0.
12	C	SMF99_MAX_SR	4	binary	Maximum service rate for the resource group in unweighted CPU service units per second. When there is no maximum defined, this field is X'7FFFFFFF'.
16	10	SMF99_ACT_SR	4	binary	Service rate received in the last policy adjustment interval on the local system in unweighted CPU service units per second.
20	14	SMF99_SPAS	4	binary	Service per non-capped slice in unweighted CPU service units per second.
24	18	SMF99_SLICES	2	binary	The number of cap slices in which work in this resource group was capped.
26	1A	SMF99_RHELPCNT0	2	binary	A count of the systems that can help special system address spaces (work at importance 0). The count can include any systems in the sysplex running in goal mode other than the local system.
28	1C	SMF99_RHELPCNT1	2	binary	A count of the systems that can help work at importance 1. The count can include any systems in the sysplex running in goal mode other than the local system.
30	1E	SMF99_RHELPCNT2	2	binary	A count of the systems that can help work at importance 2. The count can include any systems in the sysplex running in goal mode other than the local system.
32	20	SMF99_RHELPCNT3	2	binary	A count of the systems that can help work at importance 3. The count can include any systems in the sysplex running in goal mode other than the local system.
34	22	SMF99_RHELPCNT4	2	binary	A count of the systems that can help work at importance 4. The count can include any systems in the sysplex running in goal mode other than the local system.
36	24	SMF99_RHELPCNT5	2	binary	A count of the systems that can help work at importance 5. The count can include any systems in the sysplex running in goal mode other than the local system.
38	26	SMF99_RHELPCNT6	2	binary	A count of the systems that can help discretionary work (work at importance 6). The count can include any systems in the sysplex running in goal mode other than the local system.

Offsets		Name	Length	Format	Description
40	28	SMF99_LHELP_FLGS	1	binary	Flag indicating whether the local system can help work at each importance level. 1 indicates it can help, 0 indicates it cannot help. **Bit** **Meaning When Set** **0** Reserved **1** Local system can help work at importance 0. **2** Local system can help work at importance 1. **3** Local system can help work at importance 2. **4** Local system can help work at importance 3. **5** Local system can help work at importance 4. **6** Local system can help work at importance 5. **7** Local system can help work at importance 6.
41	29	SMF99_RG_FLAGS	1	binary	Resource group flags **Bit** **Meaning When Set** **0** Indicates that the resource group is dynamic **1-7** Reserved
42	30	*	2	EBCDIC	Reserved

Generic Resource Entry Section

Offsets		Name	Length	Format	Description
0		SMF99_GR _SYSNAME	8	EBCDIC	Name of the system where the sessions were routed.
8	8	SMF99_GR_TSO _SESSIONS_ROUTED	4	binary	Number of TSO sessions that were routed in the last 10 seconds to the system named by SMF99_GR_SYSNAME.
12	C	SMF99_GR_NONTSO _SESSIONS_ROUTED	4	binary	Number of non-TSO sessions that were routed in the last 10 seconds to the system named by SMF99_GR_SYSNAME.
16	10	SMF99_GR_TSO _AVG_COST	4	binary	Average cost of a TSO session in raw CPU service units on the system named by SMF99_GR_SYSNAME.
20	14	SMF99_GR_ _TSO_PI	4	binary	Weighted average of PI of service class periods running TSO work on the system named by SMF99_GR_SYSNAME.
24	18	SMF99_GR _FLAGS	4	binary	Generic resource flags. **Bit** **Meaning When Set** **0** The system named by SMF99_GR_SYSNAME had a shortage that may have caused a session to not be routed to it. **1-31** Reserved
28	1C	SMF99_GR_SERVICE _BY_IMPORTANCE	32	binary	A single entry in the array of Importance Level Service Units, containing the number of raw CPU service units consumed by work at this importance level (or unused) over the last 10 seconds. The entries are indexed with an origin of zero so that the index matches the importance level to which the entry pertains. An index of zero indicates system work and an index of 7 indicates unused capacity.

Software Licensing Information

Offsets		Name	Length	Format	Description
0		SMF99_SLConfigFlags	1	binary	Configuration flags **Bit** **Meaning When Set** **0** Indicates that the machine supports the store system information instruction. **1** Indicates that MVS is running in a logical partition **2** Indicates that MVS is running in a virtual machine **3** Indicates that the logical CPUs are shared with other partitions **4** Indicates that the logical partition is configured to be capped (as opposed to being capped by WLM) **5-7** Reserved
1	1	SMF99_SLStateFlags	1	binary	State flags **Bit** **Meaning When Set** **0** Indicates that the logical partition is capped by WLM **1-7** Reserved
		*	2	binary	Reserved.

Offsets		Name	Length	Format	Description
4	4	SMF99_SLImgCapacity	4	binary	Capacity available to MVS image in millions of service units per hour, when not running as VM guest. If running as VM guest, capacity available to VM.
8	8	SMF99_SLCecCapacity	4	binary	Capacity of CEC in millions of service units per hour
12	C	SMF99_SLCecCpuCount	2	binary	Number of available CPUs in the CEC. This includes online and offline CPUs. It does not include reserved CPUs (CPUs that can be added via Capacity Upgrade on Demand).
14	E	SMF99_SLLogicalCpuCount	2	binary	Number of available CPUs in the logical partition. This includes online and offline CPUs. It does not include reserved CPUs (CPUs that can be added via Capacity Upgrade on Demand).
16	10	SMF99_SLCecServiceUnits PerSecToShare	4	binary	The CEC capacity in basic-mode service units per second that is available for sharing among partitions using shared logical processors.
20	14	SMF99_SLImgMsuAt CurrentWeight	4	binary	MVS image capacity in millions of service units per hour that is represented by the partition's current weight.
24	18	*	4	EBCDIC	Reserved.
28	1C	SMF99_SLAvgMsu	4	binary	Average service rate in millions of service units per hour. This is a long-term average.
32	20	SMF99_SLAvgMsuCapped	4	binary	Average service rate in millions of service units per hour while the partition was capped. This is a short-term average.
36	24	SMF99_SLAvgMsuUncapped	4	binary	Average service rate in millions of service units per hour while the partition was uncapped. This is a short-term average.
40	28	SMF99_SLIntervalService	4	binary	Service units over last policy adjustment interval. NOTE: The service units are calculated using the MP factor for the number of physical CPUs, not the number of logical CPUs. This is consistent with how capacity is measured for software licensing. These service units cannot be directly compared to other service units calculated by SRM.
44	2C	SMF99_SLIntervalTime	4	binary	Elapsed time over last policy adjustment interval in 1.024 milliseconds
48	30	*	4	EBCDIC	Reserved.
52	34	SMF99_SLRollInterval	2	binary	Number of policy adjustment intervals between computation of average service rate.
54	36	SMF99_SLService TableIntervals	2	binary	Number of consecutive policy adjustment intervals that have passed since the last time that the service table was updated.
56	38	SMF99_SLIntervalsToCap	2	binary	Number of consecutive policy adjustment intervals to cap the partition
58	3A	SMF99_SLIntervalsToUncap	2	binary	Number of consecutive policy adjustment intervals to uncap the partition
60	3C	SMF99_SLPattern IntervalCount	2	binary	Number of consecutive policy adjustment intervals that have passed in the current cap/uncap state indicated by SMF99_SLCap - pedByWlm.
62	3E	*	2	binary	Reserved.
64	40	SMF99_SL_Query _Response_Code	4	binary	Response code from the last 'query' for LPAR information
68	44	SMF99_SL_Setcap _Response_Code	4	binary	Response code from the last attempt to 'set capping flags'

Software Licensing Table Information

Offsets		Name	Length	Format	Description
0		SMF99_SLTServiceUncapped	4	binary	Basic-mode service units accumulated while the partition was uncapped. NOTE: The service units are calculated using the MP factor for the number of physical CPUs, not the number of logical CPUs. This is consistent with how capacity is measuredfor software licensing. These service units cannot be directly compared to other service units calculated in SRM.
4	4	SMF99_SLTServiceCapped	4	binary	Basic-mode service units accumulated while the partition was capped. NOTE: The service units are calculated using the MP factor for the number of physical CPUs, not the number of logical CPUs. This is consistent with how capacity is measured for software licensing. These service units cannot be directly compared to other service units calculated in SRM.

Offsets		Name	Length	Format	Description
8	8	SMF99_SLTService UncappedCount	2	binary	Number of seconds that the partition was uncapped
10	A	SMF99_SLTService CappedCount	2	binary	Number of seconds that the partition was capped
12	C	SMF99_SLTServiceLast UpdateInterval	1	binary	Policy adjustment interval ID when this entry was last updated. This field is set in goal mode only. Since the ID is only 1 byte, it will wrap multiple times over the course of the table. (That is, the time span of the table is greater than 255 intervals so the interval IDs will wrap around.)
		*	3	EBCDIC	Reserved.

Subtype 2

Self Defining Section

Offsets		Name	Length	Format	Description
0		SMF992COF	4	binary	Offset to class data sections from beginning of the record.
4	4	SMF992CLN	2	binary	Length of class data sections.
6	6	SMF992CON	2	binary	Number of class data sections. There is one per service class.
8	8	SMF992CPOF	4	binary	Offset to period data section from beginning of record (including RDW).
12	C	SMF992CPLN	2	binary	Length of period data section.
14	E	SMF992CPON	2	binary	Number of period data sections.

Class Data Section

Offsets		Name	Length	Format	Description
0		SMF99_CNAM	8	EBCDIC	Service class name.
8	8	SMF99_CGRN	8	EBCDIC	Resource group name associated with the service class. This field is blank when there is no assigned resource group.
16	10	SMF99_CNUMP	2	binary	The number of periods in this service class.
18	12	SMF99_CINDEX	2	binary	Service class index.

Period Data Section

Offsets		Name	Length	Format	Description
0		SMF99_PCNM	8	EBCDIC	Service class name associated with the service class period.
8	8	SMF99_PNUM	2	binary	Period number.
10	A	SMF99_PGOALTYP	1	binary	Goal type **Value** **Meaning** **0** System component address space, SYSSTC, or server goal **1** Short response time (less than or equal to 20 seconds). **2** Long response time (greater than 20 seconds). **3** Velocity **4** Discretionary If the goal type is a response time goal, you should check the response-time percentage field (SMF99_PRTP). If the field is zero, then the response time goal is an average response time type. If there is a percentage filled in, then the response time goal is a percentage response time type.
		*	1	binary	Reserved.
12	C	SMF99_PGOALVAL	4	binary	Goal value: For a response time goal, this is in milliseconds. For a velocity goal, this is a number from 1 to 99. For a discretionary goal, this is zero.

Offsets		Name	Length	Format	Description
16	10	SMF99_PIMPOR	2	binary	Importance.
18	12	SMF99_PBDP	1	binary	Base dispatching priority.
		*	1	binary	Reserved.
20	14	SMF99_PMPLI	2	binary	MPL in-target.
22	16	SMF99_PMPLO	2	binary	MPL out-target.
24	18	SMF99_PAMTA	4	binary	Average maximum MPL target achieved.
28	1C	SMF99_PRUA	4	binary	Average number of ready users.
32	20	SMF99_PLRUA	4	binary	Long term ready user average scaled by 16.
36	24	SMF99_PPSPT	4	binary	Length of time swapped address spaces are protected in processor storage in milliseconds.
40	28	SMF99_PPSITAR	4	binary	Protective processor storage target for each address space in the period. This is valid only for periods with short response time goals. For all other work, it is zero.
44	2C	SMF99_PESPOL	1	binary	Expanded storage policy for demand pages. **Value** **Meaning** **1** protected **2** least recently used (LRU) **3** space available This is valid only for periods with short response time goals.
45	2D	SMF99_PESVIO	1	binary	Expanded storage policy for VIO pages. **Value** **Meaning** **1** protected **2** least recently used (LRU) **3** space available This is valid only for periods with short response time goals.
46	2E	SMF99_PESHSP	1	binary	Expanded storage policy for hiperspace pages. **Value** **Meaning** **1** protected **2** least recently used (LRU) **3** space available This is valid only for periods consisting of short response time goals.
47	2F	SMF99_PESSWAP	1	binary	Expanded storage policy for swap pages. **Value** **Meaning** **1** protected **2** least recently used (LRU) **3** space available
48	30	SMF99_PPROT	2	binary	Number of address spaces with demand pages protected in processor storage. This is valid for all periods except those with short response time goals.
50	32	SMF99_PLRU	2	binary	Number of address spaces with demand pages subject to LRU expanded storage policy. This is valid for all periods except those with short response time goals.
52	34	SMF99_PSPAV	2	binary	Number of address spaces with demand pages subject to space available expanded storage policy. This is valid for all periods except those with short response time goals.
54	36	SMF99_PVIOL	2	binary	Number of address spaces with VIO pages subject to LRU expanded storage policy. This is valid for all periods except those with short response time goals.
56	38	SMF99_PVIOS	2	binary	Number of address spaces with VIO pages subject to space available expanded storage policy. This is valid for all periods except those with short response time goals.
58	3A	SMF99_PHSPL	2	binary	Number of address spaces with hiperspace pages subject to LRU expanded storage policy. This is valid for all periods except those with short response time goals.
60	3C	SMF99_PHSPS	2	binary	Number of address spaces with hiperspace pages subject to space available expanded storage policy. This is valid for all periods except those with short response time goals.
62	3E	SMF99_PESCS	2	binary	Number of explicit storage critical classified address spaces.
64	40	SMF99_PLPI	4	binary	Local performance index achieved scaled by 100.

Offsets		Name	Length	Format	Description
68	44	SMF99_PSPI	4	binary	Sysplex performance index achieved scaled by 100.
72	48	SMF99_PSERV	4	binary	Service accumulated during policy adjustment interval in unweighted CPU service units.
76	4C	SMF99_PMDP	4	binary	Maximum percentage of processor time demanded.
80	50	SMF99_PLCPUU	4	binary	CPU using samples during last policy adjustment interval.
84	54	SMF99_PLCPUD	4	binary	CPU delay samples during last policy adjustment interval.
88	58	SMF99_PMTTWA	4	binary	Mean time to wait adjusted by the maximum mean time to wait.
92	5C	SMF99_PADP	4	binary	Working variable for achievable demand percentage.
96	60	SMF99_PASERC	4	binary	Average service accumulated over management window in unweighted CPU service units per second.
100	64	SMF99_PPRSER	4	binary	Projected service in unweighted CPU service units per second.
104	68	SMF99_PIDLE	4	binary	Idle samples. The samples are collected over an interval long enough to collect a representative number of samples.
108	6C	SMF99_POTHR	4	binary	Unknown state samples.
112	70	SMF99_PCPUU	4	binary	CPU using samples. The samples are collected over an interval long enough to collect a representative number of samples.
116	74	SMF99_PCPUD	4	binary	CPU delay samples. The samples are collected over an interval long enough to collect a representative number of samples.
120	78	SMF99_PAUXP	4	binary	Primary private area paging from auxiliary storage delay samples. The samples are collected over an interval long enough to collect a representative number of samples.
124	7C	SMF99_PAUXC	4	binary	Common area paging from auxiliary storage delay samples. The samples are collected over an interval long enough to collect a representative number of samples.
128	80	SMF99_PVIO	4	binary	VIO from auxiliary storage delay samples. The samples are collected over an interval long enough to collect a representative number of samples.
132	84	SMF99_PHSS	4	binary	Scroll hiperspace from auxiliary storage delay samples. The samples are collected over an interval long enough to collect a representative number of samples.
136	88	SMF99_PHSC	4	binary	Cache hiperspace from auxiliary storage delay samples. The samples are collected over an interval long enough to collect a representative number of samples.
140	8C	SMF99_PASWP	4	binary	Swap from auxiliary storage delay samples. The samples are collected over an interval long enough to collect a representative number of samples.
144	90	SMF99_PMPLD	4	binary	MPL delay samples. The samples are collected over an interval long enough to collect a representative number of samples.
148	94	SMF99_PCAPD	4	binary	CPU capping delay samples. The samples are collected over an interval long enough to collect a representative number of samples.
152	98	SMF99_PXMO	4	binary	Other cross memory address spaces paging from auxiliary storage delay samples not included in the samples listed in subtype 2 cross memory data. The samples are collected over an interval long enough to collect a representative number of samples.
156	9C	SMF99_PXMEM_OF	4	binary	Offset to cross memory delay entries from beginning of record (including RDW).
160	A0	SMF99_PXMEM_LN	2	binary	Length of each cross memory delay entry.
162	A2	SMF99_PXMEM_ON	2	binary	Number of cross memory delay entries. There is one entry per address space responsible for cross memory delays.
164	A4	SMF99_PSERV_OF	4	binary	Offset to server data entries from beginning of record (including RDW).
168	A8	SMF99_PSERV_LN	2	binary	Length of each server data entry.
170	AA	SMF99_PSERV_ON	2	binary	Number of server data entries. There is one server data entry for each server service class, and one for each service class being served.
172	AC	SMF99_PESP_OF	4	binary	Offset to address space expanded storage policy section from beginning of record (including RDW).
176	B0	SMF99_PESP_LN	2	binary	Length of each address space expanded storage policy entry.
178	B2	SMF99_PESP_ON	2	binary	Number of address space expanded storage policy entries

Offsets		Name	Length	Format	Description
180	B4	SMF99_PCDCLOCK	2	binary	Policy adjustment count down clock. No policy action is taken until the clock is zero or less.
182	B6	SMF99_PNH	1	binary	The performance period experienced processor access delay or
183	B7	SMF99_PRTP	1	binary	Service class response time percentage. This field indicates whether the response time goal in SMF99_PGOALTYP is a percentage response time type. This field is zero when the response time goal in SMF99_PGOALTYP is an average response time.
184	B8	SMF99_PAUXS	4	binary	Shared paging samples from Aux. The samples are collected over an interval long enough to collect a representative number of samples.
188	BC	SMF99_PIOU	4	binary	DASD I/O using samples. The samples are collected over an interval long enough to collect a representative number of samples.
192	C0	SMF99_PIOD	4	binary	DASD I/O delay samples. The samples are collected over an interval long enough to collect a representative number of samples.
196	C4	SMF99_PIO_MDP	4	binary	Maximum percentage of time a period could demand DASD I/O. The percentage is scaled by 10.
200	C8	SMF99_PIODP	1	binary	I/O priority.
201	C9	SMF99_FLAGS	1	binary	Flags. **Bit** **Meaning When Set** **0** Period experienced some type of delay within the sysplex during last policy adjustment interval. **1** Period is CPU critical. **2** Period belongs to a service class that was assigned storage protection (storage critical) in the active service policy. The service class was used in subsystem type CICS or IMS and the rule specified storage critical = yes. Also on for transaction server DISPs serving protected service classes. **3** Indicates that the period is non-z/OS (Linux). **4-7** Reserved
202	CA	*	2	EBCDIC	Reserved.
204	CC	SMF99_PDEVCL	4	binary	Identifier of the device cluster associated with this period. This identifier can be used to associate the period with device cluster information in the subtype 4 record. This field will be zero if the period is not associated with a device cluster.
208	D0	SMF99_PSERVER_TYPE	4	binary	Server type flags. All bits will be zero if the period is not a server. Flags indicate what type of server is associated with the record. **Bit** **Meaning When Set** **0** Server is a transaction server **1** Server is an enclave server. **2** Server is a queue server **3-31** Reserved
212	D4	SMF99_PSDATA_OF	4	binary	Offset to server samples section from the beginning of the record (including RDW).
216	D8	SMF99_PSDATA_LN	2	bimary	Length of each server samples entry.
218	DA	SMF99_PSDATA_ON	2	binary	Number of server samples entries.
220	DC	SMF99_PQDATA_OF	4	binary	Offset to the queue server section from the beginning of the record (including RDW).
224	E0	SMF99_PQDATA_LN	2	binary	Length of each queue server entry.
226	E2	SMF99_PQDATA_ON	2	binary	Number of queue server entries.
228	E4	SMF99_PAVG_SIZE	4	binary	Average size in processor storage (frame count) of the address spaces in the period.
232	E8	SMF99_PGRN	8	EBCDIC	Group name, or blank if period doesn’t belong to a group.
240	F0	SMF99_PSYS_CPUU	4	binary	Sysplex wide CPU using samples.
244	F4	SMF99_PSYS_NONIDLE	4	binary	Sysplex wide non-idle samples.
248	F8	SMF99_PSYS_IDLE	4	binary	Sysplex wide idle samples.
252	FC	SMF99_PSYS_OTHER	4	binary	Sysplex wide other samples.
256	100	SMF99_IOSUBSAMOF	4	binary	Offset to I/O subsystem samples data from beginning of record (including RDW).
260	104	SMF99_IOSUBSAMLN	2	binary	Length of an I/O subsystem samples data section.
262	106	SMF99_IOSUBSAMON	2	binary	Number of I/O subsystem samples data sections.

Offsets		Name	Length	Format	Description
264	108	SMF99_SPMDP	4	binary	Saved copy of maximum percentage of processor time demanded.
268	10C	*	8	EBCDIC	Reserved
276	114	SMF99_SWCT	4	binary	Short wait count accumulator.
280	118	*	2	EBCDIC	Reserved
282	11A	SMF99_NUM _SAMP_HIST _ROWS_USED	2	binary	Number of sample history rows used to build sample set.
284	11C	SMF99_CADP	4	binary	Current achievable demand percentage.
288	120	SMF99_SBCPUU	4	binary	Sample based CPU usings.
292	124	SMF99_SBCPUD	4	binary	Sample based CPU delays.
296	128	SMF99_PSYS_IO_DLY	4	binary	Sysplex wide I/O delay
300	12C	SMF99_PSYS_NON_IO_DLY	4	binary	Sysplex wide non-I/O delay
304	130	SMF99_PIFAU	4	binary	IFA using samples
308	134	SMF99_PIFAD	4	binary	IFA delay samples

Cross Memory Delay Entry Section

Offsets		Name	Length	Format	Description
0	0	SMF99_XMEM_JOBN	8	EBCDIC	Name of the address space causing the cross memory delay.
8	8	SMF99_XMEM_SAMPS	4	binary	Number of cross memory samples.

Server Data Entry Section

Offsets		Name	Length	Format	Description
0		SMF99_SERVER_CNM	8	EBCDIC	Service class name. If the service class (SMF99_PCNM) is a server, then this is the name of the service class being served. If the service class (SMF99_PCNM) is being served, then this is the name of the server service class.
8	8	SMF99_SERVER_PNUM	4	binary	Service period number.
12	C	SMF99_SERVER_OBS	4	binary	If the service class (SMF99_PCNM) is a server, then this is the number of times SMF99_SERVER_CNM was being served in this period. If the service class (SMF99_PCNM) is being served, then this is the number of times SMF99_SERVER_CNM was seen serving in this period.

Server Sample Data Entry Section

Offsets		Name	Length	Format	Description
0		SMF99_SDATA_WQDEL	4	binary	Delay samples waiting for WLM-managed work queue. The samples are collected over an interval long enough to collect a representative number of samples.
4	4	SMF99_SDATA_ENC _AUXP	4	binary	Aux private paging delay samples experienced by enclave work units known to be associated with an address space. The samples are collected over an interval long enough to collect a representative number of samples.
8	8	SMF99_SDATA_ENC _VIO	4	binary	Aux VIO paging delay samples experienced by enclave work units known to be associated with an address space. The samples are collected over an interval long enough to collect a representative number of samples.
12	C	SMF99_SDATA_ENC _HSP	4	binary	Aux standard hiperspace paging delay samples experienced by enclave work units known to be associated with an address space. The samples are collected over an interval long enough to collect a representative number of samples.

Offsets		Name	Length	Format	Description
16	10	SMF99_SDATA_ENC _MPLD	4	binary	MPL delay samples experienced by enclave work units known to be associated with an address space. The samples are collected over an interval long enough to collect a representative number of samples.
20	14	SMF99_SDATA_ENC _ASWP	4	binary	Aux swap delay samples experienced by enclave work units known to be associated with an address space. The samples are collected over an interval long enough to collect a representative number of samples.
24	18	SMF99_SDATA_SERVER _CLASS_NAME	8	EBCDIC	Service class name of the server serving this period.
32	20	SMF99_SDATA _SERVER_TYPE	1	binary	Server type: **Bit** **Meaning When Set** **0** Server is an enclave or queue server. **1** Server is a batch work server. **2-7** Reserved
33	21	*	3	EBCDIC	Reserved
36	24	SMF99_SDATA _SUBSYS_TYPE	4	EBCDIC	Subsystem type of the owner of the queue. (Applies only to batch queue servers.)
40	28	SMF99_SDATA _SUBSYS_NAME	8	EBCDIC	Subsystem name of the owner of the queue. (Applies only to batch queue servers.)

Queue Server Data Entry Section

Offsets		Name	Length	Format	Description
0		SMF99_QDATA _ENV_NAME	32	EBCDIC	Application environment name associated with the work queue.
32	20	SMF99_QDATA_SERVER _CLASS_NAME	8	EBCDIC	Service class name of the server serving the period represented by this subtype 2 record. (Applies only to queue manager type servers.)
40	28	SMF99_QDATA _SERVER_WANT	4	binary	Number of server instances needed to address queue delay according to policy adjustment. This is a queue-wide count.
44	2C	SMF99_QDATA _SERVER_HAVE	4	binary	Number of server instances bound to the queue. This is a queue-wide count.
48	30	SMF99_QDATA _SERVER_ACTIVE	4	binary	Number of server instances bound to the queue and between IWMSTBGN and IWMSTEND. This is a subset of the HAVE count. (HAVE minus ACTIVE equals IDLE.)
52	34	SMF99_QDATA _AS_CAPACITY	4	binary	Address space server instance capacity.
56	38	SMF99_QDATA _ACHIEVED_QMPL	4	binary	Average number (over policy interval) of server instances that are swapped in spaces in the server service class. Only server instances serving the external service class associated with the queue are counted. The count is scaled by 16. (Not used for batch queue servers.)
60	3C	SMF99_QDATA _ACTIVE_QMPL	4	binary	Average of number of server instances between IWMSTBGN and IWMSTEND during the policy interval. The count is scaled by 16. (For batch queue servers, this is the number of initiators with active jobs sysplex-wide.)
64	40	SMF99_QDATA _QMPL_IN_TAR	4	binary	Number of server address spaces suggested to be started in the server service class on behalf of the period represented by this subtype 2 record. (Does not apply to batch queue servers.)
68	44	SMF99_QDATA_AVG _QUEUED _REQUESTS	4	binary	Average number of queued requests over a policy interval. The count is scaled by 16.
72	48	SMF99_QDATA_LT _TOTAL_REQUESTS	4	binary	Long term average total work requests for the work queue.
76	4C	SMF99_QDATA _SERVER_IDLE	4	binary	Average idle server instances over the policy period.

Offsets		Name	Length	Format	Description
80	50	SMF99_QDATA_Q_TYPE	1	binary	Work queue type: **Bit** **Meaning When Set** **0** Queue manager type work queue. **1** Batch type work queue. **2-7** Reserved
81	51	SMF99_QDATA _Q_QUALIFIER	1	binary	Work queue qualifier **Bit** **Meaning When Set** **0** Server instances are managed by WLM **1** Address spaces have been moved from this work queue to enforce the minimum number of servers of another work queue of the same application environment **2** Address spaces have been moved during policy adjustment because the maximum number of servers has been already started for the application environment **3** Minimum number of address spaces must be ditributed across all work queues of the application environment **4-7** Reserved
82	52	SMF99_QDATA _ACTIVE_RGNWORK	2	binary	Active number of server processing work requests that have been routed directly to the server region. This number is not included in either the QDATA_SERVER_IDLE count or the QDATA_SERVER_ACTIVE count.
84	54	SMF99_QDATA _RQDATA_OF	4	binary	Offset to remote queue data section from beginning of record, including RDW. (Applies only to batch queue servers.)
88	58	SMF99_QDATA _RQDATA_LN	2	binary	Length of remote queue data entries.
90	5A	SMF99_QDATA _RQDATA_ON	2	binary	Number of remote queue data entries.
92	5C	SMF99_QDATA _SUBSYS_TYPE	4	EBCDIC	Subsystem type of the owner of the queue. (Applies only to batch queue servers.)
96	60	SMF99_QDATA _SUBSYS_NAME	8	EBCDIC	Subsystem name of the owner of the queue. (Applies only to batch queue servers.)
104	68	SMF99_QDATA _INST_PER_SERVER	2	binary	Number of server instances per server. Only applies if SMF99_QDATA_TASKS_MANAGED is set.
106	6A	SMF99_QDATA _SPACES_MOVED	2	binary	Number of server address spaces moved away from this queue.
108	6C	SMF99_QDATA _AE_MAXLIMIT	2	binary	Maximum number of servers for the application environment.
110	6E	SMF99_QDATA _AE_MINLIMIT	2	binary	Minimum number of servers for the application environment.
112	70	SMF99_QDATA_AVG _INELIGIBLE_REQUESTS	4	binary	Average number of ineligible queued requests over a policy interval scaled by * 16. Currently applies to batch queues only.

Remote Queue Server Data Entry Section

Offsets	Name	Length	Format	Description
0	SMF99_RQDATA _SYS_NAME	8	EBCDIC	Name of the system this RQDATA section represents.

Offsets		Name	Length	Format	Description
8	8	SMF99_RQDATA_FLAGS	4	binary	System flags: **Bit** **Meaning When Set** **0** System started at least one server for this work queue in the policy interval that this data represents. **1** System cannot start any servers for this work due to some constraint. **2** System intended to add servers for this work queue on the just-completed policy interval, but deferred because another system appears to be a better candidate. **3** Work queue is managed on this system. **4** Originator sent valid assess data. **5-31** Reserved
12	C	SMF99_RQDATA _ACTIVE_SERVERS	4	binary	Ten-second average number of active servers, scaled by 16.
16	10	SMF99_RQDATA _TOTAL_SERVERS	4	binary	Ten-second average total servers, including active and idle.
20	14	SMF99_RQDATA _AVG_TOTAL_REQ	4	binary	Average total requests for the queue eligible to run on the system represented by this RQDATA entry. This corresponds to the last point plotted on the queue delay plot. Scaled by 16.
24	18	SMF99_RQDATA _#_SERVERS	4	binary	Number of servers required for receiver value. (Valid only if remote system deferred starting servers.)
32	20	SMF99_RQDATA _PI_DELTA	4	binary	PI delta for donor period of highest importance if servers are started. (Valid only if remote system deferred starting servers.)
36	24	SMF99_RQDATA _HIGHEST_IMP	2	binary	Highest importance of donor periods negatively affected if servers are started. (Valid only if remote system deferred starting servers.)
38	26	*	2	EBCDIC	Reserved.
40	28	SMF99_RQDATA _WAITING_FOR _SYSNAME	8	EBCDIC	System name sender is deferring to. Blank if deferring only to collect data from other systems. (Valid only if remote system deferred starting servers.)
48	30	SMF99_RQDATA _DONOR_CLASS	8	EBCDIC	Service class name for donor period most impacted by starting servers. (Valid only if remote system deferred starting servers.)
56	38	SMF99_RQDATA _PER#	4	binary	Donor's service class period number. (Valid only if remote system deferred starting servers.)
60	3C	SMF99_RQDATA _DONOR_RGROUP	8	EBCDIC	Resource group name for donor period most impacted by starting servers.
68	44	*	4	EBCDIC	Reserved
72	48	SMF99_RQDATA_PA_SKIP	2	binary	Policy adjustment skip clock.
74	4A	SMF99_RQDATA_Q_SKIP	1	binary	Defer processing skip clock.
75	4B	SMF99_Q_SKIP_REASON	1	binary	Reason defer processing skip clock was set.
76	4C	SMF99_RQDATA_AVG _QUEUED_REQUESTS	4	binary	Average number of queued requests over a policy interval scaled by * 16.
80	50	SMF99_RQDATA_AVG _INELIGIBLE_REQUESTS	4	binary	Average number of ineligible queued requests over a policy interval scaled by * 16.
84	54	SMF99_RQDATA_AVG _CONSTRAINT _REQUESTS	4	binary	Average number of queued requests with affinity to constraint systems only scaled by * 16.

Address Space Expanded Storage Access Policy Section

Offsets		Name	Length	Format	Description
0		SMF99_AS_ESP_ANAM	8	EBCDIC	Address space name.
8	8	SMF99_AS_ESP_AP	1	binary	Expanded storage access policy for demand pages. **Value** **Meaning** **1** protected **2** least recently used (LRU) **3** space available
9	9	SMF99_AS_ESP_VP	1	binary	Expanded storage access policy for VIO pages. **Value** **Meaning** **1** protected **2** least recently used (LRU) **3** space available
10	A	SMF99_AS_ESP_HP	1	binary	Expanded storage access policy for hiperspace pages. **Value** **Meaning** **1** protected **2** least recently used (LRU) **3** space available
11	B	SMF99_AS_ESP_ASID	2	binary	Address space ID.
13	D	SMF99_AS_ESP_FLAGS	1	binary	Flags. **Bit** **Meaning When Set** **0** Storage is protected at this instant. **1** Storage protection assigned to space by classification rule. **2** Address space is currently managed to region's goal rather than transaciton server's goal. **3** Address space is non swappable. **4-7** Reserved.
14	E	*	2	binary	Reserved.
16	10	SMF99_AS_ESP_CS_FMCT	4	binary	Number of central storage frames the address spaces owns.
20	14	SMF99_AS_ESP_ES_FMCT	4	binary	Number of expanded storage frames the address spaces own.
24	18	SMF99_AS_ESP_PPS_TAR	4	binary	Address space protective process storage target. See subtype 5 for other targets. This is the only target non-monitor address spaces can have.
28	1C	SMF99_AS _FULL_PREEMPTION	6	EBCDIC	Full Preemption Counts.
28	1C	SMF99_AS _CPSRP_SAMP	2	binary	One sample per IRACPSRP invocation.
30	1E	SMP99_AS _CPSRP_CUR_FP_SAMP	2	binary	Amount of IRACPSRP samples running with full preemption.
32	20	SMP99_AS _CPSRP_PREV_FP_SAMP	2	binary	Previous value of FULL_PRE1

Subtype 3

Self-Defining Section

Offsets		Name	Length	Format	Description
0		SMF993COF	4	binary	Offset to class information from the beginning of record (including RDW).
4	4	SMF993CLN	2	binary	Length of the class information.
6	6	SMF993CON	2	binary	Number of class information.
8	8	SMF993CPOF	4	binary	Offset to class period section from beginning of record (including RDW).
12	C	SMF993CPLN	2	binary	Length of the class period section.
14	E	SMF993CPON	2	binary	Number of period sections.

Class Data Section

Offsets		Name	Length	Format	Description
0		SMF99_PNAM	8	EBCDIC	Service class name

Period Self Defining Section

Offsets		Name	Length	Format	Description
0		SMF993_PRPOF	4	binary	Offset to paging rate plot for this period from the beginning of the record (including RDW).
4	4	SMF993_PRPLN	2	binary	Length of paging rate plot.
6	6	SMF993_PRPON	2	binary	Number of paging rate plots.
8	8	SMF993_MPLOF	4	binary	Offset to MPL delay plots for this period from the beginning of the record (including RDW).
12	C	SMF993_MPLLN	2	binary	Length of MPL delay plots.
14	E	SMF993_MPLON	2	binary	Number of MPL delay plots.
16	10	SMF993_RUAOF	4	binary	Offset to ready user average plots for this period from the beginning of the record (including RDW).
20	14	SMF993_RUALN	2	binary	Length of ready user average plot.
22	16	SMF993_RUAON	2	binary	Number of ready user average plots.
24	18	SMF993_SWPOF	4	binary	Offset to swap delay plots for this period from the beginning of the record (including RDW).
28	1C	SMF993_SWPLN	2	binary	Length of swap delay plot.
30	1E	SMF993_SWPON	2	binary	Number of swap delay plots.
32	20	SMF993_PASOF	4	binary	Offset to proportional aggregate speed plots for this period from the beginning of the record (including RDW).
36	24	SMF993_PASLN	2	binary	Length of proportional aggregate speed plots.
38	26	SMF993_PASON	2	binary	Number of proportional aggregate speed plots.
40	28	SMF993_QMPLOF	4	binary	Offset to the queue delay plots for this period from the beginning of the record (including RDW)
44	2C	SMF993_QMPLLN	2	binary	Length of the queue delay plot.
46	2E	SMF993_QMPLON	2	binary	Number of queue delay plots.
48	30	SMF993_QRUAOF	4	binary	Offset to the queue ready user average for this period from the beginning of the record (including RDW).
52	34	SMF993_QRUALN	2	binary	Length of the queue ready user average plot.
54	36	SMF993_QRUAON	2	binary	Number of queue ready user average plot.
56	38	SMF993_INTERNAL _CLASS_NAME	8	EBCDIC	Internal class name of the period. For non-discretionary periods, this will be the same as the external class name. For discretionary periods, this will be of the form $SRMDIxx. For dynamic periods, this will be of the form $SRMSxxx.
64	40	SMF993_QSTPOF	4	binary	Offset to queue service time for this period from beginning of record (including RDW).
68	44	SMF993_QSTPLN	2	binary	Length of queue service time plot.
70	46	SMF993_QSTPON	2	binary	Number of queue service time plots.
72	48	SMF993_AINSOF	4	binary	Offset to active server instance plot for this period from beginning of record (including RDW)
76	4C	SMF993_AINSLN	2	binary	Length of active server instance plot
78	4E	SMF993_AINSON	2	binary	Number of active server instance plot
80	50	SMF993_ASTROF	4	binary	Offset to virtual storage plot for active server instances for this period from beginning of record (including RDW)
84	54	SMF993_ASTRLN	2	binary	Length of virtual storage plot
86	56	SMF993_ASTRON	2	binary	Number of virtual storage plot
88	58	SMF993_TSTROF	4	binary	Offset to virtual storage plot for total server instances for this period from beginning of record (including RDW)
92	5C	SMF993_TSTRLN	2	binary	Length of virtual storage plot
94	5E	SMF993_TSTRON	2	binary	Number of virtual storage plot

Period Paging Rate Plot Section

Offsets		Name	Length	Format	Description
0		SMF99_PPRP_PNUM	4	binary	Period number.
4	4	SMF99_PPRP_BW	4	binary	Size of each x bucket width. X is the average address space size in frames.
8	8	SMF99_PPRP_LSTX	4	binary	Last plotted x bucket index.
		*	4	binary	Reserved.
16	10	SMF99_PPRP_POINTS _OF	4	binary	Offset of point entries.
20	14	SMF99_PPRP_POINTS _ON	2	binary	Number of point entries.
22	16	SMF99_PPRP_POINTS _LN	2	binary	Length of a point entry.

MPL Delay Plot Section

Offsets		Name	Length	Format	Description
0		SMF99_MPLP_PNUM	4	binary	Period number
4	4	SMF99_MPLP_BW	4	binary	Size of each x bucket width. X is the percentage of ready users who have an MPL slot available to them.
8	8	SMF99_MPLP_LSTX	4	binary	Last plotted x bucket index.
		*	4	binary	Reserved.
16	10	SMF99_MPLP_POINTS _OF	4	binary	Offset of point entries.
20	14	SMF99_MPLP_POINTS _ON	2	binary	Number of point entries.
22	16	SMF99_MPLP_POINTS _LN	2	binary	Length of a point entry.

Ready User Average Plot Section

Offsets		Name	Length	Format	Description
0		SMF99_RUAP_PNUM	4	binary	Period number.
4	4	SMF99_RUAP_BW	4	binary	Size of each x bucket width. X is the number of MPL slots available to the service class period scaled by 16.
8	8	SMF99_RUAP_LSTX	4	binary	Last plotted x bucket index.
		*	4	binary	Reserved.
16	10	SMF99_RUAP_POINTS _OF	4	binary	Offset of point entries.
20	14	SMF99_RUAP_POINTS _ON	2	binary	Number of point entries.
22	16	SMF99_RUAP_POINTS _LN	2	binary	Length of a point entry.

Swap Delay Plot Section

Offsets		Name	Length	Format	Description
0		SMF99_SWPP_PNUM	4	binary	Period number.
4	4	SMF99_SWPP_BW	4	binary	Size of each x bucket width. X is the average time an address space in the service class period is logically swapped or swapped on expanded storage in milliseconds.
8	8	SMF99_SWPP_LSTX	4	binary	Last plotted x bucket index.

Offsets		Name	Length	Format	Description
		*	4	binary	Reserved.
16	10	SMF99_SWPP_POINTS _OF	4	binary	Offset of point entries.
20	14	SMF99_SWPP_POINTS _ON	2	binary	Number of point entries.
22	16	SMF99_SWPP_POINTS _LN	2	binary	Length of a point entry.

Proportional Aggregate Speed Plot Section

Offsets		Name	Length	Format	Description
0		SMF99_PASP_PNUM	4	binary	Period number.
4	4	SMF99_PASP_BW	4	binary	Size of each x bucket width. X is the proportional aggregate speed of a service class. Units are the same as for velocity.
8	8	SMF99_PASP_LSTX	4	binary	Last plotted x bucket index.
		*	4	binary	Reserved.
16	10	SMF99_PASP_POINTS _OF	4	binary	Offset of point entries.
20	14	SMF99_PASP_POINTS _ON	2	binary	Number of point entries.
22	16	SMF99_PASP_POINTS _LN	2	binary	Length of a point entry.

Queue Delay Plot Section

Offsets		Name	Length	Format	Description
0		SMF99_QMPLP_PNUM	4	binary	Period number.
4	4	SMF99 _QMPLP_DISP _CLASS_NAME	8	EBCDIC	Service class name of the server where the server address spaces are running.
12	C	SMF99_QMPLP_BW	4	binary	Size of each x bucket width. X is the address space size in frames.
16	10	SMF99_QMPLP_LSTX	4	binary	Last plotted x bucket index.
		*	4	binary	Reserved.
24	18	SMF99_QMPLP_POINTS _OF	4	binary	Offset of point entries.
28	1C	SMF99_QMPLP_POINTS _ON	2	binary	Number of point entries.
30	1E	SMF99_QMPLP_POINTS _LN	2	binary	Length of a point entry.
32	20	SMF99_QMPLP_Q _TYPE	1	binary	Work queue type: **Bit** **Meaning When Set** **0** Queue manager type work queue. **1** Batch type work queue. **2-7** Reserved.
33	21	*	3	EBCDIC	Reserved.
36	24	SMF99_QMPLP _SUBSYS_TYPE	4	EBCDIC	Subsystem type of the owner of the queue. (Applies only to batch queue servers.)
40	28	SMF99_QMPLP _SUBSYS_NAME	8	EBCDIC	Subsystem name of the owner of the queue. (Applies only to batch queue servers.)

Queue Ready User Average Plot Section

Offsets		Name	Length	Format	Description
0		SMF99_QRUAP_PNUM	4	binary	Period number.
4	4	SMF99_QRUAP_DISP _CLASS_NAME	8	EBCDIC	Class name of server service class where the server address spaces are running.
12	C	SMF99_QRUAP_BW	4	binary	Size of each x bucket width. X is the address space size in frames.
16	10	SMF99_QRUAP_LSTX	4	binary	Last plotted x bucket index.
		*	4	binary	Reserved.
24	18	SMF99_QRUAP_POINTS _OF	4	binary	Offset of point entries.
28	1C	SMF99_QRUAP_POINTS _ON	2	binary	Number of point entries.
30	1E	SMF99_QRUAP_POINTS _LN	2	binary	Length of a point entry.

Active Server Instances Plot Section

Offsets		Name	Length	Format	Description
0		SMF99_AINS_PNUM	4	binary	Period number
4	4	SMF99_AINS_BW	4	binary	Bucket width
8	8	SMF99_AINS_LSTX	4	binary	Last plotted X bucket
		*	4	binary	Reserved
16	10	SMF99_AINS_POINTS_OF	4	binary	Offset of point entries
20	14	SMF99_AINS_POINTS_ON	2	binary	Number of point entries
22	16	SMF99_AINS_POINTS_LN	2	binary	Length of a point entry

VS Plot for Active Server Instances Section

Offsets		Name	Length	Format	Description
0		SMF99_ASTR_PNUM	4	binary	Period number
4	4	SMF99_ASTR_BW	4	binary	Bucket width
8	8	SMF99_ASTR_LSTX	4	binary	Last plotted X bucket
		*	4	binary	Reserved
16	10	SMF99_ASTR_POINTS_OF	4	binary	Offset of point entries
18	12	SMF99_ASTR_POINTS_ON	2	binary	Number of point entries
20	14	SMF99_ASTR_POINTS_LN	2	binary	Length of a point entry
22	16	SMF99_ASTR_C_USED	1	binary	Plot curve used **Bit** **Meaning When Set** **0** VS curve below 16MB was used last time server instances adjusted **1** VS curve above 16MB was used last time server instances adjusted **2-7** Reserved
		*	3	EBCDIC	Reserved

VS Plot for Total Server Instances Section

Offsets		Name	Length	Format	Description
0		SMF99_TSTR_PNUM	4	binary	Period number
4	4	SMF99_TSTR_BW	4	binary	Bucket width
8	8	SMF99_TSTR_LSTX	4	binary	Last plotted X bucket
		*	4	binary	Reserved
16	10	SMF99_TSTR_POINTS_OF	4	binary	Offset of point entries
18	12	SMF99_TSTR_POINTS_ON	2	binary	Number of point entries
20	14	SMF99_TSTR_POINTS_LN	2	binary	Length of a point entry

Offsets		Name	Length	Format	Description
22	16	SMF99_TSTR_C_USED	1	binary	Plot curve used **Bit** **Meaning When Set** **0** VS curve below 16MB was used last time server instances adjusted **1** VS curve above 16MB was used last time server instances adjusted **2-7** Reserved
		*	3	EBCDIC	Reserved

Queue Service Time Plot Section

Offsets		Name	Length	Format	Description
0		SMF99_QSTP_PNUM	4	binary	Period number.
4	4	SMF99_QSTP_DISP _CLASS_NAME	8	EBCDIC	Class name where the server address spaces are running.
12	C	SMF99_QSTP_BW	4	binary	Bucket width.
16	10	SMF99_QSTP_LSTX	4	binary	Last plotted x bucket index.
		*	4	binary	Reserved.
24	18	SMF99_QSTP_POINTS _OF	4	binary	Offset of point entries.
28	1C	SMF99_QSTP_POINTS _ON	2	binary	Number of point entries.
30	1E	SMF99_QSTP _POINTS _LN	2	binary	Length of a point entry.

Plot With Two Curves - Point Entry Section

Offsets	Name	Length	Format	Description
	SMF99_2PLOT_XVAL	4	binary	X value of point plotted in a bucket
	SMF99_2PLOT_Y1VAL	4	binary	Y value of point plotted on first curve
	SMF99_2PLOT_Y2VAL	4	binary	Y value of point plotted on second curve

Subtype 4

Self-Defining Section

Offsets		Name	Length	Format	Description
0		SMF994DEVCLID	4	binary	Identifier of the device cluster. Used to associate a device cluster with the periods in a device cluster through the device cluster identifier field in the subtype 2 record (SMF99_PDEVCL).
4	4	SMF994IOPTOF	4	binary	Offset to the I/O priority table information from the beginning of the record (including RDW).
8	8	SMF994IOPTLN	2	binary	Length of the I/O priority information.
10	A	SMF994IOPTON	2	binary	Number of priority table sections.
12	C	SMF994IOPLTOF	4	binary	Offset to the I/O plot section from the beginning of the record (including RDW).
16	10	SMF994IOPLTLN	2	binary	Length of the I/O plot section.
18	12	SMF99IOPLTON	2	binary	Number of I/O plot sections.

Device Cluster Priority Table Section

Offsets		Name	Length	Format	Description
0		SMF99_IPTPRTY	2	binary	I/O priority.
2	2	SMF99_IPTNP	2	binary	New I/O priority (zero if not changed)
4	4	SMF99_IPTIMDP	4	binary	Initial maximum percentage of time that work at priority could demand I/O, initial value before any priority moves. Percentage scaled by 10.
8	8	SMF99_IPTPMDP	4	binary	The projected maximum percentage of I/O time demanded at priority.
12	C	SMF99_IPTW2UR	4	binary	The ratio of I/O wait to I/O using time scaled by 16.
16	10	SMF99_IPTIMAXD	4	binary	The initial cumulative maximum demand percentage scaled by 10.
20	14	SMF99_IPTWMAXD	4	binary	The projected cumulative maximum demand percentage scaled by 10.

I/O Plot Information Section

Offsets		Name	Length	Format	Description
0		SMF99_IO_PLOT_BW	4	binary	Bucket width.
4	4	SMF99_IO_PLOT_LSTX	4	binary	Last plotted x bucket.
8	8	Reserved.	4	binary	Reserved.
12	C	SMF99_IO_PLOT _POINTS_OF	4	binary	Offset of the point entries.
16	10	SMF99_IO_PLOT _POINTS_ON	2	binary	Number of point entries.
18	12	SMF99_IO_PLOT _POINTS_LN	2	binary	Length of a point entry.

Subtype 5

Self-Defining Section

Offsets		Name	Length	Format	Description
0		SMF99ANAM	8	EBCDIC	Address space name
8	8	SMF99ACNM	8	EBCDIC	Service class to which the address space belongs.
16	10	SMF99APNUM	4	binary	Period number that the address space is in.
20	14	SMF99APCS	4	binary	Protective central storage target, in frames.
24	18	SMF99ARCS	4	binary	Restrictive central storage target, in frames.
28	1C	SMF99APPS	4	binary	Protective processor storage target, in frames.
32	20	SMF99ARPS	4	binary	Restrictive processor storage target, in frames.
36	24	SMF99CPLT	20	EBCDIC	Central storage plot. Mapped by SMF99_S5_CPLT_MAP.
56	38	SMF99PPLT	20	EBCDIC	Processor storage plot. Mapped by SMF99_S5_PPLT_MAP.
76	4C	SMF99ASID	2	binary	Address space ID.
78	4E	SMF99A_EXTERNAL _CLASS_NAME	8	EBCDIC	The name of the external class with which the address space is associated.

Offsets		Name	Length	Format	Description
86	56	SMF99_S5_FLAGS	1	binary	Flags. **Bit** **Meaning When Set** **0** Storage is protected at this instant. **1** Storage protection assigned to space by classification rule. **2** Indicates that storage critical housekeeping was the last to set the storage target for central storage. **3** Indicates that storage critical housekeeping was the last to set the storage target for processor storage. **4** Indicates that policy adjustment was the last to set the storage target for central storage. **5** Indicates that policy adjustment was the last to set the storage target for processor storage. **6-7** Reserved
87	57	*	3	EBCDIC	Reserved.

Processor Storage Plot Section

Offsets		Name	Length	Format	Description
		SMF99_S5_PPLT_MAP	*	*	
0		SMF99_PPLT_BW	4	binary	Size of each x bucket width. X is the address space size in frames.
4	4	SMF99_PPLT_LSTX	4	binary	Last plotted x bucket index.
		*	4	binary	Reserved.
12	C	SMF99_PPLT_POINTS _OF	4	binary	Offset of point entries.
16	10	SMF99_PPLT_POINTS _ON	2	binary	Number of point entries.
18	12	SMF99_PPLT_POINTS _LN	2	binary	Length of a point entry.

Central Storage Plot Section

Offsets		Name	Length	Format	Description
		SMF99_S5_CPLT_MAP	*	*	
0		SMF99_CPLT_BW	4	binary	Size of each x bucket width. X is the address space size in frames.
4	4	SMF99_CPLT_LSTX	4	binary	Last plotted x bucket index.
		*	4	binary	Reserved.
12	C	SMF99_CPLT_POINTS _OF	4	binary	Offset of point entries.
16	10	SMF99_CPLT_POINTS _ON	2	binary	Number of point entries.
18	12	SMF99_CPLT_POINTS _LN	2	binary	Length of a point entry.

Subtypes 1, 3, and 5

Plot with One Curve - Point Entry Section

Offsets		Name	Length	Format	Description
0		SMF99_PLOT_XVAL	4	binary	X value of point plotted in a bucket.
4	4	SMF99_PLOT_YVAL	4	binary	Y value of point plotted in a bucket.

Subtype 5

Plot With Three Curves - Point Entry Section

Offsets		Name	Length	Format	Description
0		SMF99_3PLOT_XVAL	4	binary	X value of point plotted in a bucket.
4	4	SMF99_3PLOT_Y1VAL	4	binary	Y value of point plotted on first curve. For the processor storage plot, the first curve is the page-in rate per captured (TCB+SRB) second from auxiliary storage. For the central storage plot, the first curve is the page-in rate per captured (TCB+SRB) second from auxiliary and expanded storage.
8	8	SMF99_3PLOT_Y2VAL	4	binary	Y value of point plotted on second curve. For the processor storage plot, the second curve is the paging cost in milliseconds per elapsed second for paging from auxiliary storage. For the central storage plot, the second curve is the paging cost in milliseconds per elapsed second for paging from auxiliary and expanded storage.
12	C	SMF99_3PLOT_Y3VAL	4	binary	Y value of point plotted on third curve. For the processor storage plot, the third curve is the captured time in milliseconds per elapsed second. For the central storage plot, the third curve is the captured time in milliseconds per elapsed second.

Subtype 6

Self-Defining Section

Offsets		Name	Length	Format	Description
0		SMF996CPOF	4	binary	Offset to service class period section.
4	4	SMF996CPLN	2	binary	Length of a service class period section.
6	6	SMF996CPON	2	binary	Number of service class period sections.

Period Data Section

Offsets		Name	Length	Format	Description
0		SMF996_ECLASS _NAME	8	EBCDIC	External class name. For an externally-defined service class, this is a name defined in the service definition. For a server period, this name will of the form $SRMSxxx. For system service classes, this name will be $SRMBEST, $SRMDUMP, $SRMGOOD, $SRMDISC, or $SRMQSC.
8	8	SMF996_PER_NUM	2	binary	Period number within class.
10	A	SMF996_GOALTYPE	1	binary	Goal type: **Value** **Meaning** **0** System, SYSSTC, or server goal **1** Short response time **2** Long response time **3** Velocity **4** Discretionary
11	B	SMF996_PERCENTILE	1	binary	Response time goal percentile. (Zero if period does not have a percentile response time goal.)
12	C	SMF996_ICLASS_NAME	8	EBCDIC	Internal service class name. Same as SMF996_ECLASS_NAME, except for discretionary periods, in which case the name will be of the form $SRMDIxx.
20	14	SMF996_GOALVAL	4	binary	Goal value. If a response time goal, this value will be the goal in milliseconds. If a velocity goal, this value will be the velocity percentage. If a discretionary goal, system goal, or if this is a server period, this value will be zero.

Offsets		Name	Length	Format	Description
24	18	SMF996_IMPOR	2	binary	Importance of service class period.
26	1A	SMF996_DP	1	binary	Dispatching priority of period for next policy interval.
27	1B	SMF996_IODP	1	binary	I/O priority of period for next policy interval.
28	1C	SMF996_MPLI	2	binary	MPL in-target for next policy interval.
30	1E	SMF996_MPLO	2	binary	MPL out-target for next policy interval.
32	20	SMF996_RUA	4	binary	Average number of ready address spaces over last policy interval, scaled by a factor of 16.
36	24	SMF996_PSPT	4	binary	Time swapped out address spaces in period are protected from being swapped to aux for next policy interval. This value is expressed in units of 1.024 milliseconds.
40	28	SMF996_PSITAR	4	binary	Storage isolation target for next policy interval for each address space in period. (Valid only for work with short response time goals, in which case the value is the number of frames protected. Otherwise, this value is zero.)
44	2C	SMF996_LOCAL_PI	4	binary	Local performance index, times 100.
48	30	SMF996_SYSPLEX_PI	4	binary	Sysplex performance index, times 100.
52	34	SMF996_SERVER_DATA _OF	4	binary	Offset to server section from beginning of record (including RDW). Only valid if period is a server period. There will be one server section entry for each different external service class to which server address spaces in this server period were originally classified.
56	38	SMF996_SERVER_DATA _LN	2	binary	Length of each server section entry.
58	3A	SMF996_SERVER_DATA _ON	2	binary	Number of server section entries.

Server Section

Offsets		Name	Length	Format	Description
0		SMF99_S6_SERVER _CLASS_NAME	8	EBCDIC	Name of the service class to which at least one of the server address spaces in the server period represented by the subtype 6 entry was originally classified.
8	8	SMF99_S6_SERVER _PER_NUM	4	binary	Period number within class.

Subtype 7

Self-Defining Section

Offsets		Name	Length	Format	Description
0		SMF997_PAV_SUBSYS_ID	32	EBCDIC	PAV subsystem ID, (NED TOKEN)
32	20	SMF997_NUM_EXT_SC	4	binary	Number of external service classes. This is needed to determine the index to the SYSTEM service class in the device service class bitmap. The device service class bitmap is in the device data section. The number of external service classes is put in the self-defining section to avoid repeating it for each device.
36	24	SMF997_PAV_DATA _DEV_OF	4	binary	Offset to the first device section, from beginning of record (including RDW).
40	28	SMF997_PAV_DATA _DEV_LEN	2	binary	Length of each device section.
38	26	SMF997_PAV_DATA _DEV_NO	2	binary	Number of device sections.

PAV Device Section

Offsets		Name	Length	Format	Description
0		SMF997_PAV_DEV_ID	2	binary	Device ID.
2	2	SMF997_PAV _DEV_FLAGS	1	binary	Goal type: **Bit** **Meaning When Set** **0** PAV device is an unbound alias **1** PAV device managed by WLM **2** PAV device temporarily unavailable **3–7** Reserved
3	3	SMF997_PAV_DEV _NUM_OF_ALIASES	1	binary	Number of aliases assigned. Valid for PAV base device.
4	4	SMF997_PAV_DEV _AVG_IOS_QUEUE_LEN	4	binary	Average IOS queue length. Valid for PAV base device.
8	8	SMF997_PAV_DEV _AVG_SERVICE_TIME	4	binary	Average service time. Valid for PAV base device in 128 micro seconds.
12	C	SMF997_PAV_DEV _IODELAY_TIME	4	binary	I/O Delay Time. Currently CU queue time.
16	10	SMF997_PAV_DEV _IODELAY_SAMPS	2	binary	I/O Delay samples
18	12	SMF997_PAV_DEV _IOSQSAMPLES	2	binary	IOS Queue samples
20	14	SMF997_PAV_DEV _SUBCHSET	1	binary	Sub Channel set
21	15	*	3	binary	Reserved
24	18	SMF997_PAV_DEV _DEVSC_MAP	14	binary	Device service class ID bit string
38	26	*	2	binary	Reserved
40	28	SMF997_PAV_DEV _UTILIZATION	4	binary	Utilization
44	2C	SMF997_PAV_DEV _PENDTIME	4	binary	Pend time
48	30	SMF997_PAV_DEV _DISCTIME	4	binary	Disconnect time
52	34	SMF997_PAV_DEV_SSC	4	binary	Start subchannel count
56	38	SMF997_PAV_DEV _MINACNT	1	binary	Local min alias count
57	39	SMF997_PAV_DEV _GMINACNT	1	binary	Global min alias count
58	3A	*	2	binary	Unused
60	3C	SMF997_PAV_DEV _RSRVD2	4	binary	Reserved

Subtype 8

Self Defining Section

Offsets		Name	Length	Format	Description
0		SMF998_LD_DATA _OFFSET	4	binary	Offset to LPAR data section from beginning of record (including RDW)
4	4	SMF998_LD_DATA _LENGTH	2	binary	Length of a LPAR data section
6	6	SMF998_LD_DATA _NUMBER	2	binary	Number of LPAR data sections
8	8	SMF998_PT_DATA _OFFSET	4	binary	Offset to priority table section from beginning of record (including RDW)
12	C	SMF998_PT_DATA _LENGTH	2	binary	Length of a priority table section

Offsets		Name	Length	Format	Description
14	E	SMF998_PT_DATA _NUMBER	2	binary	Number of priority table sections
16	10	SMF998_PC_DATA _OFFSET	4	binary	Offset to period CPU section from beginning of record (including RDW)
20	14	SMF998_PC_DATA _LENGTH	2	binary	Length of a period CPU section
22	16	SMF998_PC_DATA _NUMBER	2	binary	Number of period CPU sections
24	18	SMF998_IMAGE_CPU _DATA_OFFSET	4	binary	Offset to image CPU section, from beginning of record (including RDW)
28	1C	SMF998_IMAGE_CPU _DATA_LENGTH	2	binary	Length of an image CPU section
30	1E	SMF998_IMAGE_CPU _DATA_NUMBER	2	binary	Number of image CPU sections
32	20	SMF998_SYSH_CPU _PLOT_OF	4	binary	Offset to the SYSH CPU plot section, from beginning of record (including RDW)
36	22	SMF998_SYSH_CPU _PLOT_LN	2	binary	Length of SYSH CPU plot section
38	24	SMF998_SYSH_CPU _PLOT_ON	2	binary	Number of SYSH CPU plot sections

LPAR Data Entry Section

Offsets		Name	Length	Format	Description
0		SMF998_ImageSystemName	8	EBCDIC	Image system name
8	8	SMF998_ControlFlag1	1	binary	Control flag that indicates why the rest of the data in the LD entry has not been filled in. **Bit** **Meaning When Set** **0** Indicates that this is an overflow SMF 99 subtype 8 record for specified system. The appropriate LD data for this system appears in the first SMF 99 subtype 8 record for this system. **1** Indicates that this system does not have DIAG support. **2** Indicates that LPAR CPU Management is not enabled. **3** Indicates that this system issued DIAG and it failed. **4** Indicates that an image entry was not returned via the DIAG interface for this system. **5** Indicates that the image is non-z/OS. (LINUX) **6-7** Reserved.
9	9	SMF998_SystemNumber	1	binary	System slot number. The source for this value is QUASNUM in IXCYQUAA.
10	A	*	2	EBCDIC	Reserved
12	C	SMF998_LastSetTime	8	binary	Timestamp in STCK format
20	14	SMF998_TotalWeight	4	binary	Total weight of the CEC
24	18	SMF998_ NumberOfSharedPhysicalCPUs	1	binary	Total number of shared (non-dedicated) physical CPU configured for the CEC use
25	19	*	3	EBCDIC	Reserved
28	1C	SMF998_ImageID	1	binary	Image ID of the partition
29	1D	SMF998_ImageFlags	1	binary	Image Flags **Bit** **Meaning When Set** **0** Image is capped by software. **1** Identifies whether WLM should be involved in dynamic LPAR weight management. **2** Identifies whether partition is using shared CPs. **3** Identifies whether partition is using dedicated CPs. **4** Identifies whether partition is capped by installation from console. **5-7** Reserved.
30	1E	*	2	EBCDIC	Reserved
32	20	SMF998_ NumberCpusActive	2	binary	Number of CPUs that are currently active
34	22	SMF998_ AverageCpuUtilization	2	binary	Average CPU utilization
36	24	SMF998_ ImageInitialWeight	2	binary	Image initial weight
38	26	SMF998_ ImageCurrentWeight	2	binary	Image current weight

Offsets		Name	Length	Format	Description
40	28	SMF998_ ImageMinimumWeight	2	binary	Image minimum weight
42	2A	SMF998_ ImageMaximumWeight	2	binary	Image maximum weight
44	2C	SMF998_Pro _Time_Avail	4	binary	Total processor time available, includes captured time plus wait time
48	30	SMF998_Service _Units_Per_Second	4	binary	Unweighted CPU service units per second per online CPU that the hardware is capable of
52	34	*	16	EBCDIC	Reserved
68	44	SMF998_SoftCapMsu	4	binary	Capacity in millions of service units per hour for which the logical partition is licensed.
72	48	*	4	EBCDIC	Reserved
76	4C	SMF998_ PricingManagementWeight	4	binary	Current pricing management weight.

Priority Table Entry Section

Offsets		Name	Length	Format	Description
0		SMF998_PTPRTY	2	binary	Dispatch priority
2	2	SMF998_PTNP	2	binary	New dispatch priority (zero if not changed)
4	4	SMF998_PTIMDP	4	binary	Initial maximum percentage of processor demanded at priority, initial value before any priority moves or slice changes
8	8	SMF998_PTPMDP	4	binary	Projected maximum percentage of processor demanded at priority
12	C	SMF998_PTCPUU	4	binary	CPU using samples at priority
16	10	SMF998_PTCPUD	4	binary	CPU delay samples at priority
20	14	SMF998_PTW2UR	4	binary	Wait-to-using ratio at priority (*16)
24	18	SMF998_PTAPU	4	binary	Actual measured processor used at priority
28	1C	SMF998_PTPPU	4	binary	Projected processor time to be used at priority
32	20	SMF998_PTACMD	4	binary	Achievable cumulative max demand for priorities affected by a move
36	24	*	4	binary	Reserved
40	28	SMF998_PTIMAXD	4	binary	Initial cumulative maximum demand
44	2C	SMF998_PTWMAXD	4	binary	Projected cumulative maximum demand
48	30	SMF998_PTIAMTW	4	binary	Initial average mean time to wait
52	34	SMF998_PTWAMTW	4	binary	Projected average mean time to wait

CPU Period Table Entry Section

Offsets		Name	Length	Format	Description
0		SMF998_Service _Class_Name	8	EBCDIC	Internal service class name
8	8	SMF998_Importance	2	binary	Importance
10	A	SMF998_Period _Number	2	binary	Period number
12	C	*	4	EBCDIC	Reserved
16	10	SMF998_Dasd_Io _Delay_Sample	4	binary	Copy of I/O delay samples
20	14	SMF998_Non _Idle_Samp	4	binary	Number of non-idle samples
24	18	SMF998_Cpu _Using_Sample	4	binary	Copy of CPU using samples
28	1C	SMF998_Cpu _Delay_Sample	4	binary	Copy of CPU delay samples
32	20	SMF998_Wlm_Queue _Delay_Sample	4	binary	Copy of WLM queue delay samples
36	24	SMF998_Dasd_Io _Using_Sample	4	binary	Copy of DASD I/O using samples

Offsets		Name	Length	Format	Description
40	28	SMF998_Max_Dem_Per	4	binary	Maximum percentage of processor time demanded (constant across policy adjustment)
44	2C	SMF998_Pi_Achieved	4	binary	Performance index achieved, adjusted into range, used to select donors and receivers
48	30	SMF998_Sysplex _Pi_Achieved	4	binary	Sysplex performance index achieved, adjusted into range, used to select donors and receivers
52	34	SMF998_Service_Ow	4	binary	Average service over a WLM-defined moving interva
56	38	SMF998_Mtw_Adj	4	binary	Mean time to wait adjusted by cccmxmtw
60	3C	SMF998_Base _Priority	2	binary	Base dispatching priority
62	3E	SMF998_Cap _Num_Slices	2	binary	Current number of sleep slices, or 0
64	40	SMF998_Work _Pro_Used	4	binary	Working variable for assess for processor used
68	44	SMF998_Current _Ach_Dem_Per	4	binary	Current achievable demand percentage for the period calculated from the initial PDT fields.
72	48	SMF998_Ach_Dem_Per	4	binary	Working variable for achievable demand percentage
76	4C	SMF998_Old_Work _Pro_Used	4	binary	Work field computed during phase 1 move
80	50	SMF998_Proj_Pi_Com	4	binary	Unadjusted projected PI for committed actions only, used as base for projections
84	54	SMF998_Using_Delta	4	binary	Computed during assessment
88	58	SMF998_LparMgmt _Delay_Delta	4	binary	Delay delta computed by LPAR Mgmt algorithm. This field captures the delay delta for SMF99 recording before it is cleared out.
92	5C	SMF998_Cpu_Cap _Delay_Sample	4	binary	CPU capping delay sample
96	60	SMF998_Iosub _Samples_Data_Offset	4	binary	Offset to I/O subsystem samples data from beginning of record (including RDW)
100	64	SMF998_Iosub _Samples_Data_Length	2	binary	Length of a I/O subsystem samples data section
102	66	SMF998_Iosub _Samples_Data_number	2	binary	Number of I/O subsystem samples data sections
104	68	SMF998_Sysplex _Proj_Pi_Com	4	binary	Unadjusted sysplex projected PI for committed actions only, used as base for projections
108	6C	SMF998_PC_CSS_NUMBER	1	binary	Channel subsystem identifier
109	6D	*	11	EBCDIC	Reserved

LPAR CPU Data for a Partition in an LPAR Cluster Section

Offsets		Name	Length	Format	Description
0		SMF998_LC _Service_Class_Name	8	EBCDIC	Internal service class name
8	8	SMF998_LC _Period_Number	2	binary	Period number
		*	2	binary	Reserved
12	C	SMF998_LC _Machine_Percentage	4	binary	Percent of the CEC shared capacity used by the partition either based on its current weight or utilization
16	10	SMF998_LC _Max_Dem_Per	4	binary	Maximum percentage of processor time demanded by the image during current interval (scaled by 10)
20	14	SMF998_LC _LastInt_Cpu_Using	4	binary	Last interval CPU using samples count
24	18	SMF998_LC _LastInt_Cpu_Delay	4	binary	Last interval CPU delay samples count
28	1C	SMF998_LC _LastInt_Non_Idle	4	binary	Last interval non idle sample count which include using, delay and other
32	20	SMF998_LC _Avg_Cpu_Using	4	binary	Average CPU using samples count
36	24	SMF998_LC _Avg_Cpu_Delay	4	binary	Average CPU delay samples count
40	28	SMF998_LC_Using_Delta	4	binary	Using delta
44	2C	SMF998_LC_Delay_Delta	4	binary	Delay delta
48	30	SMF998_LC _Work_Max_Dem_Per	4	binary	New maximum percentage of processor time demanded by the image during current interval as a result of weight change (scaled by 10)

Offsets		Name	Length	Format	Description
52	34	SMF998_LC _Work_Weighted_ Max_Dem_Per	4	binary	Maximum percentage of processor time demanded by the image as a result of weight change, with respect to its current machine share (based on weight or utilization)
56	38	SMF998_LC _Work_W2U_Ratio	4	binary	New W2U ratio due to change in LPAR weight
60	3C	SMF998_LC_Pi_Delta	4	binary	PI delta projection
64	40	SMF998_LC _Sysplex_Pi_Delta	4	binary	Sysplex PI delta projection

SYSH CPU Plot Section

Offsets		Name	Length	Format	Description
0		SMF99_SYSH _CPU_PLOT_INUM	4	binary	Image number
4	4	SMF99_SYSH _CPU_PLOT_BW	4	binary	Bucket width
8	8	SMF99_SYSH _CPU_PLOT_LSTX	4	binary	Last plotted X bucket
12	C	SMF99_SYSH _CPU_PLOT_POINTS_OF	4	binary	Offset of point entries
16	10	SMF99_SYSH _CPU_PLOT_POINTS_ON	2	binary	Number of point entries
18	12	SMF99_SYSH _CPU_PLOT_POINTS_LN	2	binary	Length of a point entry

Subtypes 2 and 8

I/O Subsystems Samples Data Section

Offsets		Name	Length	Format	Description
0		SMF99_IOSUB_Index	2	binary	Subsystem index. This correlates with SMF999_IOSUB_INDEX.
2	2	*	2	binary	Reserved
4	4	SMF99_IOSUB _ConnectSamples	2	binary	Connect samples.
6	6	SMF99_IOSUB _PendingSamples	2	binary	Pending samples.

Subtype 9

Self Defining Section

Offsets		Name	Length	Format	Description
0		SMF999_IO_SUBSYSTEM _DATA_OFFSET	4	binary	Offset to IO Subsystem data section from beginning of record (including RDW)
4	4	SMF999_IO_SUBSYSTEM _DATA_LENGTH	2	binary	Length of IO Subsystem Data section
6	6	SMF999_IO_SUBSYSTEM _DATA_NUMBER	2	binary	Number of IO Subsytem Data sections
8	8	SMF999_IOSUB _PLOT_OF	4	binary	Offset to IO Subsystem plots
12	C	SMF999_IOSUB _PLOT_LN	2	binary	Length of IO Subsystem plots
14	E	SMF999_IOSUB _PLOT_ON	2	binary	Number of IO Subsystem plots
16	10	SMF999_CHANNEL _DATA_OF	4	binary	Offset to Channel Data section

Offsets		Name	Length	Format	Description
20	14	SMF999_CHANNEL _DATA_LN	2	binary	Length of Channel Data section
22	16	SMF999_CHANNEL _DATA_ON	2	binary	Number of Channel Data section

Channel Path Data Entry Section

Offsets		Name	Length	Format	Description
0		SMF999_FLAG1	1	binary	IO subsystem flags **Bit** **Meaning When Set** **0** Indicates that the I/O subsystem is eligible for dynamic management. **1** Indicates CONFIG change has been made. **2** Indicates that no point was plotted this interval. If this indicator is on, SMF99_IOSUB_INTERVAL_VELOCITY is not relevant. **3** Indicates that no channel data was written this interval. This indicator is set when the structure for the channel data does not exist. **4** Indicates that while calculating the busy to connect ratio an entry ratio was converted from >1.6 to 1.3. **5-7** Reserved.
1	1	SMF999_CONTROL_FLAGS	1	binary	Control flags **Bit** **Meaning When Set** **0** Indicates that this SMF 99 subtype 9 record represents a situation that caused us not to create valid SMF 99 subtype 9 data. Identify the condition by checking one of the following indicators. Data in this SMF 99 subtype 9 is invalid other than possibly the SMF999_IOSUB_INDEX (valid when empty slot or old slot entry). **1** Indicates that registry data does not exist. **2** Indicates that the WLM LPAR Cluster structure is not connected. **3** Indicates that the SMF 99 buffer for the subtype 9 data was not processed from the previous interval. **4** Indicates empty slot entry. **5** Indicates old slot entry. **6** Indicates unknown reason. **7** Reserved.
2	2	SMF999_ROW_INDEX	2	binary	Channel path data row index
4	4	*	1	EBCDIC	Reserved
5	5	SMF999_DIAG_TOKEN	3	binary	Internal diagnosis data
8	8	SMF999_TOKEN_NED	32	EBCDIC	Token NED of I/O subsystem
40	28	SMF999_IOSUB _TARGET_VELOCITY	4	binary	I/O subsystem target velocity set by WLM
44	2C	SMF999_IOSUB _VELOCITY	4	binary	The actual I/O velocity of the subsystem
48	30	SMF999_IOSUB _AVG_SVC_TIME	4	binary	Average service time
52	34	SMF999_IOSUB _CHECK_POINT_TIME	4	binary	Average service time of the subsystem when SRM set a target
56	38	SMF999_IOSUB _INDEX	2	binary	IO Subsystem Index
58	3A	SMF999_LCU _SQNUMBER	2	binary	LCU sequence number
60	3C	SMF999_CONTROL _UNIT_ARRAY	16	binary	Control unit numbers, SMF999_CONTROL_UNITS(1-8), associated with LCU

Offsets		Name	Length	Format	Description
76	4C	SMF999_IOSUB _PROJECTED_VELOCITY	4	binary	Projected velocity to be expected if a change is to be made
80	50	SMF999_IOSUB _INTERVAL_VELOCITY	4	binary	The 10 second I/O velocity that is used to plot a point.
84	54	SMF999_AVG_BUSY _TO_CONNECT_RATIO	4	binary	The average busy to connect time ratio calculated by WLM during the 10 second copy interval.
88	58	SMF999_CLEAR_INTERVAL	2	binary	Clear interval index
90	5A	SMF999_CSS_NUMBER	1	binary	Channel subsystem identifier
91	5B	*	5	binary	Reserved
92	5C	SMF999_IOSUB_INTERVALCHANNEL WAITTIME	4	HEX	Interval Channel-Wait-Time
96	60	SMF999_TIMESTAMP_SYSTEM	8	EBCDIC	Identifies the system that made a CONFIG change

I/O Subsystem Plot Section

Offsets		Name	Length	Format	Description
0		SMF99_IOSUB_BW	4	binary	Bucket width
4	4	SMF99_IOSUB_LSTX	4	binary	Last plotted x bucket
8	8	*	4	binary	Reserved
12	C	SMF99_IOSUB _POINTS_OF	4	binary	Offset of point entries
16	10	SMF99_IOSUB _POINTS_ON	2	binary	Number of point entries
18	12	SMF99_IOSUB _POINTS_LN	2	binary	Length of a point entry

Channel Path Data Entry Section

Offsets		Name	Length	Format	Description
0		SMF999_CHANNEL_ID	1	binary	I/O Subsystem channel ID.
1	1	SMF999_CHANNEL _TYPE	1	binary	I/O Subsystem channel type.
2	2	SMF999_CHANNEL _FLAG	1	binary	I/O Subsystem channel flags bit indicate if channel is managed: **Bit** **Meaning When Set** **0** Indicates that this channel can be managed by WLM. **1-7** Reserved.
3	3	*	1	EBCDIC	Reserved
4	4	SMF999_CHANNEL _UTILIZATION	4	binary	I/O Subsystem Channel utilization for the current data collection interval.
8	8	SMF999_CHANNEL _PROJECTED_UTILIZATION	1	binary	Projected I/O Subsystem Channel utilization for the current data collection interval (percentage)
9	9	SMF999_CHANNEL _PROJ_CURRENT _PATH_LOAD	1	binary	Percent use for path projected for the current configuration during the calibration pass.
10	A	SMF999_CHANNEL _#SYSTEMS_CONTRIBUTED	2	binary	Count of systems that have contributed to this channel data.
12	C	SMF999_CHANNEL _PORT_BUSY_COUNT	4	binary	Channel port busy count.

Subtype 10

Header/Self-defining Section

Offsets		Name	Length	Format	Description
0		SMF9910_CPU_DATA _OFFSET	4	HEX	Offset to CPU data section from beginning of record
4	4	SMF9910_CPU_DATA _LENGTH	2	HEX	Length of CPU data section
6	6	SMF9910_CPU_DATA _NUMBER	2	HEX	Number of CPU data sections

Offsets		Name	Length	Format	Description
8	8	SMF9910_PROC_SPEED _CHG_DATA_OLD_OFFSET	4	HEX	Offset to old processor speed change data section (including RDW)
12	C	SMF9910_PROC_SPEED _CHG_DATA_OLD_LENGTH	2	HEX	Length of old processor speed change data section
14	E	SMF9910_PROC_SPEED _CHG_DATA_OLD_NUMBER	2	HEX	Number of old processor speed change data sections
16	10	SMF9910_PROC_SPEED _CHG_DATA_NEW_OFFSET	4	HEX	Offset to new processor speed change data section (including RDW)
20	14	SMF9910_PROC_SPEED _CHG_DATA_NEW_LENGTH	2	HEX	Length of new processor speed change data section
22	16	SMF9910_PROC_SPEED _CHG_DATA_NEW_NUMBER	2	HEX	Number of new processor speed change data sections

CPU Data Section

Offsets		Name	Length	Format	Description
0		SMF99A_CPU_Reserved	2	HEX	Reserved
2	2	SMF99A_CPU_RmctScSq	2	HEX	Number of speed changes
4	4	SMF99A_CPU_Reserved	6C	HEX	Reserved

Processor Speed Change Section (old or new)

Offsets		Name	Length	Format	Description
0		SMF99A_PSC_Reserved	C	HEX	Reserved
12	C	SMF99A_PSC_RMCTCpMp	4	HEX	CP speed
16	10	SMF99A_PSC_RMCTAdjc	4	HEX	CPU rate adjustment factor
20	14	SMF99A_PSC_Reserved	828	HEX	Reserved

Record Type 100 (64) — DATABASE 2 Statistics

DATABASE 2 (DB2) writes record type 100 to record transaction data collected at event monitoring points.

Reference book

For more information about record type 100, see *IBM DB2 Administration Guide*.

Record Type 101 (65) — DATABASE 2 Accounting

DATABASE 2 (DB2) writes record type 101 to account for resources during a transaction.

Reference book

For more information about record type 101, see *IBM DB2 Administration Guide*.

Record Type 102 (66) — DATABASE 2 Performance

DATABASE 2 (DB2) writes record type 102 to record performance information.

Reference book

For more information about record type 102, see *IBM DB2 Administration Guide*.

Record Type 103 (67) — HTTP Server

IBM HTTP Server for OS/390 writes record type 103 to record configuration and performance information.

Reference book

For more information about record type 103, see *HTTP Server Planning, Installing, and Using*.

Record Type 108 (6C) — Domino Server Statistics

This record type presents data for a Domino for S/390 server running on an z/OS system. The specific type of data that is being reported is defined by the subtype field on the record (SMF108STP) in the standard record header.

Subtype Descriptions

Subtype 1 - Server Load

This subtype contains counts of activity done by the server running on the z/OS system.

Subtype 3 - Monitoring and Tuning

This subtype will monitor some statistics and certain configuration parameters used by the server.

Record Environment

SMF Type 108 records are generated using the C language function 'smf_record' which is a part of the z/OS extensions to the language. Records are generated at the expiration of the SMF Global Interval (combination of INTVAL an SYNCVAL parameters in the SMFPRMxx parmlib member). The generated invocation results in an environment which equates to

Macro
SMFTWM (SVC level interface) — record exit = IEFU83

Mode
Task

Storage Residency
31-bit

SUBSYS
'STC'

Security Notice

Because the processing which generates these records is using the ‘C’ language interface there is some security setup that must be done in order to enable these records to be generated. The RACF commands (or their equivalent) must be issued before these records can be generated:

- RDEFINE FACILITY BPX.SMF UACC(NONE) — may have already been done
- PERMIT BPX.SMF CLASS(FACILITY) ID(<server>) ACCESS(READ) — allow access
- SETROPTS RACLIST(FACILITY) REFRESH — refresh in-core tables

Record Mappings

The record mappings are shown as two sections, a Common Section which appears on all subtypes and a Unique Section for each subtype.

Common Sections

The following sections appear on each of the Type 108 subtype records and are included in the documentation once.

Header/Self-defining Section: This section contains the common SMF record headers fields and the triplet fields (offset/length/number), if applicable, that locate the other sections on the record.

Offsets		Name	Length	Format	Description
0	0	SMF108LEN	2	binary	Record length. This field and the next field (total of four bytes) form the RDW (record descriptor word).
2	2	SMF108SEG	2	binary	Segment description (see record length field).
4	4	SMF108FLG	1	binary	System indicator: **Bit** **Meaning When Set** **0** Reserved **1** Subtypes used **2** Reserved **3-6** Version indicators* **7** Reserved.
5	5	SMF108RTY	1	binary	Record type 108 (X'6C').
6	6	SMF108TME	4	binary	Time since midnight, in hundredths of a second, that the record was moved into the SMF buffer.
10	A	SMF108DTE	4	packed	Date when the record was moved into the SMF buffer, in the form 0*cyydddF*.
14	E	SMF108SID	4	EBCDIC	System identification (from the SID parameter).
18	12	SMF108SSI	4	EBCDIC	Subsystem identification.
22	16	SMF108STP	2	binary	Record Subtype **Subtype** **Description** **1** Server Load **3** Monitoring and Tuning
24	18	SMF108PRO	4	binary	Offset to Product Section
28	1C	SMF108PRL	2	binary	Length of Product Section
30	1E	SMF108PRN	2	binary	Number of Product Sections (should be ’1’)
32	20	SMF108SSO	4	binary	Offset to Self-Defining Section
36	28	SMF108SSL	2	binary	Length of Self-Defining Section
38	2A	SMF108SSN	2	binary	Number of Self-Defining Section (should be ’1’)

Product Section: This section contains the general information about the server and the system that it is running on.

Offsets		Name	Length	Format	Description
0	0	SMF108PRRVN	4	binary	Record version number. Set to 3 for Domino Release 5.02 and above. Increased by 1 each time additional function is added to the record.
4	4	SMF108PRPVN	8	EBCDIC	Domino version number (5.0 for example). This is the first eight bytes of the product version string and may contain text or other characters after the number.
12	C	SMF108PRSVN	32	EBCDIC	Server Name (used to identify partitioned servers)
44	2C	SMF108PRSPN	8	EBCDIC	Sysplex Name (general-use-programming-interface (gupi) field in cvt/ecvt)
52	34	SMF108PRSYN	8	EBCDIC	System Name (gupi field in cvt/ecvt)
60	3C	SMF108PROSL	8	EBCDIC	OS/390 System Level (gupi field in cvt/ecvt)
68	44	SMF108PRISTARTT	8	binary STCK	Interval Start Time
76	4C	SMF108PRIENDT	8	binary STCK	Interval End Time

Subtype 1 — Server Load

Self-Defining Section: This section contains the triplet fields (offset/length/number) that locate the specific sections for this subtype on the record.

Offsets		Name	Length	Format	Description
0	0	SMF108SLO	4	binary	Offset to Server Load Section
4	4	SMF108SLL	2	binary	Length of Server Load Section
6	6	SMF108SLN	2	binary	Number of Server Load Section (should be ’1’)
8	8	SMF108TRO	4	binary	Offset to Transaction Section
12	C	SMF108TRL	2	binary	Length of Transaction Section
14	E	SMF108TRN	2	binary	Number of Transaction Section (1 per transaction type processed)
16	10	SMF108PTO	4	binary	Offset to Port Activity Section
20	14	SMF108PTL	2	binary	Length of Port Activity Section
22	16	SMF108PTN	2	binary	Number of Port Activity Sections (1 per TCP/IP port)

Server Load Section: This section contains the counters showing activity at the server level (globally).

Offsets		Name	Length	Format	Description
0	0	SMF108SLCU	4	binary	Current number of users
4	4	SMF108SLUA	4	binary	Number of currently connected users that are currently active
8	8	SMF108SLUA1M	4	binary	Number of currently connected users that have been active within the last 1 minute
12	12	SMF108SLUA3M	4	binary	Number of currently connected users that have been active within the last 3 minutes
16	10	SMF108SLUA5M	4	binary	Number of currently connected users that have been active within the last 5 minutes
20	14	SMF108SLUA15M	4	binary	Number of currently connected users that have been active within the last 15 minutes
24	18	SMF108SLUA30M	4	binary	Number of currently connected users that have been active within the last 30 minutes
28	1C	SMF108SLDMSENTL	4	binary	Number of Domino mail messages delivered to local users

Offsets		Name	Length	Format	Description
32	20	SMF108SLDMSENTLAS	4	binary	Average size of Domino mail and SMTP messages delivered to local users
36	24	SMF108SLDMSENTR	4	binary	Number of Domino mail and SMTP messages sent to other servers
40	28	SMF108SLDMSENTRAS	4	binary	Average size of Domino mail messages sent to other servers
44	2C	SMF108SLSMREC	4	binary	Number of SMTP messages received from other servers during interval
48	30	SMF108SLSMRECAS	4	binary	Average size of SMTP messages received from other servers during interval
52	34	SMF108SLSMSENT	4	binary	Number of SMTP messages sent to other servers during interval
56	38	SMF108SLSMSENTAS	4	binary	Average size of SMTP messages sent to other servers during interval
60	3C	SMF108SLTRANS	4	binary	Total number of transactions processed during interval
64	40	SMF108SLSVREPL	4	binary	Number of replications initiated by this server
68	44	SMF108SLNWSESIN	4	binary	Number of incoming (to the server from clients) sessions established during the interval. (Version 1 format only. For Release 5.01 or higher this field will be set to zero. This data is now recorded in the Port Activity Section).
72	48	SMF108SLNWSESOUT	4	binary	Number of outgoing sessions established during the interval. (Version 1 format only. For Release 5.01 or higher this field will be set to zero. This data is now recorded in the Port Activity Section).
76	4C	SMF108SLNWBR	4	binary	Number of network Bytes/1024 received during interval. (Version 1 format only. For Release 5.01 or higher this field will be set to zero. This data is now recorded in the Port Activity Section).
80	50	SMF108SLNWBS	4	binary	Number of network Bytes/1024 sent during interval. (Version 1 format only. For Release 5.01 or higher this field will be set to zero. This data is now recorded in the Port Activity Section).
84	54	SMF108SLTT	2	binary	Total number of physical thread pool threads, server_pool_tasks
86	56	SMF108SLVTIU	2	binary	Number of virtual thread pool threads currently in use
88	58	SMF108SLAIOR	4	binary	Number of async i/o reads during interval
92	5C	SMF108SLAIOW	4	binary	Number of async i/o writes during interval
96	60	SMF108SLPOP3R	4	binary	Number of POP3 reads during interval
100	64	SMF108SLIMAPR	4	binary	Number of IMAP reads during interval
104	68	SMF108SLHTTPR	4	binary	Number of HTTP reads during interval
108	6C	SMF108SLHTTPW	4	binary	Number of HTTP writes during interval
112	70	SMF108SLVTIUMAX	2	binary	Maximum number of virtual thread pool threads in use during interval
114	72	SMF108SLTASKS	2	binary	Number of tasks currently in use
116	74	SMF108SLTASKSMAX	2	binary	Maximum number of tasks in use during interval
118	76	SMF108SLPTIU	2	binary	Number of physical thread pool threads currently in use
120	78	SMF108SLPTIUMAX	2	binary	Maximum number of physical thread pool threads in use during interval

Transaction Section: This section contains the data being reported for each transaction (by type) that is requested of the server. Only transactions with non-zero activity counts are included.

Offsets		Name	Length	Format	Description
0	0	SMF108TRTYPE	4	binary	Transaction type. See Table 13-4 on page 13-590
4	4	SMF108TRTYPENP	4	binary	Number of transactions of type processed during interval
8	8	SMF108TRTYPETA	4	binary	Total accumulated response time, in milliseconds, for all transactions of type that completed during interval
12	C	SMF108TRTYPENW	4	binary	Total accumulated net wait time, in milliseconds, for all transactions of type that completed during interval. This is the time the server has been waiting for clients to respond.

Port Activity Section: This section contains the data being reported for each TCP/IP port that the server has a connection to.

Offsets		Name	Length	Format	Description
0	0	SMF108PTNAME	8	EBCDIC	The first eight bytes of the TCP/IP port. ('TCPIP' for example)
8	8	SMF108PTNWSESIN	4	binary	Number of incoming sessions processed during the interval (client to server connection).
12	C	SMF108PTNWSESOUT	4	binary	Number of outgoing sessions processed during the interval
16	10	SMF108PTNWBR	4	binary	Total number of bytes/1024 received for this port during the interval.
20	14	SMF108PTNWBS	4	binary	Total number of bytes/1024 sent for this port during the interval.

Subtype 3 — Monitoring and Tuning

Self-Defining Section: This section contains the triplet fields (offset/length/number) that locate the specific sections for this subtype on the record.

Offsets		Name	Length	Format	Description
0	0	SMF108MTO	4	binary	Offset to Data Section
4	4	SMF108MTL	2	binary	Length of Data Section
6	6	SMF108MTN	2	binary	Number of Data Sections (should be '1')

Monitoring and Tuning Data Section: This section contains some statistics and certain configuration parameters for tuning the Domino server.

Offsets		Name	Length	Format	Description
0	0	SMF108MTMAXUSERS	4	binary	Maximum number of users
4	4	SMF108MTMAXCONTR	4	binary	Limit for number of concurrent transactions
8	8	SMF108MTMAXCONSES	4	binary	Maximum number of sessions to run concurrently
12	C	SMF108MTSESTIMEOUT	2	binary	Number of minutes in timeout
14	E	SMF108MTUPMAX	2	binary	Maximum number of concurrent update tasks
16	10	SMF108MTMAILBOXES	2	binary	Maximum number of mail.box'es
18	12	SMF108MTREPMAX	2	binary	Maximum number of replicators (concurrent)
20	14	SMF108MTNSFPOOL	4	binary	Maximum size of nsf buffer pool (in bytes)
24	18	SMF108MTSFPOOLIU	4	binary	Number of bytes in nsf buffer pool (in use)
28	1C	SMF108MTDBCENAB	1	binary	dbcache enabled = 1, 0 if disabled
29	1D	RESERVECHAR	3	N/A	Reserved for alignment
32	20	SMF108MTDBCMAXE	4	binary	Maximum number of dbcache entries
36	24	SMF108MTDBCCE	4	binary	Number of dbcache (current entries)

Offsets		Name	Length	Format	Description
40	28	SMF108MTDBCIDBO	4	binary	Number of dbcache (initial db opens)
44	2C	SMF108MTDBCOCR	4	binary	Number of dbcache (overcrowding rejections)
48	30	SMF108MTDBCHITS	4	binary	Number of dbcache (hits)
52	34	SMF108MTDBCHWM	4	binary	dbcache (high water mark)
56	38	SMF108MTSATH	2	binary	Server availability threshold
58	3A	SMF108MTSAX	2	binary	Server availability index
60	3C	SMF108MTNIFS	4	binary	Database.NIFPool.Size (in bytes)
64	40	SMF108MTNIFN	4	binary	Database.NIFPool.Used
68	44	SMF108MTNSFS	4	binary	Database.NSFPool.Size (in bytes)
72	48	SMF108MTNSFN	4	binary	Database.NSFPool.Used
76	4C	SMF108MTDBPR	4	binary	Number of Database.BufferPool (Reads)
80	50	SMF108MTDBPW	4	binary	Number of Database.BufferPool (Writes)
84	54	SMF108MTMMXFER	2	binary	Maximum number of mail transfer threads
86	56	SMF108MTMMXDLV	2	binary	Maximum number of mail delivery threads
88	58	SMF108MTMMXCONXFR	2	binary	Maximum number of concurrent mail transfer threads

Constants

Transaction Types

This table contains a brief description of the transaction types recorded above.

Table 13-4. Transaction Types

Decimal Type	Description
1	OPEN_DB_RQST
2	CREATE_DB_RQST
3	CLOSE_DB_RQST
4	GET_SPECIAL_NOTE_ID_RQST
5	ITEM_DEF_TABLE_RQST
6	OPEN_NOTE_RQST
7	UPDATE_NOTE_RQST
8	UPDATE_NOTE_RQST_ALT
9	DELETE_NOTE_RQST
10	GET_NOTE_INFO_RQST
11	SET_SPECIAL_NOTE_ID_RQST
12	DB_INFO_GET_RQST
13	DB_INFO_SET_RQST
14	DB_MODIFIED_TIME_RQST
15	SEARCHSTART_RQST
16	SEARCHSTOP_RQST
17	SERVER_TIME_RQST
18	DELETE_DB_RQST
19	FILE_SUMMARY_RQST
22	DB_REPLINFO_SET_RQST
23	DB_REPLINFO_GET_RQST
24	GET_MODIFIED_NOTES_RQST
25	STAMP_NOTES_RQST

Table 13-4. Transaction Types (continued)

Decimal Type	Description
26	RENAME_DB_RQST
27	REPLICATE_RQST
28	LOOKUP_HELP_NOTE_RQST
29	DB_SPACE_USAGE_RQST
30	GET_OBJECT_SIZE_RQST
31	FREE_OBJECT_RQST
32	ALLOC_OBJECT_RQST
33	REALLOC_OBJECT_RQST
34	READ_OBJECT_RQST
35	WRITE_OBJECT_RQST
36	TEXT_SEARCH_RQST
37	ALLOC_UPDATE_OBJECT_RQST
38	FREE_UPDATE_OBJECT_RQST
39	GET_SERVER_STATS_RQST
40	FT_SEARCH_RQST
41	FT_CLOSE_SEARCH_RQST
42	COMPACT_DB_RQST
43	FT_GET_LAST_INDEXTIME_RQST
44	RELAY_EVENT_RQST
45	REMOTE_CONSOLE_RQST
46	FT_DELETE_INDEX_RQST
47	FT_INDEX_RQST
48	CLOSE_DB_RQST_ALT
49	CLOSE_COLLECTION_RQST_ALT
50	CREATE_COLLECTION_RQST
51	OPEN_COLLECTION_RQST
52	CLOSE_COLLECTION_RQST
53	UPDATE_COLLECTION_RQST
54	UPDATE_FILTERS_RQST
55	READ_ENTRIES_RQST
56	LOCATE_NOTE_RQST
57	FIND_NOTEID_RQST
58	FIND_BY_KEY_RQST
59	NIFOPENNOTE_RQST
60	NIFSTAMPNOTES_RQST
61	GET_COLLECTION_DATA_RQST
62	ASYNC_NIFOPENNOTE_RQST
63	ASYNC_READ_ENTRIES_RQST
64	UPDATE_UNID_TABLE_RQST
65	SET_COLLATION_RQST
66	NIF_UPDATE_FOLDER_RQST
67	NIF_FOLDER_COUNT_RQST
68	NIF_PURGE_FOLDER_RQST
69	PURGE_COLLECTION_RQST

Table 13-4. Transaction Types (continued)

Decimal Type	Description
70	NIF_GET_IDTABLE_RQST
75	NAME_LOOKUP_RQST
76	GET_SERVER_NAMES_RQST
77	GET_SERVER_NAMES_LITE_RQST
78	NAME_GET_AB_RQST
79	NAME_LOOKUPID_RQST
80	ASYNC_NAME_LOOKUP_RQST
81	ME_LOOKUP_RQST32
101	GET_NAMED_OBJECT_ID_RQST
102	DB_READ_HIST_RQST
103	DB_WRITE_HIST_RQST
104	GET_NOTE_INFO_BY_UNID_RQST
105	POLL_DEL_SEQNUM_RQST
106	GET_MULT_NOTE_INFO_BY_UNID_RQST
107	ASYNC_CANCEL_RQST
108	ASYNC_OPEN_NOTE_RQST
109	ASYNC_READ_OBJECT_RQST
110	ASYNC_NOTIFICATION_RSP
111	SERVER_TIME_LITE_RQST
112	GET_SERVER_STATS_LITE_RQST
114	GET_REPLICA_MATCHES_RQST
115	ASYNC_URL_GET_HEADER_RQST
116	DB_LSEC_INFO_GET_RQST
117	DB_LSEC_INFO_SET_RQST
118	GET_MULT_NOTE_INFO_RQST
119	DB_QUOTA_GET_RQST
120	DB_QUOTA_SET_RQST
121	SERVER_AVAILABLE_RQST
122	SERVER_AVAILABLE_LITE_RQST
123	SERVER_FIND_REPID_RQST
124	SERVER_FIND_REPID_LITE_RQST
125	OPEN_NOTE_BY_URL_RQST
126	ASYNC_OPEN_NOTE_BY_URL_RQST
127	AUTHENTICATE_RQST
128	UPDATE_FOLDER_RQST
129	PURGE_FOLDER_RQST
130	COPY_FOLDER_RQST
131	START_FOLDER_REPL_SOURCE_RQST
132	START_FOLDER_REPL_DEST_RQST
133	GET_FOLDER_REPL_OPS_RQST
134	APPLY_FOLDER_REPL_OPS_RQST
135	END_FOLDER_REPL_SOURCE_RQST
136	END_FOLDER_REPL_DEST_RQST
137	FOLDER_GETIDTABLE_RQST

Table 13-4. Transaction Types (continued)

Decimal Type	Description
138	DB_ADMIN_FUNC_RQST
139	DB_ADMIN_SET_RQST
140	DB_ADMIN_GET_RQST
141	DB_FTSIZE_GET_RQST
142	START_SERVER_RQST
143	RUNDOWN_TRANS_RQST
144	ASYNC_RUNDOWN_RQST
145	DB_GET_PURGE_INFO_RQST
146	DB_GETSET_DEL_SEQNUM_RQST
147	DB_DIRLINK_GET_RQST
148	DB_DIRLINK_SET_RQST
149	DB_SET_TRUNC_INFO_RQST
150	SCHED_RQST
151	ASYNC_SCHED_RQST
152	COPY_OBJECT_RQST
153	ASYNC_REMOTE_CONSOLE_RQST
154	DB_STREAMMODE_SET_RQST
155	ASYNC_READ_OBJECT_BY_URL_RQST
156	GET_UNREAD_TABLE_RQST
157	SET_UNREAD_TABLE_RQST
158	RUN_SERVER_AGENT_RQST
159	GET_TCP_HOSTNAME_RQST
160	ITEM_DEF_TABLE_EXT_RQST
161	GET_DBOPTIONS_RQST
162	SET_DBOPTIONS_RQST
163	PUT_QUEUE_MSG_RQST
164	ASYNC_TRACK_MESSAGE_RQST
165	MAIL_ROUTER_PUSH_RQST
166	FOLDER_GETMODTIME_RQST
167	COPY_FDO_RQST
168	GET_FDO_SIZE_RQST
169	SET_SUPERBLOCK_FDO_RQST
170	GET_SUPERBLOCK_FDO_RQST
171	REGISTER_MONITOR_RQST
172	DEREGISTER_MONITOR_RQST
173	MONITOR_GETEVENTS_RQST
174	SV_INFO_GET_RQST
175	GET_ARCHIVE_NOTES_RQST
176	PROFILE_ENUM_RQST
177	LOCK_NOTE_RQST
178	JS_GETSCHED_RQST
179	UNDELETE_NOTES_RQST
180	NSF_FIND_DESIGNNOTE_RQST
181	NSF_DESIGNNOTE_ENUM_RQST

Table 13-4. Transaction Types (continued)

Decimal Type	Description
182	GET_DBINFOFLAGS_RQST

Record Type 109 (6D) — TCP/IP Statistics

The Transmission Control Protocol/Internet Protocol (TCP/IP) syslog daemon writes type 109 records to collect system messages.

Reference book

For more information about record type 109, see *z/OS Communications Server: IP Configuration Reference*.

Record Type 110 (6E) — CICS/ESA Statistics

CICS/ESA writes record type 110 to record transaction data collected at event monitoring points.

Reference book

For more information about record type 110, see *CICS Customization Guide*.

Record Type 115 (73) — MQSeries Statistics

MQSeries writes record type 115 to record statistics information.

Reference book

For more information about record type 115, see *IBM MQSeries for OS/390 System Management Guide*.

Record Type 116 (74) — MQSeries Statistics

MQSeries writes record type 116 to record accounting information.

Reference book

For more information about record type 116, see *IBM MQSeries for OS/390 System Management Guide*.

Record Type 118 (76) — TCP/IP Statistics

Transmission Control Protocol/Internet Protocol (TCP/IP) writes type 118 records to collect statistics about Telnet and FTP servers, API calls, and Telnet and FTP client calls.

Reference book

For more information about record type 118, see *z/OS Communications Server: IP Configuration Reference*.

Record Type 119 (77) — TCP/IP Statistics

Transmission Control Protocol/Internet Protocol (TCP/IP) writes type 119 records to collect statistics about Telnet servers and clients, FTP servers and clients, and API activity and stack usage information.

Reference book

For more information about record type 119, see *z/OS Communications Server: IP Configuration Reference*.

Record Type 120 (78) — WebSphere Application Server for z/OS Performance Statistics

WebSphere Application Server for z/OS writes record type 120 to collect WebSphere performance statistics.

Reference book

For more information about record type 120, see the WebSphere Application Server for z/OS product documentation available at this URL:

`http://www-306.ibm.com/software/webservers/appserv/was/library/`

The information center has an embedded search feature.

Appendix. Accessibility

Accessibility features help a user who has a physical disability, such as restricted mobility or limited vision, to use software products successfully. The major accessibility features in z/OS enable users to:

- Use assistive technologies such as screen readers and screen magnifier software
- Operate specific or equivalent features using only the keyboard
- Customize display attributes such as color, contrast, and font size

Using assistive technologies

Assistive technology products, such as screen readers, function with the user interfaces found in z/OS. Consult the assistive technology documentation for specific information when using such products to access z/OS interfaces.

Keyboard navigation of the user interface

Users can access z/OS user interfaces using TSO/E or ISPF. Refer to *z/OS TSO/E Primer*, *z/OS TSO/E User's Guide*, and *z/OS ISPF User's Guide Vol I* for information about accessing TSO/E and ISPF interfaces. These guides describe how to use TSO/E and ISPF, including the use of keyboard shortcuts or function keys (PF keys). Each guide includes the default settings for the PF keys and explains how to modify their functions.

z/OS information

z/OS information is accessible using screen readers with the BookServer/Library Server versions of z/OS books in the Internet library at:

`www.ibm.com/servers/eserver/zseries/zos/bkserv/`

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