GC28-1153-4
File No. S370-34

MVS/Extended Architecture System Programming Library: System Management Facilities (SMF)

Program Product

MVS/System Products:

JES3 Version 2 5665-291
JES2 Version 2 5740-XC6

IBM

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 experiences of the speakers at that GUIDE session, Mr. Brian Currah and Mr. Mario Morino. As such, they have not been submitted to any IBM test; SMF users should evaluate the applicability of these examples in their environment before implementing them.

Fifth Edition (June 1986)

This is a major revision of GC28-1153-3. See the Summary of Amendments following the Contents for a summary of the changes made to this manual. Technical changes or additions to the text and illustrations are indicated by a vertical line to the left of the change.

This edition applies to Version 2 Release 1.7 of MVS/System Product 5665-291 or 5740-XC6 and to all subsequent releases until otherwise indicated in new editions or Technical Newsletters. The previous edition still applies to Version 2 through Release 1.3 and may now be ordered using the temporary order number GT00-1938. Changes are made periodically to the information herein; before using this publication in connection with the operation of IBM systems, consult the latest *IBM System/370 Bibliography*, GC20-0001, for the editions that are applicable and current.

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Preface

The objective of this book is to help installation managers and system programmers plan for, install, and use SMF in an MVS/XA system. This book describes:

- The basic relationship of SMF to the operating system
- Possible uses of SMF data
- How to add user-written routines to the appropriate SMF exits either before or after SYSGEN
- The system areas that require additional storage for SMF and approximately how much additional storage is needed in each area
- How to execute the SMF dump program
- How to use an SMFPRMxx member of SYS1.PARMLIB to define the use of SMF
- How to write records to installation-defined or SMF-defined data sets
- How to plan and write exit routines that will monitor jobs or job steps at various points during their processing cycle
- How to test user-written routines using the TESTEXIT procedure
- How to design report programs that format and print the data from SMF records
- The information contained in each SMF record

Note: In addition to Version 2 of the MVS/System Products, this edition also includes the following program products:

OS/VS2 MVS Programmed Cryptographic Facility 5740-XY5
OS/VS2 MVS Cryptographic Unit Support 5740-XY6
OS/VS2 MVS ACF/VTAM 5735-RC2
OS/VS2 MVS Resource Measurement Facility (RMF) 5665-274
OS/VS2 Sort/Merge - Release 5 5740-SM1

Related Publications

The following manuals should be available for reference while you are reading this SRL:

MVS/Extended Architecture Resource Measurement Facility Version 3 Reference and User's Guide	LC28-1138
MVS/Extended Architecture Message Library: System Codes	GC28-1157
MVS/Extended Architecture Message Library: System Messages	GC28-1156
MVS/Extended Architecture Operations: System Commands	GC28-1206
MVS/Extended Architecture Conversion Notebook	GC28-1143
MVS/Extended Architecture JCL	GC28-1148
MVS/Extended Architecture Debugging Handbook Volume 1	LC28-1164
MVS/Extended Architecture Debugging Handbook Volume 2	LC28-1165
MVS/Extended Architecture Debugging Handbook Volume 3	LC28-1166
MVS/Extended Architecture Debugging Handbook Volume 4	LC28-1167
MVS/Extended Architecture Debugging Handbook Volume 5	LC28-1168

MVS/Extended Architecture System Programming Library: Initialization and Tuning	GC28-1149
MVS/Extended Architecture System Programming Library: JES3 Initialization and Tuning	SC23-0059
MVS/Extended Architecture System Programming Library: JES2 Initialization and Tuning	SC23-0065
MVS/Extended Architecture System Programming Library: System Modifications	GC28-1152
MVS/Extended Architecture System Programming Library: System Macros and Facilities Volume 1	GC28-1150
MVS/Extended Architecture System Programming Library: System Macros and Facilities Volume 2	GC28-1151
MVS/Extended Architecture Data Management Services	GC26-4013
MVS/Extended Architecture System Programming Library: JES3 User Modifications and Macros	SC23-0060
MVS/Extended Architecture Utilities	GC26-4018
MVS/Extended Architecture System Programming Library: 31-Bit Addressing	GC28-1158

Notational Conventions

The parameters and instructions shown in this publication use the following notational conventions:

- **Bold** type letters, words, and symbols: code them exactly as shown.
- *Italic* type letters. words, and symbols: substitute specific information.
- ~~b~~ (blank characters): code a blank.
- { } (braces): code only one of the items or use the default value. Do not code the braces.
- [ ] (brackets): code any enclosed item or items – they are optional. Do not code the brackets but specify commas if they are included with the items enclosed in the brackets.
- | (OR signs): select only one of the items separated by the OR signs.
- Underscores: if you do not code a value, the underscored one is the default.

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Figures

Summary of Amendments

Summary of Amendments for GC28-1153-4 as Updated June 1986 for MVS/System Product Version 2 Release 1.7

The changes in this major revision include:

- Updates to the exit routines IEFUII and IEFACTRT found in Chapter 4.
- The additions of record type 38 (26) – Network Performance Monitor Statistics and record type 39 – Network Logical Data Manager.
- Record type 37 – Network Problems Determination Application, record type 79 – Monitor II Activity are updated.
- Updates to figures 10-3 (IEFUJI – Job Initiation Exit and IEFUSI – Step Initiation Exit) and 10-9 (IEFACTRT – Termination Exit).

In addition, other minor technical and editorial changes have been made.

Summary of Amendments for GC28-1153-3 as Updated January 16, 1986 by Technical Newsletter GN28-1095

This Technical Newsletter, which supports MVS/System Product Version 2 Release 1.3, consists of:

- Updates to record type 21 (15) – Error Statics by Volume.
- The addition of record type 102 (66) – DATABASE 2 Performance.
- Additions to Chapter 7 "Field-to-Record-Cross-Reference"

Summary of Amendments for GC28-1153-3 as Updated January 3, 1986 by Technical Newsletter GN28-1094

This Technical Newsletter contains changes to support MVS/System Product Version 2 Release 1.3 Vector Facility Enhancement. The changes include:

- Changes to record type 22.
- Additions to record type 30, and record type 70.
- Additions to Chapter 7 "Field-to-Record Cross-Reference" and to Chapter 9 "CPU Time."

Chapter 1: Introduction

SMF (System Management Facilities) collects and records a variety of system and job-related information. SMF formats the information into a number of different 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, and TSO session.

By creating analysis and report routines, installations can use the information in SMF records in many ways. For example, the collected information is useful in producing reports for billing users, for analyzing the workload, or for profiling system resource usage.

SMF runs in its own address space (SMF). Because the SMF address space contains the SMF control blocks and buffers, an installation can restart SMF. If SMF fails, an installation does not have to re-IPL to regain SMF recording capabilities. The SET command can be used to restart SMF. An IPL might be necessary to restart SMF if the system management facilities control area (SMCA) has been destroyed.

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

Because SMF data-collection routines and exit routines are independent of each other, they can be used in combination or separately. For example, by analyzing the information SMF data-collection routines obtain, an installation can set a time limit for all jobs running on the system. Any job exceeding this limit is automatically terminated. However, if an installation would like certain jobs to exceed the time limit, a routine can be added at the SMF time limit exit, IEFUTL. This exit routine could then extend the time limit for selected jobs.

SMF Overview

Figure 1-1 and its associated paragraphs provide an overview of SMF. The use of SMF will vary from installation to installation according to: (1) the SMF parameters selected, (2) the exit routines added, and (3) the analysis/report routines used to summarize the collected data.

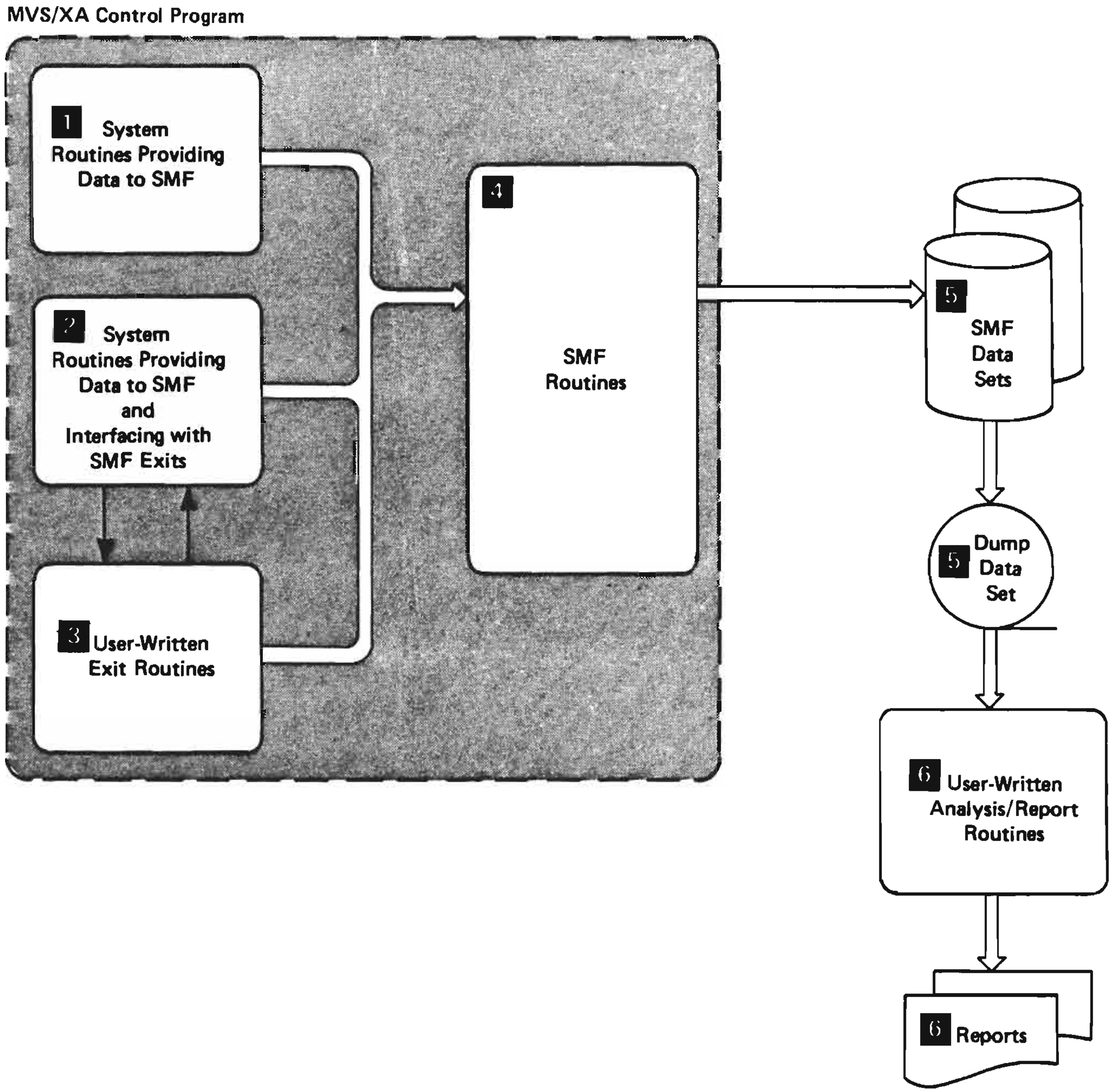


Figure 1-1. SMF Overview

1 Most system components contain routines that provide data to SMF. Some system routines (such as timer supervisor routines) collect a single data item and accumulante the value of the item in an SMF control block. Other routines build a record of various data items and use SVC 83 to eventually transfer the record to the SMF data set.

For information on: (1) the system routines that interface with SMF to write records, (2) the specific events that cause SMF to write records, and (3) the contents of each record, see the chapter "SMF Records". To locate a specific system or job-related data item, use Chapter 7, the "Field-to-Record Cross-Reference", which alphabetically lists all the data items (or 'fields') in the SMF records.

2 In addition to collecting data for SMF, some system routines interface with the SMF exits. These system routines pass control to the SMF exits at several points during job and job step processing. They also pass control to the SMF exits when specific events occur, such as when the output limit of a data set is exceeded. For a description of the interface between these system routines and the SMF exits, see the chapter "User-Written Exit Routines".

3 An installation can include routines for any or all of the SMF exits. These user-written routines could:

- Enforce installation standards for resource requests, accounting fields, and naming conventions
- Supply defaults for missing or incorrect parameters to avoid unnecessary job termination
- Collect installation-dependent job information and write it to the SMF data set for further analysis

Several programming facilities are available for user-written exit routines. These facilities, such as the common exit parameter area and the SMFWTM macro instruction for writing to the SMF data sets, are common to most exit routines. The chapter "User-Written Exit Routines" describes the programming facilities that SMF provides. That chapter also lists programming restrictions that apply to the exit routines, mentions several sample routines, and shows a procedure for testing the exit routines. For information on adding the user-written routines to the control program, see "Including User-Written Exit Routines in the Operating System" in the chapter "System Requirements and Considerations".

4 SMF routines:

- Collect and format data from job, system, and SMF control blocks
- Build SMF data management records such as the SMF dump header and trailer records
- Transfer records from the SMF buffer to the SMF data sets
- Issue messages to the operator indicating the successful or unsuccessful completion of specific SMF-related events

The chapter "System Requirements and Considerations" lists the SMF storage requirements and several SMF performance considerations.

An installation can vary the amount of information SMF routines collect and record by using several SMF parameters. The chapter "Defining the Use of SMF" describes the formats, uses, and default values of these parameters.

5 There are many SMF data sets; each data set must be named SYS1.MANn, where n can be A through Z or 0 through 9. These data sets are filled alternately: while the SMF writer records on one data set, the others can be written out (or cleared). As long as one inactive data set is empty when the active data set becomes full, the SMF writer continues to record.

At system initialization time, the first data set specified in the DSNAME parameter of the SMFPRMxx parmlib member is used as the active recording data set unless it is full. SMF checks each data set in the order it is listed until it finds one that is not full. SMF then uses this data set and requests that the operator dump all data sets that are not empty.

At SET SMF time, recording continues on the active data set unless the active data set was omitted from the new options. In that case, a switch is made to the first empty data set. For more information on the SET SMF command, see "Using the SET Command".

For additional information on allocating, dumping, and switching the data sets, see the chapter "System Requirements and Considerations".

6 User-written analysis and report routines process the information recorded by SMF. Analysis routines could 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. For a description of sort/merge routines and a sample report program, see the chapter "User-Written Report Programs." For examples and suggestions on creating reports from SMF data, see the following section, "Uses of SMF Data".

Uses of SMF Data

The volume and variety of information in the SMF records enables installations to produce many types of analyses and summarizations. 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 the amount of system resources that are wasted because of poor operational procedures or programming conventions.

The following examples illustrate the types of reports that can be created from SMF data. The examples should be viewed primarily as suggestions to assist you in beginning SMF analyses and reports in the areas of:

- Billing users
- Reporting reliability
- Analyzing the configuration
- Scheduling jobs
- Summarizing direct access volume activity
- Evaluating data set activity
- Profiling system resource utilization

For example the Service Level Reporter (5668-966) can be used to report on reliability, scheduling jobs, and profile system resource utilization.

Billing Users

SMF reports a great deal of 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 billing 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 (listed in Chapter 7) 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 examples that follow illustrate how different installations might implement this procedure.

Example 1. An installation whose primary goal is to recover its total cost (personnel, equipment, supplies, etc.) might set the following billing objectives:

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

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 "step CPU time under TCBs", "number of cards read/punched", or "number of lines/pages printed".

Example 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 fullfill these objectives, such an installation might take the following steps in creating 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.

Example 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 only pay 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.

Example 4. An installation where the use of TSO is heavy might set these specific objectives:

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

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

Note: To use transaction billing for TSO commands, you must have installed MVS TSO Extensions (5665-285).

Degradation Billing

Installations can use degradation billing to enforce standards that were created to balance system resource usage. Degradation billing allows a user to process his job even though he has violated a specified resource-usage standard. However, because of the standard violation, the installation will charge the user an additional "punitive" cost for his 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. Hence, for each of the first six tape units allocated, the installation will charge a base cost; however, for each unit allocated over the allowed six, it might charge a progressively increasing cost.

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 (illustrated in Figure 1-2):

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

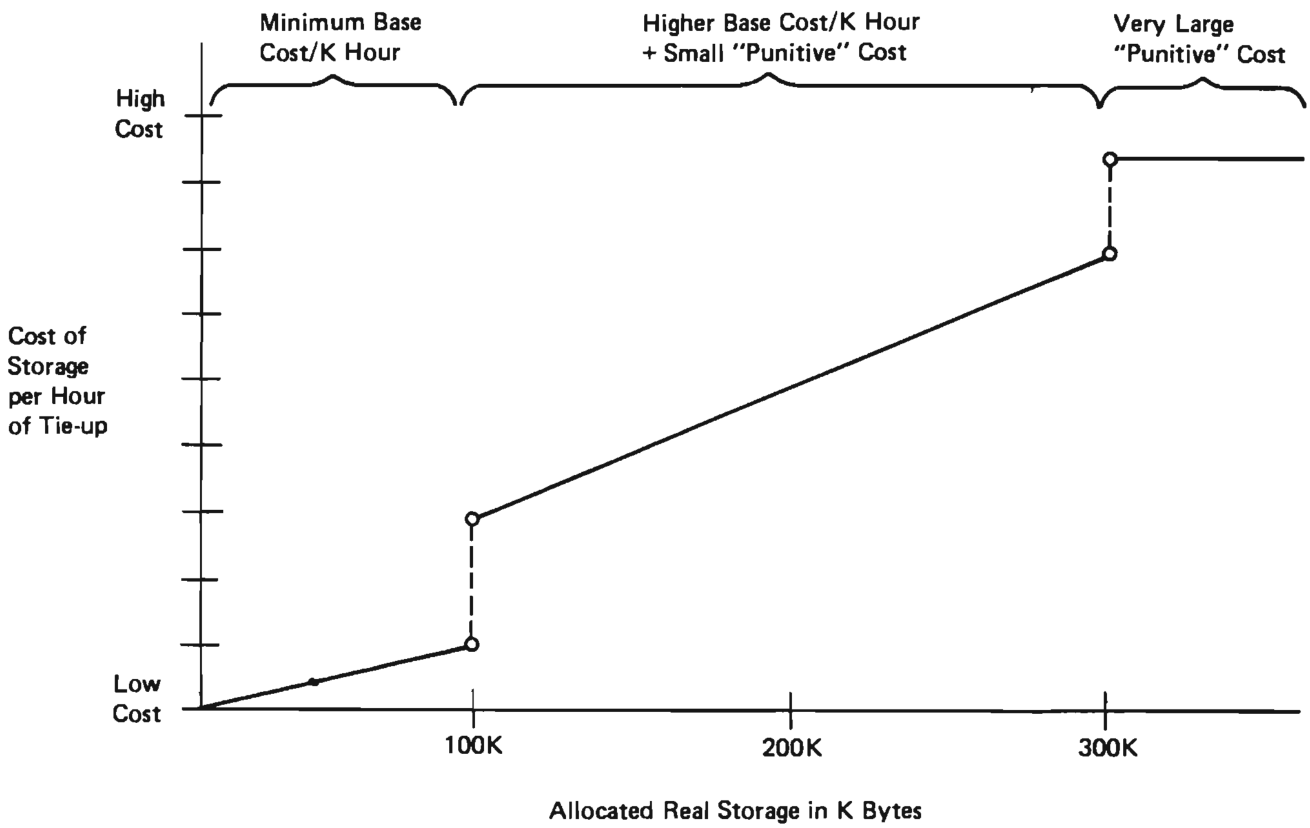


Figure 1-2. Sample Degradation Billing for ADDRSPC=REAL Storage

Efficiency Billing

Efficiency billing is very similar to degradation billing in that it encourages 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

Note: To use transaction billing for TSO commands, you must have installed MVS TSO Extensions for MVS/XA (5665-293).

Transaction billing charges for work in units that are meaningful to the user. Transaction units can include executions of a particular program, online invocations of a defined function, or records read or printed by a standard application. Also, bills based on transaction units show a clear relationship between the service requested and the payment due, a relationship that, for TSO 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 enables the users, who see the correlation between what they do and what they pay, to develop cost-effective operating standards. If transaction prices incorporate the average cost of resources consumed, the users can evaluate alternatives and make rational decisions in the framework of their own operations.

Example 4 suggests billing for the use of some TSO commands. To be suitable as a billing unit, a transaction should involve processing costs that are consistent enough over a period of time to be meaningfully averaged. The transactional billing data collected for TSO is the number of each TSO command issued. A TSO command does not relate to the system resources manager (SRM) definition of a TSO transaction as described in *Initialization and Tuning*. The following steps can be used to develop a method of transaction billing, as described in example 4.

1. Determine the TSO costs to be recovered. To determine the TSO cost, summarize the total installation cost and then allocate part of it to TSO. You can obtain a gross allocation ratio from the data in type 30 records by comparing the resource consumption for TSO with the overall resource consumption.
2. For each type of TSO 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 type 32 records with the DETAIL option. For further discrimination, all calculations could be further broken down by 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 type 32 records, so that the use predicted in step 3 recovers the TSO costs from step one. That is, the resources used multiplied by the rates set for the resources should equal the cost to be recovered.
5. Set prices for each type of TSO 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, count the commands being issued by type and user-id from the data in the type 32 record. 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 the prices must be recalculated. (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 examples that follow 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 prior to shutdown of the system, an installation can establish the following 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
- Reason 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 times, 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 code for each job and job step that abends. By tracking those codes issued as a result of 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 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 is set if the system fails while a VTOC is being updated. 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 – The SMF type 21 records provide 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 describing changes in the system configuration:

- At IPL for online devices and MSS units (types 0, 8, 19, and 22)
- When a device is added to the configuration (type 9)
- When a device is removed from the configuration (type 11)
- When a CPU, channel path, storage, or MSS 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 8 for a detailed explanation of EXCP counts and the SMF record types that record them.) 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 Usage – 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 device activity records (type 74), an installation can identify periods of the day when the percentage of problem-program device usage was exceptionally high or low. Further evaluation might also show the cause of concurrent device usage. If, for example, no more than 12 of the available 16 tape drives are ever in use at the same time, any of the following situations might be responsible:

- Job classes are conflicting.
- Too few initiators are started.

Scheduling Jobs

Through the use of SMF 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 session, and started task. Using these times, an installation can determine the jobs that are executing 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 userid), as well as 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 also use SMF to determine the time of day when the largest number of production jobs were going through the system. By then 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
- Performance group number

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 also use this information to determine whether its service goals are being met for specific combinations of job class, priority, performance group, and JES3 deadline type.

Summarizing Direct Access Volume Activity

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

Allocated But Unused Direct Access Storage – Many times users make allocation requests for direct access storage that are far in excess of the actual requirement. This misuse can be a significant drain on the direct access resource pool. In order to determine the number of tracks that were allocated for sequential data sets but were 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. By summarizing these records by volume, an installation can obtain 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 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 DSCBs. 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 (such as types 4, 14, 15, 17, 18, and 34). These SMF records can assist an installation in answering questions such as:

- 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 is permanent ? What percentage is temporary ?
- What percentage of all temporary data sets does VIO control ?
- Which data sets do problem programs use most frequently ?
- How often do problem programs reuse permenent data sets ?
- What is the average blocksize, 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 the 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 as well as fragment the space on direct access volumes. Thus, an installation detecting a significant amount of secondary allocation activity might want to consider using VIO.

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)
- Defines an Integrated Catalog Facility (ICF) catalog entry (type 61)
- Deletes an Integrated Catalog Facility (ICF) catalog entry (type 65)
- Alters or renames an Integrated Catalog Facility catalog entry (type 66)
- Defines or alters a VSAM catalog entry (type 63)
- Deletes a VSAM catalog entry (type 67)
- Renames a VSAM catalog entry (type 68)

By sorting these records by job name or userid, 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. An installation can determine how many of these SMF record types were written for a given data set. The number of type 14 and 15 records can then be used to represent the number of times that the data set was closed or processed by EOV. (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 "blocksize" 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 2314 device. An installation discovering such a data set through SMF might increase its blocksize to 1680 (21 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 Usage

All 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 session's use of system resources such as:

- CPU time
- Storage
- Paging facilities
- I/O devices
- Service units
- Programming languages

CPU Time Usage – SMF accumulates the job/step CPU time in two separate fields of each job/step termination record: execution time under TCBs and execution time under SRBs. (See Chapter 9 for 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 might identify programs that have excessive interrupt processing.

In addition to CPU time, SMF reports many different times relating to job, job step, and TSO session processing. For example, SMF records the following time statistics:

- Job/step/TSO session start and stop times
- Job/step/TSO session elapsed (turnaround) time
- Device allocation start time
- Problem program start time
- Initiator selection time
- TSO logon enqueue time
- Reader start and stop times
- Converter start and stop times
- Execution processor start and stop times
- Output processor start and stop times

By examining these SMF-recorded 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 also want to use these time fields to determine which jobs are running on the system at the same time or what the average turnaround time is for all TSO sessions.

Storage Usage and Paging Activity – The SMF paging activity record (type 71) contains information about the demands made on the system paging facilities and the use of real and auxiliary storage. This record is written for specified measurement intervals and includes information such as the number of:

- Non-VIO page-ins and page-outs
- Non-VIO page reclaims
- Swap-ins and swap-outs
- Address space swap sequences
- VIO page-ins and page-outs
- VIO page reclaims

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 then plotting several paging rates over a long period of time, an installation can develop a correlation between its workload and real storage capacity.

SMF also reports the following information on storage usage and paging activity for each job step and TSO 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, 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 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 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 is given 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 *Initialization and Tuning* for more information on service, transaction active time, and performance group numbers.)

Programming Language Usage – The 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 (using the ACCT= parameter on the EXEC statement) and evaluating the SMF step termination records (which report those names), an installation can also produce reports for each step in a cataloged procedure.

Chapter 2: System Requirements and Considerations

To record SMF data, an installation must define how it will use SMF (see the chapter "Defining the Use of SMF"), add user-written exit routines to the control program, allocate direct access space for the SMF data sets, and catalog the SMF data sets. This chapter describes these requirements as well as SMF storage requirements and performance considerations.

Including User-Written Exit Routines In The Operating System

User-written exit routines are optional – SMF automatically provides dummy routines for all unused SMF exits. To include user-written exit routines in the operating system, you can add them to the appropriate distribution libraries before SYSGEN, or link-edit them into their load modules in SYS1.LPALIB after SYSGEN. When link-edited after SYSGEN, the modules are not available for use until the next IPL with the CLPA option.

Figure 2-1 shows the distribution libraries to use to add exit routines prior to SYSGEN. It also shows the load module assignments to use to add exit routines after SYSGEN. When adding exit routines after SYSGEN, refer to your SYSGEN listing for exact load module names, aliases, link-edit control statements, and link-edit parameters. Specify link-edit parameters according to the characteristics of the user-written exit routines.

Exit Routine	Descriptive Name	Distribution Library for Adding User-Written Exit Routine before SYSGEN[1]	Load Module Assignment for Adding User-Written Exit Routine to SYS1.LPALIB after SYSGEN
IEFUJV	Job Validation	SYS1.AOSB3	IEFUJV
IEFUJI	Job Initiation	SYS1.AOSB3	IEFUJI
IEFUSI	Step Initiation	SYS1.AOSB3	IEFUSI
IEFUTL	Time Limit	SYS1.AOSB3	IEFUTL
IEFUSO	SYSOUT Limit	SYS1.ALPALIB	IEFUSO
IEFU83	SVC Entry SMF Record	SYS1.AOS00	IEFU83
IEFU84	Branch Entry SMF Record	SYS1.AOS00	IEFU84
IEFACTRT	Termination	SYS1.AOSB3	IEFACTRT
IEFUJP	Job Purge	SYS1.ALPALIB	IEFUJP
IEFU29	SMF Dump	SYS1.AOS00	IEFU29

[1]User-written exit routines to be added before SYSGEN must be in load module format.

Figure 2-1. Including User-Written Exit Routines in the Operating System

Figure 2-2 shows sample JCL for adding user-written exit routines to SYS1.LPALIB after SYSGEN. Note that when user-written exit routines become part of SYS1.LPALIB they do not become active until the next IPL of the system that includes the CLPA option.

Note: Refer to your SYSGEN listing for exact load module names, aliases, link-edit control statements, and link-edit parameters. Specify link-edit parameters according to the characteristics of the user-written exit routines.

```
//LINKEXIT   JOB    MSGLEVEL=1
//STEP1      EXEC   PGM=IEWL,PARM='link-edit parameters'
//SYSPRINT   DD     SYSOUT=A
//SYSLMOD    DD     DISP=(OLD,KEEP),DSN=SYS1.LPALIB
//SYSUT1     DD     UNIT=SYSDA,DISP=(,DELETE),
                    SPACE=(TRK,(20,5))
//SYSLIN     DD     *
(IEFUJV object deck)
  ENTRY      IEFUJV
  NAME       IEFUJV(R)
(IEFACTRT object deck)
  INCLUDE    SYSLMOD(IEFACTRT)
  ENTRY      IEFACTRT
  NAME       IEFACTRT(R)
(IEFUJI object deck)
  ENTRY      IEFUJI
  NAME       IEFUJI(R)
(IEFUSI object deck)
  ENTRY      IEFUSI
  NAME       IEFUSI(R)
(IEFUTL object deck)
  ENTRY      IEFUTL
  NAME       IEFUTL(R)
(IEFU84 object deck)
  ENTRY      IEFU84
  NAME       IEFU84(R)
(IEFUSO object deck)
  ENTRY      IEFUSO
  NAME       IEFUSO(R)
(IEFU83 object deck)
  ENTRY      IEFU83
  NAME       IEFU83(R)
(IEFUJP object deck)
  ENTRY      IEFUJP
  NAME       IEFUJP(R)
/*
```

Figure 2-2. Sample JCL for Adding User-Written Exit Routines to SYS1.LPALIB after SYSGEN

SMF Buffers

Each buffer consists of 4096 bytes plus 24 additional bytes of buffer control information that is not written to the data set. The number of buffers available is limited only by the amount of virtual storage in the SMF address space below 16 megabytes. At initialization, SMF obtains 10 permanent and 100 temporary buffers. SMF obtains and releases more buffers as SMF activity increases and decreases in order to keep real storage use to a minimum.

SMF Data Sets

You can allocate space for up to 36 SMF data sets. These data sets should be password or RACF protected. The space must be allocated using the DEFINE access methods services utility or at system generation time using the DATASET macro instruction.

The primary data set is the data set normally used for SMF recording; the secondary data sets are used when the primary one is full. The SMF data set selection algorithms expect the primary data set to be allocated on a high performance device and the secondary data sets to be allocated where space is available. Primary and secondary data sets are designated using the DSNAME parameter in SMFPRMxx, where the first data set specified is the primary and all others are secondary. Each data set must be a VSAM data set that resides on a single volume and is cataloged and not extendable; do not specify secondary allocations for RECORDS, TRACKS, or CYLINDERS.

SMF data sets allocated with the DEFINE utility require the following options:

- Reuse (RUS) indicates that the data set can be cleared by the dump program.
- Control interval size (CISZ) indicates the size of the SMF buffer. (This value must be 4096).
- Record size (RECSZ) indicates the average and maximum logical record size. (This value must be 4086,32767).
- Share options (SHR) indicates that sharing occurs with reading and serialization occurs with writing. (This value must be 2).
- Non-indexed (NIXD) indicates that the entries are entry sequenced.
- Spanned (SPND) indicates that the records can span control intervals.
- Speed (SPEED) indicates that the dataset will not be preformatted by VSAM while IFASMFDP is preformatting.

For more information on the DEFINE utility see *Access Method Services*. Several factors, such as specific system configuration, amount of SMF data to be written, and report program requirements, will determine which device type is most efficient for a particular installation.

Note: If DB2 Performance, Serviceability, or Audit Data is sent to SMF, CIS2 (4096) and BUFSP (81920) must be specified for each SMF VSAM Dataset on MVS/XA.

Figure 2-3 illustrates 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 the VSAM data space already exists and that an IPL with the NOACTIVE SMF parameter was performed. Each SMF data set must be created according to this example before the first IPL that starts SMF recording. The second step in this example preformats the data set. If the preformatting is not done during the definition process, SMF initialization preformats the data set. In either case, SMF preformats the data set with dummy records. To avoid increasing the time required to IPL the system, it is recommended that the installation use the SMF dump program, IFASMFDP, to preformat the data sets. When the SMF dump program dumps the data set at a later time, it does not read to the physical end of file on a partially full data set. SMF recognizes the first dummy record and terminates processing.

```
//CREATE JOB
//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(4096)      +
                   SHAREOPTIONS(2))
/*
//FORMAT EXEC PGM=IFASMFDP
//SYSPRINT DD SYSOUT=A
//NEWDS DD DSN=SYS1.MANX,DISP=SHR
//SYSIN DD *
  INDD(NEWDS,OPTIONS(CLEAR))
/*
```

Figure 2-3. Sample DD Statements for Allocating and Cataloging the SMF Data Sets

When an SMF data set is defined at system generation time using the DATASET macro instruction, space is allocated and the data set is catalogued. However, the data set is not preformatted.

For more information on using the DATASET macro instruction, see *System Generation Reference.*

Regardless of how the data sets are allocated, the amount of DASD space required for the SMF data sets 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, it may be necessary to select a trial size for the data sets and adjust it as necessary.

For example, you might start with two SMF data sets, each allocating 25 cylinders of space on a 3330. If the data sets fill up too quickly and data is lost, you can allocate more space for each data set, or allocate additional data sets. If DASD space is severely limited in your installation, you might have to dump the data sets more frequently.

Dumping The SMF Data Sets

When the current recording data set cannot accomodate 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 SMF dump exit, IEFU29. The operator is then informed that the data set needs to be dumped. (For information on the IEFU29 exit, see the chapter "User-Written Exit Routines".) The operator should use the SMF dump program, IFASMFDP, to transfer a full SMF data set to another data set, and to reset the status of the dumped data set to empty so that it can be used again for recording data. For those installations choosing 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, thereby improving data set processing performance.

Note that programs that access the output of the SMF dump program are required to specify the correct 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 RDW. The LRECL value can be larger than the BLKSIZE value because the records can be segmented.

The SMF dump program IFASMFDP, allows multiple, VSAM or QSAM data sets to be dumped to one or more sequential data sets on either tape or direct access devices. Also, IFASMFDP allows the installation to route different records to separate files and produce a summary activity report. This report is described later in "The Summary Activity Report."

The installation can also specify three 24-bit addressable user exit routines to be given control during the dump processing. These exit routines allow the user to 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 2-4). 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 IFASMFDP
word 2 – register 1 on entry to IFASMFDP
word 3 – reserved for user. This word is initialized to zero before the first user exit is invoked.

The contents of the second and third words depends on the user exit being invoked. The user exits are described in "The SMF Dump Options."

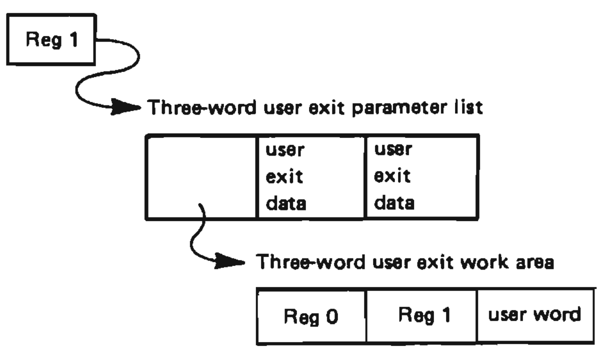


Figure 2-4. IFASMFDP Input Parameter Structure

The SMF dump program copies the input data sets to the output data sets. During the copy process, the dump program creates two SMF records and writes them to each 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.

The SMF dump program also writes messages, as required, to SYSOUT:

- The operator must not clear a data set that is being filled. If the operator attempts to clear the active SMF data set, IFASMFDP returns a code of X'08' in register 15. The operator can, however, dump the active or alternate data set without clearing it.
- If IFASMFDP 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, the number of lost records is tracked in SMF record type 7 and the operator receives a message stating that data is being lost.

Switching The SMF Data Sets

To prepare an SMF data set for dumping *before* it becomes full the operator can use the HALT EOD and SWITCH SMF commands. (These operator commands are fully described in *System Commands*).

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.

Note: When switching the SMF data sets, an inactive data set cannot become active unless it is empty. Therefore, the operator should use the DISPLAY SMF command to verify that there is at least one alternate data set before issuing the HALT or SWITCH command.

Performance Considerations

SMF will reduce system throughput by various amounts depending upon factors such as:

- SMF options selected through the SMFPRMxx parameters. (For a description of these parameters, see the chapter "Defining the Use of SMF".)
- SMF data set size, device type, and dumping requirements.
- Execution time of user-written exit routines.

- System configuration, especially the type and degree of multiprogramming.
- Processing characteristics, such as the number of jobs (the number of records generated by SMF depends on the number of jobs), the contention for SMF resources, and user data set requirements.
- Specific record type chosen to be recorded.

Note that record types can be suppressed, as described under "Defining the Use of SMF".

Defining the Use of the SMF Dump Program

This section describes the SMF dump program, IFASMFDP. Included in this section are:

- The SMF dump options
- Executing the SMF dump program
- The summary activity report

The SMF Dump Options

The IFASMFDP parameters control the processing of the dump program. The parameters are:

Parameter	Meaning and Use
INDD(ddname,OPTIONS(data))	Describes the input data set, where ddname is the 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 "Summary Activity Report."
OUTDD(ddname,{TYPE | NOTYPE}(list))	Describes the output data set, where ddname is the 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 records except those specified in list are to be included in the data set. List can be any record or combination of records; the records can be specified individually or as a range. For example, TYPE(2,4:7,9,11) indicates that records 2, 4, 5, 6, 7, 9, and 11 are to be included in the data set. If OUTDD is not specified the default is: OUTDD(DUMPOUT,TYPE(000:255)) 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 or CLEAR, the job is terminated.
DATE(yyddd,yyddd)	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 and ddd is the Julian date. The value for ddd can not exceed 366. If only one date is requested, the start and end dates are the same. If two dates are specified, only those records written on or between the two dates are written. If DATE is not specified the default is: DATE(00000,99366)
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)
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)

Parameter	Meaning and Use
SID(cccc)	Specifies that only records written by the operating system with the specified system identifier can be written to the output data set, where cccc is the system identifier. SID can be specified for each system the dump program is expected to handle. If SID is not specified, records pertaining to any operating system are written.
USER1(name)	Specifies the name of a user-written exit 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 user exit routine must set a return code in register 15 before passing control back to the dump program. The return codes are as follows: *Code* *Meaning* 00 Indicates that normal processing should continue. 04 Indicates that the record should not be written to the output data set. Any other return code indicates that a problem was encountered and that the dump program is not to invoke the exit again.
USER2(name)	Specifies the name of the user-written exit routine that is given control only when the 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 dump program before any records are read. The return codes are the same as those for USER1.
USER3(name)	Specifies the name of the user-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 user exit routine must set a return code in register 15 before passing control back to the dump program. The return codes for USER3 are as follows: 0 indicates that normal processing should continue. Any non-zero return code indicates that a problem was encountered and that the dump program is not to invoke the exit again.

Notes:

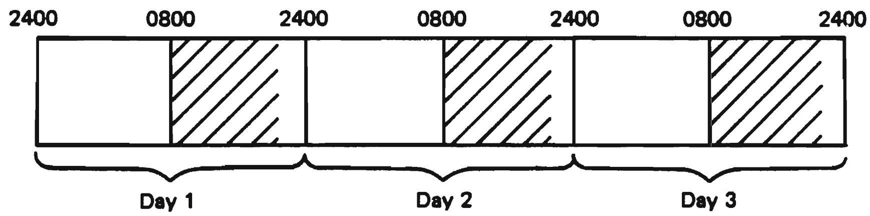
1. If a syntax error occurs in the processing of a parameter, the parameter is not processed and a message is printed in the SYSPRINT data set. If a parameter is not specified, the default is used. The valid dump parameters specified or used by default are listed in the SYSPRINT data set on completion of the dump program.

2. The name field in USER1, USER2, or USER3 specifies the name of a load module which IFASMFDP LOADs and CALLs at the indicated times. Each exit should be link edited into an APF-authorized library but the exit should not be link edited with the AC=1 attribute.

3. 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)

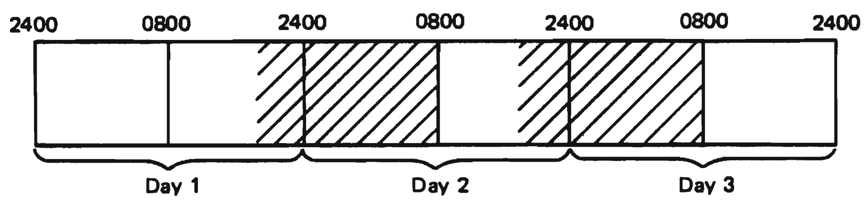
   SMF selects records during the period indicated by the shaded area:



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 the records produced between 0800 hours and 2000 hours in any day are not selected.

4. User records must include a standard record header; the IFASMFDP program might not dump or flag in error a record that does not have a standard header.

Executing the SMF Dump Program

Figure 2-5 shows sample JCL for executing the SMF dump program (IFASMFDP). 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. Note that it is not necessary to specify the DCB=keyword. The dump program assigns the following DCB attributes:

- BLKSIZE=4096
- LRECL=32767
- RECFM=VBS

```
//DUMPX      JOB   MSGLEVEL=1
//STEP1      EXEC  PGM=IFASMFDP
//DUMPIN     DD    DSN=SYS1.MAN {A-Z} ,DISP=SHR
                                {0-9}
//DUMPOUT    DD    DSN=SMFDATA,UNIT=tapeaddr,
//                 DISP=(NEW,KEEP),LABEL=(,SL),VOL=SER=serial
//SYSPRINT   DD    SYSOUT=A
```

Figure 2-5. Sample JCL for Executing the SMF Dump Program

Figure 2-6 illustrates a sample job using the IFASMFDP to dump and clear an SMF data set (INDD1) and to combine its records with those in an old dumped file (INDD2) to two online data sets.

There can be any number of input (INDD) or output (OUTDD) files in the dump program. The input files are dumped in reverse order unless concatenated under one input file. For example, in Figure 2-6, two input files are specified. After the dump program is executed, the output file contains the records from INDD2 first, followed by the records from INDD1.

```
//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
//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))
        DATE(82002,82366)
        SID(308A)
        SID(308B)
/*
```

Figure 2-6. Sample Job for Dumping SMF Data Sets

After the IFASMFDP job shown in Figure 2-6 executes, 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(82002,82366) – 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 executing the SMF dump program is to enter jobs that specify the 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 2-7 illustrates two sample procedures (DUMPX and DUMPY) for dumping the SMF data sets to a standard-labeled tape (VOL=SER=SMFTAP) by means of the operator START command. In both procedures, the default tape specified on the PROC statement is 192. Figure 2-7 also illustrates 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=SYS1.MANX,DISP=SHR
//DUMPOUT   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 2-7. Sample Procedures for Dumping the SMF Data Sets

The CLEAR function of IFASMFDP requires APF-authorization. Executing the dump program as shown in the above JCL examples preserves the APF-authorization assigned to the program when link-edited by SYSGEN. Invoking IFASMFDP in any way other than as shown above (for example, invoking IFASMFDP from another program or invoking it as a TSO 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 *System Macros and Facilities*. For more information on executing authorized programs under TSO, see *TSO*.

The IFASMFDP dump utility also issues return codes. They are as follows:

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

The Summary Activity Report

The 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.

Figure 2-8 shows an example of the summary activity report the 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 and 3 and those greater than 127.
- END DATE-TIME indicates the date and time of the latest record read, excluding record types 2 and 3, and those greater than 127.
- RECORD TYPE indicates the identifying number of each record type read by the 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 the 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 for each record type.
- TOTAL indicates the total activity for each column.
- NUMBER OF RECORDS IN ERROR indicates the number of spanned records (a record that is larger than the 4K SMF buffer size) that were found in error. This can occur when a physical I/O error occurs on a recording data set, while a record longer than 4K is being written. RMF record types 74, 76, and 79 or SMF record type 30 can be longer than 4K.

SUMMARY ACTIVITY REPORT

START DATE-TIME 06/07/82 – 04:17:40 END DATE-TIME 06/07/85 – 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
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	26	.01 %	74.53	73	75	26
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	916	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	3.91 %	95.00	95	95	7,689
248	790	.40 %	86.00	86	86	790
249	108	.05 %	86.00	86	86	108
TOTAL	196,825	100 %	159.00	24	8,128	196,827

NUMBER OF RECORDS IN ERROR 0

Figure 2-8. Summary Activity Report Example

Chapter 3: Defining The Use Of SMF

An installation can define how it will use SMF through selecting SMF parameters. The parameters can be placed in a SYS1.PARMLIB member SMFPRMxx, or the installation can use the IBM-supplied values in SMFPRM00 or the SMF defaults. You can specify SMFPRMxx parameters:

- Before the first IPL of a newly generated system by adding SMFPRMxx as a member of SYS1.PARMLIB.
- At each initialization of SMF by entering the parameters at the console if PROMPT (LIST or ALL) is specified in the active SMF parmlib member.
- During execution of SMF by using the SET SMF operator command to specify a new SMFPRMxx member.
- During execution of SMF by using the SETSMF operator command to replace individual parameters in the SMFPRMxx member.

SMFPRMxx Parameters

The possible SMFPRMxx parameters are described in Figure 3-1.

Note: If you specify the same keyword more than once, SMF uses the first valid specification read from the parmlib member, or the last one specified in an operator reply.

Parameter	Meaning and Use	Value Range	Default Value
ACTIVE NOACTIVE	Specifies whether or not SMF recording is to be active.	N/A	ACTIVE
DSNAME (data set)	Specifies a list of up to 36 VSAM data sets that are to be used for SMF recording. Each data set must be named SYS1.MANn, where n can be any alphameric character. The first data set specified is the primary SMF recording data set. All other specified data sets are secondary data sets.	See explanation	DSNAME (SYS1.MANX, SYS1.MANY)
LISTDSN NOLISTDSN	Specifies whether the system is to generate SMF data set status messages to the operator at IPL or SET SMF time. The messages contain the following information for each data set used for recording: ● data set name ● data set status — active — alternate — dump required ● data set size (in number of 4096-byte blocks) ● percentage full	N/A	LISTDSN
SID {(xxxx) (xxxx,ser# [,ser#])}	Specifies the system identifier to be used in all SMF records, where xxxx can be any four alphameric and/or special characters. If you want to use one SMFPRMxx parmlib member for your entire installation, specify a SID parameter for each system and use the serial number subparameter on each SID parameter. SMF selects the SID with the serial number(s) that match the processor serial number(s) at IPL. The xxxx value associated with the serial number(s) will be the system identifier placed in each SMF record. For example, if SID(SYSA,006204) and SID(SYSB,006204,206204) are specified in the same parmlib member, and processor 006204 was IPLed as a uniprocessor, SID(SYSA,006204) applies. If the processor was IPLed as a multiprocessor, SID(SYSB,006204,206204) applies. **Notes:** 1. The SID parameter cannot be changed by a SET SMF or a SETSMF command. 2. Note that it is possible for an installation to have more than one processor (such as a 3081 and a 3083) with the same serial number. In such cases, use a separate SMFPRMxx parmlib member for each processor. Otherwise, SMF will select the system identifier that contains the first occurrence of the matching serial number, regardless of the value specified for xxxx.	See explanation	SID (3081) The SID assigned is the four-digit processor model number taken from the PCCA control block.
REC({ALL PERM})	Specifies whether information for record type 17 (scratch data set status) is to be collected for temporary data sets. PERM specifies that record type 17 is to be written only for non-temporary data sets. ALL specifies that record type 17 is to be written for both temporary and non-temporary data sets.	N/A	REC (PERM)

Figure 3-1. SMFPRMxx Parameters (Part 1 of 4)

Parameter	Meaning and Use	Value Range	Default Value
MAXDORM (mmss) NOMAXDORM	Specifies the amount of real time that SMF allows data to remain in an SMF buffer before it is written to a recording data set, where mm is real time in minutes and ss is seconds. NOMAXDORM specifies that the data remains in the buffer until the buffer is full.	0001-5959	MAXDORM (3000) 30 minutes
STATUS (hhmmss) NOSTATUS	Specifies the amount of real time between creations of record type 23 (SMF statistics) where hh is the hours, mm is the minutes, and ss is the seconds.	000001- 240000	STATUS (010000) 1 hour
JWT (hhmm)	Specifies the maximum amount of time that a job is allowed to wait continuously, where hh is the amount of real time in hours and mm is in minutes. When the specified time limit has expired, the time limit exit, IEFUTL is entered (if active). **Note:** If TIME=1440 is coded on the JOB or EXEC JCL statement, IEFUTL is not invoked for that job.	0001-2400	JWT (0010) 10 minutes
PROMPT (option) NOPROMPT	Specifies whether the selected SMF parameters are to be displayed on the system console at IPL time. The operator can be prompted for a reason for the IPL or to modify the parmlib parameters. The options are as follows: • IPLR specifies that the operator is to supply a reason for the IPL. • LIST specifies that the operator can modify the SMF parameters. • ALL specifies that the operator is prompted for the IPL reason and can modify the SMF parameters. NOPROMPT specifies that the parameters are not listed and the operator is not prompted unless there is a syntax error in the parmlib member. NOPROMPT is the default if PROMPT is specified without an option. PROMPT(ALL) is the default if no keyword is specified.	N/A	PROMPT (ALL)
SYS (options)	Specifies the global recording options for the entire system. The options include the records to be collected, the real time intervals between recording, and the valid SMF exits. If the same option is specified more than once, the first valid specification read from the parmlib or the last one specified in a operator reply, is used. The options are as follows: TYPE / NOTYPE ({ aa,bb / aa,bb:zz / aa,bb, . . . }) TYPE specifies the record types to be collected by SMF, where aa, bb, and zz are the decimal notations for each record. A colon is used as a delimiter to indicate that all records from bb up to and including zz are to be recorded.	See each option 0-255	See each option TYPE (0:255)

Figure 3-1. SMFPRMxx Parameters (Part 2 of 4)

Parameters	Meaning and Use	Value Range	Default Value
SYS (options) (continued)	NOTYPE specifies that all records except those specified are to be written by SMF, where aa, bb, and zz are the decimal notations for each record. A colon is used as a delimiter to indicate that all records from bb up to and including zz are not recorded.		
	NOINTERVAL INTERVAL (hhmmss)	000001-240000	NOINTERVAL
	NOINTERVAL specifies that no checkpoints are taken. NOINTERVAL is the default.		
	INTERVAL specifies the amount of real time between each checkpoint, where hh is the hours, mm is the minutes, and ss is the seconds. At each checkpoint, a type 30 record if specified, is written. For TSO users, a type 32 record can also be written.		
	The INTERVAL options allows the user to preserve accounting data for long-running jobs or TSO sessions. Because accounting data is recorded for each job or task each time the interval expires, the data is not completely lost in the event of a system failure. However, using the interval option causes some system overhead. For this reason, caution should be used when specifying this value. Note that the INTERVAL value must be greater than the JWT value. If the interval is less than the SWT time, the IEFUTL exit is not taken.		
	EXITS (exit name, exit name, . . .) NOEXITS	N/A	See explanation
	EXITS specifies which SMF exits are to be invoked. A maximum of 15 exits are allowed; if an exit is not specified then it is not invoked. If this system parameter is not specified, all SMF system exits are allowed.		
	NOEXITS specifies that SMF exits are not invoked.		
	NODETAIL DETAIL		
	Specifies the level of data collection. When DETAIL is specified for TSO, type 32 records contain the total CPU time under TCBs and SRBs and the total number of TGETs, TPUTs, EXCPs, and transactions associated with the command. When DETAIL is specified for STC, type 30 records (subtypes 4 and 5) contain all the EXCP sections for the step or job.		NODETAIL

Figure 3-1. SMFPRMxx Parameters (Part 3 of 4)

Parameter	Meaning and Use	Value Range	Default Value
SUBPARM (name (parameters))	Specifies the information to be passed to a specific subsystem where: name — specifies a one to four character subsystem name. The first character must be an alphabetic or national (#, @, or $), and the remaining characters can be either alphameric or national. parameters — specifies a 1 to 60 character information string to be passed to the subsystem specified in name. SMF does not check the validity of the information string. The inner set or parentheses marks the beginning and the end of the information string.	N/A	None
SUBSYS (name,options)	Specifies what data is to be collected and recorded for a specific subsystem, where name specifies a one to four character subsystem name. The first character must be alphabetic or national (#, @, or $), and the remaining characters can be either alphameric or national. Through this publication, the term subsystem means the one to four character name specified in the SUBSYS parameter in the SMFPRMxx parmlib member. The options are the same as the options that can be specified with the SYS keyword. If a subsystem option is not specified, the corresponding SYS option is used. The name is not validity checked. Data can be recorded for up to eight subsystems in any IPL, including both those specified at IPL and through subsequent SET commands. When the limit is reached, no additional subsystems can be added. The two SMF-defined subsystems are STC and TSO. Work started from the operator console is associated with the STC subsystems. Logged on TSO users are assigned to the TSO subsystem. Batch jobs are assigned to the job entry subsystem that presented the work to the system. The name of the job entry subsystem (for example, JES2 or JES3) is specified in the SCHEDULR sysgen macro instruction.		

Figure 3-1. SMFPRMxx Parameters (Part 4 of 4)

SMF Functions

The following section describes some of the functions that can be controlled by the SMFPRMxx parameters.

Collecting SMF Statistics

Type 23 records collect SMF statistics. Creation of the type 23 record allows the installation to track SMF recording activity. The type 23 record is written at the expiration of the interval specified in the STATUS parameter.

The MAXDORM parameter allows the installation to minimize the amount of data lost because of system failure. By specifying MAXDORM, the installation specifies the period of real time that data is permitted to remain in the SMF buffer before it is written.

Interval Accounting

Record type 30 provides accounting information and consolidates data that is also found in record types 4, 5, 20, 34, 35, and 40. However, using the type 30 record simplifies accounting by means of installation-written post processing routines. Record type 30 is written when:

- A TSO session, started task, or batch job starts
- A TSO session, batch step, or batch job ends
- The recording interval expires

A recording interval is specified through the INTERVAL option of the SYS or SUBSYS keywords. A recording interval makes it possible to checkpoint accounting data so that if a system failure occurs, not all of the accounting data is lost. When the recording interval expires, a type 30 record is written that contains the accounting information for the job. At the end of a step, a final interval record includes the accounting information for the time between the last interval record and the end of the step. In addition, SMF produces a type 30 record that contains the accounting data for the entire step regardless of the number of intervals that have expired.

If the internal value is changed through the SET SMF or SETSMF command, the new interval does not take effect until the current interval expires. If interval recording is not active when a job is started, there is no interval recording for that job. If interval recording is turned off and then back on by means of a SET command, interval recording starts at the new rate, at the beginning of the next step.

In the following example, the installation decided to take a checkpoint of accounting data for started tasks (such as VTAM) at a one-hour interval. The SMFPRMxx options specified:

SUBSYS(STC,INTERVAL(010000))

The values specified cause a type 30 record to be produced each hour after the start of each started task step. The record contains the accounting data for the resources used during the previous hour.

TSO Command Accounting

Record type 32 contains the number of TSO commands issued by a TSO user. The record is written when a TSO user logs off or when an SMF recording interval expires.

Type 32 records allow the installation to keep track of individual TSO commands entered during a TSO session, during recording interval, or in a CLIST. If no commands are entered during a reporting interval, no record is created.

The installation can specify, through the DETAIL parameter in SMFPRMxx, that the record is also to include the total CPU time under TCBs and SRBs and the total number of TPUTs, EXCPs, transactions, and TGETs associated with the command.

To use the type 32 record and TSO command accounting, you must have installed TSO Extensions for MVS/XA.

Many TSO commands, such as EDIT, have subcommands. These subcommands are also 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.

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

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

- 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 indicate that the command has completed.

  Following the four-byte flag word is an eight-byte command (or prefixed-sub-command) name field. The command must be left-justified and padded with blanks.
- Load register 15 with X'19'.
- Issue SVC 109.

The user of this interface 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 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
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 as long as they use the TSO 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.

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 message IEE956A 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. For more information on message IEE956A, see *System Messages*.

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. Also, 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.

Started Task Accounting

For accounting purposes, the system sees the master address space, system address spaces, mounts, job entry subsystems, and tasks initiated with a START command at the operator console as started tasks. The system does accounting for started tasks much as it does for batch jobs and TSO work. Started task accounting includes:

- Accumulating CPU time under started task TCBs and SRBs
- Counting started task I/O operations
- Invoking SMF exits on behalf of started tasks
- Creating SMF records for started task activity

The SYS default in SMFPRMxx requests that SMF write all possible records for what the system sees as started tasks. For started task accounting, SMF writes record types 4, 5, 6, 14, 15, 17, 18, 19, 20, 23, 25, 26, 30, 40, 57, 62, 63, 64, 67, and 68.

You can suppress started task accounting records by suppressing the accounting record types through the SUBSYS option in SMFPRMxx (STC parameter). To suppress all SMF records for started task accounting in a JES2 system, specify:

SUBSYS(STC,NOTYPE(4,5,14,15,17,18,19,20,23,30,40,62,63,67,68))

To suppress all SMF records for started task accounting in a JES3 system, specify:

SUBSYS(STC,NOTYPE(4,5,6,14,15,17,18,19,20,23,25,26,30,40,57,62,63,67,68))

In either case, specifying any other record types might cause loss of data other than accounting data for started tasks. For example, a JES2 installation might run the Resource Measurement Facility, which the system sees as a started task, to monitor system activity. To suppress started task accounting records for the Resource Measurement Facility, the installation might inadvertently specify:

SUBSYS(STC,NOTYPE(4,5,14,15,17,18,19,20,30,40,62,63,67,68,70))

Because this specification includes record type 70, the installation is suppressing, in addition to started task accounting data on the Resource Measurement Facility, important data collected by the Resource Measurement Facility itself on CPU activity.

For an initiator, the only data that is meaningful 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 *System Modifications*).

Notes:

1. MSTRJCL has been modified to include TIME=1440.
2. Many IBM-supplied entries in the PPT have the system task bit set on.

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, STC, JES2, or JES3. You specify the information to be passed in the SUBPARM parameter of the SMFPRMxx 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 "Using the SMFSUBP Macro to Determine Subsystem Parameters" later in this book.)

In response to a SET command, SMF issues a subsystem interface (SSI) call to all user-defined subsystems that have a SUBPARM option specified. (For more information on the subsystem interface, see *Diagnostic Techniques*.) In response to a SETSMF command, SMF issues a SSI call only to the subsystem specified in the SETSMF command.

To determine if any values that affect its operation have been changed, each subsystem, upon receiving the SSI call, must issue the SMFSUBP macro instruction. If the subsystem determines that the information string passed to it is incorrect, it uses the SMFCHSUB macro instruction to change the information. (See "Using the SMFCHSUB Macro to Change Subsystem Parameters".)

Selecting SMF Records Using SMFPRMxx Parameters

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, 18, 62, 63, 64, 67, or 68 is specified with theTYPE option, data is collected for all records. Likewise, if either record type 19 or 69 is specified with the TYPE option, data is collected for both records. However, only those records that are selected as a result of TYPE or NOTYPE request are written to the SMF data set.

User-written exit routines IEFU83 and IEFU84 (SMF writer) and IEFACTRT (termination) can also 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.

Entering SMFPRMxx in SYS1.PARMLIB

When you have determined which SMF parameters to use, place them in an SMFPRMxx member of SYS1.PARMLIB. The two alphameric characters, represented by xx, are appended to SMFPRM to identify your SMFPRMxx member. If you do not specify an SMFPRMxx member (with system parameters, such as SMF=01 for member SMFPRM01, or with an alternate member, such as IEASYSxx), the default member SMFPRM00 is used. The parameters in SMFPRM00 are:

```
ACTIVE                          /*ACTIVE SMF RECORDING*/
DSNAME(SYS1.MANX,SYS1.MANY)     /*TWO DATA SETS MANX AND MANY*/
PROMPT(ALL)                     /*PROMPT THE OPERATOR FOR OPTIONS*/
REC(PERM)                       /*TYPE 17 PERM RECORDS ONLY*/
MAXDORM(3000)                   /*WRITE AN IDLE BUFFER AFTER 30 MIN*/
STATUS(010000)                  /*WRITE SMF STATS AFTER 1 HOUR*/
JWT(0010)                       /*522 AFTER 10 MINUTES*/
SID(3081)                       /*SYSTEM ID IS 3081*/
LISTDSN                         /*LIST DATA SET STATUS AT IPL*/
SYS(TYPE(0:255),EXITS(IEFU83,IEFU84,IEFACTRT,IEFUJV,IEFUSI,IEFUJP,
                    IEFUSO,IEFUJI,IEFUTL,IEFU29),NOINTERVAL,NODETAIL)
/* WRITE ALL RECORDS AS THE SYSTEM DEFAULT, TAKE ALL KNOWN EXITS.
   THERE ARE NO DEFAULT INTERVAL RECORDS WRITTEN. ONLY SUMMARY
   TYPE 32 RECORDS ARE WRITTEN FOR TSO.*/
SUBSYS(STC,EXITS(IEFU29,IEFU83,IEFU84,IEFUJP,IEFUSO))
/* WRITE ALL RECORDS AS BY SYSTEM DEFAULT, TAKE ONLY FIVE EXITS, NOTE:
   IEFU29 EXECUTES IN THE MASTER ASID WHICH IS A STC ADDRESS SPACE SO
   IEFU29 MUST BE ON FOR STC. USE ALL OTHER SYS PARAMETERS AS A DEFAULT*/
```

The SMFPRMxx parameters can be entered in any order; however, note the following coding restrictions:

- Code each series of parameters in logical records no more than 80 bytes long.
- Use columns 1-71; columns 72-80 are ignored.
- Enter each parameter in the format: **keyword(value).**
- Avoid embedded blanks.
- Indicate continuation by placing a comma after the last entry on a record, followed by a blank before column 72.
- Comments must be bracket by /* and */.

To add the SMFPRMxx parameters as a member of SYS1.PARMLIB, use the IEBUPDTE utility program. Figure 3-2 illustrates sample JCL for using IEBUPDTE to enter SMFPRM01 into SYS1.PARMLIB. To change the default member, SMFPRM00, or the installation-defined SMFPRMxx member, replace them with a new version by again executing IEBUPDTE. For information on the IEBUPDTE program, see *Utilities.*

```
//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 SYSGEN, use the SYS1.APARMLIB data set.

Figure 3-2. Sample JCL for Entering SMFPRM01 into SYS1.PARMLIB Using IEBUPDTE

If PROMPT(LIST or ALL) was specified, the operator can modify the values in SMFPRMxx 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 the SET Command

The SET operator command can be used to restart SMF or modify the SMF recording options dynamically by specifying which SMFPRMxx parmlib member is to be used. The format of the command is:

$$\begin{Bmatrix} \text{SET} \\ \text{T} \end{Bmatrix} \text{SMF=xx}$$

where xx is the two-character identifier of the member of SYS1.PARMLIB that contains the SMF options.

If SMF terminates, you may use the SET command to restart SMF; it is not necessary to IPL again. For more information on using the SET command to restart SMF, see *System Commands.*

The SET command also allows the installation to replace the existing SMF options. For example, an installation can activate SMF recording after an IPL in which NOACTIVE is specified by using the SET command 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.

Notes:

1. To avoid installation exit communication problems, the installation should terminate all address spaces except the master scheduler address space, the system address spaces (such as PCAUTH, ALLOCAS, and GRS) and the job entry subsystem before issuing a SET command that changes the EXIT keyword.
2. The SET command cannot be used to change the SID parameter; if a value is specified, it is ignored.
3. The new values for STATUS or MAXDORM do not take effect until the old ones, if any, expire.
4. SET SMF, SETSMF, and DISPLAY SMF commands cannot run simultaneously. One waits for the other to complete before starting.
5. A maximum of eight subsystems are allowed for each IPL. This is a combined total of those specified at IPL and subsequent SET commands. If the maximum is reached, no new subsystems may be added. Those subsystems previously specified can be given different options.
6. Recording data set switching does not take place at SET time unless it is necessary. 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.
7. 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

In contrast to the SET operator command with the SMF option, which allows an installation to specify a different SMFPRMxx parmlib member, 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. The format is:

$\left\{\begin{matrix}\text{SETSMF}\\\text{SS}\end{matrix}\right\}$ parameter (value), . . .

The parameters are:

parameter
  specifies any SMF parmlib parameter except ACTIVE, PROMPT, SID, or EXITS.

value
  specifies the new value for the specified parameter.

Notes:

1. More than one parameter can be changed as long as the length of the command does not exceed 124 characters.
2. Both the SUBSYS and SUBPARM specifications can be changed on the same SETSMF command as long as the subsystem name is the same.
3. SET SMF, SETSMF, and DISPLAY SMF commands cannot run simultaneously. One waits for the other to complete before starting.
4. The new values for STATUS or MAXDORM do not take effect until the old ones, if any, expire.

Using the DISPLAY Command

The DISPLAY (D) operator command can be used to display the status of the SMF data sets or the current SMFPRMxx options, to the operator console. The format is:

$$\left\{\begin{matrix}\text{DISPLAY}\\ \text{D}\end{matrix}\right\}\text{SMF}\left[\left\{\begin{matrix}\underline{\text{,S}}\\ \text{,O}\end{matrix}\right\}\right]\ [\text{,L=cca}]$$

The parameters are explained below:

,S
: specifies that the status of the SMF data sets is to be displayed.

,O
: specifies that the current SMFPRMxx options are to be displayed.

,L=cca
: specifies the console(cc) and the display area(a) where the action specified by S or O is to take place.

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

Chapter 4: User-Written Exit Routines and Facilities

SMF has exits in the control program that can link to user-written routines for monitoring jobs or job steps at various points in their processing cycles. These exits can execute in either 24-bit addressing mode or 31-bit addressing mode. For more information on 31-bit addressing, see *SPL: 31-Bit Addressing*. An installation can use any or all of the SMF exits by including user-written exit routines in the appropriate distribution libraries before SYSGEN or in SYS1.LPALIB after SYSGEN. SMF automatically provides dummy routines for all unused exits. (For detailed information on adding user-written exit routines, see "Including Exit Routines in the Operating System" in the chapter "System Requirements and Considerations".)

Chapter 4 is divided into three parts:

- Part I describes user-written exit routines.
- Part II describes testing exit routines.
- Part III describes exit routine facilities.

Part I – User-Written Exit Routines

Part I introduces the SMF exits. It briefly describes when each exit is called, the parameters passed to it, and the return codes required from it.

Exit Routines and Their Characteristics

SMF supplies exits, which can link to user-written exit routines, as follows:

- The job validation exit (IEFUJV) receives control from the converter before each job control statement (or cataloged procedure) in the input stream is interpreted. This exit also receives control after all the JCL is converted and again after all the JCL is interpreted. It is not taken for JCL comment statements. A return code from this exit indicates whether processing of the job is to be continued.
- The job initiation exit (IEFUJI) receives control from the initiator before a job on the input queue is selected for initiation. A return code from this exit indicates whether the job is to be started or canceled.
- The step initiation exit (IEFUSI) receives control from the initiator before each job step is started (prior to allocation). A return code from this exit indicates whether the job step is to be started or the job is to be canceled.

- The time limit exit (IEFUTL) receives control from the timer interruption handler 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 or the default from the job entry subsystem); or the continuous wait time limit for the job (from the SMFPRMxx JWT parameter). A return code from this exit indicates whether the job step is to be terminated or processing is to be continued with a new time limit.

- The SYSOUT limit exit (IEFUSO) receives control from the job entry subsystem 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 job is to be terminated or processing is to be continued using a new limit.

- The SMF record exit (IEFU83) receives control from the SVC 83 routine before each record is written to the SMF data set. A return code from this exit indicates whether the current SMF record is to be suppressed.

- The termination exit (IEFACTRT) receives control from the terminator on the normal or abnormal termination of each job step and job. A return code from this exit indicates whether the job is to be continued (for job steps only) or terminated, and whether the SMF termination records are to be written to the SMF data set.

- The job purge exit (IEFUJP) receives control from the job entry subsystem when a job is ready to be purged from the system (that is, 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 is to be written to the SMF data set.

- The SMF dump exit (IEFU29) receives control from the SMF writer when an SMF data set becomes full. A return code from this exit indicates whether or not the dump message (IEE362I) is to be issued.

- The SMF record exit (IEFU84) receives control when the SMF writer SVC is branch entered. A return code from this exit indicates whether the current SMF record is to be suppressed.

Figure 4-1 summarizes when each SMF exit is called, the modules that call each user-written exit routine, the information passed to each exit (in addition to the common exit parameters, described in Figure 16), and the return from each exit to the control program.

Module:	At:	Interfaces With:	For User Exit:	Parameters Passed:	Type of Return:
IEFVHEB	Prescan in Converter	SMFEXIT	IEFUJV (entry codes 0-8)	JCL statement image, type of JCL statement, converterm parameter	Continue or cancel.
IEFVHF	Converter Termination	SMFEXIT	IEFUJV (entry code 16)		
IEFVHH	Interpreter Termination	SMFEXIT	IEFUJV (entry code 32)		
IEFSMFIE	Job Initiation	SMFEXIT	IEFUJI	Programmer name, job priority, job accounting fields.	Continue or cancel.
IEFSMFIE	Step Initiation	SMFEXIT	IEFUSI	Job step name, program name, step accounting fields.	Continue or cancel.
IEATLEXT	Timer Expiration	SMFEXIT	IEFUTL	None.	Continue with new time limit or cancel.
HASPAM[1] IATDMEB[2]	Output Limit Expiration	SMFEXIT	IEFUSO	None.	Continue with new limit or cancel.
IGC0008C	SVC Call to SMF Writer SMF Buffer Time	SMFEXIT	IEFU83	SMF record to be written.	Write or do not write record to SMF data set.
IEEMB830	Branch entry call to SMF	SMFEXIT	IEFU84	SMF record to be written.	Write or do not write record to SMF data set.
IEFTB721	Job Termination	SMFEXIT	IEFACTRT	Job step name, programmer name, job CPU time, job accounting fields, step CPU time, step accounting fields, completion code, SMF termination record.	Continue or cancel; write or do not write record to SMF data set.
IEFTB721	Step Termination	SMFEXIT	IEFACTRT		
HASPMISC[1] IATOSDR[2]	Job Purge	SMFEXIT	IEFUJP	SMF job purge record, subsystem ID.	Write or do not write record to SMF data set.
IEEMB829	SMF Dump Time	SMFEXIT	IEFU29	SMF data set name.	Tell operator to clear or not to clear SMF data set.

[1] JES2 only

[2] JES3 only

Figure 4-1. Exit Routine Characteristics

Sample Exit Routines in SYS1.ASAMPLIB

Sample assembler language exit routines for some SMF exits are provided in the member SMFEXITS of SYS1.ASAMPLIB. Figure 4-2 shows sample JCL for obtaining a listing of these sample routines.

```
//PRINT      JOB     MSGLEVEL=1
//           EXEC    PGM=IEBPTPCH
//SYSPRINT   DD      SYSOUT=A
//SYSUT1     DD      DSNAME=SYS1.ASAMPLIB,DISP=(OLD,KEEP),
//                   UNIT=xxxx,VOLUME=SER=xxxxxx1
//SYSUT2     DD      SYSOUT=A
//SYSIN      DD      *
             PRINT   TYPORG=PO,MAXNAME=1,MAXFLDS=1
             MEMBER  NAME=SMFEXITS
             RECORD  FIELD=(80)
/*
```

[1]The volume and unit parameters depend upon your installation's request.

Figure 4-2. Sample JCL For Obtaining a Listing of Sample Exit Routines

A summary of the sample exit routines in SYS1.ASAMPLIB follows:

- IEFUJV – Sample routine checks the validity of a continued JOB statement and of values supplied for REGION, PRTY, TIME, and accounting parameters in the JOB statement. The routine uses characters from the account number to index a table that contains allowable values for these parameters. If any value is invalid, the sample IEFUJV routine terminates the job.
- IEFUJI – Sample routine determines how long a job has been on the input job queue before it is initiated. It then writes this value and the job priority to the SMF data set as a user record.
- IEFUSI – No sample provided.
- IEFUTL – Sample routine terminates a job if either the job CPU time limit or the job step CPU time limit has been exceeded. If the continuous wait time limit for the job has been exceeded, the routine extends the limit twice; on the third entry for exceeding the continuous wait time limit, it cancels the job. The continuous wait time limit is not an accumulation of all the time the task spends waiting but rather a single continuous wait period that exceeds the specified limit. Each time the routine is entered for exceeding the continuous wait time limit, it writes a record describing the action taken to the SMF data set.
- IEFUSO – No sample provided.

- IEFU83 — Sample routine determines whether the record to be written is an IPL record. If it is, the routine writes to the operator with a reply request for the record types to be written. If the record is not an IPL record, the return code depends upon the records currently requested.

  The sample IEFU83 routine has a special macro definition for "write to operator with reply" so that output normally directed to the operator is suppressed and a standard reply is assumed for testing with the TESTEXIT procedure. Remove this macro definition if you want the message printed at the console. The sample routine also has special macro definitions for "write to operator" and "wait", which generate no-op instructions.

- IEFU84 — No sample provided.
- IEFACTRT— Sample routine changes the SMF job termination (types 5 and 35) and job step termination (types 4 and 34) records (unless the job step is flushed) to user records, and attempts to write them to the SMF data set. If the data set is full, the routine writes a message to the console indicating that SMF records are being lost. At job termination, the routine writes a record containing the job name, programmer's name, and account number to the SYSOUT data set.
- IEFUJP — No sample provided.
- IEFU29 — No sample provided.

Writing Exit Routines

This section describes:

- Exit routine restrictions and facilities, including information on communication among user-written exit routines; the common parameters passed to all routines; the SMF macro instructions, which are used to write records to the SMF data set; and the IFASMFR macro instruction, which is used to symbolically address fields in the SMF records.
- Exit routines, including a full description of the parameters passed to each routine and the required return codes.

Exit Routine Restrictions

This section describes only the restrictions and conditions common to most user-written exit routines. For those restrictions and conditions that involve only one or two exit routines, see the specific routine(s) later in this chapter.

Before writing an exit routine, note the following user-written exit routine restrictions and conditions:

- All user-written exit routines must be reenterable and refreshable because PLPA pages are stolen and can be paged-in but not paged-out. Any code changes would be overlaid by subsequent page-in.

- All user-written exit routines receive control via a BALR instruction. The routines must save registers when they receive control and restore registers when they return control to the control program. Register 13 contains the address of the register save area; register 14 contains the return address; and register 15 contains the entry point address.

- SMF exit routines can execute unchanged in MVS/XA. If the exit routines are rewritten to either address data above the 16-megabyte line or to reside above the 16-megabyte line, and are link edited again, SMF passes control to the exit routines in the proper addressing and residency mode. You establish addressing and residency modes at system initialization or through EXIT parameters on the SETSMF command. Exits that run in 31-bit addressing mode must return control to SMF via a BSM instruction.

- Figure 4-3 shows the storage proctection key in which each user-written exit routine receives control.

Key	Exit Routine
0	IEFUJV (with entry code 32) IEFUJI IEFUSI IEFUTL IEFU83 IEFU84 IEFACTRT IEFU29
1	IEFUJV (with entry codes 0-16) IEFUSO IEFUJP

Figure 4-3. Storage Protection Keys

- All user-written exit routines receive control with the system enabled for interrupts.

- No user-written exit routines except IEFACTRT can write to the system output message data set.

- Do not allocate installation-defined data sets to SYSOUT.

- User exits must use standard linkage conventions.

- User-written exit routines entered for foreground jobs cannot access installation-defined data sets. Routines entered for background jobs must write to installation data sets defined as follows:
  - A data set used by the exit routines IEFUJI, IEFUSI, IEFUTL and IEFACTRT requires a DD statement in the initiator cataloged procedure.
  - A data set used by the IEFUJV and IEFUJP exit routines requires a DD statement in the job entry subsystem cataloged procedure.
  - User-written exit routines IEFUSO, IEFU29, IEFU83, and IEFU84 cannot write to installation-defined data sets.
  - IEFUJV, IEFUJI, IEFACTRT, and IEFUSI cannot access ISAM data sets.
- All user-written exit routines that issue a WTOR macro instruction should also specify the LONG=YES parameter in the WAIT macro instruction.
- If you plan to use the TESTEXIT procedure for testing user-written exit routines, see "TESTEXIT Exit Routine Requirements" in Part II "Testing Exit Routines" of this chapter.
- If you plan to use the IBM OS/VS Sort /Merge Program Product, do not create any records smaller than the minimum length required by the program. (When using tape work devices, the minimum length this program can sort is 18 bytes. Otherwise, the minimum is one byte.)
- IEFU84 cannot issue any SVCs.

Common Exit Parameter Area

When a user-written exit routine receives control, register 1 points to a list of four-byte addresses. The first entry in this list is common to all exit routines except IEFU83, IEFU84, and IEFU29. The first entry points to a parameter area that is 36 bytes long.

Figure 4-4 describes the format of the common exit parameter area. Each job has its own common exit parameter area. Note that the fields in this parameter area are filled chronologically; therefore, not all fields are meaningful for all user-written exit routines.

Displacement from Pointer	Field Size	Data Format	Description
0	8	EBCDIC	Job name
8	4	binary	Time, in hundredths of a second, reader recognized the JOB card for this job
12	4	packed	Date reader recognized the JOB card for the job, in the form 00YYDDDF where F is the sign
16	4	EBCDIC	System identification (taken from SID parameter[1])
20	8	EBCDIC	User identification. SMF places this data in all subsequent records for this job. This field is initialized to EBCDIC blanks when each job is read[2]
28	1	binary	Number of the step being processed
29	1	binary	Indicator of the SMF options selected by the user *Bit* *Meaning When Set* 0 Reserved 1 Reserved 2 Reserved 3 Data set accounting. Record types (see note 3) selected 4 Volume accounting. Record types 19 or 69 selected 5 Reserved 6 Type 17 records will be written for temporary data set (REC(ALL)) 7 If 0, background job. If 1, foreground job
30	1	binary	Restart indicator *Bit* *Meaning When Set* 0 Automatic restart 1 Automatic checkpoint/restart 2 Step continue 3 Reserved 4 System restart 5-7 Reserved
31	1	EBCDIC	Job class
32	4	binary	User-communication field. This field is intended for communication among user-written exit routines within a unique job. The field is initialized to zeros by the job entry subsystem when the control block is first passed to the converter.

[1]Modifications for the SID parameter are ignored during a system restart IPL for SMF record types 4, 5, 34 and 35.

[2]These fields are provided for user modification.

[3]If one of record types 14, 15, 17, 18, 62, 63, 64, 67, or 68 is selected, this bit is set on.

Figure 4-4. Common Exit Parameter Area

Exit Routines

IEFUJV – Job Validation Exit

IEFUJV receives control before the system converts each job control statement (or cataloged procedure) in the input stream and again after it converts all JCL. This exit routine also receives control after the system interprets all JCL. The procedure does not receive control for comment statements for console-started tasks. A user-written IEFUJV exit routine could do any or all of the following:

- Validate any account fields included in the JOB and EXEC statements (except symbolic parameters) by comparing them to a standard list.
- Validate or assign the REGION request.
- Validate or assign job TIME and job step TIME parameters.
- Control output stream data by using the OUTLIM or SPACE parameters.
- Check for authorization to use restricted data sets.
- Create user-written records.
- Assign the user identification to be included in both the SMF job/step termination record and the SMF job purge record.
- Limit the size of temporary data sets handled by VIO.
- Require checkpoint/restart for jobs requesting a large amount of CPU time.
- Enforce installation standards on usage of the ADDRSPC=REAL parameter.

Notes:
1. If a cataloged procedure is used, it is expanded *before* the IEFUJV exit routine receives control; the sequence of statements is JOB, EXEC PROC= . . . , EXEC PGM= . . . , followed by the other statements of the procedure. Override statements immediately precede the statements being overriden. Note, however, that the resolved values for symbolic parameters are not passed to the IEFUJV exit routine.
2. When modifying a JCL statement, do not include additional JCL statements or continuation cards. Also, when adding or modifying operand fields, begin the first operand field in the same place that it was before any additions or modifications were made.
3. Depending upon the processing to be performed, it may be more efficient to check JOB and EXEC statement accounting fields in the IEFUJI exit routine and the first IEFUSI exit routine, respectively. The accounting fields are passed as parameters to IEFUJI and IEFUSI, making a statement scan routine unnecessary. Either of these exit routines can assign user identification, and the IEFACTRT exit routine can write messages to the system output message data set.
4. To use installation-defined data sets with this exit routine, you must define them with a DD statement in the job entry subsystem cataloged procedure. When running JES2, you must also define the data sets with a DD statement in the initiator cataloged procedure.

5. When running JES2, you can use the job statement accounting field scan exit (Exit 3), as well as the IEFUJV exit. Exit 3 interprets any variables in the JOB card accounting field, and sets the appropriate fields in JES2 control blocks representing these variables. Because the exit receives control before the IEFUJV exit, do not use the IEFUJV exit to change the following fields of the JOB card: CLASS, MSGCLASS, NOTIFY, PRTY, PASSWORD and TYPRUN. For more information about Exit 3, see *System Programming Library: JES2 Initialization and Tuning*.

   When running JES3, a JES3 user can use JES3 user exits, in addition to the IEFUJV exit, to write programs to examine and change the results of interpreter processing and allow the job to proceed or to flush the job from the system. For more information about the JES3 user exits, see *System Programming Library: JES3 User Modifications and Macros*.
6. For jobs canceled by IEFUJV from the converter, only SMF record types 6 and 26 are generated.
7. Conversion might take place on one CPU and interpretation of the same job on another. Therefore, the IEFUJV exits could receive control on different CPUs for the same job, and timing comparisons of the job flow would not be valid.
8. If an installation checks job card accounting in the IEFUJV exit for all tasks, the IEFUJV exit should not be taken, unless modified, for started tasks. Started tasks do not have any job card accounting and might be cancelled by the user exit.

Parameters

At entry to the IEFUJV exit routine, register 1 points to a list of four-byte addresses, as follows:

1. The address of the common exit parameter area. (See Figure 4-4).
2. The address of an 80-character JCL statement image (in EBCDIC). (JCL statements are identical to those listed in the SYSOUT data set; control statements containing only comments and resolved values for symbolic parameters, however, are not made available to this exit routine.)
3. The address of a one-byte area that indicates the type of JCL statement being passed to this exit routine. The indicator will be a binary value, as follows:

   0 indicates a null statement.
   1 indicates a JOB statement.
   2 indicates an EXEC statement.
   4 indicates a DD statement.
   8 indicates a PROC statement.
   16 indicates all JCL has been converted.
   32 indicates a JDT (JCL definition table) defined verb.
   64 indicates that JDT defined JCL appears on this statement.

4. The address of the JES initialization parameters that are passed to the converter routine. The address points to the first converter parameter field. The field is a one-byte binary number that can have one of the following meanings when set:
   0 No account number or programmer name required.
   1 Programmer name required but not account number.
   2 Account number required but not programmer name.
   3 Account number and programmer name required.

   Note: The account number must not be required in the exit for started task JOB cards because there is no way to put an account number on a started task JOB card. An accounting number can be required on an EXEC card in SYS1.PROCLIB.

Return Codes

Before the IEFUJV exit routine returns to the control program, it must place a return code in register 15, as follows:

0 indicates job processing should be continued.

4 indicates job processing should be canceled.

IEFUJI – Job Initiation Exit

IEFUJI receives control when the initiator selects a job on the input queue for initiation. A user-written IEFUJI exit routine could validate job accounting information or write to a user data set. It could also determine how long a job was on the input job queue before the initiator selected it. If the System Availability Management (SAM) Function is active and operational, SMF calls the SAM job/step initialization exit routine, AMSUJI, before it calls IEFUJI. IEFSMFIE then uses SMFEXIT to call the SMF job start user exit, IEFUJI.

Notes:
1. If an installation uses major and minor account numbers with several fields, this exit routine is easier to use than IEFUJV for account number processing because the accounting fields are placed in a formatted list. Figure 4-5 shows the format of the JOB statement accounting information that is available to IEFUJI.

Offsets Dec.	Offsets Hex.	Length	Format	Description
0	0	1	binary	Number of accounting fields.
1	1	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.

Figure 4-5. Format of Accounting Information Passed to IEFUJI and IEFUSI

2. At job step or job termination, use the termination indicators in record types 4, 5, 30, 34 and 35 to determine whether IEFUJI canceled the job.
3. To use installation-defined data sets with this exit routine, you must define them with a DD statement in the initiator cataloged procedure.

Parameters

At entry to the IEFUJI exit routine, register 1 points to a list of four-byte addresses as follows:

1. The address of the common exit parameter area. (See Figure 4-4.)
2. The address of a 20-byte area containing the programmer's name (in EBCDIC) from the JOB statement. This area is aligned left and padded with blanks if necessary.
3. The address of a one-byte area indicating (in binary) the requested job selection priority. This field equals the user-assigned priority of 0 to 14 (taken from the PRTY parameter on the JOB statement).
4. The address of an area containing the accounting information from the JOB statement. (See Figure 4-5.)

Return Codes

Before the IEFUJI exit routine returns control to the control program, it must place a return code in register 15, as follows:

0 indicates job processing should be continued.

4 indicates job processing should be canceled.

IEFUSI – Step Initiation Exit

IEFUSI receives control before the initiator starts each job step. A user-written IEFUSI exit routine could:

- Validate job step accounting information
- Write to a user data set
- For long-running jobs, create a user step-initiation record in the case of system failure
- Set region size and GETMAIN limit defaults for all applications. For more information on using IEFUSI to limit the region size, see *System Modifications*.

Notes:

1. If an installation uses major and minor account numbers with several fields, this exit routine is easier to use than IEFUJV for account number processing because the accounting fields are placed in a formatted list. Figure 4-5 shows the format of the EXEC statement accounting information that is available to IEFUSI.
2. At job or job step termination, use the termination indicators in record types 4, 5, 30, 34 and 35 to determine whether IEFUSI canceled the job.
3. To use installation-defined data sets with this exit routine, you must define them with a DD statement in the initiator cataloged procedure.
4. If region requested by a job is greater than 16 megabytes, 32 megabytes will be the minimum region established by VSM. The IEFUSI cannot override the 32 megabyte minimum value set by VSM.

Parameters

At entry to the IEFUSI exit routine, register 1 points to a list of four-byte addresses, as follows:

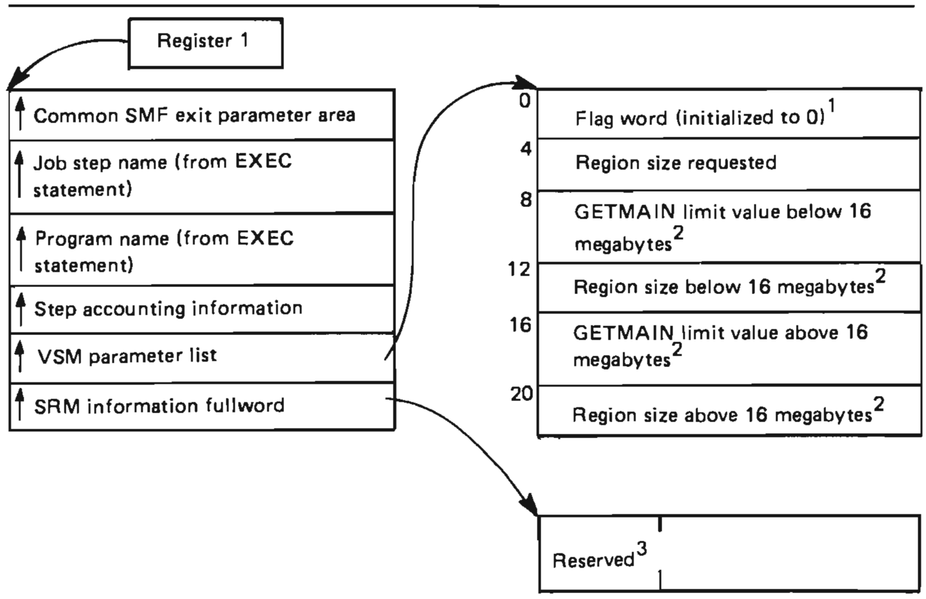
1. The address of the common exit parameter area. (See Figure 4-4).
2. The address of an eight-byte area containing the job step name (in EBCDIC) from the EXEC statement. This area is aligned left and padded with blanks if necessary.
3. The address of an eight-byte area containing the program name (in EBCDIC) from the EXEC statement. This area is aligned left and padded with blanks if necessary. If you use a refer back, the area contains "pgm=*.DD".
4. The address of an area containing the accounting information from the EXEC statement. (See Figure 4-5.)
5. The address of a six-word area containing region limit values. (See Figure 4-6.)
6. The address of a word containing a flag indicating a V=R job. (See Figure 4-6.)

Return Codes

Before the IEFUSI exit routine returns control to the control program, it must place a return code in register 15, as follows:

0 indicates job processing should be continued.

4 indicates job processing should be canceled.



[1] The VSM flag word contains:

Bit	*Meaning*
0	on = IEFUSI has set region limit values. **NOTE: If GETMAIN limits are not set by the exit, but a check for contiguous free space by VSM should be performed, Bit 0 of the VSM flag word must be set.**
1	on = VSM is *not* to check for the availability of the requested amount of contiguous free space below 16 megabytes. off = VSM is to check for the availability of the requested amount of contiguous free space below 16 megabytes. **NOTE: VSM tests this bit only when the REGION value is less than 16 megabytes.**
2	on = VSM is to check for the availability of the requested amount of contiguous free space above 16 megabytes. off = VSM is *not* to check for the availability of the requested amount of contiguous free space above 16 megabytes. **NOTE: VSM tests this bit only when the REGION value is greater than 16 megabytes.**
3-31	Reserved **NOTE: Because of compatability considerations for previous MVS/XA releases, the settings for bits 1 and 2 have opposite meanings. In previous releases, VSM made no checks for free space above sixteen megabytes. Now, if the amount of contiguous free space requested is critical for the step to be executed, bit 2 must be turned on.**

[2] On every entry to IEFUSI, the last four words in the VSM parameter list are set to X'FFFFFFFF'.

[3] The SRM flag word is received

Figure 4-6. IEFUSI Input Parameter Structure

IEFUTL – Time Limit Exit

IEFUTL receives control from the timer second level interrupt handler 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 or the default from the job entry subsystem).
- The continuous wait time limit for the job (from the SMFPRMxx JWT parameter).

A user-written IEFUTL exit routine could do any of the following:

- Cancel a job.
- Inform the operator that a job has exceeded its continuous-wait-time limit.
- Extend CPU time limits for selected jobs.
- Extend wait time limit within a job.
- Keep a record of time limit expirations.
- Vary the handling of time limit expirations for different types of jobs, such as teleprocessing, test, or production jobs.
- In addition to interval accounting and the expiration of MAXDORM, the exit can collect information at fixed intervals for long-running jobs to prevent loss of data in case of system failure. (See Note 1 for more information on testing a resource's availability before issuing an SMFWTM or SVC.)

Notes:

1. *A system interlock occurs anytime IEFUTL enqueues on a resource already enqueued on by the job step task or any of its subtasks.* (More specifically, the initiator abnormally terminates if IEFUTL enqueues on such a resource because the asynchronous exit interface routine sets a "step must complete" status before IEFUTL receives control.) The enqueue can be explicit (for example, issue ENQSVC in exit IEFUTL) or implicit (the enqueue is done by an SVC that was issued by IEFUTL). An interlock also occurs if IEFUTL issues a TGET or a TPUT when the session manager is active during a TSO session.

   In any case, you can try to minimize the possibility of an interlock by first determining the resources used before the SVC or TSO macros were issued. Issue an ENQ macro specifying (1) the major and minor resource names in the QNAME and RNAME parameters, and (2) the RET=TEST parameter, as follows:

   ENQ(QNAME,RNAME,E,3(SYSTEM),RET=TEST,MF=(E,CNTLADDR)

   Because SMF exits must be reentrant, be sure to use the execute form of the macro.

   For more information on the ENQ macro instruction, see *System Macros and Facilities.*

2. A user-written IEFUTL exit routine should control the number of extensions for a given step to prevent looping. It can record the expiration in the SMF data set or write a message to the console, however, in doing so, a system interlock could occur. (See Note 1.) To record the expiration in installation-defined data sets, you must define the data sets with a DD statement in the initiator cataloged procedure.

3. CPU time is collected in two categories: execution under TCBs and execution under SRBs. The limiting function and the IEFUTL exit interfaces apply only to TCB time.

4. If a job time limit is not specified on the JOB statement, the time limit for each job step is the value specified for the TIME= parameter on the EXEC statement, or the default value from the job entry subsystem.

   If a job time limit is specified on the JOB statement, the time limit for each job step is the remaining job time or the job step time limit (from the TIME= parameter or the job entry subsystem default), whichever is smaller.

5. You can extend execution and wait time only within a step. Each extension resets the limit for the entire step to the extension value. If the step does not use all of the extended execution time, the time is *not* carried over for the next step.

6. The wait time limit extension value replaces the previous wait time limit for the step.

7. The smallest time extension granted is 2^{20} microseconds or 1.048576 seconds.

8. The CPU time-used field is checked each time a task status is saved, to determine if the specified time limit has been exceeded.

Parameters

At entry to the IEFUTL exit routine, register 1 points to the four-byte address of the common exit parameter area. (See Figure 4-4.) Register 0 will have a binary value, as follows:

0 indicates the job CPU time limit expired.

4 indicates the step CPU time limit expired.

8 indicates the continuous wait time limit for the job expired.

Return Codes

Before the IEFUTL exit routines returns control to the control program, it must place a return code in register 15, as follows:

0 indicates job processing is to be canceled.

4 indicates job processing is to be continued with a time extension in timer units.

8 indicates job processing is to be continued with a time extension in seconds.

You must place the time extension in register 1; you can determine the number of timer units by the algorithm:

1 second = 38400 timer units.

IEFUSO – SYSOUT Limit Exit

IEFUSO receives control from the job entry subsystem when the number of records written to an output data set exceeds the output limit for that data set. If the output limit is exceeded and an IEFUSO exit routine is not supplied, the job entry subsystem cancels the job. To specify the output limit, use the OUTLIM parameter on the DD statement defining the output data set. Note that the OUTLIM parameter limits output only to spooled data sets. This parameter is described in *JCL*.

A user-written IEFUSO exit routine could:

- Cancel a job that exceeds its output limit.
- Inform the operator when a job exceeds its output limit and let the job continue processing.
- Extend output limits for selected jobs.
- Keep a record of jobs that exceed output limits.

Notes:

1. If IEFUSO indicates that the output limit is to be increased (register 15=4) but you do not increase the limit (register 1=0), the exit routine will receive control again when the next record is written to the output data set.
2. The IEFUSO exit routine cannot access installation-defined data sets.

Parameters

At entry to the IEFUSO exit routine, register 1 points to the four-byte address of the common exit parameter area. (See Figure 4-4.)

Return Codes

Before the IEFUSO exit routine returns control to the control program, it must place a return code in register 15, as follows:

4 indicates job step processing is to be continued and the output limit is to be increased by the value placed in register 1.

A value other than 4 indicates job step processing is to be canceled.

IEFU83 – SMF Record Exit

IEFU83 receives control before the SVC 83 routine buffers each record. This exit routine does not receive control for records whose writing has been suppressed either because of a system failure or because of options selected at IPL time. A user-written IEFU83 exit routine could:

- Select or suppress those records to be written to the SMF data set. For example, an installation with a large TSO account might want to suppress the SMF dynamic DD records (type 40).
- Check resource usage during a specific interval. For example, select records during the peak workload period.

Notes:

1. The IEFU83 exit routines access installation-defined data sets. Also, it cannot issue the SMFWTM or SMFEWTM macro instruction to write to the SMF data set.
2. The addresses of the user-communication and user-identification fields of the common exit parameter area are *not* passed to the IEFU83 exit routine. (To obtain these addresses, the exit routine could follow the pointers to the TCTJMR field via the TCB plus X'A4'.)
3. If IEFU83 abnormally terminates, SMF, in most cases, does not terminate. SMF marks the exit as invalid and issues message IEE952I to the operator. If the exit performs a critical function, the operator can issue a SET SMF or SETSMF command to terminate recording. Otherwise, recording continues, but SMF does not invoke the exit.

Parameters

At entry to the IEFU83 exit routine, register 1 points to the four-byte address of the record descriptor word (RDW) of the SMF record to be written.

Return Codes

Before the IEFU83 exit routine returns control to the control program, it must place a return code in register 15, as follows:

0 indicates the record is to be written to the SMF data set.

4 indicates the record is not to be written to the SMF data set.

IEFU84 – SMF Record Exit

IEFU84 receives control before the branch entered SMF writer (SMFEWTM BRANCH=YES) routine buffers each record. The routine may be running locked or in SRB mode. This exit routine does not receive control for records whose writing has been suppressed because of options selected at IPL time. A user-written IEFU84 exit routine could:

- Select or suppress those records to be written to the SMF data set. For example, an installation with a large TSO account might want to suppress SMF records for all but a few selected TSO users.
- Check resource usage during a specific interval. For example, select records during the peak workload period.
- Suppress some of the record type 30 subtypes.

Notes:

1. The IEFU84 exit routine cannot access installation-defined data sets. Also, it cannot use the SMFWTM or SMFEWTM macro instruction to write to the SMF data set.
2. Since IEFU84 may be locked or in SRB mode, the exit routine cannot issue any SVCs. IEFU83 may be given the alias name IEFU84, if IEFU83 can run locked or SRB mode.
3. The addresses of the user-communication and user-identification fields of the common exit parameter area are *not* passed to the IEFU84 exit routine. (To obtain these addresses, the exit routine could follow the pointers to the TCTJMR field via the TCB plus X'A4'.)
4. If IEFU84 abnormally terminates, SMF, in most cases, does not terminate. SMF marks the exit as invalid and issues message IEE952I to the operator. If the exit performs a critical function, the operator can issue a SET SMF or SETSMF command to terminate recording. Otherwise, recording continues, but SMF does not invoke the exit.
5. IEFU84 is called from the SMF address space rather than the master scheduler address space at system initialization (IPL) for record types 0, 8, 19, 22, and 90. Therefore, if IEFU84 references data in the master scheduler private area, which is no longer available, for record types 0, 8, 19, 22, and 90, you must modify the exit. Use cross memory instructions (SSAR, MVCP, and MVCS) to move data between the two address spaces.

Parameters

At entry to the IEFU84 exit routine, register 1 points to the four-byte address of the record descriptor word (RDW) of the SMF record to be written.

Return Codes

Before the IEFU84 exit routine returns control to the control program, it must place a return code in register 15, as follows:

0 indicates the record is to be written to the SMF data set.

4 indicates the record is not to be written to the SMF data set.

IEFACTRT – Termination Exit

IEFACTRT receives control from the terminator when each job or job step normally or abnormally terminates. If the System Availability Management (SAM) Function is active and operational, SMF calls the SAM job/step termination exit routine, AMSACT, before it calls IEFACTRT. A user-written IEFACTRT exit routine could perform various functions that are unique to an installation's requirements. For example, the routine could:

- Write selected job/step records to an installation-defined data set for further analysis.
- Include additional information in the SMF job/step termination records.
- Write messages to SYSOUT to provide additional information about the job/step. For example, if the operator canceled the job, issue a WTOR to learn why the job was canceled, and then write the reason as a message to SYSOUT.
- Write an estimated job/step cost to SYSOUT.
- Update tables that describe the amount of resources allowed to certain users. For example, keep a total of the CPU time used by specific users and flag their account numbers if they exceed their allowed time limit.

Notes:

1. IEFACTRT is the only exit routine than can write to the system output message data set, and only by passing a message to module IEFYS. If a user-written IEFACTRT exit routine writes messages for system output, the contents of register 12 must be the same as when the routine received control, and register 13 must contain the address of an 18-word work area. Figure 4-7 shows the procedure to use when writing system output messages from IEFACTRT. Note that the maximum number of characters printed on one line is 132.

```
            MVC    36(4,12),MSGADDR     MOVE MESSAGE ADDRESS AND
            MVC    42(2,12),MSGLEN      LENGTH TO SYSTEM TABLE
            L      REG15,VIEFYS         BRANCH AND LINK TO MESSAGE
            BALR   REG14,REG15          ROUTINE
MSGADDR     DC     A(MSG)
MSG         DC     C'message text'
MSGLEN      DC     H'xx'                MESSAGE LENGTH1
VIEFYS      DC     V(IEFYS)
```

[1]The message will be truncated to 132 characters if necessary.

Figure 4-7. Writing System Output Messages from IEFACTRT

2. IEFACTRT can direct output to the console or to the system output device. It can also write to the SMF data set or to an installation-defined data set. To use installation-defined data sets with this exit routine, you must define them with a DD statement in the initiator cataloged procedure.
3. At job step or job termination, use the termination indicators in record types 4, 5, and 30, to determine whether IEFACTRT canceled the job.
4. If the type 30 record exceeds 32,756 bytes and is split additional type 30 records are produced, and IEFACTRT is also entered for each of these records. See 'Notes' under the description of record 30 for more information concerning maximum length.

Parameters

At entry to the IEFACTRT exit routine, register 1 points to a list of four-byte addresses, as follows:

1. The address of the common exit parameter area. (See Figure 4-4.)
2. The address of an eight-byte area containing the job step name (in EBCDIC). This area is aligned left and padded with blanks if necessary. At job termination, the address is zero.
3. The address of a 20-byte area containing the programmer's name (in EBCDIC). This area is aligned left and padded with blanks if necessary.
4. The address of a four-byte area whose first three bytes contain the job CPU time under TCBs, in hundredths of a second (in binary), and whose last byte contains the number of accounting fields in the JOB statement (in binary).
5. The address of an area that contains accounting information from the JOB statement. This area has the format described earlier in Figure 4-5, excluding the first field shown (the number of accounting fields).
6. The address of a four-byte area whose first three bytes contain the step CPU time under TCBs, in hundredths of a second (in binary), and whose last byte contains the number of accounting fields in the EXEC statement (in binary). At job termination, the address is zero.
7. The address of an area that contains accounting information from the EXEC statement. This area has the format described earlier in Figure 4-5, excluding the first field shown (the number of accounting fields). At job termination, the address is zero.
8. The address of a two-byte area. The first byte is an indicator: if bit 7 is set to 1 when the exit routine is entered, the job has been canceled; if the exit routine sets bit 7 to 1, the job will be canceled. The second byte contains the number of the job step currently being processed. At job termination, the second byte contains the number of steps in the job.
9. The address of a two-byte area containing the termination status (condition or completion code) of the job or job step.
10. The address of an area containing a four-byte record descriptor word (RDW) immediately followed by the job step termination record (type 4 or 34) or the job termination record (type 5 or 35) or the common address space work record (type 30), or the TSO command counting record (type 32) to be written to the SMF data set.

Return Codes

At entry to the IEFACTRT exit routine, register 0 contains a binary code indicating the reason for entry, as follows:

12 indicates job step termination.

16 indicates job termination.

20 indicates job or step termination. The tenth parameter is the address of the RDW for a type 30 record. The subtype field in the record determines if it is a job or step termination record.

24 indicates that the tenth parameter is the address of the RDW for a type 32 record.

Return Codes

Before the IEFACTRT exit routine returns control to the control program, it must place return codes in registers 1 and 15, as follows:

- In register 1:

4	indicates the termination record is not to be written to the SMF data set.
A value other than 4	indicates the termination record is to be written to the SMF data set.

- In register 15:

4	indicates the remaining job steps are to be canceled.
A value other than 4	indicates job processing is to be continued.

IEFUJP – Job Purge Exit

IEFUJP receives control when a job entry subsystem is ready to purge a job from the system, that is, after a job has terminated and the system has written all the SYSOUT output that pertains to the job. A user-written IEFUJP exit routine could use the SMF job purge record (type 26) to summarize a job's activities in the system.

Note: To use installation-defined data sets with this exit routine, you must define them with a DD statement in the job entry subsystem cataloged procedure.

Parameters

At entry to the IEFUJP exit routine, register 1 points to a list of four-byte addresses, as follows:

1. The address of the common exit parameter area. (See Figure 4-4.)
2. The address of an area containing the job purge record (type 26) to be written to the SMF data set.

Return Codes

Before the IEFUJP exit routine returns control to the control program, it must place a return code in register 15, as follows:

4	indicates the job purge record is not to be written to the SMF data set.
A value other than 4	indicates the job purge record is to be written to the SMF data set.

IEFU29 – SMF Dump Exit

IEEMB829 calls IEFU29 whenever a SMF data set requires dumping. Some examples are:

- During SMF initialization for alternate data sets that are not empty.
- During SWITCH SMF command processing for a data set that is not yet full.
- During SMF processing when a data set becomes full.

A user-written IEFU29 exit routine can issue a WTO macro instruction requesting the operator to start the dump program or can initiate the dump program by submitting a job request to an internal reader. For more information on submitting a job request to an internal reader, see *System Modifications*.

Note: IEFU29 runs in the SMF address space. If an existing exit routine references data that exists in the private area of the master scheduler address space, you must modify the exit. Use cross memory instructions (SSAR, MVCP, and MVCS) to move data between the two address spaces.

Parameters

At entry to the IEFU29 exit routine, register 1 points to the four-byte address of the ten character data set name of the SMF data set to be dumped.

Return Codes

Before the IEFU29 exit routine returns control to the control program, it must place a return code in register 15. A return code of 4 indicates that the dump message, IEE362I or IEE362A, is to be suppressed. A value other than 4 indicates that the dump message, IEE362I or IEE362A, is to be issued.

Part II – Testing Exit Routines

Part II describes one method of testing user-written exit routines, the TESTEXIT procedure in SYS1.ASAMPLIB. This procedure contains an assembler language source program (also named TESTEXIT) which attaches the data generator utility program (IEBDG) to create sample parameter lists for all user-written exit routines except IEFU29. (The TESTEXIT procedure creates the parameter list for the IEFU29 exit routine without using the data generator utility program.) The source program then calls each user-written exit routine being tested, and passes the appropriate parameter list to it. Figure 4-8 illustrates the input/output and control flow of the TESTEXIT source program.

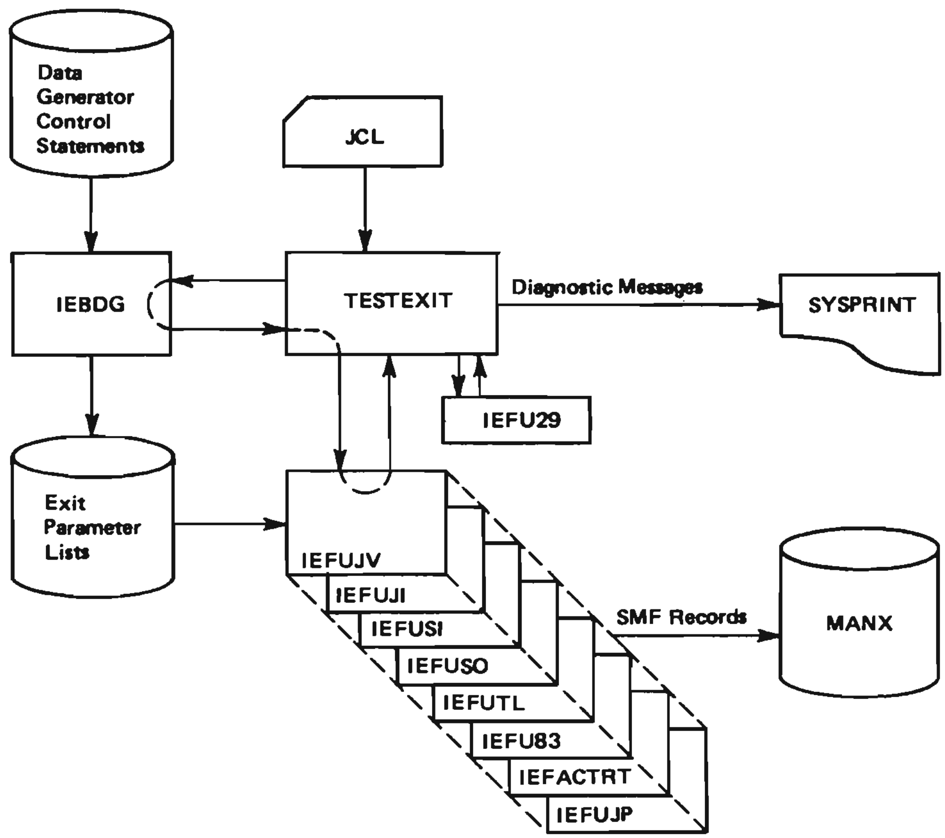


Figure 4-8. TESTEXIT Input/Output and Control Flow

Before using the TESTEXIT procedure:

1. Fulfill the following user-written exit routine testing requirements:
   - Specify a user subpool (0-127) in all GETMAIN macro instructions included in the routines.

- Provide a special SMFWTM macro instruction in all routines that use the macro.
- Place the routines in a partitioned data set.

2. Obtain the TESTEXIT procedure from SYS1.ASAMPLIB.
3. Modify the procedure to meet the installation's testing requirements.

TESTEXIT Exit Routine Requirements

Before using the TESTEXIT procedure, fulfill the following exit routine requirements:

- Specify a user subpool (0-127) in all GETMAIN macro instructions included in your routines. When testing is completed, specify one of the subpools shown in Figure 4-14 for the area used to communicate between exit routines (see Part III, "Obtaining Additional Work Areas").

- Provide a special SMFWTM macro instruction in all exit routines that use the macro. The special macro definition writes to the TESTEXIT data set defined by the DD statement named MANX. (With the normal SMFWTM macro instruction, the data is written to the active SMF data set.) Using this macro definition, then, data is processed without accessing the system data on the active SMF data set. When testing is completed, remove the macro definition. Figure 4-9 shows the SMFWTM macro instruction that is required for using the TEXTEXIT procedure.

```
         MACRO
&NAME    SMFWTM   &MSGAD
         AIF      ('&MSGAD' EQ '') . E1
         AIF      ('&MSGAD' EQ ' (1)') . BAL
         AIF      ('&MSGAD' (1,1) EQ '(') . REGA
         AGO      .LODIT
.E1      MNOTE    '*** NO OPERAND SPECIFIED ***'
         MEXIT
.BAL     ANOP
         CNOP     0,4
&NAME    BAL      15,*+8
.LIST    DC       V(TSMFWTM)
         L        15,0(15)
         BALR     14,15
         MEXIT
.REGA    ANOP
&NAME    LR       1,&MSGAD(1)
         CNOP     0,4
         BAL      15,*+8
         AGO      .LIST
.LODIT   ANOP
&NAME    LA       1,&MSGAD
         CNOP     0,4
         BAL      15,*+8
         AGO      .LIST
         MEND
```

Figure 4-9. SMFWTM Macro Definitions Required for Using TESTEXIT

- Place the exit routines in a partitioned data set named EXITLIB. Figure 4-10 shows sample JCL for entering the routines into EXITLIB.

```
//UPDTE       JOB     MSGLEVEL=1
//            EXEC    PGM=IEBUPDTE,PARM=NEW
//SYSUT2      DD      DSNAME=EXITLIB,VOLUME=SER=231400,
//            UNIT=3350,SPACE=(TRK,(10,3,1)),DISP=(,KEEP), .
//            DCB=(LRECL=80,BLKSIZE=400,RECFM=FB)
//SYSPRINT    DD      SYSOUT=A
//SYSIN       DD      DATA
./ ADD        NAME=IEFUJV
(IEFUJV object deck)
./ ADD        NAME=IEFUJI
(IEFUJI object deck)
./ ADD        NAME=IEFUSI
(IEFUSI object deck)
./ ADD        NAME=IEFUTL
(IEFUTL object deck)
./ ADD        NAME=IEFUSO
(IEFUSO object deck)
./ ADD        NAME=IEFU83
(IEFU83 object deck)
./ ADD        NAME=IEFACTRT
(IEFACTRT object deck)
./ ADD        NAME=IEFUJP
(IEFUJP object deck)
./ ADD        NAME=IEFU29
(IEFU29 object deck)
./ ADD        NAME=IEFU84
(IEFU84 object deck)
./ ENDUP
/*
```

Figure 4-10. Sample JCL for Entering User-Written Exit Routines into EXITLIB

Obtaining TESTEXIT from SYS1.ASAMPLIB

Figure 4-11 shows sample JCL for obtaining a punched deck of TESTEXIT from SYS1.ASAMPLIB.

```
//PUNCH       JOB       MSGLEVEL=1
//            EXEC      PGM=IEBPTPCH
//SYSPRINT    DD        SYSOUT=A
//SYSUT1      DD        DSNAME=SYS1.ASAMPLIB,DISP=(OLD,KEEP),
//            UNIT=xxxx,VOLUME=SER=xxxxxx1
//SYSUT2      DD        UNIT=2540-2
//SYSIN       DD        *
              PUNCH     TYPORG=PO,MAXNAME=1,MAXFLDS=1
              MEMBER    NAME=TESTEXIT
              RECORD    FIELD=(80)
/*
```

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

Figure 4-11. Sample JCL for Obtaining a Punched Deck of TESTEXIT

Modifying the TESTEXIT Procedure

Figure 4-12 shows sample JCL for executing the TESTEXIT procedure.

```
//TESTEXIT       JOB    MSGLEVEL=1
//TEST           EXEC   ASMFCL
//ASM.SYSIN      DD     *
(TESTEXIT Source Module)
/*
//LKED.SYSLMOD   DD   DSNAME=TESTLIB,VOLUME=SER=335000,
//             UNIT=3350,SPACE=(TRK,(5,2,1)),
//             DISP=(NEW,KEEP)
//LKED.EXITS     DD   DSNAME=EXITLIB,VOLUME=SER=335000,
//             UNIT=3350,DISP=OLD
//LKED.SYSIN     DD     *
  INCLUDE EXITS(IEFUJV,EFUJI,IEFUSI,IEFUTL,IEFUSO,
               IEFU83,IEFACTRT,IEFUJP,IEFU29,IEFU84)
  ENTRY TESTEXIT
  NAME TESTEXIT
/*
//DATAGEN        JOB    MSGLEVEL=1
//               EXEC   PGM=IEBGENER
//SYSUT2         DD     DSNAME=DGINPUT,UNIT=3350,DISP=(,KEEP),
//               VOLUME=SER=335000,SPACE=(TRK,(10,5,1)),
//               DCB=(LRECL=80,BLKSIZE=400,RECFM=FB)
//SYSPRINT       DD     SYSOUT=A
//SYSIN          DD     *,DLM=XX
   GENERATE MAXNAME=9,MAXGPS=0
   MEMBER   NAME=UJV
   RECORD   IDENT=(6,'ENDUJV',1)
   MEMBER   NAME=UJI
   RECORD   IDENT=(6,'ENDUJI',1)
   MEMBER   NAME=USI
   RECORD   IDENT=(6,'ENDUSI',1)
   MEMBER   NAME=UTL
   RECORD   IDENT=(6,'ENDUTL',1)
   MEMBER   NAME=U83
   RECORD   IDENT=(6,'ENDU83',1)
   MEMBER   NAME=ACT
   RECORD   IDENT=(6,'ENDACT',1)
   MEMBER   NAME=USO
   RECORD   IDENT=(6,'ENDUSO',1)
   MEMBER   NAME=UJP
   RECORD   IDENT=(6,'ENDUJP',1)
   MEMBER   NAME=U84
   RECORD   IDENT=(6,'ENDU84',1)
XX
//SYSUT1         DD     DATA,DLM=YY
                 DSD    OUTPUT=(OUTUJV)
                 (IEBDG Control Statements for IEFUJV)
ENDUJV           END
                 DSD    OUTPUT=(OUTUJI)
                 (IEBDG Control Statements for IEFUJI)
ENDUJI           END
                 DSD    OUTPUT=(OUTUSI)
                 (IEBDG Control Statements for IEFUSI)
```

Figure 4-12. Sample JCL for Executing TESTEXIT (Part 1 of 3)

```
ENDUSI          END
                DSD    OUTPUT=(OUTUTL)
                (IEBDG Control Statements for IEFUTL)
ENDUTL          END
                DSD    OUTPUT=(OUTU83)
                (IEBDG Control Statements for IEFU83)
ENDU83          END
                DSD    OUTPUT=(OUTACT)
                (IEBDG Control Statements for IEFACTRT)
ENDACT          END
                DSD    OUTPUT=(OUTUSO)
                (IEBDG Control Statements for IEFUSO)
ENDUSO          END
                DSD    OUTPUT=(OUTUJP)
                (IEBDG Control Statements for IEFUJP)
ENDUJP          END
                DSD    OUTPUT=(OUTU84)
                (IEBDG Control Statements for IEFU84)
ENDU84          END
YY
//TESTING       JOB    MSGLEVEL=1
//JOBLIB        DD     DSNAME=TESTLIB,VOLUME=SER=335000,
//              UNIT=3350,DISP=(OLD,KEEP)
//              EXEC   PGM=TESTEXIT,
// PARM='UJV=25,UJI=8,USI=8,USO=5,UTL=5,U83=12,ACT=2,UJP=2,U29=2,U84=12'
//INUJV         DD     DSNAME=DGINPUT(UJV),DCB=(LRECL=80,
//              BLKSIZE=400,RECFM=FB),DISP=(OLD,PASS),
//              UNIT=3350,VOLUME=SER=335000
//INUJI         DD     DSNAME=DGINPUT(UJI),DCB=(LRECL=80,
//              BLKSIZE=400,RECFM=FB),DISP=(OLD,PASS),
//              UNIT=3350,VOLUME=SER=335000
//INUSI         DD     DSNAME=DGINPUT(USI),DCB=(LRECL=80,
//              BLKSIZE=400,RECFM=FB),DISP=(OLD,PASS),
//              UNIT=3350,VOLUME=SER=335000
//INUSO         DD     DSNAME=DGINPUT(USO),DCB=(LRECL=80,
//              BLKSIZE=400,RECFM=FB),DISP=(OLD,PASS),
//              UNIT=3350,VOLUME=SER=335000
//INUTL         DD     DSNAME=DGINPUT(UTL),DCB=(LRECL=80,
//              BLKSIZE=400,RECFM=FB),DISP=(OLD,PASS),
//              UNIT=3350,VOLUME=SER=335000
//INU83         DD     DSNAME=DGINPUT(U83),DCB=(LRECL=80,
//              BLKSIZE=400,RECFM=FB),DISP=(OLD,PASS),
//              UNIT=3350,VOLUME=SER=335000
//INACT         DD     DSNAME=DGINPUT(ACT),DCB=(LRECL=80,
//              BLKSIZE=400,RECFM=FB),DISP=(OLD,PASS),
//              UNIT=3350,VOLUME=SER=335000
//INUJP         DD     DSNAME=DGINPUT(UJP),DCB=(LRECL=80,
//              BLKSIZE=400,RECFM=FB),DISP=(OLD,PASS),
//              UNIT=3350,VOLUME=SER=335000
//INU84         DD DSNAME=DGINPUT(U84),DCB=(LRECL=80,
//              BLKSIZE=400,RECFM=FB),DISP=(OLD,PASS),
//              UNIT=3350,VOLUME=SER=335000
```

Figure 4-12. Sample JCL for Executing TESTEXIT (Part 2 of 3)

```
//OUTUJV       DD      DSNAME=UJV(OUT),UNIT=3350,DISP=(,PASS),
//             SPACE=(TRK,(10,5,1)),VOLUME=SER=335000,
//             DCB=(LRECL=80,BLKSIZE=400,RECFM=FB)
//OUTUJI       DD      DSNAME=UJI(OUT),UNIT=3350,DISP=(,PASS),
//             SPACE=(TRK,(10,5,1)),VOLUME=SER=335000,
//             DCB=(LRECL=80,BLKSIZE=400,RECFM=FB)
//OUTUSI       DD      DSNAME=(USI(OUT),UNIT=3350,DISP=(,PASS),
//             SPACE=(TRK,(10,5,1)),VOLUME=SER=335000,
//             DCB=(LRECL=80,BLKSIZE=400,RECFM=FB)
//OUTUSO       DD      DSNAME=(USO(OUT),UNIT=3350,DISP=(,PASS),
//             SPACE=(TRK(10,5,1)),VOLUME=SER=335000,
//             DCB=(LRECL=80,BLKSIZE=400,RECFM=FB)
//OUTUTL       DD      DSNAME=UTL(OUT),UNIT=3350,DISP=(,PASS),
//             SPACE=(TRK,(10,5,1)),VOLUME=SER=335000,
//             DCB=(LRECL=80,BLKSIZE=400,RECFM=FB)
//OUTU83       DD      DSNAME=U83(OUT),UNIT=3350,DISP=(,PASS),
//             SPACE=(TRK,(10,5,1)),VOLUME=SER=335000,
//             DCB=(LRECL=130,BLKSIZE=130,RECFM=FB)
//OUTACT       DD      DSNAME=ACT(OUT),UNIT=3350,DISP=(,PASS),
//             SPACE=(TRK,(10,5,1)),VOLUME=SER=335000,
//             DCB=(LRECL=180,BLKSIZE=180,RECFM=FB)
//OUTUJP       DD      DSNAME=UJP(OUT),UNIT=3350,DISP=(,PASS),
//             SPACE=(TRK,(10,5,1)),VOLUME=SER=335000,
//             DCB=(LRECL=130,BLKSIZE=130,RECFM=FB)
//OUTU84       DD DSNAME=U84(OUT),UNIT=3350,DISP=(,PASS),
//             SPACE=(TRK,(10,5,1)),VOLUME=SER=335000,
//             DCB=(LRECL=130,BLKSIZE=130,RECFM=FB)
//MANX         DD      UNIT=3350,VOLUME=SER=335000,DSN=MANX,
//             SPACE=(TRK,(3,1)),DISP=(NEW,KEEP),
//             DCB=(BLKSIZE=200,LRECL=196)
//SYSPRINT     DD      SYSOUT=A,DCB=(BLKSIZE=136,LRECL=132)
//DGPRINT      DD      SYSOUT=A
//SYSABEND     DD      SYSOUT=A
/*
```

Figure 4-12. Sample JCL for Executing TESTEXIT (Part 3 of 3)

A summary of the operations performed by the procedure shown in Figure 4-12 is as follows:

- The TESTEXIT job assembles the TESTEXIT source program (not illustrated in the figure) and link-edits it with the exit routines being tested. (Note that the exit routines must reside in EXITLIB, a partitioned data set.)
- The DATAGEN job, using the IEBGENER utility program, creates a partitioned data set (DGINPUT) containing control statements for the IEBDG utility program, which will be attached by the TESTEXIT source program.
- The TESTING job includes the execution of the TESTEXIT source program.

Use the TESTEXIT procedure provided in SYS1.ASAMPLIB to link-edit the sample exit routines in SYS1.ASAMPLIB, generate sample parameter lists, and test the sample exit routines. To adapt the TESTEXIT procedure to your installation's testing requirements, however, note the following modifications:

- The TESTEXIT job shown in Figure 4-12 link-edits the TESTEXIT source program with the exit routines. The TESTEXIT procedure in SYS1.ASAMPLIB contains ten exit names in the INCLUDE statement. However, when you use the TESTEXIT procedure your INCLUDE statement should contain only the names of the exit routines you are testing.

- The DATAGEN job shown in Figure 4-12 creates a partitioned data set containing the IEBDG control statements that generate samples of standard parameter lists. The TESTEXIT procedure contains the control statements for nine exits. Note that control statements are not required for the IEFU29 exit routine because the TESTEXIT procedure creates the parameters needed to test that routine. When using the TESTEXIT procedure you should include only those statements needed for the routine you are testing. When testing for special conditions or required additional test parameters, you must make appropriate modifications and additions to the control statements.
  Note that you must supply control statements in such an order that the records subsequently generated by the IEBDG utility program will be grouped as complete parameter lists that conform in length and format to the exit parameters previously defined in this chapter. (Be sure to include the entry code passed to exits IEFUTL and IEFACTRT in register 0 as a one-byte parameter at the end of the parameter lists for those exits.) For detailed information on the use of IEBDG control statements, see *Utilities.*
- The TESTING job shown in Figure 4-12 includes the execution of the TESTEXIT source program. Values for the PARM parameter of the EXEC statement specify which exit routines are to be tested and the number of times each is to be tested. The TESTEXIT procedure in SYS1.ASAMPLIB contains the parameters to test ten exits. However, when you use the TESTEXIT procedure you should include only the parameters for the routines you are testing. This parameter has the format:

```
PARM='xxx=nnn,... ,xxx=nnn'
```

where:

xxx
is an exit routine identifier.

nnn
is the number of times an exit routine is to be tested (the maximum value is 255).

The DD statements to be included depend upon the exit routines being tested. The TESTEXIT procedure contains DD statements for nine exits as shown in the sample (Figure 4-12). When you use the TESTEXIT procedure you should include only the DD statements for exits you are testing. DD statements are not required for the IEFU29 exit. Figure 4-13 shows the exit-routine identifiers, specified on the EXEC statement, and the DD statements that you must include for each exit routine being tested.

Exit Routine	Identifier	DD Statements
IEFUJV	UJV	INUJV, OUTUJV
IEFUJI	UJI	INUJI, OUTUJI
IEFUSI	USI	INUSI, OUTUSI
IEFUTL	UTL	INUTL, OUTUTL
IEFUSO	USO	INUSO, OUTUSO
IEFU83	U83	INU83, OUTU83
IEFU84	U84	INU84, OUTU84
IEFACTRT	ACT	INACT, OUTACT
IEFUJP	UJP	INUJP, OUTUJP
IEFU29	U29	Not required
Any		MANX, SYSPRINT, DGPRINT, SYSABEND

Figure 4-13. Parameters and DD Statements for Executing TESTEXIT

Note that you must include DD statements for any other data sets used by the exit routines in the JCL for the TESTEXIT procedure.

Part III – Exit Routine Facilities

Part III describes the facilities available to user-written exit routines. The following macro facilities are described later in Part III:

- IFASMFR
- SMFWTM
- SMFEWTM
- SMFRTEST
- SMFEXIT
- SMFINTVL
- SMFDETAL
- SMFSUBP
- SMFCHSUB

Part III also details how user-written exit routines can communicate with each other and how to obtain additional work areas. For more information on the facilities that apply to a specific exit routine, see that exit routine described in Part I of this chapter.

Communicating Between Exit Routines

User-written exit routines can communicate with each other in two ways: by using the user-communication field or by using the user-identification field. Both of these fields are contained in the common exit parameter area, which is passed to all user-written exit routines except IEFU83, IEFU84, and IEFU29.

All exit routines (except IEFU83, IEFU84, and IEFU29) that are executing within the same job can communicate via the user-communication field (displacement 32 in Figure 4-4) and the user-identification field (displacement 20 in Figure 4-4). Either data or the address of a data area can be placed in the communication field. However, passing the address of a data area can cause a problem. For example, assume the user exit IEFUJV runs on the global processor with JES3. The exit issues a GETMAIN, and stores the address of the data area in the user communication field. Unless the related job runs on the same processor, it will terminate abnormally. The same problem can occur if a system restart occurs after IEFUJV sets the address but before the related job tries to use the address. Additionally, jobs that are requeued for execution or warm started through the $E command also contain invalid data.

Notes:

1. The user-communication field is initialized to zeros by the job entry subsystem each time a job begins execution; the user-identification field is initialized to EBCDIC blanks each time a job is read. Neither of these fields is maintained if the system is restarted.
2. If there is communication between exits, use care in creating the SMF parmlib members; make sure that all exits involved are included in each member.

Obtaining Additional Work Areas

Any user-written exit routine can obtain an additional work area by issuing a GETMAIN macro instruction that specifies an appropriate subpool. Figure 4-14 shows the subpools (and their characteristics) that are required to obtain additional work areas. Be sure to consider the storage required by an additional work area when estimating the sizes of the common service area (CSA), system queue area (SQA), and local system queue area (LSQA).

Subpool Number	Area in Storage	Attributes of Subpool	Notes
229	Private Area Storage	User protection key Pageable Fetch-protected	Automatically freed at task termination. Assigned from top of private area.
230	Private Area Storage	User protection key Pageable Not fetch-protected.	Automatically freed at task termination. Assigned from top of private area.
231	CSA	Explicitly freed Pageable Fetch-protected System-oriented User Key	Because subpool 231 is fetch-protected, use it for exit communication only among exits of the same key (see Figure 4-3).
241	CSA	Explicitly freed Pageable Not fetch-protected System-oriented User key	Because SMF exit routines receive control in different keys (see Figure 4-3), and subpool 241 is not fetch-protected, use it for read access from all exits.
245	SQA	Explicitly freed Fixed Not fetch-protected System-oriented Key=0	Allows a task running in key 0 to acquire non-accountable, fixed, protected storage that is system-oriented.
253	LSQA (task-related)	Automatically freed at end of task Fixed Not fetch-protected Job-oriented Key=0 Swappable	Allows a task running in key 0 to acquire fixed, accountable, protected storage in the LSQA for the user's region that is job-oriented and freed when the task terminates.
254	LSQA (step-related)	Automatically freed at end of step Fixed Not fetch-protected Job-oriented Key=0 Swappable	Allows a task running in key 0 to acquire fixed, accountable, protected storage in the LSQA for the user's region that is job-oriented and freed when the job step terminates.
255	LSQA	Explicitly freed Fixed Not fetch-protected Job-oriented Key=0 Swappable	Allows a task running in key 0 to acquire fixed, non-accountable, protected storage in the LSQA that is job-oriented and must be explicitly freed.

Figure 4-14. Required Subpools for Obtaining Additional Work Areas

Using the IFASMFR Macro to Address SMF Record Fields

Use the IFASMFR macro instruction in user-written exit routines (or in any problem program application) to symbolically address SMF record fields. The macro instruction is written in assembler language and is supplied on SYS1.AMODGEN. Depending on your installation's requirements, you may want to copy the IFASMFR macro from SYS1.AMODGEN into your own macro library or SYS1.MACLIB. Note that the IFASMFR macro is distributed as 14 submacros: IFASMFR, IFASMFR1, IFASMFR2, . . . IFASMFR9, IFASMFRA, . . . IFASMFRD.

The format of the IFASMFR macro is:

```
IFASMFR n
```

where:

n

is the record type to be defined. You must specify at least one record type with the macro; if more than one record type is specified, you must enclose the record types in parentheses and separate them by commas. The values for n can be: 0, 2-11, 14, 15, 17-23, 24 (JES2 only), 25 (JES3 only), 26, 30-32, 34, 35, 37, 40, 43, 45, 47-49, 52-59, 62-64, 67-74, 80-81, 90. For records not listed, see the description of the record in "SMF Records."

Notes:

1. The "Name" column in all the SMF record formats (see the chapter "SMF Records") contains the symbolic addresses defined by the IFASMFR macro instruction.
2. Do not specify both record type 14 and record type 15 in the same program. Because these records are identical, whenever record type 15 is specified in the IFASMFR macro, record type 14 is defined.
3. 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 instruction. (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).
4. To address SMF record fields for record types 60, 61, 65, and 66, use the IFASMFI6 macro instruction instead of IFASMFR macro instruction.
5. To generate the JES SMF record mappings, IFASMFR invokes the IAZSMFR macro. Both IFASMFR and IAZSMFR should reside on macro libraries used in your SYSLIB concatenation. IAZSMFR is supplied on SYS1.MACLIB and is distributed as 14 submacros: IAZSMF25, 26, 43, 45, 47, 48, 52 . . . 58.

Using the SMFWTM Macro to Write Records

Use the SMFWTM macro instruction to write records to the SMF data set. The address of each record to be written must be less than 16 megabytes. If the address is greater than 16 megabytes, the routine that issued SMFWTM abends with an X'353' system completion code. You can use this macro in any exit routine that has a storage protect key of zero except IEFU83 and IEFU29 (see Figure 4-3), and in any installation problem program that has an APF authorization. The SMFWTM macro is written in assembler language and is supplied on SYS1.MACLIB. Its format is:

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

where:

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 128 through 255 are available for user-written records. When using the SMFWTM macro instruction to write user records, you must provide the standard SMF record header, which includes a record descriptor word (RDW) for the record. You must also fill in the date, time, and system identifier in the record header. While the system identifier can be any four character identifier, specifying the SMCASID is consistent with the system records SMF produces. (For a description of the standard SMF record header, see the chapter "SMF Records" in this book. For a description of the RDW, see *Data Management Services.)*

Record types 0 through 127 are SMF-formatted records. For all SMF-formatted records you must supply:

- The RDW (offsets 1 and 2 in Figure 6-1 and 6-2)
- The record type field in the standard SMF record header (offset 5 in Figure 6-1 and Figure 6-2)

The SMFWTM macro supplies the remaining header information.

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

The SMFWTM macro instruction returns a code in register 15 that indicates the record's status, as follows:

- 0 indicates the record was written without error.
- 8 indicates the record was not written because the length specified in the RDW was less than 18 bytes.
- 16 indicates the record was not written because SMF is not active.

- 20 indicates the record was not written because the user-written IEFU83 exit routine suppressed the record.
- 24 indicates that the record was not written because the data was lost.
- 36 indicates that the record was not written because the record specified is not currently being recorded.
- 40 indicates that the record was not written because a buffer storage caused the data to be lost
- 44 indicates that the record was not written because SVC 83 was unable to establish recovery.

Using the SMFEWTM Macro to Write Records

Use the SMFEWTM macro instruction to write records to the SMF data set. The address of each record to be written must be less than 16 megabytes. If the address is greater that 16 megabytes, the routine that issued SMFEWTM abends with an X'353' system completion code. You can use this macro in any exit routine that is in supervisor state except IEFU83, IEFU84, and IEFU29 (see Figure 15), 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 the SVC routine without issuing the SVC. When you invoke SMFEWTM, the macro makes reference to two fields SMCAMACR and SMCABASE found in the SMCA control block. Because SMF uses this control block as a major communication area, you can check these two SMCA fields to determine if SMF is active. The SMFEWTM macro is written in assembler language and is supplied on SYS1.MACLIB. Its format is:

```
[label] SMFEWTM [rec addr]  [{,BRANCH=NO }]
                            [{,BRANCH=YES}]

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

The parameters are:

rec addr
: specifies the address or the register (2)-(12), that contains the address of the record to be written.

,BRANCH=NO
,BRANCH=YES
: specifies the entry method to the SVC routine. If BRANCH=NO is specified, the macro generates an SVC 83. If BRANCH=YES is specified, the macro generates a call to the subroutine that moves the data to the SMF buffer. 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.

All SMF records are given to user exits before they are written to the SMF data set. If you specify BRANCH=NO (or use the SMFWTM macro), user exit IEFU83 is invoked. If you specify BRANCH=YES, user exit IEFU84 is invoked.

Notes: If you are currently using the SMFWTM macro to write SMF records and change to the SMFEWTM macro, BRANCH=YES, then the SMF records are given to user exit IEFU84 (rather than user exit IEFU83).

,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 a register is used, the register must be enclosed in parentheses.

If SUBSYS is not specified, the subsystem name for the current address space is used. For example, TSO for TSO users, STC for started tasks, and the name of the job entry subsystem (JES2 or JES3) for batch jobs.

The subsystem name is compared with the list of subsystems specified in SMFPRMxx. If the subsystem is listed in SMFPRMxx, the options for that subsystem are used to determine if the record is written. Otherwise, the options specified for the entire system by means of the SYS option are used.

,WRKAREA=addr
,WRKAREA=(reg)

specifies the address or a register (2)–(12) that points to a five-word work area that you must supply for SMF to use. If a register is specified, the register must be enclosed in parentheses. WRKAREA must be specified if SUBSYS is specified.

Record types 0 through 127 are SMF-formatted records. For all SMF-formatted records you must supply the RDW:

- The RDW (offsets 1 and 2 in Figure 6-1 and 6-2)
- The record type field in the standard SMF record header (offset 5 in Figure 6-1 and 6-2)

The SMFEWTM macro supplies the remaining header information.

Record types 128 through 255 are available for user-written records. When using the SMFEWTM macro instruction to write user records, you must provide the standard SMF record header, which includes a four-byte record descriptor word (RDW) for each record. You must also fill in the date, time, and system identifier in the record header. While the system identifier can be any four character identifier, specifying the SMCASID is consistent with the system records SMF produces. (For a description of the standard SMF record header, see the chapter "SMF Records" in this book. For a description of the RDW, see *Data Management Services*.)

Using the SMFEWTM Macro to Write Records (continued)

The SMFEWTM macro instruction returns a code in register 15 that indicates the record's status, as follows:

- 0 indicates the record was written without error.
- 8 indicates the record was not written because the length specified in the RDW was less than 18 bytes.
- 16 indicates the record was not written because SMF is not active.
- 20 indicates the record was not written because the user-written IEFU83 or IEFU84 exit routine suppressed the record.
- 24 indicates that the record was not written because the data was lost.
- 36 indicates that the record was not written because the record type specified is not currently being recorded.
- 40 indicates that the record was not written because a buffer shortage caused the data to be lost.
- 44 indicates that the record was not written because SVC 83 could not establish recovery.

Using the SMFRTEST Macro to Test Record Recording

The SMFRTEST macro instruction allows a user to determine if a particular type of record is being recorded. This macro should be issued before collecting data for a record to avoid the overhead of data collection if the record is not written. The syntax is as follows:

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

The parameters are:

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 reg is specified, the register (2)-(12) contains the record type. The record type must be right-justified 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 a register is used, the register must be enclosed in parentheses.

If SUBSYS is not specified, the subsystem name for the current address space is used. For example, TSO for TSO users, STC for started tasks, and the name of the job entry subsystem (JES2 or JES3) for batch jobs.

Using the SMFRTEST Macro to Test Record Recording (continued)

The subsystem name is compared with the list of subsystems specified in SMFPRMxx. If the subsystem is listed in SMFPRMxx, the options for that subsystem are used to determine if the record type is selected. Otherwise, the options specified for the entire system through the SYS option are used.

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

Code	*Meaning*
00	The record type is being recorded.
16	SMF is not active.
36	Information is not being collected for the specified record type.

Note: 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.

Using the SMFEXIT Macro to Branch to the SMF Exits

The SMFEXIT macro instruction allows the user to branch directly to any user-written SMF exit that resides in the SYS1.LPALIB. The SMF exit name must have been defined to SMF with the EXIT parameter before the macro instruction is issued.

The syntax is as follows:

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

The parameters are:

exitname
specifies the load module name of the exit.

,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 a register is used, the register must be enclosed in parentheses.

If SUBSYS is not specified, the subsystem name for the current address space is used. For example, TSO for TSO users, STC for started tasks, and the name of the job entry subsystem (JES2 or JES3) for batch jobs.

The subsystem name is compared with the list of subsystems specified in SMFPRMxx. If the subsystem is listed in SMFPRMxx, the options for that subsystem are used to determine if the exit is to be invoked. Otherwise, the options specified for the entire system through the SYS option are used.

,WORKREG=(reg)
specifies a register that is intended for exits that run in 31-bit addressing mode. SMF uses this register to save and restore the caller's addressing mode and return address. If you do not specify this parameter, the default is register 2.

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 user-exit routine can place a return code in register 15. For more information see the section, "User-Written Exit Routines".

Using the SMFINTVL Macro to Determine Interval Time

The SMFINTVL macro instruction allows the user to determine the current INTERVAL value specified for a subsystem. A user subsystem could use this value to set up interval recording for a subsystem and MVS supervisor services to set up the timer value. For example, MVS uses this macro to determine how often to write interval type 30 records to SMF.

The format is:

```
[label] SMFINTVL (interval) [,SUBSYS= {(reg) }]
                                      {name  }
```

The parameters are:

interval
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 an unsigned 64-bit fixed-point number, where bit 51 is equivalent to 1 microsecond.

,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 a register is used, the register must be enclosed in parentheses.

If SUBSYS is not specified, the subsystem name for the current address space is used. For example, TSO for TSO users, STC for started tasks, and the name of the job entry subsystem (JES2 or JES3) for batch jobs.

The subsystem name is compared with the list of subsystems specified in SMFPRMxx. If the subsystem is listed in SMFPRMxx, the options for that subsystem are used to determine the length of the interval. Otherwise, the options specified for the entire system through the SYS option are used.

Using the SMFINTVL Macro to Determine Interval Time (continued)

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

Code	*Meaning*
00	(interval) contains the address of the interval value.
04	There is no interval time defined. The contents of (interval) are unpredictable.
16	SMF is not active. The contents of (interval) are unpredictable.

Using the SMFDETAL Macro to Test Detail Recording

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

The syntax is as follows:

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

The parameters are explained below:

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 a register is used, the register must be enclosed in parentheses.

If SUBSYS is not specified, the subsystem name for the current address space is used. For example, TSO for TSO users, STC for started tasks, and the name of the primary job entry subsystem (JES2 or JES3) for batch jobs.

The subsystem name is compared with the list of subsystems specified in SMFPRMxx. If the subsystem is listed in SMFPRMxx, the options for that subsystem are used to determine if detail level data is requested. Otherwise, the options specified for the entire system through the SYS option are used.

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

Code	*Meaning*
00	Detail recording is in effect.
04	Detail recording for the subsystem is not in effect.
16	SMF is not active.

Using the SMFSUBP Macro to Determine Subsystem Parameters

An installation specifies a parameter string for a specific subsystem on the SUBPARM parameter in the SMF parmlib member. A user-defined subsystem issues the SMFSUBP macro instruction during subsystem initialization or after the subsystem interface call generated by a SET or SETSMF operator command.

The syntax is as follows:

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

The parameters are:

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 four-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	Reserved
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	Reserved

- The console identifier in the remaining byte

,SUBSYS=(reg)
,SUBSYS=name

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 address of the SUBPARM value for the subsystem name of the current address space is returned.

When the macro instruction returns control, register 15 contains one of the following return codes:

Code	*Meaning*
0	Successful completion of the macro
4	No SUBPARM parameters are entered for the specified subsystem.
16	SMF is not active.

Using the SMFCHSUB Macro to Change Subsystem Parameters

A user-defined subsystem issues the SMFCHSUB macro instruction to change the information string specified in the current SUBPARM parameter. A user-defined subsystem issues this macro instruction 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.

The syntax is as follows:

$$\text{(label) SMFCHSUB SUBSYS=}\left\{\begin{array}{c}\text{(reg)}\\ \text{name}\end{array}\right\}\left[\text{,SUBPARM=}\left\{\begin{array}{c}\text{(reg)}\\ \text{(addr)}\end{array}\right\}\right]$$

The parameters are:

SUBSYS=name
SYBSYS=(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) for the subsystem of the current address space is changed.

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.

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

Code	*Meaning*
0	Successful completion of the macro instruction.
4	No SUBPARM value found; thus, the value was not changed.
8	A SETSMF or a SET command is currently being processed. SUBPARM is not changed for this request. The subsystem can reissue the macro instruction.
12	A DISPLAY command for SMF is currently being processed. SUBPARM is not changed for this request. The subsystem can reissue the macro instruction.
16	SMF is not active.

Chapter 5: User-Written Report Programs

The SMF dump program (IFASMFDP) can be used to create data sets containing certain record types. In addition, the dump program produces a summary activity report. In some cases, an installation may wish to produce their own report. Producing a report usually requires at least two operations: sorting the SMF records and writing them in an appropriate format.

For those installations choosing 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, thereby 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 OS/VS Sort/Merge Program Product (Program No. 5740-SM1). (For a detailed description of this particular sort/merge program, see *OS/VS Sort/Merge Programmer's Guide.*)

Sample Sort/Merge Exit Routines

The IBM OS/VS Sort/Merge Program Product can, during various phases of execution, pass control to routines designed and written to perform specific functions. SYS1.ASAMPLIB 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 and time and date that the reader recognized the JOB card) from the SMF dump data set. SMFE15 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 5-1 shows sample JCL for obtaining a listing of the SMFE15 and SMFE35 exit routines from SYS1.ASAMPLIB. Figure 26 also shows sample JCL for obtaining a listing of the SYS1.ASAMPLIB member named SMFSORT. SMFSORT contains sample JCL for executing the IBM OS/VS Sort/Merge Program Product.

```
//PRINT      JOB      123456,SMITH
//           EXEC     PGM=IEBPTPCH
//SYSPRINT   DD       SYSOUT=A
//SYSUT1     DD       DSNAME=SYS1.ASAMPLIB,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 5-1. Sample JCL for Obtaining a Listing of Sample Sort Exit Routines

To include the sample exit routines in your sort application, you must assemble and link-edit them before executing the sort/merge program. Figure 5-2 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 (as shown in the record formats in the next chapter) are 14, 6, and 2. Note, however, that you must add an additional four bytes for the 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 5-2.

```
//SMFSORT          JOB     MSGLEVEL=1
//STEP1            EXEC    ASMFCL(1)
//ASM.SYSIN        DD      *
(E15 Source Deck)
/*
//LKED.SYSLMOD     DD      DSNAME=SMF1.EXITS,UNIT=2314,(2)
//                         DISP=(NEW,KEEP),SPACE=(TRK,(10,5,1)),
//                         VOL=SER=335000
//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=3350,VOL=SER=335000
//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=3350,VOL=SER=335000
//SORTIN           DD      UNIT=2400, VOL=SER=SYSMAN,DISP=OLD,(6)
//                 LABEL=(,SL),DCB=(RECFM=VBS,LRECL=600,BLKSIZE=200)(7)
//SORTWK01         DD      UNIT=3350,SPACE=(TRK,(50),,CONTIG)(8)
//SORTWK02         DD      UNIT=3350,SPACE=(TRK,(50),,CONTIG)(8)
//SORTWK03         DD      UNIT=3350,SPACE=(TRK,(50),,CONTIG)(8)
//SORTOUT          DD      UNIT=2400,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
/*
```

[1] EXEC statement for cataloged procedure ASMFCL (assemble and link-edit). (For a description of the ASMFCL procedure, see *Assembler H Version 2: Application Programming 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.

Figure 5-2. Sample JCL for Executing a Sort Procedure

Designing a Report Program

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

SYS1.ASAMPLIB 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. Figure 5-3 illustrates a sample SMF activity report and an operator tracking report produced by SMFFRMT.

```
                                                                                                                PAGE      1
                                                    SMF ACTIVITY REPORT
                  TIME    5:01:47 PM                                                                     DATE  05/03/85

SYSTEM TIME RECORD  DATA REC  REC  PRODUCT  REPORTING  RELEASE  BUFFERS     RECORDS    BUFFERS       RECORDS  MAX FULL    # USERS
 ID        WRITTEN   WRITTEN  VER     NAME   INTERVAL   NUMBER  WRITTEN     WRITTEN    PER MIN       PER SEC   BUFFERS  SUSPENDED

 168A  10:30:37.86  03/20/79   01 SMF       01:00:00      038       11         208       0.18          0.05         9         00
 168A  11:51:03.51  03/20/79   01 SMF       01:00:00      038       04          67       0.06          0.01         1         00
 168A  12:51:03.82  03/20/79   01 SMF       01:00:00      038       00          09       0.00          0.00         0         00
 168B  13:51:03.92  03/20/79   01 SMF       01:00:00      038       00          13       0.00          0.00         0         00
 168A  12:37:04.41  03/20/79   01 SMF       00:05:00      038       07         111       1.40          0.37         1         00
 168A  12:39:25.11  01/12/12   01 SMF       01:00:00      038       00          12       0.00          0.00         0         00
 MINE  21:06:39.15  03/20/79   01 SMF       00:01:00      038       01          36       1.00          0.60         1         00
 MINE  21:07:39.17  03/20/79   01 SMF       00:01:00      038       00          04       0.00          0.06         0         00

   TOTAL / AVERAGE / MAXIMUM                                        23         460       0.07          0.02         9         00
```

```
                                                 OPERATOR TRACKING REPORT                                       PAGE     27
                  TIME    5:01:47 PM
                                                                                                         DATE  05/03/85
SYSTEM TIME RECORD  DATE REC  REC  PRODUCT
 ID        WRITTEN   WRITTEN  VER     NAME
 168A  12:12:43.12  03/20/79   01 SMF

 ***  SMF OPTIONS AT SET

      MAXDORM   STATUS   JOB WAIT TIME   SYSTEM   MIN   MAX   REL
       MM:SS HH:MM:SS            HH:MM     ID     BUFS  BUFS  NUM       IPL TIME     IPL DATE

       30:00 01:00:00            00:10    168A      4      9  038     11:18:49.88    03/20/79

           PROMPT(ALL)        REC(PERM)         LISTDSN

      ACTIVE SMF RECORDING DATA SETS

           SYS1.MANC    SYS1.MAND

      RECORDING OPTIONS BY SUBSYSTEM

               SYS NAME  DETAIL RECORDING   INTERVAL

                  SYS       NOT IN EFFECT   * NONE *

               RECORDS COLLECTED FOR THIS SUBSYSTEM  (BITS REPRESENT COLLECTABLE RECORDS)

                   FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF

               ACTIVE SMF EXITS FOR THIS SUBSYSTEM

                   IEFUTL    IEFUSI    IEFUJV    IEFUJI    IEFACTRT  IEFU29    IEFU84    IEFU83

               SYS NAME  DETAIL RECORDING   INTERVAL

                  TSO            IN EFFECT  * NONE *

               RECORDS COLLECTED FOR THIS SUBSYSTEM  (BITS REPRESENT COLLECTABLE RECORDS)

                   FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF

               ACTIVE SMF EXITS FOR THIS SUBSYSTEM

                   IEFU83    IEFU84    IEFU29    IEFACTRT  IEFUJI    IEFUJV    IEFUSI    IEFUTL
```

Figure 5-3. Sample Output from SMFFRMT

Before using the SMFFRMT program, you must compile the program using the PL/I compiler. Figure 5-4 shows sample JCL for executing the SMFFRMT program after it is compiled and link-edited into SYS1.LINKLIB.

```
//FORMAT      JOB    MSGLEVEL=1
//FRMT        EXEC   PGM=SMFFRMT
//SYSPRINT    DD     SYSOUT=A
//REPORT      DD     SYSOUT=A
//SMFDATA     DD     DISP=(OLD,KEEP),LABEL=(,SL),VOL=SER=xxxxxx,DSN=nnn,
//                   UNIT=2400
```

Figure 5-4. Sample JCL for Executing SMFFRMT

Chapter 6: SMF Records

This chapter fully describes all of the SMF-formatted records. Note that the fields in these records marked "Reserved" are for use by SMF and are not available for your use.

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 also include the standard record header. The length and field types for the record header vary with the kind of record written. Figure 6-1 illustrates the header for records without subtypes; its length is 18 bytes. Figure 6-2 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 make use of 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 precede an 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 32,760 bytes. This field (the second two bytes) is set to zero if the record is *not* spanned. For a discussion of the RDW, see *Data Management Services.*

Offsets		Name	Length	Format	Source	Description
0	0	(The "Name" field in all of the SMF records contains the symbolic addresses defined by the IFASMFR macro instruction.)	2	binary	internal	Record length (maximum size of 32,760)[1]
2	2		2	binary	internal	Segment descriptor[1]
4	4		1	binary	SVC 83 internal SVC 83 SVC 83 SVC 83	System indicator *Bit* *Meaning When Set* 0 Subsystem identification follows system identification 1-4 Reserved 5 MVS/XA 6 VS2 7 VS1
5	5		1	binary	internal	Record type (Hexadecimal values are 0-255)
6	6		4	binary	SVC 11 or SVC 83	Time since midnight, in hundredths of a second, record was presented to SMF[2]
10	A		4	packed	SVC 11 or SVC 83	Date record was presented to SMF, in the form 00YYDDDF, where F is the sign[2]
14	E		4	EBCDIC	JUMRCPUID or SMCASID	System identification (taken from SID parameter)

[1]These two fields (total of four bytes) form the record descriptor word (RDW). The first two bytes must contain the logical record length including the RDW. The second two bytes 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.

[2]In record types 2 and 3, these fields indicate the time and date that the record was moved to the dump data set.

Notes:

1. 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. In this case, you might have to subtract four bytes from the offsets listed in your record.

2. For MVS/XA, both the MVS/XA bit and the VS/2 bit are set.

Figure 6-1. Standard SMF Record Header for Records without Subtypes

Offsets		Name	Length	Format	Source	Description
0	0	(The "Name" field in all of the SMF records contains the symbolic addresses defined by the IFASMFR macro instruction.)	2	binary	internal	Record length (maximum size of 32,760)[1]
2	2		2	binary	internal	Segment descriptor[1]
4	4		1	binary	SVC 83 internal SVC 83 SVC 83 SVC 83	System indicator *Bit* *Meaning When Set* 0 Subsystem identification follows system identification 1-4 Reserved 5 MVS/XA 6 VS2 7 VS1
5	5		1	binary	internal	Record type (Hexadecimal values are 0-255)
6	6		4	binary	SVC 11 or SVC 83	Time since midnight, in hundredths of a second, record was presented to SMF[2]
10	A		4	packed	SVC 11 or SVC 83	Date record was presented to SMF, in the form 00YYDDDF, where F is the sign[2]
14	E		4	EBCDIC	JUMRCPUID or SMCASID	System identification (taken from SID parameter)
18	12		4	EBCDIC	internal	Subsystem identification. This field is a four byte character value set by the SUBSYS=option specified in the SMF macros.
22	16		2	binary	internal	Record subtype

[1] These two fields (total of four bytes) form the record descriptor word (RDW). The first two bytes must contain the logical record length including the RDW. The second two bytes 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.

[2] In record types 2 and 3, these fields indicate the time and date that the record was moved to the dump data set.

Notes:

1. 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. In this case, you might have to subtract four bytes from the offsets listed in your record.

2. For MVS/XA, both the MVS/XA bit and the VS/2 bit are set.

Figure 6-2. Standard SMF Header for Records with Subtypes

Summary of SMF Records

Figure 6-3 summarizes the SMF records according to the type of data they contain, such as VSAM or JES2 data, and the events (or status indicators) that cause SMF to generate the records. To write any SMF-formatted records (except record types 2, 3 and 7) to the SMF data set, you must specify the ACTIVE parameter. To write record type 17 for temporary data sets, you must specify REC(ALL). Figure 6-2 also indicates the method of entry to the SMF SVC 83 routine. The method of entry determines which user exit routine, either IEFU83 or IEFU84, receives control before control is returned to the caller of the SVC 83 routine. A branch entry, indicated by BR, results in the IEFU84 exit receiving control whereas an SVC call, indicated by SVC, results in the IEFU83 exit receiving 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 such as record type 23, 30, 32, and 90, contain offsets that point directly from the record header to the data section.

Note: 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 executed on processor (B). The STOP/LOGOFF time is recorded from processor (B).

For a summary of all of the fields in the SMF records, see "Chapter 7: Field-to-Record Cross-Reference."

Category of Data	Event or Status		Record Type	Entry Type
Day Data	IPL		0	BR
	Devices online at IPL		8	BR
			19	SVC
			22	BR[1]
	MODIFY TCAM command issued		31	SVC
	SET, HALT and SWITCH command information		90	BR[2]
Machine Data	CPU, storage, or channel path moved online or offline		22	SVC[1]
	Devices brought online		9	SVC
			22	SVC[1]
	Devices recovered at allocation		10	SVC
	Devices taken offline		11	SVC
			22	SVC[1]
Auxiliary Storage Data	Space available on DASD volumes: at IPL, after HALT EOD or SWITCH SMF command, when demounted		19	SVC
	Tape volume demounted		21	SVC
	VSAM data space defined, extended, or deleted		69	SVC
Processing Data	Step processing		4	BR
			30	BR
			34	BR
	Job processing		5	BR
			35	BR
	SYSOUT processing		6	SVC
			26	SVC
	Job initiated		20	BR
	Data set dynamically unallocated, concatenated or deconcatenated		30	BR
			40	SVC
	Normal or abnormal termination		30	BR
	TSO normal or abnormal termination		32	BR
Non-VSAM Data Set Activity Data	Data set closed or processed by EOV	Data Set opened for INPUT, or RDBACK	14	SVC
		Data set opened for OUTPUT, UPDAT, INOUT, or OUTIN	15	SVC
	Data set scratched		17	SVC
	Data set renamed		18	SVC
VSAM Data Set Activity Set	Integrated Catalog Facility component or cluster created, updated or deleted		60	SVC
	Integrated Catalog Facility entry defined		61	SVC
	Component or cluster opened		62	SVC
	Entry defined		63	SVC
	Component or cluster status		64	SVC
	Integrated Catalog Facility entry deleted		65	SVC
	Integrated Catalog Facility entry altered		66	SVC
	Entry deleted		67	SVC
	Entry renamed		68	SVC

[1] Only when written after an IPL by IEEMB823. All other records are written by means of an SVC call.

[2] Except when written for a SETDMN command by IEE8603D or for a HALT EOD command by IEE70110. These records are written by means of an SVC call.

Figure 6-3. Summary of SMF Records (Part 1 of 3)

Category of Data	Event or Status	Record Type	Entry Type
JES2 Data	JES2 Output Writer	6	SVC
	JES2 Job Purge	26	SVC
	S JES2 or $E SYS command issued	43	SVC
	$P JES2 command issued	45	SVC
	$S LNEn or $E LNEn command issued, or remote user signed on	47	SVC
	$P LNEn command issued or remote user signed off	48	SVC
	$E LNEn command issued, or remote user attempted to sign on with invalid password	49	SVC
	JES2 LOGON/Start Line	52	SVC
	JES2 LOGOFF/Stop Line	53	SVC
	JES2 Integrity	54	SVC
	Network Sign-on	55	SVC
	Network Integrity	56	SVC
	Network SYSOUT transmission	57	SVC
	Network Sign-off	58	SVC
JES3 Data	JES3 Output Writer	6	SVC
	JES3 Job Purge	26	SVC
	Job processed by JES3 MDS	25	SVC
	JES3 started	43	SVC
	JES3 terminated	45	SVC
	RJP line started or remote user signed on	47	SVC
	RJP line stopped or remote user signed off	48	SVC
	Remote user attempted to sign on with invalid password	49	SVC
	JES3 completes a network transmission	57	SVC
Network Data	Network Problem Determination Application reporting	37	SVC
	Network Performance Monitor	38	SVC
	Network Logical Data Manager	39	SVC
MVS/BDT Data	MVS/BDT File-to-File Transmission	59	SVC
Record Management Data	Dump header	2	N/A
	Dump trailer	3	N/A
	SMF records lost	7	BR
	Record descriptor word (RDW)	ALL	N/A
	Block descriptor word (BDW)	N/A	N/N
	SMF statistics	23	BR
	Sort/merge statistics	16	SVC
RACF	Processing Record	80	SVC
	Initialization Record	81	SVC
ACF/VTAM Tuning Data	ACF/VTAM tuning statistics	50	SVC

Figure 6-3. Summary of SMF Records (Part 2 of 3)

Category of Data	Event or Status	Record Type	Entry Type
RMF	CPU Activity	70	SVC
	Paging Activity	71	SVC
	Workload Activity	72	SVC
	Channel Activity	73	SVC
	Device Activity	74	SVC
	Page/Swap Data Set Activity Record	75	SVC
	Trace Activity Record	76	SVC
	Enqueue Activity Record	77	SVC
	Monitor I Activity	78	SVC
	Monitor II Activity Record	79	SVC
Security	Cryptographic Facilities	82	SVC
Data Base information	DATABASE statistics	100	SVC
	DATABASE accounting	101	SVC
	DATABASE performance	102	BR
	CICS/VS statistics	110	BR

Figure 6-3. Summary of SMF Records (Part 3 of 3)

Record Type 0 (00) – IPL

Record type 0 is written by IEEMB823 after every IPL of the system. It includes the virtual and real storage sizes and some of the SMF options in effect. Its length is 35 bytes:

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF0LEN	2	binary	internal	Record length
2	2	SMF0SEG	2	binary	internal	Segment descriptor
4	4	SMF0FLG	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 VS1
5	5	SMF0RTY	1	binary	internal	Record type
6	6	SMF0TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF0DTE	4	packed	SVC 83	Date record was moved to SMF buffer, in the form 00YYDDDF where F is the sign
14	E	SMF0SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF0JWT	4	binary	SMCAJWT	Limit, in minutes, of continuous wait time for the job (taken from JWT parameter)
22	16	SMF0BUF	4	binary	SMCANMBF x 4096	Number of bytes in SMF buffer
26	1A	SMF0VST	4	binary	(CVTMZ00+1)/1024	Number of 1K bytes in virtual storage
30	1E	SMF0OPT	1	binary	SMCAOPT	SMF options *Bit* *Meaning When Set* 0 Reserved 1 Reserved 2 Reserved 3 Data set accounting. Record types (see Note 1) selected 4 Volume accounting. Record types 10 or 69 selected 5 Reserved 6 Type 17 records will be written for temporary data sets (REC(ALL)) 7 Reserved
31	1F	SMF0RST	4	binary	CVTRLSTG	Number of 1K bytes in real storage

Notes:

1. This bit is set on when one of the following record types is selected: 14, 15, 17, 18, 62, 63, 64, 67, or 68.

Record Type 2 (02) – Dump Header

Record type 2 is written directly to the dump data set by IFASMFDP, the SMF dump program. This record consists of only the standard SMF record header. It indicates the beginning of a dump of the SMF data set from a direct access device usually to a tape. Its length is 18 bytes.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF2LEN	2	binary	internal	Record length
2	2	SMF2SEG	2	binary	internal	Segment descriptor
4	4	SMF2FLG	1	binary	IFASMFDP	System indicator *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 VS1
5	5	SMF2RTY	1	binary	internal	Record type
6	6	SMF2TME	4	binary	SVC 11 (Set by IFASMFDP)	Time, in hundredths of a second, record was moved to the dump data set
10	A	SMF2DTE	4	packed	SVC 11 (Set by IFASMFDP)	Date record was moved to the dump data set, in the form 00YYDDDF where F is the sign
14	E	SMF2SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)

Record Type 3 (03) – Dump Trailer

Record type 3 is written directly to the dump data set by IFASMFDP, the SMF dump program. This record consists of only the standard SMF record header. It marks the end of a dump of the SMF data set from a direct access device usually to a tape. Its length is 18 bytes.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF3LEN	2	binary	internal	Record length
2	2	SMF3SEG	2	binary	internal	Segment descriptor
4	4	SMF3FLG	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 VS1
5	5	SMF3RTY	1	binary	internal	Record type
6	6	SMF3TME	4	binary	SVC 11 (Set by IFASMFDP)	Time, in hundredths of a second, record was moved to the dump data set
10	A	SMF3DTE	4	packed	SVC 11 (Set by IFASMFDP)	Date record was moved to the dump data set, in the form 00YYDDDF where F is the sign
14	E	SMF3SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)

Record Type 4 (04) – Step Termination

Record type 4 is constructed by IEFTB722 and written by IEFTB721 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. Its length is 202 bytes plus (1) eight bytes for each device entry and (2) the length of the step accounting fields.

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. 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 for the step, device allocation start time, problem program start time, and 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.

Notes:

1. Data sets are usually recorded in the order of the step DD statements; they are not identified by name. (A user-written IEFUJV exit routine can record this order as each statement is validated.) Dynamic allocation or deallocation can affect the order.

2. For data sets that are dynamically unallocated, the data set entry information is in record type 40 – not in record type 4.

3. For more information on EXCP count and CPU time, see Chapters 8 and 9, respectively.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF4LEN	2	binary	internal	Record length
2	2	SMF4SEG	2	binary	internal	Segment descriptor
4	4	SMF4FLG	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 VS1
5	5	SMF4RTY	1	binary	internal	Record type
6	6	SMF4TME	4	binary	SVC 83	Time, in hundredths of a second, record is passed to the SMF writer. This is the time the step terminated.
10	A	SMF4DTE	4	packed	SVC 83	Date in the form 00YYDDDF, where F is the sign, record is passed to the SMF writer. This is the date the step terminated.
14	E	SMF4SID	4	EBCDIC	JMRCPUID	System identification (taken from SID parameter)
18	12	SMF4JBN	8	EBCDIC	JMRJOB	Job name[1]
26	1A	SMF4RST	4	binary	JMRENTRY	Time, in hundredths of a second, reader recognized the JOB card for this job[1]
30	1E	SMF4RSD	4	packed	JMREDATE	Date reader recognized the JOB card for this job, in the form 00YYDDDF where F is the sign[1]
34	22	SMF4UIF	8	EBCDIC	JMRUSEID	User identification (taken from common exit parameter area)
42	2A	SMF4STN	1	binary	LCTSNUMB	Step number (first step=1, etc.)
43	2B	SMF4SIT	4	binary	JCTJMRSS (Set by IEFSMFIE)	Time, in hundredths of a second, initiator selected this step
47	2F	SMF4STID	4	packed	JCTSSD (Set by IEFSMFIE)	Date initiator selected this step, in the form 00YYDDDF where F is the sign
51	33	SMF4NCI	4	binary	SCTSMF	Number of card-image records in DD DATA and DD* data sets read by the reader for the step
55	37	SMF4SCC	2	binary	TCBCMPC	Step completion code: X'0ccc' indicates system ABEND in the job step where ccc is the system ABEND code. (See *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 executed) 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 step termination indicator field (offset 87).

[1]The job name and the time and date that the reader recognized the JOB card for this job constitute the job log identification.

(Continued)

Offsets		Name	Length	Format	Source	Description
57	39	SMF4PRTY	1	binary	SCTSDPTY	Address space dispatching priority (taken from DPRTY= parameter on EXEC card or the APG value in CVTAPG)[2]
58	3A	SMF4PGMN	8	EBCDIC	SCTPGMNM	Program name (taken from PGM= parameter on EXEC card). If a backward reference was used (SCTSTYPE equals X'80'), then this field containd *.DD.
66	42	SMF4STMN	8	EBCDIC	SCTSNAME	Step name (taken from name on EXEC card)
74	4A	SMF4RSV5	2	binary		Reserved. Note that SMF4RSHO, formerly a two-byte field at this offset, has been increased to four bytes and moved to offset 82.
76	4C	SMF4SYST	2	binary	TCTHWM/1024	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 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. See offsets 82 and 102.[3]
78	4E	SMF4H0ST	2	binary	TCTLWM/1024	Largest amount of storage used from bottom of private area, in 1K units. This storage area includes subpools 0-127, 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.[3]
80	50	SMF4RV1	2	binary		Reserved
82	52	SMF4RSHO	4	binary	TCTRSZ*2	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 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	SMF4SPK	1	binary	TCBPKF	Storage protect key, in the form xxxx0000 where xxxx is the key
87	57	SMF4STI	1	binary		Step termination indicator
						Bit *Meaning When Set*
						0-1 Reserved
					JCTJMRCL	2 Canceled by exit IEFUJI[4]
					JCTJMRCL	3 Canceled by exit IEFUSI[4]
					JCTJMRCL	4 Canceled by exit IEFACTRT[4]
					JCTSTEPR	5 Step is to be restarted
					TCBFA	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.
					TCTHWM	7 If 0, normal completion. If 1, step was flushed.
88	58	SMF4RV2	2	binary		Reserved
90	5A	SMF4AST	4	binary	TCTAST (Set by IEFBB401)	Device allocation start time, in hundredths of a second

(Continued)

[2]If the dispatching priority falls within the APG range, the actual execution dispatching priority will be assigned based on the Installation Performance Specification (IPS). If the dispatching priority is controlled via the IPS, it may periodically change based upon user characteristics. If the dispatching priority is not in the APG range, the value in the field (SMF4PRTY) will be the actual execution dispatching priority. For more information see *Initialization and Tuning.*

[3]If storage was not allcoated (job step was flushed), these fields equal zero.

[4]Job steps canceled by IEFUJI and IEFUSI will not be executed; therefore bit 7 will also be on. Job steps canceled by IEFACTRT will cause subsequent job steps to be canceled; record type 4 is not produced for subsequent job steps.

Offsets		Name	Length	Format	Source	Description
94	5E	SMF4PPST	4	binary	TCTPPST (Set by IEFAB820)	Problem program start time, in hundredths of a second
98	62	SMF4RV3	1	binary		Reserved
99	63	SMF4SRBT	3	binary	SCTSRBT	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.
102	66	SMF4RIN	2	binary		Record indicator *Bit* *Meaning When Set* 0-5 Reserved 6 EXCP count might be wrong.[6] 7 If 0, storage is virtual. If 1, storage is real. 8-15 Reserved
104	68	SMF4RLCT	2	binary	internal	Offset from the beginning of the record (SMF4FLG) header to the relocate section
106	6A	SMF4LENN	2	binary	internal	Length of device entry portion of record. Calculated as: (8 times the number of devices) + 2
For each device assigned to each *non-spooled* data set, there is an eight-byte entry with the following format:[7]						
+0		SMF4DEVC	1	binary	UCBTBYT3	Device class
+1		SMF4UTYP	1	binary	UCBTBYT4	Unit type
+2		SMF4CUAD	2	binary	UBCHAN	Device number.
+4		SMF4EXCP	4	binary	TCTDCTR	EXCP count (see offset 102).
After the device entries are the following fields:						
Accounting Section:						
+0		SMF4LNTH	1	binary	internal	Length of accounting section, excluding this field
+1		SMF4SETM	3	binary	ACTJTIME	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.[5]
+4		SMF4NAF	1	binary	internal	Number of accounting fields
+5		SMF4ACTF	variable	EBCDIC	EXEC statement	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:						
+0[8]		SMF4PGIN	4	binary	OUXBPIN	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.

(Continued)

[3] If storage was not allocated (job step was flushed), these fields equal zero.

[5] CPU time is not expected to be constant between different runs of the same job step. For more information on CPU time, see Chapter 9.

[6] If a GETMAIN for expanding the TCTIOT (the data area where EXCPs are maintained) fails, only the existing data sets are counted. If the functional recovery routine is entered, EXCP counting for the step is discontinued and no device entries are produced. If ADDRSPC=REAL is specified, the EXCP does not include PCIs. For more information on EXCP count, see Chapter 8.

[7] Entries for DD*, DD DATA, DD DUMMY and spooled data sets are zero. (A DD DUMMY entry occurs when a forward reference to a DD statement with that DD name, but no matching DD statement is found, or when DD DUMMY is specified.) Entries for virtual I/O data sets are zero for class and type, and X'7FFF' for device number. When the high order bit is on in the device number field, a virtual device is indicated.

[8] The displacement of this field depends upon the size of the accounting fields and the number of devices. Offset 104 contains the displacement for this field.

Offsets	Name	Length	Format	Source	Description
Relocate Section: (Continued)					
+4	SMF4PGOT	4	binary	OUXBPOUT	Number of non-VIO, non-swap 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 as a result of 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	SMF4NSW	4	binary	OUXBSWCT	Number of address space swap sequences. (A swap sequence consists of an address space swap-out and swap-in.)
+12	SMF4PSI	4	binary	OUXBSPIN	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 SRB's started after completion of swap-in Stage 1 processing).
+16	SMF4PSO	4	binary	OUXBSPOT	Number of pages swapped out. This field includes: LSQA, private area fixed pages, and private area non-fixed changed pages.
+20	SMF4VPI	4	binary	OUXBVAMI	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	SMF4VPO	4	binary	OUXBVAMO	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 as a result of infrequent use. It does not include VIO swap-outs or page-outs for the common area.
+28	SMF4SST	4	binary	OUXBJBS + OUXBTRS	Step service, in service units. This field is calculated as: total iob service minus the accumulated job service prior to this step's initialization.[9]
+32	SMF4ACT	4	binary	OUXBJBT + OUXBTRT	Step transaction active time, in 1024-microsecond units. Calculated as: total job transaction active time minus the accumulated transaction active time prior to this step's initialization.[9]
+36	SMF4PGNO	2	binary	OUCBNPG	Step performance group number (taken from PERFORM= parameter on JOB or EXEC card or the RESET operator command).[9]
+38	SMF4TRAN	4	binary	OUXBJBR + OUXBTRR	Step transaction residency time, in 1024-microsecond units. That is the amount of time the transaction was in real storage.
+42	SMF4RECL	4	binary	OUXBPREC	Number of reclaims for private areas in this step
+46	SMF4RCLM	4	binary	OUXBVAMR	Number of VIO reclaims for this step
+50	SMF4CPGN	4	binary	OUXBCAPI	Number of common area page-ins for this step (LPA + CSA)
+54	SMF4CRCL	4	binary	OUXBCAPR	Number of common area reclaims for this step (LPA + CSA)
+58	SMF4PGST	4	binary	OUXBSTCT	Number of pages stolen from the storage for this step
+62	SMF4PSEC	8	binary	OUCBPSS	Number of page seconds for this step, in page millisecond units. Calculated as: the number of pages used by this step times the execution time it held that number of pages.
+70	SMF4LPAI	4	binary	OUXBLPAI	Number of link pack area page-ins for the step
+74	SMF4LPAR	4	binary	OUXBLPAR	Number of link pack area reclaims for the step
+78	SMF4CPUS	4	binary	OUXBJCPU + OUXBTCPU	Step CPU service, in service units[9]
+82	SMF4IOCS	4	binary	OUXBJIOC + OUXBTIOC	Step I/O service, in service units[9]
+86	SMF4MSOS	4	binary	OUXBJMSO + OUXBTMSO	Step main storage service, in service units[9]
+90	SMF4SRBS	4	binary	OUXBJSRB + OUXBTSRB	Step SRB service, in service units[9]

[9] For more information on service, transaction active time, and performance group number, see *Initialization and Tuning.*

Record Type 5 (05) – Job Termination

Record type 5 is constructed by IEFTB722 and written by IEFTB721 at the normal or abnormal termination of a background job. Its length is 137 bytes plus the length of the job accounting fields. (The maximum length of this record is 281 bytes.)

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.

This record also contains operating information such as the job start and end times, number of steps in the job, number of records in DD DATA and DD* data sets for 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.)

Note: For more information on EXCP count and CPU time, see Chapters 8 and 9, respectively.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF5LEN	2	binary	internal	Record length
2	2	SMF5SEG	2	binary	internal	Segment descriptor
4	4	SMF5FLG	1	binary	SVC 83	System indicator ***Bit*** ***Meaning When Set*** 0-4 Reserved 5 MVS/XA 6 VS2 7 VS1
5	5	SMF5RTY	1	binary	internal	Record type
6	6	SMF5TME	4	binary	SVC 83	Time, in hundredths of a second, record is passed to the SMF writer. This is the time the job terminated.
10	A	SMF5DTE	4	packed	SVC 83	Date, in the form 00YYDDDF, where F is the sign, record is passed to the SMF writer. This is the date the job terminated.
14	E	SMF5SID	4	EBCDIC	JMRCPUID	System identification (taken from SID parameter)
18	12	SMF5JBN	8	EBCDIC	JMRJOB	Job name[1]
26	1A	SMF5RST	4	binary	JMRENTRY	Time, in hundredths of a second, reader recognized the JOB card for this job[1]
30	1E	SMF5RSD	4	packed	JMREDATE	Date reader recognized the JOB card for this job, in the form 00YYDDDF where F is the sign[1]
34	22	SMF5UIF	8	EBCDIC	JMRUSEID	User identification (taken from common exit parameter area)
42	2A	SMF5NST	1	binary	JMRSTEP	Number of steps in the job
43	2B	SMF5JIT	4	binary	JCTJMRJT (Set by IEFSMFIE)	Time, in hundredths of a second, initiator selected the job
47	2F	SMF5JID	4	packed	JCTJMRJD (Set by IEFSMFIE)	Date initiator selected the job, in the form 00YYDDDF where F is the sign
51	33	SMF5NCI	4	binary	JMRJOBIN	Number of card-image records in DD DATA and DD* data sets read by the reader for the job

[1]The job name and the time and date that the reader recognized the JOB card for this job constitute the job log identification.

(Continued)

Offsets		Name	Length	Format	Source	Description
55	37	SMF5JCC	2	binary	TCBCMPC	Job completion code: X'0ccc' indicates system ABEND in the last job step where ccc is the system ABEND code (see *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.[2] X'0000' indicates normal job completion with a return code of 0.[2] Use this field in conjunction with the job termination indicator field (offset 66).
57	39	SMF5JPTY	1	binary	JCTJPRTY	Job selection priority. This field normally equals the user-assigned priority of 0 to 13, but if the job fails while being scheduled, this field equals 14 (taken from the PRTY parameter on the JOB card).[3]
58	3A	SMF5RSTT	4	binary	JMRDRSTP	Time, in hundredths of a second, reader recognized the end of the job.[4]
62	3E	SMF5RSTD	4	packed	JMRDRSTP + 4	Date reader recognized the end of the job, in the form 00YYDDDF where F is the sign.[4]
66	42	SMF5JBTI	1	binary	 JCTJMRCL JCTJMRCL JCTJMRCL	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 (step exit only) 5 Reserved 6 If 0, normal completion. If 1, ABEND. 7 Reserved
67	43	SMF5SMCI	1	binary		Reserved
68	44	SMF5TRAN	4	binary	OUXBJBR + OUXBTRR	Job transaction residency time, in 1024-microsecond units. That is the total amount of time the transaction was in real storage.[5]
72	48	SMF5CKRE	1	binary		Reserved
73	49	SMF5RDCL	1	binary	JMRRDR	Reader device class. (This field is not filled in for jobs submitted via an internal reader.)
74	4A	SMF5RUTY	1	binary	JMRRDR	Reader unit type. (This field is not filled in for jobs submitted via an internal reader.)

(Continued)

[2] 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 by this record. The code appears in the step termination record (type 4). In this case, the field, 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.

[3] 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.

[4] If the job that is terminating is 'JES2' or 'JES3' then this field might be set to zero.

[5] For more information on service, transaction active time, and performance group number, see *Initialization and Tuning.* Note that the service, active time, and residency time may have been accumulated under different performance group numbers.

Offsets		Name	Length	Format	Source	Description
75	4B	SMF5JICL	1	EBCDIC	JCTJCSMF	Job input class (taken from JOB card; default equals 'A')
76	4C	SMF5SPK	1	binary	TCBPKF	Storage protect key, in the form xxxx0000 where xxxx is the key
77	4D	SMF5SRBT	3	binary	SCTSRBT	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/O POST), and TQE scheduling.[6]
80	50	SMF5TJS	4	binary	OUXBJBS + OUXBTRS	Job service, in service units [5]
84	54	SMF5TTAT	4	binary	OUXBJBT + OUXBTRT	Job transaction active time, in 1024-microsecond units[5]
88	58	SMF5RV2	4	binary		Reserved
92	5C	SMF5PGNO	2	binary	OUCBNPG	Performance group number of last step (taken from PERFORM= parameter on JOB or EXEC card or the result of a RESET or SET IPS command)[5]
94	5E	SMF5RV3	2	binary		Reserved
96	60	SMF5TLEN	1	binary	ACTLEN (in JCT)	Length of rest of the fixed portion of the record
97	61	SMF5PRGN	20	EBCDIC	ACTPRGNM (in JCT)	Programmer's name
117	75	SMF5JCPU	3	binary	ACTJTIME (in JCT)	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.[6]
120	78	SMF5ACTF	1	binary	ACTJNFLD (in JCT)	Number of accounting fields
121	79	SMF5JSAF	variable	EBCDIC	JOB statement	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:						
+0		SMF5CPUS	4	binary	OUXBJCPU + OUXBTCPU	Job CPU service, in service units[5]
+4		SMF5IOCS	4	binary	OUXBJIOC + OUXBTIOC	Job I/O service, in service units[5]
+8		SMF5MSOS	4	binary	OUXBJMSO + OUXBTMSO	Job main storage service, in service units[5]
+12		SMF5SRBS	4	binary	OUXBJSRB + OUXBTSRB	Job SRB service, in service units[5]

[5]For more information on service, transaction active time, and performance group number, see *Initialization and Tuning.* Note that the service, active time, and residency time may have been accumulated under different performance group numbers.

[6]CPU time may not be constant between different runs of the same job. For more information on CPU time, see Chapter 9.

Record Type 6 (06) – JES2 Output Writer

Record type 6 is written by HASPPRPU (JES2 writer). The JES2 writer writes this record 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. 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 also written for spin data sets. If the JES2 writer is used, the record length is 94 bytes plus 36 bytes for the 3800 (non-impact) printing subsystem section and 14 bytes for the routing section. (**Note**: If an external writer or user-supplied writer is used, the length is 88 bytes. See "Record Type 6 (06) – External Writer" for more information.)

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 also 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.

This record also provides information on the activity of the 3800 (non-impact) printing subsystem. For additional information on the 3800 printer, see the *IBM 3800 Printing Subsystem Programmer's Guide.*

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF6LEN	2	binary	internal	Record length
2	2	SMF6SEG	2	binary	internal	Segment descriptor
4	4	SMF6FLG	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 Reserved
5	5	SMF6RTY	1	binary	internal	Record type
6	6	SMF6TME	4	binary	SVC 83	Time, in hundredths of a second record was moved to SMF buffer
10	A	SMF6DTE	4	packed	SVC 83	Date record was moved to SMF buffer, in the form 00YYDDDF where F is the sign
14	E	SMF6SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)

Offsets		Name	Length	Format	Source	Description
18	12	SMF6JBN	8	EBCDIC	JCTJMRN	Job name[1]
26	1A	SMF6RST	4	binary	JCTRDRON	Time, in hundredths of a second, reader recognized the JOB card for this job[1]
30	1E	SMF6RSD	4	packed	JCTRDTON	Date reader recognized the JOB card for this job in the form 00YYDDDF where F is the sign[1]
34	22	SMF6UIF	8	EBCDIC	JCTUSEID	User identification (taken from common exit parameter area)
42	2A	SMF60WC	1	EBCDIC	JOECURCL	*SYSOUT class. (This field is blank for non-SYSOUT data sets.)
43	2B	SMF6WST	4	binary	PITMEON (in PPPWORK)[2]	Start time, in hundredths of a second, of print/punch processor working on the data in this record
47	2F	SMF6WSD	4	packed	PTIMEON +4 (in PPPWORK)[2]	Start date of print/punch processor working on the data in this record, in the form 00YYDDDF where F is the sign
51	33	SMF6NLR	4	binary	PPLNCDCT (in PPPWORK)[2]	Number of logical records written by the writer, by form number and class. (This field includes JOBLOG information and data set copies.)
55	37	SMF6IOE	1	binary	PPFLAG (in PPPWORK)[2]	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	PPJNDS (in PPPWORK)[2]	Number of data sets processed by the writer and included in this record. If multiple copies are produced, each copy is not counted. (This field includes JOBLOG information.)
57	39	SMF6FMN	4	EBCDIC	DCTFORMS	Output 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, described under the JES2 Routing Section later in this record.
61	3D	SMF6PAD1	1	binary	UCBTYP	Section indicator *Bit* *Meaning When Set* 0 3800 printing subsystem section present 1 Routing section present 2-7 Reserved
62	3E	SMF6SBS	2	binary	internal	Subsystem identification – X'0002' signifies JES2
64	40	SMF6LN1	2	binary	internal	Length of rest of record, including this field, but not including any additional sections indicated by the SMF6PAD1 field

[1]The job name and the time and date that the reader recognized the JOB card for this job constitute the job log identification.
[2]PPPWORK is the print/punch processor work area.

*A change in this field will cause a new record type 6 to be written.

Offsets		Name	Length	Format	Source	Description
66	42	SMF6DCI	1	binary	PSMFDCI (in PPPWORK)[1]	Data set control indicators *Bit* *Meaning When Set* 0 Reserved 1 Record represents spin data sets *2 Operator terminated 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)
67	43	SMF6INDC	1	binary	internal	Record level indicator[2] *Bit* *Meaning When Set* 0-3 Reserved 4-7 A value of X'01' indicates the first level of the restructured SMF type 6 record for JES2 Version 2 Release 1.5.
68	44	SMF6JNM	4	EBCDIC	JCTJOBID +4	JES2-assigned job number
72	48	SMF6OUT	8	EBCDIC	DCTDEVN	JES2 logical output device name
80	50	SMF6FCB	4	EBCDIC	DCTFCB	*FCB image identification (printer only)
84	54	SMF6UCS	4	EBCDIC	DCTUCS	*UCS image identification (printer only)
88	58	SMF6PGE	4	binary	PRPAGECT/+0	Approximate page count (printer only)[3] (in PPPWORK)[1]
92	5C	SMF6RTE	2	binary	DCTNO	Output route code[4]

[1]PPPWORK is the print/punch processor work area.
[2]Each time the record is changed, the value of this field is increased by 1.
[3]For a printer controlled by JES2, the count is updated:

- On a skip to any channel instruction 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 a skip to any channel instruction is reached

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

[4]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 that node) indicates remote routine; and X'00nn' indicates special local routing. If more than 255 remotes are specified for the system, this field is set to zero.

*A change in this field will cause a new type 6 record to be written.

Offsets		Name	Length	Format	Source	Description
3800 (non-impact) Printing Subsystem Section:						
0	0	SMF6LN2	2	binary	internal	Length of 3800 printing subsystem section, including this field
2	2	SMF6CPS	8	binary	PCOPYGRP (in PPPWORK)[1]	*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.
10	10	SMF6CHR	16	EBCDIC	DCTCHAR1, 2, 3, 4	*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	18	SMF6MID	4	EBCDIC	DCTMODF	*Names of the copy modification module used to modify the data
30	1E	SMF6FLI	4	EBCDIC	DCTFLASH	*Name of the forms overlay printed on the copies
34	22	SMF6FLC	1	binary	PFLASHC	*Number of copies on which the forms overlay is printed (in PPPWORK)[1]
35	23	SMF6BID	1	binary		Options indicator *Bit* *Meaning When Set*
					DCTPPSW2	*0 Output was burst into sheets by the Burster-Trimmer-Stacker
					PPFLAG2 (in PPPWORK)[1]	*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
JES2 Routing Section:						
0	0	SMF6LN3	2	binary	internal	Length of routing section (including this field)
2	2	SMF6ROUT	4	binary	DCTNO	Output route code[2]
6	6	SMF6EFMN	8	EBCDIC	DCTFORMS	Output form number. This field is set regardless of the number of characters in the forms field (SMF6FMN)

*A change in this field will cause a new type 6 record to be written.

[1] PPPWORK is the print/punch processor work area.

[2] 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.

Record Type 6 (06) – External Writer

Record type 6 is written by IASXSD82 (external writer). The external writer writes this record when processing is completed for a 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. It also 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.

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)

Its format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF6LEN	2	binary	internal	Record length
2	2	SMF6SEG	2	binary	internal	Segment descriptor
4	4	SMF6FLG	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 Reserved
5	5	SMF6RTY	1	binary	internal	Record type
6	6	SMF6TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF6DTE	4	packed	SVC 83	Date record was moved to SMF buffer, in the form 00YYDDDF where F is the sign
14	E	SMF6SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)

Offsets		Name	Length	Format	Source	Description
18	12	SMF6JBN	8	EBCDIC	SSSOJOBN (in SSOB)	Job name[1]
26	1A	SMF6RST	4	binary	job log[2] +4	Time, in hundredths of a second, reader recognized the JOB card for this job[1]
30	1E	SMF6RSD	4	packed	job log[2] +8	Date reader recognized the JOB card for this job, in the form 00YYDDDF where F is the sign
34	22	SMF6UIF	8	EBCDIC	job log[2] +12	User identification (taken from common exit paremeter area)
42	2A	SMF6OWC	1	EBCDIC	SSSOCLAS (in SSOB)	SYSOUT class. This field is blank for non-SYSOUT data sets.)
43	2B	SMF6WST	4	binary	SVC 11 (set by IASXSD82)	Start time, in hundredths of a second, of print/punch processor working on the data in this record
47	2F	SMF6WSD	4	packed	SVC 11 (set by IASXSD82)	Start date of print/punch processor working on the data in this record, in the form 00YYDDDF where F is the sign
51	33	SMF6NLR	4	binary		zero
55	37	SMF6IOE	1	binary		zero
56	38	SMF6NDS	1	binary	internal	Number of data sets processed by the writer and included in this record. If multiple copies are produced, each copy is counted. (This field included JOBLOG information.)
57	39	SMF6FMN	4	EBCDIC	SSSOFORM (in SSOB)	Form number
61	3D	SMF6PAD1	1	binary		Reserved
62	3E	SMF6SBS	2	binary		Subsystem identification (x'0000' indicates external writer)
64	40	SMF6LN1	2	binary	internal	Length of rest of record, including this field
66	42	SMF6DCI	2	binary		X'0000' indicates external writer
68	44	SMF6JNM	4	EBCDIC	JCTJOBID +4 (in SSOB)	JES2-assigned job number
72	48	SMF6OUT	8	EBCDIC	DCTDEVN	X'0000' indicates external writer
80	50	SMF6FCB	4	EBCDIC	DCTFCB	FCB image identification (printer only)
84	54	SMF6UCS	4	EBCDIC	DCTUCS	UCS image identification (printer only)

[1]The job name and the time and date that the reader recognized the JOB card for this job constitute job log identification.
[2]The job log is pointed to by SSSOWTRC field in the SSOB data area.

Record Type 6 (06) – JES3 Output Writer

Record type 6 is writted by IATOSWD for each data set processed by JES3 output service. One type 6 record is written for each copy with a given form name. If a printer is running under the control of a functional subsystem (FSS), record type 6 is written on the processor with the FSS address space for each data set printed on that printer. This record is also written for spin data sets. Its length is 116 bytes plus 36 bytes for the 3800 (non-impact) printing subsystem section, and 14 bytes for the routing section.

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 also 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, and output activity.

This record also provides information on the activity of the 3800 printing (non-impact) subsystem. For additional information on the 3800 printer, see the *IBM 3800 Printing Subsystem Programmer's Guide.*

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF6LEN	2	binary	internal	Record length
2	2	SMF6SEG	2	binary	internal	Segment descriptor
4	4	SMF6FLG	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 Reserved
5	5	SMF6RTY	1	binary	internal	Record type
6	6	SMF6TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF6DTE	4	packed	SVC 83	Date record was moved to SMF buffer in the form 00YYDDDF where F is the sign
14	E	SMF6SID	4	EBCDIC	JMRCPUID	System identification (taken from SID parameter)
18	12	SMF6JBN	8	EBCDIC	RQJOBNAM	Job name[1] (taken from job's RESQ)
26	1A	SMF6RST	4	binary	JMRENTRY macro (Set by IATISJB)	Time, in hundredths of a second, reader recognized the JOB card for this job[1]
30	1E	SMF6RSD	4	packed	JMREDATE macro (Set by IATISJB)	Date reader recognized the JOB card for thisjob, in the form 00YYDDDF where F is the sign[1]
34	22	SMF6UIF	8	EBCDIC	JMRUSEID (Set by IATOSWD)	User identification (taken from common exit parameter area)
42	2A	SMF6OWC	1	EBCDIC	OSECLASS	SYSOUT class. (This field is blank for non-SYSOUT data sets.)
43	2B	SMF6WST	4	binary	IATXTOD macro (Set by IATOSWP)	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.
47	2F	SMF6WSD	4	packed	IATXTOD macro (Set by IATOSWP)	Start date of output service working on the data in this record, in the form 00YYDDDF where F is the sign. This field is filled in at JES3 LOGIN time for the writer job.

[1] The job name and the time and date that the reader recognized the JOB card for this job log identification.

Offsets		Name	Length	Format	Source	Description
51	33	SMF6NLR	4	binary	WTRDRCDS or PPQRCDCT	Number of logical records written by the writer, by form number and class. (This field is filled in when a data set is completed or restarted; it includes repeats and restarts.)
55	37	SMF61OE	1	binary	internal	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	WTRJCOPY or PPYSTCPY	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	SUPFORMS (in SUPUNITS entry for the output device)	Form number – only the first 4 bytes appear in this field.
61	3D	SMF6PAD1	1	binary	IATOSWP	Section indicator *Bit* *Meaning When Set* 0 3800 printing subsystem section present 1 Routing section present 2-7 Reserved
62	3E	SMF6SBS	2	binary	IATOSWP	Subsystem identification – X'0005' signifies JES3
64	40	SMF6LN1	2	binary	IATOSWP	Length of rest of record, including this field, but not including any additional sections indicated by the SMF6PAD1 field
66	42	SMF6DCI	1	binary	IATOSWP	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 terminated 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
67	43	SMF6INDC	1	binary	internal	Record level indicator[2] *Bit* *Meaning When Set* 0-3 Reserved 4-7 A value of X'01' indicates the first level of the restructured SMF type 6 record for JES3 releases 1.3.1, 1.3.4, and 2.1.5.
68	44	SMF6JNM	4	EBCDIC	RQJNUM or IATOSWD	JES3-assigned job number (taken from the job's RESQ)
72	48	SMF6OUT	8	EBCDIC	SUPDD (in SUPUNITS entry for the output device)	JES3 logical output device name
80	50	SMF6FCB	4	EBCDIC	SUPCARR (in SUPUNITS entry for the output device)	FCB image identification (printer only)

[2]Each time the record is changed, the value of this field is increased by 1.

Offsets		Name	Length	Format	Source	Description
84	54	SMF6UCS	4	EBCDIC	SUPUCS (in SUPUNITS entry for the output device)	UCS image identification (printer only)
88	58	SMF6PGE	4	binary	WTRDPGET	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
92	5C	SMF6DFE	2	binary	IATOSWP	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
94	5E	SMF6OPR	2	binary	OSEPRTY	Output priority
96	60	SMF6GRP	8	EBCDIC	SUPGROUP (in SUPUNITS entry for the output device)	JES3 logical output device group name
104	68	SMF6RSVJ	8	EBCDIC		Reserved for JES3
112	70	SMF6RSVU	4	EBCDIC		Reserved for user
3800 (non-impact) Printing Subsystem Section:						
0	0	SMF6LN2	2	binary	IATOSWP	Length of 3800 printing subsystem section, including this field
2	2	SMF6CPS	8	binary	OSEMODRC	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	OSECHARS	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	OSEMODID	Name of the copy modification module used to modify the data.
30	1E	SMF6FLI	4	EBCDIC	SUPFLASH or PABFLASH	Name of the forms overlay printed on the copies
34	22	SMF6FLC	1	binary	OSEFLCNT	Number of copies on which the forms overlay is printed
35	23	SMF6BID	1	binary	 OSESTACK OSEDFLG1	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 Routing Section:						
0	0	SMF6LN3	2	binary	internal	Length of routing section (including this field)
2	2	SMF6ROUT	4			Reserved
6	6	SMF6EFMN	8	EBCDIC	SUPUNITS	Output form number. This field is set regardless of the number of characters in the forms field (SMF6FMN)

Record Type 6 (06) – Print Services Facility (PSF)

Record type 6 is written by APSPNST. PSF writes this record whenever data set processing is complete, that is, whenever the JES subsystem that PSF is running under is informed that the data set is to be released. Its length is 92 bytes plus 36 bytes for the non-impact printing subsystem section, and 47 bytes for the all-points-addressable or APA printing subsystem section.

The record identifies the output writer according to SYSOUT class form number and subsystem identification. It also identifies the job according to job log identification, JES-assigned job number, and user identification. In addition, it contains information on the output writer activity such as the number of logical records processed, writer start time, and input/output status indicators, logical output device name, and number of resources such as fonts, overlays, page segments, PAGEDEFs, and 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. For additional information on the 3800 printer, see the *IBM 3800 Printing Subsystem Programmer's Guide*. For more information on the 3800-3 or 3820 printers, see the section "Related Publications" in the PREFACE.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF6LEN	2	binary	internal	Record length
2	2	SMF6SEG	2	binary	internal	Segment descriptor
4	4	SMF6FLG	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-5 Reserved 6 VS2 7 Reserved
5	5	SMF6RTY	1	binary	internal	Record type
6	6	SMF6TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF6DTE	4	packed	SVC 83	Date record was moved to SMF buffer in the form 00YYDDDF where F is the sign
14	E	SMF6SID	4	EBCDIC	JMRCPUID	System identification (taken from SID parameter)
18	12	SMF6JBN	8	EBCDIC	JMRJOB	Job name[1] (taken from job's RESQ)
26	1A	SMF6RST	4	binary	JMRENTRY	Time, in hundredths of a second, reader recognized the JOB card for this job[1]
30	1E	SMF6RSD	4	packed	JMREDATE	Date reader recognized the JOB card for this job, in the form 00YYDDDF where F is the sign[1]

[1] The job name and the time and date that the reader recognized the JOB card for this job log identification.

Offsets		Name	Length	Format	Source	Description
34	22	SMF6UIF	8	EBCDIC	JMRUSEID	User identification (taken from common exit paramter area)
42	2A	SMF6OWC	1	EBCDIC	JSPJSOCL	SYSOUT class. (This field is blank for non-SYSOUT data sets.)
43	2B	SMF6WST	4	binary	DIAWST	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.
47	2F	SMF6WSD	4	packed	DIAWSD	Start date of output service working on the data in this record, in the form 00YYDDDF where F is the sign. This field is filled in at JES3 LOGIN time for the writer job.
51	33	SMF6NLR	4	binary	DIAREC	Number of logical records written by the writer, by form number and class. (This field is filled in when a data set is completed or restarted; it includes repeats and restarts.)
55	37	SMF6IOE	1	binary	DIAIOE	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	internal	Number of data sets processed by the writer and included in this record. If multiple copies are produced, each copy is not counted.
57	39	SMF6FMN	4	EBCDIC	DIAFORM	Form number – only the first 4 bytes appear in this field.
61	3D	SMF6PAD1	1	binary	internal	Section indicator *Bit* *Meaning When Set* 0 Non-impact printing subsystem section present 1 Reserved 2 All-points-addressable (APA) printing subsystem section present 3-7 Reserved
62	3E	SMF6SBS	2	binary	internal	Subsystem identification – X'0007' signifies PSF
64	40	SMF6LN1	2	binary	internal	Length of rest of record, including this field, but not including any additional sections indicated by the SMF6PAD1 field
66	42	SMF6DCI	1	binary	DIADCI	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 terminated 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
67	43	SMF6INDC	1	binary	internal	Record level indicator[2] *Bit* *Meaning When Set* 0-3 Reserved 4-7 A value of X'01' indicates the first level of the restructured SMF type 6 record for PSF 1.0. A value of X'02' indicates PSF 1.1.

[2]Each time the record is changed, the value of this field is increased by 1.

Offsets		Name	Length	Format	Source	Description
68	44	SMF6JNM	4	EBCDIC	JSPAJBID	JES-assigned job number.
72	48	SMF6OUT	8	EBCDIC	CCBPCLBL	JES-logical output device name. (For the 3820, ACF VTAM logical unit name.)
80	50	SMF6FCB	4		internal	Reserved
84	54	SMF6UCS	4		internal	Reserved
88	58	SMF6PGE	4	binary	DIAPAGE	Approximate physical page count
Non-impact Printing Subsystem Section:						
0	0	SMF6LN2	2	binary	internal	Length of non-impact printing subsystem section, including this field
2	2	SMF6CPS	8	binary	DIACPYGP	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.
10	10	SMF6CHR	16	EBCDIC	DIACHR	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	18	SMF6MID	4			Reserved
30	1E	SMF6FLI	4	EBCDIC	DIAFLI	Name of the forms overlay printed on the copies
34	22	SMF6FLC	1	binary	DIAFLC	Number of copies on which the forms overlay is printed
35	23	SMF6BID	1	binary	DIABID DIACSP	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 charecter that selected the font used when printing thet line. 2 Cut-sheet printer[3] 3-7 Reserved
All-Points-Addressable or APA Printing Subsystem Section: These fields contain meaningful data only if the All-points-addressable printing subsystem is running under the control of print services facility (PSF).						
0	0	SMF6LN4	2	binary	internal	Length of the section (including this field)
2	2		2			Reserved
4	4	SMF6FONT	4	binary	DIAFNTCT	Number of fonts used
8	8	SMF6LFNT	4	binary	DIALFTCT	Number of fonts loaded
12	C	SMF6OVLY	1	binary	DIAOVLCT	Number of overlays used

[3]This field is valid only when SMF6SBS equals x'0007', and SMF6INDC is equal to or greater than x'02'.

Offsets		Name	Length	Format	Source	Description
16	10	SMF6LOLY	4	binary	DIALOVCT	Number of overlays loaded
20	14	SMF6PGSG	4	binary	DISPSCT	Number of page segments used
24	18	SMF6LPSG	4	packed	DIALPSCT	Number of page segments loaded
28	1C	SMF6IMPS	4	binary	DIASHEET	Number of sides of sheets of paper printed (number of logical impressions[3]
32	20	SMF6FEET	4	binary	DIAFEET	Number of feet of document printed. (Zero for the 3820.)
36	24	SMF6PGDF	4	binary	DIAPGDEF	Number PAGEFDEFs used
40	28	SMF6FMDF	4	binary	DIAFMDEF	Number FORMDEFs used
44	2C	SMF6BIN	1	binary	internal	Bin indicators[3] *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 2-7 Reserved
45	2D	SMF6PGOP	2	binary	internal	Duplex indicators[3] *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 2-15 Reserved

[3]This field is valid only when SMF6SBS equals x'0007', and SMF6INDC is equal to or greater than x'02'.

Record Type 7 (07) – Data Lost

Record type 7 is the first record built when an SMF data set becomes available for recording after a period when no data sets were available. Data existing in the SMF buffer is written to the newly available SMF data set before record type 7 is built in the buffer. Consequently record type 7 is not the first record in the data set. It is written by IEEMB829 and its length is 28 bytes.

This record contains a count of the SMF records that were not written, and the start and end times of the period during which no records were written. (The end time is the time recorded in offset 6.)

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF7LEN	2	binary	internal	Record length
2	2	SMF7SEG	2	binary	internal	Segment descriptor
4	4	SMF7FLG	1	binary	IEEMB829	System indicator *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 VS1
5	5	SMF7RTY	1	binary	internal	Record type
6	6	SMF7TME	4	binary	SVC 11 (Set by IEEMB829)	Time, in hundredths of a second, record was built in SMF buffer
10	A	SMF7DTE	4	packed	SVC 11 (Set by IEEMB829)	Date record was built in SMF buffer, in the form 00YYDDDF where F is the sign
14	E	SMF7SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF7NRO	2	binary	SMCADSCT	Number of SMF records lost because no SMF data sets were available for recording
20	14	SMF7STM	4	binary	SMCADSTM (Set by IEEMB829)	Start time, in hundredths of a second, of period during which no SMF data sets were available for recording
24	18	SMF7STD	4	packed	SMCADSTM (Set by IEEMB829)	Start date of period during which no SMF data sets were available for recording, in the form 00YYDDDF where F is the sign

Record Type 8 (08) – I/O Configuration

Record type 8 is written by IEEMB823 after the IPL of the system 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. Its length is 20 bytes plus four bytes for each device online at IPL.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF8LEN	2	binary	internal	Record length
2	2	SMF8SEG	2	binary	internal	Segment descriptor
4	4	SMF8FLG	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 VS1
5	5	SMF8RTY	1	binary	internal	Record type
6	6	SMF8TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF8DTE	4	packed	SVC 83	Date record was moved to SMF buffer, in the form 00YYDDDF where F is the sign
14	E	SMF8SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF8LENN	2	binary	internal	Length of rest of record including this field
For each online device, there is a four-byte entry with the following format:						
+0		SMF8IODV	1	binary	UCBTBYT3	Device class
+1			1	binary	UCBTBYT4	Unit type
+2			2	binary	UCBCHAN	Device number.

Record Type 9 (09) – VARY Device ONLINE

Record type 9 is written by ICB2MSG (for the 3850 Mass Storage Control), IEECLEAN, IEEVPTH, and IEE2303D 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. Its length is 20 bytes plus four bytes for each device varied online.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF9LEN	2	binary	internal	Record length
2	2	SMF9SEG	2	binary	internal	Segment descriptor
4	4	SMF9FLG	1	binary	SVC 83	System indicator ***Bit*** ***Meaning When Set*** 0-4 Reserved 5 MVS/XA 6 VS2 7 VS1
5	5	SMF9RTY	1	binary	internal	Record type
6	6	SMF9TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF9DTE	4	packed	SVC 83	Date record was moved to SMF buffer, in the form 00YYDDDF where F is the sign
14	E	SMF9SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF9LENN	2	binary	internal	Length of rest of record including this field
For each device varied online, there is a four-byte entry with the following format:						
+0		SMF9DVAD	1	binary	UCBTBYT3	Device class
+1			1	binary	UCBTBYT4	Unit type
+2			2	binary	UCBCHAN	Device number.

Record Type 10 (0A) – Allocation Recovery

Record type 10 is written by IEFAB488 after a successful device allocation recovery Its length is 44 bytes plus four bytes for each device entry.

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 not produced if the operator cancels the job instead of attempting recovery.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF10LEN	2	binary	internal	Record length
2	2	SMF10SEG	2	binary	internal	Segment descriptor
4	4	SMF10FLG	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 VS1
5	5	SMF10RTY	1	binary	internal	Record type
6	6	SMF10TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF10DTE	4	packed	SVC 83	Date record was moved to SMF buffer, in the form 00YYDDDF where F is the sign
14	E	SMF10SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF10JBN	8	EBCDIC	JMRJOB	Job name. This field contains blanks if allocation recovery is for a system task [1]
26	1A	SMF10RST	4	binary	JMRENTRY	Time, in hundredths of a second, reader recognized the JOB card for this job. This field equals zero if allocation recovery is for a system task [1]
30	1E	SMF10RSD	4	packed	JMREDATE	Date reader recognized the JOB card for this job, in the form 00YYDDDF where F is the sign. This field equals zero if allocation recovery is for a system task [1]
34	22	SMF10UIF	8	EBCDIC	JMRUSEID	User identification (taken from common exit parameter area)
42	2A	SMF10LN	2	binary	internal	Length of rest of record including this field
For each device made available, there is a four-byte entry with the following format:						
+0		SMF10DEV	1	binary	UCBTBYT3	Device class
+1			1	binary	UCBTBYT4	Unit type
+2			2	binary	UCBCHAN	Device number.

Record Type 11 (0B) – VARY Device OFFLINE

Record type 11 is written when a VARY Device OFFLINE command is processed. It is written by ICB2MSG (for the 3850 Mass Storage Control), IEECLEAN, IEEVPTH, IEFAB421, IGC0005I, and IGC0905I. This record identifies the device being removed from the configuration by device class, unit type, and device number. Its length is 20 bytes plus four bytes for each device varied offline.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF11LEN	2	binary	internal	Record length
2	2	SMF11SEG	2	binary	internal	Segment descriptor
4	4	SMF11FLG	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 Reserved
5	5	SMF11RTY	1	binary	internal	Record type
6	6	SMF11TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF11DTE	4	packed	SVC 83	Date record was moved to SMF buffer, in the form 00YYDDDF where F is the sign
14	E	SMF11SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF11LN	2	binary	internal	Length of rest of record including this field
For each device varied offline, there is a four-byte entry with the following format:						
+0		SMF11DEV	1	binary	UCBTBYT3	Device class
+1			1	binary	UCBTBYT4	Unit type
+2			2	binary	UCBCHAN	Device number

Record Type 14 (0E) – INPUT or RDBACK Data Set Activity

Record type 14 is written for non-VSAM direct access or tape data sets that are defined by DD statements or dynamic allocation and opened for INPUT or RDBACK processing by problem programs. It is written by IFG0202H and IFG0202I when a data set, as described above, is closed or processed by EOV. Its length varies from 292 to 6,416 bytes, depending upon the number of volumes for the data set.

This record contains information (associated with both the access method used and the type of data set used) from the TIOT, JFCB, DCB, DEB, and UCB data areas. For more information about these data areas, see *Debugging Handbook*.

Note: Record type 14 is not written for a data set defined by a DD* or DD DATA statement. For accounting purposes, the card-image count for these data sets is provided in record type 4.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF14LEN	2	binary	internal	Record length
2	2	SMF14SEG	2	binary	internal	Segment descriptor
4	4	SMF14FLG	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 VS1
5	5	SMF14RTY	1	binary	internal	Record type
6	6	SMF14TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF14DTE	4	packed	SVC 83	Date record was moved to SMF buffer, in the form 00YYDDDF where F is the sign
14	E	SMF14SID	4	EBCDIC	JMRCPUID	System identification (taken from SID parameter)
18	12	SMF14JBN	8	EBCDIC	JMRJOB	Job name[1]
26	1A	SMF14RST	4	binary	JMRENTRY	Time, in hundredths of a second, reader recognized the JOB card for this job [1]
30	1E	SMF14RSD	4	packed	JMREDATE	Date reader recognized the JOB card for this job, in the form 00YYDDDF where F is the sign [1]
34	22	SMF14UID	8	EBCDIC	JMRUSEID	User identification (taken from common exit parameter area)
42	2A	SMF14RIN	2	binary	 internal UCBTYP JFCBDSNM DCBDSORG DCBDSORG JFCDSORG (in JFCB)	Record and data set indicator *Bit* *Meaning When Set* 0 Reserved 1 Record written by EOV (Register 14=0 if CLOSE; register 14=4 if EOV) 2 DASD device 3 Temporary data set. (A data set is temporary if it has a system-generated name, is created within a job or job step, and exists only for the duration of that job or job step.) 4 DCBDSORG=DA. (The data set organization being used is direct access.) 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 VIO data set 8-15 Reserved

[1]The job name and the time and date that the reader recognized the JOB card for this job constitute the job log identification.

(Continued)

Offsets		Name	Length	Format	Source	Description
Section Sizes:						
44	2C	SMF14SDC	1	binary	internal	Size of DCB/DEB section. This field equals 24.
45	2D	SMF14NUC	1	binary	internal	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-concatenated data sets, there is one UCB section for each data set in the concatenated data set.
46	2E	SMF14SUC	1	binary	internal	Size of each UCB section. This field equals 24.
47	2F	SMF14SET	1	binary	internal	Size of ISAM extension section. This field equals 28 (or 0 if there are no ISAM data sets).
48	30	SMF14OPE	4	binary	internal	Time, in hundredths of a second, when the data set was opened.
TIOT Section – a portion of the TIOT, including:						
52	34	SMFTIOE1	1	binary	TIOELNGH	Length, in bytes, of the DD entry (including all device entries)
53	35	SMFTIOE2	1	binary	TIOESTTA	Status indicator. This field indicates the tape label processing to be performed; whether unallocating, rewinding, or unloading tape data sets is required; and whether this is the first DD entry for a split cylinder.
54	36	SMFTIOE3	1	binary	TIOEWTCT	Number of devices requested for this data set during allocation
55	37	SMFTIOE4	1	binary	TIOELINK	During allocation, this field indicates a link to the appropriate prime split, unit affinity, volume affinity, or suballocate TIOT entry. After allocation, it is a data set and device indicator.
56	38	SMFTIOE5	8	EBCDIC	TIOEDDNM	DDname
64	40	SMFTIOE6	3	binary	TIOEJFCB	Relative track address (TTR) of the JFCB. During allocation, this field contains the TTR of the SIOT.
67	43	SMFTIOE7	1	binary	TIOESTTC	Status indicator during allocation only and set to zeros at the end of allocation. This field indicates whether the unit affinity, volume affinity, and suballocate TIOT entry are primary or secondary.
JFCB Section:						
68	44	SMFJFCB1	176	binary	JFCB	The JFCB, excluding JFCB extensions
DCB/DEB Section – portions of the DCB and DEB, including:						
244	F4	SMFDCBOR	2	binary	DCBDSORG	Data set organization being used
246	F6	SMFDCBRF	1	binary	DCBRECFM	Record format
247	F7	SMFDCBMF	2	binary	DCBMACRF	Type of I/O macro instruction and options
249	F9	SMFDCBFL	1	binary	DCBOFLGS	Indicator used by the OPEN routine such as the type of the last I/O operation, and the return from the user's exit.
250	FA	SMFDCBOP	1	binary	DCBOPTCD	Option codes used by access-method interfaces
251	FB	SMF14RV2	1	binary		Reserved
252	FC	SMFDEBFL	1	binary	DEBOFLGS	Data set and device status indicator. This field indicates whether a data set is modified, new or old, and shows the status of DASD.
253	FD	SMFDEBOP	1	binary	DEBOPATB	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.
254	FE	SMFDEBVL	2	binary	DEBVLSEQ	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.

(Continued)

Offsets		Name	Length	Format	Source	Description
For each DCB/DEB tape extension, there is a 12-byte entry with the following format:						
+0		SMFDCBBL	4	binary	DCBBLKCT	Block count for each volume
+4		SMFDSSNO	6	EBCDIC	UCBSQC	Data set serial number
+10		SMF14RV3	2	binary		Reserved
The following 12 bytes apply to the DCB/DEB DASD extension:						
+0		SMF14NTU	4	binary	DCBFDAD	Relative track and concatenation number (TTRN) of the last record processed for a physical sequential or partitioned data set. N is always zero except for BPAM-concatenated data sets. If the last operation was a read (DCBOFLGS bit 0 is off) the TTR is: (1) zero, (2) the start of a BPAM member if there are two or more IOBs, or (3) the last write of the data set if there is one IOB. This is true because the access method maintains DCBFDAD while reading only if RECFM=FS, RECFM=FBS, or only one IOB (BUFNO, NCP) is used.
+4		SMF14NTR	4	binary	TCTTKRLD	Number of tracks released by the DADSM routine
+8		SMF14NER	1	binary	TCTEXRLD	Number of extents released by the DADSM routine
+9		SMF14RV4	3	binary		Reserved
UCB Section – a portion of the UCB (see offsets 45 and 47), including:						
+0		SMFUCBDV	2	binary	UCBCHAN	Device number
+2		SMFSRTEV	6	EBCDIC	UCBVOLI	Volume serial number
+8		SMFUCBTY	4	EBCDIC	UCBTYP	Unit type
+12		SMFSRTES	1	EBCDIC	UCBSTAB	DASD volume status indicator. This field indicates whether this DASD volume is a private, public, storage, or control volume.
+13		SMF14NEX	1	binary	internal (in DEB)	Number of extents
+14		SMF14RV5	2	EBCDIC		Reserved
+16		SMFEXCP	4	binary	TCTDCTR	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 8.
For each UCB tape extension, there is a four-byte entry with the following format:						
+0		SMFSRTEF	2	binary	UCBFSCT	Data set sequence count
+2		SMFSRTEQ	2	binary	UCBFSEQ	Data set sequence number
The following four bytes apply to the UCB DASD extension:						
+0		SMF14NTA	4	binary	DEBNMTRK for all extents	Number of tracks allocated on the device
ISAM Extension Section (DCBDSORG=IS and DCBMACRF not EXCP):						
+0		SMF14RV6	2	binary		Reserved
+2		SMFDCBMA	1	binary	DCBMAC	Extension of I/O macro instruction field (DCBMACRF) for ISAM
+3		SMFDCBNL	1	binary	DCBNLEV	Number of index levels
+4		SMFDCBR3	4	binary	DCBRORG3	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
+8		SMFDCBNR	4	binary	DCBNREC	Number of logical records in the prime data area
+12		SMFDCBR2	2	binary	DCBRORG2	Number of tracks (whole or partial) remaining in the overflow area

[1]These fields are zero for DD DUMMY and spooled data sets.

(Continued)

For virtual I/O data sets, the device number is X'7FFF'. When the high order bit is on in the device number field, a virtual device is indicated.

Offsets		Name	Length	Format	Source	Description
ISAM Extension Section: (Continued)						
+14		SMFDCBNO	2	binary	DCBNOREC	Number of logical records in the overflow area
+16		SMFDCBR1	2	binary	DCBRORG1	Number of cylinder overflow areas that are full
+18		SMF14RV7	1	binary		Reserved
+19		SMFDEBNI	1	binary	DEBNIEE	Number of extents in the independent index area
+20		SMFDEBNP	1	binary	DEBNPEE	Number of extents in the prime data area
+21		SMFDEBNO	1	binary	DEBNOEE	Number of extents in the independent overflow area
+22		SMFNCYLS	2	binary	internal (in DEB)	Number of cylinders in the independent index area
+24		SMFNPCYL	2	binary	internal (in DEB)	Number of cylinders in the prime data area
+26		SMFNOCYL	2	binary	internal (in DEB)	Number of cylinders in the independent overflow area

Record Type 15 (0F) – OUTPUT, UPDAT, INOUT, or OUTIN Data Set Activity

Record type 15 is written for non-VSAM direct access or 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 by IFG0202H and IFG0202I when a data set, as described above, is closed or processed by EOV. Its length varies from 292 to 6,416 bytes, depending upon the number of volumes for the data set.

This record contains information (associated with both the access method used and the type of data set used) from the TIOT, JFCB, DCB, DEB, and UCB data areas. For more information about these data areas, see *Debugging Handbook.*

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) – Sort/Merge Statistics

Record type 16 is written by IGX00017 to record information about events and operations of the Sort/Merge Program Product (5740-SM1). Depending on the option specified at initialization, a complete record, a short record, or no record is produced. A short record does not contain the record length statistics section. Note, however, that a full SMF record is produced by Sort/Merge only if the user requests a full SMF record and variable-length records are being sorted. Its length is 76 bytes plus the length of the product, data, and statistics sections.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF16LEN	2	binary	internal	Record length
2	2	SMF16SEG	2	binary	internal	Segment descriptor
4	4	ICESIND	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0 Subsystem name follows standard header 1-4 Reserved 5 MVS/XA 6 VS2 7 VS1
5	5	ICERTYPE	1	binary	internal	Record type
6	6	ICEBTIME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	ICEBDATE	4	packed	SVC 83	Date record was moved to SMF buffer, in the form 00YYDDDF where F is the sign
14	E	ICESID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	ICEJOBNM	8	EBCDIC	JMRJOB	Jobname
26	1A	ICERST	4	binary	JMRENTRY	Time reader recognized job card
30	1E	ICERDS	4	packed	JMREDATE	Date reader recognized job card
34	22	ICEUIF	8	EBCDIC	JMRUSID	User ID (taken from common exit parameter area)
42	2A	ICESTN	1	binary	JMRSTEP	Step number
43	2B	ICERES1	3			Reserved
46	2E	ICESUBID	4	EBCDIC	internal	Subsystem identification
50	32	ICERSUB	2	binary	internal	Record subtype X'01': Short record X'02': Full record
52	34	ICEPROD	4	binary	internal	Offset to product section
56	38	ICEPRODL	2	binary	internal	Product section length
58	3A	ICEPRODN	2	binary	internal	Number of product sections
60	3C	ICEDATA	4	binary	internal	Offset to common data section
64	40	ICEDATAL	2	binary	internal	Common data section length
66	42	ICEDATAN	2	binary	internal	Number of data sections
68	44	ICESTAT	4	binary	internal	Offset to statistics section
72	48	ICESTATL	2	binary	internal	Statistics section length
74	4A	ICESTATN	2	binary	internal	Number of statistics sections
Product section:						
+0		ICERECV	2	EBCDIC	internal	Record version
+2		ICEPRDCT	8	EBCDIC	internal	Product name: '5740-SM1'

Offsets	Name	Length	Format	Source	Description
Data section:					
+0	ICERES2	2	binary	internal	Reserved
+2	ICESTPNM	8	EBCDIC	internal	Stepname; blank if no stepname
+10	ICERCDS	4	binary	internal	Number of records sorted
+14	ICEBYTES	4	binary	internal	Number of bytes sorted (sum of record lengths)
+18	ICECPUT	4	binary	SVC 46	Sort processor time, hundredths of a second
+22	ICELEN	2	binary	internal	Specified record length
+24	ICEIBLK	2	binary	internal	Maximum input blocksize[1]
+26	ICEOBLK	2	binary	internal	Output blocksize[1,2]
+28	ICEKEYLN	2	binary	internal	Total control field length (number of bytes actually compared by Sort)
+30	ICEWBLK	4	binary	internal	Number of work data set tracks used
+34	ICEFLBYT	1	binary	internal	*Bit* *Meaning When Set* 0 Reserved 1-2[3] 00=Fixed-length records 01=Variable-length records 10=Variable-length spanned records 3-4 00=Blockset 01=Peerage 10=Vale 11=Conventional and merge 5 '1'B if Sort dynamically or explicitly invoked 6-7 Reserved
+35	ICENDYNA	1	binary	internal	Number of allocated work data sets
+36	ICERES3	2			Reserved
Statistics section:					
+0	ICECTR01	4	binary	internal	Records in interval 1
+4	ICECTR02	4	binary	internal	Records in interval 2
+8	ICECTR03	4	binary	internal	Records in interval 3
+12	ICECTR04	4	binary	internal	Records in interval 4
+16	ICECTR05	4	binary	internal	Records in interval 5
+20	ICECTR06	4	binary	internal	Records in interval 6
+24	ICECTR07	4	binary	internal	Records in interval 7
+28	ICECTR08	4	binary	internal	Records in interval 8
+32	ICECTR09	4	binary	internal	Records in interval 9
+36	ICECTR10	4	binary	internal	Records in interval 10
+40	ICECTR11	4	binary	internal	Records in interval 11
+44	ICECTR12	4	binary	internal	Records in interval 12
+48	ICECTR13	4	binary	internal	Records in interval 13
+52	ICECTR14	4	binary	internal	Records in interval 14
+56	ICECTR15	4	binary	internal	Records in interval 15
+60	ICECTR16	4	binary	internal	Records in interval 16

[1] ICEIBLK and ICEOBLK are set to zero if the corresponding data set (input or output, respectively) is not present.

[2] Invalid for VSAM data sets and set to zero.

[3] If ICEFLBYT bits 1-2 are binary zeroes (indicating a 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 the short form has been produced.

Record Type 17 (11) – Scratch Data Set Status

Record type 17 is written by IGG0290D when a non-temporary data set or a temporary data set is scratched. This record contains the data set name, number of volumes, and volume serial numbers. Its length varies from 100 to 2,140 bytes, depending upon the number of volumes for the data set.

Note: You use the REC parameter in the SMFPRMxx parmlib member to specify whether information for 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 record type 17 is to be written only for non-temporary data sets.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF17LEN	2	binary	internal	Record length
2	2	SMF17SEG	2	binary	internal	Segment descriptor
4	4	SMF17FLG	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 VS1
5	5	SMF17RTY	1	binary	internal	Record type
6	6	SMF17TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF17DTE	4	packed	SVC 83	Date record was moved to SMF buffer, in the form 00YYDDDF where F is the sign
14	E	SMF17SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF17JBN	8	EBCDIC	JMRJOB	Job name[1]
26	1A	SMF17RST	4	binary	JMRENTRY	Time, in hundredths of a second, reader recognized the JOB card for this job [1]
30	1E	SMF17RSD	4	packed	JMREDATE	Date reader recognized the JOB card for this job, in the form 00YYDDDF where F is the sign [1]
34	22	SMF17UID	8	EBCDIC	JMRUSEID	User identification (taken from common exit parameter area)
42	2A	SMF17RIN	2	binary		Reserved
44	2C	SMF17DSN	44	EBCDIC	user's parameter list	Data set name
88	58	SMF17RV1	3	binary		Reserved
91	5B	SMF17NVL	1	binary	user's parameter list	Number of volumes
For each volume, there is a eight-byte entry with the following format:						
+0		SMF17RV2	2	binary		Reserved
+2		SMF17FVL	6	EBCDIC	user's parameter list	Volume serial number

[1]The job name and the time and date that the reader recognized the JOB card for this job constitute the job log identification.

Record Type 18 (12) – Rename Data Set Status

Record type 18 is written by IGG03001 when a non-VSAM data set that is 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 from 144 to 2,184 bytes, depending upon the number of volumes for the data set.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF18LEN	2	binary	internal	Record length
2	2	SMF18SEG	2	binary	internal	Segment Descriptor
4	4	SMF18FLG	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 VS1
5	5	SMF18RTY	1	binary	internal	Record type
6	6	SMF18TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF18DTE	4	packed	SVC 83	Date record was moved to SMF buffer, in the form 00YYDDDF where F is the sign
14	E	SMF18SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF18JBN	8	EBCDIC	JMRJOB	Job name[1]
26	1A	SMF18RST	4	binary	JMRENTRY	Time, in hundredths of a second, reader recognized the JOB card for this job [1]
30	1E	SMF18RSD	4	packed	JMREDATE	Date reader recognized the JOB card for this job, in the form 00YYDDDF where F is the sign [1]
34	22	SMF18UID	8	EBCDIC	JMRUSEID	User identification (taken from common exit parameter area)
42	2A	SMF18RIN	2	binary		Reserved
44	2C	SMF18ODS	44	EBCDIC	user's parameter list	Old data set name
88	58	SMF18NDS	44	EBCDIC	user's parameter list	New data set name
132	84	SMF18RV1	3	binary		Reserved
135	87	SMF18NVL	1	binary	user's parameter list	Number of volumes
For each volume, there is an eight-byte entry with the following format:						
+0		SMF18RV2	2	binary		Reserved
+2		SMF18FVL	6	EBCDIC	user's parameter list	Volume serial number

[1]The job name and the time and date that the reader recognized the JOB card for this job constitute the job log identification.

Record Type 19 (13) – Direct Access Volume

Record type 19 is written by IGC0107H (1) for each direct access device that is online at IPL, (2) for each direct access device that is online when a HALT EOD or SWITCH SMF command is processed, and (3) when a volume that is defined by a DD statement is demounted. Its length is 68 bytes.

This record contains the volume serial number, VTOC address, owner identification, unit type, number of unused alternate tracks, number of unallocated cylinders and tracks, number of cylinders and tracks in the largest free extent, and number of unallocated extents. It also contains the device number and module identification for devices having movable address 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.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF19LEN	2	binary	internal	Record length
2	2	SMF19SEG	2	binary	internal	Segment descriptor
4	4	SMF19FLG	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 VS1
5	5	SMF19RTY	1	binary	internal	Record type
6	6	SMF19TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF19DTE	4	packed	SVC 83	Date record was moved to SMF buffer, in the form 00YYDDDF where F is the sign
14	E	SMF19SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF19RV1	2	binary		Reserved
20	14	SMF19VOL	6	EBCDIC	volume label[1] (VOLSERNO)	Volume serial number
26	1A	SMF19OID	10	EBCDIC	volume label[1] (VOLOWNER)	Owner identification of direct access volume
36	24	SMF19DEV	4	binary	UCBTYP	Unit type
40	28	SMF19VTC	5	binary	volume label[1] (VOLVTOC)	VTOC address
45	2D	SMF19VTI	1	binary	DS4VTOCI (in DSCB4) DS4DOSBT DS4DSTKP DS4DICVT DS4DIRF DS4DICVT DS4IVTOC	VTOC indicator *Bit* *Meaning When Set* 0 Format 5 DSCBs missing or erroneous 1-2 Reserved 3 VTOC does not begin on record 1 4 Accurate Format 5 and 6 DSCBs; bit 0 set to 0 5 Possible VTOC or VTOC index error[2] 6 VTOC error has been fixed; bit 5 set to 0 7 Indexed VTOC
46	2E	SMF19NDS	2	binary	internal	Number of DSCBs, calculated as: number of DSCBs per track times number of tracks in VTOC
48	30	SMF19DSR	2	binary	DS4DSREC (in DSCB4)	Number of DSCB0s, that is, number of available DSCBs
50	32	SMF19NAT	2	binary	DS4NOATK (in DSCB4)	Number of unused alternate tracks
52	34	SMF19SPC	2	binary	internal (DSCB5)	Number of unallocated cylinders
54	36		2	binary	internal (DSCB5)	Number of unallocated tracks
56	38	SMF19LEX	2	binary	internal (DSCB5)	Number of cylinders in the largest unallocated extent
58	3A		2	binary	internal (DSCB5)	Number of tracks in the largest unallocated extent
60	3C	SMF19NUE	2	binary	internal (DSCB5)	Number of unallocated extents
62	3E	SMF19RV2	2	binary		Reserved
64	40	SMF19CUU	2	binary	UCBCHAN	Device number
66	42	SMF19IND	2	binary	internal	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.)

[1]The volume label for the direct access device is record 3 of cylinder 0 of track 0.

[2]Bit 5 may be set for SMF record 19 even though it may not be set in Format 4 DSCB for an indexed VTOC when active VTOC Recording Facility (VRF) data is present in the VTOC index.

Record Type 20 (14) – Job Initiation

Record type 20 is written by IEFSMFIE at job initiation (including TSO logon). This record contains the job log identification, user identification programmer's name, number of accounting fields on the JOB statement, accounting fields, and RACF-related information. Its length is 65 bytes plus the length of the JOB statement accounting fields and the relocatable RACF section.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF20LEN	2	binary	internal	Record length
2	2	SMF20SEG	2	binary	internal	Segment descriptor
4	4	SMF20FLG	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 VS1
5	5	SMF20RTY	1	binary	internal	Record type
6	6	SMF20TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF20DTE	4	packed	SVC 83	Date record was moved to SMF buffer, in the form 00YYDDDF where F is the sign
14	E	SMF20SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF20JBN	8	EBCDIC	JMRJOB	Job name[1]
26	1A	SMF20RST	4	binary	JMRENTRY	Time, in hundredths of a second, reader recognized the JOB card for this job[1]
30	1E	SMF20RSD	4	packed	JMREDATE	Date reader recognized the JOB card for this job, in the form 00YYDDDF where F is the sign[1]
34	22	SMF20UID	8	EBCDIC	JMRUSEID	User identification (taken from common exit parameter area)
42	2A	SMF20RLO	2	binary	IEFSMFIE	Offset to relocatable area from beginning of record.
44	2C	SMF20PGM	20	EBCDIC	ACTPRGNM (in JCT)	Programmer's name
64	40	SMF20NAF	1	binary	ACTJNFLD (in JCT)	Number of accounting fields
65	41	SMF20ACT	variable	EBCDIC	JOB statement	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						
+0	0	SMF20RLS	2	Binary	internal	Size of relocate section including this field.
+2	2	SMF20GRP	8	EBCDIC	ACEEGRPN	RACF Group ID. If RACF is not active, this field is set to zero.
+10	A	SMF20RUD	8	EBCDIC	ACEEUSRI	RACF User ID. If RACF is not active, this field is set to zero.
+18	12	SMF20TID	8	EBCDIC	ACEETRMP	If RACF is not active, this field is set to zero. Also, if RACF is active and the user is not a terminal user then this field is set to zero.

[1]The job name and the time and date that the reader recognized the JOB card for this job constitute the job log identification.

Record Type 21 (15) – Error Statistics by Volume

Record type 21 is written by IGC0009A when a user 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. Its length is 62 bytes.

This record contains the volume serial number, device number, unit type, and tape density. It also contains the number of temporary and permanent read and write errors, START Subchannel (SSCH) instructions, 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. For a detailed description of this utility program, see *OS/VS2 Utilities.*
2. If a maximum count is reached, it is no longer incremented. A counter at its maximum value indicates at least that number since no record is written when the counter is full.
3. A record type 21 is written, in addition to demount tine, any time EREP is run or when EOD is issued. Therefore, more than one type 21 record may be written for each tape that was mounted. The total count will be accurate because the counters are cleared when a type 21 record is written.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF21LEN	2	binary	internal	Record Length
2	2	SMF21SEG	2	binary	internal	Segment descriptor
4	4	SMF21FLG	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 VS1
5	5	SMF21RTY	1	binary	internal	Record type
6	6	SMF21TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF21DTE	4	packed	SVC 83	Data record was moved to SMF buffer, in the form 00YYDDDF where F is the sign
14	E	SMF21SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF21LGH	2	binary	internal	Length of rest of record including this field. (This field is always 44.)
20	14	SMF21VOL	6	EBCDIC	UCBVOLI	Volume serial number
26	1A	SMF21CA	2	binary	UCBHAN	Device number or device address
28	1C	SMF21UCB	4	binary	UCBTYP	Unit type
32	20	SMF21TR	1	binary	UCBTR	Number of temporary read errors (Non-buffered log)
33	21	SMF21TW	1	binary	UCBTW	Number of temporary write errors (Non-buffered log)
34	22	SMF21SIO	2	binary	UCBSIO	Number of SSCH instructions
36	24	SMF21PR	1	binary	UCBPR	Number of permanent read errors
37	25	SMF21PW	1	binary	UCBPW	Number of permanent write errors

(Continued)

Offsets		Name	Length	Format	Source	Description
38	26	SMF21NB	1	binary	UCBNB	Number of noise blocks (Non-buffered log)
39	27	SMF21ERG	2	binary	UCBERG	Number of erase gaps
41	29	SMF21CLN	2	binary	UCBCLN	Number of cleaner actions
43	2B	SMF21DEN	1	binary	DCBDEN	Tape density — 2400 and 3400 series magnetic tape units
						Bits *Meaning When Set*
						Code *7-Track* *9-Track*
					DCBMTDN0	6,7 0 200 BPI N/A
					DCBMTDN1	1,6,7 1 556 BPI N/A
					DCBMTDN2	0,6,7 2 800 BPI 800 BPI
					DCBMTDN3	0,1,6,7 3 N/A 1600 BPI
					DCBMTDN4	0,1,3,6,7 4 N/A 6250 BPI
44	2C	SMF21BLS	2	binary	DCBBLKSI	Block size. This field is zero if DCBRECFM indicates variable or unblocked records, if you are doing your own EXCP processing, or if module IGC0009A was entered from EREP, VARY, or Allocation.
46	2E	SMF21OFL	1	binary	DCBCOFLG	DCBOFLG
47	2F	SMF21TUS	3	packed	UCBCXTUS UCBCTD	Tape unit serial
50	32	SMF21TRF	2	binary	UCBCXRD	Temporary read forward errors
52	34	SMF21TRB	2	binary	UCBCXRDB	Temporary read backward errors
54	36	SMF21TWF	2	binary	UCBCXWR	Temporary write errors
56	38	SMF21BR	3	binary	UCBCXMBR	Bytes read * 4096
59	3B	SMF21BW	3	binary	UCBCXMBW	Bytes written * 4096

Record Type 22 (16) – Configuration

Record type 22 is written:

- by ICB2MSG and IEEMB823 after every IPL of the system,
- by IEECLEAN when a CONFIG CPU or CONFIG CHP operator command is processed,
- by IEEMPVST or IEEVSTGL when a CONFIG STOR operator command is processed,
- by IGC0012F when a VARY ONLINE,S or VARY OFFLINE,S operator command is processed

This record describes the processor, channel path, storage, or mass storage device configuration in effect after the IPL or change. The storage section contains 31-bit real storage addresses. Record type 22 also describes the MSS units online at IPL. The length of this record is 22 bytes plus the length of the sections in the record.

Notes:

1. During system initialization, the Mass Storage Control (MSC) creates a configuration record (called Message 92) and puts it in a message buffer. After SMF is initialized, ICB2MSG creates the "MSS IPL Configuration section" of record type 22 from the Message 92 in the MSC buffer.
2. By using the VARY ONLINE,S and VARY OFFLINE,S commands, the operator can modify the configuration. (The format of these commands is described in *Operator's Library: IBM 3850 Mass Storage System (MSS) Under OS/VS.*) In a record type 22, a "VARY ONLINE,S section" or a "VARY OFFLINE,S section" is written for *each* unit varied by these commands.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF22LEN	2	binary	internal	Record length
2	2	SMF22SEG	2	binary	internal	Segment descriptor
4	4	SMF22FLG	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 VS1
5	5	SMF22RTY	1	binary	internal	Record type
6	6	SMF22TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF22DTE	4	packed	SVC 83	Date record was moved to SMF buffer, in the form 00YYDDDF where F is the sign
14	E	SMF22SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF22IND	2	binary	 IEEMB823 IEEVCPR/ IEEVSTGL IEEVCPR/ IEEVSTGL ICB2MSG IGC0012F IGC0012F	Record creator indicator *Value* *Meaning* 1 IPL 2 VARY ONLINE 3 VARY OFFLINE 4 MSS at IPL 5 VARY ONLINE,S 6 VARY OFFLINE,S 7 VARY CHANNEL PATH ONLINE OR OFFLINE
20	14	SMF22ECT	2	binary	internal	Number of sections following

(Continued)

Offsets		Name	Length	Format	Source	Description
CPU Section:						
+0		SMF22CFG	1	binary	internal	CPU Flags *Bit* *Meaning When Set* 0 Vector Facility indicator (VF online) 1-7 Reserved
+1		SMF22PID	1	binary	IEEVCPR 1	CPU section identification. (This field is always 1.)
+2		SMF22CPN	2	binary	IEEVCPR	CPU model number (taken from CONFIG CPU command
+4		SMF22RV1	1	binary		Reserved
+5		SMF22CPA	1	binary	IEECLEAN	CPU identifier (taken from CONFIG CPU command or default in PSACPUPA)
Channel Path Section:						
+0		SMF22RV7	1	binary		Reserved
+1		SMF22UID	1	binary	internal	Channel Path section identification. (This field is always 7.)
+2		SMF22PAR SMF22PFG SMF22POW SMF22PON	256 x'80' x'40' x'20'	EBCDIC	ICHICPT	Array of 256 entries to map each unique CHP If 1=CHP, CHP is valid for this installation. If 0, SMF22POW=0 and SMF22PON=0 If 1=CHP, CHP is owned by this system, and SMF22PFG=1; if 0, SMF22PON=0 If 1=CHP, CHP is ONLINE, SMF22PFG=1, and SMF22POW=1
Reconfigured Channel Path Section:						
+0		SMF22RV8	1	binary		Reserved
+1		SMF22RID	1	binary	internal	Reconfigured Channel Path section identification. (This field is always 8.)
+2		SMF22CNT	1	binary	internal	Count of CHPIDs in this section
+3		SMF22CHI	1	EBCDIC	internal	Array of channel path identifiers
Storage Section:						
+0		SMF22MFL	1	EBCDIC	IEEMB823	Storage flags *Bit* *Meaning When Set.* 0 Real storage frames are interleaved 1-7 Reserved
+1		SMF22TID	1	binary	IEEVSTGL	Storage section identification. (This field is always 3.)
+2		SMF22PGL	4	binary	IEEVSTGL	Address of lowest frame in real contiguous storage (taken from CONFIG STOR command
+6		SMF22NPG	4	binary	IEEVSTGL	Number of frames in real contiguous storage (taken from CONFIG STOR command)
Extended Storage Section: (one contiguous block of online extended storage):						
+0	+0		1	EBCDIC		Reserved
+1	+1	SMF22XID	1	binary	internal	Extended storage identification. (This field is always 9.)
+2	+2	SMF22XAD	4	binary	internal	Beginning extended storage frame (E-frame) address in this contiguous block **Note:** Extended storage is always addressed in frames
+6	+6	SMF22XNP	4	binary	internal	Number of 4K extended storage frames in this contiguous block

Offsets		Name	Length	Format	Source	Description
MSS IPL Configuration Section:						
+0	0	SMF22RV4	1	binary		Reserved
+1	1	SMF22IID	1	binary	ICB2MSG	MSS IPL configuration section identification. (This field is always 4.)
The following 40 bytes contain the bit pattern of MSS units online at IPL:						
+2	2	SMF22ION	1	binary	(See Note 1)	Data recording devices (DRDs) of MSF(0) *Bit* *SSID* 0 200 1 201 2 202 3 203 4 204 5 205 6 206 7 207
+3	3		1	binary		Data recording devices (DRDs) or MSF(1) *Bit* *SSID* 0 210 1 211 2 212 3 213 4 214 5 215 6 216 7 217
+4	4		2	binary		Reserved
+6	6		2	binary		Staging Adapters *Bit* *SSID* 0 800 1 810 2 820 3 830 : : 15 8F0
+8	8		1	binary		Device recording controls (DRCs) of MSF(0) *Bit* *SSID* 0 400 1 401 2 402 3 403 Device recording controls (DRCs) of MSF(1) 4 410 5 411 6 412 7 413
+9	9		1	binary		Reserved
+10	10		28	binary		Staging spindles in staging data groups (SDGs) *SDG* *Bits* *SSIDs* 0 0-7 000-007 1 0-7 008-00F 2 0-7 010-017 3 0-7 018-01F : : : 27 0-7 0E8-0EF

Offsets		Name	Length	Format	Source	Description
MSS IPL Configuration Section: (Continued)						
+38	26		3	binary		Reserved
+41	29		1	binary		MSF indicator *Bit* *Meaning When Set* 0 MSF(0) with SSID of 101 1 MSF(0) with SSID of 102 2 MSF(1) with SSID of 111 3 MSF(1) with SSID of 112 4-7 Reserved
VARY ONLINE,S Section:						
+0	0	SMF22RV5	1	binary		Reserved
+1	1	SMF22NID	1	binary	IGC0012F	VARY ONLINE,S section identification. (This field is always 5.)
+2	2	SMF22RVA	1	binary		Reserved
+3	3	SMF22NSI	3	binary	IGC0012F	Subsystem identification of device (taken from VARY ONLINE,S command)
VARY OFFLINE,S Section:						
+0	0	SMF22RV6	1	binary		Reserved
+1	1	SMF22FID	1	binary	IGC0012F	VARY OFFLINE,S section identification. (This field is always 6.)
+2	2	SMF22RVB	1	binary		Reserved
+3	3	SMF22FSI	3	binary	IGC0012F	Subsystem identification of device (taken from VARY OFFLINE,S command)

Record Type 23 (17) – SMF Status Record

Record type 23 is written by IEEMB842 at the interval specified by the STATUS keyword. It records SMF statistics collected during the reporting interval. Its length is 82 bytes.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF23LEN	2	binary	internal	Record length
2	2	SMF23SEG	2	binary	internal	Segment descriptor
4	4	SMF23FLG	1	binary	SVC 83	Header flag byte
5	5	SMF23RTY	1	binary	internal	Record type
6	6	SMF23TME	4	binary	SVC 83	Time, in hundredths of a second, when the record was moved to SMF buffer
10	A	SMF23DTE	4	packed	SVC 83	Date record was moved to SMF buffer, in the form 00YYDDDF, where F is the sign
14	E	SMF23SID	4	EBCDIC	SMCASID	System identification (taken from the SID parameter)
18	12		2	binary	internal	Reserved
20	14	SMF23POF	4	binary	internal	Offset to product section from start of record, including the RDW
24	18	SMF23PLN	2	binary	internal	Length of product section
26	1A	SMF23PON	2	binary	internal	Number of product sections
28	1C	SMF23SOF	4	binary	internal	Offset to system action from start of record, including the RDW
32	20	SMF23SLN	2	binary	internal	Length of system section
34	22	SMF23SON	2	binary	internal	Number of system sections
36	24	SMF23ROF	4	binary	internal	Offset to SMF statistics section from start of record, including the RDW
40	28	SMF23RLN	2	binary	internal	Length of SMF statistics section
42	2A	SMF23RON	2	binary	internal	Number of SMF statistics sections
Product Section:						
+0		SMF23TID	2	binary	internal	Sub type identification — '0'
+2		SMF23RVN	2	EBCDIC	internal	Record version number — '01'
+4		SMF23PNM	8	EBCDIC	internal	Product name — 'SMF'
System Section:						
+0		SMF23INT	6	EBCDIC	SMCASSTS	Length of measurement interval
+6		SMF23RLS	4	EBCDIC	CVTRELNO	Operating system release level
SMF Statistics Section:						
+0		SMF23BFW	4	binary	SMCABFWT	Number of buffers written
+4		SMF23BFQ	4	binary	SMCABFMF	Maximum number of buffers used at one time.
+8		SMF23SUS	4	binary	SMCANMSU	Number of times suspended because no buffers are available
+12		SMF23RCW	4	binary	SMCARCWT	Number of records written

Record Type 24 (18) – JES2 Spool Offload

Record type 24 is written by HASPNET or HASPRDR 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-execution 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-execution job.

This record identifies the name, time and date of each job that has been transmitted or received. It also includes specific information about jobs in a record subtype. For jobs not yet executed, it reports job-related information such as job class and system affinity in the job selection criteria section. For jobs that have already executed, it reports information about SYSOUT data sets such as output group id and forms name in the SYSOUT selection criteria section. Whenever record type 24 contains the job selection criteria section, the length is 206 bytes; when it contains the SYSOUT selection criteria section, the length is 227 bytes. Record type 24 never contains both sections.

Use IFASMFR to map the JES2 type 24 record. For more information see "Using the IFASMFR Macro to Address SMF Record Fields" in Chapter 4.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF24LEN	2	binary	internal	Record length
2	2	SMF24SEG	2	binary	internal	Segment descriptor
4	4	SMF24FLG	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0 Subsystem name follows standard header 1-4 Reserved 5 MVS/XA 6 VS2 7 Reserved
5	5	SMF24RTY	1	binary	internal	Record type
6	6	SMF24TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF24DTE	4	packed	SVC 83	Date record was moved to SMF buffer, in the form 00YYDDDF where F is the sign
14	E	SMF24SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF24SSI	2	EBCDIC	internal	Subsystem identification
22	16	SMF24SUB	2	EBCDIC	internal	Record subtype *Value* *Meaning* 1 Job transmitted 2 Job received 3 SYSOUT transmitted 4 SYSOUT received

Offsets		Name	Length	Format	Source	Description
24	18	SMF24NTR	2	binary	internal	Number of triplets
26	1A	SMF24RSV	2			Reserved
28	1C	SMF24OPS	4	binary	internal	Offset to product section
32	20	SMF24LPS	2	binary	internal	Product section length
34	22	SMF24NPS	2	binary	internal	Number of product sections
36	24	SMF24OGN	4	binary	internal	Offset to general sections
40	28	SMF24LGN	2	binary	internal	General section length
42	2A	SMF24NGN	2	binary	internal	Number of general sections
44	2C	SMF24OSP	4	binary	internal	Offset to job or SYSOUT selection criteria section
48	30	SMF24LSP	2	binary	internal	Job or SYSOUT selection criteria section length
50	32	SMF24NSP	2	binary	internal	Number of job or SYSOUT selection criteria sections
Product Section:						
+0	+0	SMF24PVR	2	EBCDIC	internal	Record version number
+2	+2	SMF24PNM	8	EBCDIC	internal	Product name 'JES2'
General Section for Spool Offload Devices:						
+0	+0	SMF24GLN	2	binary	internal	Length of general section
+2	+2	SMF24BCF	1	binary	internal	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
+3	+3	SMF24EOJ	1	binary	internal	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	JCTNAME	Job name
+12	+C	SMF24JID	8	EBCDIC	JCTNOJID	Original job identification
+20	+14	SMF24CJD	8	EBCDIC	JCTJOBID	Current job identification
+28	+1C	SMF24SYS	4	EBCDIC	SSID	System identification
+32	+20	SMF24DSN	44	EBCDIC	XDCTDSN	Offload data set name
+76	+4C	SMF24CNT	4	binary	vanes with subtype[1]	Number of records transmitted or received

[1] The source of this field varies with the subtype value set in SMF24SUB. If the value equals 1, the source is JTWCOUNT; if the value equals 2, the source is RDWCNTRR; if the value equals 3, the source is STWCOUNT; if the value equals 4, the source is SRWCOUNT.

Offsets		Name	Length	Format	Source	Description
General Section (continued):						
+80	+50	SMF24TDS	4	binary	XDCTTIME	Time offload data set was allocated
+84	+54	SMF24DDS	4	binary	JCTNONDE	Date offload data set was allocated, in the form 00YYDDDF where F is the sign
+88	+48	SMF24ORG	8	EBCDIC	XDCTDATE	Node of origin
+96	+60	SMF24TRD	4	binary	JCTNONDE	Time on reader where F is the sign
+100	+64	SMF24DRD	4	binary	JCTRDTON	Date on reader, in the form 00YYDDF where F is the sign
Job Selection Criteria Section:						
+0	+0	SMF24LN	2	binary	internal	Length of job section
+1	+1	SMF24JFG	1	binary	internal	Job flags *Bit* *Meaning When Set* 0 Held job 1 Affinity = any 2-7 Reserved
+3	+3	SMF24JCL	1	EBCDIC	varies with subtype[2]	Job class
+4	+4	SMF24JND	8	EBCDIC	JCTNXNDE	Node name
+12	+C	SMF24JAF	28	EBCDIC	internal	Affinity system identification
SYSOUT Selection Criteria Section:						
+0	+0	SMF24LN2	2	binary	internal	Length of SYSOUT section
+2	+2	SMF24SFG	1	binary	internal	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	NDHGCLAS	SYSOUT class
+4	+4	SMF24SND	8	EBCDIC	NDHGNODE	Node name
+12	+C	SMF24SRN	8	EBCDIC	NDHGRMT	Remote name
+20	+14	SMF24FCB	4	EBCDIC	NDHGFCB	Forms control buffer (FCB)
+24	+18	SMF24FOR	8	EBCDIC	NDHGFORM	Forms overlay name
+32	+20	SMF24FLS	4	EBCDIC	NDHAFLSH	Flash cartridge name
+36	+24	SMF24PRM	8	EBCDIC	NDHGPMDE	Print data set (PR) mode
+44	+2C	SMF24UCS	4	EBCDIC	NDHGUCS	Universal character set (UCS)
+48	+30	SMF24WID	8	EBCDIC	NDHGXNTR	Writer
+56	+38	SMF24REC	4	binary	NDHGNREC	Data set record count
+60	+3C	SMF24PRY	1	binary	PDBPRIO	Output selection priority

[2] The source of this field varies with the subtype value set in SMF24SUB. If the value equals 1, the source is JTWCOUNT; if the value equals 2, the source is RDWCNTRR.

Record Type 25 (19) – JES3 Device Allocation

Record type 25 is written by IATPURG for each job that completed JES3 converter/interpreter (C/I) processing. One type 25 record is written for all device allocations required for the job, whether or not the job contains DD statements. Also, for any job that uses a private catalogue, IATPURG writes a separate type 25 record for each group of JES3 device allocations used by that job, and IATMDBK writes a separate type 25 record for each main device scheduling (MDS) dynamic allocation request.

This record contains allocation-related information such as the number of tape and disk volumes fetched and mounted, the time and date of the first mount message, and the time and date of JES3 device verification.

Use IFASMFR to generate the JES3 record type 25 macro mappiing. For more information, see "Using the IFASMFR Macro to Address SMF Record Fields" in Chapter 4.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF25LEN	2	binary	internal	Record length
2	2	SMF25SEG	2	binary	internal	Segment descriptor
4	4	SMF25FLG	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 Reserved
5	5	SMF25RTY	1	binary	internal	Record type
6	6	SMF25TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF25DTE	4	packed	SVC 83	Date record was moved to SMF buffer, in the form 00YYDDDF where F is the sign
14	E	SMF25SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF25JBN	8	EBCDIC	JSTJBNAM	Job name[1]
26	1A	SMF25RST	4	binary	JMRENTRY (Set by IATISJB)	Time, in hundredths of a second, reader recognized the JOB card for this job[1]
30	1E	SMF25RSD	4	packed	JMREDATE (Set by IATISJB)	Date reader recognized the JOB card for this job, in the form 00YYDDDF where F is the sign[1]
34	22	SMF25UIF	8	EBCDIC	JMRUSEID	User identification (taken from common exit parameter area)
Descriptor Section:						
42	2A	SMF25IND	2	binary	JST25FG1	Allocation indicators *Bit* *Meaning When Set* 0 If 0, allocation by user's DD statements. If 1, dynamic allocation. 1 If 0, non-catalog allocation by JES3. If 1, catalog allocation by JES3. 2 If 0, manual allocation by operator. If 1, automatic allocation by JES3. (See the MDS parameter SETPARAM in *OS/VS2 System Programming Library: JES3 System Programmer's Guide* for more information.) 3-15 Reserved

[1]The job name and the time and date that the reader recognized the JOB card for this job constitute the job log identification.

(Continued)

Offsets		Name	Length	Format	Source	Description
Descriptor Section (Continued)						
44	2C	SMF25NTF	4	binary	JST25NTF	Number of IAT5110 GET messages for tape volumes issued for the job.
48	30	SMF25NDF	4	binary	JST25NDF	Number of IAT5110 GET messages for disk volumes issued for the job.
52	34	SMF25FST	4	binary	JST25FST (Set by IATMDFE)	Time, in hundredths of a second, 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 execute.)
56	38	SMF25FSD	4	packed	JST25FSD (Set by IATMDFE)	Date fetch processing ended, in the form 00YYDDDF where F is the sign
60	3C	SMF25SST	4	binary	JST25SST (Set by IATMDDR)	If manual allocation, time *START SETUP operator command issued. If automatic allocation, this field contains zeros.
64	40	SMF25SSD	4	packed	JST25SSD (Set by IATMDDR)	If manual allocation, date *START SETUP operator command issued. If automatic allocation, this field contains zeros.
68	44	SMF25NTM	4	binary	JST25NTM	Number of tape volumes mounted by MDS.
72	48	SMF25NDM	4	binary	JST25NDM	Number of disk volumes mounted by MDS.
76	4C	SMF25MST	4	binary	JST25MST (Set by IATMDSL)	Time, in hundredths of a second, when all JES3 volume mount messages have been issued. If no mounts were required, this field equals the time of JES3 allocation.
80	50	SMF25MSD	4	packed	JST25MSD (Set by IATMDSL)	Date when all JES3 volume mount messages have been issued, in the form 00YYDDDF where F is the sign. If no mounts were required, this field equals the date of JES3 allocation.
84	54	SMF25VVT	4	binary	JST25VVT (Set by IATMDVE)	Time, in hundredths of a second, of JES3 device verification
88	58	SMF25VVD	4	packed	JST25VVD (Set by IATMDVE)	Date of JES3 device verification, in the form 00YYDDDF where F is the sign
92	5C	SMF25NMV	4	binary	JST25NMV	Number of Mass Storage Volume requests allocated by MDS for the job.

Record Type 26 (1A) – JES2 Job Purge

Record type 26 is written by HASPMISC at job purge after all SYSOUT for the job is processed. This record identifies the job by job log identification, JES2-assigned job number and programmer's name.

Record type 26 also 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, and start and stop times for the reader, converter, execution processor, and output processor. Its length is 236 bytes plus 80 bytes for the network section, 22 bytes for the routing section and 18 bytes for the print section.

Use IFASMFR to generate the JES2 record type 26 macro mapping. For more information, see "Using the IFASMFR Macro to Address SMF Record Fields" in Chapter 4.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF26LEN	2	binary	internal	Record length
2	2	SMF26SEG	2	binary	internal	Segment descriptor
4	4	SMF26FLG	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 Reserved
5	5	SMF26RTY	1	binary	internal	Record type
6	6	SMF26TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF26DTE	4	packed	SVC 83	Date record was moved to SMF buffer, in the form 00YYDDDF where F is the sign
14	E	SMF26SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF26JBN	8	EBCDIC	JCTJMRJN	Job name[1]
26	14	SMF26RST	4	binary	JCTRDRON	Time, in hundredths of a second, reader recognized the JOB card for this job[1]
30	1E	SMF26RSD	4	packed	JCTRDTON	Date reader recognized the JOB card for this job, in the form 00YYDDDF where F is the sign[1]
34	22	SMF26UIF	8	EBCDIC	JCTUSEID	User identification (taken from common exit parameter area)
42	2A	SMF26RSV	4	binary		Reserved
46	2E	SMF26SBS	2	binary	internal	Subsystem identification – X'0002' signifies JES2
48	30	SMF26IND	2	binary	internal	Entry type indicator: *Bit* *Meaning When Set* 0 Descriptor section present 1 Events section present 2 Acutals section present 3 Reserved 4 Routing section present 5 Print section present 6 JES2 Spool use section 7-15 Reserved

Offsets		Name	Length	Format	Source	Description
Descriptor Section:						
50	32	SMF26LN1	2	binary	internal	Length of descriptor section, including this field
52	34	SMF26RV1	2	binary		Reserved
54	36	SMF26IN2	1	binary	JCTJOBFL	Job information indicator *Bit* *Meaning When Set* 0 Background batch job 1 Foreground TSO 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	JCTJBOPT	Job information indicator *Bit* *Meaning When Set* 0 /* PRIORITY card present or keyword 'PRTY =' was specified on JOB card 1 /* SETUP card(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	JCTJOBID + 4	JES2-assigned job number
60	3C	SMF26JID	8	EBCDIC	JCTJOBID	Job identification in the form xxx0yyyy where yyyy is the JES2-assigned job number and xxx is: JOB — for normal JES2 job STC — for started task control job TSU — for TSO job
68	44	SMF26NAM	20	EBCDIC	JCTPNAME	Programmer's name (taken from JOB card)
88	58	SMF26MSG	1	EBCDIC	JCTMCLAS	Message class (taken from JOB card)
89	59	SMF26CLS	1	EBCDIC	JCTJCLAS	Job class (taken from JOB card)
90	5A	SMF26XPI	1	binary	JCTIPRIO	JES2 job selection priority when the job was initially read
91	5B	SMF26XPS	1	binary	JCTPRIO	JES2 job selection priority when the job was selected
92	5C	SMF26OPI	1	binary		Reserved
93	5D	SMF26OPS	1	binary		Reserved
94	5E	SMF26LOC	2	binary	JCTROUTE	Input route code[3]
96	60	SMF26DEV	8	EBCDIC	JCTINDEV	JES2 logical input device name
104	68	SMF26ACT	4	EBCDIC	JCTACCTN	Programmer's accounting number
108	6C	SMF26ROM	4	EBCDIC	JCTROOMN	Programmer's room number[2]
112	70	SMF26XTM	4	binary	JCTETIME	Estimated execution time, in seconds[2]
116	74	SMF26ELN	4	binary	JCTESTLN	Estimated output lines[2]
120	78	SMF26EPU	4	binary	JCTESTPU	Estimated output punched cards[2]
124	7C	SMF26FRM	4	EBCDIC	JCTFORMS	Output form number. If the source field contains four or fewer characters, SMF26FRM is set. Otherwise, this field is set to blanks, and the contents of the source field appears only in SMF26EFM, described under the Routing Section later in this record.

(Continued)

[1]The job name and the time and date that the reader recognized the JOB card for this job constitute the job log identification.

[2]These fields are JES2-defined subfields from the accounting information field in the JOB card or default values assigned for this job or from /*JOBPARM, JES2 control card.

[3]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. The routing section has the expanded route codes that should be used if these fields are zero. See the Routing Section described later in this record.

Offsets		Name	Length	Format	Source	Description
128	80	SMF26CYP	2	binary	JCTCPYCT	Job print copy count[2]
130	82	SMF26LIN	2	binary	JCTLINCT	Lines per page[2]
132	84	SMF26PRR	2	binary	JCTPROUT	Job print route code[3]
134	86	SMF26PUR	2	binary	JCTPUOUT	Job punch route code[3]
136	88	SMF26PDD	8	EBCDIC	JCTPROCN	Procedure DDNAME used for JCL conversion
Events Section:						
144	90	SMF26LN2	2	binary	internal	Length of events section, including this field
146	92	SMF26RV2	2	binary		Reserved
148	94	SMF26RPT	4	binary	JCTRDROF	Reader stop time, in hundredths of a second
152	98	SMF26RPD	4	packed	JCTRDTOF	Reader stop date, in the form 00YYDDDF where F is the sign
156	9C	SMF26CST	4	binary	JCTCNVON	Converter start time, in hundredths of a second
160	A0	SMF26CSD	4	packed	JCTCDTON	Converter start date, in the form 00YYDDDF where F is the sign
164	A4	SMF26CPT	4	binary	JCTCNVOF	Converter stop time, in hundredths of a second
168	A8	SMF26CPD	4	packed	JCTCDTOF	Converter stop date, in the form 00YYDDDF where F is the sign
172	AC	SMF26XST	4	binary	JCTXEQON	Execution processor start time, in hundredths of a second
176	B0	SMF26XSD	4	packed	JCTXDTON	Execution processor start date, in the form 00YYDDDF where F is the sign
180	B4	SMF26XPT	4	binary	JCTXEQOF	Execution processor stop time, in hundredths of a second
184	B8	SMF26XPD	4	packed	JCTXDTOF	Execution processor stop date, in the form 00YYDDDF where F is the sign
188	BC	SMF26OST	4	binary	JCTOUTON	Output processor start time, in hundredths of a second
192	C0	SMF26OSD	4	packed	JCTODTON	Output processor start date, in the form 00YYDDDF where F is the sign
196	C4	SMF26OPT	4	binary	JCTOUTOF	Output processor stop time, in hundredths of a second
200	C8	SMF26OPD	4	packed	JCTODTOF	Output processor stop date, in the form 00YYDDDF where F is the sign
Actuals Section:						
204	CC	SMF26LN3	2	binary	internal	Length of actuals section, including this field
206	CE	SMF26RV4	2	binary		Reserved
208	D0	SMF26ICD	4	binary	JCTCARDS	Number of input cards for job. This field includes JCL and SYSIN cards.
212	D4	SMF26XLN	4	binary	JCTLINES	Number of output lines generated to spool
216	D8	SMF26XPU	4	binary	JCTPUNCH	Number of punched cards generated to spool
220	DC	SMF26RID	4	EBCDIC	JCTRDSID	Input processor system (CPU) identification
224	E0	SMF26CID	4	EBCDIC	JCTCVSID	Conversion processor system (CPU) identification
228	E4	SMF26XID	4	EBCDIC	JCTEXSID	Execution processor system (CPU) identification
232	E8	SMF26OID	4	EBCDIC	JCTOTSID	Output processor system (CPU) identification

[2]These fields are JES2-defined subfields from the accounting information field in the JOB card or default values assigned for this job or from /*JOBPARM, JES2 control card.

[3]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. The routing section has the expanded route codes that should be used if these fields are zero. See the Routing Section described later in this record.

Offset		Name	Length	Format	Source	Description
Network Section:						
+0	+0	SMF26LN4	2	binary	internal	Length of network section including this field
+2	+2	SMF26RV5	2	binary		Reserved
+4	+4	SMF26NID	4	EBCDIC	JCTNJSID	Job transmitter system identifier
+8	+8	SMF26NST	4	binary	SVC 11	Job transmitter start time
+12	+C	SMF26NSD	4	packed	SVC 11	Job transmitter start date
+16	+10	SMF26NPT	4	binary	SVC 11	Job transmitter stop time
+20	+14	SMF26NPD	4	packed	SVC 11	Job transmitter stop date
+24	+18	SMF26NAC	8	EBCDIC	JCTNACCT	Network accounting number
+32	+20	SMF26NJB	8	EBCDIC	JCTNOJID	Original job identification
+40	+28	SMF26NDV	8	EBCDIC	DCTDEVN	Job transmitter device name
+48	+30	SMF26NON	8	EBCDIC	NITNODE	Original node name
+56	+38	SMF26NXN	8	EBCDIC	NITNODE	Execution node name
+64	+40	SMF26NNM	8	EBCDIC	NITNODE	Next node name
+72	+48	SMF26NLN	8	EBCDIC	NITNODE	Last node name
Routing Section:						
+0	+0	SMF26LN5	2	binary	internal	Length of routing section including this field
+2	+2	SMF26INR	4	binary	JCTROUTE	Input route code[1]
+6	+6	SMF26PRD	4	binary	JCTPROUT	Default print route code [1]
+10	+A	SMF26PUD	4	binary	JCTPUOUT	Default punch route code[1]
Print Section:						
+0	+0	SMF26LN6	2	binary	internal	Length of print section including this field
+2	+2	SMF26EBT	4	binary	JCTESTBY	Estimated SYSOUT byte count
+6	+6	SMF26XBT	4	binary	JCTBYTES	Actual SYSOUT byte count
+10	+A	SMF26EPG	4	binary	JCTESTPG	Estimated page count
+14	+E	SMF26XPG	4	binary	JCTPAGES	Actual page count[2]
+18	+12	SMF26EFM	8	EBCDIC	JCTFORMS	Output form number. This field is set regardless of the number of characters in the forms field.

[1] These fields are defined as follows: X'00010000' indicates 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.

[2] For page mode data sets, JES2 updates the page count when it encounters a "begin page" indicator in the data stream header.

Record Type 26 (1A) – JES3 Job Purge

Record type 26 is written by IATPURG 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 also contains operating information such as message class, job class, JES3 job selection priority, JES3 logical input device name, execution time, output lines, output punched cards, deadline schedule type, deadline schedule time and date, and the start and stop times and dates for the reader, the converter, the execution processor, and the output processor. Its length is 418 bytes.

Note: The format of all fields in this record are binary unless data is entered in the field.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF26LEN	2	binary	internal	Record length
2	2	SMF26SEG	2	binary	internal	Segment descriptor
4	4	SMF26FLG	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-5 Reserved 6 VS2 7 Reserved
5	5	SMF26RTY	1	binary	internal	Record type
6	6	SMF26TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF26DTE	4	packed	SVC 83	Date record was moved to SMF buffer, in the form 00YYDDDF where F is the sign
14	E	SMF26SID	4	EBCDIC	JMRCPUID	System identification (taken from SID parameter)
18	12	SMF26JBN	8	EBCDIC	IATISJB	Job name[1] (taken from job's RESQ)
26	1A	SMF26RST	4	binary	IATXTOD macro (Set by IATISJB)	Time, in hundredths of a second, reader recognized the JOB card for this job[1]
30	1E	SMF26RSD	4	packed	IATXTOD macro (Set by IATISJB)	Date reader recognized the JOB card for this job, in the form 00YYDDDF where F is the sign[1]
34	22	SMF26UIF	8	EBCDIC	JMRUSEID (Set by IATPURG)	User identification (taken from common exit parameter area)
42	2A	SMF26RSV	4	binary		Reserved
46	2E	SMF26SBS	2	binary	internal	Subsystem identification – X'0005' signifies JES3
48	30	SMF26IND	2	binary	internal	Entry type indicator: *Bit* *Meaning when set* 0-4 Descriptor section present 1 Events section present 2 Actuals section present 3-4 Reserved 5 Print section present 6-15 Reserved

[1]The job name and the time and date that the reader recognized the JOB card for this job constitute the job log identification.

(Continued)

Offsets		Name	Length	Format	Source	Description
Descriptor Section:						
50	32	SMF26LN1	2	binary	internal	Length of descriptor section, including this field
52	34	SMF26RV1	2	binary		Reserved
54	36	SMF26IN3	1	binary	 IATISNT IATISDL IATPURG IATISPR IATNJDJ IATNJDJ IATDJOT IATDJIN	Job information indicator *Bit* *Meaning When Set* 0 Dependent job (//* NET card processed) 1 Deadline scheduling (DEADLINE parameter was specified on //* MAIN card) 2 Deadline job met deadline 3 Process job (//* PROCESS card processed) 4 Job left system via NJP (network job processing) 5 Job entered system via NJP 6 Job left system via DJ (dump job) 7 Job entered system via DJ
55	37	SMF26INF	1	binary	 IATISJB IATIIDR IATISJB IATISJB IATMSIN for ASP or IATMSMS for JES3 IATPURG	Job information indicator *Bit* *Meaning When Set* 0 Job priority (taken from PRTY= parameter on JOB card) 1 Job processed by preexec setup 2 TYPRUN=HOLD was specified on JOB card 3-4 Reserved 5 Job was entered on internal reader 6 Job was rerun on an ASP main reader or a JES3 reader 7 Job was canceled by the operator
56	38	SMF26JNM	4	EBCDIC	IATISJB or IATPURG	JES3-assigned job number (taken from job's RESQ)
60	3C	SMF26JID	8	EBCDIC	IATISJB	Job identification in the form xxx0yyyy where yyyy is the JES3-assigned job number and xxx is: JOB – for normal JES3 job STC – for started task control job TSU – for TSO job
68	44	SMF26NAM	20	EBCDIC	IATIIPR	Programmer's name (taken from JOB card)
88	58	SMF26MSG	1	EBCDIC	IATISJB	Message class (taken from MSGCLASS= parameter on JOB card)
89	59	SMF26CLS	1	EBCDIC	IATISJB	Job class (taken from CLASS= parameter on JOB card). This field is blank if the default is used or if a valid CLASS= parameter is specified on the //* MAIN card. See offset 172.
90	5A	SMF26XPI	1	binary	IATISJB if PRTY= parameter or IATISEN	JES3 job selection priority when the job was initially read (taken from: 1) PRTY= parameter on JOB card, 2) class default priority from main processor job class table, or 3) default priority from TVT)
91	5B	SMF26XPS	1	binary	IATMSIN for ASP, IATMSMS for JES3	JES3 job selection priority when the job was selected (taken from job's RESQ)
92	5C	SMF26RV8	4	binary		Reserved
96	60	SMF26DEV	8	EBCDIC	IATISJB or IATNJDJ if NJP	JES3 logical input device name, or user identification if TSO job, or line name if NJP job
104	68	SMF26RVA	8	binary		Reserved
112	70	SMF26XTM	4	binary	IATIIPR	Estimated execution time, in seconds
116	74	SMF26ELN	4	binary	IATISMN if LINES= parameter or IATISJB if default	Estimated output lines (taken from LINES= parameter on //* MAIN card or default (JOBLINES field in TVT times 1000))

(Continued)

Offsets		Name	Length	Format	Source	Description
Descriptor Section: (Continued)						
120	78	SMF26EPU	4	binary	IATISMN if CARDS= parameter or IATISJB if default	Estimated output punched cards (taken from CARDS= parameter on //* MAIN card or default (JOBCARDS field in TVT times 100))
124	7C	SMF26DTY	1	EBCDIC	IATISDL	Deadline schedule type (taken from DEADLINE parameter on //* MAIN card). Valid types are A-Z and 0-9.
125	70	SMF26RV6	3	binary		Reserved
128	80	SMF26IGP	8	EBCDIC	IATISJB	JES3 logical input device group name
136	88	SMF26PD3	8	EBCDIC	IATISMN if PROC= parameter or IATISJB if default	Procedure DDNAME used for JCL conversion (taken from PROC= parameter on //* MAIN card or default (IATPLBST))
144	90	SMF26NJO	8	EBCDIC	IATNJDJ	Name of system to which job is sent via NJP
152	98	SMF26NJI	8	EBCDIC	IATNJDJ	Name of local NJP terminal supplied by the JES3 initialization deck
160	A0	SMF26NET	8	EBCDIC	IATISNT	Identification of dependent job net to which this job belongs (taken from //* NET card)
168	A8	SMF26DTM	4	binary	IATISDL	Deadline schedule time, in hundredths of a second (taken from DEADLINE parameter on //* MAIN card)
172	AC	SMF26DDT	4	packed	IATISDL	Deadline schedule date, in the form 00YYDDDF where F is the sign (taken from DEADLINE parameter on //* MAIN card)
176	B0	SMF26CLN	8	EBCDIC	IATISMN if CLASS= parameter or IATISJB if default	Job class (taken from CLASS= parameter on //* MAIN card if valid, or the default (JS3BATCH))
Events Section:						
184	B4	SMF26LN2	2	binary	internal	Length of events section, including this field
186	BA	SMF26RV2	2	binary		Reserved
188	BC	SMF26RPT	4	binary	IATXTOD macro (Set by IATISEN)	Reader stop time, in hundredths of a second. This field is filled in during JOB card processing.
192	C0	SMF26RPD	4	packed	IATXTOD macro (Set by IATISEN)	Reader stop date in the form 00YYDDDF where F is the sign. This field is filled in during JOB card processing.
196	C4	SMF26CST	4	binary	IATXTOD macro (Set by IATIIDR)	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	CVTDATE (Set by IATIIDR)	Converter start date, in the form 00YYDDDF where F is the sign. This field is filled in following the JES3 LOGIN of the interpreter job.
204	CC	SMF26CPT	4	binary	IATXTOD macro (Set by IATIIDR)	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	CVTDATE (Set by IATIIDR)	Converter stop date, in the form 00YYDDDF where F is the sign. This field is filled in at the end of the interpreter function.
212	D4	SMF26XST	4	binary	IATXTOD macro (Set by IATMSMS)	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 global processor.
216	D8	SMF26XSD	4	packed	CVTDATE (Set by IATMSMS)	Execution processor start date, in the form 00YYDDDF where F is the sign. This field is filled in when the job is scheduled to run on a JES3 local or global processor.
220	DC	SMF26XPT	4	binary	IATXTOD macro (Set by IATMSMS)	Execution processor stop time, in hundredths of a second. This field is filled in when the job is terminated on a JES3 local or global processor.
224	E0	SMF26XPD	4	packed	IATXTOD macro (Set by IATMSMS)	Execution processor stop date, in the form 00YYDDDF where F is the sign. This field is filled in when the job is terminated on a JES3 local or global processor.

(Continued)

Offsets		Name	Length	Format	Source	Description
Events Section: (Continued)						
228	E4	SMF26OST	4	binary	IATXTOD macro (Set by IATOSDR)	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	IATXTOD macro (Set by IATOSDR)	Output processor start date, in the form 00YYDDDF where F is the sign. This field is filled in when output service starts to process the job's data sets.
236	EC	SMF26OPT	4	binary	IATXTOD macro (Set by IATOSWS)	Output processor stop time, in hundredths of a second. This field is filled in: 1) when an RQ is removed from the writer queue, 2) when all output OSEs are deleted/released, and 3) when a request from the SYSOUT interface is processed.
240	F0	SMF26OPD	4	packed	IATXTOD macro (Set by IATOSWS)	Output processor stop date, in the form 00YYDDDF where F is the sign. This field is filled in: 1) when an RQ is removed from the writer queue, 2) when all output OSEs are deleted/released, and 3) when a request from the SYSOUT interface is processed.
Actuals Section:						
244	F4	SMF26LN3	2	binary	internal	Length of actuals section, including this field
246	F6	SMF26RV4	2	binary		Reserved
248	F8	SMF26ICD	4	binary	IATISEN	Number of input cards for job. This field includes JCL and SYSIN cards.
252	FC	SMF26XLN	4	binary	IATMSMS	Number of output lines generated to spool. This field is filled in when the job is terminated on a JES3 local or global processor.
256	100	SMF26XPU	4	binary	IATMSMS	Number of punched cards generated to spool. This field is filled in when the job is terminated on a JES3 local or global processor.
260	104	SMF26RID	4	EBCDIC	TVTCPUID (Set by IATISJB)	Input processor system (CPU) identification
264	108	SMF26CID	4	EBCDIC	TVTCPUID (Set by IATIIDR)	Conversion processor system (CPU) identification
268	10C	SMF26XID	4	EBCDIC	TVTCPUID (Set by IATMSMS)	Execution processor system (CPU) identification
272	110	SMF26OID	4	EBCDIC	TVTCPUID (Set by IATOSDR)	Output processor system (CPU) identification
276	114	SMF26JAF	42	EBCDIC		Reserved for job accounting fields
318	13E	NJEJMRID	8	EBCDIC	internal	Networking identifier 'NJEJMR'
326	146	NJEJMRLN	2	binary	NJEJMRSZ	Length of data that follows including this field
328	148	NJEJOBNO	2	EBCDIC	NJHGJID	Original job number
330	14A	NJEJOBNM	8	EBCDIC	NJHGJNAM	Job name
338	152	NJEXEQM	8	EBCDIC	NJHGXEQN	Execution node name
346	15A	NJEPRGMR	20	EBCDIC	NJHGPRGN	Programmer name
366	16E	NJEUSRID	8	EBCDIC	NJHGUSID	Origin or notify user identification
374	176	NJEACCT	8	EBCDIC	NJHGACCT	Networking account number
382	17E	NJEDEPT	8	EBCDIC	NJHGDEPT	Programmer's department number
390	186	NJEBLDG	8	EBCDIC	NJHGBLDG	Programmer's building number
398	18E	NJEROOM	8	EBCDIC	NJHGROOM	Programmer's room number
406	196	NJEXEQU	8	EBCDIC	NJHGXEQU	Execution user identifier
414	19E	NJETRANS	4	binary		Reserved
418	1A2	SMF26SRC	4	binary	Set by IATURG	Number of spool records

Offset		Name	Length	Format	Source	Description
Print Section:						
+0	+0	SMF26LNG	2	binary	internal	Length of print section including this field
+2	+2	SMF26EBT	4	binary	TVTMAXB	Estimated SYSOUT byte count
+6	+6	SMF26XBT	4	binary	JSQACTB	Actual SYSOUT byte count
+10	+A	SMF26EPG	4	binary	TVTMAXP	Estimated page count
+14	+E	SMF26XPG	4	binary	JSQACTP	Actual page count. For page mode data sets, JES3 updates the page count when it encounters a "begin page" indicator in the data stream header.

Record Type 30 (1E) – Common Address Space Work Record

Record type 30 is written by IEFTB721 at normal or abnormal termination of a batch job or step, a TSO session, or a started task, by IEEMB836 at the expiration of an accounting interval if INTERVAL is specified in SMFPRMxx, by IEFSMFIE at the start of a job or at the start of the first step after a warm start, or by IFAEASI at the expiration of an accounting interval for a system address space.

The type 30 record consolidates the data in the type 4, 5, 20, 34, 35, and 40 records. The record identifies the job and job step by the job log identification, step name, number of the step within the job, user identification, program name, performance group number and JES job number. If accounting numbers (which can be alphameric) are specified in the JOB or EXEC statements, they are included. For job start records (subtype 1) and job termination records (subtype 5), accounting numbers are taken from the job card. For all other subtypes, the accounting numbers are taken from the EXEC card. (The subtype is identified in offset 0 of the subsystem section). In addition, the interval record (subtype 2) and the step termination record (subtype 3), contain data that represents the change since the last interval record or the start of the step.

The record also 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 for the step and job, device allocation start time, problem program start time, and storage protect key. The record also contains the number of page-ins, page-outs, swap-ins, and swap-outs for both VIO and non-VIO data sets. The record contains an entry for each data set that was defined by a DD statement or dynamic allocation. Each entry lists the device class, unit type, device number, EXCP count, and device connect time for the data set.

The length of record type 30 is variable.

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. The valid fields in each section are:

Section	Offset	Field Name
Header and Defining Section	0 through 104	All fields
Subsystem Section	+0	SMF30TYP
	+2	SMF30RSI
	+4	SMF30RVN
	+6	SMF30PMN

Section	Offset	Field Name
Identification Section	+0	SMF30JBN
	+44	SMF30PGN
Storage and Paging Section	+8	SMF30PGI
	+12	SMF30PGO
	+16	SMF30REC
	+20	SMF30NSW
	+24	SMF30PSI
	+28	SMF30PSO
	+32	SMF30VPI
	+36	SMF30VPO
	+40	SMF30VPR
	+44	SMF30CPI
	+48	SMF30CPR
	+52	SMF30LPI
	+56	SMF30LPR
	+60	SMF30PST
	+64	SMF30PSC
Performance Section	+0	SMF30SRV
	+4	SMF30CSU
	+8	SMF30SRB
	+12	SMF30IO
	+16	SMF30MSO
	+20	SMF30TAT
	+28	SMF30RES
	+32	SMF30TRS
I/O Activity Section	+4	SMF30TEP
Processor Accounting Section	+0	SMF30PTY
	+4	SMF30CPT
	+8	SMF30CPS

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 last interval and the time that the address space goes through full function start.

For more information on system address spaces and full function start, refer to *Initialization and Tuning.*

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 job start record (subtype 1).

Notes:

1. Data sets are recorded in the order of the DD statements; they are not identified by name. However, the ddname is included in the record. (A user 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.
2. For more information on EXCP count and CPU time, see Chapters 8 and 9, respectively.
3. Duplicate EXCP entries are consolidated. That is, if the ddname, device class, unit type, channel address, and unit address are the same for the entries in the TCTTIOT, the EXCP count is accumulated in one entry in the type 30 record.
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. The maximum length of the type 30 record is 32,756 bytes. If the number of DD statments 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, product, identification, and EXCP sections. When examining a type 30 record, SMF30EON indicates the number of EXCP section in the record you are examining; SMF30EOR field indicates the number of EXCP sections in all subsequent type 30 records for the job.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF30LEN	2	binary	internal	Record length
2	2	SMF30SEG	2	binary	internal	Segment descriptor
4	4	SMF30FLG	1	binary	SVC 83	System indicator *BIT* *Meaning When Set* 0 Subsystem identification follows system identification 1-4 Reserved 5 MVS/XA 6 VS2 7 VS1
5	5	SMF30RTY	1	binary	internal	Record type
6	6	SMF30TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF30DTE	4	packed	SVC 83	Date record was moved to SMF buffer, in the form 00YYDDDF, where F is the sign. For a TSO session, this date is the logoff date.
14	E	SMF30SID	4	EBCDIC	SMCASID	System Identification
18	12	SMF30WID	4	EBCDIC	OUCBSUBN	Subsystem identifier
22	16	SMF30STP	2	binary	internal	Record subtype
24	18	SMF30SOF	4	binary	internal	Offset to subsystem section from start of record, including the RDW
28	1C	SMF30SLN	2	binary	internal	Length of subsystem section
30	1E	SMF30SON	2	binary	internal	Number of subsystem sections
32	20	SMF30IOF	4	binary	internal	Offset to identification section from start of record, including the RDW
36	24	SMF30ILN	2	binary	internal	Length of identification section
38	26	SMF30ION	2	binary	internal	Number of identification sections
40	28	SMF30UOF	4	binary	internal	Offset to I/O activity section from start of record, including the RDW
44	2C	SMF30ULN	2	binary	internal	Length of I/O activity section
46	2E	SMF30UON	2	binary	internal	Number of I/O activity sections
48	30	SMF30TOF	4	binary	internal	Offset to completion section from start of record, including the RDW
52	34	SMF30TIN	2	binary	internal	Length of completion section
54	36	SMF30TON	2	binary	internal	Number of completion sections
56	38	SMF30COF	4	binary	internal	Offset to processor section from start of record, including the RDW
60	3C	SMF30CLN	2	binary	internal	Length of processor section
62	3E	SMF30CON	2	binary	internal	Number of processor sections
64	40	SMF30AOF	4	binary	internal	Offset to accounting section from start of record, including the RDW
68	44	SMF30ALN	2	binary	internal	Length of accounting section
70	46	SMF30AON	2	binary	internal	Number of accounting sections
72	48	SMF30ROF	4	binary	internal	Offset to storage section from start of record, including the RDW
76	4C	SMF30RLN	2	binary	internal	Length of storage section
78	4E	SMF30RON	2	binary	internal	Number of storage sections
80	50	SMF30POF	4	binary	internal	Offset to performance section from start of record, including the RDW
84	54	SMF30PLN	2	binary	internal	Length of performance section
86	56	SMF30PON	2	binary	internal	Number of performance sections
88	58	SMF30OOF	4	binary	internal	Offset to operator section from start of record, including the RDW
92	5C	SMF30OLN	2	binary	internal	Length of operator section

Offsets		Name	Length	Format	Source	Description
94	5E	SMF30OON	2	binary	internal	Number of operator sections
96	60	SMF30EOF	4	binary	internal	Offset to EXCP section from start of record, including the RDW
100	64	SMF30ELN	2	binary	internal	Length of EXCP section
102	66	SMF30EON	2	binary	internal	Number of EXCP sections in this record
104	68	SMF30EOR	2	binary	internal	Number of EXCP sections in subsequent records
Subsystem Section:						
+0		SMF30TYP	2	binary	internal	Sub type identification 1 = Job start 2 = Interval 3 = Step termination[1] 4 = Step total 5 = Job termination 6 = System address space
+2		SMF30RS1	2			Reserved
+4		SMF30RVN	2	EBCDIC	internal	Record version number — '02'
+6		SMF30PNM	8	EBCDIC	internal	Subsystem or product name
Identification Section:						
+0		SMF30JBN	8	EBCDIC	JMRJOB	Job or session name[2]
+8		SMF30PGM	8	EBCDIC	SCTPGMNM	Program name (taken from PGM= parameter on EXEC card). If a backward reference was used (SCTSTYPE equals X'80'), then this field contains PGM=*.DD.
+16		SMF30STM	8	EBCDIC	SCTSNAME	Step name (taken from name on EXEC card)
+24		SMF30UIF	8	EBCDIC	JMRUSEID	User identification (taken from common exit parameter area)
+32		SMF30JNM	8	EBCDIC	SSIBJBID	JES job identifier
+40		SMF30STN	2	binary	LCTSNUMB	Step number (first step = 1, etc.)
+42		SMF30CLS	1	EBCDIC	JCTJCSMF	Job class. Blank for TSO session or started tasks
+43			1			Reserved
+44		SMF30PGN	2	binary	OUCBNPG	Job performance group number
+46		SMF30JPT	2	binary	JCTJPRTY	JES input priority[3]
+48		SMF30AST	4	binary	TCTAST	Device allocation start time
+52		SMF30PPS	4	binary	TCTPPST	Problem program start time, in hundredths of a second
+56		SMF30SIT	4	binary	JCTJMRSS	Time, in hundredths of a second, initiator selected this step or job
+60		SMF30STD	4	packed	JCTSSD	Date initiator selected this step, in the form 00YYDDDF where F is the sign
+64		SMF30RST	4	binary	JMRENTRY	Time, in hundredths of a second, reader recognized the JOB card for this job
+68		SMF30RSD	4	packed	JMREDATE	Date reader recognized the JOB card for this job, in the form 00YYDDDF where F is the sign[2]
+72		SMF30RET	4	binary	JMRDRSTP	Time, in hundredths of a second, reader recognized the end of the job or started task (reader stop time). For TSO, this is the logon enqueue time.
+76		SMF30RED	4	packed	JMRDRSTP + 4	Date, in the form 00YYDDDF, where F is the sign, reader recognized the end of the batch job or started task (reader stop date). For TSO, it is the logon enqueue date.

[1]Step termination records are produced only when interval accounting is specified. The data represents the activity since the last interval record was written.

[2]The job name and the time and date that the reader recognized the JOB card for this job constitute the job log identification.

[3]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. (The JES2 job selection priority is requested via the JES2 PRIORITY control statement.)

Offsets		Name	Length	Format	Source	Description
Identification Section (continued)						
+80	+50	SMF30USR	20	EBCDIC	ACTPRGNM	Programmers name
+100	+64	SMF30GRP	8	EBCDIC	ACEEGRPN	RACF group ID
+108	+6C	SMF30RUD	8	EBCDIC	ACEEUSRI	RACF user ID
+116	+74	SMF30TID	8	EBCDIC	ACEETRMF	RACF terminal ID 0 = RACF is not active; user is not a terminal user.
I/O Activity Section:						
+0	+0	SMF30INP	4	binary	SCTSMF	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 and 3.
+4	+4	SMF30TEP	4	binary	ASCBIOSC	Total blocks transferred (accumulated EXCP counts)
+8	+8	SMF30TPT	4	binary	TCTLOUT	Number of TPUTS for a TSO session[4]
+12	+C	SMF30TGT	4	binary	TCTLIN	Number of TGETS for a TSO session[4]
+16	+10	SMF30RDR	1	binary	JMRRDR	Reader device class 0 – for TSO sessions or started tasks
+17	+11	SMF30RDT	1	binary	JMRRDR	Reader device type 0 – for TSO sessions or started tasks
+18	+12	SMF30TCN	4	binary	ASCBDCTI –TCTDCTI	Total device connect time for this address space
+22	+16	SMF30MFL	4	binary		Flag word *Bit* *Meaning When Set* 0 Device connect time may be incorrect[5] 1-31 Reserved
Completion Section:						
+0	+0	SMF30SCC	2	binary	TCBCMPC	Step completion code: X'0ccc' indicates system ABEND in the job step where ccc is the system ABEND code. (See *Message Library: 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 executed) because of an error during allocation or in a preceding job step, or (2) normal job completion with a return code of 0.

(Continued)

[1] Step termination records are produced only when interval accounting is specified. The data represents the activity since the last interval record was written.

[2] The job name and the time and date that the reader recognized the JOB card for this job constitute the job log identification.

[3] 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. (The JES2 job selection priority is requested via the JES2 PRIORITY control statement.)

[4] If a batch job or a started task successfully executes TPUTs, this field might be non-zero for batch jobs or started tasks.

[5] If this flag is set, the SRM disabled the channel measurement while the job was executing. If channel measurement is disabled, device connect time is not recorded. Therefore, if this bit is set, SMF30TCN and SMF30DCT reflects less than the actual total connect time.

Offsets		Name	Length	Format	Source	Description
Completed Section (continued):						
+2	+2	SMF30STI	2	binary		Step termination indicator: *Bit* *Meaning When Set* 0-1 Reserved
					JCTJMRCL	2 Canceled by exit IEFUJI
					JCTJMRCL	3 Canceled by exit IEFUSI
					JCTJMRCL	4 Canceled by exit IEFACTRT
					JCTSTEPR	5 Step is to be restarted
					TCBFA	6 If 0, normal completion. If 1, ABEND. If step completion code equals 0322 or 0522, IEFUTL caused ABEND. If step completion code equals 0722, IEFUSO caused ABEND.
					TCTHWM	7 If 0, normal completion. If 1, step was flushed.
					TCT	8 EXCP counts might be incorrect because the record did not include all the DD statements.
					SMF30ISK	9 Previous interval record was not written because an error occurred. The cumulative count might be incorrect because the counters were cleared.
						10-15 Reserved
+4	+4	SMF30ARC	4	binary	TCBARC	Abend reason code
Processor Accounting Section:						
+0	+0	SMF30PTY	2	binary	SCTSDP	Address space dispatching priority (taken from DPRTY= parameter on EXEC card or the APG value in CVTAPG).
+2	+2	SMF30RV3	2	binary		Reserved
+4	+4	SMF30CPT	4	binary	ASCBEJST or ACTJTIME – TCTEJST	Step CPU time under TCB in hundredths of a second
+8	+8	SMF30CPS	4	binary	ASCBSRBT or SCTSRBT – TCTSRBT	Step CPU time under SRB in hundredths of a second
+12	+C	SMF30ICU	4	binary	ASCBEJST + TCTITCB	Initiator CPU time under TCB in hundredths of a second
+16	+10	SMF30ISB	4	binary	ASCBSRBT + TCTISRB	Initiator CPU time under SRB in hundredths of a second
+20	+14	SMF30JVU	4	binary	ASCBEVST or SCTTVFUT – TCTEVFUT	Step vector usage time in hundredths of a second
+24	+18	SMF30IVU	4	binary	ASCBEVST + TCTIVFUT	Initiator vector usage time in hundredths of a second
+28	+1C	SMF30JVA	4	binary	ASCBVFAT or SCTTVFAT – TCTEVFAT	Step vector affinity time in hundredth of a second
+32	+20	SMF30IVA	4	binary	ASCBVFAT + TCTIVFAT	Initiator vector affinity time in hundredths of a second
+36	+24	SMF30IST	4	EBCDIC	Internal	Interval start time for type 3 subtype 2 and 3 records
+40	+28	SMF30IDT	4	EBCDIC	Internal	Interval start date for type 30 subtype 2 and 3 records

(Continued)

Offsets		Name	Length	Format	Source	Description
EXCP Section:[6]						
+0	+0	SMF30DEV	1	binary	UCBTBYT3	Device class
+1	+1	SMF30UTP	1	binary	UCBTBYT4	Unit type
+2	+2	SMF30CUA	2	binary	UCBCHAN	Device number.[7]
+4	+4	SMF30DDN	8	EBCDIC	TIOEDDNM	DD name used to access the data set
+12	+C	SMF30BLK	4	binary	TCTDCTR – TCTDCRS	Count of blocks issued for the device against the data set
+16	+10	SMF30BSZ	2	binary	TCTBLKSZ	Largest blocksize of the data set *Bit* *When Set* 0 Indicates changed blocksize for the data set[8] 1-15 Largest blocksize of the data set
+18	+12	SMF30DCT	4	binary	TCTCONN –TCTCONNS	Device connect time for this data set (in 128 micro-second units)
Accounting Section:[9]						
+0	+0	SMF30ACL	1	binary	internal	Length of accounting section, excluding this field
+1	+1	SMF30ACT	var	EBCDIC	EXEC statement	Job or step accounting field
Storage and Paging Section:						
+0	+0	SMF30RSV	2	binary		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.
+2	+2	SMF30SFL	1	binary		Storage Flags[10] *Bit* *Meaning When Set* 0 V=R is specified[11] 1 IEFUSI changed region limit values for the extended private area 2-7 Reserved
+3	+3	SMF30SPK	1	binary	TCBPKF	Storage protect key, in the form xxxx0000 where xxxx is the key[10]
+4	+4	SMF30PRV	2	binary	TCTLWM/1024	Largest amount of storage used from bottom of private area, in 1K units. This storage area includes subpools 0-127, 251 and 252. If ADDRSPC=REAL is specified, this field equals the amount of contiguous real storage that was used.[10]
+6	+6	SMF30SYS	2	binary	TCTHWM/1024	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 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	4	binary	OUXBPIN	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.

(Continued)

[6] For each device assigned to each data set there is a 22-byte EXCP section.

[7] Entries for virtual I/O data sets are zero for class and type, and X'7FFF' for device number. If the high order bit of the device field is on, it indicates a virtual device.

[8] Post processors should use this field to avoid the possibility of negative numbers.

[9] Each entry in an accounting field contains the length of the field in the first byte, followed by the field. An omitted field is indicated by a 0 in the first byte.

[10] If storage was not allocated (job step was flushed), these fields equal zero.

[11] This bit has no meaning for subtype 5 records.

Offsets		Name	Length	Format	Source	Description
Storage and Paging Section (continued):						
+12	+C	SMF30PGO	4	binary	OUXBPOUT	Number of non-VIO, non-swap 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 as a result of infrequent use. It does not include page-outs for VIO data sets, pages that are swapped out, and page-outs for the common area.
+16	+10	SMF30REC	4	binary	OUXBPREC	Number of non-VIO reclaims
+20	+14	SMF30NSW	4	binary	OUXBSWCT	Number of address space swap sequence. (A swap sequence consists of an address space swap-out and swap-in.)
+24	+18	SMF30PSI	4	binary	OUXBSPIN	Number of pages swapped in. This field includes: (LSQA, fixed pages, and those pagas that the real storage manager determined to be active when the address space was swapped in. It does not include page reclaims or pages found in storage during the swap-in process (such as pages brought in via SRB's started after completion of swap-in State 1 processing).
+28	+1C	SMF30PSO	4	binary	OUXBSPOT	Number of pages swapped out. This field includes: LSQA, private area fixed pages, and private area non-fixed changad pages.
+32	+20	SMF30VPI	4	binary	OUXBVAMI	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-in or page-ins for the common area.
+36	+24	SMF30VPO	4	binary	OUXBVAMO	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 as a result of infrequent use. It does not include VIO swap-outs or page-outs for the common area.

Offsets		Name	Length	Format	Source	Description
Storage and Paging Section (continued):						
+40	28	SMF30VPR	4	binary	OUXBVAMR	Number of VIO reclaims
+44	2C	SMF30CPI	4	binary	OUXBCAPI	Number of common area page-ins
+48	30	SMF30CPR	4	binary	OUXBCAPR	Number of common area reclaims
+52	34	SMF30LPI	4	binary	OUXBLPAI	Number of LPA page-ins
+56	38	SMF30LPR	4	binary	OUXBLPAR	Number of LPA reclaims
+60	3C	SMF30PST	4	binary	OUXBSTCT	Number of pages stolen from this address space
+64	40	SMF30PSC	8	binary	OUCBPSS	Count of CPU page seconds for this address space
+72	48	SMF30RGB	4	binary	TCTRGNB	Private area size in bytes, below 16 megabytes
+76	4C	SMF30ERG	4	binary	TCTERGNB	Private area size in bytes, above 16 megabytes
+80	50	SMF30ARB	4	binary	TCTHWM	Maximum virtual storage in bytes allocated from the LSQA and SWA subpools below 16 megabytes
+84	54	SMF30EAR	4	binary	TCTEHWM	Maximum virtual storage in bytes allocated from the LSQA and SWA subpools above 16 megabytes
+88	58	SMF30URB	4	binary	TCTLWM	Maximum virtual storage in bytes allocated from the user subpools below 16 megabytes
+92	5C	SMF30EUR	4	binary	TCTELWM	Maximum virtual storage in bytes allocated from the user subpools above 16 megabytes
+96	60	SMF30RGN	4	binary	TCTRSZ*2	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 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.
Performance Section:						
+0	+0	SMF30SRV	4	binary	OUXBJBS + OUXBTRS	Total service units
+4	+4	SMF30CSU	4	binary	OUXBJCPU + OUXBTCPU	CPU service units
+8	+8	SMF30SRB	4	binary	OUXBJSRB + OUXBTSRB	SRB service units
+12	+C	SMF30IO	4	binary	OUXBJIOC + OUXBTIOC	I/O service units
+16	+10	SMF30MSO	4	binary	OUXBJMSO + OUXBTMSO	MSO service units
+20	+14	SMF30TAT	4	binary	OUXBJBT + OUXBTRT	Transaction active time
+24	+18	SMF30TET	4	binary		Reserved
+28	+1C	SMF30RES	4	binary	OUXBJBR + OUXBTRR	Transaction residency time
+32	+20	SMF30TRS	4	binary	OUXBTRC	Number of transactions 0 for all non-TSO users
Operator Section:						
+0	+0	SMF30PDM	4	binary	TCTPDADS	Number of non-specific DASD mounts[12]
+4	+4	SMF30PRD	4	binary	TCTRDASD	Number of specific DASD mounts[12]
+8	+8	SMF30PTM	4	binary	TCTPTAPE	Number of non-specific tape mounts[12]
+12	+C	SMF30TPR	4	binary	TCTRTAPE	Number of specific tape mounts[12]
+16	+10	SMF30MTM	4	binary	TCTPMSS	Number of non-specific MSS mounts[12]
+20	+14	SMF30MSR	4	binary	TCTRMSS	Number of specific MSS mounts[12]

[12] The count is increased by one when the mounted volume is verified. Thus, if an incorrect volume is mounted the count is not increased even though another mount message is issued.

Record Type 31 (1F) – TIOC Initialization

Record type 31 is written by IEDAY1 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[1] or LWAIT[2], OWAIT and RESTART thresholds, number of buffers reserved on the free queue, and the size of one terminal status block. Its length is 58 bytes.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	TTI31LEN	2	binary	internal	Record length
2	2	TTI31SEG	2	binary	internal	Segment descriptor
4	4	TTIRFLG	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 Reserved
5	5	TTIRCDTY	1	binary	internal	Record type
6	6	TTIRCDTS	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	TTIRCDTE	4	packed	SVC 83	Date record was moved to SMF buffer, in the form 00YYDDDF where F is the sign
14	E	TTICPUID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	TTINBF	2	binary	TIOCNBF (in TIOCRPT)	Number of time-sharing buffers
20	14	TTIBUFSE	2	binary	TIOCBFSZ (in TIOCRPT)	Time-sharing buffer size, in bytes
22	16	TTIRSVRD	2	binary		Reserved
24	18	TTIOMAX	2	binary	TIOCAOMX (in TIOCRPT)	Maximum number of output buffers allowed per terminal before OWAIT[1]
26	1A	TTIIMAX	2	binary	TIOCAIMX (in TIOCRPT)	Maximum number of input buffers allowed per terminal before LWAIT[2]
28	1C	TTIOWTH	2	binary	TIOCWTH (in TIOCRPT)	OWAIT threshold. The number of buffers that must be freed in order to be freed from OWAIT.[1]
30	1E	TTIRSTH	2	binary	TIOCRSTH (in TIOCRPT)	RESTART threshold. The number of buffers that must be freed in order to be freed from LWAIT.[2]
32	20	TTIUSLW	2	binary	TIOCUSLW (in TIOCRPT)	Number of buffers reserved on the free queue. (Less than this number results in a system-wide LWAIT.[2])
34	22	TTIUSSL	2	binary		Reserved
36	24	TTITSBS	1	binary	TIOCTSBS (in TIOCRPT)	Size of one terminal status block (TSB)
37	25	TTIUSCH	21	binary		Reserved

[1]OWAIT is the suspension of the program during input/output processing to the terminal because no output buffers are available.

[2]LWAIT is the locking of the terminal's keyboard because the terminal user filled all of the available input buffers.

Record Type 32 (20) – TSO User Work Accounting Record

Record type 32 is written by IEFTB721 at normal or abnormal termination of a TSO session or by IEFTB727 at the expiration of a TSO accounting interval.

To use the type 32 record, you must have installed MVS TSO/E.

The record contains the names of the commands and the number of times each command was used during the session as well as the device connect times for each command. For more information see "Transaction Billing" and "TSO Command Accounting". Its length is variable.

Notes:

1. TSO commands entered from batch jobs are not counted; type 32 records are produced for TSO sessions only.
2. Aliases of commands are counted in separate entries in the record. For instance, SEND and SE are counted as separate commands.
3. The resource data found under logon (if DETAIL is specified in SMFPRMxx) represents the resources used from the start of the session to the time when the first command is obtained.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF32LEN	2	binary	internal	Record length
2	2	SMF32SEG	2	binary	internal	Segment descriptor
4	4	SMF32FLG	1		SVC 83	System indicator *Bit* *Meaning When Set* 0 Subsystem name follows system identification 5 MVS/XA 6 VS2 7 VS1
5	5	SMF32RTY	1		internal	Record type
6	6	SMF32TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF32DTE	4	packed	SVC 83	Date record was moved to SMF buffer, in the form 00YYDDDF, where F is the sign
14	E	SMF32SID	4		SMCASID	System identification (taken from the SID parameter)
18	12	SMF32WID	4	EBCDIC	OUCBSUBN	Subsystem identifier
22	16	SMF32STP	2	binary	internal	Record subtype
24	18	SMF32POF	4	binary	internal	Offset to product section from start of record, including the RDW
28	1C	SMF32PLN	2	binary	internal	Length of product section
30	1E	SMF32PON	2	binary	internal	Number of product sections
32	20	SMF32IOF	4	binary	internal	Offset to the identification section from start of record, including the RDW
36	24	SMF32ILN	2	binary	internal	Length of the identification section
38	26	SMF32ION	2	binary	internal	Number of identification sections
40	28	SMF32COF	4	binary	internal	Offset to the TSO command section from start of record, including the RDW
44	2C	SMF32CLN	2	binary	internal	Length of the TSO command section
46	2E	SMF32CON	2	binary	internal	Number of TSO command sections

Offsets		Name	Length	Format	Source	Description
Product Section:						
+0	0	SMF32TYP	2	binary	internal	Sub type identification for the record: 1 = TSO user interval record 2 = TSO user session end record 3 = TSO user interval record with detail 4 = TSO user session end record with detail
+2	2	SMF32RVN	2	EBCDIC	internal	Record version number – '02'
+4	4	SMF32PNM	8	EBCDIC	internal	Product name
Identification Section:						
+0	0	SMF32JBN	8	EBCDIC	JMRJOB	Job/session name
+8	8	SMF32PGM	8	EBCDIC	SCTPGMNM	Program name
+16	10	SMF32STM	8	EBCDIC	SCTSNAME	Step name
+24	18	SMF32UIF	8	EBCDIC	JMRUSEID	User identification (taken from common exit parameter area)
+32	20	SMF32JNM	8	EBCDIC	SSIBJBID	JES job number
+40	28	SMF32STN	2	binary	LCTSNUMB	Step number
+42	2A		2			Reserved
+44	2C	SMF32PGN	2	binary	OUCBNPG	Job performance group number
+46	2E	SMF32JPT	2	binary	JCTJPRTY	JES input priority
+48	30	SMF32AST	4	binary	TCTAST	Device allocation start time
+52	34	SMF32PPS	4	binary	TCTPPST	Problem program start time, in hundredths of a second
+56	38	SMF32SIT	4	packed	JCTJMRSS	Step initiation time
+60	3C	SMF32STD	4	packed	JCTSSD	Step initiation date, in the form 00YYDDDF, where F is the sign
+64	40	SMF32RST	4	binary	JMRENTRY	Reader start time
+68	44	SMF32RSD	4	packed	JMREDATE	Reader start date, in the form 00YYDDDF, where F is the sign
+72	48	SMF32RET	4	binary	SMRDRSTP	Time, in hundredths of a second, reader recognized the end of the job or started task. For TSO, this is the logon enqueue time.
+76	4C	SMF32RED	4	packed	SMRDRSTP + 4	Date, in the form 00YYYDDF, where F is the sign, reader recognized the end of the batch job or started task. For TSO, it is the logon enqueue date.
+80	50	SMF32USR	20	EBCDIC	ACTJNFLD	Programmer name
+100	64	SMF32GRP	8	EBCDIC	ACEEGRPN	RACF group ID
+108	6C	SMF32RUD	8	EBCDIC	ACEEUSRI	RACF user ID
+116	74	SMF32TID	8	EBCDIC	ACEETRMF	RACF terminal ID 0 if RACF is not active or user is not a terminal user.
TSO Command Segment-Subtypes 1 and 2[1]						
+0	0	SMF32CMD	8	EBCDIC	internal	TSO command name
+8	8	SMF32CNT	4	binary	internal	Number of TSO commands

[1]The subtype is indicated in offset 0 of the product section. Only those commands included in CSECT IEEMB846 are used. Data for all other commands is included in '***OTHER'. Only those commands that are entered at least once, during the session are included in the record. Invalid or unknown commands appear under 'EXEC'. Subtypes 1 and 3 contain data on TSO 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 activity for the entire session. If there is no activity during an interval, no interval record is produced. The subtype is indicated in the SMF32TYP field.

Offsets		Name	Length	Format	Source	Description
TSO Command Segment-Subtypes 3 and 4[1]						
+0	0	SMF32CMD	8	EBCDIC	internal	TSO command name
+8	8	SMF32CNT	4	binary	internal	Number of times the TSO command was entered
+12	C	SMF32TCB	4	binary	internal	Total TCB time for the command
+16	10	SMF32SRB	4	binary	internal	Total SRB time for the command
+20	14	SMF32TGT	4	binary	internal	Total TGET count for the command
+24	18	SMF32TPT	4	binary	internal	Total TPUT count for the command
+28	1C	SMF32TRN	4	binary	internal	Total transaction count for the command
+32	20	SMF32EXP	4	binary	internal	Total EXCP count for the command
+36	24	SMF32TCT	4	binary	ASCBDCTI	Total device connect time for this command

[1]The subtype is indicated in offset 0 of the product section. Only those commands included in CSECT IEEMB846 are used. Data for all other commands is included in '***OTHER'. Only those commands that are entered at least once, during the session are included in the record. Invalid or unknown commands appear under 'EXEC'. Subtypes 1 and 3 contain data on TSO 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 activity for the entire session. If there is no activity during an interval, no interval record is produced. The subtype is indicated in the SMF32TYP field.

Record Type 34 (22) – TS-Step Termination

Record type 34 is constructed by IEFTB722 and written by IEFTB721 when the TSO logoff function processes a job step termination. Its length is 202 bytes plus (1) eight bytes for each device entry and (2) the length of the step accounting fields.

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 also 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, and 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 34 also 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 EXCP count for the data set.

Notes:

1. Data sets are recorded in the order of the step DD statements; they are not identified by name. (A user-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 Chapters 8 and 9, respectively.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	TIV34LEN	2	binary	internal	Record length
2	2	TIV34SEG	2	binary	internal	Segment descriptor
4	4	TIVRFLG	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 Reserved
5	5	TIVRCDTY	1	binary	internal	Record type
6	6	TIVRCDTS	4	binary	SVC 83	Time, in hundredths of a second, record is passed to the SMF writer. This is the time the step terminated.
10	A	TIVRCDTE	4	packed	SVC 83	Date, in the form 00YYDDDF where F is the sign, record is passed to the SMF writer. This is the date the step terminated.
14	E	TIVCPUID	4	EBCDIC	JMRCPUID	System identification (taken from SID parameter)
18	12	TIVUIF	8	EBCDIC	JMRJOB	Job name
26	1A	TIVONTME	4	binary	JMRENTRY	Logon time, in hundredths of a second
30	1E	TIVONDTE	4	packed	JMREDATE	Logon date, in the form 00YYDDDF where F is the sign
34	22	TIVUDATA	8	EBCDIC	JMRUSEID	User identification (taken from common exit parameter area)
42	2A	TIVINVSQ	1	binary	LCTSNUMB	Step number. (This field always equals 1.)
43	2B	TIVSIT	4	binary	JCTJMRSS (Set by IEFSMFIE)	Time, in hundredths of a second, initiator selected this step

(Continued)

Offsets		Name	Length	Format	Source	Description
47	2F	TIVOUTCT	4	binary	TCTLOUT	Number of lines of terminal output, that is, number of TPUTs issued
51	33	TIVINCT	4	binary	TCTLIN	Number of lines of terminal input, that is, number of TGETs satisfied
55	37	TIVSTAT	2	binary	TCBCMPC	Step completion code: X'0ccc' indicates system ABEND where code is the system ABEND code. (See *System Codes*.) X'8ccc' indicates user ABEND where ccc is the user ABEND code. X'nnnn' indicates normal completion where nnn 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 executed) because of an error during allocation, or (2) normal job completion with a return code of 0. Use this field in conjunction iwth the step-termination indicator field (offset 87).
57	39	TIVPRI	1	binary	SCTSDPTY	Address space dispatching priority (taken from DPRTY= parameter on EXEC card or the APG value in CVTAPG).[1]
58	3A	TIVPRGNM	8	EBCDIC	SCTPGMNM	Program name (taken from PGM= parameter on EXEC card). If a backward reference was used (SCTSTYPE equals X'80'), then this field contains *.DD.
66	42	TIVINVNM	8	EBCDIC	SCTSNAME	Step name (taken from name on EXEC card)
74	4A	TIVRSV5	2	binary		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	TCTHWM/1024	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 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. See offsets 82 and 102.[1]
78	4E	TIVMCRE	2	binary	TCTLWM/1024	Largest amount of storage used from bottom of private area, in 1K units. This storage area includes subpool 0-127, 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.[2]
80	50	TIVRVC	2	binary		Reserved
82	52	TIVEFRGN	4	binary	TCTRSZ*2	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	TCBPKF	Storage protect key, in the form xxxx0000 where xxxx is the key

(Continued)

[1] If the dispatching priority falls within the APG range, the actual execution dispatching priority will be assigned based on the Installation Performance Specification (IPS). If the dispatching priority is controlled via the IPS, it may periodically change based upon characteristics. If the dispatching priority is not in the APG range, the value in field TIVPRI will be the actual execution dispatching priority. For more information, see *Initialization and Tuning*.

[2] If storage was not allocated (job step was flushed), these fields equal zero.

Offsets		Name	Length	Format	Source	Description
87	57	TIVSTI	1	binary	 JCTJMRCL JCTJMRCL JCTJMRCL JCTSTEPR TCBFA TCTHWM	Step termination indicator *Bit* *Meaning When Set* 0-1 Reserved 2 Canceled by exit IEFUJI[3] 3 Canceled by exit IEFUSI[3] 4 Reserved 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	TIVRV1	2	binary		Reserved
90	5A	TIVAST	4	binary	TCTAST (Set by IEFBB401)	Device allocation start time, in hundredths of a second
94	5E	TIVPPST	4	binary	TCTPPST (Set by IEFAB820)	Problem program start time, in hundredths of a second
98	62	TIVRV2	1	binary		Reserved
99	63	TIVSRBT	3	binary	SCTSRBT	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.[4]
102	66	TIVRIN	2	binary	 TCTIEX SCTSSTAT	Record indicator *Bit* *Meaning When Set* 0-5 Reserved 6 EXCP count may be wrong [5] 7 If 0, storage is virtual. If 1, storage is real. 8-15 Reserved
104	68	TIVRLCT	2	binary	internal	Offset from the beginning of the record header to the relocate section
106	6A	TIVVAR	2	binary	internal	Length of device entry portion of record. Calculated as: (8 times the number of devices) + 2
For each device assigned to each *non-spooled* data set, there is an eight-byte entry with the following format:[6]						
+0	0	TIVDEVC	1	binary	UCBTBYT3	Device class
+1	1	TIVUTYP	1	binary	UCBTBYT4	Unit type
+2	2	TIVCUAD	2	binary	UCBCHAN	Device number
+4	4	TIVNEXCP	4	binary	TCTDCTR	EXCP count (see offset 102)[5]

(Continued)

[3] Job steps canceled by IEFUJI and IEFUSI will not be executed; therefore bit 7 will also be on.

[4] CPU time is not expected to be constant between different runs of the same job step. For more information on CPU time, see Chapter 9.

[5] If a GETMAIN for expanding the TCTIOT (the data area where EXCPs are maintained) fails, only the existing data sets are counted. If the functional recovery routine is entered, EXCP counting for the step is discontinued and no device entries are produced. If ADDRSPC=REAL is specified, the EXCP count does not include PCIs. For more information on EXCP count, see Chapter 8.

[6] Entries for DD*, DD DATA, DD DUMMY and spooled data sets are zero. (A DD DUMMY entry results when a forward reference to a DD statement having that DD name is not found or when DD DUMMY is specified.) Entries for VIO data sets are zero for class and type, X'7FFF' for device number. When the high order bit in the device number field is on, it indicates a virtual device.

Offsets		Name	Length	Format	Source	Description
After the device entries are the following fields:						
Accounting Section:						
+0	0	TIVVARA	1	binary	internal	Length of accounting section, excluding this field.
+1	+1	TIVCPUTM	3	binary	ACTJTIME	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.[4]
+4	+4	TIVNBRAC	1	binary	internal	Number of accounting fields.
+5	+5	TIVACFLD	variable	EBCDIC	EXEC statement	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:						
+0[7]	+0	TIVPGIN[7]	4	binary	OUXBPIN	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	TIVPGOUT	4	binary	OUXBPOUT	Number of non-VIO, non-swap 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 as a result of 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	TIVRGNS	4	binary	OUXBSWCT	Number of address space swap sequences. (A swap sequence consists of a physical swap-out and swap-in of an address space. Logical swap-out and swap-in are not included).
+12	+C	TIVSIN	4	binary	OUXBSPIN	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 out. It does not include page reclaims nor pages found in storage during the swap-in process (such as pages brought in via SRB's started after completion of swap-in Stage 1 processing).
+16	+10	TIVSOUT	4	binary	OUXBSPOT	Number of pages swapped out. This field includes: LSQA, private area fixed pages, and private area non-fixed changed pages.
+20	+14	TIVVPI	4	binary	OUXBVAMI	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	TIVVPO	4	binary	OUXBVAMO	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 as a result of infrequent use. It does not include VIO swap-outs or page-outs for the common area.
+28	+1C	TIVSST	4	binary	OUXBJBS + OUXBTRS	Step service, in service units[8]
+32	+20	TIVACT	4	binary	OUXBJBT + OUXBTRT	Step transaction active time, in 1024-microsecond units[8]
+36	+24	TIVPGNO	2	binary	OUCBNPG	Step performance group number (taken from PERFORM= parameter on JOB or EXEC card or the RESET operator command).[8]

(continued)

[4]CPU time is not expected to be constant between different runs of the same job step. For more information on CPU time, see Chapter 9.

[7]The displacement of this field depends upon the size of the accounting fields and the number of devices. Offset 104 contains the displacement for this field.

[8]For more information on service, transaction active time, and performance group number, see *Initialization and Tuning.*

Offset		Name	Length	Format	Source	Description
+38	26	TIVTRANT	4	binary	OUXBJBR + OUXBTRR	Step transaction residency time, in 1024-microsecond units. That is the amount of time the transaction was in real storage.
+42	2A	TIVRECLM	4	binary	OUXBPREC	Number of reclaims for this step
+46	2E	TIVRCLAM	4	binary	OUXBVAMR	Number of VIO reclaims for this step
+50	32	TIVCPGIN	4	binary	OUXBCAPI	Number of common area page-ins for this step (LPA + CSA)
+54	36	TIVCRECL	4	binary	OUXBCAPR	Number of common area reclaims for this step (LPA + CSA)
+58	3A	TIVPGSTL	4	binary	OUXBSTCT	Number of pages stolen from the storage for this step
+62	3E	TIVPGSEC	8	binary	OUCBPSS	Number of page seconds for this step, in page millisecond units. Calculated as: the number of pages used by this step times the execution time it held that number of pages.
+70	46	TIVLPAI	4	binary	OUXBLPAI	Number of link pack area page-ins for the step
+74	4A	TIVLPAR	4	binary	OUXBLPAR	Number of link pack area reclaims for the step
+78	4E	TIVCPUS	4	binary	OUXBJCPU + OUXBTCPU	Step CPU service, in service units[8]
+82	52	TIVIOCS	4	binary	OUXBJIOC + OUXBTIOC	Step I/O service, in service units[8]
+86	56	TIVMSOS	4	binary	OUXBJMSO + OUXBTMSO	Step main storage service, in service units[8]
+90	5A	TIVSRBS	4	binary	OUXBJSRB + OUXBTSRB	Step SRB service, in service units[8]

[8]For more information on service, transaction active time, and performance group number, see *Initialization and Tuning*.

Record Type 35 (23) – LOGOFF

Record type 35 is constructed by IEFTB722 and written by IEFTB721 when a logoff process is completed. Its length is 137 bytes plus the length of the job accounting fields.

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 also 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.

Notes:

1. For more information on CPU time, see Chapter 9.
2. 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.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	TLG35LEN	2	binary	internal	Record length
2	2	TLG35SEG	2	binary	internal	Segment descriptor
4	4	TLGRFLG	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 Reserved
5	5	TLGRCDTY	1	binary	internal	Record type
6	6	TLGRCDTS	4	binary	SVC 83	Time, in hundredths of a second, record is passed to the SMF writer. This is the logoff time.
10	A	TLGRCDTE	4	packed	SVC 83	Date, in the form 00YYDDDF where F is the sign, record is passed to the SMF writer. This is the logoff date.
14	E	TLGCPUID	4	EBCDIC	JMRCPUID	System identification (taken from SID parameter)
18	12	TLGUIF	8	EBCDIC	JMRJOB	Job name
26	1A	TLGONTME	4	binary	JMRENTRY	Logon time, in hundredths of a second
30	1E	TLGONDTE	4	packed	JMREDATE	Logon date, in the form 00YYDDDF where F is the sign
34	22	TLGUDATA	8	EBCDIC	JMRUSEID	User identification (taken from common exit parameter area)
42	2A	TLGSTPCT	1	binary	JMRSTEP	Number of steps in session. (This field always equals 1.)
43	2B	TLGCRTME	4	binary		Reserved
47	2F	TLGOUTCT	4	binary	TCTLOUT	Number of lines of terminal output, that is, number of TPUTs issued
51	33	TLGINCT	4	binary	TCTLIN	Number of lines of terminal input, that is, number of TGETs satisfied

(Continued)

Offsets		Name	Length	Format	Source	Description
55	37	TLGSTAT	2	binary	TCBCMPC	Job completion code: X'0ccc' indicates system ABEND where ccc is the system (See *Message Library: 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	JCTJPRTY	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)[3]
58	3A	TLGNQTME	4	binary	JMRDRSTP	Logon enqueue time, in hundredths of a second
62	3E	TLGNQDTE	4	packed	JMRDRSTP + 4	Logon enqueue date, in the form 00YYDDDF where F is the sign
66	42	TLGTRMI	1	binary	JCTJMRCL JCTJMRCL	Job termination indicator *Bit* *Meaning When Set* 0-1 Reserved 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	binary		Reserved
68	44	TLGTRANT	4	binary	OUXBJBR + OUXBTRR	Job transaction residency time, in 1024-microsecond units. That is the total amount of time all transactions were in real storage.[2]
72	48	TLGRVC	4	binary		Reserved
76	4C	TLGSPK	1	binary	TCBPKF	Storage protect key, in the form xxxx0000 where xxxx is the key
77	4D	TLGSRBT	3	binary	SCTSRBT	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.[1]
80	50	TLGTJS	4	binary	OUXBJBS + OUXBTRS	Job service, in service units[2]
84	54	TLGTTAT	4	binary	OUXBJBT + OUXBTRT	Job transaction active time, in 1024-microsecond units[2]
88	58	TLGNTSN	4	binary	OUXBTRC	Number of transactions[2]

(Continued)

[1]CPU time may not be constant between different runs of the same job. For more information on CPU time, see Chapter 9.

[2]For more information on service, transaction active time, and performance group number, see *Initialization and Tuning.* Note that the service, active time, and residency time may have been accumulated under different performance group numbers.

[3]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. (The JES2 job selection priority is requested via the JES2 PRIORITY control statement.)

Offsets		Name	Length	Format	Source	Description
92	5C	TLGPGNO	2	binary	OUCBNPG	Performance group number (taken from PERFORM= parameter on JOB card or from a RESET or SET IPS command).[2]
94	5E	TLGRV2	2	binary		Reserved
96	60	TLGVAR	1	binary	ACTLEN	Length of rest of record, excluding this field
97	61	TLGRVB	20	EBCDIC		Reserved
117	75	TLGCPUTM	3	binary	ACTJTIME	Job CPU time under TCBs, in hundredths of a second. This field inclues the CPU time for all tasks that are dispatched via TCBs below the level of RCT.[1]
120	78	TLGNBRAC	1	binary	ACTJNFLD	Number of accounting fields
121	79	TLGACFLD	variable	EBCDIC	JOB statement	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:						
+0		TLGCPUS	4	binary	OUXBJCPU + OUXBTCPU	Job CPU service, in service units[2]
+4	4	TLGIOCS	4	binary	OUXBJIOC + OUXBTIOC	Job I/O service, in service units[2]
+8	8	TLGMSOS	4	binary	OUXBJMSO + OUXBTMSO	Job main storage service, in service units[2]
+12	12	TLGSRBS	4	binary	OUXBJSRB + OUXBTSRB	Job SRB service, in service units[2]

[1]CPU time may not be constant between different runs of the same job. For more information on CPU time, see Chapter 9.

[2]For more information on service, transaction active time, and performance group number, see *Initialization and Tuning.* Note that the service, active time, and residency time may have been accumulated under different performance group numbers.

Record Type 37 (25) - Network Problems Determination Application

Record type 37 is written by NCCF whenever the NPDA REPORTS option is invoked and each time an NPDA input record passes the NPDA recording filters.

This record contains event and/or statistical data. It includes information on resource names and types (common data section), error description and probable cause (events section), traffic information (statistical data section), and modem data (modem data section and LPDA-2 data section), and local area network data (LAN data section). All unused fields in record-type 37 are set to hexadecimal zeroes.

Notes

NPDA does not create a report record for the following:

- RECFMS 01, 02, 03 (counter sets 1, 2, and 4), 05, and 06
- solicited Network Management Vector Transport 0025 (NMVT) records
- a record that results from intensive mode recording

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	BRFRLEN	2	binary	internal	Record length
2	2	BRFRSEG	2	binary	internal	Segment descriptor
4	4	BRFRFLG	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0 Standard identification follows system identification 1-4 Reserved 5 MVS/XA 6 VS2 7 Reserved
5	5	BRFRRTY	1	binary	internal	Record type 37 (X'25')
6	6	BRFRTME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	BRFRDTE	4	packed	SVC 83	Data record was moved to SMF buffer, in the form 00yydddF, where F is the sign
14	E	BRFRSID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	BRFRWID	4	EBCDIC	internal	Subsystem identification ('NCCF')
22	16	BRFRSUBT	2	EBCDIC	internal	Record subtype ('01' – NPDA V3R2) ('02' – NPDA V3R3)
24	18	BRFRPRODI	4	binary	internal	Offset to product section
26	1A	BRFRPROLN	2	binary	internal	Product section length
28	1C	BRFRPRONO	2	binary	internal	Number of product sections (0 or 1)
30	1E	BRFALLDI	4	binary	internal	Offset to common data sections
34	22	BRFALLLN	2	binary	internal	Common data section length
36	24	BRFALLNO	2	binary	internal	Number of common data sections (0 or 1)
38	26	BRFEVTDI	4	binary	internal	Offset to event section
42	2A	BRFEVLN	2	binary	internal	Event section length
44	2C	BRFEVNO	2	binary	internal	Number of event sections (0 or 1)
46	2E	BRFSTADI	4	binary	internal	Offset to statistics section
50	32	BRFSTALN	2	binary	internal	Statistics section length
52	34	BRFSTANO	2	binary	internal	Number of statistics sections (0 or 1)
54	36	BRFMODDI	4	binary	internal	Offset to modem section
58	3A	BRFMODLN	2	binary	internal	Modem section length
60	3C	BRFCMODNO	2	binary	internal	Number of modem sections (0 or 1)
62	3E	BRFLPDDI	4	binary	internal	Offsec to LPDA-2 section
66	42	BRFLPDLN	2	binary	internal	LPDA-2 section length
68	44	BRFLPDNO	2	binary	internal	Number of LPDA-2 sections (0, 1, or 2)
70	46	BRFLANDI	4	binary	internal	Offset to LAN section
74	4A	BRFLANLN	2	binary	internal	LAN section length
76	4C	BRFLANNO	2	binary	internal	Number of LAN sections (0 or 1)

Offsets		Name	Length	Format	Source	Description
Product Section:						
+0	+0	BRFSUBTY	2	binary	internal	Record subtype ('01' – NPDA V3R2) ('02' – NPDA V3R3)
+2	+2	BRFREVLT	2	binary	internal	NPDA release level
+4	+4	BRFPRONM	4	EBCDIC		Product name: 'NPDA'
+8	+8	BRFTIMST	8	packed	internal	Time and date in the form 00YYDDDFHHMMSSOF where F is the sign
Common data section:						
+0	+0	BRFDOMNM	8	EBCDIC	internal	Domain name
+8	+8	BRFLRNM	8	EBCDIC	internal	Failing resource name
+16	+10	BRFLRTY	4	EBCDIC	internal	Failing resource type
+20	+14	BRFHINM1	8	EBCDIC	internal	Resource level 1 name
+28	+1C	BRFHITY1	4	EBCDIC	internal	Resource level 1 type
+32	+20	BRFHINM2	8	EBCDIC	internal	Resource level 2 name
+40	+28	BRFHITY2	4	EBCDIC	internal	Resource level 2 type
+44	+2C	BRFHINM3	8	EBCDIC	internal	Resource level 3 name
+52	+34	BRFHITY3	4	EBCDIC	internal	Resource level 3 type
+56	+38	BRFHINM4	8	EBCDIC	internal	Resource level 4 name
+64	+40	BRFHITY4	4	EBCDIC	internal	Resource level 4 type
+68	+44	BRFHINM5	8	EBCDIC	internal	Resource level 5 name
+76	+4C	BRFHITY5	4	EBCDIC	internal	Resource level 5 type
+80	+50	BRFCPL	1	binary	internal	Complex link indicator x'00' no x'01' yes
+52	+51	BRFALT	1	binary	internal	Alert indicator x'00' no x'01' yes
Event Section:						
+0	+0	BRFALRTT	1	binary	internal	Alert type for event record
+1	+1	BRFGENCA	1	binary	internal	General cause for event record
+2	+2	BRFSPECA	1	binary	internal	Specific cause for event record
+3	+3	BRFBLKID	2	binary	internal	Block identification
+5	+5	BRFUACD	1	binary	internal	Action code
+6	+6	BRFUAQL1	8	EBCDIC	internal	Detail qualifier 1
+14	+E	BRFUAQL2	8	EBCDIC	internal	Detail qualifier 2
+22	+16	BRFUAQL3	8	EBCDIC	internal	Detail qualifier 3
+30	+1E	BRF48TXT	48	EBCDIC	internal	Error description: probable cause
+78	+4E	BRFDBKID	2	binary	internal	Detail Block id
+80	+50	BRFDUACD	1	binary	internal	Detail Action code
+81	+51	BRFNMVTY	1	binary	internal	00=NMVT 0000 01=NMVT 0001 02=NMVT 0025 0F=MISC. NMVT FF=NON NMVT

Offsets		Name	Length	Format	Source	Description
Statistics section:						
+0	+0	BRFTRFFC	4	binary	internal	Total traffic
+4	+4	BRFTEMPS	2	binary	internal	Total temporary errors
Modem Section:						
+0	+0	BRFFAIL	1	binary	internal	Failure indicator X'00' Not applicable X'01' Modem probe X'02' Line X'03' Remote device X'04' Communications (if unknown) X'05' Modem interface
+1	+1	BRFLNKTY	1	binary	internal	Type of link X'01' BSC X'01' SDLC
+2	+2	BRFLMSIN	1	binary	internal	Local modem status indicator - includes modem speed X'00' invalid X'01' valid
+3	+3	BRFRMSIN	1	binary	internal	Remote modem status indicator X'00' invalid X'01' valid
+4	+4	BRFMODOD	2	EBCDIC	internal	Modem address
+6	+6	BRFMODTP	6	EBCDIC	internal	Modem type. This field contains either the machine number or N/AV (not available).
+12	+C	BRFMODSP	4	EBCDIC	internal	Data rate (full or half)
+16	+10	BRFLNQUL	2	binary	internal	Local modem line quality (0-15)
+18	+12	BRFHTCTL	2	binary	internal	Local modem line hits (0-63). This field is model dependent. See relevant pubs for your modem model.
+20	+14	BRFLDBIN	2	binary	internal	This field indicates whether the Receive Level in DBm for the local modem is within measurable limits. Value Meaning X'0000' Not applicable X'0001' Receive Level is greater than the maximum measurable value (-4) as shown in BRFLDBNO X'0002' Receive Level is less than the minimum measurable value (-48) as shown in BRFLDBNO X'0003' Receive Level is within measurable limits as shown in BRFLDBNO
+22	+16	BRFLDBNO	2	binary	internal	Receive Level in DBm for the local modem (signed decimal)

Offsets		Name	Length	Format	Source	Description
Modem Section: (continued)						
+24	+18	BRFLNQUR	2	binary	internal	Remote modem line quality (0-15)
+26	+1A	BRFHTCTR	2	binary	internal	Remote modem line hits (0-63). This field is model dependent. See relevant pubs for your modem model.
+28	+1E	BRFRDBIN	2	binary	internal	This field indicates whether the Receive Level in DBm for the remote modem is within measurable limits. Value Meaning X'0000' Not applicable X'0001' Receive Level is greater than the maximum measurable value (-4) as shown in BRFRDBNO X'0002' Receive Level is less than the minimum measurable value (-48) as shwon in BRFRDBNO X'0003' Receive Level is within measurable limits as shown in BRFRDBNO
+2A	+20	BRFRDBNO	2	binary	internal	Receive Level in DBm for the remote modem (signed decimal)
LPDA-2 Section:						
+0	+0	BRFFAIND	1	binary	internal	Failure indicator X'00' Not appliable X'01' Modem/probe X'02' Line X'03' Remote device X'04' Communications (if unknown) X'05' Modem interface
+1	+1	BRFLINK	1	binary	internal	Type of link X'01' BSC X'02' SDLC
+2	+2	BRFSENSE	1	binary	internal	Modem Sense Byte
+3	+3	BRFLSL	1	binary	internal	Link Segment Level
+4	+4	BRFADDR	2	EBCDIC	internal	Modem address
+6	+6	BRFTYPE	4	EBCDIC	internal	Modem type. This field contains the four digit machine number.
+10	+A	BRFMODEL	2	EBCDIC	internal	Modem model. This field contains the two digit modem model.
+12	+C	*	2			Reserved.
+14	+E	BRFLOCAL	24	binary	internal	Local Modem Report This field is overlayed by the section entitled LOCAL AND REMOTE MODEM REPORTS.
+36	+24	BRFRMT	24	binary	internal	Remote Modem Report This field is overlayed by the section entitled LOCAL AND REMOTE MODEM REPORTS

Offsets		Name	Length	Format	Source	Description
Local and Remote Modem Reports:						
+0	+0	BRFLQ	2	binary	internal	Line Quality (0-15)
+2	+2	BRFWLQ	2	binary	internal	Worst Line Quality (0-15)
+4	+4	BRFIMP	2	binary	internal	Impulse Hit Count
+6	+6	BRFRDBM	2	EBCDIC	internal	Receive Level in DBm
+8	+8	BRFMRDBM	2	EBCDIC	internal	Minimum Receive Level in DBm during last 15 minutes
+10	+A	BRFSPEED	6	EBCDIC	internal	Modem Speed ('FULL ' or 'BACKUP')
+16	+10	BRFACTSP	4	binary	internal	Actual Modem Speed in bits per second
+18	+12	BRFNETFÚ	1	EBCDIC	internal	Network Function '01'X = PRIMARY, '02'X = SECONDARY, '03'X = CONTROL, '04'X = TRIBUTARY
+19	+13	BRFFEAIN	1	binary	internal	Features Installed BIT 0 — Reserved BIT 1 — Reserved BIT 2 — Reserved BIT 3 — Fan Out Installed BIT 4 — Reserved BIT 5 — Reserved BIT 6 — Reserved BIT 7 — Reserved
+20	+14	BRFFEAER	1	binary	internal	Features in Error BIT 0 — Reserved BIT 1 — Reserved BIT 2 — Reserved BIT 3 — Fan Out in Error BIT 4 — Reserved BIT 5 — Modem in Idle State BIT 6 — Non Vital Data Lost BIT 7 — Base Modem Error
+21	+15	*	1			Reserved
Local Area Network Section:						
+0	+0	BRFLMADR	6	EBCDIC	internal	Local MAC Address
+6	+6	BRFRMADR	6	EBCDIC	internal	Remote MAC Address
+12	+C	BRFROUTI	18	EBCDIC	internal	Routing Information
+30	+1E	BRFUPADR	6	EBCDIC	internal	MAC Address of Upstream Member
+36	+24	BRFDNADR	6	EBCDIC	internal	MAC Address of Downstream Member

Record Type 38 (26) – Network Performance Monitor Statistics

Record type 38 is written by Network Performance Monitor (NPM) at user specified intervals and contains network statistics. For more information about the type 38 record, refer to Network Performance Monitor Problem Determination Guide (SH20-6363).

Record Type 39 (27) – NLDM Response Time

Record type 39 is written by the Network Logical Data Manager (NLDM). 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 LU attached to a 3274 controller 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.

The format is:

Offsets		Name	Length	Format	Source	Description
+0	0	LOGRLENG	2	binary	internal	Record length
+2	2	LOGRSEGD	2	binary	internal	Segment descriptor
+4	4	LOGRSYSI	1	binary	SVC 83	System indicator Bit Meaning When Set 0-4 Reserved 5 MVS/XA 6 VS2 7 VS1
+5	5	LOGRRECT	1	binary	internal	Record type (X'27')
+6	6	LOGRTIME	4	EBCDIC	SVC 83	Time, in hundredth of a second, record was moved to external log buffer.
+10	A	LOGRDATE	4	EBCDIC	SVC 83	Date record was moved to external log buffer, in the form 00YYDDDF where F is the sign.
+14	E	LOGRSYID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
+18	12	LOGRSUBS	4	EBCDIC	internal	Subsystem ID 'NCCF'
+22	16	LOGRSUBT	2	binary	internal	Record subtype 1 = COLLECT RTM LOG 2 = Session end 3 = Session start 4 = Accounting and availability data 5 = Combined 6 = Bind failure

Offsets		Name	Length	Format	Source	Description
Data Descriptor Section:						
+0	0	LHRDRPRDO	4	binary	internal	Offset of product section
+4	4	LHDRPRDL	2	binary	internal	Length of product section
+6	6	LHDRPRDN	2	binary	internal	Number of product sections
+8	8	LHDRSESO	4	binary	internal	Offset of session configuration section
+12	C	LHDRSESL	2	binary	internal	Length of session configuration section
+14	E	LHDRSESN	2	binary	internal	Number of session configuration sections
+16	10	LHDRRTEO	4	binary	internal	Offset of route data section
+20	14	LHDRRTEL	2	binary	internal	Length of route data section
+22	16	LHDRRTEN	2	binary	internal	Number of route data sections
+24	18	LHDRRTMO	4	binary	internal	Offset of response-time data section
+28	1C	LHDRRTML	2	binary	internal	Length of response-time data section
+30	1E	LHDRRTMN	2	binary	internal	Number of resonse-time data sections
+34	22	LHDRACCO	4	binary	internal	Offset of accounting and availability data sections
+38	26	LHDRACCL	2	BINARY	internal	Length of accounting and availability data sections
+40	28	LHDRACCN	2	BINARY	internal	Number of accounting and availability data sections

Note: The offset fields of this section are the offsets of the data areas from the beginning of log record.

Offsets		Name	Length	Format	Source	Description
Product Section:						
+0	0	LPRDSUBT	2	binary	internal	Record subtype 1 = COLLECT RTM LOG 2 = Session end 3 = Session start 4 = Accounting and availability data 5 = Combined 6 = Bind failure
+2	2	LPRDVERN	2	EBCDIC	internal	Product version and release ('F1F2' – VIR2) ('F1F3' – VIR3)
+4	4	LPRDNAME	4	EBCDIC	internal	Product name – "NLDM"

Note: LPRDSUBT is the same as LOGRRECT in Log Record Header Section.

Offsets		Name	Length	Format	Source	Description
Session Configuration Data Section:						
+0	0	LSESREVL	2	binary	VTAM	Revision level: NLDMVIR2 1 NLDNVIR3 2
+2	2	LSESPNAM	8	EBCDIC	VTAM	Primary logical unit (PLU) name
+10	A	LSESPPUN	8	EBCDIC	VTAM	Primary physical unit (PU) name
+18	12	LSESPLNK	8	EBCDIC	VTAM	Primary link name
+26	1A	LSESPSAP	8	EBCDIC	VTAM	PLU subarea physical unit (PU)
+34	22	LSESPDOM	8	EBCDIC	internal	PLU domain name
+42	2A	LSESSNAM	8	EBCDIC	VTAM	Secondary logical unit (SLU) name
+50	32	LSESSPUN	8	EBCDIC	VTAM	Physical unit (PU) name for SLU
+58	3A	LSESSLNK	8	EBCDIC	VTAM	Name of the link for the SLU
+66	42	LSESSSAP	8	EBCDIC	VTAM	SLU subarea PU
+74	4A	LESSSDOM	8	EBCDIC	internal	SLU domain name
+82	52	LSESPCLS	8	EBCDIC	internal	Performance class name
+90	5A	LSESCOST	8	EBCDIC	VTAM V2R1	Class of service
+98	62	LSESERN	2	binary	VTAM V2R1	Explicit route number
+100	64	LSESRERN	2	binary	VTAM V2R1	Reverse explicit route number
+102	66	LSESVRN	2	binary	VTAM V2R1	Virtual route number
+104	68	LSESTPF	2	binary	VTAM V2R1	Transmission priority
+106	6A	LSESPCID	8	binary	VTAM	Unique session ID (PCIDARSI)
+114	72	LSESTYPE	1	EBCDIC	VTAM	Session type 1 = LU-LU 2 = SSCP-LU 3 = SSCP-PU 4 = SSCP-SSCP
+115	73	LSESXNET	1	EBCDIC	VTAM V2R1	Cross network session (Y or N)
+116	74	LSESCODE	1	binary	VTAM	bind failure or unbind reason code

Note: If data is not available LSESPPUN, LSESPLNK, and LSESPSAP contain '00'x. If data is not available LSESERN, LSESRERN, LSESVRN and LSESTPF contain 'FF'X.

Offsets		Name	Length	Format	Source	Description
Route Data Section:						
+0	0	LRTEREVL	2	binary	internal	Revision level: 1
+2	2	LRTENUME	2	binary	internal	Number of route elements
+4	4	LRTENUMT	2	binary	internal	Number of route elements in table.
+6	6	LRTEETAB[1]	0		Route test	Route element table
For each route element, there is a ten-byte entry with the following format:						
+0	0	LRTEENAM	8	binary	internal	Route element name
+8	8	LRTEETGO	2	binary	Route test	Transmission group (out) number
Response Time Data Section:						
+0	0	LRTMREVL	2	binary	internal	Revision level: 1
+2	2	LRTMCOLB[2]	8	binary	internal	Collection period begin time stamp
+10	A	LRTMCOLE[2]	8	binary	internal	Collection period end time stamp
+18	12	LRTMOBJP	2	binary	internal	Objective – percentage
+20	14	LRTMOBJB	2	binary	internal	Objective – counter number
+22	16	LRTMDEF	1	EBCDIC	internal	Response time definition
+23	17	LRTMOBJF	1	EBCDIC	internal	Objective – Y=met N=not met
+24	18	LRTMTRAN	4	binary	RTM Feature[4]	Number of transactions measured
+28	1C	LRTMTOTT[3]	4	binary	RTM Feature[4]	Total response delay
+32	20	LRTMBNDS	16	binary	internal	Four four-byte fields containing counter boundaries
+48	30	LRTMBKTS[3]	20	binary	RTM Feature[4]	Five four-byte fields with contents of counters
+68	44	LRTMOBJT	4	binary	internal	Objective – response time

[1]LRTEETAB is an array of structures. LRTEENAM and LRTEETGO are fields in the structure.

[2]For LRTMCOLB and LRTMCOLE, the first four bytes of time stamp are the local time in STCK format, the last four are the local time in STCK format, the last four are the conversion factor from GMT to local time. (Example: 982B5412 FFFFCA5B).

[3]LRTMBKTS and LRTMTOTT are in tenth-of-seconds.

[4]The data is allocated by the RTM Feature of the PU.

Offsets		Name	Length	Format	Source	Description
Accounting and Availability Data Section:						
+0	0	LACCREVL	2	binary	internal	Revision level: 2
+4	4	LACCBEGT	8	binary	internal	Collection period begin time stamp
+12	C	LACCENDT	8	binary	internal	Collection period end time stamp
+20	14	LACCPCBC	4	binary	internal	Number of control PIUs sent from primary to secondary
+24	18	LACCPCCC	4	binary	internal	Number of control bytes sent from primary to secondary
+28	1C	LACCSCBC	4	binary	internal	Number of control PIUs sent from secondary to primary
+32	20	LACCSCCC	4	binary	internal	Number of control bytes sent from secondary to primary
+36	24	LACCPTBC	4	binary	internal	Number of text PIUs sent from primary to secondary
+40	28	LACCPTCC	4	binary	internal	Number of text bytes sent from primary to secondary
+44	2C	LACCSTBC	4	binary	internal	Number of text PIUs sent from secondary to primary
+48	30	LACCSTCC	4	binary	internal	Number of text bytes sent from secondary to primary

Notes:

1. For LACCBEGT abd LACCENDT, the first four bytes of the time stamp are local time in STCK format. The last four bytes are the conversion factor from GMT to local time. (Example: 982B5412 FFFFCA5B).
2. The Network Logical Data Manager (NLDM) uses the indicators in the first byte of the RH to select control and next PIUs.
3. The number of bytes counted are data bytes only.
4. BSC connections do not have control PIUs.

Record Type 40 (28) – Dynamic DD

Record type 40 is written by IEFDB4F9 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 in the TCTIOT. Its length is 66 bytes plus eight bytes for each device 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 EXCP count for the data set.
set.

Note: For more information on EXCP count and CPU time, see Chapters 8 and 9, respectively.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	TDDRLEN	2	binary	internal	Record length
2	2	TDDRSEG	2	binary	internal	Segment descriptor
4	4	TDDRFLG	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 Reserved
5	5	TDDRCDTY	1	binary	internal	Record type
6	6	TDDRCDTS	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	TDDRCDTE	4	packed	SVC 83	Date record was moved to SMF buffer, in the form 00YYDDDF where F is the sign
14	E	TDDCPUID	4	EBCDIC	JMRCPUID	System identification (taken from SID parameter)
18	12	TDDUIF	8	EBCDIC	JMRJOB	Job name[1]
26	1A	TDDONTME	4	binary	JMRENTRY	Logon time, in hundredths of a second (If background job, this field contains the time the reader recognized the JOB card.)[1]
30	1E	TDDONDTE	4	packed	JMREDATE	Logon date, in the form 00YYDDDF where F is the sign. (If background job, this field contains the date the reader recognized the JOB card.)[1]
34	22	TDDUDATA	8	EBCDIC	JMRUSEID	User identification (taken from common exit parameter area)
42	29	TDDINVSQ	1	binary	JMRSTEP	Step number (first step = 1, etc.)
43	2B	TDDFLG	1	binary	internal	Functional indicator *Value* *Meaning* 2 Unallocation 3 Concatenation 4 Deconcatenation

[1]The job name and the time and date that the reader recognized the JOB card for this job constitute the job log identification.

Offsets		Name	Length	Format	Source	Description
44	2C	TDDRIN	2	binary		Record indicator *Bit* *Meaning When Set* 0-6 Reserved
					TCTIEX	7 EXCP count may be wrong[2]
						8-25 Reserved
46	2E	TDDRVA	18	binary		Reserved
64	40	TDDVAR	2	binary	internal	Length of device entry portion of this record. Calculated as: (8 times the number of devices) + 2
For each device, there is an eight-byte entry with the following format:[3]						
+0		TDDDEVC	1	binary	UCBTBYT3	Device class
+1		TDDUTYP	1	binary	UCBTBYT4	Unit type
+2		TDDCUAD	2	binary	UCBCHAN	Device number
+4		TDDNEXCP	4	binary	TCTDCTR	EXCP count (see offset 44)[2]

[2] If a GETMAIN for expanding the TCTIOT (the data area where EXCPs are maintained) fails, only the existing data sets are counted. If the functional recovery routine is entered, EXCP counting for the step is discontinued and no device entries are produced. If ADDRSPC=REAL is specified, the EXCP count does not include PCIs. After a Dynamic Concatenation or Deconcatenation all EXCP counts are zeroed; therefore, the EXCP count in subsequent type 40 records will not reflect the total EXCP count for the step. This information is available in the type 30 record. For more information on EXCP count, see Chapter 8.

[3] The device entry is zero when the DD entry is TERM, DUMMY, or unallocated DYNAM. (A DD DUMMY entry also results when a forward reference to a DD statement having that DD name is not found.) Entries for virtual I/O data sets are zero for class type, and X'7FFF' for device number. If the high order bit is on in the device number field, a virtual device is indicated.

Record Type 43 (2B) – JES2 Start

Record type 43 is written by HASPINIT when an S JES2 command (to start JES2) is issued, and by HASPMISC when a $E SYS command (to reclaim the job processing that was being done on the named system in a Multi-Access Spool complex) is issued. This record contains a start/warm start indicator, JES2 start options, and the identification of the system whose job processing is to be reclaimed. Its length is 32 bytes.

Record type 43 is also written by VS Personal Computing (VSPC) Program Product (5740-XR6). For more information on how VSPC uses this record, see *VSPC Installation Reference Material*, SH20-9205.

Use IFASMFR to generate the JES2 record type 43 macro mapping. For more information, see "Using the IFASMFR Macro to Address SMF Record Fields" in Chapter 4.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF43LEN	2	binary	internal	Record length
2	2	SMF43SEG	2	binary	internal	Segment descriptor
4	4	SMF43FLG	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 Reserved
5	5	SMF43RTY	1	binary	internal	Record type
6	6	SMF43TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF43DTE	4	packed	SVC 83	Date record was moved to SMF buffer, in the form 00YYDDDF where F is the sign
14	E	SMF43SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF43SBS	2	binary	internal	Subsystem identification – X'0002' signifies JES2
20	14	SMF43RSV	2	binary		Reserved
22	16	SMF43LRR	2	binary	internal	Length of rest of record, excluding this field
24	18	SMF43RV1	2	binary		Reserved
26	1A	SMF43RST	1	binary	internal	Start/warm start indicator *Bit* *Meaning When Set* 0 If 0, record written for S JES2 command. If 1, record written for $E SYS command (see offset 24). 1-7 Reserved
27	1B	SMF43OPT	1	binary	$OPTSTAT (in HCT)	JES2 start options. (This field is zero for $E SYS command.) *Bit* *Meaning When Set* 0 Format the spool 1 Cold start 2 Request automatic initiator 3 List replacement card option 4-7 Reserved
28	1C	SMF43EID	4	EBCDIC	QSESID	If $E SYS command, identification of system whose job processing is to be reclaimed (see offset 26). If S JES2 command, zero.

Record Type 43 (2B) – JES3 Start

Record type 43 is written by IATINIK 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. Its length is 54 bytes.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF43LEN	2	binary	internal	Record length
2	2	SMF43SEG	2	binary	internal	Segment descriptor
4	4	SMF43FLG	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-5 Reserved 6 VS2 7 Reserved
5	5	SMF43RTY	1	binary	internal	Record type
6	6	SMF43TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF43DTE	4	packed	SVC 83	Date record was moved to SMF buffer, in the form 00YYDDDF where F is the sign
14	E	SMF43SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF43SBS	2	binary	internal	Subsystem identification – X'0005' signifies JES3
20	14	SMF43RSV	2	binary		Reserved
22	16	SMF43LRR	2	binary	internal	Length of rest of record, excluding this field
24	18	SMF43RV1	2	binary		Reserved
26	1A	SMF43RST	1	binary	Set by IATINGL during DSI; otherwise, set by IATINGS	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	1B	SMF43RV2	1	binary		Reserved
28	1C	SMF43US1	1	binary		User flags
29	1D	SMF43NMU	1	EBCDIC	Set by IATINGS	JES3 initialization deck origin type (taken from operator's response to WTOR macro)
30	1E	SMF43ORG	8	EBCDIC	Set by IATINGS	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 Data set in JES3 procedure U Unit address Unit at specified address
38	26	SMF43PJ3	4	EBCDIC	SSCTSNAM in IEFJSCVT; Set by IATINGL	JES3 procedure name
42	2A	SMF43RVJ	8	binary		Reserved for JES3
50	32	SMF43RVU	4	binary		Reserved for user

Record Type 45 (2D) – JES2 Withdrawal

Record type 45 is written by HASPNUC when a $P JES2 command (to withdraw JES2 from the system) is issued. It is also written at the abnormal termination of JES2 if JES2 retains control long enough to write the record. This record contains a termination indicator and JES2 completion code. Its length is 28 bytes.

Record type 45 is also written by VS Personal Computing (VSPC) Program Product (5740-XR6). For more information on how VSPC uses this record, see *VSPC Installation Reference Material,* SH20-9205.

Use IFASMFR to generate the JES2 record type 45 macro mapping. For more information, see "Using the IFASMFR Macro to Address SMF Record Fields" in Chapter 4.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF45LEN	2	binary	internal	Record length
2	2	SMF45SEG	2	binary	internal	Segment descriptor
4	4	SMF45FLG	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 Reserved
5	5	SMF45RTY	1	binary	internal	Record type
6	6	SMF45TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF45DTE	4	packed	SVC 83	Date record was moved to SMF buffer, in the form 00YYDDDF where F is the sign
14	E	SMF45SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF45SBS	2	binary	internal	Subsystem identification – X'0002' signifies JES2
20	14	SMF45RSV	2	binary		Reserved
22	16	SMF45LRR	2	binary	internal	Length of rest of record, excluding this field
24	18	SMF45IND	2	binary	internal	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	internal	JES2 completion code

Record Type 45 (2D) – JES3 Stop

Record type 45 is written by IATINTK 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. Its length is 42 bytes.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF45LEN	2	binary	internal	Record length
2	2	SMF45SEG	2	binary	internal	Segment descriptor
4	4	SMF45FLG	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 Reserved
5	5	SMF45RTY	1	binary	internal	Record type
6	6	SMF45TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF45DTE	4	packed	SVC 83	Date record was moved to SMF buffer, in the form 00YYDDDF where F is the sign
14	E	SMF45SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF45SBS	2	binary	internal	Subsystem identification – X'0005' signifies JES3
20	14	SMF45RSV	2	binary		Reserved
22	16	SMF45LRR	2	binary	internal	Length of rest of record, excluding this field
24	18	SMF45FG1	1	binary	Set by IATINTK	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	Set by IATINTK	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	binary		Reserved
29	1D	SMF45US1	1	binary	internal	User flags
30	1E	SMF45RVJ	8	binary		Reserved for JES3
38	26	SMF45RVU	4	binary		Reserved for user

Record Type 47 (2F) – JES2 SIGNON/Start Line (BSC only)

Record type 47 is written by HASPRTAM when (1) a $S LNEn command (to start a line) is issued, (2) a $E LNEn command (to restart a line) is issued, and (3) a remote user signs on. This record contains a record indicator, remote name, line name, password, and message text. Its length is 52 bytes for a $S LNEn command and 90 bytes for a SIGNON record.

Record type 47 is also written by VS Personal Computing (VSPC) Program Product (5740-XR6). For more information on how VSPC uses this record, see *VSPC Installation Reference Material,* SH20-9205.

Use IFASMFR to generate the JES2 record type 47 macro mapping. For more information, see "Using the IFASMFR Macro to Address SMF Record Fields" in Chapter 4.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF47LEN	2	binary	internal	Record length
2	2	SMF47SEG	2	binary	internal	Segment descriptor
4	4	SMF47FLG	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 Reserved
5	5	SMF47RTY	1	binary	internal	Record type
6	6	SMF47TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF47DTE	4	packed	SVC 83	Date record was moved to SMF buffer, in the form 00YYDDDF where F is the sign
14	E	SMF47SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF47SBS	2	binary	internal	Subsystem identification – X'0002' signifies JES2
20	14	SMF47RSV	2	binary		Reserved
22	16	SMF47LRR	2	binary	internal	Length of rest of record, excluding this field
24	18	SMF47EVT	2	binary	internal	Record indicator *Bit* *Meaning When Set* 0-13 Reserved 14 Record written for $S LNEn command 15 Record written for SIGNON
Identification Section:						
26	1A	SMF47LN1	2	binary	internal	Length of identification section, including this field
28	1C	SMF47RMT	8	EBCDIC	RATNAME	Remote name. (This field is filled in only if a remote terminal is connected to this line.)
36	24	SMF47LIN	8	EBCDIC	DCTDEVN	Line name
44	2C	SMF47PSW	8	EBCDIC	MDCTPSWD (in DCT)	Password
The following fields apply when a remote user signs on:						
Message Section:						
52	34	SMF47LN2	2	binary	internal	Length of rest of record, including this field
54	36	SMF47MSG	36	EBCDIC	SIGNON record	Message text. This field includes columns 35-70 of the SIGNON card image.

Record Type 47 (2F) – JES3 SIGNON/Start Line/LOGON

Record type 47 is written by IATSNDT when a system network architecture (SNA) remote user logs on or by IATRJM3 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 a SNA log on is 52 bytes. For BSC, the record contains a record indicator, a remote name, a line name, a password, and, for a remote sign on, a message text. The record length is 52 bytes for a started line or 102 bytes for a sign on.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF47LEN	2	binary	internal	Record length
2	2	SMF47SEG	2	binary	internal	Segment descriptor
4	4	SMF47FLG	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 Reserved
5	5	SMF47RTY	1	binary	internal	Record type
6	6	SMF47TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF47DTE	4	packed	SVC 83	Date record was moved to SMF buffer, in the form 00YYDDDF where F is the sign
14	E	SMF47SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF47SBS	2	binary	internal	Subsystem identification – X'0005' signifies JES3
20	14	SMF47RSV	2	binary		Reserved
22	16	SMF47LRR	2	binary	internal	Length of rest of record, excluding this field
24	18	SMF47EVT	2	binary	 IATSNLD IATRJM1 IATRJM3	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

Offsets		Name	Length	Format	Source	Description
Identification Section:						
26	1A	SMF47LN1	2	binary	internal	Length of identification section including this field
28	1C	SMF47RMT	8	EBCDIC	IATRJM1 for line, IATRJM3 for SIGNON IATSNDT for LOGON	Remote name. (This field is filled in only if a remote terminal is connected to this line.) Work station name
36	24	SMF47LIN	8	EBCDIC	IATRJM1 for line, IATRJM3 for SIGNON IATSNDT for LOGON	Line name LU name
44	2C	SMF47PSW	8	EBCDIC	SIGNON/LOGON	Password
The following fields apply when a BSC remote user signs on:						
Message Section:						
52	34	SMF47LN2	2	binary	internal	Length of message section, including this field
54	36	SMF47MSG	36	EBCDIC	SIGNON record	Message text. This field includes columns 35-70 of the SIGNON card image.
90	5A	SMF47RVJ	8	binary		Reserved for JES3
98	62	SMF47RVU	4	binary		Reserved for user

Record Type 48 (30) – JES2 SIGNOFF/Stop Line (BSC only)

Record type 48 is written by HASPRTAM when (1) a $P LNEn command (to stop a line) is issued, (2) a $E LNEn command (to restart a line) is issued, and (3) a remote user signs off. This record contains a record indicator, remote name, line name, password, line adapter address, and the number of EXCPs, negative acknowledgements to write text, data checks to read text, and time outs to read text. Its length is 75 bytes.

Record type 48 is also written by VS Personal Computing (VSPC) Program Product (5740-XR6). For more information on how VSPC uses this record, see *VSPC Installation Reference Material,* SH20-9205.

Use IFASMFR to generate the JES2 record type 48 macro mapping. For more information, see "Using the IFASMFR Macro to Address SMF Record Fields" in Chapter 4.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF48LEN	2	binary	internal	Record length
2	2	SMF48SEG	2	binary	internal	Segment descriptor
4	4	SMF48FLG	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 Reserved
5	5	SMF48RTY	1	binary	internal	Record type
6	6	SMF48TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF48DTE	4	packed	SVC 83	Date record was moved to SMF buffer, in the form 00YYDDDF where F is the sign
14	E	SMF48SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF48SBS	2	binary	internal	Subsystem identification – X'0002' signifies JES2
20	14	SMF48RSV	2	binary		Reserved
22	16	SMF48LRR	2	binary	internal	Length of rest of record, excluding this field
24	18	SMF48EVT	2	binary	internal	Record indicator *Bit* *Meaning When Set* 0-13 Reserved 14 Record written for $P LNEn command 15 Record written for SIGNOFF
26	1A	SMF48RV1	2	binary		Reserved

Offsets		Name	Length	Format	Source	Description
28	1C	SMF48RMT	8	EBCDIC	RATNAME	Remote name. (This field is filled in only if a remote terminal is connected to this line.)
36	24	SMF48LIN	8	EBCDIC	DCTDEVN	Line name
44	2C	SMF48PSW	8	EBCDIC	MDCTPSWD (in DCT)	Password
52	34	SMF48IO	4	binary	MDCTSXCP or MDCTXCP[1]	EXCP count
56	36	SMF48NAK	4	binary	MDCTSNAK or MDCTNAK[1]	Number of negative acknowledgements to write text
60	3C	SMF48DCK	4	binary	MDCTSDCK or MDCTDCK[1]	Number of data checks to read text
64	40	SMF48OUT	4	binary	MDCTSTO or MDCTTO[1]	Number of time outs to read text
68	44	SMF48ERR	4	binary	MDCTSREM or MDCTREM[1]	Sum of all other line errors
72	48	SMF48LAA	3	EBCDIC	UCBNAME	Line adapter number

[1]The field names beginning with MDCTS are for SIGNOFF and contain session totals; the other fields are for $P LNEn commands and contain connection totals.

Record Type 48 (30) – JES3 SIGNOFF/Stop Line/LOGOFF

Record type 48 is written by IATSNLC when a system network architecture (SNA) remote user logs off or by IATRJM4 when a binary synchronous communication (BSC) remote line is stopped or 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. The record length is 68 bytes. 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. The record length is 95 bytes.

Note: For BSC, the statistics in this record are accumulated for the line from SIGNON/LOGON to SIGNOFF/LOGOFF.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF48LEN	2	binary	internal	Record length
2	2	SMF48SEG	2	binary	internal	Segment descriptor
4	4	SMF48FLG	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 Reserved
5	5	SMF48RTY	1	binary	internal	Record type
6	6	SMF48TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF48DTE	4	packed	SVC 83	Date record was moved to SMF buffer, in the form 00YYDDDF where F is the sign
14	E	SMF48SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF48SBS	2	binary	internal	Subsystem identification – X'0005' signifies JES3
20	14	SMF48RSV	2	binary		Reserved
22	16	SMF48LRR	2	binary	internal	Length of rest of record, excluding this field
24	18	SMF48EVT	2	binary	 IATSNLD IATRJM4 IATRJM4	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	binary		Reserved
28	1C	SMF48RMT	8	EBCDIC	IATRJM4 for BSC IATSNLC for SNA	Remote name. (This field is filled in only if a remote terminal is connected to this line.) Work station name
36	24	SMF48LIN	8	EBCDIC	IATRJM4 for BSC IATSNLC for SNA	Line name LU name
44	26	SMF48PSW	8	EBCDIC	IATRJM4 for BSC IATSNLC for SNA	Password
52	34	SMF48TRN	4	binary	IATRJM4 for BSC IATSNLC for SNA	EXCP count SEND count

Offsets		Name	Length	Format	Source	Description
56	38	SMF48ERS	4	binary	IATRJM4 for BSC IATSNLC for SNA	Number of line errors RECEIVE count
60	3C	SMF48TOT	2	binary	IATRJM4 for BSC IATSNLC for SNA	Number of time outs to read text SEND negative response count
62	3E	SMF48NKS	2	binary	IATRJM4 for BSC IATSNLC for SNA	Number of negative acknowledgements to write text RECEIVE negative response count
64	40	SMF48S0	1 2	binary	IATRJM4 for BSC IATSNDM for SNA	Number of command rejects SEND positive response count
65 [1]	41 [1]	SMF48S1	1	binary	IATRJM4	Number of interventions required
66 [1]	42 [1]	SMF48S2	1 2	binary	IATRJM4 for BSC IATSDR for SNA	Number of bus-out checks RECEIVE positive response count
67 [1]	43 [1]	SMF38S3	1	binary	IATRJM4	Number of equipment checks
The following fields apply only to BSC:						
68	44	SMF48S4	1	binary	IATRJM4	Number of data checks
69	45	SMF48S5	1	binary	IATRJM4	Number of data overruns
70	46	SMF48S6	1	binary	IATRJM4	Number of lost datas
71	47	SMF48USR	9	binary		Reserved
80	50	SMF48ADP	3	EBCDIC	IATRJM4	Line adapter number
83	53	SMF48RVJ	8	binary		Reserved for JES3
91	5B	SNF48RVU	4	binary		Reserved for user

1 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 by HASPRTAM when a remote user attempts to sign on with an invalid password. This record is the same as record type 47 except the password is invalid. It contains a record indicator, remote name, line name, invalid password, and message text. Its length is 90 bytes.

Record type 49 is also written by VS Personal Computing (VSPC) Program Product (5740-XR6). For more information on how VSPC uses this record, see *VSPC Installation Reference Material,* SH20-9205.

Use IFASMFR to generate the JES2 record type 49 macro mapping. For more information, see "Using the IFASMFR Macro to Address SMF Record Fields" in Chapter 4.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF49LEN	2	binary	internal	Record length
2	2	SMF49SEG	2	binary	internal	Segment descriptor
4	4	SMF49FLG	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 Reserved
5	5	SMF49RTY	1	binary	internal	Record type
6	6	SMF49TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF49DTE	4	packed	SVC 83	Date record was moved to SMF buffer, in the form 00YYDDDF where F is the sign
14	E	SMF49SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF49SBS	2	binary	internal	Subsystem identification – X'0002' signifies JES2
20	14	SMF49RSV	2	binary		Reserved
22	16	SMF49LRR	2	binary	internal	Length of rest of record, excluding this field
24	18	SMF49EVT	2	binary	internal	Record indicator *Bit* *Meaning When Set* 0-13 Reserved 14 Started line 15 Record written for SIGNON
Identification Section:						
26	1A	SMF49LN1	2	binary	internal	Length of identification section, including this field
28	1C	SMF49RMT	8	EBCDIC	RATNAME	Remote name. (This field is filled in only if a remote terminal is connected to this line.)
36	24	SMF49LIN	8	EBCDIC	DCTDEVN	Line name
44	2C	SMF49PSW	8	EBCDIC	SIGNON record	Invalid password
Message Section:						
52	34	SMF49LN2	2	binary	internal	Length of rest of record, including this field
54	36	SMF49MSG	36	EBCDIC	SIGNON record	Message text. This field includes columns 35-70 of the SIGNON card image.

Record Type 49 (31) – JES3 Integrity

Record type 49 is written by IATSNLS when a system network architecture (SNA) remote user attempt to logon on with an invalid password or by IATRJM3 when a binary synchronous communication (BSC) remote line user attempts to sign on with an invalid password.

For SNA, the record contains a record indicator, a work station name, a logical unit (LU) name, and an invalid password. The record length is 52 bytes. For BSC, the record contains a record indicator, a remote name, a line name, an invalid password, and, for a remote sign on, a message text. The record length is 90 bytes.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF49LEN	2	binary	internal	Record length
2	2	SMF49SEG	2	binary	internal	Segment descriptor
4	4	SMF49FLG	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 Reserved
5	5	SMF49RTY	1	binary	internal	Record type
6	6	SMF49TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF49DTE	4	packed	SVC 83	Date record was moved to SMF buffer, in the form 00YYDDDF where F is the sign
14	E	SMF49SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF49SBS	2	binary	internal	Subsystem identification – X'0005' signifies JES3
20	14	SMF49RSV	2	binary		Reserved
22	16	SMF49LRR	2	binary	internal	Length of rest of record, excluding this field
24	18	SMF49EVT	2	binary	IATRJM3 for BSC IATSNLS for SNA	Record indicator *Value* *Meaning* 1 Terminal not defined (BSC) 2 Invalid password (BSC) 3 Line already signed on (BSC) 4 Terminal already signed on (BSC) 5 Session limit exceeded (SNA) 6 Work station undefined (SNA) 7 Invalid password (SNA) 8 Bind failed (SNA)
Identification Section:						
26	1A	SMF49LN1	2	binary	internal	Length of identification section, including this field
28	1C	SMF49RMT	8	EBCDIC	IATRJM3 for SIGNON IATSNLS for LOGON	Remote name. (This field is filled in only if a remote terminal is connected to this line.) Work station name
36	24	SMF49LIN	8	EBCDIC	IATRJM3 for SIGNON IATSNLS for LOGON	Line name LU name
44	2C	SMF49PSW	8	EBCDIC	SIGNON/LOGON	Invalid password
The following fields apply only to BSC: **Message Section:**						
52	34	SMF49L	2	binary	internal	Length of message section, including this field
54	36	SMF49MSG	36	EBCDIC	SIGNON record	Message text. This field includes columns 35-70 of the SIGNON card image.

Record Type 50 (32) – ACF/VTAM Tuning Statistics

Record type 50 is written by ISTINCTS to report ACF/VTAM tuning statistics. If specified, tuning statistics are collected when a user-specified time interval expires. Tuning statistics and the time interval are specified in an option when ACF/VTAM is started or its options are modified.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF50LEN	2	binary	internal	Record length
2	2	SMF50SEG	2	binary	internal	Segment descriptor
4	4	SMF50FLG	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 Reserved
5	5	SMF50RTY	1	binary	internal	Record type
6	6	SMF50TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF50DTE	4	packed	SVC 83	Date record was moved to SMF buffer, in the form 00YYDDDF where F is the sign
14	E	SMF50SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF50NME	8	EBCDIC	internal	Intelligence controller name
26	1A	SNF50DLR	4	binary	internal	Maximum dump-load-restart requests
30	1E	SMF50CWR	4	binary	internal	Count of WRITE channel programs
34	22	SMF50CRD	4	binary	internal	Count of READ channel programs
38	26	SMF50ATN	4	binary	internal	Total number of attentions received
42	2A	SMF50ATR	4	binary	internal	Attentions on ending status of READ channel programs
46	2E	SMF50PUI	4	binary	internal	Number of inbound PIU's
50	32	SMF50PUO	4	binary	internal	Number of outbound PIU's
54	36	SMF50BUF	4	binary	internal	Total number of read buffers used
58	3A	SMF50SLD	4	binary	internal	Number of times NCP entered slowdown.

Record Type 52 (34) JES2 LOGON/Start Line (SNA only)

Record type 52 is written by HASPRTAM when (1) a $S LNEn command (to start a line) is issued, (2) a $E LNEn command (to restart a line) is issued, and (3) a remote user signs on. This record contains a record indicator, remote name, line name, password, and message text. Its length is 38 bytes for a $S LNEn command and 62 bytes for a SIGNON record.

Use IFASMFR to generate the JES2 record type 52 macro mapping. For more information, see "Using the IFASMFR Macro to Address SMF Record Fields" in Chapter 4.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF52LEN	2	binary	internal	Record length
2	2	SMF52SEG	2	binary	internal	Segment descriptor
4	4	SMF52FL6	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 Reserved
5	5	SMF52RTY	1	binary	internal	Record type
6	6	SMF52TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer.
10	A	SMF52DTE	4	packed	SVC 83	Data record was moved to SMF buffer, in the form 00YYDDDF where F is the sign
14	E	SMF52SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF52POF	2	binary	internal	Offset to product section
20	14	SMF52PRL	2	binary	internal	Length of product section
22	16	SMF52PRN	2	binary	internal	Number of product section
24	18	SMF52IDO	2	binary	internal	Offset to identification section
26	1A	SMF52IDL	2	binary	internal	Length of identification section
28	1C	SMF52IDN	2	binary	internal	Number of identification section
Product Section:						
30	1E	SMF52SUB	2	binary	internal	Subtype id, 1 = Record written for LOGON 2 = Record written for $S LNEn
32	20	SMF52VER	2	EBCDIC	internal	Record version number
34	22	SMF52SYS	4	EBCDIC	internal	Subsystem name, 'JES2'
Identification Section:						
38	26	SMF52RMT	8	EBCDIC	RATNAME	Remote name (only for Subtype id = 1)
46	2E	SMF52LIN	8	EBCDIC	DCTDEVN	Line name
54	36	SMF52PSW	8	EBCDIC	MDCTPSND	Line password

Record Type 53 (35) JES2 LOGOFF/Stop Line (SNA only)

Record type 53 is written by HASPRTAM when (1) a $P LNEn command (to stop a line) is issued, (2) a $E LNEn command (to restart a line) is issued and (3) a remote user signs off. This record contains a record indicator, remote name, line name, password, line adapter address, and the number of EXCPs, negative acknowledgements to write text, data checks to read text, and time outs to read text. Its length is 85 bytes.

Use IFASMFR to generate the JES2 record type 53 macro mapping. For more information, see "Using the IFASMFR Macro to Address SMF Record Fields" in Chapter 4.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF53LEN	2	binary	internal	Record length
2	2	SMF53SEG	2	binary	internal	Segment descriptor
4	4	SMF53FLG	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 Reserved
5	5	SMF53RTY	1	binary	internal	Record type
6	6	SMF53TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer.
10	A	SMF53DTE	4	packed	SVC 83	Date record was moved to SMF buffer, in the form 00YYDDDF where F is the sign
14	E	SMF53SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF53POF	2	binary	internal	Offset to product section
20	14	SMF53PRL	2	binary	internal	Length of product section
22	16	SMF53PRN	2	binary	internal	Number of product section
24	18	SMF53IDO	2	binary	internal	Offset to identification section
26	1A	SMF53IDL	2	binary	internal	Length of identification section
28	1C	SMF53IDN	2	binary	internal	Number of identification section
Product Section:						
30	1E	SMF53SUB	2	binary	internal	Subtype id, 1 = Record written for LOGOFF 2 = Record written for $P LNEn
32	20	SMF53VER	2	EBCDIC	internal	Record version number
34	22	SMF53SYS	4	EBCDIC	internal	Subsystem name, 'JES2'

Offsets		Name	Length	Format	Source	Description
Identification Section:						
38	26	SMF53RMT	8	EBCDIC	RATNAME	Remote name
46	2E	SMF53LIN	8	EBCDIC	DCTDEVN	Line name
54	36	SMF53PSW	8	EBCDIC	MDCTPSND	Line password
62	3E	SMF53CTR	4	binary	MDCTSCNT or MDCTVREQ[1]	Number of VTAM request processed
66	42	SMF53CTR +4	4	binary	MDCTSCNT + 4 or MDCTXRSP[1]	Number of exception responses
70	46	SMF53CTR +8	4	binary	MDCTSCNT + 8 or MDCTLUST[1]	Number of LUSTAT's received
74	4A	SMF53CTR +12	4	binary	MDCTSCNT + 12 or MDCTBIDR[1]	Number of bid rejects
78	4E	SMF53CTR +16	4	binary	MDCTSCNT + 16 or MDETMPER[1]	Number of temporary errors
82	52	SMF53ADP	3	EBCDIC	internal	Line identifier, 'SNA'

[1]The field names MDCTSCNT are for LOGOFF and contain session totals; the other fields are for $P LNEn commands and contain connection totals.

Record Type 54 (36) – JES2 Integrity (SNA only)

Record type 54 is written by HASPRTAM when a SNA remote user attempts to sign on with an invalid password. It contains a record indicator, remote name, line name, invalid password, and message text. Its length is 62 bytes.

Use IFASMFR to generate the JES2 record type 54 macro mapping. For more information, see "Using the IFASMFR Macro to Address SMF Record Fields" in Chapter 4.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF54LEN	2	binary	internal	Record length
2	2	SMF54SEG	2	binary	internal	Segment descriptor
4	4	SMF54FLG	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 Reserved
5	5	SMF54RTY	1	binary	internal	Record type
6	6	SMF54TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF54DTE	4	packed	SVC 83	Data record was moved to SMF buffer, in the form 00YYDDDF where F is the sign
14	E	SMF54SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF54POF	2	binary	internal	Offset to product section
20	14	SMF54PRL	2	binary	internal	Length of product section
22	16	SMF54PRN	2	binary	internal	Number of product section
24	18	SMF54IDO	2	binary	internal	Offset to identification section
26	1A	SMF54IDL	2	binary	internal	Length of identification section
28	1C	SMF54IDN	2	binary	internal	Number of identification section
Product Section:						
30	1E	SMF54SUB	2	binary	internal	Subtype id, 1 = Record written for LOGON
32	20	SMF54VER	2	EBCDIC	internal	Record version number
34	22	SMF54SYS	4	EBCDIC	internal	Subsystem name, 'JES2'
Identification Section:						
38	26	SMF54RMT	8	EBCDIC	RATNAME	Remote name
46	2E	SMF54RPW	8	EBCDIC	User's Logon	Remote password
54	36	SMF54PSW	8	EBCDIC	User's Logon	Line Password

Record Type 55 (37) – JES2 Network SIGNON Record

Record type 55 is written by HASPNET at each node when a start networking command is executed. 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. Its length is 58 bytes.

Use IFASMFR to generate the JES2 record type 55 macro mapping. For more information, see "Using the IFASMFR Macro to Address SMF Record Fields" in Chapter 4.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF55LEN	2	binary	internal	Record length
2	2	SMF55SEG	2	binary	internal	Segment descriptor
4	4	SMF55FLG	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 Reserved
5	5	SMF55RTY	1	binary	internal	Record type
6	6	SMF55TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF55DTE	4	packed	SVC 83	Date record was moved to SMF buffer, in the form 00YYDDDF, where F is the sign
14	E	SMF55SID	4	EBCDIC	SMCASID	System identification (taken from SW parameter)
18	12	SMF55SBS	2	binary	internal	Subsystem identification X'0002' signifies JES2
20	14	SMF55SUB	2	binary	internal	Record subtype
22	16	SMF55LRR	2	binary	internal	Length of rest of record, not including this field
24	18	SMF55NNM	8	EBCDIC	NCCINODE	Node name
32	20	SMF55MEM	1	binary	NCCIQUAL	Member number
33	21	SMF55FG1	1	binary	SMFRSPSO	Sign-On Status Flag: *Bit* *Meaning When Set* 0 Response sign-on (off = initial sign-on) 1-7 Reserved
34	22	SMF55LPW	8	EBCDIC	NCCILPAS	Line password
42	2A	SMF55NPW	8	EBCDIC	NCCINPAS	Node password
50	32	SMF55LNM	8	EBCDIC	DCTDEVN	Line name

Record Type 56 (38) – JES2 Network Integrity Record

Record type 56 is written by HASPNET whenever an attempt to SIGNON contains an invalid line or node password. Its length is 58 bytes.

Use IFASMFR to generate the JES2 record type 56 macro mapping. For more information, see "Using the IFASMFR Macro to Address SMF Record Fields" in Chapter 4.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF56LEN	2	binary	internal	Record length
2	2	SMF56SEG	2	binary	internal	Segment descriptor
4	4	SMF56FLG	1	binary	SVC 83	System indicator: *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 Reserved
5	5	SMF56RTY	1	binary	internal	Record type
6	6	SMF56TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF56DTE	4	packed	SVC 83	Date record was moved to SMF buffer, in the form 00YYDDDF, where F is the sign
14	E	SMF56SID	4	EBCDIC	SMCASID	System identification (taken from the SID parameter)
18	12	SMF56SBS	2	binary	internal	Subsystem identification X'0002' signifies JES2
20	14	SMF56SUB	2	binary	internal	Record subtype
22	16	SMF56LRR	2	binary	internal	Length of rest of record, not including this field
24	18	SMF56NNM	8	EBCDIC	NCCINODE	Node name
32	20	SMF56MEM	1	binary	NCCIQUAL	Member number
33	21	SMF56FG1	1	binary	SMFRSPSO	Sign-on Status Flag: *Bit* *Meaning When Set* 0 Response sign-on (off = initial sign-on) 1-7 Reserved
34	22	SMF56LPW	8	EBCDIC	NCCILPAS	Line password
42	2A	SMF56NPW	8	EBCDIC	NCCINPAS	Node password
50	32	SMF56LNM	8	EBCDIC	DCTDEVN	Line name

Record Type 57 (39) – JES2 Network SYSOUT Transmission Record

Record type 57 is written by HASPNET whenever JES2 completes a network SYSOUT transmission. This record contains original and current job identifiers, transmitter start and stop times, and a count of the records transmitted. Its length is 104 bytes.

Use IFASMFR to generate the JES2 record type 57 macro mapping. For more information, see "Using the IFASMFR Macro to Address SMF Record Fields" in Chapter 4.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF57LEN	2	binary	internal	Record Length
2	2	SMF57SEG	2	binary	internal	Segment descriptor
4	4	SMF57FLG	1	binary	SVC 83	System indicator: *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 Reserved
5	5	SMF57RTY	1	binary	internal	Record type
6	6	SMF57TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF57DTE	4	packed	SVC 83	Date record was moved to SMF buffer, in form 00YYDDDF, where F is the sign
14	E	SMF57SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF57SBS	2	binary	internal	Subsystem identification X'0002' signifies JES2
20	14	SMF57SUB	2	binary	internal	Record subtype
22	16	SMF57LRR	2	binary	internal	Length of rest of record, not including this field
24	18	SMF57JID	8	EBCDIC	JCTJOBID	Original job identification
32	20	SMF57CJD	8	EBCDIC	JCTJOBID	Current job identification
40	28	SMF57ONN	8	EBCDIC	NITNODE	Original node name
48	30	SMF57ENN	8	EBCDIC	NITNODE	Execution node name
56	38	SMF57NNN	8	EBCDIC	NITNODE	Next node name
64	40	SMF57DVN	8	EBCDIC	DCTDEVN	SYSOUT transmitter device name
72	48	SMF57TSS	4	binary	SVC 11	SYSOUT transmitter start time
76	40	SMF57DSS	4	packed	SVC 11	SYSOUT transmitter start date
80	50	SMF57TPS	4	binary	SVC 11	SYSOUT transmitter stop time
84	54	SMF57DPS	4	packed	SVC 11	SYSOUT transmitter stop date
88	58	SMF57TSI	8	EBCDIC	JCTNACCT	Network account number
96	60	SMF57TSI	4	EBCDIC	$SID	SYSOUT transmitter system identification
100	64	SMF57CNT	4	binary	NSTCOUNT	Count of logical TP records

Record Type 57 (39) – JES3 Networking SYSOUT Transmission Record

Record type 57 is written by IATNTSD whenever JES3 completes a network transmission. This record contains original and current job identifiers, accounting information, transmission path, and destination. The length is 170 bytes.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMFNJLEN	2	binary	internal	Record length
2	2	SMFNJDES	2	binary	internal	Segment descriptor
4	4	SMFNJFLG	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 Reserved
5	5	SMFJNRTY	1	binary	internal	Record type
6	6	SMFNJTME	4	binary	STRTIME	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMFNJDTE	4	packed	STRTIME	Date record was moved to SMF buffer, in the form 00YYDDDF where F is the sign
14	E	SMFSYSID	4	EBCDIC	TVTCDVID	System identifier (taken from SID parameter)
18	12	SMFSUBID	4	binary	internal	Subsystem identifier X'0005' signifies JES3
20	14		2	binary		Reserved
22	16	SMFRSV	2	binary		Reserved
24	18	SMFNJETM	4	binary	STRTIME	Transmission start time
28	1C	SMFNJEDT	4	EBCDIC	STRTIME	Transmission start date
32	20	SMFNJIND	2	EBCDIC	internal	Job type indicator JB – indicates data is a job stream OP – indicates data is a SYSOUT data stream
34	22	SMFNJNAM	8	EBCDIC	NJEJOBNM	Job name
42	2A	SMFNJNUM	4	EBCDIC	NJMSGJNO	Current JES3-assigned job number
46	2E	SMFNJONM	2	EBCDIC	NJEJOBNO	Original number
48	30		2	binary		Reserved
50	32	SMFNJPGM	20	EBCDIC	NJEPRGMR	Programmer name
70	46	SMFNJUSR	8	EBCDIC	NJEUSRID	Origin or notify user identifier
78	4E	SMFNJACT	8	EBCDIC	NJEACCT	Networking account number
86	56	SMFNJDPT	8	EBCDIC	NJEDEPT	Department number
94	5E	SMFNJBLD	8	EBCDIC	NJEBLDG	Building number
102	66	SMFNJLOC	8	EBCDIC	NJEROOM	Location number
110	6E	SMFNJORG	8	EBCDIC	internal	Job origin
118	76	SMFNJRMT	8	EBCDIC	internal	Secondary job origin
126	7E	SMFNJXEQ	8	EBCDIC	NJEXEQN	Execution node name
134	86	SMFNJEXU	8	EBCDIC	NJEXEQN	Execution user identifier
142	8E	SMFNJDST	8	EBCDIC	JDSDEST	Destination node name
150	96	SMFNJPTH	8	EBCDIC	NJEPATH	Transmission path node name
158	9E	SMFNJRCT	4	binary	XRCDCNT	Record count
162	A2	CMRNJCNT	4	binary	XCHARCNT	Compressed byte count
166	A6	SMFNJTRN	4	binary	XBUFCNT	Transmission buffer count

Record Type 58 (3A) – JES2 Network SIGNOFF Record

Record type 58 is written by HASPNET at each node when a networking session is terminated. The record contains the node name, member number, and line name. Its length is 42 bytes.

Use IFASMFR to generate the JES2 record type 58 macro mapping. For more information, see "Using the IFASMFR Macro to Address SMF Record Fields" in Chapter 4.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF58LEN	2	binary	internal	Record length
2	2	SMF58SEG	2	binary	internal	Segment descriptor
4	4	SMF58FLG	1	binary	SVC 83	System Indicator: *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 Reserved
5	5	SMF58RTY	1	binary	internal	Record type
6	6	SMF58TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF58DTE	4	packed	SVC 83	Date record was moved to SMF buffer, in form 00YYDDDF, where F is the sign
14	E	SMF58SID	4	EBCDIC	SMCASID	System identification
18	12	SMF58SBS	2	binary	internal	Subsystem identification X'0002' signifies JES2
20	14	SMF58SUB	2	binary	internal	Record subtype
22	16	SMF58LRR	2	binary	internal	Length of rest of record, not including this field
24	18	SMF58NNM	8	EBCDIC	NITNODE	Node name
32	20	SMF58MEM	1	binary	DCTNO	Member number
33	21	SMF58RVI	1	binary		Reserved
34	22	SMF58LNM	8	EBCDIC	DCTDEVN	Line name

See inserted newsletter which updates Record 59

Record Type 59 (3B) – MVS/BDT File-to-File Transmission Record

Record type 59 is written by BDTACMN when MVS/Bulk Data Transfer (MVS/BDT) completes a file-to-file transmission. MVS/BDT writes the record from the global node where the transaction is queued. MVS/BDT produces a record type 59 whether or not the transmission successfully completes.

The record contains sections for MVS/BDT product information, transaction identification, file-to-file (FTF) and network information (transaction type section), transaction data, transaction accounting information (which is optional), and transmission information. There are two 40-byte fields for user information at SMF59US1 (transaction data section) and SMF59US2 (transmission data section).

The SMF record mapping macro for record type 59 is IFASMFR. IFASMFR uses BDTDSMF, and MVS/BDT macro instructions, to generate the mapping. If you want 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.

The length of record type 59 is 548 bytes plus the length of the transaction accounting section if included. (The transaction accounting section is optional.)

MVS/BDT invokes the optional user exit BDTUX24 prior to writing the record.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF59LEN	2	binary	internal	Record length
2	2	SMF59SEG	2	binary	internal	Segment descriptor
4	4	SMF59FLG	1	binary	SVC 83	System indicator *Bit* *Meaning when set* 0 Subsystem name follows system identification 1-4 Reserved 5 MVS/XA 6 OS/VS2 7 Reserved
5	5	SMF59RTY	1	binary	internal	Record type 59 (X'3B')
6	6	SMF59TME	4	binary	SVC 83	Time, in hundredths of a second, record was written by SMF.
10	A	SMF59DTE	4	packed	SVC 83	Data record was written by SMF buffer, in the form 00yydddF, where F is the sign.
14	E	SMF59SID	4	EBCDIC	SVC 83	System identification (taken from SID parameter)
18	12	SMF59SSI	4	EBCDIC	internal	Subsystem identification ('BDT')
22	16	SMF59VER	2	EBCDIC	internal	Version number
24	18	SMF59OPD	4	binary	internal	Offset to MVS/BDT product section
28	1C	SMF59LPD	2	binary	internal	Length of MVS/BDT product section
30	1E	SMF59NPD	2	binary	internal	Number of MVS/BDT product sections

(Continued)

Offsets		Name	Length	Format	Source	Description
32	20	SMF59OTI	4	binary	internal	Offset to transaction identifier section
36	24	SMF59LTI	2	binary	internal	Length of transaction identifier section
38	26	SMF59NTI	2	binary	internal	Number of transaction identifier sections
40	28	SMF59OTT	4	binary	internal	Offset to transaction type section
44	2C	SMF59LTT	2	binary	internal	Length of transaction type section
46	2E	SMF59NTT	2	binary	internal	Number of transaction type sections
48	30	SMF59OTD	4	binary	internal	Offset to transaction data section
52	34	SMF59LTD	2	binary	internal	Length of transaction data section
54	36	SMF59NTD	2	binary	internal	Number of transaction data sections
56	38	SFM59OTS	4	binary	internal	Offset to transmission section
60	3C	SMF59LTS	2	binary	internal	Length of transmission section
62	3E	SMF59NTS	2	binary	internal	Number of transmission sections
64	40	SMF59OTA	4	binary	internal	Offset to transaction accounting section (an optional section)
68	44	SMF59LTA	2	binary	internal	Length of transaction accounting section (an optional section)
70	46	SMF59NTA	2	binary	internal	Number of transaction accounting sections (an optional section)
MVS/BDT Product Section:						
+0	+0	SMF59RCD	2	EBCDIC	internal	MVS/BDT version number ('01')
+2	+2	SMF59BDT	8	EBCDIC	internal	Product name 'MVS-BDT'
+10	+A	SMF59SSN	8	EBCDIC	TVTSYSID	MVS/BDT node name
+18	+12	SMF59TID	2	EBCDIC	internal	Transaction type identifier — "FF" for FTF,
Transaction Identifier Section:						
+0	+0	SMF59TNU	4	EBCDIC	JCTJOB	MVS/BDT job number
+4	+4	SMF59TI1	8			Reserved
+12	+C	SMF59TI2	8			Reserved
+20	+14	SMF59TQS	8	EBCDIC	TVTSYSID	MVS/BDT transaction queuing node
+28	+1C	SMF59TI3	8			Reserved
+36	+24	SMF59TSP	8	EBCDIC	MDJXBSN	Transaction source processor name
+44	+2C	SMF59TSS	8	EBCDIC	MJDXBSI	MVS/BDT transaction source node
+52	+34	SMF59TUT	2	EBCDIC	MJDXTYP	Transaction source userid type: 'T' — TSO user 'J' — JES console 'B' — Batch job 'M' — MCS console
+54	+36	SMF59TI5	2			Reserved
+56	+38	SMF59TSU	8	EBCDIC	 MJDUSID MJDCNDD MJDBJAM MJDMCSI	Transaction source userid TSO userid JES console DD name Batch job name MCS console identified
Transaction Type Section for FTF:						
+0	+0	SMF59ONN	8	EBCDIC	MJDFRLOC	MVS/BDT origin node name
+8	+8	SMF59OFN	44	EBCDIC	MJD text unit	Origin file name if specified in transaction
+52	+34	SMF59OMN	8	EBCDIC	MJD text unit	PDS member name of origin file if specified in SEQ transaction
+60	+3C	SMF59OVI	6	EBCDIC	MJD text unit	First volume serial number for origin file if specified in transaction
+66	+42	SMF59OFG	1	EBCDIC	internal	Origin file flag: 'D' — DUMMY specified
+67	+43	SMF59TT1	3			Reserved

(Continued)

Offsets		Name	Length	Format	Source	Description
+70	+46	SMF59DNN	8	EBCDIC	MJDTOLOC	MVS/BDT destination node name
+78	+4E	SMF59DFN	44	EBCDIC	MJD text unit	Destination file name if specified in transaction
+122	+7A	SMF59DMN	8	EBCDIC	MJD text unit	PDS member name of destination file is specified in SEQ transaction
+130	+82	SMF59DVI	6	ENCDIC	MJD text unit	First volume serial number for destination file is specified in transaction
+136	+88	SMF59DFG	1	EBCDIC	internal	Destination file flag: 'D' — DUMMY specified — INTRDR specified
+137	+89	SMF59TT2	3			Reserved
Transaction Data Section:						
+0	+0	SMF59TTQ	4	binary	MJDJST	Time, in hundredths of a second, transaction was queued (GMT)
+4	+4	SMF59DTQ	4	packed	MJDJSD	Date transaction was queued, in the form 00YYDDDF, where F is the sign (GMT)
+8	+8	SMF59TTC	4	binary	internal	Time, in hundredths of a second, transaction was completed (GMT)
+12	+C	SMF59DTC	4	packed	internal	Date transaction was completed, in the form 00YYDDDF, where F is the sign (GMT)
+16	+10	SMF59BJN	8	EBCDIC	MJDJOBNM	MVS/BDT job name
+24	+18	SMF59PNM	20	EBCDIC	MJD text unit	Programmer name
+44	+2C	SMF59TPR	2	EBCDIC	MJDXPRTY	Transaction priority
+46	+2E	SMF59TCM	2	EBCDIC	internal	Transaction completion code: '00' — normal '04' — operator cancelled '08' — abnormal
+48	+30	SMF59BTC	8	EBCDIC	MJDXCODE	MVS/BDT transaction code
+56	+38	SMF59TD1	4			Reserved
+60	+3C	SMF59BCT	8	binary	MJDBYTES	Number of bytes transferred
+68	+44	SMF59US1	40	EBCDIC		User area (initialized with blanks)
Transmission Section:						
+0	+0	SMF59X01	8			Reserved
+8	+8	SMF59X02	8			Reserved
+16	+10	SMF59SNN	8	EBCDIC	MJDFRLOC	MVS/BDT sender node
+24	+18	SMF59X03	8			Reserved
+32	+20	SMF59X04	8			Reserved
+40	+28	SMF59X05	8			Reserved
+48	+30	SMF59RCN	8	EBCDIC	MJDTOLOC	MVS/BDT receiver node
+56	+38	SMF59X06	8			Reserved
+64	+40	SMF59XST	4	binary	MJDXST	Time, in hundredths of a second, transmission started (GMT)
+68	+44	SMF59XSD	4	packed	MJDXSD	Date transmission started, in the form 00YYDDDF, where F is the sign (GMT)
+72	+48	SMF59XPT	4	binary	MJDXPT	Time, in hundredths of a second, transmission stopped (GMT)
+76	+4C	SMF59XPD	4	packed	MJDXPD	Date transmission stopped, in the for 00YYDDDF, where F is the sign (GMT)
+80	+50	SMF59X08	8			Reserved
+88	+58	SMF59X09	4			Reserved

Offsets		Name	Length	Format	Source	Description
+92	+5C	SMF59XOC	5	EBCDIC	SEFRCOMP (JCT)	Transmission origin completion code
+97	+61	SMF59XDC	5	EBCDIC	SETOCOMP (JCT)	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.)						
+0	+0	SMF59ACT	variable	EBCDIC	MJD text unit	User accounting data from ACCT parameter

Record Type 60 (3C) – VSAM Volume Data Set Updated

Record type 60 is written by IGG0CLED when a VSAM Volume Record (VRR) 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 VRR written or deleted.

Record type 60 identifies the VVDS in which the VVR is written or deleted and gives the new, updated, or deleted VVR. It identifies the job by job log and user identifiers.

The length of the record is 208 bytes plus the length of the VVR.

The SMF record mapping macro for record types 60, 61, 65, and 66 is IFASMFI6.

Its format is:

IFASMFI6 nn

where nn identifies the type of the record you want to map. The mapping macro resides in SYS1.MACLIB.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF60LEN	2	binary	internal	Length of record descriptor word
2	2	SMF60SEG	2	binary	internal	Record descriptor word descriptor
4	4	SMF60SYS	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 VS1
5	5	SMF60RTY	1	binary	internal	Record type
6	6	SMF60TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF60DTE	4	packed	SVC 83	Date record was moved to SMF buffer, in the form 00YYDDDF where F is the sign
14	E	SMF60CPU	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF60SBS	4			Reserved
22	16	SMF60SUB	2	EBCDIC	VVDS parameter list	Contains 'IN' if VVR is inserted; 'UP' if VVR is updated; or 'DE' if VVR is deleted
24	18	SMF60POF	4	binary	internal	Offset of product section
28	1C	SMF60PLN	2	binary	internal	Length of product section
30	1E	SMF60PNO	2	binary	internal	Number of product sections
32	20	SMF60DOF	4	binary	internal	Offset of data section
36	24	SMF60DLN	2	binary	internal	Length of data section
38	26	SMF60DNO	2	binary	internal	Number of data sections

(Continued)

Offsets		Name	Length	Format	Source	Description
Product and data section:						
40	28	SMF60VER	2	EBCDIC	internal	Version of the type 60 record
42	2A	SMF60PNM	8	EBCDIC	internal	Catalog management product identifier
50	32	SMF60JNM	8	EBCDIC	JMRJOB	Job name [1]
58	3A	SMF60RST	4	binary	JMRENTRY	Time, in hundredths of a second, reader recognized the JOB card for this job [1]
62	3E	SMF60RDT	4	packed	JMREDATE	Date reader recognized the JOB card for this job, in the form 00YYDDDF where F is the sign [1]
66	42	SMF60UID	8	EBCDIC	JMRUSEID	User identification (taken from common exit parameter area)
74	4A	SMF60FNC	1			Reserved
75	4B	SMF60CNM	44	EBCDIC	VVDS parameter list	Name of VVDS in which entry is made
119	77	SMF60TYP	1	EBCDIC	VVRCOMTP	Entry type identifer
120	78	SMF60ENM	44	EBCDIC	VVRCMPNM	Entry name
164	A4	SMF60NNM	44			Reserved
208	D0	SMF60CRC	variable	binary	VVR	VVR (the length of the VVR is contained in the first 2 bytes of this field)

[1] The job name and the time and date that the reader recognized the JOB card for this job constitute the job log identification.

Record Type 61 (3D) – Integrated Catalog Facility Define Activity

Record type 61 is written by IGG0CLED when an ICF catalog record is written during the processing of an Access Method Services DEFINE command. 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.

Its length is 208 bytes plus the length of the catalog record.

For a description of the mapping macro, see Record type 60.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF61LEN	2	binary	internal	Length of record descriptor word
2	2	SMF61SEG	2	binary	internal	Record descriptor word descriptor
4	4	SMF61SYS	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 VS1
5	5	SMF61RTY	1	binary	internal	Record type
6	6	SMF61TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF61DTE	4	packed	SVC 83	Date record was moved to SMF buffer, in the form 00YYDDDF where F is the sign
14	E	SMF61CPU	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF61SBS	4			Reserved
22	16	SMF61SUB	2	EBCDIC	VVDS parameter list	Contains 'IN' if VVR is inserted; 'UP' if VVR is updated; or 'DE' if VVR is deleted
24	18	SMF61POF	4	binary	internal	Offset of product section
28	1C	SMF61PLN	2	binary	internal	Length of product section
30	1E	SMF61PNO	2	binary	internal	Number of product sections
32	20	SMF61DOF	4	binary	internal	Offset of data section
36	24	SMF61DLN	2	binary	internal	Length of data section
38	26	SMF61DNO	2	binary	internal	Number of data sections

(Continued)

Offsets		Name	Length	Format	Source	Description
Product and data section:						
40	28	SMF61VER	2	EBCDIC	internal	Version of the type 61 record
42	2A	SMF61PNM	8	EBCDIC	internal	Catalog management product identifier
50	32	SMF61JNM	8	EBCDIC	JMRJOB	Job name[1]
58	3A	SMF61RST	4	binary	JMRENTRY	Time, in hundredths of a second, reader recognized the JOB card for this job[1]
62	3E	SMF61RDT	4	packed	JMREDATE	Date reader recognized the JOB card for this job, in the form 00YYDDDF where F is the sign[1]
66	42	SMF61UID	8	EBCDIC	JMRUSEID	User identification (taken from common exit parameter area)
74	4A	SMF61FNC	1			Reserved
75	4B	SMF61CNM	44	EBCDIC	CAXCNAM	Name of catalog in which entry is defined
119	77	SMF61TYP	1	EBCDIC	internal	Entry type identifier
120	78	SMF61ENM	44	EBCDIC	Catalog parameter list	Entry name
164	A4	SMF61NNM	44			Reserved
208	D0	SMF61CRC	variable	binary	Catalog record	New catalog record for defined entry (the length of this record is contained in the first two bytes of this field)

[1]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 user-identification fields contain blanks and the time and date fields contain zeros.

Record Type 62 (3E) – VSAM Component or Cluster Opened

Record type 62 is written by IDA0192S at the successful or unsuccessful opening of a VSAM component or cluster. Its length is 142 bytes plus ten bytes for each volume listed.

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 also identifies the job that issued the OPEN macro by job log identification and user identification.

Note: This record is not generated when a system task issues the OPEN macro.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF62LEN	2	binary	internal	Record length
2	2	SMF62SEG	2	binary	internal	Segment descriptor
4	4	SMF62FLG	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 VS1
5	5	SMF62RTY	1	binary	internal	Record type
6	6	SMF62TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF62DTE	4	packed	SVC 83	Date record was moved to SMF buffer, in the form 00YYDDDF where F is the sign
14	E	SMF62SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF62JBN	8	EBCDIC	JMRJOB	Job name[1]
26	1A	SMF62RST	4	binary	JMRENTRY	Time, in hundredths of a second, reader recognized the JOB card for this job[1]
30	1E	SMF62RSD	4	packed	JMREDATE	Date reader recognized the JOB card for this job, in the form 00YYDDDF where F is the sign[1]
34	22	SMF62UIF	8	EBCDIC	JMRUSEID	User identification (taken from common exit parameter area)
42	2A	SMF62IND	4	binary	Set by IDA0192A and passed to IDA0192S in parameter list	Open status indicator *Bit* *Meaning When Set* 0 Component or cluster was successfully opened 1 Security violation, that is, invalid password 2 Record is a catalog or CRA record 3 Record is for a VVDS or ICF catalog being opened or closed as a data set[2] 4-31 Reserved
46	2E	SMF62CNM	44	EBCDIC	CAXCNAM (in IGGCAXWA)	Name of the catalog in which the component or cluster is defined
90	5A	SMF62CVS	6	EBCDIC	UCBVOLI	Volume serial number of the volume containing the catalog
96	60	SMF62DNM	44	EBCDIC	JFCBDDNM	Name of the component or cluster being opened
140	8C	SMF62VCT	2	binary	OPEN routine calculates from VMT entries	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		SMF62VSR	6	EBCDIC	VMTVLSER	Volume serial number of the volume containing the component or cluster
+6		SMF62DTY	4	binary	UCBTYP	Unit type of the volume containing the component or cluster

[1]The job name and the time and date that the reader recognized the JOB card for this job constitute the job log identification.

[2]If this bit is set, the catalog name field and the cluster name field might be set to zeroes.

Record Type 63 (3F) – VSAM Entry Defined

Record type 63 is written by IGGOCLBV when a VSAM catalog entry (a component, cluster, catalog, alternate index, path, or non-VSAM data set) is defined by the Define Access Method Service command and when that definition is altered. For example, when a VSAM catalog entry (1) is altered with new space allocation information (that is, when the VSAM End-Of-Volume EOV routine extends the entries object), or (2) is changed by the Alter Access Method Services command. One record type 63 is written for each newly created or altered entry. Its length is 136 bytes plus the length of the catalog records required to describe the entry.

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.

Notes:

1. The length of this record 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 this record is to be written to the SMF data set, be sure to include the sizes of these catalog records when estimating the additional storage required for the SMF buffer and the SMF data sets.
2. This record is not written when a VSAM catalog entry is renamed. (Record type 68 is written in this case.)

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF63LEN	2	binary	internal	Record length
	2	SMF63SEG	2	binary	internal	Segment descriptor
4	4	SMF63FLG	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 VS1
5	5	SMF63RTY	1	binary	internal	Record type
6	6	SMF63TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF63DTE	4	packed	SVC 83	Date record was moved to SMF buffer, in the form 00YYDDDF where F is the sign
14	E	SMF63SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF63JBN	8	EBCDIC	JMRJOB	Job name[1]
26	1A	SMF63RST	4	binary	JMRENTRY	Time, in hundredths of a second, reader recognized the JOB card for this job[1]
30	1E	SMF63RSD	4	packed	JMREDATE	Date reader recognized the JOB card for this job, in the form 00YYDDDF where F is the sign[1]
34	22	SMF63UIF	8	EBCDIC	JMRUSEID	User identification (taken from common exit parameter area)[1]

(Continued)

[1]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 user-identification fields contain blanks and the time and date fields contain zeros.

Offsets		Name	Length	Format	Source	Description
42	2A	SMF63FDT	1	binary	VSAM catalog record entry type	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	VSAM catalog record entry type	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	internal	Size of new catalog record. (Be sure to include the contents of this field when estimating the additional storage required by SMF.)[2]
46	2E	SMF63OSZ	2	binary	internal	Size of old catalog record. This field contains the size of the old records before they were altered. (Be sure to include the contents of this field when estimating the additional storage required by SMF.)[2]
48	30	SMF63CNM	44	EBCDIC	CAXCNAM (in IGGCAXWA)	Name of catalog in which the entry is defined
92	5C	SMF63ENM	44	EBCDIC	Name field of VSAM catalog record	Entry name
136	88	SMF63NCR	variable	binary	VSAM catalog entry records	New catalog record followed by old catalog record.[2] 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.

[2]A VSAM catalog record is contained in one or more physical catalog records. Offsets 44 and 46 are the sums of the sizes of the physical catalog records that constitute the total logical VSAM catalog record.

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, and (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. This record is written by IDA0192S. Its length is 254 bytes plus 26 bytes for each extent.

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 also 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 format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF64LEN	2	binary	internal	Record length
2	2	SMF64SEG	2	binary	internal	Segment descriptor
4	4	SMF64FLG	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 VS1
5	5	SMF64RTY	1	binary	internal	Record type
6	6	SMF64TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF64DTE	4	packed	SVC 83	Date record was moved to SMF buffer, in the form 00YYDDDF where F is the sign
14	E	SMF64SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF64JBN	8	EBCDIC	JMRJOB	Job name[1]
26	1A	SMF64RST	4	binary	JMRENTRY	Time, in hundredths of a second, reader recognized the JOB card for this job[1]
30	1E	SMF64RSD	4	packed	JMREDATE	Date reader recognized the JOB card for this job, in the form 00YYDDDF where F is the sign[1]
34	22	SMF64UIF	8	EBCDIC	JMRUSEID	User identification (taken from common exit parameter area)
42	2A	SMF64RIN	1	binary	internal	Situation indicator *Bit* *Meaning When Set* 0 Component closed 1 Volume switched 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[2] 7 Reserved
43	2B	SMF64DTY	1	binary	AMBTYPE	Indicator of component being processed *Bit* *Meaning When Set* 0 Data component 1 Index component 2-7 Reserved
44	2C	SMF64CNM	44	EBCDIC	CAXCNAM (in IGGCAXWA)	Name of the catalog in which the component is defined
88	58	SMF64DNM	44	EBCDIC	VSAM catalog (ENTNAME)	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	VSAM catalog (PRIMSPAC for primary allocation; SCONSPAC for secondary allocation)	Number of tracks that were requested but could not be allocated
134	86	SMF64CHR	4	binary	ARDHRBA (in ARDB)	Highest used relative byte address (RBA) of the component
138	8A	SMF64ESL	2	binary	DEBNMEXT * 26	Length of extent entry portion of record, excluding this field

[1] The job name and the time and date that the reader recognized the JOB card for this job constitute the job log identification.

[2] If this bit is set, the catalog name field and the cluster name field might be set to zeroes.

Offsets		Name	Length	Format	Source	Description
For each extent, there is a 26-byte entry with the following format:						
+0		SMF64FCC	4	binary	DEBSTRCC	Beginning cylinder and track, in the form CCHH where CC is the cylinder number and HH is the track number
+4		SMF64TCC	4	binary	DEBENDCC	Ending cylinder and track, in the form CCHH where CC is the cylinder number and HH is the track number
+8		SMF64VSN	6	EBCDIC	UCBVOLI	Volume serial number of the volume containing the extent
+14		SMF64CUU	2	binary	UCBCHAN	Device number
+16		SMF64IND	2	binary	internal	Spindle identification
+18		SMF64UTY	4	binary	UCBTYP	Unit type
+22		SMF64RV1	4	binary		Reserved
Statistics Section: 3						
Accumulative Statistics from Creation Until the Current OPEN:						
+0		SMF64SLN	4	binary	internal	Length of the statistics section, including this field
+4		SMF64NIL	4	binary	AMDNIL	Number of levels in the index
+8		SMF64NEX	4	binary	AMDNEXT	Number of extents
+12		SMF64NLR	4	binary	AMDNLR	Number of records in the component
+16		SMF64NDE	4	binary	AMDDELR	Number of records that were deleted from the component
+20		SMF64NIN	4	binary	AMDIREC	Number of records that were inserted into the component
+24		SMF64NUP	4	binary	AMDUPR	Number of records that were updated in the component
+28		SMF64NRE	4	binary	AMDRETR	Number of records that were retrieved from the component
+32		SMF64NFS	4	binary	AMDASPA	Number of unused control intervals in the component multiplied by the control interval size
+36		SMF64NCS	4	binary	AMDNCIS	Number of control intervals that were split in the component
+40		SMF64NAS	4	binary	AMDNCAS	Number of control areas that were split in the component
+44		SMF64NEP	4	binary	AMDEXCP	Number of EXCPs. (For more information about EXCP count, see Chapter 8.)
Change in Statistics from OPEN to Time of EOV and CLOSE:						
+48		SMF64DIL	4	binary	AMDNIL	Change in number of levels in the index
+52		SMF64DEX	4	binary	AMDNEXT	Change in number of extents
+56		SMF64DLR	4	binary	AMDNLR	Change in number of records in the component. The field may be negative.
+60		SMF64DDE	4	binary	AMDDELR	Change in number of records that were deleted from the component
+64		SMF64DIN	4	binary	AMDIREC	Change in number of records that were inserted into the component
+68		SMF64DUP	4	binary	AMDUPR	Change in number of records that were updated in the component
+72		SMF64DRE	4	binary	AMDRETR	Change in number of records that were retrieved from the component
+76		SMF64DFS	4	binary	AMDASPA	Change in number of unused control intervals in the component multiplied by the control interval size. (This field may be negative.)
+80		SMF64DCS	4	binary	AMDNCIS	Change in number of control intervals that were split in the component
+84		SMF64DAS	4	binary	AMDNCAS	Change in number of control areas that were split in the component
+88		SMF64DEP	4	binary	AMDEXCP	Change in number of EXCP. (For more information about EXCP count, see Chapter 8.)

2 These fields are zero for DD*, DD DATA, DD DUMMY and spooled data sets.

(Continued)

3 All the fields in this section are present and are taken from the AMDSB data area; inapplicable fields contain zeros.

Offsets		Name	Length	Format	Source	Description
Data Set Characteristics Section:						
+92		SMF64DBS	4	binary	LPMBLKSZ (in IDALPMB)	Physical block size
+96		SMF64DCI	4	binary	AMDCINV (in AMDSB)	Control interval size
+100		SMF64DLS	4	binary	AMDLRECL (in AMDSB)	Maximum logical record size
+104		SMF64DKL	2	binary	AMDKEYLN (in AMDSB)	Key length
+106		SMF64DDN	8	EBCDIC	TIOEDDNM	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.

Record Type 65 (41) – Integrated Catalog Facility Delete Activity

Record type 65 is written by IGG0CLED when an ICF catalog record is written or deleted during the processing of an Access Method Services DELETE command. 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 also 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. Its length is 208 bytes plus the length of the catalog record.

For a description of the mapping macro, see record type 60.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF65LEN	2	binary	internal	Length of record descriptor word
2	2	SMF65SEG	2	binary	internal	Record descriptor word descriptor
4	4	SMF65SYS	1	binary	SVC 83	System indicator *Bit Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 VS1
5	5	SMF65RTY	1	binary	internal	Record type
6	6	SMF65TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF65DTE	4	packed	SVC 83	Date record was moved to SMF buffer, in the form 00YYDDDF where F is the sign
14	E	SMF65CPU	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF65SBS	4			Reserved
22	16	SMF65SUB	2	EBCDIC	VVDS parameter list	Contains 'IN' if VVR is inserted; 'UP' if VVR is updated; or 'DE' if VVR is deleted
24	18	SMF65POF	4	binary	internal	Offset of product section
28	1C	SMF65PLN	2	binary	internal	Length of product section
30	1E	SMF65PNO	2	binary	internal	Number of product sections
32	20	SMF65DOF	4	binary	internal	Offset of data section
36	24	SMF65DLN	2	binary	internal	Length of data section
38	26	SMF65DNO	2	binary	internal	Number of data sections

Offsets		Name	Length	Format	Source	Description
Product and data section:						
40	28	SMF65VER	2	EBCDIC	internal	Version of the type 65 record
42	2A	SMF65PNM	8	EBCDIC	internal	Catalog management product identifier
50	32	SMF65JNM	8	EBCDIC	JMRJOB	Job name[1]
58	3A	SMF65RST	4	binary	JMRENTRY	Time, in hundredths of a second, reader recognized the JOB card for this job[1]
62	3E	SMF65RDT	4	packed	JMREDATE	Date reader recognized the JOB card for this job, in the form 00YYDDDF where F is the sign[1]
66	42	SMF65UID	8	EBCDIC	JMRUSEID	User identification
74	4A	SMF65FNC	1	EBCDIC	internal	Contains 'S' if a data set was scratched; 'U' if only catalog entries were modified
75	4B	SMF65CNM	44	EBCDIC	CAXCNAM	Name of catalog in which record was updated or deleted
119	77	SMF65TYP	1	EBCDIC	internal	Entry type identifier
120	78	SMF65ENM	44	EBCDIC	Catalog parameter list	Entry name
164	A4	SMF65NNM	44			Reserved
208	D0	SMF65CRC	var-iable	binary	Catalog record	Catalog record for updated or deleted entry (the length of this record is contained in the first two bytes of this field)

[1]The job name and the time and data 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 zeroes.

Record Type 66 (42) – Integrated Catalog Facility Alter Activity

Record type 66 is written by IGG0CLED when an ICF catalog record is written or deleted during the processing of an Access Method Services ALTER command or a data set extend operation. 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 also 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. Its length is 208 bytes plus the length of the catalog record.

For a description of the mapping macro, see record type 60.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF66LEN	2	binary	internal	Length of record descriptor word
2	2	SMF66SEG	2	binary	internal	Record descriptor word descriptor
4	4	SMF66SYS	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 VS1
5	5	SMF66RTY	1	binary	internal	Record type
6	6	SMF66TME	4	binary	SVC 83	Time, in hundredths of a second record was moved to SMF buffer
10	A	SMF66DTE	4	packed	SVC 83	Date record was moved to SMF buffer, in the form 00YYDDDF where F is the sign
14	E	SMF66CPU	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF66SBS	4			Reserved
22	16	SMF66SUB	2	EBCDIC	VVDS parameter list	Contains 'IN' if VVR is inserted; 'UP' if VVR is updated; or 'DE' if VVR is deleted
24	18	SMF66POF	4	binary	internal	Offset of product section
28	1C	SMF66PLN	2	binary	internal	Length of product section
30	1E	SMF66PNO	2	binary	internal	Number of product sections
32	20	SMF66DOF	4	binary	internal	Offset of data section
36	24	SMF66DLN	2	binary	internal	Length of data section
38	26	SMF66DNO	2	binary	internal	Number of data sections

(Continued)

Offsets		Name	Length	Format	Source	Description
Product and data section:						
40	28	SMF66VER	2	EBCDIC	internal	Version of the type 66 record
42	2A	SMF66PNM	8	EBCDIC	internal	Catalog management product identifier
50	32	SMF66JNM	8	EBCDIC	JMRJOB	Job name[1]
58	3A	SMF66RST	4	binary	JMRENTRY	Time, in hundredths of a second, reader recognized the JOB card for this job[1]
62	3E	SMF66RDT	4	packed	JMREDATE	Date reader recognized the JOB card for this job, in the form 00YYDDDF where F is the sign[1]
66	42	SMF66UID	8	EBCDIC	JMRUSEID	User identification (taken from common exit parameter area)
74	4A	SMF66FNC	1	EBCDIC	internal	Contains 'R' if catalog entry is renamed
75	4B	SMF66CNM	44	EBCDIC	CAXCNAM	Name of catalog in which entry is updated or deleted
119	77	SMF66TYP	1	EBCDIC	internal	Entry type identifier
120	78	SMF66ENM	44	EBCDIC	Catalog parameter list	Current entry name
164	A4	SMF66NNM	44	EBCDIC	Catalog parameter list	New entry name
208	D0	SMF66CRC	var-iable	binary	Catalog record	Catalog record for updated or deleted entry (the length of this record is contained in the first two bytes of this field)

[1]The job name and the time and date that the reader recognized the JOB card for this job constitutes the job identification. If a system task caused the record to be written, the job name and user identification fields contain blanks and the time and data fields contain zeroes.

Record Type 67 (43) – VSAM Entry Deleted

Record type 67 is written by IGG0CLBV when a VSAM catalog entry (a component, cluster, catalog, alternate index, path, or non-VSAM data set) is deleted. A type 63 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. Its length is 134 bytes plus the length of the catalog records required to describe the entry.

Record type 67 identifies the deleted entry, the VSAM catalog in which the entry was defined, and the deleted catalog records. It identifies the job by job log identification and user identification.

Notes:

1. The length of this record can be from 1000 to 4000 bytes or more, depending upon the sizes of the catalog records that describe the entry (offset 132). If this record is to be written to the SMF data set, be sure to include the sizes of these catalog records when estimating the additional storage required for the SMF buffer and the SMF data sets.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF67LEN	2	binary	internal	Record length
2	2	SMF67SEG	2	binary	internal	Segment descriptor
4	4	SMF67FLG	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 VS1
5	5	SMF67RTY	1	binary	internal	Record type
6	6	SMF67TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF67DTE	4	packed	SVC 83	Date record was moved to SMF buffer, in the form 00YYDDDF where F is the sign
14	E	SMF67SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF67JBN	8	EBCDIC	JMRJOB	Job name[1]
26	1A	SMF67RST	4	binary	JMRENTRY	Time, in hundredths of a second, reader recognized the JOB card for this job[1]
30	1E	SMF67RSD	4	packed	JMREDATE	Date reader recognized the JOB card for this job, in the form 00YYDDDF where F is the sign[1]
34	22	SMF67UIF	8	EBCDIC	JMRUSEID	User identification (taken from common exit parameter area)[1]
42	2A	SMF67FDT	1	binary	VSAM catalog record entry type	Record creator/entry type indicator *Bit* *Meaning When Set* 0 Uncataloged[2] 1 Scratched[2] 2-5 Reserved 6 Path deleted 7 Alternate index deleted

(Continued)

[1]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 user-identification fields contain blanks and the time and date fields contain zeros.

[2]Both 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 uncatalog bit is always set and the scratched bit is set if the physical non-VSAM space was deleted.

Offsets		Name	Length	Format	Source	Description
43	2B	SMF67IOD	1	binary	VSAM catalog record entry type	Entry type indicator *Bit* *Meaning When Set* 0 VSAM cluster 1 VSAM data component[3] 2 VSAM index component[3] 3 VSAM catalog 4 Non-VSAM data set 5 Generation data group 6 Alias 7 Reserved
44	2C	SMF67CNM	44	EBCDIC	CAXCNAM (in IGGCAXWA)	Name of catalog in which the entry was defined
88	58	SMF67DEN	44	EBCDIC	Name field of VSAM catalog record	Entry name
132	84	SMF67RSZ	2	binary	internal	Size of catalog record that defined the entry.[4] (Be sure to include the contents of this field when estimating the additional storage required by SMF.)
134	86	SMF67CRC	variable	binary	VSAM catalog entry records	Catalog record[4]

[3]A data or index component can only be deleted as one of the three catalog records deleted when a cluster is deleted.

[4]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.

Record Type 68 (44) – VSAM Entry Renamed

Record type 68 is written by IGG0CLBV when a VSAM catalog entry (a component, cluster, catalog, alternate index, path, or non-VSAM data set) 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 also identifies the job by job log identification and user identification. Its length is 174 bytes.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF68LEN	2	binary	internal	Record length
2	2	SMF68SEG	2	binary	internal	Segment descriptor
4	4	SMF68FLG	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 VS1
5	5	SMF68RTY	1	binary	internal	Record type
6	6	SMF68TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF68DTE	4	packed	SVC 83	Date record was moved to SMF buffer, in the form 00YYDDDF where F is the sign
14	E	SMF68SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF68JBN	8	EBCDIC	JMRJOB	Job name[1]
26	1A	SMF68RST	4	binary	JMRENTRY	Time, in hundredths of a second, reader recognized the JOB card for this job[1]
30	1E	SMF68RSD	4	packed	JMREDATE	Date reader recognized the JOB card for this job, in the form 00YYDDDF where F is the sign[1]
34	22	SMF68UIF	8	EBCDIC	JMRUSEID	User identification (taken from common exit parameter area)[1]
42	2A	SMF68CNM	44	EBCDIC	CAXCNAM (in IGGCAXWA)	Name of catalog in which the entry is defined
86	56	SMF68ONM	44	EBCDIC	Pointed to by CTGFVENT field in IEZCTGFV parameter list	Old name of the entry. (AMS obtains this name from the ALTER command.)
130	82	SMF68NNM	44	EBCDIC	Pointed to by CTGNEWNM field in IEZCTGPL parameter list	New name of the entry. (AMS obtains this name from the ALTER command.)

[1]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 user-identification fields contain blanks and the time and date fields contain zeros.

Record Type 69 (45) – VSAM Data Space Defined, Extended, or Deleted

Record type 69 is written by IGG0CLBV 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. Its length is 106 bytes.

This record identifies the catalog in which the data space is defined and the volume on which it is (or was) allocated. It also 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 format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF69LEN	2	binary	internal	Record length
2	2	SMF69SEG	2	binary	internal	Segment descriptor
4	4	SMF69FLG	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 VS1
5	5	SMF69RTY	1	binary	internal	Record type
6	6	SMF69TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF69DTE	4	packed	SVC 83	Date record was moved to SMF buffer, in the form 00YYDDDF where F is the sign
14	E	SMF69SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF69JBN	8	EBCDIC	JMRJOB	Job name[1]
26	1A	SMF69RST	4	binary	JMRENTRY	Time, in hundredths of a second, reader recognized the JOB card for this job[1]
30	1E	SMF69RSD	4	packed	JMREDATE	Date reader recognized the JOB card for this job, in the form 00YYDDDF where F is the sign[1]
34	22	SMF69UIF	8	EBCDIC	JMRUSEID	User identification (taken from common exit parameter area)[1]
42	2A	SMF69CUU	2	binary	UCBCHAN	Device number
44	2C	SMF69IND	2	binary	EXCP of sense data	Spindle identification
46	2E	SMF69NDS	2	binary	VSAM catalog volume entry	Number of free data space extents on the affected volume after the data space is defined, extended, or deleted
48	30	SMF69NUC	2	binary	VSAM catalog volume entry	Number of unallocated cylinders in all of the data spaces on the volume
50	32	SMF69NUT	2	binary	VSAM catalog volume entry	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	VSAM catalog volume entry	Number of cylinders in the largest continuous unallocated area in any data space on the volume
54	36	SMF69LNT	2	binary	VSAM catalog volume entry	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	CAXCNAM (in IGGCAXWA)	Name of catalog in which the data space is defined
100	64	SMF69VSR	6	EBCDIC	Name field of VSAM catalog volume entry	Volume serial number of the volume on which the data space is defined

[1]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 user-identification fields contain blanks and the time and date fields contain zeros.

Record Type 70 (46) – CPU Activity

Record type 70 is written by ERBMFDCP for each measurement interval and when the session is terminated. It contains data that identifies each processor, its status, the amount of wait time that has taken place during an RMF reporting interval, and data describing address space utilization during an interval, as well as I/O interruption measurements. Its length is 635 bytes plus 24 bytes for each processor included.

The SMF record mapping macro for all records produced by RMF is: ERBSMFR. Its format is: ERBSMFR (nn(nn,. . .)) where nn identifies the types of the records 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.RMFMAC01.

Offsets		Name	Length	Format	Source	Description
0	0	SMF70LEN	2	binary	internal	Record length
2	2	SMF70SEG	2	binary	internal	Segment descriptor
4	4	SMF70FLG	1	binary	SMFWTM service routine	System indicator *Bit* *Meaning When Set* 0 A subsystem ID follows the standard header; record is in relocatable format 1-4 Reserved 5 MVS/XA 6 VS2 7 Reserved
5	5	SMF70RTY	1	binary	internal	Record type: 70 (X'46')
6	6	SMF70TME	4	binary	SMFWTM service routine	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF70DTE	4	packed	SMFWTM service routine	Data Record was moved to SMF buffer, in the form 00yydddF, where F is the sign
14	E	SMF70SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF70SSI	4	EBCDIC	internal	Subsystem identification ('RMF')
22	16	SMF70STY	2	binary	internal	Record subtype=1
24	18	SMF70TRN	2	binary	internal	Number of triplets in this record[1]
26	1A		2	binary		Reserved
28	1C	SMF70PRS	4	binary	internal	Offset to RMF product section
32	20	SMF70PRL	2	binary	internal	Length of RMF product section
34	22	SMF70PRN	2	binary	internal	Number of RMF product sections
36	24	SMF70CCS	4	binary	internal	Offset to CPU control section
40	28	SMF70CCL	2	binary	internal	Length of CPU control section
42	2A	SMF70CCN	2	binary	internal	Number of CPU control section
44	2C	SMF70CPS	4	binary	internal	Offset to CPU data section
48	30	SMF70CPL	2	binary	internal	Length of CPU data section
50	32	SMF70CPN	2	binary	internal	Number of CPU data sections in this record
52	34	SMF70ASS	4	binary	internal	Offset to ASID data section
56	38	SMF70ASL	2	binary	internal	Length of ASID data section
58	3A	SMF70ASN	2	binary	internal	Number of ASID data sections

[1] A triplet is a set of offset/length/number values that defines a section of the record.

Offsets		Name	Length	Format	Source	Description
RMF Product Section:						

0	0	SMF70MFV	2	EDCDIC
				
				packed
					internal
					
					internal
						RMF version number. The contents of this field can be any one of the following:
						– X'F0F1' for MF/1
						– X'F0F2' for RMF Version 1
						– X'F0F3' for RMF Version 2, Release 1 or 2
						– X'F0F4' for RMF Version 2, Release 2 with MVS/System Extensions Release 1 installed
						– X'F0F5' for either of the following:
						  – RMF Version 2, Release 2 with MVS/System Extensions Release 2 installed
						  – RMF Version 2, Release 3
						– X'F0F6' for RMF Version 2, Release 3 when either MVS/System Product-JES2 Release 1 Support Feature (5740/XYZ) or MVS/System Product—JES3 Release 1 Support Feature (5740-XYN) is installed
						– X'F0F7' for RMF Version 2, Release 4
						– X'F0F8' for RMF Version 2, Release 4 Enhancements
						– X'F3F1' for RMF Version 3, Release 1
						– X'F3F2' for RMF Version 3, Release 2
						– X'321F' for RMF Version 3, Release 2 Modification Level 1
						– X'330F' for RMF Version 3, Release 3
						
						For more information on the use of RMF, see *Resource Measurement Facility (RMF) Reference and User's Guide.*

2	2	SMF70PRD	8	EBCDIC	internal	Product name ('RMF')
10	A	SMF70IST	4	packed	internal	Time RMF measurement interval started, in the form 0hhmmssF, where F is the sign
14	E	SM70DAT	4	packed	internal	Date RMF measurement interval started, in the form 00yydddF, where F is the sign
18	12	SMF70INT	4	packed	internal	Duration of RMF measurement interval, in the form mmsstttF, where F is the sign. (The end of the measurement interval is the sum of the recorded start time and this field.)
22	16	SMF70MFL	2	binary	internal	Record maintenance indicator
24	18	SFM70SAM	4	binary	internal (Set by ERBMFECP)	Number of RMF samples
28	1C	SMF70RV2	2	binary		Reserved
30	1E	SMF70FLA	2	binary	internal	Flags *Bit* *Meaning When Set* 0 Used internally by RMF post processor 1-15 Reserved
32	20	SMF70RLS	4	EBCDIC	CVTRELNO	Operating system release number and level, in the form nnll
36	24	SMF70CYC	4	packed	internal	Sampling cycle length, in the form 000ttttF, where F is the sign.
40	28	SMF70MVS	8	EBCDIC	CVTPRODN	MVS software level (consists of an acronym and the version, release, and modification level numbers)
48	30	SMF70IML	1	binary	CSDIOML	Indicates the type of processor complex on which data measurements were taken *Value* *Meaning* 01 308x or 908x processor 02 4381 processor 03 3090 processor
49	31	SMF70PRF	1	binary	internal	X'80' indicates the system has extended storage
50	52		2			Reserved

Offsets		Name	Length	Format	Source	Description
CPU Control Section: (continued)						
+0	0	SMF70MOD	2	packed	CVTMDL	Signless CPU model number
+2	2	SMF70VER	1	binary	internal	CPU version number — meaning varies with model number
+3	3		1	binary		Reserved
CPU Data Section: Data is not collected for processors that were offline at the end of the measurement interval or that had any reconfiguration activity during the interval.						
+0	+0	SMF70WAT	8	binary	LCCAWTIM (Set by ERBMFDCP	CPU wait time, where bit 51 = 1 microsecond. That is, the amount of time that the CPU is not executing instructions (PSW wait state bit is on). **Note:** Data could be invalid if a SET CLOCK occurred during the RMF interval.
+8	+8	SMF70CID	2	binary	internal	CPU identification
+10	+A	SMF70CNF	1	binary	internal	Configuration activity indicator *Bit* *Meaning When Set* 0-4 Reserved 5 CPU reconfigured during post processor duration interval
		SMF70VAC			CSDMICP	6 CPU reconfigured during the measurement interval. Data for this CPU is invalid
		SMF70STA			CSDCPUAL	7 CPU online at end of interval
+11	+B	SMF70RV3	1	binary		Reserved
+12	+C	SMF70SER	3	packed	PCCAPID	CPU serial number (6 hexadecimal digits)
+15	+F	SMF70RV4	1	binary		Reserved
+16	+10	SMF70SLH	4	binary	PCCASLIH	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	PCCASTPI	Number of TPI with CC=1; number of I/O interruptions that this processor handled as a result of issuing the TPI instruction.
+24	+18	SM70VFS	4	binary	PSACR0SV	Number of samples where the vector bit in the PSA image was on.
+28	+1C	SMF70V SMF70VFON	1	binary	internal	Vector configuration. *Bit* *Meaning when set* 0 Vector was online 1-7 Reserved.
+29	+1D	SMF70AL1	3	binary	CSDCPUVF	Reserved.

(continued)

Offsets		Name	Length	Format	Source	Description
ASID Data Area Section:						
0	0	SMF70RMN	2	binary	internal (Set by ERBMFECP)	Ready minimum value over interval
2	2	SMF70RMM	2			Ready maximum value over interval
4	4	SMF70RTT	4			Ready total value over interval
8	8	SMF70R00	4			Count of times ready value was 0
12	C	SMF70R01	4			Count of times ready value was 1
16	10	SMF70R02	4			Count of times ready value was 2
20	14	SMF70R03	4			Count of times ready value was 3
24	18	SMF70R04	4			Count of times ready value was 4
28	1C	SMF70R05	4			Count of times ready value was 5
32	20	SMF70R06	4			Count of times ready value was 6
36	24	SMF70R07	4			Count of times ready value was 7
40	28	SMF70R08	4			Count of times ready value was 8
44	2C	SMF70R09	4			Count of times ready value was 9
48	30	SMF70R10	4			Count of times ready value was 10
52	34	SMF70R11	4			Count of times ready value was 11
56	38	SMF70R12	4			Count of times ready value was 12
60	3C	SMF70R13	4			Count of times ready value was 13
64	40	SMF70R14	4			Count of times ready value was 14
68	44	SMF70R15	4			Count of times ready value was 15 or more
72	48	SMF70IMN	2			IN users minimum over interval
74	4A	SMF70IMM	2			IN users maximum over interval
76	4C	SMF70ITT	4			IN users total value over interval
80	50	SMF70I00	4			Count of times IN users was 0
84	54	SMF70I01	4			Count of times IN users was 1 or 2
88	58	SMF70I02	4			Count of times IN users was 3 or 4
92	5C	SMF70I03	4			Count of times IN users was 5 or 6
96	60	SMF70I04	4			Count of times IN users was 7 or 8
100	64	SMF70I05	4			Count of times IN users was 9 or 10
104	68	SMF70I06	4			Count of times IN users was 11 - 15
108	6C	SMF70I07	4			Count of times IN users was 16 - 20
112	70	SMF70I08	4			Count of times IN users was 21 - 25
116	74	SMF70I09	4			Count of times IN users was 26 - 30
120	78	SMF70I10	4			Count of times IN users was 31 - 35
124	7C	SMF70I11	4			Count of times IN users was 36 or more
128	80	SMF70OMN	2			Out users minimum over interval
130	82	SMF70OMM	2			Out users maximum over interval
132	84	SMF70OTT	4			Out users total value over interval
136	88	SMF70O00	4			Count of times out users was 0
140	8C	SMF70O01	4			Count of times out users was 1 or 2
144	90	SMF70O02	4			Count of times out users was 3 or 4
148	94	SMF70O03	4			Count of times out users was 5 or 6
152	98	SMF70O04	4			Count of times out users was 7 or 8
156	9C	SMF70O05	4	binary	internal (Set by ERBMFECP)	Count of times out users was 9 or 10

(continued)

Offsets		Name	Length	Format	Source	Description
ASID Data Area Section: (continued)						
160	A0	SMF70O06	4	binary	internal (Set by ERBMFECP)	Count of times out users was 11 - 15
164	A4	SMF70O07	4			Count of times out users was 16 - 20
168	A8	SMF70O08	4			Count of times out users was 21 - 25
172	AC	SMF70O09	4			Count of times out users was 26 - 30
176	B0	SMF70O10	4			Count of times out users was 31 - 35
180	B4	SMF70O11	4			Count of times out users was 36 or more
184	B8	SMF70WMN	2			Wait user minimum over interval
186	BA	SMF70WMM	2			Wait users maximum over interval
188	BC	SMF70WTT	4			Wait users total value over interval
192	C0	SMF70W00	4			Count of times wait users was 0
196	C4	SMF70W01	4			Count of times wait users was 1 or 2
200	C8	SMF70W02	4			Count of times wait users was 3 or 4
204	CC	SMF70W03	4			Count of times wait users was 5 or 6
208	D0	SMF70W04	4			Count of times wait users was 7 or 8
212	D4	SMF70W05	4			Count of times wait users was 9 or 10
216	D8	SMF70W06	4			Count of times wait users was 11 - 15
220	DC	SMF70W07	4			Count of times wait users was 16 - 20
224	E0	SMF70W08	4			Count of times wait users was 21 - 25
228	E4	SMF70W09	4			Count of times wait users was 26 - 30
232	E8	SMF70W10	4			Count of times wait users was 31 - 35
236	EC	SMF70W11	4			Count of times wait users was 36 or more
240	F0	SMF70BMN	2			Batch users minimum over interval
242	F2	SMF70BMM	2			Batch users maximum over interval
244	F4	SMF70BTT	4			Batch users total value over interval
248	F8	SMF70B00	4			Count of times batch users was 0
252	FC	SMF70B01	4			Count of times batch users was 1 or 2
256	100	SMF70B02	4			Count of times batch users was 3 or 4
260	104	SMF70B03	4			Count of times batch users was 5 or 6
264	108	SMF70B04	4			Count of times batch users was 7 or 8
268	10C	SMF70B05	4			Count of times batch users was 9 or 10
272	110	SMF70B06	4			Count of times batch users was 11 - 15
276	114	SMF70B07	4			Count of times batch users was 16 - 20
280	118	SMF70B08	4			Count of times batch users was 21 - 25
284	11C	SMF70B09	4			Count of times batch users was 26 - 30
288	120	SMF70B10	4			Count of times batch users was 31 - 35
292	124	SMF70B11	4			Count of times batch users was 36 or more
296	128	SMF70SMN	2			Started users minimum over interval
298	12A	SMF70SMM	2			Started users maximum over interval
300	12C	SMF70STT	4			Started users total value over interval
304	130	SMF70S00	4			Count of times started users was 0
308	134	SMF70S01	4			Count of times started users was 1 or 2
312	138	SMF70S02	4			Count of times started users was 3 or 4
316	13C	SMF70S03	4			Count of times started users was 5 or 6
320	140	SMF70S04	4			Count of times started users was 7 or 8
324	144	SMF70S05	4	binary	internal (Set by ERBMFECP)	Count of times started users was 9 or 10

(continued)

Offsets		Name	Length	Format	Source	Description
ASID Data Area Section: (continued)						
328	148	SMF70S06	4	binary	internal (Set by ERBMFECP)	Count of times started users was 11 - 15
332	14C	SMF70S07	4			Count of times started users was 16 - 20
336	150	SMF70S08	4			Count of times started users was 21 - 25
340	154	SMF70S09	4			Count of times started users was 26 - 30
344	158	SMF70S10	4			Count of times started users was 31 - 35
348	15C	SMF70S11	4			Count of times started users was 36 or more
352	160	SMF70TMN	2			TSO users minimum over interval
354	162	SMF70TMM	2			TSO users maximum over interval
356	164	SMF70TTT	4			TSO users total value over interval
360	168	SMF70T00	4			Count of times TSO users was 0
364	16C	SMF70T01	4			Count of times TSO users was 1 or 2
368	170	SMF70T02	4			Count of times TSO users was 3 or 4
372	174	SMF70T03	4			Count of times TSO users was 5 or 6
376	178	SMF70T04	4			Count of times TSO users was 7 or 8
380	17C	SMF70T05	4			Count of times TSO users was 9 or 10
384	180	SMF70T06	4			Count of times TSO users was 11 - 15
388	184	SMF70T07	4			Count of times TSO users was 16 - 20
392	188	SMF70T08	4			Count of times TSO users was 21 - 25
396	18C	SMF70T09	4			Count of times TSO users was 26 - 30
400	190	SMF70T10	4			Count of times TSO users was 31 - 35
404	194	SMF70T11	4			Count of times TSO users was 36 or more
408	198	SMF70LMN	2			Logical ready users minimum over interval
410	19A	SMF70LMM	2			Logical ready users maximum over interval
412	19C	SMF70LTT	4			Logical ready users total value over interval
416	1A0	SMF70L00	4			Count of times the number of logical ready users was 0
420	1A4	SMF70L01	4			Count of times the number of logical ready users was 1 or 2
424	1A8	SMF70L02	4			Count of times the number of logical ready users was 3 or 4
428	1AC	SMF70L03	4			Count of times the number of logical ready users was 5 or 6
432	1B0	SMF70L04	4			Count of times the number of logical ready users was 7 or 8
436	1B4	SMF70L05	4			Count of times the number of logical ready users was 9 or 10
440	1B8	SMF70L06	4			Count of times the number of logical ready users was 11 - 15
444	1BC	SMF70L07	4			Count of times the number of logical ready users was 16 - 20
448	1C0	SMF70L08	4			Count of times the number of logical ready users was 21 - 25
452	1C4	SMF70L09	4			Count of times the number of logical ready users was 26 - 30
456	1C8	SMF70L10	4			Count of times the number of logical ready users was 31 - 35
460	1CC	SMF70L11	4	binary	internal (Set by ERBMFECP)	Count of times the number of logical ready users was 36 or more

(continued)

Offsets		Name	Length	Format	Source	Description
ASID Data Areas Section: (continued)						
464	1D0	SMF70AMN	2	binary	internal (Set by ERBMFECP)	Logical wait users minimum over interval
466	1D2	SMF70AMM	2			Logical wait users maximum over interval
468	1D4	SMF70ATT	4			Logical wait users total value over interval
472	1D8	SMF70A00	4			Count of times the number of logical wait users was 0
476	1DC	SMF70A01	4			Count of times the number of logical wait users was 1 or 2
480	1E0	SMF70A02	4			Count of times the number of logical wait users was 3 or 4
484	1E4	SMF70A03	4			Count of times the number of logical wait users was 5 or 6
488	1E8	SMF70A04	4			Count of times the number of logical wait users was 7 or 8
492	1EC	SMF70A05	4			Count of times the number of logical wait users was 9 or 10
496	1F0	SMF70A06	4			Count of times the number of logical wait users was 11 - 15
500	1F4	SMF70A07	4			Count of times the number of logical wait users was 16 - 20
504	1F8	SMF70A08	4			Count of times the number of logical wait users was 21 - 25
508	1FC	SMF70A09	4			Count of times the number of logical wait users was 26 - 30
512	200	SMF70A10	4			Count of times the number of logical wait users was 31 - 35
516	204	SMF70A11	4	binary	internal (Set by ERBMFECP)	Count of times the number of logical wait users was 36 or more

Record Type 71 (47) – Paging Activity

Record type 71 is written by ERBMFDPP for each measurement interval and when the session is terminated. It contains information about the demands made on the system paging facilities and the utilization of real storage and external page storage during the reporting interval. Its length is 540 bytes.

For a description of the mapping macro, see record type 70.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF71LEN	2	binary	internal	Record length
2	2	SMF71SEG	2	binary	internal	Segment descriptor
4	4	SMF71FLG	1	binary	SMFWTM service routine	System indicator *Bit* *Meaning When Set* 0 A subsystem ID follows the standard header; record is in relocatable format 1-4 Reserved 5 MVS/XA 6 VS2 7 Reserved
5	5	SMF71RTY	1	binary	internal	Record type: 71 (X'47')
6	6	SMF71TME	4	binary	SMFWTM service routine	Time, in hundredths of a second, when record was moved to SMF buffer
10	A	SMF71DTE	4	packed	SMFWTM service routine	Date record was moved to SMF buffer, in the form 00yydddF, where F is the sign
14	E	SMF71SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF71SSI	4	EBCDIC	internal	Subsystem identification ('RMF')
22	16	SMF71STY	2	binary	internal	Record subtype=1
24	18	SMF71TRN	2	binary	internal	Number of triplets in this record[1]
26	1A		2	binary		Reserved
28	1C	SMF71PRS	4	binary	internal	Offset to RMF product section
32	20	SMF71PRL	2	binary	internal	Length of RMF product section
34	22	SMF71PRN	2	binary	internal	Number of RMF product sections
36	24	SMF71PDS	4	binary	internal	Offset to paging data section
40	28	SMF71PDL	2	binary	internal	Length of paging data section
42	2A	SMF71PDN	2	binary	internal	Number of paging data section
44	2C	SMF71SWS	4	binary	internal	Offset to swap placement data section
48	30	SMF71SWL	2	binary	internal	Length of swap placement data section
50	32	SMF71SWN	2	binary	internal	Number of swap placement data sections
RMF Product Section:						
0	0	SMF71MFV	2	EBCDIC/ packed	STSCMIV (in STSCT)	RMF version number. For more information on the version number, see the RMF version number description in record type 70 and the *Resource Measurement Facility (RMF) Reference and User's Guide.*
2	2	SMF71PRD	8	EBCDIC	internal	Product name ('RMF')
10	A	SMF71IST	4	packed	internal	Time RMF measurement interval started, in the form 0hhmmssF, where F is the sign
14	E	SMF71DAT	4	packed	internal	Date RMF measurement interval started, in the form 00yydddF, where F is the sign

[1]A triplet is a set of offset/length/number values that defines a section of the record.

Offsets		Name	Length	Format	Source	Description
RMF Product Section (Cont):						
18	12	SMF71INT	4	packed	internal	Duration of RMF measurement interval, in the form mmssttttF, where F is the sign. (The end of the measurement interval is the sum of the record start time and this field.
22	16	SMF71MFL	2	binary	internal	Record maintenance indication
24	18	SMF71SAM	4	binary	internal (Set by ERBMFEPG)	Number of RMF samples
28	1C	SMF71RV2	2	binary		Reserved
30	1E	SMF71FLA	2	binary	internal	Flags *Bit* *Meaning When Set* 0 Used internally by RMF post processor 1-15 Reserved
32	20	SMF71RLS	4	EBCDIC	CVTRELNO	Operating system release number and level, in the form nnll
36	24	SMF71CYC	4	packed	internal	Sampling cycle length, in the form 000ttttF, where F is the sign
40	28	SMF71MVS	8	EBCDIC	CVTPRODN	MVS software level (consists of an acronym and the version, release, and modification level numbers)
48	30	SMF71IML	1	binary	CSDIOML	Indicates the type of processor on which data measurements were taken *Value* *Meaning* 01 308x or 908x processor 02 4381 processor 03 3090 processor
49		SMF71PRF	1	binary	internal	X'80' indicates the system has extended storage
50	52		2			Reserved

Offsets		Name	Length	Format	Source	Description
Paging Data Section:						
+0	+0	SMF71PIN	4	binary	RCETOTPI	Number of non-VIO, non-swap page-ins. 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 pages that are swapped in.
+4	+4	SMF71POT	4	binary	RCETOTPO	Number of non-VIO, non-swap page outs. This field includes page-outs required through specific page requests as well as those pages stolen by the paging supervisor as a result of infrequent use. It does not include page-outs for VIO data sets and pages that are swapped out.
+8	+8	SMF71PRC	4	binary	RCETOTRC	Number of non-VIO, non-swap page reclaims. This field contains the number of requests for pages as a result of page faults, specific page requests, and page fixes that are satisfied without starting new page-ins. It does not include those pages that are recovered by explicit VIO reclaim.
+12	+C	SMF71SSQ	4	binary	RCENSWPS	Number of address space swap sequences. (A swap sequence consists of an address space swap-out and swap-in.)
+16	+10	SMF71SIN	4	binary	RCESWPPI	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	RCESWPPO	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	RCEVIOPI	Number of VIO page-ins. 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	RCEVIOPQ	Number of VIO page-outs. This field includes page-outs resulting from specific page requests on a VIO window as well as those pages stolen by the paging supervisor as a result of infrequent use. It does not include VIO swap-outs or page-outs for the common area.
+32	+20	SMF71VRC	4	binary	RCEVIORU	Number of VIO page reclaims. This field includes page reclaims required through a VIO request that was satisfied without page-in by means of the explicit VIO reclaim interface.
+36	+24	SMF71SNI	4	binary	RCECOMPI	Number of non-VIO page-ins performed in common area (LPA/CSA).
+40	+28	SMF71SNO	4	binary	RCECOMPO	Number of non-VIO page-outs performed in common area (LPA/CSA).
+44	+2C	SMF71SNR	4	binary	RCECOMRC	Number of non-VIO page reclaims performed in common area (LPA/CSA).
+48	+30	SMF71LNI	4	binary	RCELPAPI	Number of non-VIO, non-swap page-ins performed in LPA.
+52	+34	SMF71LNR	4	binary	RCELPARC	Number of non-VIO, non-swap reclaims performed in LPA.
+56	+38	SMF71AFC	4	binary	RCEAFC	Number of page frames available in real storage.
+60	+3C	SMF71TFC	4	binary	RCEPOOL	Number of page frames defined in real storage. (This field does not include frames occupied by the nucleus and frames marked as bad or offline.)

(Continued)

Offsets		Name	Length	Format	Source	Description
Paging Data Section: (continued)						
+64	+40	SMF71TSC	4	binary	ASMSLOTS	Total number of local page data set slots.
+68	+44	SMF71DSC	4	binary	ASMVSC	Number of local page data set slots allocated to VIO private area pages.
+72	+48	SMF71VSC	4	binary	ASMNVSC	Number of local page data set slots allocated to non-VIO private area pages.
+76	+4C	SMF71NSC	4	binary	ASMSLOTS- (ASMVSC + ASMNVSC + ASMERRS)	Number of usable local page data set slots that have not been allocated
+80	+50	SMF71FIN	4	binary	(CVTDOFFE- CVTDOFFS)+ (CVTRWNE- CVTRWNS)+ (CVTERWNE- CVTERWNS)+ (CVTRONE- CVTRONS)	Number of frames in nucleus
+84	+54	SMF71MNF	4	binary	RCEAFC	Minimum number of unused page frames
+88	+58	SMF71MXF	4	binary	RCEAFC	Maximum number of unused page frames
+92	+5C	SMF71AVF	4	binary	RCEAFC	Average number of unused page frames
+96	+60	SMF71MNP	4	binary	RCECOMAL- LPA frames[2]- SQA frames[2]	Minimum number of CSA frames
+100	+64	SMF71MXP	4	binary	RCEOMAL- LPA frames[2]- SQA frames[2]	Maximum number of CSA frames
+104	+68	SMF71AVP	4	binary	RCECOMAL- LPA frames[2]- SQA frames[2]	Average number of CSA frames
+108	+6C	SMF71MNS	4	binary	RCEPOOL- RCEAFC- RCECOMAL- LSQA frames[2]	Minimum number of pageable address space frames in the private address space
+112	+70	SMF71MXS	4	binary	RCEPOOL- RCEAFC- RCECOMAL- LSQA frames[2]	Maximum number of address space frames in the private address space
+116	+74	SMF71AVS	4	binary	RCEPOOL- RCEAFC- RCECOMAL- LSQA frames[2]	Average number of address space frames in the private address space
+120	+78	SMF71MNT	4	binary	RCEPOOL	Minimum total number of frames
+124	+7C	SMF71MXT	4	binary	RCEPOOL	Maximum total number of frames
+128	+80	SMF71AVT	4	binary	RCEPOOL	Average total number of frames

(Continued)

[2] From the IARXCRMF service routine

Offsets		Name	Length	Format	Source	Description
Paging Data Section: (continued)						
+132	+84	SMF71MNQ	4	binary	SQA frames[2]	Minimum number of SQA fixed frames
+136	+88	SMF71MXQ	4	binary	SQA frames[2]	Maximum number of SQA fixed frames
+140	+8C	SMF71AVQ	4	binary	SQA frames[2]	Average number of SQA fixed frames
+144	+90	SMF71MNC	4	binary	common fixed frames[3]	Minimum number of CSA + LPA fixed frames
+148	+94	SMF71MXC	4	binary	common fixed frames[3]	Maximum number of CSA + LPA fixed frames
+152	+98	SMF71AVC	4	binary	common fixed frames[3]	Average number of CSA + LPA fixed frames
+156	+9C	SMF71MNR	4	binary	RCETOTFX-SQA frames[2]-LSQA frames[2]-common fixed frames[3]	Minimum number of non-LSQA fixed frames in the private address space
+160	+A0	SMF71MXR	4	binary	RCETOTFX-SQA frames[2]-LSQA frames[2]-common fixed frames[3]	Maximum number of non-LSQA fixed frames in the private address space
+164	+A4	SMF71AVR	4	binary	RCETOTFX-SQA frames[2]-LSQA frames[2]-common fixed frames[3]	Average number of non-LSQA fixed frames in the private address space
+168	+A8	SMF71MNX	4	binary	RCETOTFX	Minimum total number of fixed frames
+172	+AC	SMF71MXX	4	binary	RCETOTFX	Maximum total number of fixed frames
+176	+B0	SMF71AVX	4	binary	RCETOTFX	Average total number of fixed frames

[2]From the IARXCRMF service routine

[3]From the IARXCNTF service routine

(Continued)

Offsets		Name	Length	Format	Source	Description
Paging Data Section: (continued)						
+180	+B4	SMF71MNU	4	binary	ASMSLOTS-(ASMVSC + ASMNVSC + ASMERRS)	Minimum number of usable local page data set slots that have not been allocated
+184	+B8	SMF71MXU	4	binary	ASMSLOTS-(ASMVSC + ASMNVSC + ASMERRS)	Maximum number of usable local page data set slots that have not been allocated
+188	+BC	SMF71AVU	4	binary	ASMSLOTS-(ASMVSC + ASMNVSC + ASMERRS)	Average number of usable local page data set slots that have not been allocated
+192	+C0	SMF71MNV	4	binary	ASMVSC	Minimum number of local page data set slots allocated to VIO private area pages
+196	+C4	SMF71MXV	4	binary	ASMVSC	Maximum number of local page data set slots allocated to VIO private area pages
+200	+C8	SMF71AVV	4	binary	ASMVSC	Average number of local page data set slots allocated to VIO private area pages
+204	+CC	SMF71MNM	4	binary	ASMNVSC	Minimum number of local page data set slots allocated to non-VIO private area pages
+208	+D0	SMF71MXM	4	binary	ASMNVSC	Maximum number of local page data set page slots allocated to non-VIO private area pages
+212	+D4	SMF71AVM	4	binary	ASMNVSC	Average number of local page data set slots allocated to non-VIO private area pages
+216	+D8	SMF71MNB	4	binary	ASMERRS	Minimum number of unusable local page data set slots
+220	+DC	SMF71MXB	4	binary	ASMERRS	Maximum number of unusable local page data set slots
+224	+E0	SMF71AVB	4	binary	ASMERRS	Average number of unusable local page data set slots
+228	+E4	SMF71MNA	4	binary	ASMSLOTS	Minimum total number of local page data set slots
+232	+E8	SMF71MXA	4	binary	ASMSLOTS	Maximum total number of local page data set slots
+236	+EC	SMF71IS1	2	binary	internal	Number of invalid samples skipped due to IARXCNTF
+238	+EE	SMF71IS2	2	binary	internal	Number of invalid samples resulting from negative calculations
+240	+F0	SMF71TIS	4			Reserved
+244	+F4	SMF71LWS	4			Reserved
+248	+F8	SMF71DWS	4			Reserved
+252	+FC	SMF71ULS	4			Reserved
+256	+100	SMF71NRS	4			Reserved
+260	+104	SMF71ASS	4			Reserved
+264	+108	SMF71RSS	4			Reserved
+268	+10C	SMF71EXS	4			Reserved
+272	+110	SMF71EES	4			Reserved
+276	+114	SMF71TOS	4			Reserved
+280	+118	SMF71TXS	4			Reserved
+284	+11C	SMF71LGS	4			Reserved
+288	+120	SMF71LFS	4			Reserved
+292	+124	SMF71LSS	4			Reserved
+296	+128	SMF71LSE	4			Reserved

Offsets		Name	Length	Format	Source	Description
Paging Data Section: (continued)						
+300	+12C	SMF71NLP	4	binary	LPA frames[2]	Minimum number of LPA frames
+304	+130	SMF71XLP	4	binary	LPA frames[2]	Maximum number of LPA frames
+308	+134	SMF71ALP	4	binary	LPA frames[2]	Average number of LPA frames
+312	+138	SMF71NLF	4	binary	LPA fixed frames[2]	Minimum number of LPA fixed frames
+316	+13C	SMF71XLF	4	binary	LPA fixed frames[2]	Maximum number of LPA fixed frames
+320	+140	SMF71ALF	4	binary	LPA fixed frames[2]	Average number of LPA fixed frames
+324	+144	SMF71NLS	4	binary	LSQA frames[2]	Minimum number of LSQA fixed frames
+328	+148	SMF71XLS	4	binary	LSQA frames[2]	Maximum number of LSQA fixed frames
+332	+14C	SMF71ALS	4	binary	LSQA frames[2]	Average number of LSQA fixed frames
+336	+150	SMF71MNL	4	binary	RCEBELFX	Minimum number of fixed frames below 16 megabytes
+340	+154	SMF71MXL	4	binary	RCEBELFX	Maximum number of fixed frames below 16 megabytes
+344	+158	SMF71AVL	4	binary	RCEBELFX	Average number of fixed frames below 16 megabytes
+348	+15C	SMF71PMV	4	binary	RCEPAGMV	Total number of pages moved
+352	+160	SMF71OPT	8	EBCIDIC	RMPTOPTN	SRM opt member name
+360	+168	SMF71PES	4	binary	RCEESWRT	Total number of pages moved to extended storage
+364	+16C	SMF71PEA	4	binary	RCENWSF +RCEWSDNE	Total number of pages migrated from extended storage to auxiliary storage
+368	+170	SMF71AMN	4	binary	RCEAEC	Minimum number of available extended storage frames
+372	+174	SMF71AMX	4	binary	RCEAEC	Maximum number of available extended storage frames
+376	+178	SMF71ASA	4	binary	RCEAEC	Average number of available extended storage frames
+380	+17C	SMF71LIC	4	binary	MCVSTCRI	Minimum high UIC
+384	+180	SMF71HIC	4	binary	MCVSTCRI	Maximum high UIC
+388	+184	SMF71ACA	4	binary	MCVSTCRI	Average high UIC (scale factor=—1) see note 1
+392	+188	SMF71LMA	4	binary	MCVMGAGE	Minimum migration age; the time an unreferenced page remains in extended storage before migrating to auxiliary storage
+396	+18C	SMF71HMA	4	binary	MCVMGAGE	Maximum migration age; the time an unreferenced page remains in extended storage before migrating to auxiliary storage
+400	+190	SMF71AMA	4	binary	MCVMGAGE	Average migration age; the time an unreferenced page remains in extended storage before migrating to auxiliary storage (scale factor=—1) see note 1
+404	+194	SMF71CF	4	binary	SCCBNXSB* SCCBMESI	Number of installed extended storage frames
+408	+198	SMF71OLE	4	binary	RCEESPL	Number of online extended storage frames
Swap Placement Section: (One per swap reason, located by SMF71SWS). See Note 2.						
0	0	SMF71TOT	4	binary	RMCATOSC	Total number of swap candidates
4	4	SMF71AXD	4	binary	SWCT	Number of physical swaps directed to auxiliary storage
8	8	SMF71LES	4	binary	SWCT	Number of logical swaps physically swapped to extended storage
12	C	SMF71LAX	4	binary	SWCT	Number of logical swaps physically swapped to auxiliary storage
16	10	SMF71ESD	4	binary	SWCT	Number of physical swaps directly to extended storage
20	14	SMF71MIG	4	binary	SWCT	Total number of physical swaps that migrated from extended storage to auxiliary storage

[2]From the IARXCRMF service routine

Note 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.

Note 2: There are eleven swap placement sections, one per swap reason. If there were no swaps for a particular reason, its data fields contain zeroes. The sections are ordered as follows:

Section number	*Reason*
1	Terminal output wait
2	Terminal input wait
3	Long wait
4	Auxiliary storage shortage
5	Real pageable storage shortage
6	Detected wait
7	Request swap
8	Enqueue exchange
9	Exchange on recommendation value
10	Unilateral
11	Transition to non-swappable

Record Type 72 (48) – Workload Activity

Record type 72 is written by ERBMFDWP for each performance group (PG) defined in the installation performance specification (IPS). Type 72 records are generated in the order of low to high PG number. Each record contains data on the one-to-eight PG periods for a PG number. Its length is 204 bytes plus 56 bytes for each performance group period data section.

This record contains the PG number, number of PG periods, IPS name, number of terminated transactions, elapsed time of terminated transactions, and active time, service and workload level of all transactions. Resource and service information is also provided on IOC, CPU, ERV, MSO, and SRB.

For a description of the mapping macro, see record type 70.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF72LEN	2	binary	internal	Record length
2	2	SMF72SEG	2	binary	internal	Segment descriptor
4	4	SMF72FLG	1	binary	SMFWTM service routine	System indicator *Bit* *Meaning When Set* 0 A subsystem ID follows the standard header; record in relocatable format 1-4 Reserved 5 MVS/XA 6 VS2 7 Reserved
5	5	SMF72RTY	1	binary	internal	Record type: 72 (X'48')
6	6	SMF72TME	4	binary	SMFWTM service routine	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF72DTE	4	packed	SMDWTM service routine	Date record was moved to SMF buffer, in the form 00yydddF, where F is the sign
14	E	SMF72SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF72SSI	4	EBCDIC	internal	Subsystem identification ('RMF')
22	16	SMF72STY	2	binary	internal	Record subtype=1
24	18	SMF72TRN	2	binary	internal	Number of triplets in this record[1]
26	1A		2	binary		Reserved
28	1C	SMF72PRS	4	binary	internal	Offset to RMF product section
32	20	SMF72PRL	2	binary	internal	Length of RMF product section
34	22	SMF72PRN	2	binary	internal	Number of RMF product section
36	24	SMF72WLS	4	binary	internal	Offset to workload control section
40	28	SMF72WLL	2	binary	internal	Length of workload control section
42	2A	SMF72WLN	2	binary	internal	Number of workload control sections
44	2C	SMF72PGS	4	binary	internal	Offset to performance group period section
48	30	SMF72PGL	2	binary	internal	Length of performance group period section
50	32	SMF72PGN	2	binary	internal	Number of performance group period sections

[1] A triplet is a set of offset/length/number values that defines a section of the record.

Offsets		Name	Length	Format	Source	Description
RMF Product Section:						
0	0	SMF72MFV	2	EBCDIC/ packed	internal	RMF version number. For more information on the RMF version number, see the RMF version number description in record type 70 and the ***Resource Measurement Facility (RMF) Reference and User's Guide.***
2	2	SMF72PRD	8	EBCDIC	internal	Product name
10	A	SMF72IST	4	packed	internal	Time RMF measurement interval started, in the form 0hhmmssF, where F is the sign
14	E	SMF72DAT	4	packed	internal	Date RMF measurement interval started, in the form 00yydddF, where F is the sign
18	12	SMF72INT	4	packed	internal	Duration of RMF measurement interval, in the form mmsstttF, where F is the sign. (The end of the measurement interval is the sum of the recorded start time and this field.)
22	16	SMF72MFL	2	binary	internal	Record maintenance indication
24	18	SMF72SAM	4	binary	internal	Number of RMF samples
28	1C	SMF72RV2	2	binary		Reserved
30	1E	SMF72FLA	2	binary	internal	Flags *Bit* *Meaning When Set* 0 Used internally by RMF post processor 1-15 Reserved
32	20	SMF72RLS	4	EBCDIC	CVTRELNO	Operating system release number and level, in the form nnll
36	24	SMF72CYC	4	packed	internal	Sampling cycle length, in the form 000ttttF, where F is the sign
40	28	SMF72MVS	8	EBCDIC	CVTPRODN	MVS software level (consists of an acronym and the version, release, and modification level numbers)
48	30	SMF72IML	1	binary	CSDIOML	Indicates the type of processor complex on which data measurements were taken *Value* *Meaning* 01 308x or 908x processor 02 4381 processor 03 3090 processor
49	31	SMF72PRF	1	binary	internal	x'80' indicates the system has extended storage
50	32		2			Reserved
Workload Control Section:						
+0	+0	SMF72FGI	1	binary	internal	Flags *Bit* *Meaning When Set* 0-5 Reserved 6 Report class 7 Change to performance sensitive variable was made
+1	+1	SMF72RV3	1			Reserved
+2	+2	SMF72SUB	2	binary	internal	Subcategory code, performance group (PG) number
+4	+4	SMF72HPG	2	binary	WAMTHPG	Highest PG number defined in installation performance specification (IPS) or installation control specification (ICS)
+6	+6	SMF72IPS	8	EBCDIC	WAMTIPS	Name of IPS
+14	+E	SMF72IRF	3	EBCDIC	RMPTOPI	IOC resource factor coefficient
+17	+11	SMF72CRF	3	EBCDIC	RMPTOPC	CPU resource factor coefficient
+20	+14	SMF72ERF	6	EBCDIC	RMPTOPE	ERV resource manager coefficient
+26	+1A	SMF72ISD	4	EBCDIC	WAMTIPI	IOC service definition coefficient
+30	+1E	SMF72CSD	4	EBCDIC	WAMTIPC	CPU service definition coefficient

Offsets		Name	Length	Format	Source	Description
Workload Control Section: (continued)						
+34	+22	SMF72MSD	4	EBCDIC	WAMTIPM	Main storage service definition coefficient
+38	+26	SMF72SSD	4	EBCDIC	WAMTIPB	SRB service definition coefficient
+42	+2A	SMF72OPT	8	EBCDIC	RMPTOPTN	Name of IEAOPTxx member
+50	+32	SMF72ICS	8	EBCDIC	AMPTICSN	Name of IEAICSxx member
+58	+3A	SMF72SYS	4	EBCDIC	Symbolic name table	Name of subsystem associated with this PGN
+62	+3E	SMF72CLS	10	EBCDIC	Symbolic name table	Name of class associated with this PGN
+72	+48	SMF72USR	10	EBCDIC	Symbolic name table	User identifier associated with this PGN
+82	+52	SMF72NAM	10	EBCDIC	Symbolic name table	Name of transaction associated with this PGN
+92	+5C	SMF72ADJ	4	binary	RMCTADJ	CPU time per service unit (in microseconds), multiplied by 16. RMF uses this field to derive the number of service units per CPU second.
Performance Group Period Data Section:						
+0	+0	SMF72TTX	4	binary	WAMPTRN	Number of transactions terminated
+4	+4	SMF72ACT	4	binary	WAMPTAT (Set by IRARMWAR)	Active time of all transactions, in 1024-microsecond units. This field includes the total time that each transaction was in real 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	WAMPSRV	Service used in all transactions, in service units.
+12	+C	SMF72TTM	4	binary	WAMPTET (Set by IRARMWAR)	Elapsed time accumulated by all transactions that terminated in this PG period, in 1024-microsecond units.
+16	+10	SMF72LEV	4	binary	WAMPNWL	Workload level of all transactions, in units of 1/256 of a level
+20	+14	SMF72MTS	4	binary	WAMPMSO	Main storage total service units
+24	+18	SMF72ITS	4	binary	WAMPIOC	I/O total service units [2]
+28	+1C	SMF72CTS	4	binary	WAMPCPU	CPU total service units
+32	+20	SMF72TAT	4	binary	WAMPTRR	Transaction residency time, in 1024-microsecond units. This field does not include time between job steps for batch transactions.
+36	+24	SMF72SPP	4	binary	WAMPSWC	Number of swap sequences in period
+40	+28	SMF72CDN	2	binary	WAMPDMN	Domain number
+42	+2A	SMF72PON	1	binary	WAMPOBJN	Performance objective number
+43	+2B	SMF72TSG	1	binary	WAMPTSGN	Time slice group number
+44	+2C	SMF72STS	4	binary	WAMPSRB	SRB total service units
+48	+30	SMF72ETI	4	binary	WAMPETS	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	WAMPETS	The second four bytes of the sum of the squares.

[2] See *Initialization and Tuning*, for an explanation of how I/O service units are measured.

Record Type 73 (49) – Channel Path Activity

Record type 73 is written by ERBMFDHP when channel path activity measurement is requested. Entries are created for all channel paths in the system that are valid/installed since RMF was started. However, report data is not formatted for channel paths that were offline at the end of the reporting interval or for channel paths that were reconfigured during the interval. Its length depends on the number of installed channels.

The record contains identification information and channel path use data.

For a description of the mapping macro, see record type 70.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF73LEN	2	binary	internal	Record length
2	2	SMF73SEG	2	binary	internal	Segment descriptor
4	4	SMF73FLG	1	binary	SMFWTM service routine	System indicator *Bit* *Meaning When Set* 0 A subsystem ID follows the standard header; record is in relocatable format 1-4 Reserved 5 MVS/XA 6 VS2 7 Reserved
5	5	SMF73RTY	1	binary	internal	Record type: 73 (X'49')
6	6	SMF73TME	4	binary	SMFWTM service routine	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF73DTE	4	packed	SMWTM service routine	Date record was moved to SMF buffer, in the form 00yydddF, where F is the sign
14	E	SMF73SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF73SSI	4	EBCDIC	internal	Subsystem identification ('RMF')
22	16	SMF73STY	2	binary	internal	Record subtype=1
24	18	SMF73TRN	2	binary	internal	Number of triplets in this record[1]
26	1A		2	binary		Reserved
28	1C	SMF73PRS	4	binary	internal	Offset to RMF product section
32	20	SMF73PRL	2	binary	internal	Length of RMF product section
34	22	SMF73PRN	2	binary	internal	Number of RMF product section
36	24	SMF73HIS	4	binary	internal	Offset to channel path control section
40	28	SMF73HIL	2	binary	internal	Length of channel path control section
42	2A	SMF73HIN	2	binary	internal	Number of channel path control sections
44	2C	SMF73HPS	4	binary	internal	Offset to channel path data section
48	30	SMF73HPL	2	binary	internal	Length of channel path data section
50	32	SMF73HPN	2	binary	internal	Number of channel path data sections
RMF Product Section:						
0	0	SMF73MFV	2	EBCDIC/ packed	STSCMF1V (in STSCT)	RMF version number. For more information on the RMF version number, see the RMF version number description in record type 70 and the ***Resource Measurement Facility (RMF) Reference and User's Guide.***

[1] A triplet is a set of offset/length/number values that defines a section of the record.

Offsets		Name	Length	Format	Source	Description
RMF Product Section (continued):						
2	2	SMF73PRD	8	EBCDIC	internal	Product name
10	A	SMF73IST	4	packed	internal	Time RMF measurement interval started, in the form 0hhmmssF, where F is the sign
14	E	SMF73DAT	4	packed	internal	Date RMF measurement interval started, in the form 00yydddF, where F is the sign
18	12	SMF73INT	4	packed	interval	Duration of RMF measurement interval, in the form mmsstttF, where F is the sign. (The end of the measurement interval is the sum of the recorded start time and this field.)
22	16	SMF73MFL	2	binary	internal	Record maintenance indication
24	18	SMF73SAM	4	binary	internal	Number of RMF samples
28	1C	SMF73RV2	2	binary		Reserved
30	1E	SMF73FLA	2	binary	internal	Flags *Bit* *Meaning When Set* 0 Used internally by RMF processor 1-15 Reserved
32	20	SMF73RLS	4	EBCDIC	CVTRELNO	Operating system release number and level, in the form nnll
36	24	SMF73CYC	4	packed	internal	Sampling cycle length, in the form 000ttttF, where F is the sign (taken from CYCLE option). The range of values is 0.050 to 9.999 seconds.
40	28	SMF73MVS	8	EBCDIC	CVTPRODN	MVS software level (consists of an acronym and the version, release, and modification level numbers)
48	30	SMF73IML	1	binary	CSDIOML	Indicates the type of processor complex on which data measurements were taken *Value* *Meaning* 01 308x or 908x processor 02 4381 processor 03 3090 processor
49	31	SMF73PRF	1	binary	internal	x'80' indicates system has extended storage
+50	+51		2			Reserved
Channel Path Control Section (one per record):						
+0	+0	SMF73SMP	4	binary	CPMTSAMP	Number of times SRM issued STCPS to sample channel path busy; SRM OPT parmlib options. RMFTTOM sets the rate of STCPS.
Channel Path Data Section (one per channel path):						
+0	+0	SMF73PID	1	binary	IOCDS	Channel path identification
+1	+1	SMF73FG2	1	binary	IOCDS	Channel flags *Bit* *Meaning When Set* 0-1 Reserved 2 Block multiplexor 3 Byte multiplexor 4 Reserved 5 Partial statistics 6 Data recorded is invalid because channel path was reconfigured during interval 7 Channel path is currently online
+2	+2	SMF73RV5	2	binary		Reserved
+4	+4	SMF73BSY	4	binary	CMPTBUSY	Number of samples in which the channel path was busy

Record Type 74 (4A) – Device Activity

Record type 74 is written by ERBMFDDP for all devices specified in the DEVICE option. 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. The length of record type 74 is 112 bytes plus 84 bytes for each device data section. Because the maximum length of an SMF record is 32,756 bytes, a maximum of 388 device data sections can fit in one record.

This record identifies the sampling cycle length, number of samples, and the number of devices. Each device entry contains the volume serial number (tape and direct access devices only), numbers of requests serviced on the device, the total active, pending, and connect time to service those requests, requests enqueued for the device, and the device number, class, and type, as well as other data collected about the device.

For a description of the mapping macro, see record type 70.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF74LEN	2	binary	internal	Record length
2	2	SMF74SEG	2	binary	internal	Segment descriptor
4	4	SMF74FLG	1	binary	SMFWTM service routine	System indicator *Bit* *Meaning When Set* 0 A subsystem ID follows the standard header; record is in relocatable format 1-4 Reserved 5 MVS/XA 6 VS2 7 Reserved
5	5	SMF74RTY	1	binary	internal	Record type: 74 (X'4A')
6	6	SMF74TME	4	binary	SMFWTM service routine	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF74DTE	4	packed	SMFWTM service routine	Date record was moved to SMF buffer, in the form 00yydddF, where F is the sign
14	E	SMF74SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF74SSI	4	EBCDIC	internal	Subsystem identification ('RMF')
22	16	SMF74STY	2	binary	internal	Record subtype=1
24	18	SMF74TRN	2	binary	internal	Number of triplets in this record [1]
26	1A		2	binary		Reserved
28	1C	SMF74PRS	4	binary	internal	Offset to RMF product section
32	20	SMF74PRL	2	binary	internal	Length of RMF product section
34	22	SMF74PRN	2	binary	internal	Number of RMF product sections
36	24	SMF74DCS	4	binary	internal	Offset to device control data section
40	28	SMF74DCL	2	binary	internal	Length of device control data section
42	2A	SMF74DCN	2	binary	internal	Number of device control data section
44	2C	SMF74DDS	4	binary	internal	Offset to device data section
48	30	SMF74DDL	2	binary	internal	Length of device data section
50	32	SMF74DDN	2	binary	internal	Number of device data section

[1] A triplet is a set of offset/length/number values that defines a section of the record.

Offsets		Name	Length	Format	Source	Description
RMF Product Section:						
0	0	SMF74MFV	2	EBCDIC/ packed	STSCMFIV (in STSCT)	RMF version number. For more information on the RMF version number, see the RMF version number description in record type 70 and the ***Resource Measurement Facility (RMF) Reference and User's Guide.***
2	2	SMF74PRD	8	EBCDIC	internal	Product name
10	A	SMF74IST	4	packed	interval	Time RMF measurement interval started, in the form 0hhmmssF, where F is the sign
14	E	SMF74DAT	4	packed	internal	Date RMF measurement interval started, in the form 00yydddF, where F is the sign
18	12	SMF74INT	4	packed	internal	Duration of RMF measurement interval, in the form mmsstttF, where F is the sign. (The end of the measurement interval is the sum of the recorded start time and this field.)
22	16	SMF74MFL	2	binary	internal	Record maintenance indication
24	18	SMF74SAM	4	binary	internal (Set by (ERBMFEDV)	Number of RMF samples
28	1C	SMF74RV2	2	binary		Reserved
30	1E	SMF74FLA	2	binary	internal	Flags *Bit* *Meaning When Set* 0 Used internally by RMF post processor 1-15 Reserved
32	20	SMF74RLS	4	EBCDIC	CVTRELNO	Operating system release number and level, in the form nnll
36	24	SMF74CYC	4	packed	internal	Sampling cycle length, in the form 000ttttF, where F is the sign (taken from CYCLE option). The range of values is 0.050 to 9.999 seconds.
40	28	SMF74MVS	8	EBCDIC	CVTPRODN	MVS software level (consists of an acronym and the version, release, and modification level numbers)
48	30	SMF74IML	1	binary	CSDIOML	Indicates the type of processor complex on which data measurements were taken *Value* *Meaning* 01 308x or 908x processor 02 4381 processor 03 3090 processor
49	31	SMF74PRF	1	binary	internal	x'80' indicates system has extended storage
50	32		2			Reserved
Device Control Data Section (one per record):						
+0	+0	SMF74NXT	2	binary	internal	Number of device data sections in following records for this class
+2	+2	SMF74TOT	2	binary	internal	Total number of device data sections in all records for this class
+4	+4	SMF74GEN	2	binary	internal	Total number of devices specified for all classes at system generation
+6	+6	SMF74SUB	2	binary	UCBTBYT3	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

Offset		Name	Length	Format	Source	Description
Device Data Section (one per device):						
+0	+0	SMF74NUM	2	binary	UCBNAME	Device number, in the range X'0000' to X'0FFF'
+2	+2	SMF74LCU	2	binary	IOCDS	Logical control unit number, in the range X'00' to X'FF'
+4	+4	SMF74RV3	1	binary		Reserved. Used internally.
+5	+5	SMF74CNF	1	binary		Device indicator
						Bit *Meaning When Set*
		SMF74QUL			IOSUCNT routine	0 IOS queue length is invalid
		SMF74LCD			IOCDS absent or unreadable	1 No logical control unit information
		SMF74CMB			internal	2 CMB data is invalid
						3 Reserved
		SMF74PAR			internal	4 Only partial statistics are available
		SMF74MXB			UCBMTPXP and UCBBASE	5 Device is a multiple exposure device; this is base exposure
		SMF74VAC			UCBONLI	6 Data recorded is invalid because device was configured during interval
		SMF74STA			UCBONLI	7 Device is currently online
+6	+6	SMF74SER	6	EBCDIC	UCBVOLI	Volume serial of the volume mounted on this device (tape or direct access device only)
+12	+C	SMF74TYP	4	binary	UCBTYP	Unit type
+16	+10	SMF74NUX	4	binary	UCBNEXP	Number of exposures for a multiple exposure device
+20	+14	SMF74SSC	4	binary	CMBSSCHC	Start subshannel count
+24	+18	SMF74MEC	4	binary	CMBSAMP	Measurement event count (number of SSCH instructions for which connect, pending, and active times were stored)
+28	+1C	SMF74CNN	4	binary	CMBCONNT	Device connect time (in 128 microsecond units)
+32	+2D	SMF74PEN	4	binary	CMBPENDT	Device pending time (in 128 microsecond units)
+36	+24	SMF74ATV	4	binary	CMBCONNT CMBPENDT CMBDISCT	Device active time (in 128 microsecond units)
+40	+28	SMF74DIS	4	binary	CMBDISCT	Device disconnect time (in 128 microsecond units)
+44	+2C	SMF74QUE	4	binary	IOSVCNT routine	Number of requests queued in IOS for this device
+48	+30	SMF74UTL	4	binary	UCBRESVH UCBSTRT	Number of samples when the device was reserved but an SSCH instruction had not been issued to the device
+52	+34	SMF74RSV	4	binary	UCBRESVH UCBRESVP	Number of samples taken when the device was reserved
+56	+38	SMF74DSO	4	binary	UCBDMC	Total number of data sets open on the device
+60	+3C	SMF74ALC	4	binary	UCBALOC	Number of samples taken that indicated that the device was allocated
+64	+40	SMF74MTP	4	binary	UCBMOUNT UCBALOC UCBNRY	Number of samples taken that indicated a mount pending condition
+68	+44	SMF74NRD	4	binary	UCBNRY	Number of samples taken that indicated that the device was not ready
+72	+48	SMF74COF	2	binary	UCBDCTOF	Number of requests that had hardware timer overflow for connect time measurement
+74	+4A	SMF74ICT	2	binary	IOCSTSQE (IOS Service)	Number of invalid samples
+76	+4C	SMF74DVB	4	binary	SCHMDTDB	Device busy delay time, from SCHIB.
+80	+50	SMF74CUB	4	binary	SCHMDTCB	Control unit busy delay time

Record Type 75 (4B) – Page/Swap Data Set Activity

Record type 75 is written by ERBMFDSP at the end of each RMF measurement interval. One record is written for each page data set or swap data set monitored during the interval. It provides information on the use of auxiliary storage page slots, and the use of the page/swap data set by ASM. Its length is 200 bytes.

For a description of the mapping macro, see record type 70.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF75LEN	2	binary	internal	Record length
2	2	SMF75SEG	2	binary	internal	Segment descriptor
4	4	SMF75FLG	1	binary	SMWFTM service routine	System indicator *Bit* *Meaning When Set* 0 A subsystem ID follows the standard header; record is in relocatable format 1-4 Reserved 5 MVS/XA 6 VS2 7 Reserved
5	5	SMF75RTY	1	binary	internal	Record type: 75 (X'4B')
6	6	SMF75TME	4	binary	SMFWTM service routine	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF75DTE	4	packed	SMFWTM service routine	Date record was moved to SMF buffer, in the form 00yydddF, where F is the sign
14	E	SMF75SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF75SSI	4	EBCDIC	internal	Subsystem identification ('RMF')
22	16	SMF75STY	2	binary	internal	Record subtype=1
24	18	SMF75TRN	2	binary	internal	Number of triplets in this record[1]
26	IA		2	binary		Reserved
28	IC	SMF75PRS	4	binary	internal	Offset to RMF product section
32	20	SMF75PRL	2	binary	internal	Length of RMF product section
34	22	SMF75PRN	2	binary	internal	Number of RMF product section
36	24	SMF75PSS	4	binary	internal	Offset to page/swap data set data section
40	28	SMF75PSL	2	binary	internal	Length of page/swap data set data section
42	2A	SMF75PSN	2	binary	internal	Number of page/swap data set data sections
RMF Product Section:						
0	0	SMF75MFV	2	EBCDIC/ packed	STSCMF1V (in STSCT)	RMF version number. For more information on the RMF version number, see the RMF version number description in record type 70 and the *Resource Measurement Facility (RMF) Reference and User's Guide.*
2	2	SMF75PRD	8	EBCDIC	internal	Product name
10	A	SMF75IST	4	packed	internal	Time RMF measurement interval started, in the form 0hhmmssF, where F is the sign
14	E	SMF75DAT	4	packed	internal	Date RMF measurement interval started, in the form 00yydddF, where F is the sign
18	12	SMF75INT	4	packed	internal	Duration of RMF measurement interval, in the form mmsstttF, where F is the sign. (The end of the measurement interval is the sum of the recorded start time and this field.)

[1] A triplet is a set of offset/length/number values that defines a section of the record.

Offset		Name	Length	Format	Source	Description
22	16	SMF75MFL	2	binary		Record maintenance indication
24	18	SMF75SAM	4	binary	internal (Set by ERBMFESP)	Number of RMF samples
28	1C	SMF75RV2	2	binary		Reserved
30	1E	SMF75FLA	2	binary	internal	*Bit* *Meaning When Set* 0 Used internally by RMF post processor 1-15 Reserved
32	20	SMF75RLS	4	EBCDIC	CVTRELNO	Operating system release number and level, in the form nnll
36	24	SMF75CYC	4	packed	internal	Sampling cycle length, in the form 000ttttF, where F is the sign (taken from CYCLE option). The range of values is 0.050 to 9.999 seconds.
40	28	SMF75MVS	8	EBCDIC	CVTPRODN	MVS software level (consists of an acronym and the version, release, and modification level numbers)
48	30	SMF75IML	1	binary	CSDIOML	Indicates the type of processor complex on which data measurements were taken *Value* *Meaning* 01 308x or 908x processor 02 4381 processor 03 3090 processor
49	31	SMF75PRF	1	binary	internal	X'80' indicates system has extended storage
50	32		2			Reserved

Offsets		Name	Length	Format	Source	Description
Page/Swap Data Set Data Section:						
+0	+0	SMF75DSN	44	EBCDIC	PARTDSNL or SARDSNL	Page/swap data set name
+44	+2C	SMF75PST	1	binary	PARETYPE	Page space type *Bit* *Meaning When Set* 0 PLPA 1 COMMON 2 DUPLEX 3 LOCAL 4 SWAP 5 Data set unusable 6 Data set came online during interval 7 Reserved
+45	+2D	SMF75FL2	1	binary	internal	Flags *Bit* *Meaning When Set* 0 Data set accepts VIO pages 1 Data set on multiple exposure device 2 Data set on device with alternate control unit 3-7 Reserved
+46	+2E	SMF75RV5	1	binary		Reserved
+47	+2F	SMF75TYP	4	binary	UCBTYP	Unit type
+51	+33	SMF75CHA	2	binary	UCBNAME	Device number in the form hhhF, hex digits followed by F
+53	+35	SMF75VOL	6	EBCDIC	UCBVOLI	Volume serial number
+59	+3B	SMF75RV3	5	binary		Reserved
+64	+40	SMF75SLA	4	binary	PARESZSL or SRETOTSL	Total number of slots or swap sets contained within the page or swap data set
+68	+44	SMF75MXU	4	binary	(PARESZSL - PARESLTA) or (SRETOTSL - SREAVLSL)	Maximum number of slots used or maximum number of swap sets used
+72	+48	SMF75MNU	4	binary	(PARESZSL - PARESLTA) or (SRETOTSL - SREAVLSL)	Minimum number of slots used or minimum number of swap sets used
+76	+4C	SMF75AVU	4	binary	(PARESZSL - PARESLTA) or (SRETOTSL - SREAVLSL)	Average number of slots used or average number of swap sets used
+80	+50	SMF75BDS	4	binary	PARERRCT or SRERRCT	Number of unusable slots or unusable swap sets
+84	+54	SMF75USE	4	binary	IORFUSE	Number of samples indicating data set was being used by ASM
+88	+5A	SMF75REQ	4	binary	IORFUSE	Number of requests for the data set observed during RMF sampling. For single exposure devices, this is the same as SMF75USE. For multiple exposure devices, this value is the sum of all outstanding requests on all exposures.
+92	+5C	SMF75SIO	4	binary	IORSION	Number of I/O requests for the data set
+96	+62	SMF75PGX	4	binary	IORTREQ	Number of pages transferred to or from page data set
+100	+64	SMF75RV8	4	binary		Reserved

Record Type 76 (4C) – Trace Activity

Record type 76 is written by ERBMFDTP at the end of each measurement interval. One record is written for each field name sampled during the interval. Record type 76 contains information on the number of samples, the number of sets, (lines of data), 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. The trace values collected for each set are grouped at the end of the record. The length of record type 76 is 166 bytes plus 2 or more bytes for the length of the variable trace data section.

Offsets		Name	Length	Format	Source	Description
0	0	SMF76LEN	2	binary	internal	Record length
2	2	SMF76SEG	2	binary	internal	Segment descriptor
4	4	SMF76FLG	1	binary	SMFWTM service routine	System indicator *Bit* *Meaning When Set* 0 A subsystem ID follows the standard header; record is in relocatable format 1-4 Reserved 5 MVS/XA 6 VS2 7 Reserved
5	5	SMF76RTY	1	binary	internal	Record type: 76 (X'4C')
6	6	SMF76TME	4	binary	SMFWTM service routine	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF76DTE	4	packed	SMFWTM service routine	Date record was moved to SMF buffer, in the form 00yydddF, where F is the sign
14	E	SMF76SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF76SSI	4	EBCDIC	internal	Subsystem identification ('RMF')
22	16	SMF76STY	2	binary	internal	Record subtype=1
24	18	SMF76RTN	2	binary	internal	Number of triplets in this record[1]
26	1A		2	binary		Reserved
28	1C	SMF76PRS	4	binary	internal	Offset to RMF product section
32	20	SMF76PRL	2	binary	internal	Length of RMF product section
34	22	SMF76PRN	2	binary	internal	Number of RMF product section
36	24	SMF76TCS	4	binary	internal	Offset to trace control section
40	28	SMF76TCL	2	binary	internal	Length of trace control section
42	2A	SMF76TCN	2	binary	internal	Number of trace control sections
44	2C	SMF76TDS	4	binary	internal	Offset to trace data entry section
48	30	SMF76TDL	2	binary	internal	Length of trace data entry section
50	32	SMF76TDN	2	binary	internal	Number of trace data entry sections
52	34	SMF76VFS	4	binary	internal	Offset to variable format set
56	38	SMF76VFL	2	binary	internal	Length of variable format set
58	3A	SMF76VFN	4	binary	internal	Number of variable format sets
RMF Product Section:						
0	0	SMF76MFV	2	EBCDIC/ packed	STSCMFIV (in STSCT)	RMF version number. For more information on the RMF version number, see the RMF version number description in record type 70 and the *Resource Measurement Facility (RMF) Reference and User's Guide.*
2	2	SMF76PRD	8	EBCDIC	internal	Product name
10	A	SMF76IST	4	packed	internal	Time RMF measurement interval started, in the form 0hhmmssF, where F is the sign

[1] A triplet is a set of offset/length/number values that defines a section of the record.

Offsets		Name	Length	Format	Source	Description
RMF Product Section (continued):						
14	E	SMF76DAT	4	packed	internal	Date RMF measurement interval started, in the form 00yydddF, where F is the sign
18	12	SMF76INT	4	packed	internal	Duration of RMF measurement interval, in the form mmssttttF, where F is the sign. (The end of the measurement interval is the sum of the recorded start time and this field.)
22	16	SMF76MFL	2	binary	internal	Record maintenance indication
24	18	SMF76SAM	4	binary	ERBMFETR	Number of RMF samples
28	1C	SMF76RV2	2	binary		Reserved
30	1E	SMF76FLA	2	binary	internal	Flags *Bit* *Meaning When Set* 0 Used internally by RMF post processor 1-15 Reserved
32	20	SMF76RLS	4	EBCDIC	CVTRELNO	Operating system release number and level, in the form nnll
36	24	SMF76CYC	4	packed	internal	Sampling cycle length, in the form 000ttttF, where F is the sign (taken from CYCLE option). The range of values is 0.050 to 9.999 seconds.
40	28	SMF76MVS	8	EBCDIC	CVTPRODN	MVS software level (consists of an acronym and the version, release, and modification level numbers)
48	30	SMF76IML	1	binary	CSDIOML	Indicates the type of processor complex on which data measurements were taken *Value* *Meaning* 01 308x or 908x processor 02 4381 processor 03 3090 processor
49	31	SMF76PRF	1			X'80' indicates system has extended storage
50	32		2			Reserved
Trace Control Section:						
+0	+0	SMF76NUM	2	binary	internal	Number of sample sets (lines of data) in the trace
+2	+2	SMF76RV4	2	binary		Reserved
Trace Data Section:						
+0	+0	SMF76NAM	8	EBCDIC	MFTRTRAC	Field name
+8	+8	SMF76OPT	1	binary	ERBMFETR	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

Offsets		Name	Length	Format	Source	Description
Trace Data Section: (continued)						
+10	+A	SMF76SLN	1	binary		Length of a set
+11	+B	SMF76DLN	1	binary	ERBMFETR	Length of a field sampled
+12	+C	SMF76SSS	2	binary	ERBMFETR	Standard samples per set used
+14	+E	SMF76SSL	2	binary		Samples per set
+16	+10	SMF76MIN	4	binary	ERBMFETR	Minimum value during interval
+20	+14	SMF76MAX	4	binary	ERBMFETR	Maximum value during interval
+24	+18	SMF76AVG	8	binary	ERBMFETR	Accumulated value used to compute the average
+32	+20	SMF76STD	12	binary	ERBMFETR	Sum of squares (used to compute standard deviation)
+44	+2C	SMF76ENV	4	binary	ERBMFETR	End value of field
Variable Trace Data Section:						
+0	+0	SMF76C or SMF76D	4	binary	ERBMFETR	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

Field Size	Size of Array Element in Bytes	Length of data in bytes and relative position in array				
		Min. Value	Sum of Values	Max. Value	Sum of Sq. Vals	End Value
halfword	2	2	6	2	8	2
fullword	4	4	8	4	12	4

Record Type 77 (4D) – Enqueue Activity

Record type 77 is written by ERBMFDEQ at each measurement interval and when the session is terminated. It contains data that identifies the resources for which ENQ/DEQ contention occurred during the measurement interval and data that describes any contention that occurred. Its length is 106 bytes, plus 156 bytes for each resource for which data was gathered.

For a description of the mapping macro, see record type 70.

The format is:

Offsets		Name	Length	Format	Source	Description
Record Type 77 (4D) – Enqueue Activity						
0	0	SMF77LEN	2	binary	internal	Record length
2	2	SMF77SEG	2	binary	internal	Segment descriptor
4	4	SMF77FLG	1	binary	SMFWTM service routine	System indicator *Bit* *Meaning When Set* 0 A subsystem ID follows the standard header; record is in relocatable format 1-4 Reserved 5 MVS/XA 6 VS2 7 Reserved
5	5	SMF77RTY	1	binary	internal	Record type: 77 (X'4D')
6	6	SMF77TME	4	binary	SMFWTM saervice routine	Time, in hundredths of a second record was moved to SMF buffer
10	A	SMF77DTE	4	packed	SMFWTM service routine	Date record was moved to SMF buffer, in the form 00yydddF, where F is the sign
14	E	SMF77SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF77SSI	4	EBCDIC	internal	Subsystem identification ('RMF')
22	16	SMF77STY	2	binary	internal	Record subtype=1
24	18	SMF77TRN	2	binary	internal	Number of triplets in this record [1]
26	1A		2	binary		Reserved
28	1C	SMF77PRS	4	binary	internal	Offset to RMF product section
32	20	SMF77PRL	2	binary	internal	Length of RMF product section
34	22	SMF77PRN	2	binary	internal	Number of RMF product section
36	24	SMF77EQS	4	binary	internal	Offset to enqueue control section
40	28	SMF77EQL	2	binary	internal	Length of enqueue control section
42	2A	SMF77EQN	2	binary	internal	Number of enqueue control sections
44	2C	SMF77EDS	4	binary	internal	Offset to enqueue data section
48	30	SMF77EDL	2	binary	internal	Length of enqueue data section
50	32	SMF77EDN	2	binary	internal	Number of enqueue data sections
RMF Product Section:						
0	0	SMF77MFV	2	EBCDIC/ packed	STSCMF1V (in STSCT)	RMF version number. For more information on the RMF version number, see the RMF version number description in record type 70 and the ***Resource Measurement Facility (RMF) Reference and User's Guide.***
2	2	SMF77PRD	8	EBCDIC	internal	Product name
10	A	SMD77IST	4	packed	internal	Time RMF measurement interval started, in the form 0hhmmssF, where F is the sign
14	E	SMF77DAT	4	packed	internal	Date RMF measurement interval started, in the form 00yydddF, where F is the sign

[1] A triplet is a set of offset/length/number values that defines a section of the record.

Offsets		Name	Length	Format	Source	Description
RMF Product Section (continued):						
+9	+9	SMF76OP1	1	binary	ERBMFETR	Trace options *Bit* *Meaning When Set* 0 LPB trace requested 1 LPB trace request ended
18	12	SMF77INT	4	packed	internal	Duration of RMF measurement interval, in the form mmsstttF, where F is the sign. (The end of the measurement interval is the sum of the recorded start time and this field.)
22	16	SMF77MFL	2	binary	internal	Record maintenance indication
24	18	SMF77SAM	4	binary	internal	Number of RMF samples
28	1C	SMF77RV2	2	binary		Reserved
30	1E	SMF77FLA	2	binary	internal	Flags *Bit* *Meaning When Set* 0 Used internally by RMF post processor 1-15 Reserved
32	20	SMF77RLS	4	EBCDIC	CVTRELNO	Operating system release number and level, in form nnll
36	24	SMF77CYC	4	packed	internal	Sampling cycle length, in the form 000ttttF, where F is the sign (taken from CYCLE option). The range of values is 0.050 to 9.999 seconds.
40	28	SMF77MVS	8	EBCDIC	CVTPRODN	MVS software level (consists of an acronym and the version, release, and modification level numbers)
48	30	SMF77IML	1	binary	CSDIOML	Indicates the type of processor complex on which data measurements were taken *Value* *Meaning* 01 308x or 908x processor 02 4381 processor 03 3090 processor
49	31	SMF77PRF	1			X'80' indicates system has extended storage
+50	32		2			Reserved
Enqueue Control Section:						
+0	+0	SMF77FG1	1	binary	internal	Enqueue status indicator *Bit* *Meaning* 0 On – enqueue summary table full 1 On – specified resource had no contention 2 On – enqueue had bad CPU clock 3 On – enqueue event processing abend 4 On – detail data requested Off – summary data requested 5-7 Reserved
+1	+1	SMF77RF2	1			Reserved

Offsets		Name	Length	Format	Source	Description
Enqueue Data Section:						
+0	+0	SMF77QNM	8	EBCDIC	RIBQNAME	Major name of resource
+8	+8	SMF77RNM	44	EBCDIC	RIBRNAME	Minor name of resource
+52	+34	SMF77WTM	4	binary	internal	Minimum resource contention time, in 1024-microsecond units
+56	+38	SMF77WTX	4	binary	internal	Maximum resource contention time, in 1024-microsecond units
+60	+3C	SMF77WTT	4	binary	internal	Total resource contention time, in 1024-microsecond units
+64	+40	SMF77RV3	2	binary	internal	Reserved
+66	+42	SMF77QL1	2	binary	RIBNTWE + RIBNTWS	Counter for queue length of 1
+68	+44	SMF77QL2	2	binary	RIBNTWE + RIBNTWS	Counter for queue length of 2
+70	+46	SMF77QL3	2	binary	RIBNTWE + RIBNTWS	Counter for queue length of 3
+72	+48	SMF77QL4	2	binary	RIBNTWE + RIBNTWS	Counter for queue length of 4 or more
+74	+4A	SMF77QLT	2	binary	RIBNTWE + RIBNTWS	Total number of waiting requests during the measurement interval
+76	+4C	SMF77EXM	2	binary	RIBNTWE	Minimum number of exclusive requests waiting
+78	+4E	SMF77EXX	2	binary	RIBNTWE	Maximum number of exclusive requests waiting
+80	+50	SMF77SHM	2	binary	RIBNTWS	Minimum number of share requests waiting
+82	+52	SMF77SHX	2	binary	RIBNTWS	Maximum number of share requests waiting
+84	+54	SMF77EVT	2	binary	internal	Total number of contention events that occurred during the measurement interval
+86	+56	SMF77RLN	1	binary	RIBRNMLN	Minor name length
+87	+57	SMF77DFG	1	binary	internal	Current resource detail indicator *Bit* *Meaning When Set* 0 On — 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 On — resource is global Off — resource is local 6-7 Reserved
+88	+58	SMF77DOW	2	binary	internal	Number of owners using the resource at maximum contention
+90	+5A	SMF77DWR	2	binary	internal	Number of jobs waiting for the resource at maximum contention
+92	+5C	SMF77DO1	8	EBCDIC	RIBEJBNM	Job name 1 of resource owner at maximum contention
+100	+64	SMF77DO2	8	EBCDIC	RIBEJBNM	Job name 2 of resource owner at maximum contention
+108	+6C	SMF77DW1	8	EBCDIC	RIBEJBNM	Job name 1 waiting for the resource at maximum contention
+116	+74	SMF77DW2	8	EBCDIC	RIBEJBNM	Job name 2 waiting for the resource at maximum contention
+124	+7C	SMF77SY1	8	EBCDIC	RIBESYSN	System identifier of job name 1 (resource owner at maximum contention)
+132	+84	SMF77SY2	8	EBCDIC	RIBESYSN	System identifier of job name 2 (resource owner at maximum contention)
+140	+8C	SMF77SY3	8	EBCDIC	RIBESYSN	System identifier of job name 1 (waiting for the resource at maximum contention)
+148	+94	SMF77SY4	8	EBCDIC	RIBESYSN	System identifier of job name 2 (waiting for the resource at maximum contention)

Record Type 78 (4E) Monitor I Activity

Record type 78 has three sub-types and is written by ERBMFDOQ (sub-type 1), ERBMFDVP (sub-type 2) or ERBMFDGQ (sub-type 3) during a Monitor I session. Sub-type 1 and sub-type 3 report I/O queuing activity and contain an entry for each logical control unit that had any activity during the interval. Sub-type 2 reports virtual storage activity and contains a common storage data section and possibly one or more private area data sections.

The record has a standard SMF header and product section that are common to both sub-types. The length of record type 78 depends on the sub-type. For sub-type 1 the length is 108 bytes plus 56-92 bytes for each logical control unit. For sub-type 2, the minimum length is 1836 bytes if no private area data is included. Otherwise, the length is 1836 bytes plus at least 392 bytes for each private area that is monitored. For sub-type 3, written only when RMF is measuring data on a 3090 processor, the length is 108 bytes plus 60-96 bytes for each logical control unit.

For a description of the mapping macro, see record type 70.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF78LEN	2	binary	internal	Record length
2	2	SMF78SEG	2	binary	internal	Segment descriptor
4	4	SMF78FLG	1	binary	SMFWTM service routine	System indicator *Bit* *Meaning When Set* 0 A subsystem ID follows standard header; record is in relocatable format 1-4 Reserved 5 MVS/XA 6 VS2 7 Reserved
5	5	SMF78RTY	1	binary	internal	Record type 78 (X'4E')
6	6	SMF78TME	4	binary	SMFWTM service routine	Time in hundreths of a second when record was moved to SMF buffer
10	A	SMF78DTE	4	packed	SMDWTM service routine	Date record was moved to SMF buffer, in the form 00yydddF where F is the sign
14	E	SMF78SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF78SSI	4	EBCDIC	internal	Subsystem identification ('RMF')
22	16	SMF78STY	2	binary	internal	Subtype
24	18	SMF78TRN	2	binary	internal	Number of triplets in record [1]
26	1A		2	binary		Reserved
28	1C	SMF78PRS	4	binary	internal	Offset to RMF product section
32	20	SMF78PRL	2	binary	internal	Length of RMF product section
34	22	SMF78PRN	2	binary	internal	Number of RMF product sections
36	24	SMF78DCS	4	binary	internal	Offset to data control section
40	28	SMF78DCL	2	binary	internal	Length of data control section
42	2A	SMF78DCN	2	binary	internal	Number of data control sections
44	2C	SMF78ASS	4	binary	internal	Offset to data section
48	30	SMF78ASL	2	binary	internal	Length of data section
50	32	SMF78ASN	2	binary	internal	Number of data sections

[1] A triplet is a set of offset/length/number values that defines a section of the record.

Offsets		Name	Length	Format	Source	Description
The following three fields apply only to sub-type 2:						
+52	+34	SMF78SPS	4	binary	internal	Offset to private area subpool section
+56	+38	SMF78SPL	2	binary	internal	Length of private area subpool section
+58	+3A	SMF78SPN	2	binary	internal	Number of private area subpool sections
The following three fields apply only to sub-type 3, written when RMF is running on a 3090 processor.						
+52	+34	SMF78QDS	4	binary	internal	Offset to IOQ global section.
+56	+38	SMF78QDL	2	binary	internal	Length of IOQ global section
+58	+3A	SMF78QDN	2	binary	internal	Number of IOQ global section
RMF Product Section:						
0	0	SMF78MFV	2	EBCDIC/ packed	STSCMF1V (in STSCT)	RMF version number. For more information on the version number, see the RMF version number description in record type 70 and the ***Resource Measurement Facility (RMF) Reference and User's Guide.***
2	2	SMF78PRD	8	EBCDIC	internal	Product name
10	A	SMF78IST	4	packed	internal	Time RMF Monitor I measurement interval started, in the form 0hhmmssF, where F is the sign
14	E	SMF78DAT	4	packed	internal	Date RMF Monitor I measurement interval started, in the form 00yydddF, where F is the sign
18	12	SMF78INT	4	packed	internal	Duration of RMF Monitor I measurement interval, in the form mmsstttF where F is the sign. (The end of the measurement interval is the sum of the recorded start time and this field.)
22	16	SMF78MFL	2	binary	internal	Record Maintenance Indication
24	18	SMF78SAM	4	binary	internal	Number of RMF samples. This field is used to calculate the averages for the common storage data section fields.
28	1C	SMF78RV2	2	binary		Reserved
30	1E	SMF78FLA	2	binary	internal	Flags *Bit* *Meaning When Set* 0 Used internally by RMF post processor 1-15 Reserved
32	20	SMF78RLS	4	EBCDIC	CVTRELNO	Operating system release number and level, in the form nnll
36	24	SMF78CYC	4	packed	internal	Sampling cycle length, in the form 000ttttF, where F is the sign (taken from CYCLE option). The range of values is 0.050 to 9.999 seconds.
40	28	SMF78MVS	8	EBCDIC	CVTPRODN	MVS software level (consists of an acronym and the version, release, and modification level numbers)
48	30	SMF78IML	1	binary	CSDIOML	Indicates the type of processor complex on which data measurements were taken *Value* *Meaning* 01 308x or 908x processor 02 4381 processor 03 3090 processor
49	31	SMF78PRF	1	binary	internal	X'80' indicates system has extended storage
50	32		2			Reserved

Offsets		Name	Length	Format	Source	Description
Sub-type 1 I/O Queuing Control Section for the 308x, 908x, and 4381 processors: (one per LCU, described by triplet SMF78DCS)						
+0	+0	R781ID1	1	binary	internal	Logical control unit identifier
+2	+2	R781NTR	2	binary	internal	Number of triplets following
+4	+4	R781CPDS	4	binary	internal	Offset to I/O queuing configuration data section
+8	+8	R781CPDL	2	binary	internal	Length of I/O queuing configuration data section
+10	+A	R781CPDN	2	binary	internal	Number of I/O queuing configuration data sections for this logical control unit
Sub-type 1 I/O Queuing Configuration Data Section for the 308x, 908x and 4381 processors: (one per channel path, described by triplet R781CPDS)						
+0	+0	R781CPID	1	binary	IOCDS	Channel path identifier
+1	+1	R781CPST	1	binary		Channel path status
						Bit *Meaning When Set*
					ICHCONFG	0 ON = channel path installed
					ICHONLIN	1 ON = channel path online
					ERBMFEAR	2 ON = channel path varied
					(module)	3 ON = channel path offline to all devices of the LCU
						4 ON = channel path connection to devices of the LCU altered by VARY PATH during interval
						5-7 Reserved
+2	+2	R781CUN	2	binary	IOCDS	Number of control units attached
+4	+4	R781CU1	2	binary	IOCDS	First control unit attached
+6	+6	R781CU2	2	binary	IOCDS	Second control unit attached
+8	+8	R781CU3	2	binary	IOCDS	Third control unit attached
+10	+A	R781CU4	2	binary	IOCDS	Fourth control unit attached

Offsets		Name	Length	Format	Source	Description
Sub-type 1 I/O Queuing Data Section for the 308x, 908x, and 4381 processors: (one per LCU, described by triplet SMF78ASS)						
+0	+0		1			Reserved
+1	+1	R781DST	1	binary		Data Status
						Bit *Meaning When Set*
					CMCTPAA	0 No STCPS data available
					IOCDS + UCB'S	1 No UCB found - normal if IOCDS defines more devices than SYSGEN
						2 No hardware measurements available
						3-7 Reserved
+2	+2	R781ICT	2	binary	internal	Count of invalid samples
+4	+4	R781ABY	4	binary		Number of samples when all channel paths in the logical control unit were busy
+8	+8	R781TIS	4	binary	SCHIB	Total number of initial selection attempts
+12	+C	R781SIS	4	binary	SCHIB	Total number of successful selection attempts
+16	+10	R781CUB	4	binary	SCHIB	Total number of unsuccessful selection attempts because control unit was busy
+20	+14	R781DVB	4	binary	SCHIB	Total number unsuccessful selection attempts because device was busy
+24	+18	R781QUE	4	binary	SCHIB	In a 308x/908x processor complex, total number of requests queued for the logical control unit (accumulated at initial selection time)
+28	+1C	R781ID2	2	binary	IOCDS	Logical control unit identifier
+30	+1E		2			Reserved
Sub-type 2 (Virtual Storage) Common Storage Data Section: (described by triplet SMF78DCS)						
+0	+0	R782PA	4	binary	4096	Private area address below 16 megabytes
+4	+4	R782PS	4	binary	GDAPVTSZ-4096	Private area size below 16 megabytes
+8	+8	R782EPA	4	binary	GDAEPVT	Private area address above 16 megabytes
+12	+C	R782EPS	4	binary	GDAEPVTS	Private area size above 16 megabytes
+16	+10	R782CA	4	binary	GDACSA	CSA address below 16 megabytes
+20	+14	R782CS	4	binary	GDACSASZ	CSA size below 16 megabytes
+24	+18	R782ECA	4	binary	GDAECSA	CSA address above 16 megabytes
+28	+1C	R782ECS	4	binary	GDAECSAS	CSA size above 16 megabytes
+32	+20	R782BA	4	binary		Reserved
+36	+24	R782BS	4	binary		Reserved
+40	+28	R782MLA	4	binary	CVTMLPAS	MLPA address below 16 megabytes
+44	+2C	R782MLS	4	binary	CVTMLPAE+1 −CVTMLPAS	MLPA size below 16 megabytes
+48	+30	R782EMLA	4	binary	CVTEMLPS	MLPA address above 16 megabytes
+52	+34	R782EMLS	4	binary	CVTEMLPE+1 −CVTEMLPS	MLPA size above 16 megabytes
+56	+38	R782FLA	4	binary	CVTFLPAS	FLPA address below 16 megabytes
+60	+3C	R782FLS	4	binary	CVTFLPAE+1 −CVTFLPAS	FLPA size below 16 megabytes
+64	+40	R782EFLA	4	binary	CVTEFLPS	FLPA address above 16 megabytes
+68	+44	R782EFLS	4	binary	CVTEFLPE+1 −CVTEFLPS	FLPA size above 16 megabytes
+72	+48	R782PLA	4	binary	CVTPLPAS	PLPA address below 16 megabytes
+76	+4C	R782PLS	4	binary	CVTPLPAE+1 −CVTPLPAS	PLPA size below 16 megabytes

Offsets		Name	Length	Format	Source	Description
Sub-type 2 (Virtual Storage) Common Storage Data Section: (described by triplet SMF78DCS) (continued)						
+80	+50	R782ELPA	4	binary	CVTEPLPS	PLPA address above 16 megabytes
+84	+54	R782ELPS	4	binary	CVTEPLPE+1 −CVTEPLPS	PLPA size above 16 megabytes
+88	+58	R782SA	4	binary	GDASQA	SQA address below 16 megabytes
+92	+5C	R782SS	4	binary	GDASQASZ	SQA size below 16 megabytes
+96	+60	R782ESA	4	binary	GDAESQA	SQA address above 16 megabytes
+100	+64	R782ESS	4	binary	GDAESQAS	SQA size above 16 megabytes
+104	+68	R782NA	4	binary	CVTRWNS	Nucleus address below 16 megabytes
+108	+6C	R782NS	4	binary	(CVTRWNE+1 −CVTRWNS)+ (16 meg+1 −CVTRONS)	Nucleus size below 16 megabytes
+112	+70	R782ENA	4	binary	16 meg (16777216)	Nucleus address above 16 megabytes
+116	+74	R782ENS	4	binary	(CVTERWNE+1 −CVTERWNS)+ (CVTRONE+1 −16 meg)	Nucleus size above 16 megabytes
+120	+78	R782NL	4	binary	If LPDE present, sum of LPDEXTLN for each CDE chained from CVTQLPAQ	PLPA space redundant with MLPA/FLPA below 16 megabytes
+124	+7C	R782ENL	4	binary	If LPDE present, sum of LPDEXTLN for each CDE chained from CVTQLPAQ	PLPA space redundant with MLPA/FLPA above 16 megabytes
+128	+80	R782LPAI	4	binary	R782PLS− size of LPDEs− sum of LPDEXTLN	Intermodule space in PLPA below 16 megabytes
+132	+84	R782ELPI	4	binary	R782ELPS− sum of LPDEXTLN	Intermodule space in PLPA above 16 megabytes
+136	+88	R782MR	4	binary	GDAPVTSZ− 4096−TCTHWM (for RMF address space at START time)	Maximum possible user region below 16 megabytes
+140	+8C	R782EMR	4	binary	GDAEPVTS− TCTEHWM (for RMF address space at START time)	Maximum possible user region above 16 megabytes
+144	+90	R782SQAU	40	See Note 1	VSMLIST SP=SQA, SPACE=FREE	SQA usage both above and below 16 megabytes
+184	+B8	R782CSAU	40	See Note 1	VSMLIST SP=CSA, SPACE=ALLOC	CSA usage both above and below 16 megabytes

Offsets		Name	Length	Format	Source	Description
Sub-type 2 (Virtual Storage) Common Storage Data Section: (described by triplet SMF78DCS) (continued)						
+224	+E0	R782CSAK	360 (40 bytes for each of 9 keys)	See Note 1	VSMLIST SP=CSA, SPACE=ALLOC	CSA used both above and below 16 megabytes by subpool key[2]
+584	+248	R782CSAF	40	See Note 1	VSMLIST SP=CSA, SPACE=UNALLOC	Free CSA both above and below 16 megabytes
+624	+270	R782CSLF	40	See Note 1	VSMLIST SP=CSA, SPACE=UNALLOC	Largest free block of CSA both above and below 16 megabytes
+664	+298	R782CSAL	40	See Note 1	VSMLIST SP=CSA, SPACE=ALLOC and GDACSA +GDACSASZ and GDAECSA +GDAECSAS	CSA allocated area size both above and below 16 megabytes
+704	+2C0	R782SQAF	40	See Note 1	VSMLIST SP=SQA, SPACE=FREE	Free SQA both above and below 16 megabytes
+744	+2E8	R782SQLF	40	See Note 1	VSMLIST SP=SQA, SPACE=FREE	Largest free block of SQA both above and below 16 megabytes
+784	+310	R782SQAL	40	See Note 1	VSMLIST SP=SQA, SPACE=FREE and GDASQASZ and GDAESQAS	SQA allocated area size both above and below 16 megabytes
+824	+338	R782SQEX	40	See Note 1	VSMLIST SP=SQA, SPACE=FREE	SQA expansion into CSA both above and below 16 megabytes
+864	+360	R782227K	200 (20 bytes for each of 10 keys)	See Note 1	VSMLIST SP=CSA, SPACE=ALLOC	CSA subpool 227 (below 16 megabytes) by key[3]
+1064	+428	R782228K	200 (20 bytes for each of 10 keys)	See Note 1	VSMLIST SP=CSA, SPACE=ALLOC	CSA subpool 228 (below 16 megabytes) by key[3]

[2]The key data appears in the following order: 0, 1, 2, 3, 4, 5, 6, 7, 8-F.

[3]The key data appears in the following order: 0, 1, 2, 3, 4, 5, 6, 7, 8-F, ALL.

Offsets		Name	Length	Format	Source	Description
Sub-type 2 (Virtual Storage) Common Storage Data Section: (described by triplet SMF78DCS) (continued)						
+1264	+4F0	R782231K	200 (20 bytes for each of 10 keys)	See Note 1	VSMLIST SP=CSA, SPACE=ALLOC	CSA subpool 231 (below 16 megabytes) by key[3]
+1464	+568	R782241K	200 (20 bytes for each of 10 keys)	See Note 1	VSMLIST SP=CSA, SPACE=ALLOC	CSA subpool 241 (below 16 megabytes) by key[3]
+1664	+680	R782226	20	See Note 1	VSMLIST SP=SQA, SPACE=FREE	SQA subpool 226 (below 16 megabytes)
+1684	+694	R782239	20	See Note 1	VSMLIST SP=SQA, SPACE=FREE	SQA subpool 239 (below 16 megabytes)
+1704	+6A8	R782245	20	See Note 1	VSMLIST SP=SQA, SPACE=FREE	SQA subpool 245 (below 16 megabytes)
Sub-type 2 (Virtual Storage) Private Area Data Section: (described by triplet SMF78ASS)						
+0	+0	R782JOBN	8	EBCDIC	ASCBJBNS or ASCBJBNI	Name of job being monitored
+8	+8	R782RDTM	4	binary	JMRENTRY	Reader start time
+12	+C	R782RDDT	4	packed	JMREDATE	Reader start date
+16	+10	R782SUBI	2	binary	internal	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	internal	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	TIOCSTEP	Name of step active when monitoring began
+28	+1C	R782PGMN	8	EBCDIC	JSCBPGMN	Program name of job being monitored
+36	+24	R782FLGS	2	binary	internal	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 invalid because RMF terminated abnormally while sampling 4-15 Reserved
+38	+26	R782RSV	2	binary		Reserved
+40	+28	R782SAMP	4	binary	internal	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	LDAREGRQ	Region requested by JCL (in bytes)
+48	+30	R782RGAB	4	binary	LDAVVRG	Region below 16 megabytes assigned by exits (in bytes)
+52	+34	R782RGAA	4	binary	LDAEVVRG	Region above 16 megabytes assigned by exits (in bytes)
+56	+38	R782GMLB	4	binary	LDASTRTA+ LDALIMIT	GETMAIN limit below 16 megabytes (in bytes)
+60	+3C	R782GMLA	4	binary	GDAEPVT+ LDAELIM	GETMAIN limit above 16 megabytes (in bytes)

[3]The key data appears in the following order: 0, 1, 2, 3, 4, 5, 6, 7, 8-F, ALL.

Offsets		Name	Length	Format	Source	Description
Sub-type 2 (Virtual Storage) Private Area Data Section: (described by triplet SMF78ASS) (continued)						
+64	+40	R782URAB	4	binary	LDASTRTA	User region address below 16 megabytes
+68	+44	R782URAA	4	binary	GDAEPVT	User region address above 16 megabytes
+72	+48	R782LSFP	40	See Note 1	VSMLIST SP=PVT, SPACE=UNALLOC	LSQA/SWA/229/230 free pages both above and below 16 megabytes
+112	+70	R782LSFB	40	See Note 1	VSMLIST SP=PVT, SPACE=UNALLOC	LSQA/SWA/229/230 largest free block both above and below 16 megabytes
+152	+98	R782LSAL	40	See Note 1	For below: GDAPVT+ GDAPVTSZ– (LDACRGTP+ size of free block directly above LDACRGTP from VSMLIST SP=PVT, SPACE= UNALLOC) For above: GDAEPVT (LDAERGTP block directly above LDAERGTP from VSMLIST SP=PVT, SPACE= UNALLOC)	LSQA/SWA/229/230 allocated area size both above and below 16 megabytes
+192	+C0	R782LSPA	40	See Note 1	For below: LDAHIAL For above: LDAEHIAL	LSQA/SWA/229/230 allocated pages both above and below 16 megabytes
+232	+E8	R782USFP	40	See Note 1	VSMLIST SP=PVT, SPACE=UNALLOC	User region free pages both above and below 16 megabytes
+272	+110	R782USFB	40	See Note 1	VSMLIST SP=PVT, SPACE=UNALLOC	User region largest free block both above and below 16 megabytes
+312	+138	R782USAL	40	See Note 1	LDACRGTP– LDASTRTA LDAERGTP– GDAEPVT	User region allocated area size below 16 megabytes User region allocated area size above 16 megabytes
+352	+160	R782USPA	40	See Note 1	LDALOAL LDAELOAL	User region pages allocated below 16 megabytes User region pages allocated above 16 megabytes
Sub-type 2 (Virtual Storage) Private Area Subpool Section: (described by triplet SMF78SPS)						
+0	+0	R782SPN	2	binary	VSMLIST SP=PVT, SP=LSQA, SPACE=ALLOC	Subpool number[4]
+2	+2		2			Reserved
+4	+4	R782SPD	20	See Note 1	VSMLIST SP=PVT, SP=LSQA, SPACE=ALLOC	Subpool data

[4]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 R782SUBI and R782SUBN fields in the private area data section.

Note 1:
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.

Offsets		Name	Length	Format	Source	Description
Data collected below 16 megabytes:						
+0	+0	VSDBMIN	4	binary		Minimum value for below 16 megabytes
+4	+4	VSDBNTME	4	binary		Time stamp for minimum*
+8	+8	VSDBMAX	4	binary		Maximum value for below 16 megabytes
+12	+C	VSDBXTME	4	binary		Time stamp for maximum*
+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:						
+20	+14	VSDAMIN	4	binary		Minimum value for above 16 megabytes
+24	+18	VSDANTME	4	binary		Time stamp for minimum*
+28	+1C	VSDAMAX	4	binary		Maximum value for above 16 megabytes
+32	+20	VSDAXTME	4	binary		Time stamp for maximum*
+36	+24	VSDATOTL	4	single precision floating point		Total for all samples above 16 megabytes (used to calculate average).

*The format of a time stamp is the high order word of the TOD clock adjusted to local time by adding CVTTZ.
The time stamp is in units of 1.048576 seconds.

Offsets		Name	Length	Format	Source	Description
Sub-type 3 IOP Initiative Queue Control Section for the 3090 processor: (described by triplet SMF78QDS).						
+0	+0	R783GFLG	1	binary	internal	IOQ global flags *Bit Meaning* 0 ON = invalid data because channel measurement facility failed 1 ON = DIAGNOSE interface failed 2-7 Reserved
+1	+1					Reserved
+2	+2	R783GNTR	2	binary	internal	Number of triplets following
+4	+4	R783GIDS	4	binary	internal	Offset to IOP initiative queue data section
+8	+8	R783GIDL	2	binary	internal	Length of IOP initiative queue data section
+10	+A	R783GIDN	2	binary	internal	Number of IOP initiative queue data sections
+12	+C	R783GSAM	4	binary	CMPTSAMP	CMPT sample count

Offsets		Name	Length	Format	Source	Description
Sub-type 3 IOP Initiative Queue Data Section for the 3090 processor: (one per initiative queue described by triplet R783GIDS)						
+0	+0	R783IQID	2	EBCDIC	HSA(DIAGNOSE)	IOP initiative queue identifier
+2	+2	R783IFLG	1	binary	DIAGNOSE	IOP Flags *Bit Meaning* 0 ON = IOP is installed 1-7 Reserved
+3	+3		1			Reserved
+4	+4	R783IQSM	4	binary	HSA	Sum of the number of requests enqueued on the IOP initiative queue. This value represents the total length of the queue and is used to calculate the average queue length for the IOP.
+8	+8	R783IQCT	4	binary	HSA	Number of IOP queue entries. This value represents the current queue length or the number of times an element was added to the queue. It is used in calculating the average queue length for the IOP.
Sub-type 3 I/O Queuing Control Section for the 3090 processor: (one per LCU, described by triplet SMF78DCS)						
+0	+0	R783ID1	2	binary	IOCDS	Logical control unit identifier
+2	+2	R783NTR	2	binary	internal	Number of triplets following
+4	+4	R783CPDS	4	binary	internal	Offset to I/O queuing configuration data section
+8	+8	R783CPDL	2	binary	internal	Length of I/O queuing configuration data section
+10	+A	R783CPDN	2	binary	internal	Number of I/O queuing configuration data sections
Sub-type 3 I/O Queuing Configuration Data Section for the 3090 processor: (one per channel path, described by triplet R783CPDS)						
+0	+0	R783CPID	1	binary	IOCDS	Channel path identifier
+1	+1	R783CPST	1	binary	 ICHCONFG ICHONLIN ERBMFEAR	Channel path status *Bit Meaning When Set* 0 ON = channel path installed 1 ON = channel path online 2 ON = channel path varied 3 ON = channel path offline to all devices of the LCU 4 ON = channel path connection to all devices of the LCU altered by VARY PATH command during interval 5 ON = measured channel path data invalid
+2	+2	R783CUN	2	binary	IOCDS	Number of control units attached
+4	+4	R783CU1	2	EBCDIC	IOCDS	First control unit attached
+6	+6	R783CU2	2	EBCDIC	IOCDS	Second control unit attached
+8	+8	R783CU3	2	EBCDIC	IOCDS	Third control unit attached
+10	+A	R783CU4	2	EBCDIC	IOCDS	Fourth control unit attached
+12	+C	R783CUB	4	binary	HSA	Number of times control unit was busy
+16	+10	R783PT	4	binary	HSA	Number of times channel path was taken
+20	+14	R783PB	4	binary	CPMTBUSY	Number of samples when this channel path (CHPID) was busy. Used with CMPT sample count, R783GSAM.
Sub-type 3 I/O Queuing Data Section for the 3090 processor: (one per LCU, described by triplet SMF78ASS)						
+0	+0	R783ID2	2	binary	IOCDS	Logical control unit identifier
+2	+2	R783DST	1	binary	ENF events	Data Status: *Bit Meaning* 0 ON = No hardware measurements available 1-7 Reserved
+3	+3		1			Reserved
+4	+4	R783QSM	4	binary	HSA	Sum of total queue length of CU-HDR
+8	+8	R783QCT	4	binary	HSA	Number of entries on CU-HDR

Record Type 79 (4F) – Monitor II Activity

Record type 79 is written during a Monitor II background session when feedback is requested in the form of SMF records. It is written by ERBMFBPC at each measurement interval and when the session is terminated. It contains a section that is identical for all Monitor II reports and a sub-type section that is unique for each report. The length of the record is 112 bytes plus 92 bytes for the Monitor II section. The sub-types are:

- sub-type 1 – contains information that describes address space state data and address space state data by jobname; for each address space identifier included, the length is 52 bytes.
- sub-type 2 – contains information that describes address space resource data and address space resource data by jobname; for each address space identifier included, the length is 112 bytes.
- sub-type 3 – contains information that describes real storage/processor/SRM activity; the length is 38 bytes.
- sub-type 4 – contains information that describes paging activity; the length is 68 bytes
- sub-type 5 – contains information that describes address space SRM data and address space SRM data by jobname; the length is 60 bytes for each address space identifier included.
- sub-type 6 – contains information that describes reserve data. The length is 84 bytes
- sub-type 7 – contains information that describes enqueue contention data. The length is 89 bytes.
- sub-type 8 – contains information that describes transaction activity; the length is 51 bytes for each performance group period included.
- sub-type 9 – contains information that describes device activity. The length depends on the number of devices.
- sub-type 10 – contains information that describes domain activity. The length is 52 bytes.
- sub-type 11 – contains information that describes paging and swap dataset activity. The length is variable.
- sub-type 12 – contains information that describes channel path activity. The length is variable.
- sub-type 13 – contains information that describes I/O queuing activity by logical control unit for the 308x, 908x, and 4381 processors. The length is variable.
- sub-type 14 – contains information that describes I/O queuing activity by logical control unit for 3090 processors. The length is variable.

For a description of the mapping macro, see record type 70.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF79LEN	2	binary	internal	Record length
2	2	SMF79SEG	2	binary	internal	Segment descriptor
4	4	SMG79FLG	1	binary	SMFWTM service routine	System indicator *Bit* *Meaning When Set* 0 Subsystem ID following standard header, relocatable record format 1-4 Reserved 5 MVS/XA 6 VS2
5	5	SMF79RTY	1	binary	internal	Record type: 79 (X'4F')
6	6	SMF79TME	4	binary	SMFWTM service routine	Time, in hundredths, of a second when record was moved to SMF buffer
10	A	SMF79DTE	4	packed	SMFWTM service routine	Data Record was moved to SMF buffer, in the form 00yydddF where F is the sign
14	E	SMF79SID	4	EBCDIC	SMCASID	System identification (taken from SID parameter)
18	12	SMF79SSI	4	EBCDIC	internal	Sub-system identification ('RMF')
22	16	SMF79STY	2	binary	internal	Record subtype
24	18	SMF79TRN	2	binary	internal	Number of triplets in this record [1]
26	1A		2	binary		Reserved
28	1C	SMF79PRS	4	binary	internal	Offset to RMF product section
32	20	SMF79PRL	2	binary	internal	Length of RMF product section
34	22	SMF79PRN	2	binary	internal	Number of RMF product sections
36	24	SMF79MCS	4	binary	internal	Offset to Monitor II control section
40	28	SMF79MCL	2	binary	internal	Length of Monitor II control section
42	2A	SMF79MCN	2	binary	internal	Number of Monitor II control sections
44	2C	SMF79ASS	4	binary	internal	Offset to data section
48	30	SMF79ASL	2	binary	internal	Length of data section
50	32	SMF79ASN	2	binary	internal	Number of data sections
(The following 6 fields are not present for all subtypes.)						
52	34	SMF79DCS	4	binary	internal	Offset to data control section or configuration section
56	38	SMF79DCL	2	binary	internal	Length of data control section or configuration section
58	3A	SMF79DCN	2	binary	internal	Number of data control section or configuration section
60	3C	SMF79QSS	4	binary	internal	Offset to IOQ global section
64	40	SMF79QSL	2	binary	internal	Length of IOQ global section
66	42	SMF79QSN	2	binary	internal	Number of IOQ global sections
RMF Product Section:						
0	0	SMF79MFV	2	EBCDIC/ packed	internal	RMF version number. For more information on the version number, see the RMF version number description in record type 70 and the *Resource Measurement Facility (RMF) Reference and User's Guide.*
2	2	SMF79PRD	8	EBCDIC	internal	Product Name
10	A	SMF79IST	4	packed	internal	Time RMF Monitor 1 measurement interval started, in the form 0hhmmssF, where F is the sign
14	E	SMF79DAT	4	packed	internal	Date RMF Monitor 1 measurement interval started, in the form 00yydddF, where F is the sign

[1] A triplet is a set of offset/length/number values that defines a section of the record.

Offsets		Name	Length	Format	Source	Description
RMF Product Section (continued):						
18	12	SMF79INT	4	packed	internal	Duration of RMF Monitor 1 measurement interval, in the form mmssttttF where F is the sign. (The end of the measurement interval is the sum of the recorded start time and this field.)
22	16	SMF79MFL	2	binary	internal	Record Maintenance Indicator
24	18	SMF79SAM	4	binary	internal	Number of RMF samples
28	1C	SMF79RV2	2	binary		Reserved
30	1E	SMF79FLA	2	binary	internal	Flags *Bit* *Meaning When Set* 0 Used internally by RMF post processor 1-15 Reserved
32	20	SMF79RLS	4	EBCDIC	CVTRELNO	Operating system release number and level, in the form nnll
36	24	SMF79CYC	4	packed	internal	Sampling cycle length in the form 000ttttF, where F is the sign (taken from CYCLE option). The range of values is 0.050 to 9.999 seconds.
40	28	SMF79MVS	8	EBCDIC	CVTPRODN	MVS software level (consists of an acronym and the version, release, and modification level numbers)
48	30	SMF79IML	1	binary	CSDIOML	Indicates the type of processor complex on which data measurements were taken *Value* *Meaning* 01 308x or 908x processor 02 4381 processor 03 3090 processor
49	31	SMF79PRF	1	binary	internal	X'80' indicates system has extended storage
+50	+32		2			Reserved
Monitor II Control Section:						
+0	+0	R79GTOD	4	packed	TIME macro	Time when call to data gatherer was issued, in the form hhmmsstF, where F is the sign
+4	+4	R79LF2	1 1	binary	internal	Flags X'80' indicates that there are not enough relocate data sections to complete data gathering
+5	+5	R79RV1	1	binary		Reserved
+6	+6	R79SES	2	EBCDIC	MISBNAME	RMF session identifier
+08	+8	R79RSV	2	binary		Reserved
+10	+A	R79USER	2			Reserved user field
+12	+C	R79RID	8	EBCDIC	PCTRID	Measurement name
+20	+14	R79CTXTL	2	binary	PCTOPRD	Length of command text
+22	+16	R79CTEXT	32	EBCDIC	PCTOTEXT	Text of command
+54	+36	R79DTXTL	2	binary	PCTDEDOL	Length of data reporter default text
+56	+38	R79DTEXT	32	EBCDIC	PCTDRO	Default data reporter text
+88	+58	R79IST	4	packed	MFSBITOD	Monitor I internal start time

Offsets		Name	Length	Format	Source	Description
Sub-type 1 (ASD and ASDJ) Data Section:						
+0	+0	R791ASID	2	binary	ASCBASID	Address space identifier
+2	+2	R791JBN	8	EBCDIC	ASCBJBNI pointer or ASCBJBNS pointer	Name of job
+10	+A	R791DMN	2	binary	OUCBDMN	Domain number
+12	+C	R791NPG	2	binary	OUCBNPG	Performance group
+14	+E	R791PGP	2	binary	((OUCBPGP (LENGTH (WPGD) LENGTH (WPGR))) /LENGTH(WPGP))+1	Performance group period
+16	+10	R791TTOD	4			Reserved
+20	+14	R791CL	2	EBCDIC		Current location
						Contents *Meaning*
					Set to IN when all other indicators are off	IN In storage
					OUCBPVL	PR Privileged
					OUCBNSW	NS Non-swappable
					OUCBOFF, OUCBMWT	WM Wait queue/MSO
					OUCBOFF, OUCBTRM	WT Wait queue/terminal wait
					OUCBOFF, OUCBLWT	WL Wait queue/long wait
					OUCBOFF	WO Wait queue/reasons other than WM, WL, or WT
					OUCBOUT, OUCBDLYB	DL Out queue/delayed
					OUCBLSW	LO Logically swapped out
					OUCBOUT	OT Swapped out and ready
					OUCBGOO	> > Transitioning out
					OUCBGOI	< < Transitioning in
+22	+16	R791TAS	2	binary		Type of user
						Contents *Meaning*
					ASCBJBNI	0 Batch
					OUCBSTT	1 Started task
					OUCBMNT	2 Mount task
					OUCBLOG	3 TSO
+24	+18	R791SRC	2	EBCDIC	OUCBSEC = 1 through 14	Reason for last swap-out
						Contents *Meaning*
						TI Terminal input
						TO Terminal output
						LW Long wait
						XS Auxiliary storage shortage
						RS Real storage shortage
						DW Detected wait
						RQ Request swap
						NQ CAP enqueue
						EX CAP exchange
						US CAP uni-swap
						TS Transition
						00 Unknown
+26	+1A	R791DP	2	binary	ASCBDP	Dispatch priority
+28	+1C	R791SEQN	2	binary		Reserved

(Continued)

Offsets		Name	Length	Format	Source	Description
Sub-type 1 (ASD and ASDJ) Data Section: (continued)						
+30	+1E	R791FMCT	2	binary	ASCBFMCT	Number of real storage frames
+32	+20	R791WSS	2	binary	OUCBWSS	Working set at last swap-in
+34	+22	R791SWC	2	binary	OUCBSWC	Transaction swap count
+36	+24	R791SWMR	2	binary	OUCBWMR/256	SRM workload recommendation value
+38	+26	R791SCRV	2	binary	OUCBCRV * RMPTCPU/256	SRM processor recommendation value
+40	+28	R791SIOC	2	binary	OUCBIRV * RMPTIOC/256	SRM I/O recommendation value
+42	+2A	R791WMS	4	binary	OUCBWMS	SRM service for the current transaction since the last swap-in
+46	+2E	R791TCPU	4	binary	ASCBEJST + ASCBSRBT	CPU time (TCB + SRB) for current job step, in milliseconds
+50	+32	R791SSRV	2	binary	OUCBSBRV	SRM storage recommendation value
+52	+34	R791ES	2	binary	RAXECST	Number of extended storage frames used by the job.
+54	+36	R791ESSL	4	binary		Reserved
Sub-type 2 (ARD and ARDJ) Data Section:						
+0	+0	R792ASID	2	binary	ASCBASID	Address space identifier
+2	+2	R792JBN	8	EBCDIC	internal	Name of job
+10	+A	R792DMN	2	binary	OUCBDMN	Domain number
+12	+C	R792NPG	2	binary	OUCBNPG	Performance group
+14	+E	R792CL	2	EBCDIC	OUCBQFL	Current location *Contents* *Meaning* IN In storage LO Logically swapped out OT Swapped out and ready NS Non-swappable WM Wait queue/MSO WL Wait queue/long wait WO Wait queue/reasons other than WM, WL, or WT DL Out queue/delayed WT Wait queue/terminal wait PR Privileged > > Transitioning out < < Transitioning in
+16	+10	R792TAS	2	binary	OUCB4FL	Type of user *Contents* *Meaning* 0 Batch 1 Started task 2 Mount task 3 TSO
+18	+12	R792TRC	2	binary	OUXBTRC	Transaction count
+20	+14	R792TTOD	4	binary	RMCTTOD, OUCBTMO	Transaction elapsed time, in milliseconds
+24	+18	R792PRFX	4	binary	IARXCNTF	Number of private fixed frames
+28	+1C	R792ARS	2	binary	OUCBPSE, R792EJST	Average number of real frames for step
+30	+1E	R792SVAR	4	binary	R792TSRM, R792RTM	SRM service absorption rate for step
+34	+22	R792TCPU	4	binary	ASCBEJST	Total processor time (TCB + SRB) for step, in milliseconds
+38	+26	R792PSS			OUCBPSS	Step product of frame, in milliseconds

Offsets		Name	Length	Format	Source	Description
Sub-type 2 (ARD and ARDJ) Data Section: (continued)						
+38	+26	R792PSS1	4	binary	OUCBPSS1	High order word
+42	+2A	R792PSS2	4	binary	OUCBPSS2	Low order word
+46	+2E	R792EJST	4	binary	ASCBEJST + ASCBSRBT	Total processor time, in milliseconds
+50	+32	R792TSRM	4	binary	OUXBJBS + OUXBTARS + OUCBWMS	Total SRM service for job or session
+54	+36	R79RTM	4	binary	OUXBJBR + OUXBTRR + RMCTTOD - OUCBTMS	Resident time for step, in milliseconds
+58	+3A	R792EXCP	2	binary	ASCBIOSM + OUCBIOSM	EXCP count for step
+60	+3C	R792CMNI	4	binary	OUXBCAPI	Number of common pages for current transaction
+64	+40	R792PNV	4	binary	OUXBPIN + OUXBPOUT	Number of non-VIO pages for current transaction
+68	+44	R792PVIO	4	binary	OUXBVAMI + OUXBVAMO	Number of VIO pages for current transaction
+72	+48	R792FXBL	4	binary	IARXCNTF	Number of fixed frames below 16-megabytes
+76	+4C	R792PSWP	4	binary	OUXBPSIN + OUXBSPOT	Number of pages swapped in and out for current transaction
+80	+50	R792LPAI	4	binary	OUXBLPAI	Number of LPA pages paged in for current transaction
+84	+54	R792CSAI	4	binary	OUXBCAPI - OUXBLPAI	Number of CSA pages paged in for current transaction
+88	+58	R792LSQA	4	binary	IARXCNTF	Number of LSQA fixed frames
+92	+5C	R792NLQF	4	binary	IARXCNTF	Number of non-LSQA fixed frames
+96	+5E	R792TDEV	4	binary	ASCBDCTI	Total device connect time in milliseconds
+100	+64	R792TWSS	2	binary	OUCBTWSS	SRM target working set size for this job.
+102	+66	R792PIN	4	binary	OUXBPIN	Page in count
+106	+6A	R792TRTM	4	binary	OUXBTRR + (RMCTTOD – OUCBTMS)	Transaction residency time
+110	+6E	R792FLG	2	binary	ASCBXMEC	Flags *Bit* *Meaning When Set* 0 On – – indicates cross memory address space 1-15 Reserved
Sub-type 3 (SRCS) Data Section:						
+0	+0	R793AFC	2	binary	RCEAFC	Number of available frames
+2	+2	R793CRI	2	binary	MCVSTCAI	Highest UIC count
+4	+4	R793SQA	2	binary	IARXCRMF	Number of SQA frames
+6	+6	R793CMNF	2	binary	RCECOMAL	Number of frames allocated to the common area
+8	+8	R793CMFF	2	binary	RCECOMFX	Number of common (LPA + CSA) fixed frames
+10	+A	R793PRFX	2	binary	RCETOTFX - RCECOMFX + IARXCRMF*	Number of private fixed frames (LSQA + non-LSQA)
+12	+C	R793CPUU	2	binary	CCVUTICP	Processor utilization (0 - 101)
+14	+E	R793DQ	2	binary	ASCB dispatching queue pointed to by CVTASCBH	Length of ASCB ready queue

*RSM service routine

Offsets		Name	Length	Format	Source	Description
Sub-type 3 (SCRS) Data Section: (continued)						
+16	+10	R793INC	2	binary	OUCB queue pointed to by RMCTIQE	Number of address spaces in storage (SRM in queue)
+18	+12	R793OUTU	2	binary	OUCB queue pointed to by RMCTOTQE	Number of address spaces out of storage (SRM out queue)
+20	+14	R793LCU	2	binary		Reserved
+22	+16	R793ASMQ	2	binary	RCVASMQA	SRM measure of ASM queue length
+24	+18	R793LPAF	2	binary	IARXCRMF*	Number of LPA pageable frames
+26	+1A	R793CSAF	2	binary	IARXCRMF* RCECOMAL	Number of CSA pageable frames
+28	+1C	R793LPFX	2	binary	IARXCRMF*	Number of LPA fixed frames
+30	+1E	R793CSFX	2	binary	IARXCRMF* RCECOMFX	Number of CSA fixed frames
+32	+20	R793LSQA	2	binary	IARXCRMF*	Number of LSQA frames
+34	+22	R793NLQF	2	binary	RCETOTFX IARXCRMF* RCECOMFX IARXCRMF*	Number of private non-LSQA fixed frames
+36	+24	R793LOUT	2	binary	OUCBLSW	Number of address spaces logically swapped out
Sub-type 4 (SPAG) Data Section:						
+0	+0	R794CMNI	4	binary	RCECOMPI	System common (LPA + CSA) pages in
+4	+4	R794CMNO	4	binary	RCECOMPO	System common (CSA) pages out
+8	+8	R794CMNR	4			Reserved
+12	+C	R794SWPO	4	binary	SWCTPSDA+ SWCTLSES+ SWCTLSAX+ SWCTPSDE+ SWCTPSM	Number of swap-outs
+16	+10	R794PSPI	4	binary	RCESWPPI	Number of pages swapped in
+20	+14	R794PSPO	4	binary	RCESWPPO	Number of pages swapped out
+24	+18	R794PRVI	4	binary	RCETOTPI + RCEVIOPI – RCECOMPI	Number of private pages (VIO + non-VIO) swapped in
+28	+1C	R794PRVO	4	binary	RCETOTPO + RCEVIOPO – RCECOMPO	Number of private pages (VIO + non-VIO) swapped out
+32	+20	R794PRVR	4			Reserved
+36	+24	R794VIO	4	binary	RCEVIOPI + RCEVIOPO	Number of VIO pages (in + out)
+40	+28	R794AFC	2	binary	RCEAFC	Number of available frames
+42	+2A	R794CRI	2	binary	MCVSTCRI	Highest UIC count
+44	+2C	R794ACRI	2			Reserved
+46	+2E	R794RV1	2			Reserved
+48	+30	R794LPAI	4	binary	RCELPAPI	System LPA pages in
+52	+34	R794CSAI	4	binary	RCECOMPI – RCELPAPI	System CSA pages out
+56	+38	R794LPAR	4			Reserved
+60	+3C	R794CSAR	4			Reserved
+64	+40	R794TWSS	2	binary	MCVTWSS	Target working set size for the common area

*RSM service routine

Offsets		Name	Length	Format	Source	Description
Sub-type 4 (SPAG) Data Section: (continued)						
+66	+42	R794MAGE	2	binary	MCVMGAGE	Migration age
+68	+44	R794ERTE	4	binary	RCEESWRT	Number of pages sent to extended storage
+72	+48	R794EVAL	4	binary	RCEAEC	Number of extended storage frames not in use
+76	+4C	R794ESSL	4	binary		Reserved
+80	+50	R794MRTE	2	binary	RCENWSF +RCEWSDNE	Number of pages migrated from extended storage to auxiliary storage
Sub-type 5 (ASRM and ASRMJ) Data Section:						
+0	+0	R795ASID	2	binary	ASCBASID	Address space identifier
+2	+2	R795JBN	8	EBCDIC	internal	Name of job
+10	+A	R795DMN	2	binary	OUCBDMN	Domain number
+12	+C	R795NPG	2	binary	OUCBNPG	Performance group
+14	+E	R795PGP	2	binary	OUCBPGP	Performance group period
+16	+10	R795TTOD	4	binary	RMCTTOD - OUCBTMO	Real time into transaction
+20	+14	R795CL	2	EBCDIC	Set to IN when all other indicators are off	Current location
						Contents *Meaning*
						IN In storage
						LO Logically swapped out
					OUCBOUT	OT Swapped out and ready
					OUCBNSW	NS Non-swappable
					OUCBMVT	WM Wait queue/MSO
					OUCBLWT	WL Wait queue/long wait
					OUCBTRM	WT Wait queue/terminal wait
					OUCBOFF	WO Wait queue/other wait
					OUCBPVL	PR Privileged
					OUCBGOO	> > Transitioning out
					OUCBGOI	< < Transitioning in
+22	+16	R795TAS	2	binary		Type of user
						Contents *Meaning*
					ASCBJBNI	0 Batch
					OUCBSTT	1 Started task
					OUCBMNT	2 Mount task
					OUCBLOG	3 TSO
+24	+18	R795TROD	4	binary	OUXBTRR + (RMCTTOD - OUCBTMS)	Transaction resident time
+28	+1C	R795TCNT	2	binary	OUXBTRC	Transaction count
+30	+1E	R795SWC	2	binary	OUCBSWC	Transaction swap count
+32	+20	R795CPUS	4	binary	OUCBCPU	Total processor service for transaction (zeroes when ASID is out of storage)
+36	+24	R795MSOS	4	binary	OUCBMSO	Total MSO service for transaction (zeroes when ASID is out of storage)
+40	+28	R795IOCS	4	binary	OUCBIOC	Total IOC service for transaction (zeroes when ASID is out of storage)
+44	+2C	R795WMS	4	binary	OUXBTRS + OUCBWMS	Total service for transaction (zeroes when ASID is out of storage)

(continued)

Offsets		Name	Length	Format	Source	Description
Sub-type 5 (ASRM and ASRMJ) Data Section: (continued)						
+48	+30	R795TOTL	4	binary	OUXBJBS + OUXBTRS + OUCBWMS	Total service for job or TSO session (zeroes when ASID is out of storage)
+52	+34	R795TOT	4	binary	OUCBWMS	Total service for transaction since last swap-in
+56	+38	R795SRBS	4	binary	OUCBSRB	Total SRB service for transaction (zeros when ASID is out of storage)
Sub-type 6 (SENQR) Data Section:						
+0	+0	R796ASID	2	Binary	RIBEASID	Address space ID of the job that issued the RESERVE
+2	+2	R796MAJ	8	EBCDIC	RIBQNAME	Major name of the resource
+10	+A	R796MIN	44	EBCDIC	RIBRNAME	Minor name of the resource
+54	+36	R796JBN	8	EBCDIC	RIBEJBNM	Name of the job that issued the RESERVE
+62	+3E	R796VOLS	6	EBCDIC	UCBVOLI	Volume serial of the volume against which the RESERVE was issued
+68	+44	R796UCB	3	EBCDIC	UCBNAME	The device against which the RESERVE was issued
+71	+47	R796REQ	2	EBCDIC	RIBESTAT + RIBETYPE	Type and status of request for the resource
+73	+49	R796MINL	2	Binary	RIBRNMLN	Length of the minor name field (used for reporting)
+75	+4B	R796FLG	1	Binary	internal	Reserve flag byte *Bit* *Meaning When Set* 0 ON=device reserved by this CPU 2 ON=minor name truncated 3-7 Reserved
+76	+4C	R796SID	8	EBCDIC	RIBESYSN	System identifier of the job that issued the RESERVE
Sub-type 7 (SENQ) Data Section:						
+0	+0	R797MAJ	8	EBCDIC	RIBQNAME	Major name of resource
+8	+8	R797MIN	44	EBCDIC	RIBRNAME	Minor name of resource
+52	+34	R797FLG	1	Binary	internal	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	RIBRNMLN	Length of the minor name field (used for reporting)
+57	+39	R797OWN	2	Binary	RIBNTO	Count of requestors that own the resource
+59	+3B	R797EXCW	2	Binary	RIBNTWE	Count of requestors waiting for exclusive use of a resource
+61	+3D	R797SHRW	2	Binary	RIBNTWS	Count of requestors waiting for shared use of a resource
+63	+3F	R797REQ	2	EBCDIC	RIBETYPE + RIBEJBNM	Type and status of resuest for a resource ('SO','SW','EO',or'EW')
+65	+41	R797JBN	8	EBCDIC	RIBEASID	Name of the job that issued the ENQ
+73	+49	R797ASID	2	Binary	RIBEASID	Address space ID of the job that issued the ENQ
+75	+4B	R797SCOP	4	EBCDIC	RIBSCOPE	Scope of the resource ('SYS','SYSS',or 'STEP')
+79	+4F	R797RES	2	EBCDIC		Reserved
+81	+51	R797SID	8	EBCDIC	RIBESYSN	System identifier of the job that issued the ENQ

Offsets		Name	Length	Format	Source	Description
Sub-type 8 (TRX) Data Section:						
+0	+0	R798ICSI	2	EBCDIC	RMCTICST	Identifier of IEAICSxx parmlib member
+2	+2	R798IPSI	2	EBCDIC	WAMTIPS	Identifier of IEAIPSxx parmlib member
+4	+4	R798PGN	2	binary	WAMT	Performance group number
+6	+6	R798PGP	2	binary	WAMT	Performance group period
+8	+8	R798SYS	4	EBCDIC	ICSM	Subsystem name associated with the performance group
+12	+C	R798TTX	4	binary	WAMPTRN	Number of ended transactions for the performance group period
+16	+10	R798TTM	4	binary	WAMPTET	Elapsed time (in 1024-microsecond units) for all ended transactions in the performance group period
+20	+24	R798CLS	10	EBCDIC	ICSM	Transaction class name associated with the performance group
+30	+2E	R798USR	10	EBCDIC	ICSM	User identifier associated with the performance group
+40	+28	R798NAM	10	EBCDIC	ICSM	Transaction name associated with the performance group
+50	+32	R798FL1	1	binary	WAMPRPT	Data type flags
						Bit *Meaning When Set*
						0 ON - performance group is a report performance group OFF - performance group is a control performance group
						1-7 Reserved
Sub-type 9 Device Data Section: (one per device)						
+0	+0	R799NUM	2	packed	EDDDNUM	Device number
+2	+2	R799LCU	2	binary	EDDDLCUN	Logical control unit number X'00' to X'FF'
+4	+4	R799RVO	1	binary		Reserved
+5	+5	R799CNF	1	binary		Device flags
						Bit *Meaning When Set*
					EDDDNQUL	0 ON = IOS queue-length invalid
					EDDDNLCD	1 ON = NO logical control unit information
					EDDDNCMB	2 ON = CMB data invalid
						3-4 Reserved
					EDDDMXPB	5 ON = device is multiple exposure device; this is base exposure
					EDDDCCHG	6 ON = device was reconfigured or DDR activity was detected during Monitor I interval
					EDDDALIV	7 ON = device is currently online
+6	+6	R799SER	6	EBCDIC	UCBVOLI	Volume serial number of the volume mounted on this device
+12	+C	R799TYP	4	binary	internal	Device type
+16	+10	R799NUX	4	binary	EDDDNUMX	Number of exposures if multiple exposure device
+20	+14	R799SSC	4	binary	CMBSSCHC - EDDDLSSC + EDDDASSC	Start subchannel (SSCH) count
+24	+18	R799MEC	4	binary	CMBSAMPC - EDDDLMEC + EDDDAMEC	Measurement event count - number of SSCH instructions for which connect, pending, and active times were stored
+28	+1C	R799CNN	4	binary	CMBCONNT - EDDDBCNN	Device connect time
+32	+20	R799PEN	4	binary	CMBPENDT - EDDDBPEN	Function pending time

Offsets		Name	Length	Format	Source	Description
Sub-type 9 Device Data Section: (one per device) (continued)						
+36	+24	R799ATV	4	binary	CMBACTVT - EDDDBATV	Function active time
+40	+28	R799DIS	4	binary	CMBACTVT - (CMBPENDT + CMBCONNT)	Device disconnect time
+44	+2C	R799QUE	4	binary	EDDDNENQ	Number of requests queued in IOS for this device
+48	+30	R799UTL	4	binary	EDDDBUSY	Number of samples when the device was reserved but an SSCH had not been issued to the device
+52	+34	R799RSV	4	binary	EDDDRESV	Number of samples taken during the measurement interval that indicated that the device was reserved
+56	+38	R799DSO	4	binary	EDDDDSOP	Total number of data sets open on the device
+60	+3C	R799ALC	4	binary	EDDDALOC	Number of samples taken during the measurement interval that indicated that the device was allocated.
+64	+40	R799DVB	4	binary	SCHMDTDB	Device busy delay time (for the 3090 processor only)
+68	+44	R799CUB	4	binary	SCHMDTCB	Control unit busy delay time (for the 3090 processor only)
+72	+48	R799ICT	2	binary	IOCSTSQE (IOS Service)	Invalid sample count for the 3090 processor only)
+74	+4A	R799RES	2			*Reserved*
Sub-type 10 (DDMN) Data Section:						
+0	+0	R79ATWSR	4	binary	DMDTTSWR	Time-weighted average service rate for this domain
+4	+4	R79AMPLT	2	binary	DMDTMPLT	Multiprogramming level target
+6	+6	R79ARUA	2	binary	DMDTRUA	Average number of ready users
+8	+8	R79AGOOU	2	binary	DMDTGOOU	Average number of users being swapped out
+10	+A	R79ACMPL	2	binary	DMDTCMPL	Current MPL value
+12	+C	R79AOUTU	2	binary	DMDTOUTU	Average number of users swapped out
+14	+E	R79AINCU	2	binary	DMDTINCU	Average number of swapped-in users
+16	+10	R79ATCTL	2	binary	DMDTWT DMDTAOBJ DMDTDOBJ DMDTFWKL	Target control value
+18	+12	R79ACIDX	2	binary	DMDTCIDX	Contention index
+20	+14	R79ANSW	2	binary	DMDTNSW	Number of non-swappable users
+22	+16	R79ADMNO	1	binary	DMDTNO	Domain number
+23	+17	R79RESV1	1			Reserved
+24	+18	R79RESV2	1			Reserved
+25	+19	R79ATYPE	1	binary	DMDTWT DMDTAOBJ DMDTDOBJ DMDTFWKL	Type of MPL target control W — weighting factor A — performance objective AOBJ D — performance objective DOBJ F — performance objective FWKL
+26	+1A	R79AIPS	2	EBCDIC	WMSTID	Current IEAIPSxx member
+28	+1C	R79ACPU	4	EBCDIC	WMSTIPC	CPU service coefficient
+32	+20	R79AIOS	4	EBCDIC	WMSTIPI	I/O service coefficient
+36	+24	R79AMSO	4	EBCDIC	WMSTIPM	MSO service coefficient
+40	+28	R79ASRB	4	EBCDIC	WMSTIPB	SRB service coefficient
+44	+2C	R79ATWET	4	binary	DMOTTWET	Average first period TSO transaction response time
+48	+30	R79ADMLO	2	binary	DMDTLO	Minimum multiprogramming level (MPL)
+50	+32	R79ADMHI	2	binary	DMDTHI	Maximum multiprogramming level (MPL)

Offsets		Name	Length	Format	Source	Description
Sub-type 11 (PGSP) Control Section: There is one control section followed by a data set section for each data set in the report.						
+0	+0	R79BETYPE	1	EBCDIC	Internal	Type of data that follows: P – PAGE data sets S – SWAP data sets
+1	+1		3			Reserved
Sub-type 11 (PGSP) Data Set Section:						
+0	+0	R79BSALC	4	binary	EPGDSALC	Number of slots/sets in this data set
+4	+4	R79BSAVL	4	binary	PARESLTA	Number of slots/sets available
+8	+8	R79BSLBD	4	binary	EPGDSLBD	Number of bad slots/sets
+12	+C	R79BSUSE	4	binary	EPGDSUSE	Number of samples that indicate ASM is using the data set
+16	+10	R79BSIOS	4	binary	IORSION	Number of SSCH instructions issued for the data set
+20	+14	R79BREQS	4	binary	IORTREQ	Number of pages transferred to/from the data set
+24	+18	R79BFLG	1	binary		Flags
						Bit *Meaning When Set*
					EPGDSBAD	0 Indicates that the data set is bad
					EPGDPLBA	1 Indicates a PLPA data set
					EPGDCOMM	2 Indicates a common data set
					EPGDDPLX	3 Indicates a duplex data set
					EPGDLOCL	4 Indicates a local page data set
					Internal	5 Indicates a paging data
					Internal	6 Indicates swapping data
						7 Indicates that the data set accepts VIO pages
+25	+19	R79BDEV	1	binary	EPGDDEV	Device type
+26	+1A	R79BDADR	3	EBCDIC	EPGDDADR	Device number
+29	+1D	R79BVSER	6	EBCDIC	EPGDVSER	Volume serial number
+35	+23	R79BDSN	44	EBCDIC	PGDSN	Data set name
+79	+4F	R79BFL2	1	binary		Flags *Bit* *Meaning When Set* 0 Multiple exposure device 1 Alternate control unit device 2-7 Reserved
+80	+50	R79BRESV	12	binary		Reserved
Sub-type 12 Channel Path Data Control Section: (one per record)						
+0	+0	R79CSMP	4	binary	CPTSAMP	Number of samples as weighted by SRM
Sub-type 12 Channel Path Data Section: (one per channel path)						
+0	+0	R79CPID	1	binary	internal	Channel path identifications
+1	+1	R79CFG2	1	binary	IOCDS	Channel flags *Bit* *Meaning When Set* 0 Reserved 1 Reserved 2 Block multiplexor 3 Byte multiplexor 4-7 Reserved
+2	+2	R79CRV3	2			Reserved
+4	+4	R79CBSY	4	binary	CPMTBUSY	Number of SRM samples in which the channel path was busy

Offsets		Name	Length	Format	Source	Description
Sub-type 13 I/O Queuing Configuration Control Section for 308x, 908x, and 4381 processors: (one per logical control unit described by triplet (SMF79DCS)						
+0	+0	R79DID1	2	binary	EIOQLCUN	Logical control unit identifier
+2	+2	R79DNTR	2	binary	internal	Number of triplets following
+4	+4	R79DCPDS	4	binary	internal	Offset to I/O queuing configuration data section relative to beginning of I/O queuing configuration control section
+8	+8	R79DCPDL	2	binary	internal	Length of I/O queuing configuration data section
+10	+A	R79DCPDN	2	binary	EIOQCHPN	Number of I/O queuing configuration data sections for LCU
Sub-type 13 I/O Queuing Configuration Data Section for 308x, 908x, and 4381 processors: (one per channel path within a logical control unit, described by triplet R79DCPDS)						
+0	+0	R79DCPID	1	binary	EIOQCHPN	Channel Path Identifier
+1	+1	R79DCPST	1	binary	EIOQCPST	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 5-7 Reserved
+2	+2	R79CUN	2	binary	EIOQCUN	Number of control units attached
+4	+4	R79DCU1	2	binary	EIOQCU	First control unit identifier
+6	+6	R79DCU2	2	binary	EIOQCU	Second control unit identifier
+8	+8	R79DCU3	2	binary	EIOQCU	Third control unit identifier
+10	+A	R79DCU4	2	binary	EIOQCU	Fourth control unit identifier
Sub-type 13 I/O Queuing Data Section for 308x, 908x, and 4381 processors: (one per logical control unit, described by triplet SMF79ASS)						
+0	+0		1			Reserved
+1	+1	R79DDST	1	binary	EIOQNCPS	Data status *Bit* *Meaning* 0 No STCPS data available 1 Reserved 2 No hardware measurements available 3-7 Reserved
+2	+2	R79DICT	2	binary	EIOQICNT	Count of invalid samples
+4	+4	R79DABY	4	binary	EIOQABY	Number of samples when all channel paths in the LCU were busy
+8	+8	R79DTIS	4	binary	EIOQATIS	Number of initial selection attempts
+12	+C	R79DSIS	4	binary	EIOQASIS	Number of successful initial selections
+16	+10	R79DCUB	4	binary	EIOQACUB	Number of initial selection attempts unsuccessful due to control unit busy
+20	+14	R79DDVB	4	binary	EIOQADVB	Number of initial selection attempts unsuccessful due to device busy
+24	+18	R79DQUE	4	binary	EIOQAQUE	Number of requests queued for the LCU (accumulated at initial selection time)
+28	+1C	R79DID2	2	binary	EIOQLCUN	Logical control unit identifier
+30	+1E		2			Reserved

Offsets		Name	Length	Format	Source	Description
Sub-type 14 I/O Queuing Control Section for 3090 Processors (described by triplet SMF79QSS)						
+0	+0	R79EGFLG	1			Global IOQ status *Bit Meaning when set* 0 Data invalid—channel measurement facility failed 1 Diagnose interface failure 2-7 Reserved
+1	+1		3			Reserved
+4	+4	R79EGSAM	4	binary	CMPTSAMP	CMPT sample count
Sub-type 14 I/O Queuing Configuration Control Section for 3090 processors: (one per logical control units described by triplet SMF79DCS)						
+0	+0	R79EID1	2	EBCDIC	IOCDS	Logical control unit identifier
+2	+2	R79ENTR	2	binary	internal	Number of triplets following
+4	+4	R79ECPDS	4	binary	internal	Offset to I/O queuing configuration data section relative to beginning of I/O queuing configuration control section
+8	+8	R79ECPDL	2	binary	internal	Length of I/O queuing configuration data section
+10	+A	R79ECPDN	2	binary	internal	Number I/O queuing configuration data sections for the LCU
Sub-type 14 I/O Queuing Configuration Data Section for the 3090 processor: (one per channel path within a logical control unit. Described by triplet R79ECPDS)						
+0	+0	R79ECPID	1	binary	IOCDS	Channel path identifier
+1	+1	R79ECPST	1	binary	internal	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 5-7 Reserved
+2	+2	R79ECUN	2	binary	IOCDS	Number of control units attached
+4	+4	R79ECU1	2	binary	IOCDS	First control unit identifier
+6	+6	R79ECU2	2	binary	IOCDS	Second control unit identifier
+8	+8	R79ECU3	2	binary	IOCDS	Third control unit identifier
+10	+A	R79ECU4	2	binary	IOCDS	Fourth control unit identifier
+12	+C	R79ECUB	4	binary	HSA	Number of initial selection attempts that were unsuccessful because control unit was busy
+16	+10	R79EPT	4	binary	HSA	Number of I/O operations accepted on this channel path
+20	+14	R79EPB	4	binary	CMPTBUSY	Number of samples when channel path was busy (total samples is R79EGSAM).
Sub-type 14 I/O Queuing Section for the 3090 processor: (one per logical control unit, described by triplet SMF79ASS)						
+0	+0	R79EID2	2	EBCDIC	IOCDS	Logical control unit identifier
+2	+2	R79EDST	1	binary		Data status *Bit Meaning when set* 0 Reserved 1 No hardware measurements available 2-7 Reserved
+3	+3		1			Reserved
+4	+4	R79EQSM	4	binary	HSA	Accumulated length of CU-HDR queue
+8	+8	R79EQCT	4	binary	HSA	Number of entries placed on the CU-HDR queue

Record Type 80 (50) – RACF Processing Record
Record Type 81 (51) – RACF Initialization Record

Record types 80 and 81 are written by RACF during RACF initialization and processing. For information about record types 80 and 81, refer to SPL: *Resource Access Control Facility (RACF): Installation Reference Manual,* SC28-1343.

Record Type 82 (52) – Security

Record type 82 is a security record used to record information about the events and operations of the Programmed Cryptographic Facility Program Number (5740-XY5). The record length is 45 bytes plus the length of the variable relocate sections.

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 by ICTMKM01 when a START command is issued for cryptography.

- Stop.

  The record is written by ICTMKM01 when a STOP command is issued for crytopgraphy.

- Generation of an operational key.

  If specified in the initialization options for cryptography, ICTMKM04 writes a record after processing each GENKEY macro instruction.

- Transformation of an operational key.

  If specified in the initialization options for cryptography, ICTMKM04 writes the record after processing each RETKEY macro instruction.

- Execution of the key generator utility.

  The record is written by ICTMKG00 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 that 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. The length of the section is 6 bytes.
- GENKEY function, which indicates the action taken in response to a GENKEY macro instruction. The length of the section is 27 bytes.
- RETKEY function, which indicates the action taken in response to a RETKEY macro instruction. The length of the section is 11 bytes.
- Cryptography initialization, which describes the SMF recording options in effect at initialization and the cryptography function and key manager user SVC numbers. The length of the section is 7 bytes.
- Installation data, which contains any information supplied by an installation user exit routine. The maximum length of the section is 66 bytes.

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 also consists of only the header section. The number of relocate sections is indicated in CRY82VCT (offset 37).

Using the ICTSMF82 and ICTCRY82 macros: Because record type 82 cannot be mapped using the IFASMFR macro, you must use two mapping macros to symbolically address record type 82. The macros are supplied on SYS1.MACLIB. ICTSMF82 maps the fields in record type 82 whose name starts with SMF. For the Programmed Cryptographic Facility, ICTSMF82 maps the fields addressed by offsets X'0' through X'16'. ICTCRY82 maps the fields in record type 82 whose name starts with CRY. For the Programmed Cryptographic Facility, ICTCRY82 maps the fields addressed by offsets X'18' through X'2C' and the variable relocate sections.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF82LEN	2	binary	internal	Record length
2	2	SMF82SEG	2	binary	internal	Segment descriptor
4	4	SMF82FLG	1	binary	SVC 83	*Bit* *Meaning When Set* 0-4 Reserved 5 MVS/XA 6 VS2 7 VS1
5	5	SMF82RTY	1	binary	internal	Record type
6	6	SMF82TME	4	binary	SVC 11 or SVC 83	Time, in hundredths of a second, record was moved to the SMF buffer
10	A	SMF82DTE	4	packed	SVC 11 or SVC 83	Date record was moved to the SMF buffer, in the form 00YYDDDF where F is the sign
14	E	SMF82SID	4	EBCDIC	JMRCPUID or SMCASID	System identification (taken from SID parameter)
18	12	SMF82LNG	4	binary	internal	Length of record header

(Continued)

Offsets		Name	Length	Format	Source	Description
22	16	SMF82TID	2	binary	internal	Security product identifier: X'0001' for Programmed Cryptographic Facility (Program number 5740-XY5)
24	18	CRY82USR	8	EBCDIC	TIOCNJOB in TIOT or ACEEUSAI in ACEE	Jobname or, for RACF users, userid
32	20	CRY82GRP	8	EBCDIC	TIOCSTEP in TIOT or ACEEGRPN in ACEE	Stepname or, for RACF users, RACF group name.
40	28	CRY82FLG	1	binary	internal	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	internal	Number of variable relocate sections
43	2B	CRY82FTN	1	binary	internal	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	internal	Return code issued by function or X'FF' if function terminated abnormally
Key Generator Utility Relocate Section:						
+0		CRY82DTP	1	binary	ICTMKG00	Data type indicator: X'01' for key generator utility
+1		CRY82DLN	1	binary	ICTMKG00	Length of the data that follows
+2		CRY82SMK	1	binary	ICTMKG00	Host system master key flags *Bit* *Meaning When Set* 0 Host system master key was successfully changed 1-7 Reserved
+3		CRY82LMK	1	binary	ICTMKG01	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		CRY82CMK	1	binary	ICTMKG01	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		CRY82RMK	1	binary	ICTMKG01	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

(Continued)

Offsets		Name	Length	Format	Source	Description
GENKEY Function Relocate Section:						
+0		CRY82DTP	1	binary	ICTMKM04	Data type indicator: X'02' for GENKEY function
+1		CRY82DLN	1	binary	ICTMKM04	Length of the data that follows
+2		CRY82GFG	1	binary	ICTMKM04	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 installation exit exceeded the length of CRY82ID (64 bytes) 5-7 Reserved
+3		CRY82LK1	8	EBCDIC	GENKEY LOCKEY parameter	'LOCKEY' key name
+11		CRY82LK2	8	EBCDIC	GENKEY LOCKEY2 parameter	'LOCKEY2' key name
+19		CRY82REM	8	EBCDIC	GENKEY REMKEY parameter	'REMKEY' key name
RETKEY Function Relocate Section:						
+0		CRY82DTP	1	binary	ICTMKM04	Data type indicator: X'03' for RETKEY function
+1		CRY82DLN	1	binary	ICTMKM04	Length of the data that follows
+2		CRY82RFG	1	binary	ICTMKM04	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		CRY82RKN	8	EBCDIC	RETKEY REMKEY parameter	'REMKEY' key name
Cryptography Initialization Relocate Section:						
+0		CRY82DTP	1	binary	ICTMKG00 ICTMKM01	Data type indicator, X'04' for initialization
+1		CRY82DLN	1	binary	ICTMKG00 ICTMKM01	Length of the data that follows
+2		CRY82SMF	1	binary	ICTOPTNS	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		CRY82SIM	2	binary	ICTOPTNS	Cryptography function user SVC number in the form X'cccc'
+5		CRY82KMG	2	binary	ICTOPTNS	Key manager user SVC number in the form X'cccc'

Offsets		Name	Length	Format	Source	Description
Installation Data Relocate Section:						
+0		CRY82DTP	1	binary	ICTMKG00, ICTMKM04	Data type indicator: X'05' for installation data
+1		CRY82DLN	1	binary	ICTCKG90, ICTMGR90, ICTMGR95	Length of the data that follows
+2		CRY82ID	VAR	EBCDIC	ICTCKG90, ICTMGR90, ICTMGR95	Installation data written by an installation user exit routine. The maximum length is 64 bytes.

Record Type 82 (52) – Security

Record type 82 is a security record used to record information about the events and operations of the Cryptographic Unit Support Program Number (5740-XY6). The record length is 41 bytes plus the length of the variable relocate sections. Record type 82 is also written by the Programmed Cryptographic Facility (5740-XY5).

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 is initialized, either when cryptography is started or as a part of the key generator utility program.

- Start.

  The record is written by ICUMKM11 when a START command is issued for cryptography.

- Stop.

  The record is written by ICUMKM11 when a STOP command is issued for cryptography.

- Modify.

  The record is written by ICUMKM11 when a MODIFY command is issued for cryptography.

- Unit check.

  The record is written by ICUMKM11 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, ICUMKM14 writes a record after processing each GENKEY macro instruction.

- Transformation of an operational key.

  If specified in the installation options for cryptography, ICUMKM14 writes the record after processing each RETKEY macro instruction.

- Execution of the key generator utility.

  The record is written by ICUMKG10 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 that 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. The length of the section is 6 bytes.

- GENKEY function, which indicates the action taken in response to a GENKEY macro instruction. The length of the section is 27 bytes.

- RETKEY function, which indicates the action taken in response to a RETKEY macro instruction. The length of the section is 11 bytes.

- Cryptography initialization, which describes the SMF recording options in effect at initialization and the cryptography function and key manager user SVC numbers. The length of the section is 7 bytes.

- Installation data, which contains any information supplied by an installation user exit routine. The maximum length of the section is 66 bytes.

- Cryptographic unit data, which indicates the status of the cryptographic unit. The length of the section is 6 bytes.

Note: The number of relocate sections depends on the type of action taken. For instance, the record written when the Cryptographic Unit Support stops consists only of the header section. The number of relocate sections is indicated in CRY82CVT (offset 41).

Using the ICUSMF82 and ICUCRY82 macros: Because record type 82 cannot be mapped using the IFASMFR macro, you must use two mapping macros to symbolically address record type 82. The macros are supplied on SYS1.MACLIB. ICUSMF82 maps the fields in record type 82 whose name starts with SMF. For the Cryptographic Unit Support, ICUSMF82 maps the fields addressed by offsets X'0' through X'16'. ICUCRY82 maps the fields in record type 82 whose name starts with CRY. For the Cryptographic Unit Support, ICUCRY82 maps the fields addressed by offsets X'18' through X'2C' and the variable relocate sections.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF82LEN	2	binary	internal	Record length
2	2	SMF82SEG	2	binary	internal	Segment descriptor
4	4	SMF82FLG	1	binary	SVC 83	System indicator *Bit* *Meaning When Set* 0-5 Reserved 6 VS2 7 VS1
5	5	SMF82RTY	1	binary	internal	Record type
6	6	SMF82TME	4	binary	SVC 11 or SVC 83	Time, in hundredths of a second, record was moved to the SMF buffer
10	A	SMF82DTE	4	packed	SVC 11 or SVC 83	Date record was moved to the SMF buffer, in the form 00YYDDDF where F is the sign
14	E	SMF82SID	4	EBCDIC	JMRCPUID or SMCASID	System identification (taken from SID parameter)
18	12	SMF82LNG	4	binary	internal	Length of record header

(Continued)

Offsets		Name	Length	Format	Source	Description
22	16	SMF82TID	2	binary	internal	Security product identifier: X'0002' for Cryptographic Unit Support (Program number 5740-XY6)
24	18	CRY82USR	8	EBCDIC	TIOCNJOB in TIOT or ACEEUSAI in ACEE	Jobname or, for RACF users, userid
32	20	CRY82GRP	8	EBCDIC	TIOCSTEP in TIOT or ACEEGRPN in ACEE	Stepname or, for RACF users, RACF group name.
40	28	CRY82FLG	1	binary	internal	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	internal	Number of variable relocate sections
43	2B	CRY82FTN	1	binary	internal	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	internal	Return code issued by function or X'FF' if function terminated abnormally
Key Generator Utility Relocate Section:						
+0		CRY82DTP	1	binary	ICUMKG10	Data type indicator: X'01' for key generator utility
+1		CRY82DLN	1	binary	ICUMKG10	Length of the data that follows
+2		CRY82SMK	1	binary	ICUMKG10	Host system master key flags *Bit* *Meaning When Set* 0 Host system master key was changed. This bit is set even if an error occurs in the key generator. 1-7 Reserved
+3		CRY82LMK	1	binary	ICUMKG11	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		CRY82CMK	1	binary	ICUMKG11	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		CRY82RMK	1	binary	ICUMKG11	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

(Continued)

Offsets		Name	Length	Format	Source	Description
GENKEY Function Relocate Section:						
+0		CRY82DTP	1	binary	ICUMKM14	Data type indicator: X'02' for GENKEY function
+1		CRY82DLN	1	binary	ICUMKM14	Length of the data that follows
+2		CRY82GFG	1	binary	ICUMKM14	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 installation exit exceeded the length of CRY82ID (64 bytes) 5-7 Reserved
+3		CRY82LK1	8	EBCDIC	GENKEY LOCKEY parameter	'LOCKEY' key name
+11		CRY82LK2	8	EBCDIC	GENKEY LOCKEY2 parameter	'LOCKEY2' key name
+19		CRY82REM	8	EBCDIC	GENKEY REMKEY parameter	'REMKEY' key name
RETKEY Function Relocate Section:						
+0		CRY82DTP	1	binary	ICUMKM14	Data type indicator: X'03' for RETKEY function
+1		CRY82DLN	1	binary	ICUMKM14	Length of the data that follows
+2		CRY82RFG	1	binary	ICUMKM14	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		CRY82RKN	8	EBCDIC	RETKEY REMKEY parameter	'REMKEY' key name
Cryptography Initialization Relocate Section:						
+0		CRY82DTP	1	binary	ICUMKG10 ICUMKM11	Data type indicator, X'04' for initialization
+1		CRY82DLN	1	binary	ICUMKG10 ICUMKM11	Length of the data that follows
+2		CRY82SMF	1	binary	ICUOPTN2	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		CRY82SIM	2	binary	ICUOPTN2	Cryptography function user SVC number in the form X'cccc'
+5		CRY82KMG	2	binary	ICUOPTN2	Key manager user SVC number in the form X'cccc'

(Continued)

Offsets		Name	Length	Format	Source	Description
Installation Data Relocate Section:						
+0		CRY82DTP	1	binary	ICUMKG10, ICUMKM14	Data type indicator: X'05' for installation data
+1		CRY82DLN	1	binary	ICUCKG90, ICUMGR90, ICUMGR95	Length of the data that follows
+2		CRY82ID	VAR	EBCDIC	ICUCKG90, ICUMGR90, ICUMGR95	Installation data written by an installation user exit routine. The maximum length is 64 bytes.
Cryptographic Unit Data Relocate Section:						
+0		CRY82DTP	1	binary	ICUMKG10 ICUMKG04 ICUMKM11	Data type indicator: X'06' for Cryptographic unit data
+1		CRY82DLN	1	binary	ICUMKG10 ICUMKG04 ICUMKM11	Length of the data that follows
+2		CRY82CID	3	EBCDIC	ICUMKG10 ICUMKG04 ICUMKM11	Cryptographic unit address
+5		CRY82CST	1	binary	ICUMKG10 ICUMKG04 ICUMKM11	Cryptographic unit status *Bit* *Meaning when set* 0 Unit is online and available 1 Unit is unavailable 2 Unit check-key verification failed 3 Unit check-key verification successful 4-7 Reserved

Record Type 90 (5A) – System Status Record

Record type 90 is written whenever certain operator commands are issued. The record is created for operator tracking and reporting of reliability data and allows the installation to establish availability statistics. The following list of commands causes the associated module to write the record:

Command	*Module*	*Command*	*Module*
SET TIME	IEE6503D	HALT EOD	IEE70110
SET DATE	IEE6503D	SET OPT	IEEMB812
SETDMN	IEE8603D	SET ICS	IEEMB812
SET IPS	IEEMB812	SETSMF	IEEMB823
SET SMF	IEEMB823	SET MPF	IEECB805
SWITCH SMF	IEEMB829	SET DAE	ADYTRNS

In addition, the record is written by IEEMB823 during IPL processing.

The record length is variable.

Note: The subtype indicator is defined at offset 0 in the product section.

The format is:

Offsets		Name	Length	Format	Source	Description
0	0	SMF90LEN	2	binary	internal	Record length
2	2	SMF90SEG	2	binary	internal	Segment descriptor
4	4	SMF90FLG	1	binary	SVC 83	Header flag byte
5	5	SMF90RTY	1	binary	internal	Record type
6	6	SMF90TME	4	binary	SVC 83	Time, in hundredths of a second, record was moved to SMF buffer
10	A	SMF90DTE	4	packed	SVC 83	Date record was moved to SMF buffer, in the form 00YYDDDF, where F is the sign.
14	E	SMF90SID	4		SMCASID	System identification (taken from the SID parameter.)
18	12		2	binary	internal	Reserved
20	14	SMF90POF	4	binary	internal	Offset to product section from start of record, including the RDW
24	18	SMF90PLN	2	binary	internal	Length of product section
26	1A	SMF90PON	2	binary	internal	Number of product sections
28	1C	SMF90DOF	4	binary	internal	Offset to data section from start of record, including the RDW
28	20	SMF90DLN	2	binary	internal	Length of data section
34	22	SMF90DON	2	binary	internal	Number of data sections
Product Section:						
+0		SMF90TID	2	binary		Sub-type identifier 1 SET TIME 2 SET DATE[1] 3 SETDMN[2] 4 SET IPS 5 SET SMF 6 SWITCH SMF 7 HALT EOD 8 IPL PROMPT 9 IPL SMF 10 IPL SRM 11 SET OPT 12 SET ICS 13 SETSMF 14 SET MPF 15 SET SMF (to restart SMF) 16 SET DAE
+2		SMF90RVN	2	EBCDIC	internal	Record version number[2]
+4		SMF90PNM	8	EBCDIC	internal	Product name

[1] 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.

[2] Programs that need to handle sub-type 3 (SETDMN) records from Release 1.3 and earlier releases can look at SMF90RVN to determine which lengths and offsets to use. This field contains X'02' if the sub-type 3 record was produced by Release 1.3 and X'01' if it was produced by an earlier release.

Offsets		Name	Length	Format	Source	Description
Self-Defining Section: For subtype 5, 9, 13, and 15 only[1]						
+0	0	SMF90OSM	4	binary	internal	Offset to IPL SMF or SET SMF section from start of record, including the RDW
+4	4	SMF90LSM	2	binary	internal	Length of IPL SMF or SET SMF section
+6	6	SMF90NSM	2	binary	internal	Number of IPL SMF or SET SMF sections
+8	8	SMF90ODA	4	binary	internal	Offset to data section from the start of record, including the RDW
+12	C	SMF90LDA	2	binary	internal	Length of data set section
+14	E	SMF90NDA	2	binary	internal	Number of data set sections
+16	10	SMF90OWK	4	binary	internal	Offset to subsystem section from the start of the record, including the RDW
+20	14	SMF90LWK	2	binary	internal	Length of subsystem section
+22	16	SMF90NWK	2	binary	internal	Number of subsystem sections
+24	18	SMF90OOT	4	binary	internal	Offset to subsystem parameter segment
+28	1C	SMF90LOT	2	binary	internal	Length of subsystem parameter segment
+30	1E	SMF90NOT	2	binary	internal	Number of subsystem parameter segments
IPL SMF/SET SMF/SETSMF Sections (Subtypes 5, 9, 13, and 15):						
+0	0	SMF90MAX	4	EBCDIC	SMCAMDM	Current value for MAXDORM in MMSS format
+4	4	SMF90STA	6	EBCDIC	SMCASSTS	Current value for STATUS in HHMMSS format
+10	A	SMF90JWT	4	EBCDIC	SMCAJJWT	Current value for JWT in the format hhmm
+14	E	SMF90SYI	4	EBCDIC	SMCASID	System identification
+18	12	SMF90BUF	1	binary	SMCAMNBF	Minimum number of buffers
+19	13	SMF90BUM	1	binary	SMCAMXBF	Maximum number of buffers
+20	14	SMF90SWT	1	binary		SMF Options
						Bit *When Set Indicates*
					SMCAIPLR	0 PROMPT(ALL)
					SMCALIST	1 PROMPT(LIST)
					SMCAIPLR	2 PROMPT(IPLR)
					SMCAIPLR	3 PROMPT(NONE)
					SMCATDS	4 REC(PERM)
					SMCATDS	5 REC(ALL)
					SMCALDS	6 LISTDSN
					SMCALDS	7 NOLISTDSN
+21	15	SMF90RV7	3			Reserved
+24	18	SMF90REL	4	EBCDIC	CVTRELNO	Operating system release number
+28	1C	SMF90IIT	4	binary	SMCAITME	Time of IPL
+32	20	SMF90IDT	4	packed	SMCAIDTE	Date of IPL
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.						
+0	0	SMF90DSN	10	EBCDIC	RDSDSNAM	SMF data set name
Subsystem Recording Section (Subtypes 5, 9, or 15): There are entries for the SYS, plus an entry for each additional subsystem subsystem specified in the SUBSYS keyword in SMFPRMxx.						
+0	0	SMF90WKN	4	EBCDIC	SSTNAME	Name of subsystem
+4	4	SMF90DTL	1	binary	SSTFLAGS	DETAIL recording indicator
						Bit *Meaning When Set*
						0 Detail recording on
						1-7 Reserved

[1] For subtypes 5, 9, and 13, this field pointed to by SMF90DOF.

Offsets		Name	Length	Format	Source	Description
Subsytsem Recording Section (Subtypes 5, 9, or 15): (continued)						
+5	5	SMF90RV9	3			Reserved
+8	8	SMF90SVL	8	binary	SSTINTVL	Length of interval, in TOD clock format, between checkpoint SMF records
+16	10	SMF90SYS	32	binary	SSTRCDON	Bit Representation of SMF record types Bit 0 corresponds to record type 0 Bit 255 corresponds to record type 255. 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.
+48	30	SMF90EXN	120	EBCDIC	EXITNAME	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.
Switch SMF/Halt EOD Section (Subtypes 6 or 7):[1]						
0	0	SMF90SWO	10	EBCDIC	RDSNAME	Old recording data set name
+10	A	SMF90SWN	10	EBCDIC	RDSNAME	New recording data set name
+20	14	SMF90IT	4	binary	SMCAITME	IPL time
+24	18	SMF90DT	4	packed	SMCAIDTE	IPL date
IPL Prompt Data Section (Subtype 8):						
+0	0	SMF90DTM	8	EBCDIC	Operator Response	System down time in the form hh-mm-ss or 'u'
+8	8	SMF90RSN	65	EBCDIC	Operator Response	Reason for the IPL or 'u'
+73	49	SMF90OPR	20	EBCDIC	Operator Response	Operators name or 'u'
+93	5D	SMF90ITM	4	binary	SMCAITME	Time, in hundredths of seconds, of IPL
+97	61	SMP90DTT	4	packed	SMCAIDTE	Date, in the form 00YYDDDF, where F is the sign, of IPL
SET DATE/TOD Section (Subtypes 1 or 2):						
+0	0	SMF90OTM	4	packed	Time Macro	Time before command was issued
+4	4	SMF90ODT	4	binary	Time Macro	Old date before command was issued
+8	8	SMF90NTM	4	packed	Time Macro	Time after command was issued
+12	C	SMF90NDT	4	binary	Time Macro	Date after command was issued
SET IPS Section (Subtype 4):						
+0	0	SMF90TIP	8	binary	Store Clock	Set IPS time
+8	8	SMF90IPO	8	char	WMSTID	Old IPS name IEAIPS — designates the skeleton IPS.
+16	10	SMF90IPN	8	char	MBSUFFIX	New IPS name
SETDMN Section (Subtype 3):						
+0	0	SMF90DDT	8	binary	SETDTOC	Time of change
+8	8	SMF90DMM	1	binary	SETDDMN	Domain number
+9	9	SMF90DFG	1	binary	SETDFLGS	Domain flags *Value* *Meaning* X'80' Minimum MPL changed X'40' Maximum MPL changed X'20' Weight changed X'10' AOBJ changed X'08' DOBJ changed X'04' FWKL changed
+10	A	SMF90NMI	2	binary	SETDMIN	New minimum MPL value

[1] If a SWITCH operator command attempts to switch recording to a data set that is not empty, a data lost condition exists and the new data set name in the subtype 6 record is left blank.

In subtype 7 records, the old and new data set names are blank.

Offsets		Name	Length	Format	Source	Description
SETDMN Section (Subtype 3): (continued)						
+12	C	SMF90NMA	2	binary	SETDMAX	New maximum MPL value[1]
+14	E	SMF90NWT	2	binary	SETDWT	New weight value[1]
+16	10	SMF90NAO	2	binary	SETDAOB	New AOBJ value[1]
+18	12	SMF90NDO	2	binary	SETDDOB	New DOBJ value[1]
+20	14	SMF90WKL	2	binary	SETDFWK	New FWKL value[1]
IPL SRM Command Section (Subtype 10):						
+0	0	SMF90IPT	8	binary	SMCIATME SMCAIDTE	Time of IPL
+8	8	SMF90IPS	8	EBCDIC	WMSTID	IPS parmlib member used. IEAIPS– – – designates the skeleton IPS
+16	10	SMF90OPT	8	EBCDIC	RMPTOPTN	OPT parmlib member used. IEAOPT – – – indicates no OPT
+24	18	SMF90ICS	8	EBCDIC	ICSCNAME	IEAICSxx parmlib member used. IEAICS** indicates no installation control specification.
SET OPT Command Section (Subtype 11):						
+0	0	SMF90TOP	8	binary	Store Clock	Time of OPT change
+8	8	SMF90OPO	8	EBCDIC	RMPTOPTN	Old OPT parmlib member, IEAOPT – – – indicates no OPT
+16	10	SMF90OPN	8	EBCDIC	MBSUFFIX	New OPT parmlib member
SET ICS Command Section (Subtype 12):						
+0	0	SMF90TIC	8	binary	Store Clock	Time of change
+8	8	SMF90ICO	8	EBCDIC	ICSCNAME	Old parmlib member, IEAICS** indicates no installation control specification
+16	10	SMF90ICN	8	EBCDIC	MBSUFFIX	New parmlib member
SET MPF Command Section (Subtype 14):						
+0	0	SMF90TMP	8	binary	Store Clock	Time and date of change
+8	8	SMF90MPO	8	EBCDIC	SMFSFX	Name of old parmlib member or blanks if there is old MPFLSTxx parmlib member
+16	10	SMF90MPN	8	EBCDIC	MBSUFFIX	Name of new parmlib member
+24	18	SMF90MPC	8	EBCDIC	MBSUFFIX	Name of old parmlib member for color
SET DAE Command Section (SUBTYPE 16):						
+0		SMF90DAT	8	binary	Store Clock	Time of date and change
+8		SMF90DAO	8	EBCDIC	DFLPLMEM	Name of old parmlib member
+16		SMF90DAN	8	EBCDIC	DFLPLMEM	Name of new parmlib member

[1] If the version number in SMF90RVN equals X'02', the length of this field equals 2; otherwise, the length equals 1.

Record Type 100 (64) – Data Base 2 Statistics

Record type 100 is written by DATABASE 2 (DB2) to record transaction data collected at event monitoring points. For more information about record type 100, see *IBM DATABASE 2 System Planning and Administration Guide* (SC26-4085).

Record Type 101 (65) – Data Base 2 Accounting

Record type 101 is written by DATABASE 2 (DB2) to account for resources during a transaction. For more information about record type 101, see *IBM DATABASE 2 System Planning and Administration Guide* (SC26-4085).

Record Type 102 (66) – Data Base 2 Performance

Record type 102 is written by DB2 to record performance information. For more information about the type 102 record refer to *IBM DATABASE 2 System Planning and Administration Guide* (SC26-4085).

Record Type 110 (6E) – CICS/VS Statistics

Record type 110 is written by CICS/VS to record transaction data collected at event monitoring points. For more information about the type 110 record, refer to *CICS/OS/VS Version 1 Release 7 Customization Guide,* SC33-0239.

Chapter 7: Field-to-Record Cross-Reference

This appendix lists all of the fields in the SMF records in alphabetical order and identifies the record type containing each field. It also gives the displacement of the field within the record.

Some records have sections of fields that are generated only when specific events occur, such as when IPL is completed or when a device is varied online or offline. The following abbreviations appear under the "offset" column to indicate the section of the record where the field is found:

ACT	Accounting section
CHAN	Channel section
CHND	Channel data section
CPU	CPU section
CPUD	CPU data section
CRYP	Cryptography initialization relocate section (5740-XY5, -XY6)
DCB	DCB/DEB DASD extension entry
DEV	Device entry
DEVD	Device data section
DSC	Data set characteristics section
EXT	Extent entry
GENK	GENKEY relocate section (5740-XY5, -XY6)
IDAT	Installation data relocate section (5740-XY5, -XY6)
ISAM	ISAM extension section
KG	Key generator relocate section (5740-XY5, -XY6)
MSS	MSS IPL configuration section
PERF	Performance group period data section
PRNT	3800 Printing Subsystem section
REL	Relocate section
RETK	RETKEY relocate section (5740-XY5, -XY6)
STAT	Statistics section
STOR	Storage section
TAPD	DCB/DEB tape extension entry
TAPU	UCB tape extension entry
UCB	UCB section
VARY	VARY ONLINE,S and VARY OFFLINE,S section
VOL	Volume entry

For MVS/System Product, the fields are not abbreviated and are listed as they appear in the record.

Field Description	Record Type	Offset Dec.	Offset Hex.
Accepting VIO pages	75 Page/Swap data set data section		
	79 PGSP data set section		
Access-method interfaces option codes	14	250	FA
	15	250	FA
Accounting fields, job	5	121	79
	20	65	41
	26**	276	114
	30 Accounting section		
	35	121	79
Accounting fields, step	4	ACT	
	30 Accounting section		
	34	ACT	
Accounting number, networking	26* Network section		
	57** Network section		
	57* Network section		
Accounting number, programmer's	26*	104	68
Address, CPU	22	CPU	
	22	CHAN	
Address, line adapter	48*	72	48
	48**	80	50
Address, VTOC	19	40	28
Address of lowest page in real contiguous storage	22	STOR	
Address space dispatching priority	4	57	39
	30 Processor section		
	34	57	39
Address space identifier	79 ARD/ARDJ section		
	79 ASD/ASDJ section		
	79 SENQR section		
Address space swap sequences	4	REL	
	34	REL	
Allocation, device start time	4	90	5A
	30 Identification section		
	32 Identification section		
	34	90	5A
Allocation status indicator	14	67	43
	15	69	43
	25**	42	2A
Alternate tracks, number of unused	19	50	32
AOBJ value	90 SETDMN section		
ASCB ready queue length	79 SRCS section		
Attentions on ending status of READ channel programs	50	40	28 (5735-RC2)
Attentions received	50	36	24 (5735-RC2)

*These records are for JES2.

**These records are for JES3.

Field Description	Record Type	Offset Dec.	Hex.
Average cycle time	79 CHANNEL section		
Average number of ready users	79 DDMN section		
Average number of slots used	75 Page/Swap data set section		
Beginning cylinder and track	64	EXT	
Bind failure or unbind reason code	39	116	74
Block count for each volume	14	TAPD	
	15	TAPD	
Block size	21	44	2C
	64	DSC	
Blocksize - Sort records			
maximum input	16 Data section		
output	16 Data section		
BUF parameter	0	22	16
Buffer, date record was moved to	ALL[1]	10	A
Buffer, number of bytes in SMF	0	22	16
Buffer, size of time-sharing	31	20	14
Buffer, time record was moved to	ALL[1]	6	6
Buffers, number allowed per terminal before LWAIT	31	26	1A
Buffers, number allowed per terminal before OWAIT	31	24	1B
Buffers, number reserved on free queue	31	32	20
Buffers, number of time-sharing	31	18	12
Buffers, number written	23 Statistics section		
Burster-Trimmer-Stacker	6	PRNT	
Bus-out checks, number of	48**	66	42
Byte count, printed			
actual	26* Print section		
estimated	26* Print section		
Bytes, number sorted	16 Data section		
Bytes read, * 4096	21	56	38
Bytes written, * 4096	21	59	3B
Cards, input, number of	26*	208	D0
	26**	248	F8
Cards, punched, number of	26	120	78
Cards generated to spool, number of	26*	216	D8
	26**	256	100
Card-image records in DD DATA and DD* data sets read for step/job	4	51	33
	5	51	33
	30 I/O activity section		
Catalog name	61	75	4B
	62	46	2E
	63	48	30
	64	44	2C
	65	75	4B
	66	75	4B
	67	44	2C
	68	42	2A
	69	56	38

*These records are for JES2.
**These records are for JES3.
[1]Except 2, 3

Field Description	Record Type	Offset Dec.	Hex.
Catalog record size	63	44	2C
	63	46	2E
	67	132	84
Catalog record	61	208	D0
	65	208	D0
	66	208	D0
Catalog records	63	136	88
	67	134	86
CCHH, beginning	64	EXT	
CCHH, ending	64	EXT	
Channel path id	4	DEV	
	8	DEV	
	9	DEV	
	10	DEV	
	11	DEV	
	14	UCB	
	15	UCB	
	19	64	40
	21	26	1A
	22	CHAN	
	30 EXCP section		
	34	DEV	
	40	DEV	
	64	EXT	
	69	42	2A
Channel busy number of samples	73 Channel path data section		
Channel identifier	79 CHANNEL section		
Channel model number	22	CHAN	
Channel path samples, number of	78 Subtype 1 I/O queuing data section		
Channel path section identification	22	CHAN	
Channel path status	78 Subtype 1 I/O queuing configuration data section Subtype 3 I/O queuing configuraiton data section		
Channel path busy, number of samples	73 Channel path data section		
Channel path busy, percent	79 Subtype 14 I/O queuing section		
Character arrangement table names	6	PRNT	
Class, job	5	75	4B
	26	89	59
Class, associated with PGN	72	62	3E
Class, message	26	88	58
Class, service	39	90	5A
Class, SYSOUT	6	42	2A
Cleaner actions, number of	21	41	29
Collection period begin time stamp	39	2	2
Collection period end time stamp	39	10	A
Configuration indicator	70 CPU section		
Contention index	79 DDMN section		
Command rejects, number of	48**	64	40

*These records are for JES2.
**These records are for JES3.

Field Description	Record Type	Offset Dec.	Offset Hex.
Common area page-ins	4	EL	
	30 Storage and paging section		
	34	REL	
Common area reclaims	4	REL	
	30 Storage and paging section		
	34	REL	
Completion code, JES2	45*	26	1A
Completion code, JES3	45**	25	19
Completion code, job	5	55	37
	30 Completion section		
	35	55	37
Completion code, step	4	55	37
	30 Completion section		
	34	55	37
Completion code, transmission destination	59 Transmission section		
Completion code, transmission origin	59 Transmission section		
Component indicator	64	43	2B
Component or cluster name	62	96	60
	64	88	58
Configuration activity indicator	70 CPU data section		
Connect time, total for this device	30 EXCP section		
Continuous wait time limit	0	18	12
Control areas, number that were split	64	STAT	
Control interval size	64	DSC	
Control intervals, number of unused	64	STAT	
Control intervals, number that were split	64	STAT	
Conversion processor (CPU) identification	26*	224	E0
	26**	264	108
Control unit busy delay	74 Device data section		
Control units attached, number of	78 Subtype 1 I/O queuing configuration data section		
Control unit (logical) identifier	78 Subtype 3 I/O queuing configuration data section		
Control unit (logical) number	74 Device data section		
	79 Subtype 9 device data section		
Converter start time	26*	156	9C
	26**	196	C4
Converter start date	26*	160	A0
	26**	200	C8
Converter stop time	26*	164	A4
	26**	204	CC
Converter stop date	26*	168	A8
	26**	208	D0
Copies, number printed with overlay	6	PRNT	
Copy groups	6	PRNT	
Copy modification module name	6	PRNT	
Count of READ channel programs	50	34	22 (5735-RC2)

*These records are for JES2.
**These records are for JES3.

Field Description	Record Type	Offset Dec.	Offset Hex.
Count of WRITE channel programs	50	30	1E (5734-RC2)
CPU identification	70	8	8
CPU address	22	CPU	
CPU model number	22	CPU	
	70 CPU control section		
CPU resource factor coefficient	72	17	11
CPU serial number	70 CPU data section		
CPU service	4	REL	
	5	REL	
	30 Performance section		
	34	REL	
	35	REL	
CPU service definition coefficient	72 Workload control section		
CPU time	4	99	63
	4	ACT	
	5	77	4D
	5	117	75
	30 Processor accounting section		
	34	99	63
	34	ACT	
	35	77	4D
	35	117	75
CPU service coefficient	79 DDMN section		
CPU-Vector Facility indicator	22 CPU section		
CPU wait time	70 CPU data section		
Cross memory address space indicator	79	106	6A
Cross netowrk session	39	115	73
CSA size	78 Common virtual storage section		
CSA usage	78 Common virtual storage section		
Cryptographic Unit Support	82 (5740-XY6)		
CKDS activity flags	82	KG	
function code	82	43	2B
installation exit data	82	IDAT	
number of variable relocate sections	82	41	19
options	82	CRYP	
return code	82	44	30
Cylinder overflow areas that are full,	14	ISAM	
number of	15	ISAM	
Cylinders, number of unallocated	19	52	34
	69	48	30

Cylinders in independent index, prime data, and independent overflow areas, number of	14 15	ISAM ISAM	
Cylinders in largest continuous unallocated area, number of	69	52	34
Cylinders in largest unallocated extent, number of	19	56	38
DAE COMMAND TIME/DATE	90 Set DATE/TOD section		
DAE MEMBER OLD/NEW	90 Set DATE/TOD section		
DASD volume status indicator	14 15	UCB UCB	
Data checks to read text, number of	48* 48**	60 68	3C 28
Data format error indicators	6**	92	5C
Data overruns, number of	48**	69	45
Data recording devices (DRDs)	22	MSS	

*These records are for JES2.
**These records are for JES3.

Field Description	Record Type	Offset Dec.	Offset Hex.
Data set, accepting VIO pages	75 Page/Swap data set data section		
	79 PGSP data set section		
Data set control indicator	6	66	42
Data set indicator	14	42	2A
	14	55	37
	14	252	FC
	15	42	2A
	15	55	37
	15	252	FC
Data set name	17	44	2C
	18	44	2C
	18	88	58
	79 PAGESP section		
Data set organization	14	244	F4
	15	244	F4
Data set record count	24 SYSOUT selection criteria section		
Data set sequence count	14	TAPU	
	15	TAPU	
Data set sequence number	14	TAPU	
	15	TAPU	
Data set serial number	14	TAPD	
	15	TAPD	
Data sets open on device, total number of	74 Device data section		
	79 Subtype 9 device data section		
Data sets processed by writer, number of	6	56	38
Data space extents, number of free	69	46	2E
Date, deadline schedule	26**	172	AC
Date, JES3 allocation	25**	80	50
Date, JES3 device verification	25**	88	58
Date, logoff	30	10	A
	35	10	A
Date, logon	30 Identification section		
	34	30	1E
	35	30	1E
	40	30	1E
Date, logon enqueue	30 Identification section		
	32 Identification section		
	35	62	3E
Date *START SETUP command issued	25	64	40
Date converter started	26*	160	A0
	26**	200	C8
Date converter stopped	26*	168	A8
	26**	208	D0
Date execution processor started	26*	176	B0
	26**	216	D8
Date execution processor stopped	26*	184	B8
	26**	224	E0
Date fetch processing ended	25**	56	38
Date all volume mount messages issued	25**	80	50

*These records are for JES2.
**These records are for JES3.

Field Description	Record Type	Offset Dec.	Offset Hex.
Date initiator selected step/job	4	47	2F
	5	47	2F
	30 Identification section		
	32 Identification section		
Date, IPL	90 Self-defining section		
Date job terminated	5	10	A
	30	10	A
	35	10	A
Date offload data set was allocated	24 General section		
Date output processor started	26*	192	C0
	26**	232	E8
Date output processor stopped	26*	200	C8
	26**	240	F0
Date output service started	6**	47	2F
Date print/punch processor started	6*	47	2F
Date reader recognized end of job	5	62	3E
	26*	152	98
	26**	192	C0
	30 Identification section		
Date reader recognized the JOB card	4	30	1E
	5	30	1E
	6	30	1E
	10	30	1E
	14	30	1E
	15	30	1E
	17	30	1E
	18	30	1E
	20	30	1E
	25**	30	1E
	26	30	1E
	30 Identification section		
	40	30	1E
	60	62	3E
	61	62	3E
	62	30	1E
	63	30	1E
	64	30	1E
	65	62	3E
	66	62	3E
	67	30	1E
	68	30	1E
	69	30	1E
	78 Subtype 2 (virtual storage) private area data section		
Date record was moved to dump data set	2	10	A
	3	10	A
Date record was moved to SMF buffer	ALL[1]	10	A
Date recording was started when SMF data set became available	7	24	18
Date RMF measurement interval started	70-79	14	E
Date step terminated	4	10	A
	30 Identification section		
	34	10	A
Date transaction queued	59 Transaction type section		

*These records are for JES2.

**These records are for JES3.

[1] Except 2, 3

Field Description	Record Type	Offset Dec.	Hex.
DCBOFLG	21	42	2F
DCB=OPTCD=J	6	PRNT	
DD DATA and DD* data set records read for step/job	4	51	33
	5	51	33
	30 I/O activity section		
DD entry length	14	52	34
	15	52	34
DD name	14	56	38
	15	56	38
	26*	136	88
	30 EXCP section		
	64	DSC	
Deadline schedule date	26**	172	AC
Deadline schedule time	26**	168	A8
Deadline schedule type	26**	124	7C
Deleted records, number of	64	STAT	
Density, tape	21	43	2B
Dependent job net identification	26**	160	A0
Detail recording indicator	90 Subsystem recording section		
Device active time	74 Device data section		
Device allocation requests, number of	14	54	36
	15	54	36
Device busy	74 Device section		
Device busy delay	74 Device data section		
Device class	4	DEV	
	5	73	49
	8	DEV	
	9	DEV	
	10	DEV	
	11	DEV	
	30 EXCP section		
	34	DEV	
	40	DEV	
Device class code	74	6	6
Device connect time	74 Device data section		
Device disconnect time	74 Device data section		
Device indicator	14	55	37
	14	252	FC
	15	55	37
	15	252	FC
Device name, logical input	26	96	60
Device name, logical output	6	72	48
Device name, transmitter	26* Network section		
	57*	64	40
Device number	4 Device section		
	8 Device section		
	9 Device section		
	10 Device section		
	11 Device section		

*These records are for JES2.
**These records are for JES3.

Field Description	Record Type	Offset Dec.	Hex.
	14 UCB section		
	15 UCB section		
	19	64	40
	21	26	1A
	30 EXCP section		
	34 Device section		
	40 Device section		
	64	EXT	
	69	42	2A
	74 Device data section		
	75 Page/Swap data set section		
	79 Subtype 9 (DEV) device data section		
	79 Subtype 11 (PGSP) data set section		
Device pending time	74 Device data section		
Device recording controls, MSF	22	MSS	
Device reserved samples, number of	74 Device data section		
	79 Subtype 9 (DEV) device data section		
Device SSID	22	VAR	
Device type	74 Device control data section		
	79 Subtype 11 (PGSP) data set section		
Devices, MSF data recording	22	MSS	
Devices requested during allocation, number of	14	54	36
	15	54	36
Device allocation start time	4	90	5A
	30 Identification section		
	34	90	5A
Disk volumes, number of requests for	25**	48	30
Disk volumes mounted by MDS, number of	25**	72	48
Dispatch position/priority	79 Subtype 1 (ASD/ASDJ) data section		
DOBJ value	90 SETDMN section		
Domain number	79 ASRM/ASRMJ section		
	90 SETDMN section		
Drive number	19	66	42
DSCBs, number of	19	46	2E
DSCB0s, number of	19	48	30
Dump data set, date record was moved to	2	10	A
	3	10	A
E-Frames	22 Extended storage section		
Dump data set, time record was moved to	2	6	6
	3	6	6
End-of-volume indicator	14	253	FD
	15	253	FD
Ending cylinder and track	64	EXT	
ENQ			
address space identifier of job that issued ENQ	79 Subtype 6 (SENQR) data section		
name of job that issued ENQ system	79 (SENQR) data section		
system identifier of job that issued ENQ	79 (SENQR) data section		

*These records are for JES2.
**These records are for JES3.

Field Description	Record Type	Offset Dec.	Offset Hex.
Enqueue status indicator	77	58	3A
Entries to the I/O SLIH, number of	70	16	10
Entry name	60	120	78
	61	120	78
	63	92	5C
	65	120	78
	66	120	78
	67	88	58
	68	130	82
Entry type indicator	60	119	77
	61	119	77
	63	42	2A
	63	43	2B
	65	119	77
	66	119	77
	67	88	58
	68	86	56
	68	130	82
Equipment checks, number of	48**	67	43
Erase gaps, number of	21	39	27
Errors, line	48*	69	45
	48**	56	38
Errors, number of temporary	53* Identification section		
ERV resource manager coefficient	72	20	14
Event records	37 Event section		
Event type	37 Event section		
Exception responses, number of	53* Identification section		
EXCP count	4	DEV	
	14	UCB	
	15	UCB	
	30 EXCP section		
	34	DEV	
	40	DEV	
	48	52	34
	64	STAT	
	79 ARD/ARDJ section		
EXCP count for step	79 ARD/ARDJ section		
Execution processor (CPU) identification	26*	228	E4
	26**	268	10C
Execution processor start time and date	26*	172	AC
	26**	212	D4
Execution processor stop time and date	26*	180	B4
	26**	220	AC
Execution time, estimated	26	112	70
Exits, names of active	90 Subsystem recording section		

*These records are for JES2.
**These records are for JES3.

Field Description	Record Type	Offset Dec.	Offset Hex.
Exposures for a multiple exposure device, number of	74 Device control data section		
Extended storage frames	22 Extended storage section		
Extents, number of	14	UCB	
	15	UCB	
	64	STAT	
Extents, number of unallocated	19	60	3C
Extents in independent index, prime data, and independent overflow areas, number of	14	ISAM	
	15	ISAM	
Extents released by DADSM routine, number of	14	DCB	
	15	DCB	
FCB image indentification	6	80	50
	24 SYSOUT selection criteria section		
Feet of document printed, number of	6*	64	40
Fetch processing end date	25**	56	38
Fetch processing end time	25**	52	34
Fixed frames below 16 megabytes, average number of	71	344	158
Fixed frames below 16 megabytes, maximum number of	71	340	154
Fixed frames below 16 megabytes, minimum number of	71	336	150
Fonts, number loaded	6*	40	28
Fonts, number used	6*	36	24
Form number	6	57	39
	6* JES2 routing section		
	26*	124	7C
	26* Print section		
FORMDEFS, number used	6*	72	48
Forms Overlay name	6	PRNT	
Frames,			
Extended storage	22 see Extended storage section		
Min/max/avg CSA	71	204	CC
	71	208	D0
	71	212	D4
Min/max/avg LSQA	71	324	144
	71	328	148
	71	332	14C
Min/max/avg LPA	71	312	138
	71	316	13C
	71	320	140
Min/max/avg in private address space	71	216	D8
	71	220	DC
	71	224	E0
Min/max/avg SQA	71	192	C0
	71	196	C4
	71	200	C8
Min/max/avg total	71	228	E4
	71	232	E8
	71	236	EC

*These records are for JES2.
**These records are for JES3.

Field Description	Record Type	Offset Dec.	Hex.
number above or below the 16-megabyte line	71 Paging data section		
Unused in nucleus	71	140	8C
Min/max/avg unused	71	84	54
	71	88	58
	71	92	5C
Function active time	79 Subtype 9 (DEV) device data section		
Function pending time	79 Subtype 9 (DEV) device data section		
Functional indicator	40	43	2B
FWKL value	90 SETDMN section		
GENKEY flags	82	GENK (5740-XY5, -XY6)	
GENKEY key name	82	GENK	
GETMAIN limit	78 Subtype 2 (virtual storage) area data section		
Highest used relative byte address	64	134	86
IEAICSxx member used old/new	72 Workload control section		
	72 Workload control section		
	79 Subtype 8 (TRX) data section		
	90 IPL SRM section		
	90 SET ICS section		
IEAIPSxx member	79 Subtype 8 (TRX) data section		
IEAOPTxx member	72 Workload control section		
	72	96	60
I/O processing method indicator	14	253	FD
	15	253	FD
I/O service	4	REL	
	5	REL	
	30 Performance section		
	34	REL	
	35	REL	
I/O status	6	55	37
IOP data status	78 Subtype 3 IOP initiative queue section		
Impulse Hit Count	37	10	A
Index levels, number of	14	ISAM	
	15	ISAM	
	64	STAT	
Initial selection attempts, total number of	78 Subtype 1 I/O queuing data section		
Initialization deck origin	43**	29	1D
Initiator select data for step/job	4	47	2F
	5	47	2F
	30 Identification section		
	32 Identification section		
Initiator select time for step/job	4	43	2B
	5	43	2B
	30 Identification section		
	32 Identification section		
	34	43	2B
Initiator Vector Facility affinity time	30	32	20
Initiator Vector Facility usage time	30	24	18
Input cards for job, number of	26*	208	D0
	26**	248	F8

*These records are for JES2.
**These records are for JES3.

Field Definition	Record Type	Offset Dec.	Offset Hex.
Input class for job	5	75	48
	30 Identification section		
Input processor (CPU) identification	26*	220	DC
	26**	260	104
Input route code	26*	94	5E
Input/output (*see* I/O)			
Inserted records, number of	64	STAT	
Intelligience controller name	50	18	12 (5735-RC2)
Interventions required, number of	48**	65	41
I/O service definition coefficient	79 Subtype 10 (DDMN) data section		
IOC resource factor coefficient	72 Workload control section		
IOC service definition coefficient	72 Workload control section		
IPL reason	90 IPL PROMPT section		
IPS name	90 IPS section		
JES selection priority	5	57	39
	26	90	5A
	26	91	5B
	30 Identification section		
	32 Identification section		
	35	59	3B
JES job number	6	68	44
	26	56	38
	30 Identification section		
	32 Identification section		
JES2 completion code	45	26	1A
JES2 identification	6*	62	3E
	24	18	12
	26*	46	2E
	43*	18	12
	45*	18	12
	47*	18	12
	48*	18	12
	49*	18	12
JES2 job selection priority	26*	90	5A
	26*	91	5B
JES2 logical input device name	26*	96	60
JES2 logical output device name	6*	72	48
JES2 output selection priority	26*	92	5C
	26*	93	5D
JES2 start options	43*	27	1B
JES2 termination indicator	45*	24	18
JES2-assigned job number	6*	68	44
	26*	56	38
	30 Identification section		
	32 Identification section		
JES3 allocation completion date	25**	80	50
JES3 allocation completion time	25**	76	4C
JES3 completion code	45**	25	19
JES3 device verification date	25**	88	58

*These records are for JES2.
**These records are for JES3.

Field Description	Record Type	Offset Dec.	Offset Hex.
JES3 device verification time	25**	84	54
JES3 identification	6*	60	3C
	26**	46	2C
	43**	18	12
	45**	18	12
	47**	18	12
	48**	18	12
	49**	19	12
JES3 initialization deck origin location	43**	30	1E
JES3 initialization deck origin type	43**	29	1D
JES3 job selection priority	26**	90	5A
	26**	91	5B
JES3 logical input device group name	26**	128	80
JES3 logical input device name	26**	96	60
JES3 logical output device group name	26**	96	60
JES3 logical output device name	26**	72	48
JES3 procedure name	43**	38	26
JES3 start options	43**	26	1A
JES3 termination indicator	45**	24	18
JES3-assigned job number	6**	68	44
	26**	56	38
JFCB	14	68	44
	15	68	44
FJCB TTR address	14	64	40
	15	64	40
Job			
origin	57**	106	6A
Job accounting fields	5	121	79
	26 Network section		
	30 Accounting section		
	35	121	79
Job class	5	75	4B
	30 Identification section		
	24 Job selection criteria section		
	26	89	59
Job class name	26**	176	B0
Job completion code	5	55	37
	30 Completion section		
	35	55	37
Job CPU time	5	77	4D
	5	117	75
	30 Processor accounting		
	35	77	4D
	35	117	75
Job identification	26	60	3C
current	24 General section		
	26	60	3C
	57**	24	18
	24 General section		
original	57**	24	18
Job information indicator	26	54	36

*These records are for JES2.

Field Description	Record Type	Offset Dec.	Offset Hex.
Job log identification	4	18	12
	5	18	12
	6	18	12
	10	18	12
	14	18	12
	15	18	12
	17	18	12
	18	18	12
	20	18	12
	24 General section		
	25**	18	12
	26	18	12
	30 Identification section		
	40	18	12
	60	50	33
	61	50	33
	62	18	12
	63	18	12
	64	18	12
	65	50	33
	66	50	33
	67	18	12
	68	18	12
	69	18	12
	78 Subtype 2 (virtual storage) private area data section		
Job name	4	18	12
	5	18	12
	6	18	12
	10	18	12
	14	18	12
	15	18	12
	17	18	12
	18	18	12
	20	18	12
	25**	18	12
	26	18	12
	30 Identification section		
	32 Identification section		
	34	18	12
	35	18	12
	40	18	12
	57**	34	22
	60	50	32
	61	50	32
	62	18	12
	63	18	12
	64	18	12
	65	50	32
	66	50	32
	67	18	12
	68	18	12
	69	18	12
	78 Subtype 2 (virtual storage) private area data section		
	82	24	18
Job Number	6	68	44
	26	56	38
	30 Identification section		
	32 Identification section		
current	57**	42	2A
original	57**	46	2E

*These records are for JES2.
**These records are for JES3.

Field Description	Record Type	Offset Dec.	Hex.
Job print copy count	26*	128	80
Job print route code	26*	132	84
Job priority	5	57	39
	30 Processor accounting section		
	35	57	39
Job selection priority	26	90	5A
	26	91	5B
Job performance group number	4	REL	
	5	92	5C
	30 Identification section		
	32 Identification section		
	34	REL	
	35	92	5C
Job punch route code	26*	134	86
Job service	5	80	50
	30 Performance section		
	35	80	50
Job/step Vector Facility affinity time	30	28	1C
Job/step Vector Facility usage time	30	20	14
Job termination date	5	10	A
	30	10	A
	35	10	A
Job termination indicator	5	66	42
	30 Completion section		
	35	66	42
Job termination time	5	6	6
	30	6	6
	35	6	6
Job transaction active time	5	84	54
	30 Performance section		
	35	84	54
Job transaction residency time	6		
	30 Performance section		
	35	68	44
Job transmitter			
Start/stop time	26* Network section		
Start/stop date	26* Network section		
Job type indicator	57**	28	2C
Job wait time limit	0	18	12
JWT parameter	0	18	12
	90 SMF command section		
Key, storage protect	4	86	56
	5	76	4C
	30 Storage and paging section		
	34	86	56
	35	76	4C
Key length	64	DSC	
Length of accounting and availability data sections	39	36	24
Length of DD entry	14	52	34
	15	52	34
Length of LPDA-2 section	37	66	42
Length of LAN section	37	74	4A

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**These records are for JES3.

Field Description	Record Type	Offset Dec.	Hex.
Length of measurable interval	23 System section		
	90 Subsystem recording section		
Length of product section	39	44	
Length of securing header	82	18	12
Limit, continuous wait time	0	18	12
	90 SMF command section		
Line adapter number	48*	72	48
	48**	80	50
Line errors	48*	68	44
	48**	56	38
Line name	47	36	24
	48	36	24
	49	36	24
	52* Identification section		
	53* Identification section		
	55*	34	22
	56*	34	22
	58* Identification section		
Line quality	37	6	6
Lines, output, number of	26	116	74
Lines, terminal input, number of	34	51	33
	30 I/O activity section		
	35	51	33
Lines, terminal output, number of	34	47	2F
	30 I/O activity section		
	35	47	2F
Lines generated to spool, number of	26*	212	D4
	26**	252	FC
Lines, password	52* Identification section		
	53* Identification section		
Lines per page, number of	26*	130	82
Lines, VTAM requests processed	53* Identification section		
Link pack area page-ins	4	REL	
	30 Storage and paging section		
	34	REL	
Link pack area reclaims	4	REL	
	30 Storage and paging section		
	34	REL	
Link Segment Level	37	3	3
Local Modem Report	37	8	8
Local page data set slots			
min/max/avg allocated to	71	204	CC
non-VIO private area	71	208	D0
	71	212	D4
min/max/avg allocated to	71	192	C0
VIO private area	71	196	C4
	71	200	C8
	71	288	120
min/max/avg unallocated	71	180	B4
	71	184	B8
	71	188	BC
min/max/avg unusable	71	216	D8
	71	220	DC
	71	224	E0

*These records are for JES2.
**These records are for JES3.

Field Description	Record Type	Offset Dec.	Hex.
Logical record size, maximum	64	DSC	
Logical record, TP	57*	100	64
Logical records, number written	6	51	33
Logical records in overflow and prime data areas, number of	14	ISAM	
	15	ISAM	
Logoff date	30	10	A
	35	10	A
Logoff time	30	6	6
	35	6	6
Logon date	30 Identification section		
	34	30	1E
	35	30	1E
	40	30	1E
Logon enqueue date	30 Identification section		
	35	62	3E
Logon enqueue time	30 Identification section		
	35	58	3A
Logon priority	30 Identification section		
	35	57	39
Logon time	30 Identification section		
	34	26	1A
	35	26	1A
	40	26	1A
Lost dates, number of	48**	70	46
Lowest page address in real continuous storage	22	STOR	
LPA page-ins	4	REL	
	30 Storage section		
	34	REL	
LPA reclaims	4	REL	
	30 Storage section		
	34	REL	
LPA size	78 Common virtual storage section		
LSQA storage usage	78 Private virtual storage section		
LU name	47**	36	24
	48**	36	24
	48**	36	24
MAC address, downstream	37	36	24
MAC address, upstream	37	30	1E
Macro instruction and option types	14	247	F7
	14	ISAM	
	15	247	F7
	15	ISAM	
Main storage service	4	REL	
	5	REL	
	30 Performance section		
	34	REL	
	35	REL	
Main storage service definition coefficient	72	34	22
MAXDORM value	90 SMF command section		
Maximum input block size	16 Data section		

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Field Description	Record Type	Offset Dec.	Offset Hex.
Maximum logical record size	64	DSC	
Measurement interval, RMF			
date started	70-79	14	E
duration	70-79	18	12
Message class	26	88	58
Message text	47	54	36
	49	54	36
Model number, channel	22	CHAN	
Model number, CPU	22	CPU	
Modem address	37 Modem section		
Modem Model	37	4	0
Modem Sense Byte	37	2	2
Modem Speed	37	16	10
Modem Type	37	0	0
Module identification	19	66	42
MPL value	90 SETDMN section		
	79 DDMN section		
MSF data recording devices	22	MSS	
MSF device recording controls	22	MSS	
MSF indicator	22	MSS	
MSO service coefficient	79 DDMN section		
MSS volume requests	25**	92	5C
MVS/BDT,			
destination file name	59 Transaction type section		
job number	59 Transaction identifier section		
node name	59 Product section		
origin file node	59 Transaction type section		
PDS member name of destination file	59 Transaction type section		
transaction queuing node	59 Transaction identifier section		
transaction source node	59 Transaction identifier section		
transaction source processor name	59 Transaction identifier section		
MVS software level	70	40	28
	71	40	28
	72	40	28
	73	40	28
	74	40	28
	75	40	28
	76	40	28
	77	40	28
	78	40	28
	79	40	28
Name of catalog	61	75	4B
	62	46	2E
	63	48	30
	64	44	2C
	65	75	48
	66	75	48
	67	44	2C
	68	42	2A
	69	66	34
Name of component or cluster	62	96	60
	64	88	58

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Field Description	Record Type	Offset Dec.	Offset Hex.
Name of data set	17	44	2C
	18	44	2C
	18	88	58
Name of device, logical	6	72	48
	26	96	60
Name of entry	60	120	78
	61	120	78
	63	92	5C
	65	120	78
	66	120	78
	67	88	58
	68	86	56
	68	130	82
Name of exits	90 Subsystem recording section		
Name of IPS	72	56	38
Name of job	4	18	12
	5	18	12
	6	18	12
	10	18	12
	14	18	12
	15	18	12
	17	18	12
	18	18	12
	20	18	12
	25**	18	12
	26	18	12
	30 Identification section		
	32 Identification section		
	34	18	12
	35	18	12
	40	18	12
	59 Transaction data section		
	60	50	32
	61	50	32
	62	18	12
	63	18	12
	64	18	12
	65	50	32
	66	50	12
	67	18	12
	68	18	12
	69	18	12
	78 Private virtual storage section		
	82	24	18
Name of job class	26**	176	80
Name of line	47	36	24
	48	36	24
	49	36	24

**These records are for JES3.

Field Description	Record Type	Offset Dec.	Offset Hex.
Name of LU	47**	36	24
	48**	36	24
	49**	36	24
Name of program	4	58	3A
	30 Identification section		
	34	58	3A
	78 Private virtual storage section		
Name of programmer	5	97	61
	20	44	26
	26	68	44
	59 Transaction data section		
Name of remote device	47	28	1C
	48	28	1C
	49	28	1C
Name of step	4	66	42
	30 Identification section		
	34	66	42
	78 Private virtual storage section		
	82	32	20
Name of system, if NJP	26**	96	60
	26**	144	90
	26**	152	98
Name of VSAM Volume data set	60	75	4B
Name of work station	47**	28	1C
	48**	28	1C
	49**	28	1C
Name of work station	47**	28	1C
	48**	28	1C
	49**	28	1C
NCP entered slowdown, number of times	50	58	3A
Negative acknowledgements to write text, number of	48*	56	38
	48**	62	3E
Negative response count, RECEIVE	48**	62	3E
Negative response count, SEND	48**	60	3C
Network accounting number	26* Network section		
	57**	74	4A
New catalog record	61	208	D0
	63	136	88
	65	208	D0
	66	208	D0
	67	134	86
New catalog record size	63	44	2C
	67	132	84
New data set name	18	88	58

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New entry name	66	164	A4
	68	130	82
New VSAM Volume Record	60	208	D0
Node name	26**	Network section	
	55*	24	18
	56*	24	18
	58*	24	18
	59 Product section		
executing	57*	48	30
	57**	122	7A
destination	57**	138	8A
next	57*	40	28
original	24 General section		
	57*	40	28
Noise blocks, number of	21	38	26
Non-VIO, non-swap page-ins	4	REL	
	30 Storage and paging section		
	34	REL	

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Field Description	Record Type	Offset Dec.	Hex.
Non-VIO, non-swap page-outs	4	REL	
	30 Storage and paging section		
Non-VIO page reclaims	30 Storage and paging section		
NPA,			
Event records	37 Event section		
Event type	37 Event section		
Modem address	37 Event section		
Release level	37 Event section		
Resource name, failure	37 Event section		
Resource type, failure	37 Event section		
Nucleus size	78 Common virtual storage section		
Number of accounting and availability data sections	39	38	26
Number of address space swap sequences	4	REL	
	30 Storage and paging section		
	34	REL	
	79 SRCS Data section		
Number of address space swap sequences	4	REL	
	30 Storage and paging section		
	34	REL	
	79 SRCS Data section		
Number of blocks per volume	14	TAPD	
	15	TAPD	
Number of buffers allowed per terminal before LWAIT	31	26	1A
Number of buffers allowed per terminal before OWAIT	31	24	18
Number of buffers reserved on free queue	31	32	20
Number of buffers			
written	23 Statistics section		
minimum/maximum	90 SMF command section		
Number of bus-out checks	48**	66	42
Number of bytes in real storage	0	31	1F
Number of bytes in SMF buffer	0	22	16
Number of bytes in virtual storage	0	26	1A
Number of bytes sorted	16 Data section		
Number of cards, input	26*	208	D0
	26**	248	F8
Number of cards, output punched	26	120	78
Number of cards generated to spool	26*	216	D8
	26**	256	100
Number of card-image records in DD DATA and DD* data sets read for step/job	4	51	33
	5	51	33
	30 I/O activity section		
Number of cleaner actions	21	41	29
Number of command rejects	48**	64	40
Number of copies printed	6	PRNT	

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Field Description	Record Type	Offset Dec.	Offset Hex.
Number of control bytes sent from primary to secondary	39	24	68
Number of control bytes sent from secondary to primary	39	24	18
Number of control PIUs sent from primary to secondary	39	20	14
Number of control PIUs sent from secondary to primary	39	28	1C
Number of cylinders in independent index, prime data, and independent overflow areas	14 15	ISAM ISAM	
Number of cylinders in largest continuous unallocated area	69	52	34
Number of cylinders in largest unallocated extent	19	56	38
Number of data checks to read text	48* 48**	60 68	3C 44
Number of data overruns	48**	69	45
Number of data sets			
open	79 DEV section		
requested	75	144	90
Number of data set sequences	14 15	TAPU TAPU	
Number of data sets processed by writer	6	56	38
Number of devices requested during allocation	14 15	54 54	36 36
Number of disk volumes requested	25**	48	30
Number of disk volumes mounted by MDS	25**	72	48
Number of DSCBs	19	46	2E
Number of DSCB0s	19	48	30
Number of E-frames	70 Paging data section		
available	79 Subtype 1 (ASD and ASDJ) data section		
installed	79 Subtype 1 (ASD and ASDJ) data section		
Number of enqueued requests	79 CHANNEL section		
Number of entries on CU-HDR queue	79 Subtype 14 I/O queuing section		
Number of equipment checks	48**	69	45
Number of erase gaps	21	39	27
Number of EXCPs	4 14 15 30 EXCP section 34 40 48 64	DEV UCB UCB DEV DEV 52 STAT	 34
Number of EXCP for address spaces	30 I/O activity section		
Number of exposures for a multiple exposure device	74 Device control data section		
Number of extents	14 15 64	UCB UCB STAT	

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Field Description	Record Type	Offset Dec.	Offset Hex.
Number of extents in independent index, prime data, and independent overflow areas	14 15	ISAM ISAM	
Number of extents released by DADSM routine	14 15	DCB DCB	
Number of feet of document printed	6*	64	40
Number of fonts loaded	6*	40	28
Number of fonts used	6*	36	24
Number of FORMDEFS used	6*	72	48
Number of 4k frames in this contiguous block	22 Extended storage section		
Number of frames	71 Paging data section		
available	79 SPAG section 79 SRCS section		
common pageable and fixed	79 SRCS section		
common/private fixed	79 SRCA section		
LPA/CSA fixed	79 SRCS section		
LPA/CSA pageable	79 SRCS section		
LSQA/non-LSQA fixed	79 ARD/ARDJ section 79 SRCS section		
SQA	79 SRCS section		
Number of free data space extents	69	46	2E
Number of full cylinder overflow areas	14 15	ISAM ISAM	
Number of full SMF buffers	23 Statistics section		
Number of inbound PIUs	50	44	2C (5735-RC2)
Number of interventions requried	48**	65	41
Number of I/O requests for a data set	75 Page/Swap data set data section 79 Subtype 11 (PGSP) data set section		
Number of LAN sections	37	76	4C
Number of line errors	48* 48**	68 56	44 38
Number of lines per page	26*	130	82
Number of logical records in overflow and prime data areas	14 15	ISAM ISAM	
Number of logical records written	6	51	33
Number of lost datas	48**	70	46
Number of LPDA-2 sections	37	68	44
Number of negative acknowledgements to write text	48* 48**	56 62	38 3E
Number of negative acknowledgements to write text	48* 48**	56 62	38 3E
Number of noise blocks	21	38	26
Number of non-specific DASD mounts	30 Operator section		
Number of non-specific tape mounts	30 Operator section		
Number of non-specific MSS mounts	30 Operator section		
Number of non-VIO, non-swap page-ins	4 30 Storage and paging section 34	REL REL	

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Field Dsscription	Record Type	Offset Dec.	Hex.
Number of non-VIO, non-swap page-outs	4	REL	
	30 Storage and paging section		
	34	REL	
Number of non-VIO page reclaims	30 Storage and paging section		
Number of outbound PIUs	50	50	32 (5735-RC2)
Number of output lines	26	116	46
Number of output lines generated to spool	26*	212	D4
	26**	252	FC
Number of output punched cards	26	120	78
Number of overlays loaded	6*	48	30
Number of overlays used	6*	44	2C
Number of page seconds	4	REL	
	30 Storage and paging section		
	34	REL	
Number of page segments loaded	6*	56	38
Number of page segments used	6*	52	34
Number of PAGEDEFS	6*	68	44
Number of pages-current transaction	79 Subtype 2 (ARD/ARDJ) data section		
Number of pages in real contiguous storage	22	STOR	
Number of pages moved to frames above or below the 16-megabyte line	71 Paging data section		
Number of pages printed	6	88	58
Number of pages stolen	4	REL	
	30 Storage and paging section		
	34	REL	
Number of pages swapped in	4	REL	
	30 Storage and paging section		
	34	REL	
Number of pages swapped out	4	REL	
	30 Storage and paging section		
	34	REL	
Number of pages transferred	75	152	98
	79 PGSP section		
Number of permanent read errors	21	36	24
Number of permanent write errors	21	37	25
Number of read or write accesses to an overflow record	14	ISAM	
	15	ISAM	
Number of read buffers used	50	52	34 (5735-RC2)
Number of reclaims	4	REL	
	34	REL	
Number of records deleted, inserted, updated, and retrieved from component	64	STAT	
Number of records in component	64	STAT	
Number of records lost	7	18	12
Number of records sorted	16 Data section		
Number of records transmitted or received	24 General section		

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Field Description	Record Type	Offset Dec.	Hex.
Number of response-time data sections	39	20	1E
Number of route data sections	39	22	16
Number of samples	70 Product section		
	71 Product section		
	73 Product section		
	74 Product section		
	75 Product section		
	76 Product section		
	78 Product section		
	78 Subtype 2 (virtual storage) private area data section		
	79 Subtype 9 (DEV) device data section		
Number of samples in an interval	79 Subtype 9 (DEV) device data section		
Number of samples indicating that the control unit is busy	79 Subtype 9 (DEV) device data section		
Number of samples indicating that the data set is being used by ASM	75	140	8C
	79 PGSP section		
Number of samples indicating a delay because a loosely-coupled processor reserved the device	74 Device section		
Number of samples indicating that the device was allocated	74 Device section		
	79 DEV section		
Number of sample indicating that the device was busy while the control was not	79 DEV section		
Number of samples indicating that the device was not ready	74 Device section		
Number of samples indicating that the device was reserved	74 Device section		
Number of samples indicating that the physical channel was in burst mode	79 CHANNEL section		
Number of samples indicating that the physical channel was in a wait state	79 CHANNEL section		
Number of session configuration sections	39	14	E
Number of slots			
bad	79 DDMN section		
total	75	120	78
	79 PGSP section		
used, min/max	75	124	7C
	75	128	80
	79 PGSP section		
unused	75	136	88
Number of SMF records written	23 Statistics section		
Number of split control areas	64	STAT	
Number of split control intervals	64	STAT	
Number of SSCHs	21	34	22
	74	16	10
	79	16	10
Number of step	4	42	2A
	30 Identification section		
	34	42	2A
	40	42	2A

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Field Description	Record Type	Offset Dec.	Offset Hex.
Number of steps in job	5	42	2A
	30 Identification section		
	35	42	2A
Number of swap candidates	70 Swap placement section		
Number of swap-ins	79 SPAG section		
Number of swap sequences	4	REL	
	30 Storage and paging section		
	34	REL	
Number of swaps migrated from extended storage	70 Swap placement section		
Number of specific DASD mounts	30 Operator section		
Number of specific MSS mounts	30 Operator section		
Number of specific tape mounts	30 Operator section		
Number of tape volumes requested	25**	44	2C
Number of tape volumes mounted by MDS	25**	68	44
Number of temporary read errors	21	32	20
Number of temporary write errors	21	33	21
Number of terminal input lines	30 I/O activity section		
	34	51	33
	35	51	33
Number of terminal output lines	30 I/O activity section		
	34	47	2F
	35	47	2F
Number of text bytes sent from primary to secondary	39	40	28
Number of text bytes sent from secondary to primary	39	48	30
Number of text PIUs sent from primary to secondary	39	36	24
Number of text PIUs sent from secondary to primary	39	44	2C
Number of TGETs	30 I/O activity section		
	32 TSO command section		
Number of times NCP entered slowdown	50	58	3A
Number of time-outs to read text	48*	64	40
	48**	60	3C
Number of time-sharing buffers	31	18	12
Number of TPUTs	30 I/O activity section		
	32 TSO command section		
Number of tracks allocated on device	14	UCB	
	15	UCB	
Number of tracks in largest unallocated extent	19	58	3A
Number of tracks in largest continuous unallocated area	69	54	36
Number of tracks in overflow area	14	ISAM	
	15	ISAM	

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Field Description	Record Type	Offset Dec.	Hex.
Number of tracks released by DADSM routine	14 15	DCB DCB	
Number of tracks requested but not allocated	64	132	84
Number of tracks used by sort	16 Data section		
Number of transactions	30 Performance section 35 39	 88 24	 58 18
Number of TSO commands	32 Command section		
Number of unallocated cylinders	19 69	52 48	34 30
Number of unallocated extents	19	60	3C
Number of unallocated tracks	19 69	54 50	36 32
Number of unused alternate tracks	19	50	32
Number of unused control intervals	64	STAT	
Number of VIO and non-VIO pages for current transaction	79 Subtype 2 (ARD/ARDJ) data section		
Number of VIO page reclaims	30 Storage and paging section		
Number of VIO page-ins	4 30 Storage and paging section 34	REL REL	
Number of VIO page-outs	4 30 Storage and paging section 34	REL REL	
Number of volumes	17 18 62	91 135 140	5B 53 58
Number of work data sets used	16 Data section		
Number of work data sets used	16 Data section		
Offset to LPDA-2 section	37	62	3E
Offset to LAN section	37	70	46
Offload data set name	24 General section		
Old catalog record	63	136	54
Old catalog record size	63	46	2E
Old data set name	18	44	2C
Old entry name	66 68	120 86	78 56
OPEN routine indicator	14 15	249 249	F9 F9
Open status indicator	62	42	2A
Operating system release level	23 System section		
Operators name	90 IPL PROMPT section		
OPT member used old/new	90 IPL SRM section 90 SET OPT section		
OPTCD=J	6	PRNT	
Options, SMF	0 90 SMF section	30	1E

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Field Description	Record Type	Offset Dec.	Hex.
Output form number	26*	124	4E
Output lines, number of	26	116	74
Ouptut lines generated to spool, number of	26*	212	D4
	26**	250	100
Output priority	6**	94	5E
Output processor (CPU) identification	26*	232	E8
	26**	272	110
Output processor start time and date	26*	188	BC
	26**	228	E4
Output processor stop time and date	26*	196	C4
	26**	236	EC
Output punched cards, number of	26	120	78
Output selection priority	24 SYSOUT selection criteria section		
Overlay name	6	PRNT	
Overlays, number loaded	6	48	30
Overlays, number used	6	44	2C
OWAIT threshold	31	28	1C
Owner identification of direct access volume	19	26	1A
Page count, printed			
actual	26* Print section		
estimated	26* Print section		
Page data set slots			
allocated to VIO	71	128	80
allocated to non-VIO	71	132	84
total number	71	124	7C
unallocated	71	136	88
Page movement rate, total	71	348	15C
Page reclaims, LPA	4	REL	
	30 Storage and paging section		
	34	REL	
	71	88	58
Page reclaims, non-VIO, non-swap	71	64	40
Page seconds	4	REL	
	30 Storage and paging section		
	34	REL	
Page segments, number loaded	6	56	38
Page segments, number used	6	52	34
PAGEDEFS, number used	6	68	44
Page-ins, LPA	4	REL	
	30 Storage and paging section		
	34	REL	
	71	104	68
Page-ins, non-VIO, non-swap	4	REL	
	30 Storage and paging section		
	34	REL	
	71	56	38

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Field Description	Record Type	Offset Dec.	Hex.
Page-ins, VIO	4	REL	
	30 Storage and paging section		
	34	REL	
	71 Paging data section		
Page-outs, non-VIO, non-swap	4	REL	
	30 Storage and paging section		
	34	REL	
	71 Paging data section		
Page-outs, VIO	4	REL	
	30 Storage and paging section		
	34	REL	
	71 Paging data section		
Pages, number in real contiguous storage	22	STOR	
Pages, number moved to frames above or below the 16-megabyte line	71 Paging data section		
Pages, number of printed	6	88	58
Pages, stolen	30 Storage and paging section		
Pages swapped in, number of	4	REL	
	30 Storage and paging section		
	34	REL	
	71 Paging data section		
Pages swapped out, number of	4	REL	
	30 Storage and paging section		
	34	REL	
	71	76	4C
Password	47	44	2C
	48	44	2C
	49	44	2C
	54* Identification section		
	55*	34	22
	55*	42	2A
	56*	34	22
	56*	42	2A
Performance class name	39	82	52
Performance group number	4	REL	
	5	92	5C
	30 Identification section		
	32 Identification section		
Performance group number (continued)	34	REL	
	35	92	5C
	79 Subtype 3 (ARD/ARDJ) data section		
	79 Subtype 3 (ASD/ASDJ) data section		
	79 Subtype 5 (ASRM/ASRMJ) data section		
	79 Subtype 8 (TRX) data section		
Performance group number, highest defined in IPS			
Permanent read errors, number of	21	36	24
Permanent write errors, number of	21	37	25
PG number, highest defined in IPS or ICS	72	4	4
Physical unit (PU) name for SLU	39	50	32
PLU domain name	39	34	22

*These records are for JES2.
**These records are for JES3.

Field Description	Record Type	Offset Dec.	Offset Hex.
PIUs, number inbound	50	46	2E (5735-RC2)
PIUs, number outbound	50	50	32 (5735-RC2)
PLU subarea physical unit (PU)	39	26	1A
Positive response count, RECEIVE	48**	66	42
Positive response count, SEND	48**	64	40
Print copy count, job	26*	128	80
Print route code, job	26*	132	84
Print/punch processor start time	6*	43	2B
Printed byte count			
actual	26 Print section		
estimated	26 Print section		
Printed page count			
actual	26 Print section		
estimated	26 Print section		
Priority, address space dispatching	4	57	39
	30 Processor section		
	34	57	39
Priority, job	5	57	39
	30 Identification section		
	35	57	39
Priority, job selection	26	90	5A
	26	91	5B
Priority, logon	30 Identification section		
	35	57	39
Priority, output selection	6**	94	5E
	24 SYSOUT selection criteria		
	26*	92	5C
	26*	93	5D
Primary link name	39	18	12
Primary logical unit (PLU) name	39	2	2
Primary physical unit (PU) name	39	10	A
Private area, storage used from bottom of	4	78	4E
	30 Storage and paging section		
	34	78	4E
	78 Private virtual storage section		
Private area, storage used from top of	4	76	4C
	30 Storage and paging section		
	34	76	4C
	78 Private virtual storage section		
Private area size in bytes, below and above 16 megabytes	30 Storage and paging section		
	78 Common virtual storage section		
	78 Private virtual storage section		
Procedure DDNAME	26	136	88
Procedure name, JES3	43**	38	26
Processor time used by sort	16 Data section		
Product name	30 Product section		
	32 Product section		
	90 Product section		

*These records are for JES2.
**These records are for JES3.

Field Description	Record Type	Offset Dec.	Hex.
Program name	4	58	3A
	30 Identification section		
	34	58	3A
	78 Private virtual storage section		
Program start time	4	94	5E
	34	94	5E
Programmed Cryptographic Facility	82		(5740-XY5)
CKDS activity flags	82	KG	
function code	82	43	2B
installation exit data	82	IDAT	
job/step name, RACF user/ group flag	82	40	28
number of variable relocate sections	82	41	29
options	82	CRYP	
return code	82	44	2C
Programmer's accounting number	26*	104	68
Programmer's building	26**	390	186
	59	98	62
Programmer's department	26**	382	175
	59	90	5A
Programmer's name	5	97	61
	30 Identification section		
	20	44	2C
	26	68	44
	57**	46	2E
	59	62	3E
Programmer's room number	26*	108	8C
	26*	398	18E
	59	82	52
Punch route code, job	26*	134	86
Punched cards, number of	26	120	78
Punched cards generated to spool, number of	26*	216	D8
	26**	256	100
RACF Group ID	20	REL	
	30 Identification section		
	32 Identification section		
RACF Terminal ID	20	REL	
	30 Identification section		
	32 Identification section		
RACF User ID	20	REL	
	30 Identification section		
	32 Identification section		
RBA, highest used	64	134	86
READ buffers used	50	54	36 (5735-RC2)
READ channel programs	50	34	22 (5735-RC2)
Read errors, number of	21	32	20
	21	36	24
Read or write accesses to an overflow record, number of	14	ISAM	
	15	ISAM	
Reader device class	5	73	49
	30 I/O activity section		

*These records are for JES2.
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Field Description	Record Type	Offset Dec.	Offset Hex.
Reader device type	30 I/O activity section		
Reader end date	5	62	3E
	30 Identification section		
	26*	152	98
	26**	192	C0
Reader end time	5	58	3A
	26*	148	94
	26**	188	BC
	30 Identification section		
Reader start date	4	30	1E
	5	30	1E
	6	30	1E
	10	30	1E
	14	30	1E
	15	30	1E
	17	30	1E
	18	30	1E
	20	30	1E
	25**	30	1E
	26	30	1E
	30 Identification section		
	32 Identification section		
	40	30	1E
Reader start date	60	62	3E
	61	62	3E
	62	30	1E
	63	30	1E
	64	30	1E
	65	62	3E
	66	62	3E
	67	30	1E
	68	30	1E
	69	30	1E
	78 Private virtual storage section		
Reader start time	4	26	1A
	5	26	1A
	6	26	1A
	10	26	1A
	14	26	1A
	17	26	1A
	18	26	1A
	20	26	1A
	25**	26	1A
	26	26	1A
	30 Identification section		
	32 Identification section		
	40	26	1A
	60	58	3A
	61	58	3A
	62	26	1A
	63	26	1A
	64	26	1A
	65	58	3A
	66	58	3A
	67	26	1A
	68	26	1A
	69	26	1A
	78 Private virtual storage section		

**These records are for JES3.

Field Description	Record Type	Offset Dec.	Offset Hex.
Reader unit type	**5**	**74**	**4A**
	30 I/O activity section		
RECEIVE count	48**	56	38
RECEIVE level ib DBm	37	12	C
RECEIVE Level in DBm, minimum	37	14	E
RECEIVE, negative response count	48**	62	3E
RECEIVE, positive response count	48**	66	42
Real storage, number of bytes in	0	31	1F
Record format	14	246	F6
	15	246	F6
Record indicator	**4**	**102**	**66**
	14	**42**	**2A**
	15	**42**	**2A**
	22	**18**	**12**
	30 Completion section		
	34	**102**	**66**
	40	**44**	**2C**
	47	**24**	**18**
	48	**24**	**18**
	49	**24**	**18**
	60	**74**	**4A**
	61	**74**	**4A**
	63	**42**	**2A**
	65	**74**	**4A**
	66	**74**	**4A**
	67	**42**	**2A**
Record size, maximum logical	**64**	**DSC**	
Record subtype	24	22	16
	60	**22**	**16**
	61	**22**	**16**
	65	**22**	**16**
	66	**22**	**16**
Records, logical, number written	**6**	**51**	**33**
Records deleted, inserted, updated, and retrieved from component, number of	**64**	**STAT**	
Records in component, number of	64	STAT	
Records in overflow and prime data areas, number of logical	14	ISAM	
	15	ISAM	
Record type	ALL	5	5
Records lost, number of	7	18	12
Records transmitted or received, number of	24 General section		
Recording data set new/old	90 Subsystem recording section		
Region requested	78 Private virtual storage section		
Region size, maximum possible	78 Common virtual storage section		
Region size established or assigned	4	82	52
	30 Storage and paging section		
	34	82	52
	78 Private virtual storage section		

Field Description	Record Type	Offset Dec.	Hex.
Relative address of last record processed for a physical sequential or partitioned data set	14 15	DCB DCB	
Relative byte address, highest used	64	134	86
Release number of operating system	90 IPL SMF section		
Remote name	24 SYSOUT selection criteria section		
	47	28	1C
	48	28	1C
	49	28	1C
	52* Identification section		
	54* Identification section		
Requests for disk/volume, number of	25**	48	30
Requests queued for the logical control unit	78 Subtype 1 I/O queuing data section		
Requests queued in IOS for the device	74 Device data section		
	79 Subtype 9 device data section		
Reserve, address of the device against which is issued	79 Subtype 6 (SENQR) data section		
Reserve, name of the job that issued	79 Subtype 6 (SENQR) data section		
Reserve, system identifier for the job that issued	79 Subtype 6 (SENQR) data section		
RESTART threshold	31	30	1E
Resource			
number of requests	77 Enqueue section		
major/minor name	77 Enqueue section		
	79 Subtypes 6 and 7 (SENQ/SENQR) data sections		
max/min/total contention	77 Enqueue section		
Resource factor coefficient			
CPU	72 Workload control section		
ERV	72 Workload control section		
IOC	72 Workload control section		
Resource name, failing	37 All section		
Resource type, failing	37 All section		
Response delay, total	39	28	1C
Response time definition	39	22	16
RETKEY flags	82	RETK	
RETKEY key name	82	RETK	
Reverse explicit route number	39	100	64
RMF samples, number of	70-79	24	18
RMF version number	70-79	0	0
Room number, programmers	26*	108	6C
	26**	398	18E
Route code	6*	92	5C
	6* Routing section		
	26*	94	5E
	26*	132	84
	26*	134	86
	26* Routing section		

*These records are for JES2.

**These records are for JES3.

Field Description	Record Type	Offset Dec.	Offset Hex.
Route element name	39	0	0
Route element table	39	6	6
Sample sets in RMF trace number of	76	0	0
Samples, invalid	78	2	2
Sampling cycle length	70-79	36	24
Security Product ID	82	22	16
Segment descriptor	39	2	2
Selection attempts delayed by control unit busy	78	16	10
Selection attempts, total	78 Subtype 1 (I/O queuing data section)		
SEND count	48**	52	34
SEND, negative response count	48**	60	3C
SEND, positive response count	48**	64	40
Service, CPU	**4**	**REL**	
	5	**REL**	
	30 Perforamnce section		
	34	**REL**	
	35	**REL**	
Service, I/O	**4**	**REL**	
	5	**REL**	
	30 Performance section		
	34	**REL**	
	35	**REL**	
Service, job	**5**	**80**	**50**
	30 Performance section		
	35	**80**	**50**
Service, main storage	**4**	**REL**	
	5	**REL**	
	30 Performance section		
	34	**REL**	
	35	**REL**	
Service, MSO units	**30 Performance section**		
Service, SRB	**4**	**REL**	
	5	**REL**	
	30 Performance section		
	34	**REL**	
	35	**REL**	
Service, step	**4**	**REL**	
	30 Performance section		
	34	**REL**	
Service, total	**30 Performance section**		

*These records are for JES2.
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Field Description	Record Type	Offset Dec.	Hex
Session name	79	6	6
SID parameter	ALL	14	E
Situation indicator	64	42	2A
SIOT TTR address	14	64	40
	15	64	40
Size of catalog record	63	44	2C
	63	46	2E
	67	132	84
Size of control interval	64	DSC	
Size of private area	4	74	4A
	34	74	4A
Size of terminal status block	31	36	24
Size of time-sharing buffer	31	20	14
SLU domain name	39	74	4A
SLU link name	39	58	3A
SLU subarea PU	39	74	4A
SMF options	0	30	1E
	90 SMF command section		
Sort			
number of records processed	16 Data section		
processor time used	16 Data section		
Spindle identification	64	EXT	
	69	44	2C
SRB service	4	REL	
	5	REL	
	30 Performance section		
	34	REL	
	35	REL	
SRB service definition coefficient	72	38	26
SRM measure of the ASM queue length	79 Subtype 3 (SRCS) data section		
SRM service for a step	79 Subtype 2 (ARD/ARDJ) data section		
SQA usage	78 Common virtual storage section		
SQA size	78 Common virtual storage section		
SSID of device	22	VAR	
Staging adapters	22	MSS	
Staging spindles in staging data groups	22	MSS	

Field Description	Record Type	Offset Dec.	Offset Hex.
Start date			
job transmitter	26* Network section		
SYSOUT transmission	57*	76	4C
Start date of recording when SMF data set became available	7	24	18
START SSCH instructions, number of	21	34	22
	74 Device data section		
	79 Subtype 11 (PGSP) data set section		
Start time			
job transmitter	26* Network section		
SYSOUT transmitter	57*	72	48
Start time of recording when SMF data set became available	7	20	14
Start/warm start indicator	43	26	1A
Step accounting fields	4	ACT	
	30 Accounting section		
	34	ACT	
Step completion code	4	55	37
	30 Completion section		
	34	55	37
Step CPU time	4	99	63
	4	ACT	
	30 Processor accounting section		
	34	99	63
	34	ACT	
Step initiation time	30 Identification section		
	32 Identification section		
Step initiation date	30 Identification section		
	32 Identification section		
Step name	4	66	42
	30 Identification section		
	32 Identification section		
	34	66	42
	78 Private virtual storage section		
	82	32	20 (5740-XY5, -XY6)
Step number	4	42	2A
	30 Identification section		
	32 Identification section		
	34	42	2A
	40	42	2A
Step performance group number	4	REL	
	5	92	5C
	30 Identification section		
	32 Identification section		
	34	REL	
	35	92	5C
Step service	4	REL	
	34	REL	
Step termination date	4	10	A
	30	10	A
	34	10	A
Step termination indicator	4	87	53
	30 Completion section		
	34	87	53

*These records are for JES2

Field Description	Record Type	Offset Dec.	Offset Hex.
Step termination time	4	6	6
	30	6	6
	34	6	6
Step transaction active time	4	REL	
	30 Performance section		
	34	REL	
Step transaction residency time	4	REL	
	30 Performance section		
	34	REL	
Stop date			
job transmitter	26* Network section		
SYSOUT transmitter	57*	84	54
Stop time			
job transmitter	26* Network section		
SYSOUT transmitter	57*	80	50
Storage, extended, number of 4k frames	22 Extended storage section		
Storage, real, number of bytes in	0	31	1F
Storage, used from bottom of private area	4	78	4E
	30 Storage section		
	34	78	4E
	78 Private virtual storage section		
Storage, used from top of private area	4	76	4C
	30 Storage section		
	34	76	4C
	78 Private virtual storage section		
Storage, virtual, number of bytes in	0	26	1A
Storage protect key	4	86	56
	5	76	4C
	30 Storage section		
	34	86	56
	35	76	4C
Subpool usage	78 Common virtual storage secton		
	78 Private virtual storage section		
Subsystem associated with PGN	72	58	3A
Subsystem identification	6	62	3E
	26	46	2E
	30	18	12
	32	18	12
	43	18	12
	45	18	12
	47	18	12
	48	18	12
	49	18	12
Subsystem identification of device	22	VAR	

*These records are for JES2.

Field Description	Record Type	Offset Dec.	Hex.
Swap candidates, number of	71 Swap placement section		
Swap sequences, number of	4	REL	
	30 Storage and paging section		
	34	REL	
	71 Swap placement section		
Swap-ins, number of	4	REL	
	30 Storage and paging section		
	34	REL	
Swap-outs, number of	4	REL	
	30 Storage and paging section		
	34	REL	
Swaps,			
directed to auxiliary storage			
logical	71 Swap placement section		
physical	71 Swap placement section		
directed to extended storage			
physical	71 Swap placement section		
migrated from extended storage	71 Swap placement section		
SYSOUT class	6	42	2A
	24 SYSOUT selection criteria section		
SYSOUT transmitter			
start date	57*	76	4C
start time	57*	72	48
stop date	57*	84	54
stop time	57*	80	50
system identifier	57*	96	60
System identification	ALL	14	E
	26* Network section		
System identification from $E SYS command	43*	28	1C
System indicator	ALL	4	4

*These records are for JES2.
**These records are for JES3.

Field Description	Record Type	Offset Dec.	Offset Hex.
System name (if NJP)	26**	96	60
	26**	144	90
	26**	152	98
Tape density	21	43	2B
Tape unit serial	21	47	2F
Tape volumes requested, number of	25**	44	2C
TCB time for step	79 ARD/ARDS section		
Temporary read forward errors	21	50	32
Temporary read errors, number of (non-buffered log)	21	32	20
Temporary read backward errors	21	52	34
Temporary write errors, number of (non buffered log)	21	33	21
Temporary write errors, number of	21	54	36
Terminal input lines, number of	30 I/O activity section		
	34	51	33
	35	51	33
Terminal output lines, number of	30 I/O activity section		
	34	47	2F
	35	47	2F
Terminal status block, size of	31	36	24
Terminal wait number of logical swapout candidates	71 Swap placement section		
Termination indicator, JES2 or JES3	45	24	18
Termination indicator, job	5	66	42
	30 Completion section		
	35	66	42
Termination indicator, step	4	87	57
	30 Completion section		
	34	87	57
TGET, count for group	32 Command section		
TGETs satisfied, number of	30 I/O activity section		
	34	51	33
	35	51	33
Time, continuous wait	0	18	12
Time, deadline schedule	26**	168	A8
Time, execution	26	112	70
Time, JES3 allocation requests	25**	76	4C
Time, JES3 device verification	25**	84	54
Time, job CPU	5	77	40
	5	117	75
	30 Completion section		
	35	77	4D
	35	117	75

*These records are for JES2.
**These records are for JES3.

Field Description	Record Type	Offset Dec.	Hex.
Time, IPL	90 Self-defining section		
Time, logoff	30	6	6
	35	6	6
Time, logon	30	6	6
	34	26	1A
	35	26	1A
Time, logon enqueue	30 Identification section		
	35	58	3A
Time, step CPU	4	99	63
	4	ACT	
	30 Processor activity section		
	34	99	63
	34	ACT	
Time, job transaction active	5	84	54
	30 Performance section		
	35	84	54
Time, step transaction active	4	REL	
	30 Performance section		
	34	REL	
Time, transaction queued	59 Transaction data		
Time, transaction completed	59 Transaction data		
Time *START SETUP command issued	25**	60	3C
Time converter started	26*	156	9C
	26**	196	C4
Time converter stopped	26*	164	A4
	26**	204	CC
Time device allocation started	4	90	5A
	30 Identification section		
	32 Identification section		
	34	90	5A
Time execution processor started	26*	172	AC
	26**	212	D4
Time execution processor stopped	26*	180	B4
	26**	220	DC
Time fetch processing ended	25**	52	34
Time all volume mount message issued	25**	76	4C
Time initiator selected step/job	4	43	2B
	5	43	2B
	30 Identification section		
	32 Identification section		
	34	43	2B
Time job terminated	5	6	6
	30	6	6
	32 Identification section		
	35	6	6
Time output processor started	26*	188	BC
	26**	228	E4
Time output processor stopped	26*	196	C4
	26**	236	EC
Time output service started	6**	43	2B

*These records are for JES2.
**These records are for JES3.

Field Description	Record Type	Offset Dec.	Offset Hex.
Time-outs to read text, number of	48*	64	40
	48**	60	3C
Time print/punch processor started	6*	43	2B
Time program started	4	94	5E
	30 Identification section		
	34	94	5E
Time reader recognized end of job	5	58	36
	26*	148	94
	26**	188	BC
	30 Identification section		
	32 Identification section		
Time reader recognized the JOB card	4	26	1A
	5	26	1A
	6	26	1A
	10	26	1A
	14	26	1A
	15	26	1A
	17	26	1A
	18	26	1A
	20	26	1A
	24 General section		
	25**	26	1A
	26	26	1A
	30 Identification section		
	32 Identification section		
	40	26	1A
	60	58	3A
	61	58	3A
	62	26	1A
	63	26	1A
	64	26	1A
	65	58	3A
	66	58	3A
	67	26	1A
	68	26	1A
	69	26	1A
	78 Subtype 2 (Private virtual storage section)		
Time record was moved to dump data set	2	6	6
	3	6	6
Time record was moved to SMF buffer	ALL[1]	6	6
Time recording was started when SMF date set became available	7	20	14
Time step terminated	4	6	6
	30	6	6
	34	6	6
Time-sharing buffer size	31	20	14
Time-sharing buffers, number of	31	18	12
Time, transaction active, elapsed, residency	30 Performance section		
TIOT status indicator	14	53	35
	15	53	35
TPUT count for group	32 Command section		
TPUTs issued, number of	30 I/O activity section		
	34	47	2F
	35	47	2F
Trace options	76	68	44

*These records are for JES2.

**These records are for JES3.

[1]Except 2, 3

Field Description	Record Type	Offset Dec.	Offset Hex.
Tracks, number in largest unallocated extent	19	58	3A
Tracks, number of unallocated	19	54	36
	69	50	32
Tracks, number of unused alternate	19	50	32
Tracks, number used by sort	16	Data section	
Tracks allocated on device, number of	14	UCB	
	15	UCB	
Tracks in largest continuous unallocated area, number of	69	54	36
Tracks in overflow area, number of	14	ISAM	
	15	ISAM	
Tracks released by DADSM routine, number of	14	DCB	
	15	DCB	
Tracks requested but not allocated, number of	64	132	84
Transaction active time	30	Performance section	
Transaction active time, job	5	88	58
	30	Performance section	
	35	88	58
Transaction active time, step	4	REL	
	30	Performance section	
	34	REL	
Transaction name associated with PGN	72	82	52
Transaction class name	79	Subtype 8 (TRX) data section	
Transaction elapsed time	30	Performance section	
	79	Subtype 5 (ASRM/ASRMJ) data section	
Transaction residency time	30	Performance section	
	79	ASRM/ASRMJ section	
Transaction residency time, job	5	68	44
	30	Performance section	
	35	68	44
Transaction residency time, step	4	REL	
	30	Performance section	
	34	REL	
Transactions, number of	30	Performance section	
	32	TSO/command segment	
	35	88	58
	72	Performance section	
	79	TRX section	
Transactions, number for group	32	Command section	
Transmission group number	39	8	8
Transmission path	57**	146	9A
Transmission priority	39	104	68
TSB (terminal status block), size of	31	36	24
TSO user identification	26**	96	60
TSO, command name	32	Command section	
TSO, number of commands	32	Command section	
TTR of JFCB or SIOT	14	64	40
	15	64	40

**These records are for JES3.

Field Description	Record Type	Offset Dec.	Offset Hex.
TTRN of last record processed for a physical sequential or partitioned data set	14	DCB	
	15	DCB	
Type of deadline schedule	26**	124	7C
Type of I/O macro instruction and options	14	247	F7
	15	247	F7
UCS image identification	6	88	58
	24 SYSOUT selection criteria section		
UIC			
average high	70 Paging data section		
maximum high	70 Paging data section		
minimum high	70 Paging data section		
Unique session ID (PCID)	39	106	6A
Unit address, cryptographic	82 Cryptographic unit section (5740-XY6)		
Unit status, cryptographic	82 Cryptographic unit section (5740-XY6)		
Unit type	5	74	4A
	8	DEV	
	9	DEV	
	10	DEV	
	11	DEV	
	14	UCB	
	15	UCB	
	19	36	24
	21	28	1C
	30 EXCP section		
	34	DEV	
	40	DEV	
	62	VOL	
	64	EXT	
	75	103	67
Unit type	74	12	C
	79	12	C
Updated records, number of	64	STAT	
User identification	4	34	22
	5	34	22
	6	34	22
	10	34	22
	14	34	22
	15	34	22
	17	34	22
	18	34	22
	20	34	22
	25**	34	22
	26	34	22
	30 Identification section		
	32 Identification section		
	34	34	22
	35	34	22
	40	34	22
	57**	66	42
	60	66	42
	61	66	42
	62	34	22
	63	34	22
	65	66	42
	66	66	42

**These records are for JES3.

Field Description	Record Type	Offset Dec.	Offset Hex.
User identification (continued)	67	34	22
	68	34	22
	69	34	22
	82	24	18
Vector Facility affinity time for initiator processing	30	32	20
Vector Facility affinity time for job/step processing	30	28	1C
Vector Facility usage time for initiator processing	30	24	18
Vector Facility usage time for job/step processing	30	20	14
Vector Facility online indicator	22 CPU section		
VIO page reclaims, number of	4	REL	
	30 Storage section		
	34	REL	
VIO page-ins, number of	4	REL	
	30 Storage section		
	34	REL	
VIO page-outs, number of	4	REL	
	30 Storage section		
	34	REL	
VIO pages, accepted by data set	75 Page/swap data set data section		
	79 Subtype 11 (PGSP) data set section		
Virtual route number	39	102	66
Virtual storage allocated from LSQA and SWA	30	80	50
	30	80	54
	78 Subtype 2 (Private virtual storage section)		
Virtual storage allocated from user subpools	30	88	58
	30	92	5C
	78 Subtype 2 (Private virtual storage section)		
Virtual storage, free	78 Subtype 2 (Common virtual storage section)		
	78 Subtype 2 (Private virtual storage section)		
Virtual storage, number of bytes in	0	26	1A
Virtual storage, used	78 Subtype 2 (Common virtual storage section)		
	78 Subtype 2 (private virtual storage section)		
Volume mount completion message date	25**	80	50
Volume mount completion message time	25**	76	4C
Volume owner identification	19	26	1A
Volume requests, MSS	25**	92	5C
Volume sequence number	14	254	FE
	15	254	FE

**These records are for JES3.

Field Description	Record Type	Offset Dec.	Hex.
Volume serial number	14	UCB	
	15	UCB	
	17	VOL	
	18	VOL	
	19	20	14
	21	20	14
	59 Transaction type section		
	62	90	5A
	62	VOL	
	64	EXT	
	69	100	64
	74 Device section		
	75	109	60
	79 Subtype 9 device section		
	79 Subtype 11 (PGSP) data section		
Volume serial of the volume mounted	74	6	6
	79 Subtype 11 (PGSP) data section		
Volumes, number of	17	91	5B
Volumes fetch messages, number of	25**	44	2C
Volumes mounted by MDS, number of	25**	68	44
VSAM Volume data set name	60	75	4B
VSAM Volume record	60	208	D0
VTOC address	19	40	28
VTOC indicator	19	45	2C
Warm start/start indicator	43	26	1A
Work station name	47**	28	1C
	48**	28	1C
	47**	28	1C
Workload control section, offset to	72	36	24
Worst Line Quality	37	8	8
Write errors, number of	21	33	21
	21	37	25

**These records are for JES3.

Chapter 8: EXCP Count

SMF record types 4, 14, 15, 30, 32, 34, 40, and 64 have fields that contain a count related to the I/O activity for a given job, job step, or interval. These fields are called EXCP counts. There are two levels of EXCP counts; the DD level and the address space level. The type 30 record provides both levels; all other records provide only the DD level.

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
- EXCPs issued via an EXCP macro (SVC 0)
- EXCPs issued via TCBEXCP macro (SVC 92)
- EXCPs issued via an EXCPVR macro (SVC 114)
- EXCPs issued in a system or user provided channel-end appendage
- EXCPs issued in an abnormal-end appendage
- I/O for VSAM data sets (SVC 121)
- 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 in a PCI appendage when ADDRSPC=REAL
- EXCPs handled by the job entry subsystem
- TPUTs and TGETs handled by macro instructions (For TPUTs and TGETs, EXCPs are accumulated on a system basis in the TCT and are contained in SMF record types 30, 32 (if detail is specified), 34 and 35 only.)

For sequential access methods (BSAM, QSAM, and BPAM), the EXCP count represents a block count when default scheduling is used. That is, each end-of-block encountered in the problem program increases the EXCP count by one. For other access methods (such as BDAM, ISAM, and VSAM) the count represents Start I/O requests.

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

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.
- OPEN and CLOSE I/O activity beyond priming and purging the buffer.

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
- JES3 spool 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 twiced 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 multivolume files (such as tape files), the EXCP count is accumulated over the volumes.
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 a concatenated data set contains more than one data set member with the same physical device, the EXCP count is accumulated in the first data set entry having that device entry.
4. If a GETMAN for the expanding TCTIOT data area (where the EXCP count is maintained) fails, 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 9: 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 also 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 execution 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 by the dispatcher on an address space basis. The accumulation of CPU time is separated into two fields: execution under TCBs and execution time under SRBs.

CPU Time Under TCBs

When a job step is set dispatchable by the initiator, the accumulated job step time field for tasks (ASCBEJST) is initialized to zero. Task CPU time is determined as follows:

1. Whenever any task is dispatched, the CPU timer is set to the value of the task timer queue element (TQE). If a task TQE does not exist, the timer is set to a value that would not expire over a period of 208 days (208 day value).
2. Whenever an I/O, program check, or external interrupt occurs, the CPU timer value is stored in PSACPUT. In addition, the value is stored:
   - By the dispatcher, when entered at the IEAODS entry point.
   - By the lock manager, when suspending a task for a local or any cross memory service locks.
   - By the program check FLIH suspend routine, when suspending a task for a page fix.
3. Whenever STATUS is saved for a unit of work, the CPU time attributed to the pre-empted task is accumulated in the ASCBEJST field as follows:
   a. If a task TQE does not exist, the CPU time is accumulated by adding the difference between the 208 day value and the PSACPUT to the ASCBEJST value.

      ASCBEJST=ASCBEJST+(208 day value-PSACPUT value)

      This excludes the interrupt handling and suspension time from the task time.

   b. If a task TQE exists and the CPU timer is not a negative value, the CPU time is accumulated by adding the difference between the TQE value and the PSACPUT value to the ASCBEJST value.

      ASCBEJST=ASCBEJST+(TQE value-PSACPUT value)

   c. If a task TQE exists and the CPU timer is a negative value, the CPU time is accumulated by adding the TQE value to the ASCBEJST value.

      ASCBJEST=ASCBEJST+TQE value

Notes:

1. If the current task uses the Vector Facility (VF), the system also accumulates VF affinity time and VF usage time.

- VF affinity time is a subset of job step time for tasks (ASCBEJST). When the task first uses a vector instruction, it is given affinity to only the processors that have the Vector Facility. It keeps this affinity until the dispatcher detects that vector instructions have not been used for a long time. If the dispatcher detects that vector instructions have not been used for a long time it removes the special affinity. VF affinity time is the job step time for tasks that was accumulated while the task had affinity to processors with the Vector Facility. This time is useful for capacity management of the Vector Facility. VF affinity time is accumulated in the ASSBVFAT field of the ASSB.
- VF usage time is a subset of the VF affinity time. It is the time that the task actually spent executing vector instructions. VF usage time is accumulated in the ASSBEVST field of the ASSB.

(The units for VF affinity and VF usage time are the same units as TCB time)

2. If the current task is the RCT task, CPU time is not accumulated. This eliminates the time that is spent in swap-out/swap-in processing and its purging of I/O. In the case of page faults that result in suspension of the current task, the PSACPUT value represents the CPU timer value when the program check (page fault) occurred. In the case of a synchronous page fix that results in suspension of the current task, the CPU timer is stored in the PSACPUT field during the suspend processing so that the suspension time is not included in the ASCBEJST. The result is that suspend time is excluded from the task time.

CPU timing is continually accumulated as described above until the job step terminates. At that time the CPU time in the ASCBEJST field is moved into the ACTJTIME field in the account control tables of the JCT. It is from this field that SMF obtains the "CPU time under TCBs" value for its records.

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 occuring within a lock spin
- Abend/Abterm
- User SPIE exit processing

Times excluded are:

- I/O interrupt time
- External interrupt time
- Page fault processing
- CPU "stopped" time if the QUIESCE command is used
- RCT time (swap-out/swap-in processing and I/O error recovery processing)

- Attention processing time for TSO
- Program check handling

CPU Time Under SRBs

When a job step is set dispatchable by the initiator, the accumulated job step time field for SRBs (ASCBSRBT) is initialized to zeros. SRB time is determined as follows:

1. Whenever the SRB is dispatched, the CPU timer is set to a value that will not expire over a period of 208 days (208 day value).
2. Whenever the SRB terminates, the CPU timer is accumulated by adding the difference between the 208 day value and the PSACPUT value to the ASCBSRBT value.

   ASCBSRBT = ASCBSRBT + (208 day value – PSACPUT)
3. If an SRB is suspended for a page fix, page fault, the local lock, or the CMS lock, the CPU timer value is saved in the SSRB. Whenever the suspended SRB is redispatched, the CPU timer is reset from the saved value. Whenever the SRM and RMF timer expires, time spent in processing SRM and RMF is not included in SRB time.

CPU timing is continually accumulated until the job step terminates. At that time the CPU time in the ASCBSRBT field is moved into the SCTSRBT field for use by SMF.

Included/Excluded SRB Times

Services that use SRBs to perform the following functions will have their execution time accumulated for the address space:

- Swap control
- Cross-memory communications
- TQE scheduling
- Any supervisor service under SRB control
- SRM/RSM page stealing
- I/O completion processing

The following functions will execute without affecting the time accumulated for the address space.

- Lock request suspension
- SRM and RMF timer expiration processing

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 execution 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 MIPS or instruction speed
- Storage access – The CPU cannot access real 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 SVCs such as SVC 15 (ERREXCP), SVC 16 (PURGE), and SVC 55 (EOV) may be required for temporary I/O errors.
- EXCP request (SVC 0) – The time to process an EXCP request varies depending on the availability status of the requested device and channel. Some possibilities are:
  (a) The device and primary channel are available – the SIO preparation and execution are done immediately.
  (b) The device is available, the primary channel is busy, but one of the alternate channels is available – the time to test alternate channels is added to the time required in (a).
  (c) All devices and channels are busy – the request must be queued on a FIFO basis.
- BLDL/FIND requests – If BPAM is used extensively, CPU time for processing BLDL/FIND requests varies if there was a 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 also 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). – System ENQ routine time will vary depending on whether the resource is available. If a resource is not available, additional time is taken to queue up the current request and to wake the requester. DEQ time also increases if other tasks have subsequently requested the resource that the current task is releasing.
- Wait processing – CPU time varies depending on whether or not ECBs have been posted prior to issuance of 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. For instance, the time to process an ENQ request varies with the number of QCBs to be examined and chained, and whether or not storage must be obtained for new QCBs. The time to process a GETMAIN request varies with the length of the FQE chain; FREEMAIN time varies with the status (free or allocated) of the adjacent areas. Also, global queue searching affects SVC time; for example, GETMAIN is greatly affected if storage is fragmented.
- Time requests – For task and real time requests, timer ENQ routine processing time varies with the number of elements on the timer queue that must be checked to find the proper slot for the current request.
- WTO, WTOR and WTL processing – CPU time may vary depending on the time required to find a free WQE and/or RQE, and possibly on whether a GETMAIN is necessary to build a new element. If the WTO or reply elements are at their limit, additional time is required for enqueuing.
- Generalized trace facility (GTF) – When GTF is active, CPU time increases depending on the system functions (SVC, SIO, 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.
- FREEMAIN resulting in available real page – When a FREEMAIN results in making a real page available to an MP system, the page must be invalidated and both CPUs' translation lookaside buffers must be purged of the entry. The invalidation and purge are synchronous: one CPU may wait (spin) a variable amount of time until the other CPU is enabled to receive a signal (EMS interrupt) and perform the synchronizing function.
- System resource manager (SRM) – SRM is run either scheduled as an SRB, as a subroutine of quiesce (RCT), or as a subroutine of a service invoked by a job. SRM execution may cause CPU time to vary when it is invoked from supervisor services that issue SYSEVENTS, such as ENQ, WAIT (LONG=YES option), TPUT and TGET.
- SRM page stealing – SRM 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.

Chapter 10: SMF Exit-System Interface Diagrams

This chapter contains diagrams for each SMF exit that show the system interface(s) for the exit. Each diagram illustrates the general flow of events that occur before and after an SMF exit receives control. Note that the diagrams do *not* indicate the specific control path between system modules.

The system interfaces for the following SMF exits are illustrated.

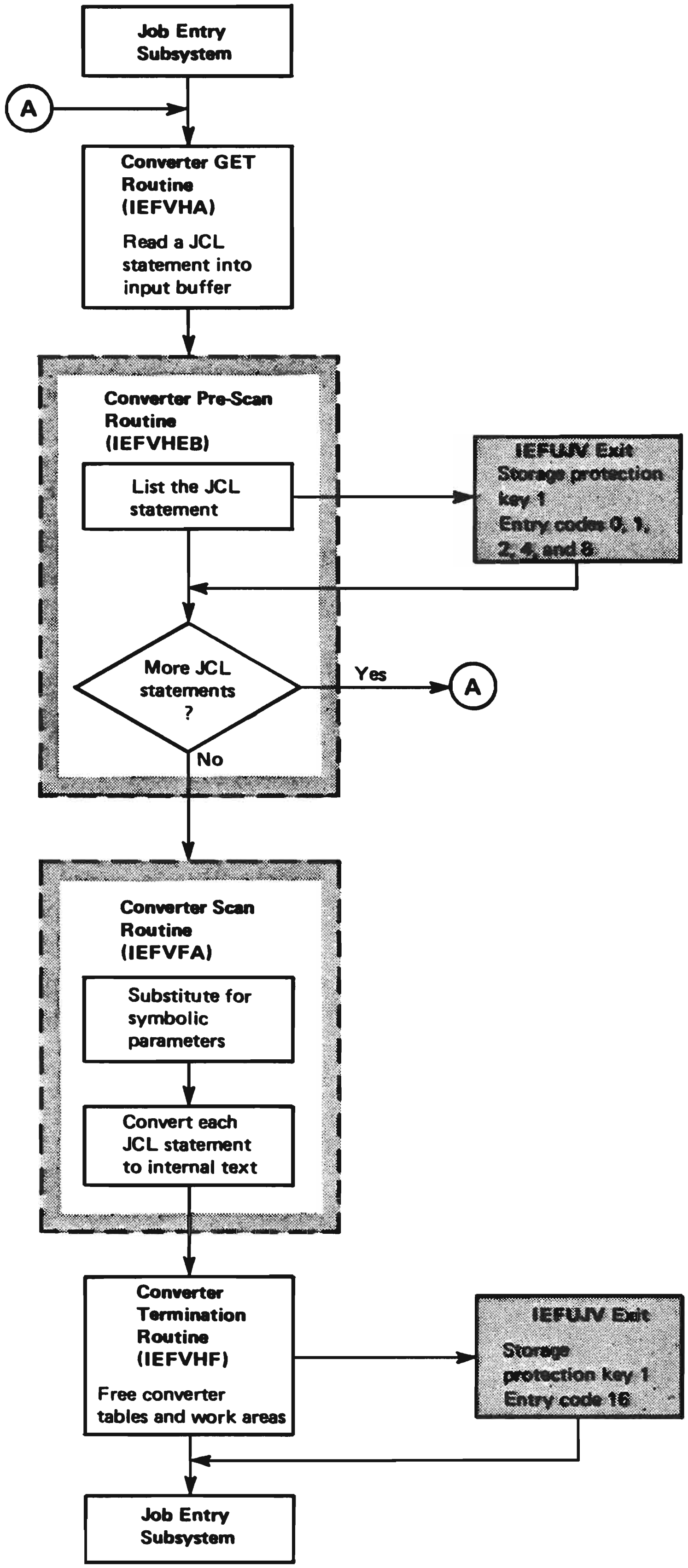


Figure 10-1. IEFUJV – Job Validation Exit (Converter)

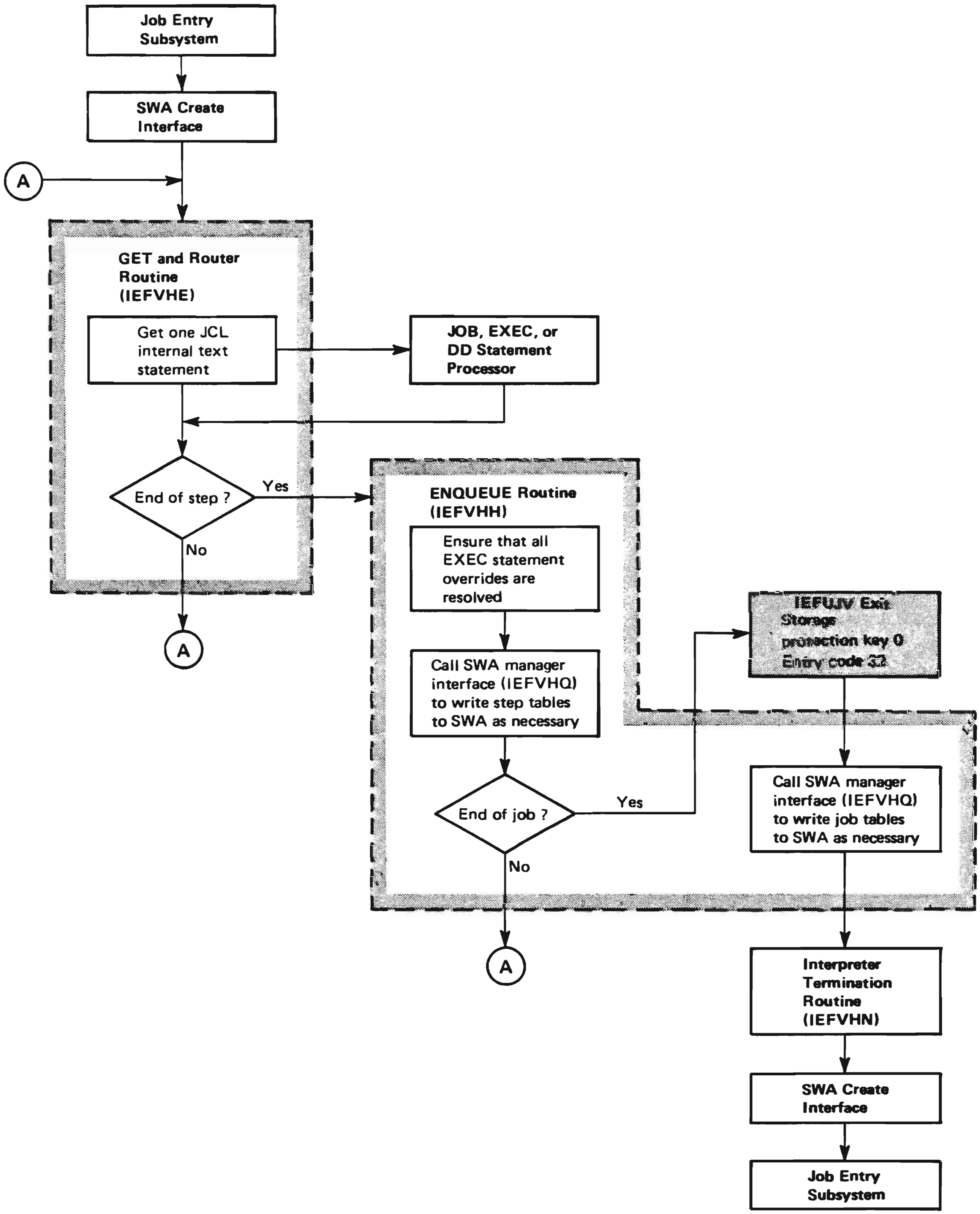


Figure 10-2. IEFUJV – Job Validation Exit (Interpreter)

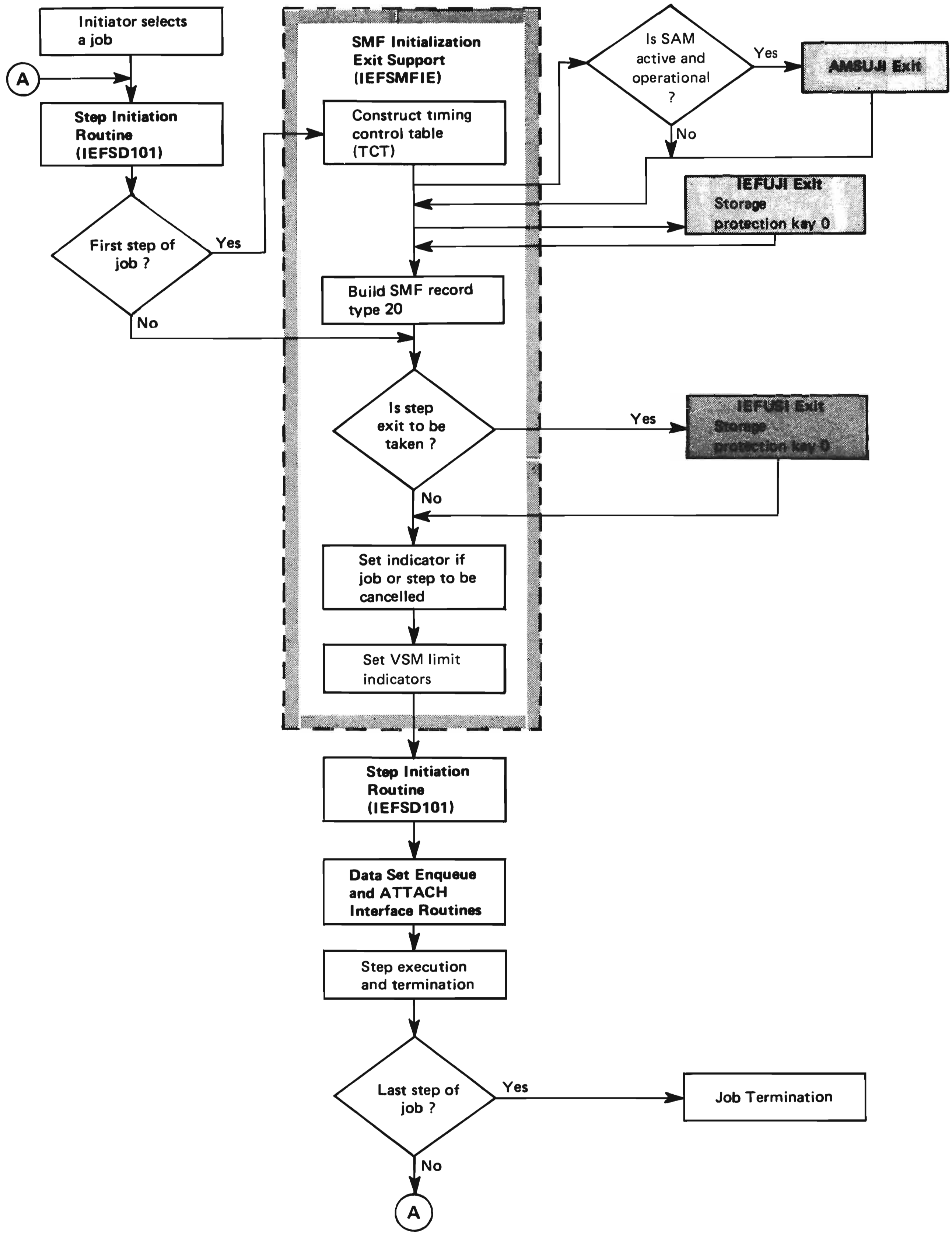


Figure 10-3. IEFUJI – Job Initialization Exit and IEFUSI – Step Initialization Exit

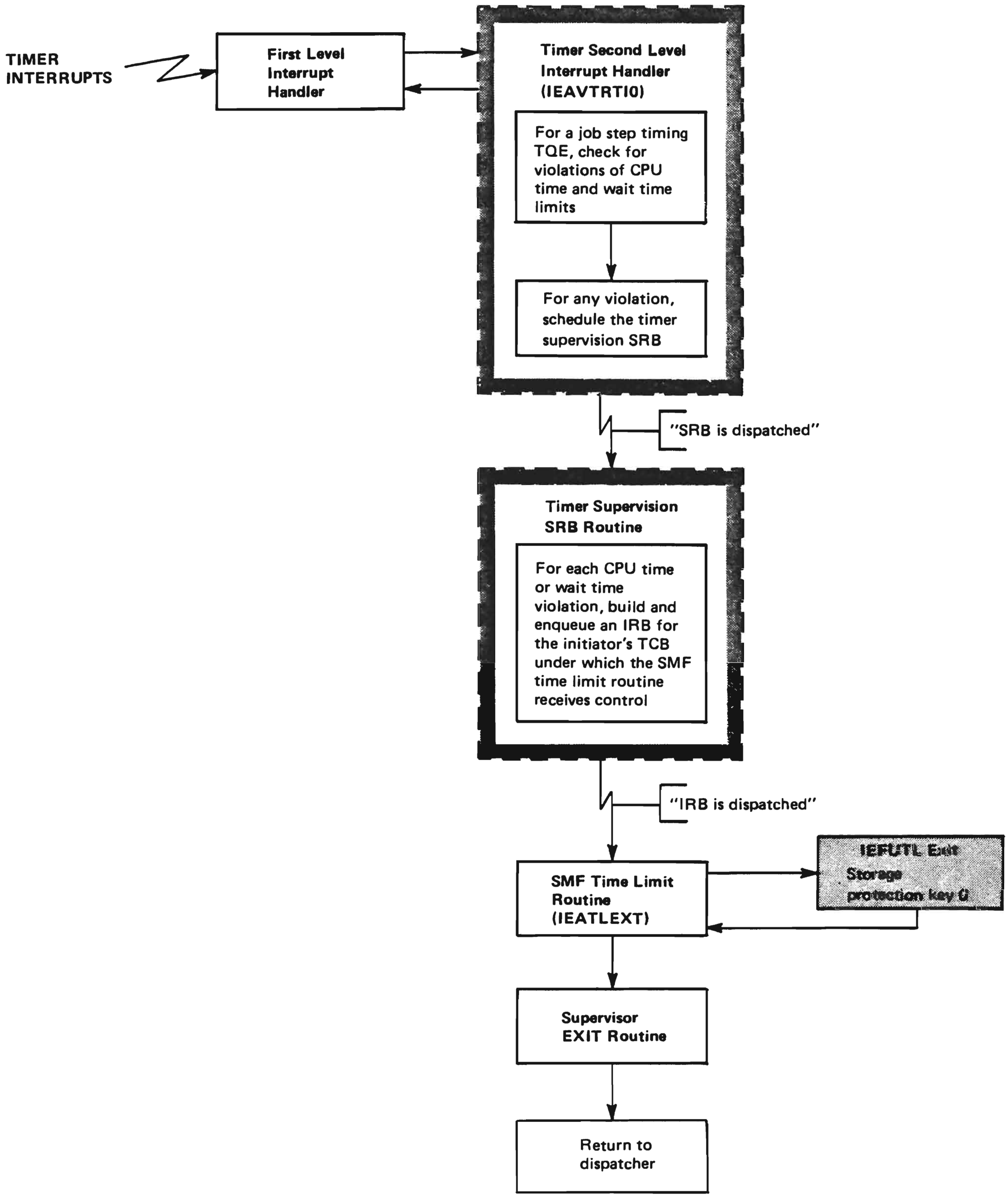


Figure 10-4. IEFUTL – Time Limit Exit

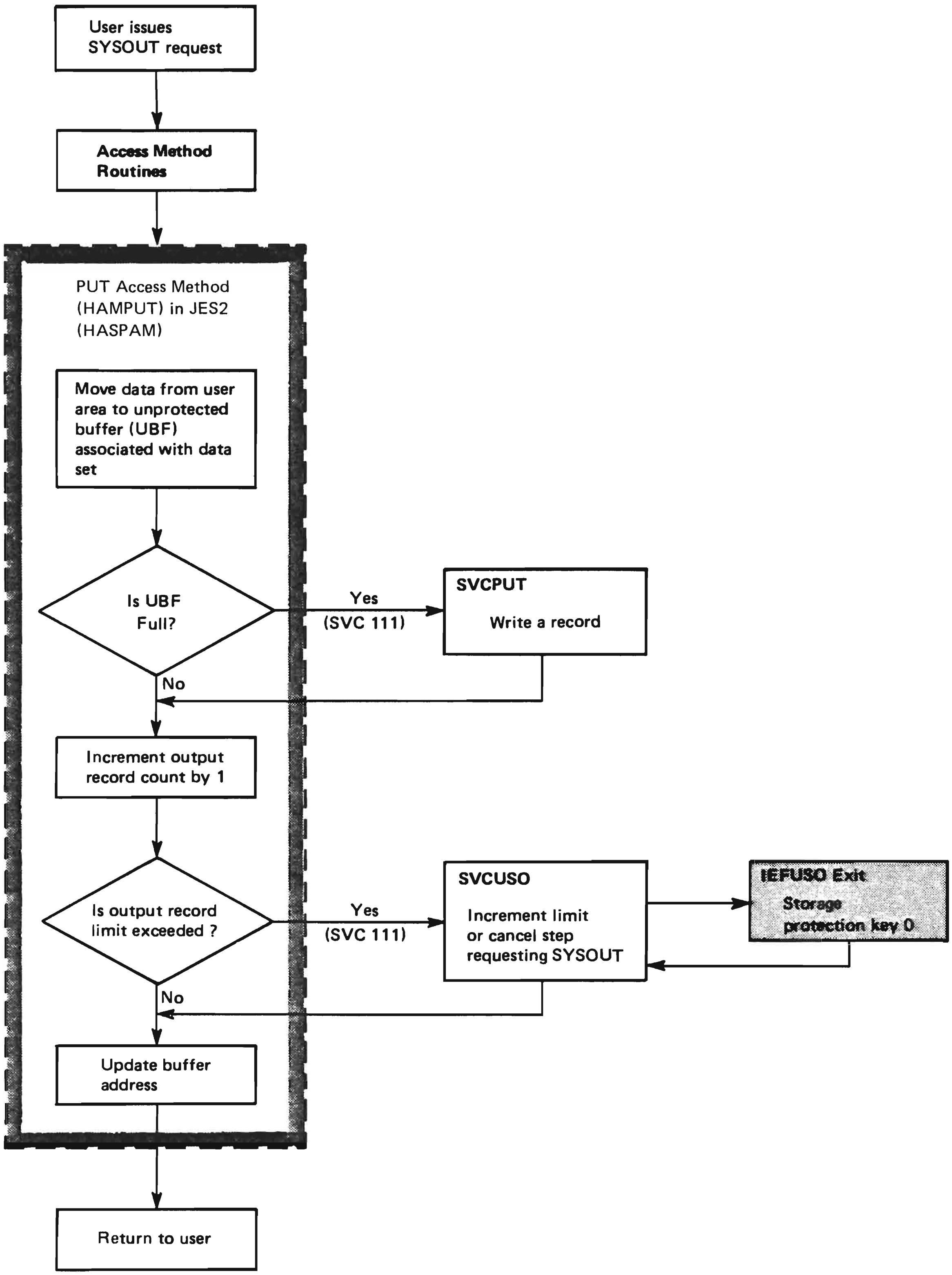


Figure 10-5. IEFUSO – JES2 SYSOUT Limit Exit

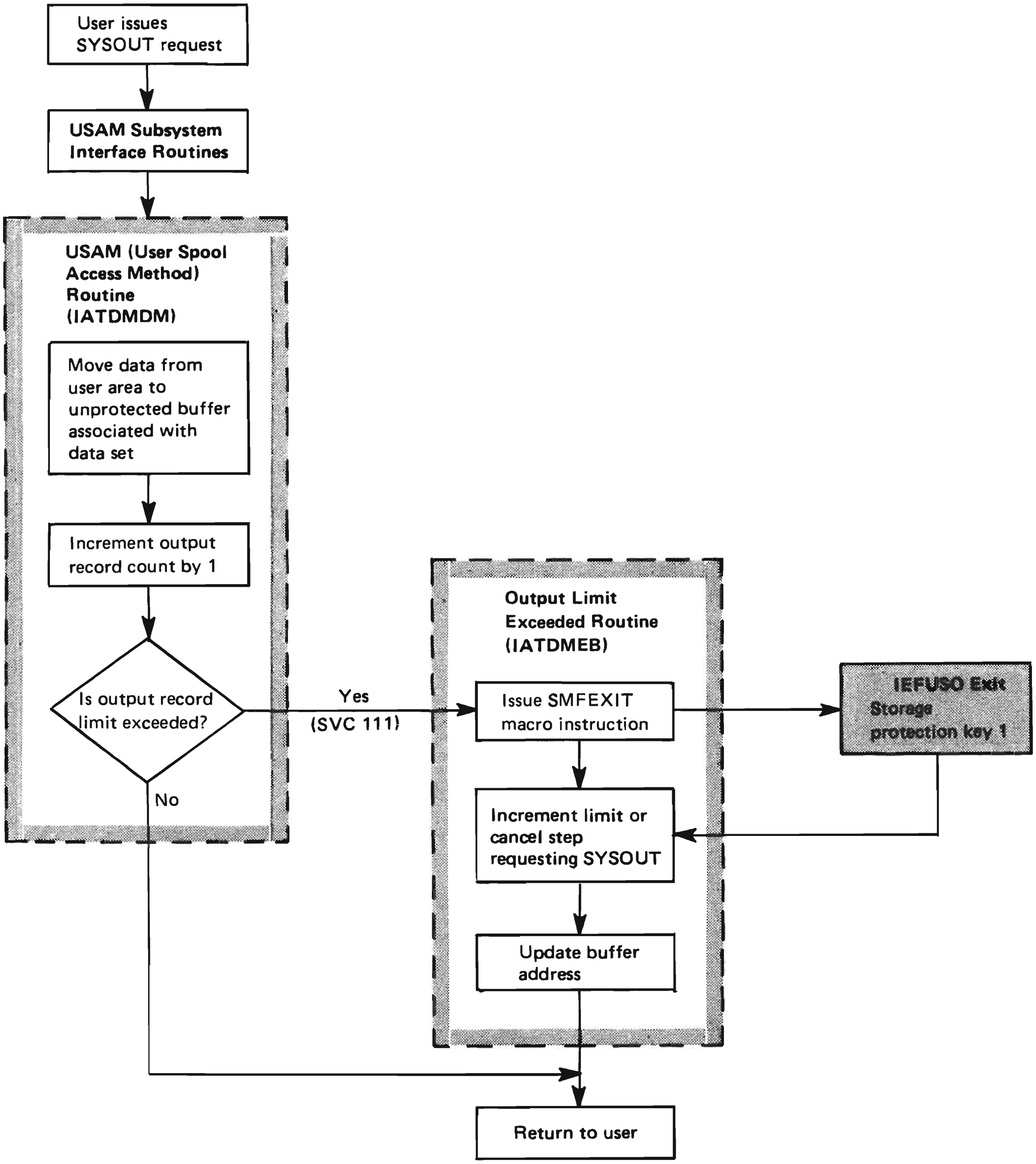
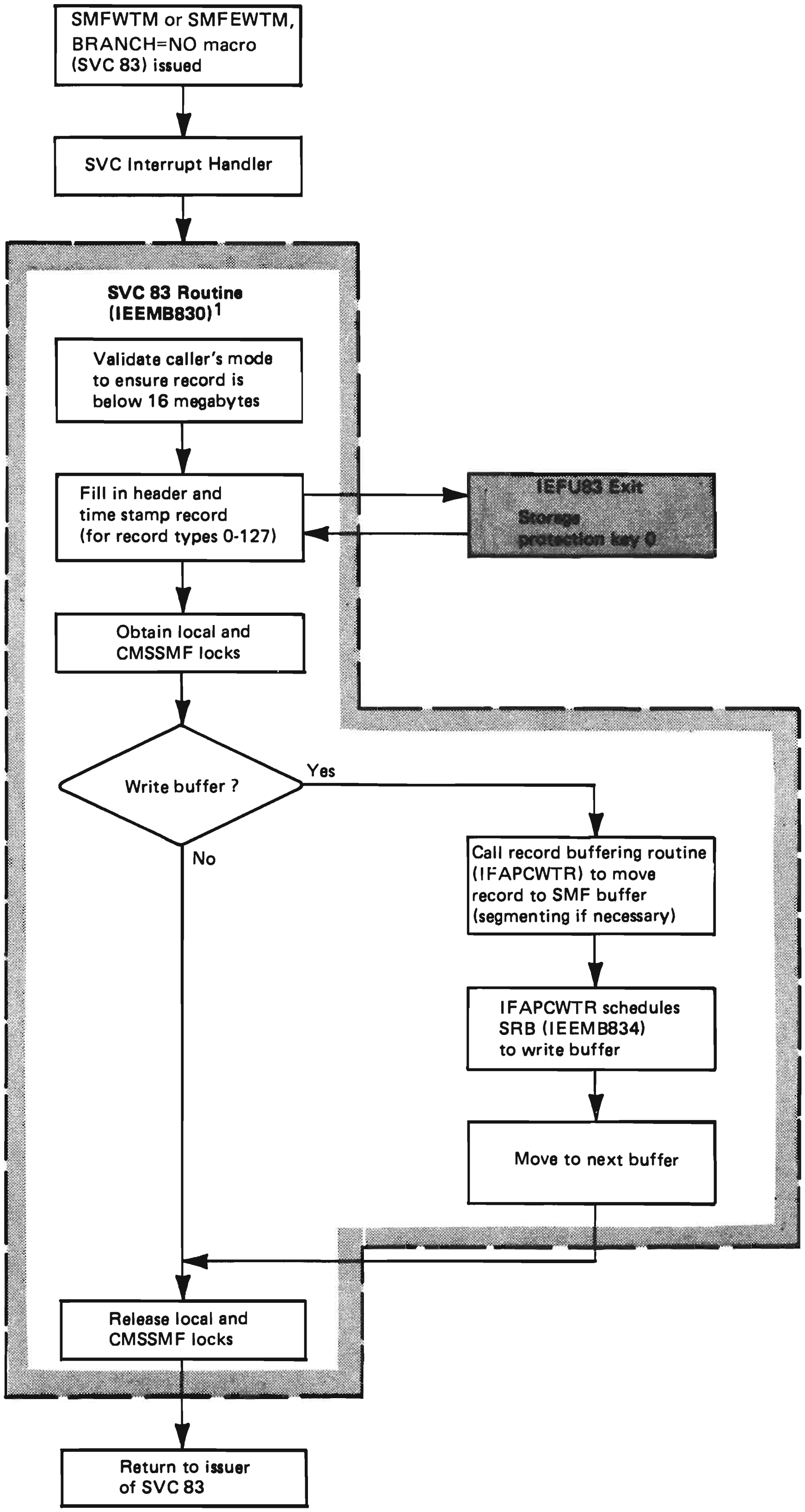
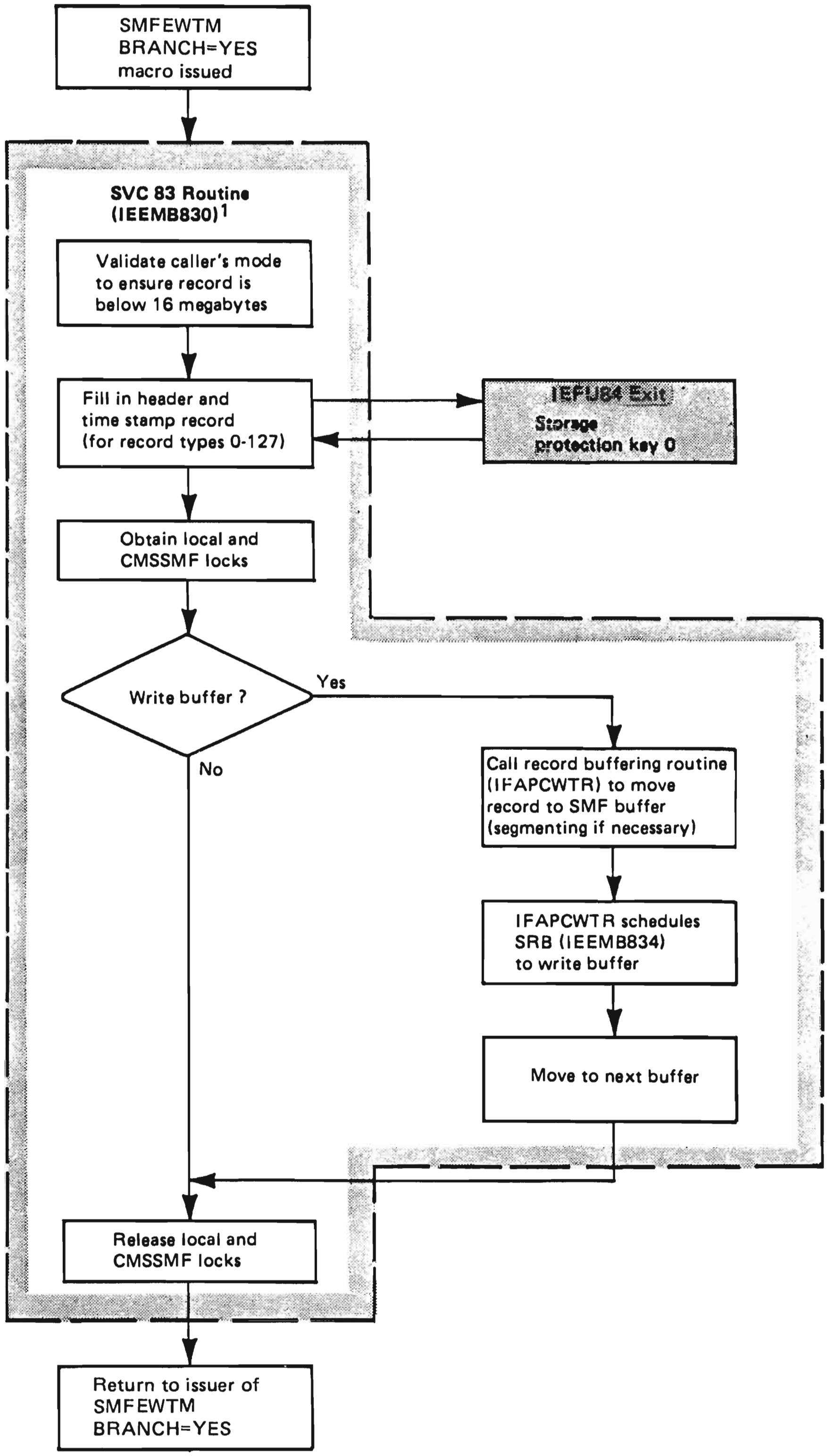


Figure 10-6. IEFUSO – JES3 SYSOUT Limit Exit



[1]See *System Logic Library Volume 12,* LY28-1250-1, for more information on IEEMB830.

Figure 10-7. IEFU83 – SMF Record Exit



[1]See *System Logic Library Volume 12,* LY28-1250-1, for more information on IEEMB830.

Figure 10-8. IEFU84 – SMF Record Exit

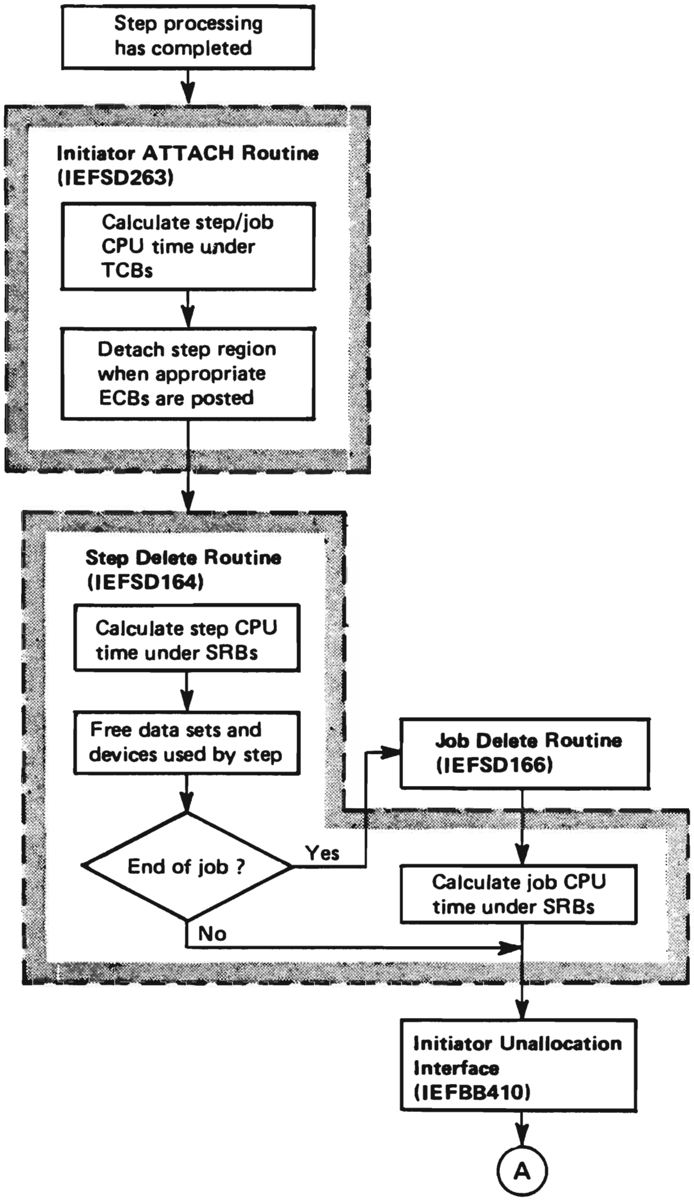


Figure 10-9. IEFACTRT – Termination Exit (Part 1 of 2)

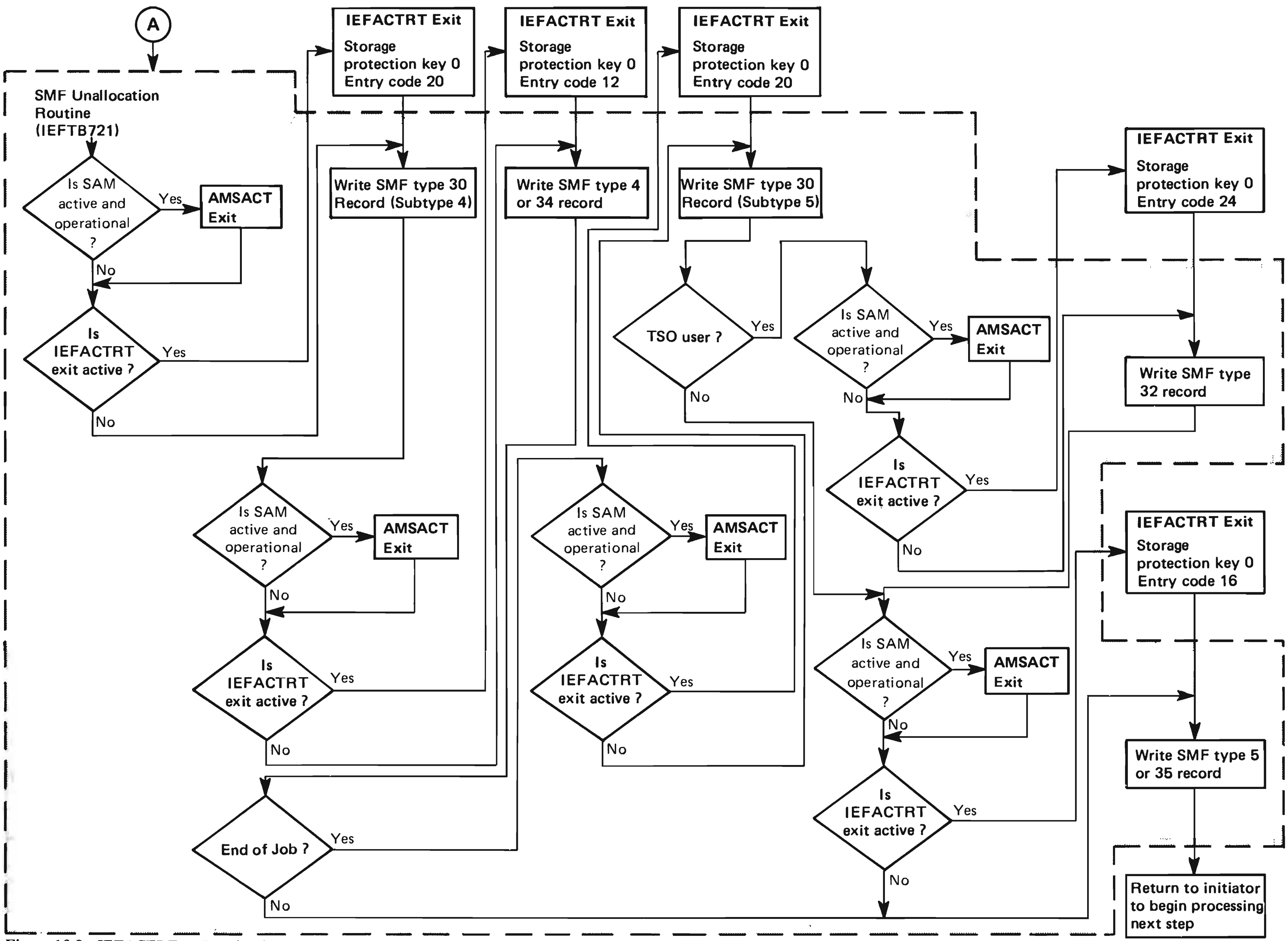


Figure 10-9. IEFACTRT – Termination Exit (Part 2 of 2)

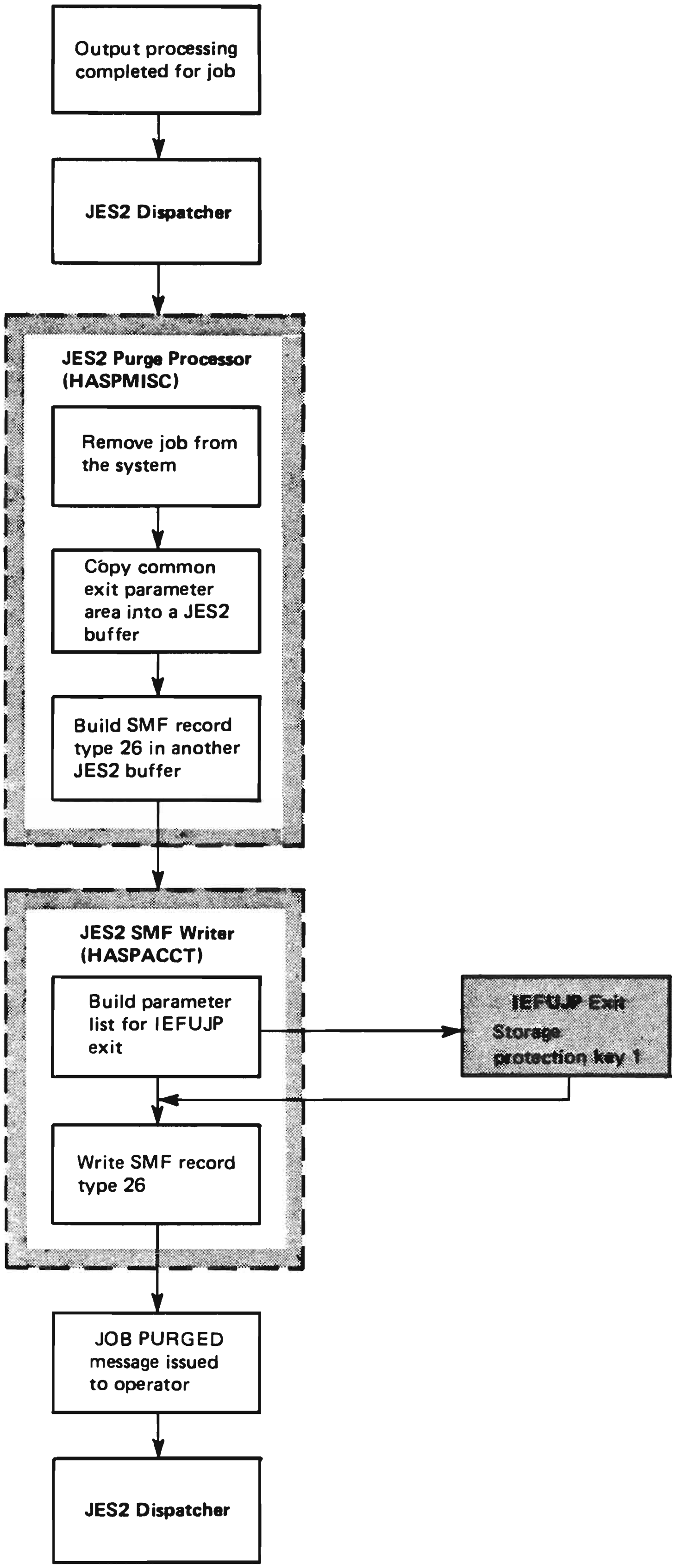


Figure 10-10. IEFUJP – JES2 Job Purge Exit

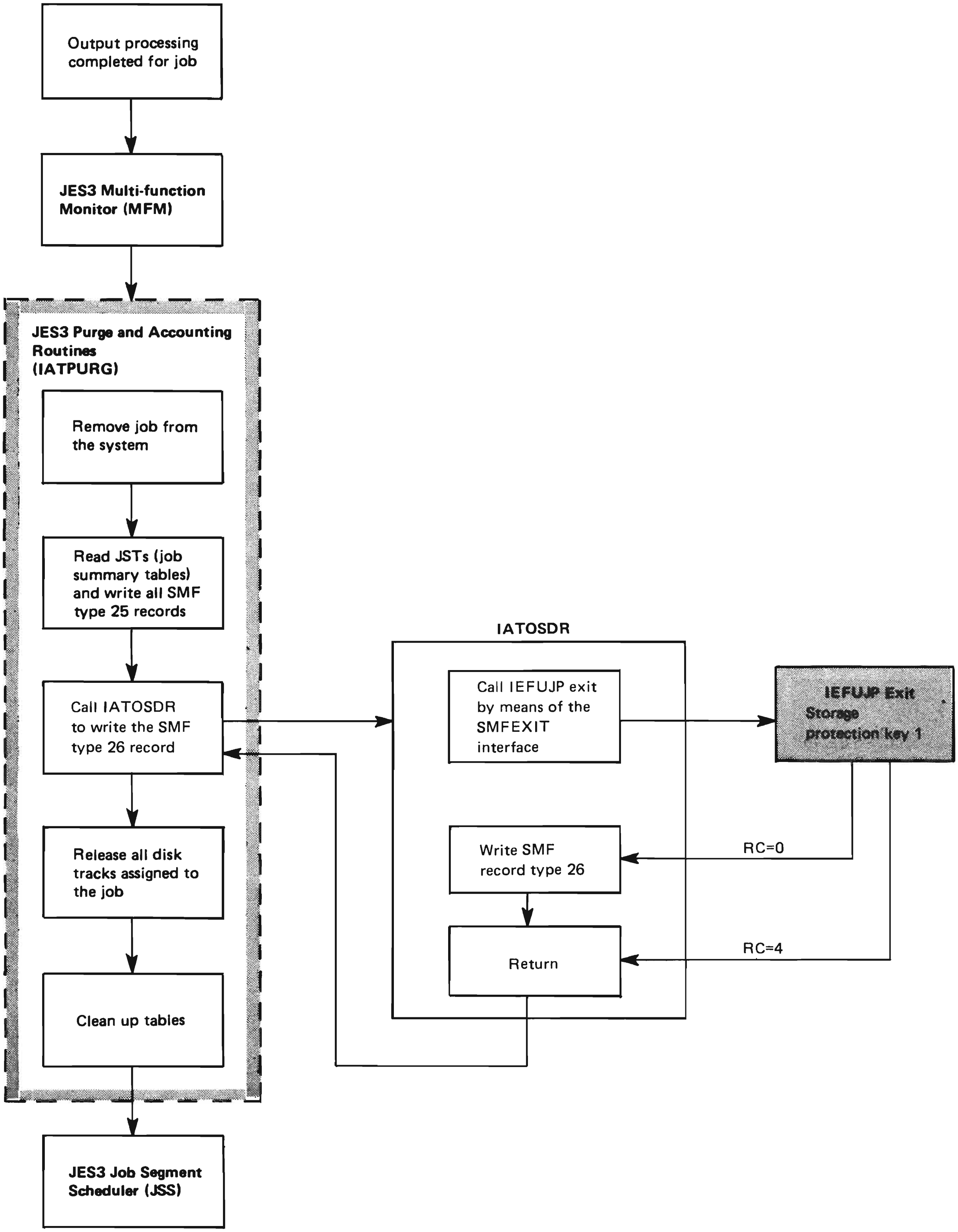


Figure 10-11. IEFUJP – JES3 Job Purge Exit

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