Publication Updates for OA66676: DFSMS SMF Type 98 Data Set Activity

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About this information
This document provides an overview of the new function delivered with APAR OA66676 (and its corequisites) and the associated updates for publications in the z/OS product library. The information in this document applies to both z/OS 2.5 and 3.1.

Currency of this information: The complete publication updates appear in the next editions of the official publications, which are scheduled to be published in September 2024. Thereafter, the information in the official publications supersedes the publication information in this APAR document. If you are reading this APAR document after September 2024, refer instead to the official publications for the most recent information.

Contents

1. Introduction

APAR OA66676 and its corequisite APARs OA66677, OA66688, OA66729 and OA66716, enhance DFSMS to allow the creation of SMF type 98 subtype 5, 6, 7 and 8 records. These records follow the structure defined in the section *Record type 98 (X'62') — Workload interaction correlator and high frequency throughput statistics* in the publication *z/OS MVS System Management Facilities (SMF) (SA38-0667).* These records provide metrics describing z/OS access method read and write activity for the most active data sets.

Each z/OS system on which SMF type 98 subtype 5-8 data is to be collected must meet the following requirements:

- IBM z/OS 2.5 or later with the required service
  - DFSMS APAR OA66676 and its corequisites
  - BCP APAR OA66716

2. Publication Updates

2.1. z/OS MVS Initialization and Tuning Reference (SA23-1380)

2.1.1. Chapter 28 DEVSUPxx (device support options)

Under section “Syntax format of DEVSUPxx” add

SMF98_DATASET_ACTIVITY = {YES|NO},

Under section “IBM-supplied defaults for DEVSUPxx” add:

SMF98_DATASET_ACTIVITY = NO,

Under section “Statements and parameters for DEVSUPxx” add:

SMF98_DATASET_ACTIVITY=

Enables or disables the generation of SMF type 98 subtype 5, 6, 7 and 8 records

NO

Suppresses the generation of SMF type 98 subtype 5, 6, 7 and 8 records

YES

Allows the generation of SMF type 98 subtype 5, 6, 7 and 8 records

Note: Generating SMF type 98 subtypes 5-8 also requires that the Workload Interaction Correlator feature be enabled and SMF configured to collect SMF type 98 subtypes 5-8 as described in the section ‘Data Set Activity’ in z/OS DFSMS Using Data Sets (SC23-6855).

If SMF98_DATASET_ACTIVITY=YES is specified, the following message is logged.

IEA253I DEVSUP SMF TYPE(98(5:8)) RECORDS ARE GENERATED

If SMF98_DATASET_ACTIVITY=NO is specified, the following message is logged:

IEA253I DEVSUP SMF TYPE(98(5:8)) RECORDS ARE SUPPRESSED

If the keyword is not specified, no message is logged.

Default: NO

2.2. z/OS MVS System Commands (SA38-0666)

2.2.1. Chapter 4 MVS System Commands Reference

Under section “Displaying DEVSUP settings” add the following to the example output

SMF98_DATASET_ACTIVITY = NO

2.3. z/OS DFSMS Using Data Sets (SC23-6855)

2.3.1. Chapter 1 Working with data sets

The following is added as a new section at the end of the chapter:

Data Set Activity

Overview

DFSMS can monitor and record read and write activity to data sets when any of the standard z/OS access methods are used. The data is captured and written out in the form of SMF type 98 subtype 5-8 records. This SMF data can then be used to analyze metrics such as

- Which data sets are read and written most frequently by userid and job name
- The volume of data read and written for the most active data sets

The metrics included in the SMF type 98 subtype 5-8 records are collected by the system during each read or write I/O operation and aggregated across an interval. The four SMF type 98 subtypes are defined as:

- Subtype 5 – Enhanced data set read activity
- Subtype 6 – Basic data set read activity
- Subtype 7 – Enhanced data set write activity
- Subtype 8 – Basic data set write activity

For the purposes of these SMF records, the terms ‘Enhanced’ and ‘Basic’ are defined to encompass the following data set types:

- Enhanced
  - Extended and non-extended format VSAM KSDS, ESDS, RRDS, Linear
  - Extended format sequential
  - PDSE
- Basic
  - Basic & Large format sequential
  - PDS

Read and write activity will be monitored when any of the standard z/OS BSAM, QSAM, BPAM, VSAM and VSAM/RLS access method macros are used.

The metrics that are recorded include the number of bytes read or written in the I/O operation, the data set name and the userid that performed the operation. See the definition of the SMF type 98 subtype 5-8 records in *z/OS MVS System Management Facilities (SMF) (SA38-0667)* for a complete description of the fields.

When the creation of SMF type 98 subtype 5-8 records is enabled through the method described below, data is collected during every monitored I/O operation, aggregated and subsequently written out (typically every 5 seconds) by SMF.

Enabling creation of SMF type 98 subtype 5-8 records

The system programmer must configure z/OS to collect SMF type 98 subtype 5-8 records as described below. Note that, in addition to DEVSUPxx configuration, SMF must also be configured to enable the Workload Interaction Correlator and allow the collection of SMF type 98 subtype 5-8 records.

Modifying DEVSUPxx

Code the following in the active SYS1.PARMLIB(DEVSUPxx) member to direct the system to collect SMF type 98 subtype 5-8 records:

SMF98_DATASET_ACTIVITY=YES

To suppress creation of SMF type 98 subtype 5-8 records, code the following statement in the active SYS1.PARMLIB(DEVSUPxx) member

SMF98_DATASET_ACTIVITY=NO

Creation of SMF type 98 subtype 5-8 records can also be suppressed by omitting the SMF98_DATASET_ACTIVITY keyword from the active DEVSUPxx member; the default is to not produce those records

See *z/OS MVS Initialization and Tuning Reference (SA23-1380)* for a description of how to specify DEVSUPxx options.

Activating DEVSUPxx

Creation of SMF type 98 subtype 5-8 records can be dynamically enabled and disabled by issuing the operator command

SET DEVSUP=xx

where xx is the suffix of a DEVSUP member that contains either SMF98_DATASET_ACTIVITY=YES or SMF98_DATASET_ACTIVITY=NO

See *z/OS MVS System Commands (SA38-0666)* for a description of how to issue the SET DEVSUP command.

Messages

If SMF98_DATASET_ACTIVITY=YES is coded in the DEVSUPxx member specified on the SET DEVSUP command the following message is logged.

IEA253I DEVSUP SMF TYPE(98(5:8)) RECORDS ARE GENERATED

If SMF98_DATASET_ACTIVITY=NO is coded in the DEVSUPxx member specified on the SET DEVSUP command, the following message is logged:

IEA253I DEVSUP SMF TYPE(98(5:8)) RECORDS ARE SUPPRESSED

If the SMF98_DATASET_ACTIVITY keyword is not present in the DEVSUPxx member specified on the SET DEVSUP command, no message is logged.

In response to a DISPLAY DEVSUP command, one of the following messages will be issued

SMF98_DATASET_ACTIVITY=YES

SMF98_DATASET_ACTIVITY=NO

Modifying SMFPRMxx

Configure SMF to activate the Workload Interaction Correlator (as described in the section "Enabling the z/OS Workload Interaction Correlator feature" in *z/OS MVS System Management Facilities (SMF) (SA38-0667))* and to collect all SMF type 98 subtypes by including the following statements in the active SYS1.PARMLIB(SMFPRMxx) member

WIC

SYS(TYPE(98))

If DEVSUPxx and SMFPRMxx have been properly configured to generate SMF type 98 subtype 5-8 records, the 4 SMF exit routines (IGGIND*) will appear in the response to a DISPLAY SMF,WIC command, as in the following example::

```
D SMF,WIC
IFA714I 11.53.01 SMF STATUS 396
 SMF WIC STATUS
  SPECIFIED SMF PARAMETER: WIC
  WorkloadIntCorr PRODUCT FEATURE: ENABLED
 ST    K PG # AS  ROUTINE  VERSION  R A E LAST ROUTINE CALL TIME
 ----- - -- ----- -------- -------- - - - ----------------------
 00001            IEAHFXSV          Y     08/23/2024 11:53:00.531
 00003            IOSVEXS3          Y     08/23/2024 11:53:00.532
 00004            IOSVEXS4          Y     08/23/2024 11:53:00.532
 00005            IGGINDVR          Y     08/23/2024 11:53:00.532
 00006            IGGINDBR          Y     08/23/2024 11:53:00.533
 00007            IGGINDVW          Y     08/23/2024 11:53:00.535
 00008            IGGINDBW          Y     08/23/2024 11:53:00.537
 KEY:
  ST      - SUBTYPE NUMBER
  K       - BUFFERKEY VALUE
  PG      - NUM4KPAGES VALUE
  # AS    - NUMBER OF ADDRESS SPACES REGISTERED
  ROUTINE - EXIT ROUTINE NAME (CURRENT / PENDING)
  VERSION - EXIT ROUTINE VERSION (IN HEXADECIMAL)
  R       - SMF PARAMETERS REQUEST SUBTYPE
  A       - EXIT ROUTINE TO BE CALLED NEXT INTERVAL
  E       - ERROR ADDING EXIT ROUTINE
  LAST... - TIME EXIT ROUTINE LAST CALLED
```

Increasing HVCOMMON

If DEVSUPxx and SMFPRMxx have been properly configured to generate SMF type 98 subtype 5-8 records, and the function is active at IPL or dynamically via operator command, approximately 1GB of disabled reference high virtual common storage will be allocated for every 500 address spaces, up to the value specified for MAXUSER in IEASYSxx. The default HVCOMMON value of 64GB, or the value specified for HVCOMMON in IEASYSxx, may need to be increased to allow for the additional usage. The operator command `DISPLAY VIRTSTOR,HVCOMMON` can be used to determine total and allocated high virtual common.

2.4. z/OS MVS System Management Facilities (SMF) (SA38-0667)

2.4.1. Record type 98 (X'62')-Workload interaction correlator and high frequency throughput statistics

Update Table 22 to include the new subtypes:

Subtype	Record Owner	Available with HFTS	Available with Correlator	Average record size per interval	Total average record data per day
5	DFSMS	No	Yes[2]	32KB	550MB
6	DFSMS	No	Yes[2]	32KB	550MB
7	DFSMS	No	Yes[2]	32KB	550MB
8	DFSMS	No	Yes[2]	32KB	550MB

2 Requires that the active DEVSUPxx member contain the keyword SMF98_DATASET_ACTIVITY=YES

Add the following new SMF 98 subtype descriptions after the description of subtype 1:

2.4.1.1. Subtype 5 – DFSMS Enhanced Data Set Read Activity

SMF record type 98 subtype 5 records contain performance information for the DFSMS component for enhanced data set read activity.

SMF type 98 subtype 5 records contain the following sections:

- Data Section
  - Aggregate Bucket 1 Section
  - Job Index Section
  - Job List Section

Data Section
The subtype 5 data section (shown below) begins with a number of data triplets (SMF98_5_DataTripletsNum) and a length of data triplet area (SMF98_5_DataTripletsLen) followed by the data triplet area (SMF98_5_DataTripletsArea). The SMF98_5_DataTripletsArea provides an offset, length, and number of entries for each data area. The contents of the 'Offset to' fields are from the start of the record.

Offset (Dec)	Offset (Hex)	Name	Length	Format	Description
0	0	SMF98_5_DataTripletsNum	4	Binary	Number of data triplets that follows
4	4	SMF98_5_DataTripletsLen	4	Binary	Length of data triplets that follows
8	8	SMF98_5_DataTripletsArea	32	Binary	Data triplets area
8	8	SMF98_5_Bucket1OF	4	Binary	Offset to Bucket1 sections. Data mapped by: SMF98_5_Bucket1
12	C	SMF98_5_Bucket1LN	2	Binary	Length of Bucket1 section
14	E	SMF98_5_Bucket1ON	2	Binary	Number Bucket1 sections

16	10	Reserved	8	Binary	Reserved for IBM use only.
24	18	SMF98_5_JobIndexOF	4	Binary	Offset to consumption sections. Data mapped by: SMF98_5_JobIndex
28	1C	SMF98_5_JobIndexLN	2	Binary	Length of consumption section
30	1E	SMF98_5_JobIndexON	2	Binary	Number of job index sections
32	20	SMF98_5_JobOF	4	Binary	Offset to job sections. Job sections mapped by: SMF98_5_Job
36	24	SMF98_5_JobLN	2	Binary	Length of the job section
38	26	SMF98_5_JobON	2	Binary	Number of job sections

Aggregate Bucket 1 Section
The SMF type 98 subtype 5 aggregate bucket 1 section contains aggregate performance metric data. This section is mapped by SMF98_5_Bucket1.

Triplet Information:
To locate this section in the record use the following triplet fields which are found in the self-defining section documented above.

Offset
SMF98_5_Bucket1OF

Length
SMF98_5_Bucket1LN

Number
SMF98_5_Bucket1ON

<table>
<tr><th>Offset (Dec)</th><th>Offset (Hex)</th><th>Name</th><th>Length</th><th>Format</th><th>Description</th></tr>
<tr><td>0</td><td>0</td><td>SMF98_5_Bucket1</td><td>0</td><td></td><td>Section – Aggregate bucket 1 header</td></tr>
<tr><td>0</td><td>0</td><td>SMF98_5_Bucket1_Header</td><td>6</td><td>Binary</td><td>Aggregate bucket 1 header</td></tr>
<tr><td>0</td><td>0</td><td>SMF98_5_Bucket1_
CpuType</td><td>2</td><td>Binary</td><td>CPU Type of this output. Can be one of:
<table><tr><th>Value</th><th>Meaning</th><th>Constant</th></tr><tr><td>0</td><td>CP</td><td>SMF98_ProcClass_CP</td></tr><tr><td>4</td><td>zIIP</td><td>SMF98_ProcClass_zIIP</td></tr></table></td></tr>
<tr><td>2</td><td>2</td><td>SMF98_5_Bucket1_
PriorityBucket</td><td>2</td><td>Binary</td><td>Job priority, can be one of:
<table><tr><th>Value</th><th>Meaning</th><th>Constant</th></tr><tr><td>FFFF</td><td>All</td><td>SMF98_kPriorityBucket_All</td></tr><tr><td>1</td><td>Critical</td><td>SMF98_kPriorityBucket_1</td></tr><tr><td>2</td><td>High</td><td>SMF98_kPriorityBucket_2</td></tr><tr><td>3</td><td>Low</td><td>SMF98_kPriorityBucket_3</td></tr><tr><td>4</td><td>Discretionary</td><td>SMF98_kPriorityBucket_4</td></tr></table></td></tr>
<tr><td>4</td><td>4</td><td>SMF98_5_Bucket1_
JobSizeBucket</td><td>2</td><td>Binary</td><td>Custom job group number 1 to 32.</td></tr>
<tr><td>6</td><td>6</td><td>SMF98_5_Bucket1_Contents</td><td>26</td><td>Binary</td><td>Mapped by SMF98_5_Bucket1_Data</td></tr>
<tr><td>6</td><td>6</td><td>SMF98_5_Bucket1_Data</td><td>26</td><td>Binary</td><td>Aggregate Bucket 1 Data</td></tr>
<tr><td>6</td><td>6</td><td>SMF98_5_Bucket1_Jobs</td><td>2</td><td>Binary</td><td>Number of address spaces in this analysis</td></tr>
<tr><td>8</td><td>8</td><td>SMF98_5_Bucket1_TotBytes</td><td>8</td><td>Binary</td><td>Total bytes read</td></tr>
<tr><td>16</td><td>10</td><td>SMF98_5_Bucket1_Reads</td><td>8</td><td>Binary</td><td>Number of read invocations</td></tr>
<tr><td>24</td><td>18</td><td>SMF98_5_Bucket1_AvgBytes</td><td>8</td><td>Binary</td><td>Average number of bytes per read invocation</td></tr>
</table>

Job Index Section
The SMF type 98 subtype 5 Job Index section contains job list information for the most exceptional metrics for each of the CPU type, Job Priority, and Custom Job Group combinations. This section is mapped by SMF98_5_JobIndex

Triplet Information:
To locate this section in the record use the following triplet fields which are found in the self defining section documented above.

Offset
SMF98_5_JobIndexOF

Length
SMF98_5_JobIndexLN

Number
SMF98_5_JobIndexON

<table>
<tr><th>Offset (Dec)</th><th>Offset (Hex)</th><th>Name</th><th>Length</th><th>Format</th><th>Description</th></tr>
<tr><td>0</td><td>0</td><td>SMF98_5_JobIndex</td><td>8</td><td></td><td>Job index data area</td></tr>
<tr><td>0</td><td>0</td><td>SMF98_5_JobIndex_CpuType</td><td>2</td><td>Binary</td><td>CPU Type of this output. Can be one of:<table><tr><th>Value</th><th>Meaning</th><th>Constant</th></tr><tr><td>0</td><td>CP</td><td>SMF98_ProcClass_CP</td></tr><tr><td>4</td><td>zIIP</td><td>SMF98_ProcClass_zIIP</td></tr></table></td></tr>
<tr><td>2</td><td>2</td><td>SMF98_5_JobIndex_PriorityBucket</td><td>2</td><td>Binary</td><td>Job priority, can be one of:<table><tr><th>Value</th><th>Meaning</th><th>Constant</th></tr><tr><td>FFFF</td><td>All</td><td>SMF98_kPriorityBucket_All</td></tr><tr><td>1</td><td>Critical</td><td>SMF98_kPriorityBucket_1</td></tr><tr><td>2</td><td>High</td><td>SMF98_kPriorityBucket_2</td></tr><tr><td>3</td><td>Low</td><td>SMF98_kPriorityBucket_3</td></tr><tr><td>4</td><td>Discretionary</td><td>SMF98_kPriorityBucket_4</td></tr></table></td></tr>
<tr><td>4</td><td>4</td><td>SMF98_5_JobIndex_JobSizeBucket</td><td>2</td><td>Binary</td><td>Custom job group number 1 to 32.</td></tr>
<tr><td>6</td><td>6</td><td>SMF98_5_JobIndex_TopTotBytes</td><td>2</td><td>Binary</td><td>Job index of the job with the highest number of bytes read for this CPU type, job priority and custom job group. See SMF98_5_Job with the matching SMF98_5_Job_ID for details</td></tr>
</table>

Job List Section
The SMF type 98 subtype 5 Job List section contains a list of the jobs (identified by their ASID and jobname) that contain the “most” exceptional activity for a given activity. This section is mapped by SMF98_5_Job.

Triplet Information:
To locate this section in the record use the following triplet fields which are found in the self defining section documented above.

Offset
SMF98_5_JobOF

Length
SMF98_5_JobLN

Number
SMF98_5_JobON

<table>
<tr><th>Offset (Dec)</th><th>Offset (Hex)</th><th>Name</th><th>Length</th><th>Format</th><th>Description</th></tr>
<tr><td>0</td><td>0</td><td>SMF98_5_Job</td><td>144</td><td></td><td>Job information area</td></tr>
<tr><td>0</td><td>0</td><td>SMF98_5_Job_ID</td><td>2</td><td>Binary</td><td>Address space id number</td></tr>
<tr><td>2</td><td>2</td><td>SMF98_5_Job_Name</td><td>8</td><td>Character</td><td>Name of the address space</td></tr>
<tr><td>10</td><td>A</td><td>SMF98_5_Job_TSO</td><td>1</td><td>Character</td><td>TSO Userid. Can be one of:
<table><tr><td>Value</td><td>Meaning</td></tr><tr><td>Y</td><td>User profile allows TSO</td></tr><tr><td>N</td><td>User profile does not allow TSO</td></tr></table></td></tr>
<tr><td>11</td><td>B</td><td>Reserved</td><td>13</td><td>Binary</td><td>Reserved area for IBM use only</td></tr>
<tr><td>24</td><td>18</td><td>SMF98_5_Job_TotBytes</td><td>8</td><td>Binary</td><td>Total number of bytes this job has read</td></tr>
<tr><td>32</td><td>20</td><td>SMF98_5_Job_Reads</td><td>8</td><td>Binary</td><td>Total number of read invocations</td></tr>
<tr><td>40</td><td>28</td><td>SMF98_5_Job_AvgBytes</td><td>8</td><td>Binary</td><td>Average number of bytes read for this job</td></tr>
<tr><td>48</td><td>30</td><td>SMF98_5_Job_TopDSStats</td><td>96</td><td>Binary</td><td>Stats for top data sets</td></tr>
<tr><td>48</td><td>30</td><td>SMF98_5_Job_DSTotal</td><td>8</td><td>Binary</td><td>Total bytes read</td></tr>
<tr><td>56</td><td>38</td><td>SMF98_5_Job_DSReads</td><td>8</td><td>Binary</td><td>Total number of reads</td></tr>
<tr><td>64</td><td>40</td><td>SMF98_5_Job_DSSize</td><td>8</td><td>Binary</td><td>Data set size at open, in bytes.
<table><tr><td>Value</td><td>Meaning</td></tr><tr><td>nnnnnnnn</td><td>Ddata set size in bytes</td></tr><tr><td>FFFFFFFF FFFFFFFF</td><td>Size not available</td></tr></table></td></tr>
</table>

<table>
<tr><td>72</td><td>48</td><td>SMF98_5_Job_DSName</td><td>44</td><td>Character</td><td>Data set name</td></tr>
<tr><td>116</td><td>74</td><td>SMF98_5_Job_DSVolser</td><td>6</td><td>Character</td><td>First volume that data set resides on</td></tr>
<tr><td>122</td><td>7A</td><td>SMF98_5_Job_DSUserid</td><td>8</td><td>Character</td><td>Userid that opened the data set</td></tr>
<tr><td>130</td><td>82</td><td>SMF98_5_Job_DSOrg</td><td>1</td><td>Binary</td><td>Data set organization.
<table>
<tr><th>Value</th><th>Meaning</th><th>Constant</th></tr>
<tr><td>0</td><td>Other</td><td></td></tr>
<tr><td>1</td><td>PS</td><td></td></tr>
<tr><td>2</td><td>PDS</td><td></td></tr>
<tr><td>3</td><td>PDSE</td><td></td></tr>
<tr><td>4</td><td>Direct</td><td></td></tr>
<tr><td>5</td><td>ISAM</td><td></td></tr>
<tr><td>6</td><td>EXCP</td><td></td></tr>
<tr><td>7</td><td>Extended Format</td><td></td></tr>
<tr><td>10</td><td>HFS</td><td></td></tr>
<tr><td>16</td><td>KSDS Data</td><td></td></tr>
<tr><td>17</td><td>KSDS Index</td><td></td></tr>
<tr><td>18</td><td>Var RRDS Data</td><td></td></tr>
<tr><td>19</td><td>Var RRDS Index</td><td></td></tr>
<tr><td>20</td><td>Fixed RRDS</td><td></td></tr>
<tr><td>21</td><td>Linear</td><td></td></tr>
<tr><td>22</td><td>ESDS</td><td></td></tr>
</table></td></tr>
<tr><td>131</td><td>83</td><td>SMF98_5_Job_DSFlag</td><td>1</td><td>Bitstring</td><td>Data set flag.</td></tr>
</table>

					Value	Meaning	Constant
					b'11000000'	VSAM GSR	
					b'10000000'	VSAM LSR	
					b'01000000'	VSAM RLS	
					b'00100000'	Encrypted	
					b'00010000'	EXCP	
					b'00001000'	Fixed length	
					b'00000100'	Program Library	
					b'00000010'	Extended Format	
					b'00000001'	Compressed	
132	84	Reserved	12	Binary	Reserved for IBM Use		

2.4.1.2. Subtype 6 – DFSMS Basic Data Set Read Activity

SMF record type 98 subtype 6 records contain performance information for the DFSMS component for basic data set read activity.

SMF type 98 subtype 6 records contain the following sections:

- Data Section
  - Aggregate Bucket 1 Section
  - Job Index Section
  - Job List Section

Data Section
The subtype 6 data section (shown below) begins with a number of data triplets (SMF98_6_DataTripletsNum) and a length of data triplet area (SMF98_6_DataTripletsLen) followed by the data triplet area (SMF98_6_DataTripletsArea). The SMF98_6_DataTripletsArea provides an offset, length, and number of entries for each data area. The contents of the 'Offset to' fields are from the start of the record.

Offset (Dec)	Offset (Hex)	Name	Length	Format	Description
0	0	SMF98_6_DataTripletsNum	4	Binary	Number of data triplets that follows
4	4	SMF98_6_DataTripletsLen	4	Binary	Length of data triplets that follows
8	8	SMF98_6_DataTripletsArea	32	Binary	Data triplets area
8	8	SMF98_6_Bucket1OF	4	Binary	Offset to Bucket1 sections. Data mapped by: SMF98_6_Bucket1
12	C	SMF98_6_Bucket1LN	2	Binary	Length of Bucket1 section
14	E	SMF98_6_Bucket1ON	2	Binary	Number Bucket1 sections
16	10	Reserved	8	Binary	Reserved for IBM use only.
24	18	SMF98_6_JobIndexOF	4	Binary	Offset to consumption sections. Data mapped by: SMF98_6_JobIndex
28	1C	SMF98_6_JobIndexLN	2	Binary	Length of consumption section
30	1E	SMF98_6_JobIndexON	2	Binary	Number of job index sections
32	20	SMF98_6_JobOF	4	Binary	Offset to job sections. Job sections mapped by: SMF98_6_Job
36	24	SMF98_6_JobLN	2	Binary	Length of the job section
38	26	SMF98_6_JobON	2	Binary	Number of job sections

Aggregate Bucket 1 Section
The SMF type 98 subtype 6 aggregate bucket 1 section contains aggregate performance metric data. This section is mapped by SMF98_6_Bucket1.

Triplet Information:
To locate this section in the record use the following triplet fields which are found in the self defining section documented above.

Offset
SMF98_6_Bucket1OF

Length
SMF98_6_Bucket1LN

Number
SMF98_6_Bucket1ON

Offset (Dec)	Offset (Hex)	Name	Length	Format	Description
0	0	SMF98_6_Bucket1	0		Section – Aggregate bucket 1 header
0	0	SMF98_6_Bucket1_Header	6	Binary	Aggregate bucket 1 header

<table>
<tr><td>0</td><td>0</td><td>SMF98_6_Bucket1_
CpuType</td><td>2</td><td>Binary</td><td>CPU Type of this output. Can be one of:<table><tr><th>Value</th><th>Meaning</th><th>Constant</th></tr><tr><td>0</td><td>CP</td><td>SMF98_ProcClass_CP</td></tr><tr><td>4</td><td>zIIP</td><td>SMF98_ProcClass_zIIP</td></tr></table></td></tr>
<tr><td>2</td><td>2</td><td>SMF98_6_Bucket1_
PriorityBucket</td><td>2</td><td>Binary</td><td>Job priority, can be one of:<table><tr><th>Value</th><th>Meaning</th><th>Constant</th></tr><tr><td>FFFF</td><td>All</td><td>SMF98_kPriorityBucket_All</td></tr><tr><td>1</td><td>Critical</td><td>SMF98_kPriorityBucket_1</td></tr><tr><td>2</td><td>High</td><td>SMF98_kPriorityBucket_2</td></tr><tr><td>3</td><td>Low</td><td>SMF98_kPriorityBucket_3</td></tr><tr><td>4</td><td>Discretionary</td><td>SMF98_kPriorityBucket_4</td></tr></table></td></tr>
<tr><td>4</td><td>4</td><td>SMF98_6_Bucket1_
JobSizeBucket</td><td>2</td><td>Binary</td><td>Custom job group number 1 to 32.</td></tr>
<tr><td>6</td><td>6</td><td>SMF98_6_Bucket1_Contents</td><td>26</td><td>Binary</td><td>Mapped by SMF98_6_Bucket1_Data</td></tr>
<tr><td>6</td><td>6</td><td>SMF98_6_Bucket1_Data</td><td>26</td><td>Binary</td><td>Aggregate Bucket 1 Data</td></tr>
<tr><td>6</td><td>6</td><td>SMF98_6_Bucket1_Jobs</td><td>2</td><td>Binary</td><td>Number of address spaces in this analysis</td></tr>
<tr><td>8</td><td>8</td><td>SMF98_6_Bucket1_TotBytes</td><td>8</td><td>Binary</td><td>Total bytes read</td></tr>
<tr><td>16</td><td>10</td><td>SMF98_6_Bucket1_Reads</td><td>8</td><td>Binary</td><td>Number of read invocations</td></tr>
<tr><td>24</td><td>18</td><td>SMF98_6_Bucket1_AvgBytes</td><td>8</td><td>Binary</td><td>Average number of bytes per read invocation</td></tr>
</table>

Job Index Section

The SMF type 98 subtype 6 Job Index section contains job list information for the most exceptional metrics for each of the CPU type, Job Priority, and Custom Job Group combinations. This section is mapped by SMF98_6_JobIndex

Triplet Information:
To locate this section in the record use the following triplet fields which are found in the self defining section documented above.

Offset
SMF98_6_JobIndexOF

Length
SMF98_6_JobIndexLN

Number
SMF98_6_JobIndexON

<table>
<tr><th>Offset (Dec)</th><th>Offset (Hex)</th><th>Name</th><th>Length</th><th>Format</th><th>Description</th></tr>
<tr><td>0</td><td>0</td><td>SMF98_6_JobIndex</td><td>8</td><td></td><td>Job index data area</td></tr>
<tr><td>0</td><td>0</td><td>SMF98_6_JobIndex_CpuType</td><td>2</td><td>Binary</td><td>CPU Type of this output. Can be one of:
<table>
<tr><th>Value</th><th>Meaning</th><th>Constant</th></tr>
<tr><td>0</td><td>CP</td><td>SMF98_ProcClass_CP</td></tr>
<tr><td>4</td><td>zIIP</td><td>SMF98_ProcClass_zIIP</td></tr>
</table></td></tr>
<tr><td>2</td><td>2</td><td>SMF98_6_JobIndex_PriorityBucket</td><td>2</td><td>Binary</td><td>Job priority, can be one of:
<table>
<tr><th>Value</th><th>Meaning</th><th>Constant</th></tr>
<tr><td>FFFF</td><td>All</td><td>SMF98_kPriorityBucket_All</td></tr>
<tr><td>1</td><td>Critical</td><td>SMF98_kPriorityBucket_1</td></tr>
<tr><td>2</td><td>High</td><td>SMF98_kPriorityBucket_2</td></tr>
<tr><td>3</td><td>Low</td><td>SMF98_kPriorityBucket_3</td></tr>
<tr><td>4</td><td>Discretionary</td><td>SMF98_kPriorityBucket_4</td></tr>
</table></td></tr>
<tr><td>4</td><td>4</td><td>SMF98_6_JobIndex_JobSizeBucket</td><td>2</td><td>Binary</td><td>Custom job group number 1 to 32.</td></tr>
<tr><td>6</td><td>6</td><td>SMF98_6_JobIndex_TopTotBytes</td><td>2</td><td>Binary</td><td>Job index of the job with the highest number of bytes read for this CPU type, job priority and custom job group. See SMF98_6_Job with the matching SMF98_6_Job_ID for details</td></tr>
</table>

Job List Section
The SMF type 98 subtype 6 Job List section contains a list of the jobs (identified by their ASID and jobname) that contain the “most” exceptional activity for a given activity. This section is mapped by SMF98_6_Job.

Triplet Information:
To locate this section in the record use the following triplet fields which are found in the self defining section documented above.

Offset
SMF98_6_JobOF

Length
SMF98_6_JobLN

Number
SMF98_6_JobON

<table>
<tr><th>Offset (Dec)</th><th>Offset (Hex)</th><th>Name</th><th>Length</th><th>Format</th><th>Description</th></tr>
<tr><td>0</td><td>0</td><td>SMF98_6_Job</td><td>0</td><td></td><td>Job information area</td></tr>
<tr><td>0</td><td>0</td><td>SMF98_6_Job_ID</td><td>2</td><td>Binary</td><td>Address space id number</td></tr>
<tr><td>2</td><td>2</td><td>SMF98_6_Job_Name</td><td>8</td><td>Character</td><td>Name of the address space</td></tr>
<tr><td>10</td><td>A</td><td>SMF98_6_Job_TSO</td><td>1</td><td>Character</td><td>TSO Userid. Can be one of:<table><tr><th>Value</th><th>Meaning</th></tr><tr><td>Y</td><td>User profile allows TSO</td></tr><tr><td>N</td><td>User profile does not allow TSO</td></tr></table></td></tr>
<tr><td>11</td><td>B</td><td>Reserved</td><td>13</td><td>Binary</td><td>Reserved area for IBM use only</td></tr>
<tr><td>24</td><td>18</td><td>SMF98_6_Job_TotBytes</td><td>8</td><td>Binary</td><td>Total number of bytes this job has read</td></tr>
<tr><td>32</td><td>20</td><td>SMF98_6_Job_Reads</td><td>8</td><td>Binary</td><td>Total number of read invocations</td></tr>
<tr><td>40</td><td>28</td><td>SMF98_6_Job_AvgBytes</td><td>8</td><td>Binary</td><td>Average number of bytes read for this job</td></tr>
<tr><td>48</td><td>30</td><td>SMF98_6_Job_TopDSStats</td><td>96</td><td>Binary</td><td>Stats for top data sets</td></tr>
<tr><td>48</td><td>30</td><td>SMF98_6_Job_DSTotal</td><td>8</td><td>Binary</td><td>Total bytes read</td></tr>
<tr><td>56</td><td>38</td><td>SMF98_6_Job_DSReads</td><td>8</td><td>Binary</td><td>Total number of reads</td></tr>
</table>

<table>
<tr><td>64</td><td>40</td><td>SMF98_6_Job_DSSize</td><td>8</td><td>Binary</td><td>Data set size at open, in bytes.
<table><tr><td>Value</td><td>Meaning</td></tr><tr><td>nnnnnnnn</td><td>Ddata set size in bytes</td></tr><tr><td>FFFFFFFF FFFFFFFF</td><td>Size not available</td></tr></table></td></tr>
<tr><td>72</td><td>48</td><td>SMF98_6_Job_DSName</td><td>44</td><td>Character</td><td>Data set name</td></tr>
<tr><td>116</td><td>74</td><td>SMF98_6_Job_DSVolser</td><td>6</td><td>Character</td><td>First volume that data set resides on</td></tr>
<tr><td>122</td><td>7A</td><td>SMF98_6_Job_DSUserid</td><td>8</td><td>Character</td><td>Userid that opened the data set</td></tr>
<tr><td>130</td><td>82</td><td>SMF98_6_Job_DSOrg</td><td>1</td><td>Binary</td><td>Data set organization.
<table><tr><td>Value</td><td>Meaning</td><td>Constant</td></tr><tr><td>0</td><td>Other</td><td></td></tr><tr><td>1</td><td>PS</td><td></td></tr><tr><td>2</td><td>PDS</td><td></td></tr><tr><td>3</td><td>PDSE</td><td></td></tr><tr><td>4</td><td>Direct</td><td></td></tr><tr><td>5</td><td>ISAM</td><td></td></tr><tr><td>6</td><td>EXCP</td><td></td></tr><tr><td>7</td><td>Extended Format</td><td></td></tr><tr><td>10</td><td>HFS</td><td></td></tr><tr><td>16</td><td>KSDS Data</td><td></td></tr><tr><td>17</td><td>KSDS Index</td><td></td></tr><tr><td>18</td><td>Var RRDS Data</td><td></td></tr><tr><td>19</td><td>Var RRDS Index</td><td></td></tr><tr><td>20</td><td>Fixed RRDS</td><td></td></tr><tr><td>21</td><td>Linear</td><td></td></tr><tr><td>22</td><td>ESDS</td><td></td></tr></table></td></tr>
</table>

<table>
<tr><td>131</td><td>83</td><td>SMF98_6_Job_DSFlag</td><td>1</td><td>Bitstring</td><td>Data set flag.
<table><tr><th>Value</th><th>Meaning</th><th>Constant</th></tr><tr><td>b'11000000'</td><td>VSAM GSR</td><td></td></tr><tr><td>b'10000000'</td><td>VSAM LSR</td><td></td></tr><tr><td>b'01000000'</td><td>VSAM RLS</td><td></td></tr><tr><td>b'00100000'</td><td>Encrypted</td><td></td></tr><tr><td>b'00010000'</td><td>EXCP</td><td></td></tr><tr><td>b'00001000'</td><td>Fixed length</td><td></td></tr><tr><td>b'00000100'</td><td>Program Library</td><td></td></tr><tr><td>b'00000010'</td><td>Extended Format</td><td></td></tr><tr><td>b'00000001'</td><td>Compressed</td><td></td></tr></table></td></tr>
<tr><td>132</td><td>84</td><td>Reserved</td><td>12</td><td>Binary</td><td>Reserved for IBM Use</td></tr>
</table>

2.4.1.3. Subtype 7 – DFSMS Enhanced Data Set Write Activity

SMF record type 98 subtype 7 records contain performance information for the DFSMS component for enhanced data set write activity.

SMF type 98 subtype 7 records contain the following sections:

- Data Section
  - Aggregate Bucket 1 Section
  - Job Index Section
  - Job List Section

Data Section
The subtype 7 data section (shown below) begins with a number of data triplets (SMF98_7_DataTripletsNum) and a length of data triplet area (SMF98_7_DataTripletsLen) followed by the data triplet area (SMF98_7_DataTripletsArea). The SMF98_7_DataTripletsArea provides an offset, length, and number of entries for each data area. The contents of the 'Offset to' fields are from the start of the record.

Offset (Dec)	Offset (Hex)	Name	Length	Format	Description
0	0	SMF98_7_DataTripletsNum	4	Binary	Number of data triplets that follows
4	4	SMF98_7_DataTripletsLen	4	Binary	Length of data triplets that follows
8	8	SMF98_7_DataTripletsArea	32	Binary	Data triplets area
8	8	SMF98_7_Bucket1OF	4	Binary	Offset to Bucket1 sections. Data mapped by: SMF98_7_Bucket1
12	C	SMF98_7_Bucket1LN	2	Binary	Length of Bucket1 section
14	E	SMF98_7_Bucket1ON	2	Binary	Number Bucket1 sections
16	10	Reserved	8	Binary	Reserved for IBM use only.
24	18	SMF98_7_JobIndexOF	4	Binary	Offset to consumption sections. Data mapped by: SMF98_7_JobIndex
28	1C	SMF98_7_JobIndexLN	2	Binary	Length of consumption section
30	1E	SMF98_7_JobIndexON	2	Binary	Number of job index sections
32	20	SMF98_7_JobOF	4	Binary	Offset to job sections. Job sections mapped by: SMF98_7_Job
36	24	SMF98_7_JobLN	2	Binary	Length of the job section
38	26	SMF98_7_JobON	2	Binary	Number of job sections

Aggregate Bucket 1 Section

The SMF type 98 subtype 7 aggregate bucket 1 section contains aggregate performance metric data. This section is mapped by SMF98_7_Bucket1.

Triplet Information:

To locate this section in the record use the following triplet fields which are found in the self defining section documented above.

Offset
SMF98_7_Bucket1OF

Length
SMF98_7_Bucket1LN

Number
SMF98_7_Bucket1ON

<table>
<tr><th>Offset (Dec)</th><th>Offset (Hex)</th><th>Name</th><th>Length</th><th>Format</th><th>Description</th></tr>
<tr><td>0</td><td>0</td><td>SMF98_7_Bucket1</td><td>0</td><td></td><td>Section – Aggregate bucket 1 header</td></tr>
<tr><td>0</td><td>0</td><td>SMF98_7_Bucket1_Header</td><td>6</td><td>Binary</td><td>Aggregate bucket 1 header</td></tr>
<tr><td>0</td><td>0</td><td>SMF98_7_Bucket1_
CpuType</td><td>2</td><td>Binary</td><td>CPU Type of this output. Can be one of:<table><tr><th>Value</th><th>Meaning</th><th>Constant</th></tr><tr><td>0</td><td>CP</td><td>SMF98_ProcClass_CP</td></tr><tr><td>4</td><td>zIIP</td><td>SMF98_ProcClass_zIIP</td></tr></table></td></tr>
<tr><td>2</td><td>2</td><td>SMF98_7_Bucket1_
PriorityBucket</td><td>2</td><td>Binary</td><td>Job priority, can be one of:<table><tr><th>Value</th><th>Meaning</th><th>Constant</th></tr><tr><td>FFFF</td><td>All</td><td>SMF98_kPriorityBucket_All</td></tr><tr><td>1</td><td>Critical</td><td>SMF98_kPriorityBucket_1</td></tr><tr><td>2</td><td>High</td><td>SMF98_kPriorityBucket_2</td></tr><tr><td>3</td><td>Low</td><td>SMF98_kPriorityBucket_3</td></tr><tr><td>4</td><td>Discretionary</td><td>SMF98_kPriorityBucket_4</td></tr></table></td></tr>
<tr><td>4</td><td>4</td><td>SMF98_7_Bucket1_
JobSizeBucket</td><td>2</td><td>Binary</td><td>Custom job group number 1 to 32.</td></tr>
<tr><td>6</td><td>6</td><td>SMF98_7_Bucket1_Contents</td><td>26</td><td>Binary</td><td>Mapped by SMF98_7_Bucket1_Data</td></tr>
<tr><td>6</td><td>6</td><td>SMF98_7_Bucket1_Data</td><td>26</td><td>Binary</td><td>Aggregate Bucket 1 Data</td></tr>
<tr><td>6</td><td>6</td><td>SMF98_7_Bucket1_Jobs</td><td>2</td><td>Binary</td><td>Number of address spaces in this analysis</td></tr>
<tr><td>8</td><td>8</td><td>SMF98_7_Bucket1_TotBytes</td><td>8</td><td>Binary</td><td>Total bytes written</td></tr>
<tr><td>16</td><td>10</td><td>SMF98_7_Bucket1_Writes</td><td>8</td><td>Binary</td><td>Number of write invocations</td></tr>
<tr><td>24</td><td>18</td><td>SMF98_7_Bucket1_AvgBytes</td><td>8</td><td>Binary</td><td>Average number of bytes per write invocation</td></tr>
</table>

Job Index Section

The SMF type 98 subtype 7 Job Index section contains job list information for the most exceptional metrics for each of the CPU type, Job Priority, and Custom Job Group combinations.

This section is mapped by SMF98_7_JobIndex

Triplet Information:
To locate this section in the record use the following triplet fields which are found in the self defining section documented above.

Offset
SMF98_7_JobIndexOF

Length
SMF98_7_JobIndexLN

Number
SMF98_7_JobIndexON

<table>
<tr><th>Offset (Dec)</th><th>Offset (Hex)</th><th>Name</th><th>Length</th><th>Format</th><th>Description</th></tr>
<tr><td>0</td><td>0</td><td>SMF98_7_JobIndex</td><td>8</td><td></td><td>Job index data area</td></tr>
<tr><td>0</td><td>0</td><td>SMF98_7_JobIndex_
CpuType</td><td>2</td><td>Binary</td><td>CPU Type of this output. Can be one of:
<table>
<tr><th>Value</th><th>Meaning</th><th>Constant</th></tr>
<tr><td>0</td><td>CP</td><td>SMF98_ProcClass_CP</td></tr>
<tr><td>4</td><td>zIIP</td><td>SMF98_ProcClass_zIIP</td></tr>
</table></td></tr>
<tr><td>2</td><td>2</td><td>SMF98_7_JobIndex_
PriorityBucket</td><td>2</td><td>Binary</td><td>Job priority, can be one of:
<table>
<tr><th>Value</th><th>Meaning</th><th>Constant</th></tr>
<tr><td>FFFF</td><td>All</td><td>SMF98_kPriorityBucket_All</td></tr>
<tr><td>1</td><td>Critical</td><td>SMF98_kPriorityBucket_1</td></tr>
<tr><td>2</td><td>High</td><td>SMF98_kPriorityBucket_2</td></tr>
<tr><td>3</td><td>Low</td><td>SMF98_kPriorityBucket_3</td></tr>
<tr><td>4</td><td>Discretionary</td><td>SMF98_kPriorityBucket_4</td></tr>
</table></td></tr>
<tr><td>4</td><td>4</td><td>SMF98_7_JobIndex_
JobSizeBucket</td><td>2</td><td>Binary</td><td>Custom job group number 1 to 32.</td></tr>
<tr><td>6</td><td>6</td><td>SMF98_7_JobIndex_
TopTotBytes</td><td>2</td><td>Binary</td><td>Job Job index of the job with the highest number of bytes written for this CPU type, job priority and custom job group. See SMF98_7_Job with the matching SMF98_7_Job_ID for details</td></tr>
</table>

Job List Section
The SMF type 98 subtype 7 Job List section contains a list of the jobs (identified by their ASID and jobname) that contain the “most” exceptional activity for a given activity. This section is mapped by SMF98_7_Job.

Triplet Information:
To locate this section in the record use the following triplet fields which are found in the self defining section documented above.

Offset
SMF98_7_JobOF

Length
SMF98_7_JobLN

Number
SMF98_7_JobON

<table>
<tr><th>Offset (Dec)</th><th>Offset (Hex)</th><th>Name</th><th>Length</th><th>Format</th><th>Description</th></tr>
<tr><td>0</td><td>0</td><td>SMF98_7_Job</td><td>0</td><td></td><td>Job information area</td></tr>
<tr><td>0</td><td>0</td><td>SMF98_7_Job_ID</td><td>2</td><td>Binary</td><td>Address space id number</td></tr>
<tr><td>2</td><td>2</td><td>SMF98_7_Job_Name</td><td>8</td><td>Character</td><td>Name of the address space</td></tr>
<tr><td>10</td><td>A</td><td>SMF98_7_Job_TSO</td><td>1</td><td>Character</td><td>TSO Userid. Can be one of:<table><tr><th>Value</th><th>Meaning</th></tr><tr><td>Y</td><td>User profile allows TSO</td></tr><tr><td>N</td><td>User profile does not allow TSO</td></tr></table></td></tr>
<tr><td>11</td><td>B</td><td>Reserved</td><td>13</td><td>Binary</td><td>Reserved area for IBM use only</td></tr>
<tr><td>24</td><td>18</td><td>SMF98_7_Job_TotBytes</td><td>8</td><td>Binary</td><td>Total number of bytes this job has written</td></tr>
<tr><td>32</td><td>20</td><td>SMF98_7_Job_Writes</td><td>8</td><td>Binary</td><td>Total number of write invocations</td></tr>
<tr><td>40</td><td>28</td><td>SMF98_7_Job_AvgBytes</td><td>8</td><td>Binary</td><td>Average number of bytes written for this job</td></tr>
<tr><td>48</td><td>30</td><td>SMF98_7_Job_TopDSStats</td><td>96</td><td>Binary</td><td>Stats for top data sets</td></tr>
<tr><td>48</td><td>30</td><td>SMF98_7_Job_DSTotal</td><td>8</td><td>Binary</td><td>Total bytes written</td></tr>
<tr><td>56</td><td>38</td><td>SMF98_7_Job_DSWrites</td><td>8</td><td>Binary</td><td>Total number of writes</td></tr>
<tr><td>64</td><td>40</td><td>SMF98_7_Job_DSSize</td><td>8</td><td>Binary</td><td>Data set size at open, in bytes.<table><tr><th>Value</th><th>Meaning</th></tr><tr><td>nnnnnnnn</td><td>Data set size in bytes</td></tr><tr><td>FFFFFFFF FFFFFFFF</td><td>Size not available</td></tr></table></td></tr>
</table>

<table>
<tr><td>72</td><td>48</td><td>SMF98_7_Job_DSName</td><td>44</td><td>Character</td><td>Data set name</td></tr>
<tr><td>116</td><td>74</td><td>SMF98_7_Job_DSVolser</td><td>6</td><td>Character</td><td>First volume that data set resides on</td></tr>
<tr><td>122</td><td>7A</td><td>SMF98_7_Job_DSUserid</td><td>8</td><td>Character</td><td>Userid that opened the data set</td></tr>
<tr><td>130</td><td>82</td><td>SMF98_7_Job_DSOrg</td><td>1</td><td>Binary</td><td>Data set organization.
<table>
<tr><th>Value</th><th>Meaning</th><th>Constant</th></tr>
<tr><td>0</td><td>Other</td><td></td></tr>
<tr><td>1</td><td>PS</td><td></td></tr>
<tr><td>2</td><td>PDS</td><td></td></tr>
<tr><td>3</td><td>PDSE</td><td></td></tr>
<tr><td>4</td><td>Direct</td><td></td></tr>
<tr><td>5</td><td>ISAM</td><td></td></tr>
<tr><td>6</td><td>EXCP</td><td></td></tr>
<tr><td>7</td><td>Extended Format</td><td></td></tr>
<tr><td>10</td><td>HFS</td><td></td></tr>
<tr><td>16</td><td>KSDS Data</td><td></td></tr>
<tr><td>17</td><td>KSDS Index</td><td></td></tr>
<tr><td>18</td><td>Var RRDS Data</td><td></td></tr>
<tr><td>19</td><td>Var RRDS Index</td><td></td></tr>
<tr><td>20</td><td>Fixed RRDS</td><td></td></tr>
<tr><td>21</td><td>Linear</td><td></td></tr>
<tr><td>22</td><td>ESDS</td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
</table></td></tr>
</table>

<table>
<tr><td>131</td><td>83</td><td>SMF98_7_Job_DSFlag</td><td>1</td><td>Bitstring</td><td>Data set flag.<table><tr><td>Value</td><td>Meaning</td><td>Constant</td></tr><tr><td>b'11000000'</td><td>VSAM GSR</td><td></td></tr><tr><td>b'10000000'</td><td>VSAM LSR</td><td></td></tr><tr><td>b'01000000'</td><td>VSAM RLS</td><td></td></tr><tr><td>b'00100000'</td><td>Encrypted</td><td></td></tr><tr><td>b'00010000'</td><td>EXCP</td><td></td></tr><tr><td>b'00001000'</td><td>Fixed length</td><td></td></tr><tr><td>b'00000100'</td><td>Program Library</td><td></td></tr><tr><td>b'00000010'</td><td>Extended Format</td><td></td></tr><tr><td>b'00000001'</td><td>Compressed</td><td></td></tr></table></td></tr>
<tr><td>132</td><td>84</td><td>Reserved</td><td>12</td><td>Binary</td><td>Reserved for IBM Use</td></tr>
</table>

2.4.1.4. Subtype 8 – DFSMS Basic Data Set Write Activity

SMF record type 98 subtype 8 records contain performance information for the DFSMS component for basic data set write activity.

SMF type 98 subtype 8 records contain the following sections:

- Data Section
  - Aggregate Bucket 1 Section
  - Job Index Section
  - Job List Section

Data Section
The subtype 8 data section (shown below) begins with a number of data triplets (SMF98_8_DataTripletsNum) and a length of data triplet area (SMF98_8_DataTripletsLen) followed by the data triplet area (SMF98_8_DataTripletsArea). The SMF98_8_DataTripletsArea provides an offset, length, and number of entries for each data area. The contents of the 'Offset to' fields are from the start of the record.

Offset (Dec)	Offset (Hex)	Name	Length	Format	Description
0	0	SMF98_8_DataTripletsNum	4	Binary	Number of data triplets that follows
4	4	SMF98_8_DataTripletsLen	4	Binary	Length of data triplets that follows
8	8	SMF98_8_DataTripletsArea	32	Binary	Data triplets area
8	8	SMF98_8_Bucket1OF	4	Binary	Offset to Bucket1 sections. Data mapped by: SMF98_8_Bucket1
12	C	SMF98_8_Bucket1LN	2	Binary	Length of Bucket1 section
14	E	SMF98_8_Bucket1ON	2	Binary	Number Bucket1 sections
16	10	Reserved	8	Binary	Reserved for IBM use only.
24	18	SMF98_8_JobIndexOF	4	Binary	Offset to consumption sections. Data mapped by: SMF98_8_JobIndex
28	1C	SMF98_8_JobIndexLN	2	Binary	Length of consumption section
30	1E	SMF98_8_JobIndexON	2	Binary	Number of job index sections
32	20	SMF98_8_JobOF	4	Binary	Offset to job sections. Job sections mapped by: SMF98_8_Job
36	24	SMF98_8_JobLN	2	Binary	Length of the job section
38	26	SMF98_8_JobON	2	Binary	Number of job sections

Aggregate Bucket 1 Section
The SMF type 98 subtype 8 aggregate bucket 1 section contains aggregate performance metric data. This section is mapped by SMF98_8_Bucket1.

Triplet Information:
To locate this section in the record use the following triplet fields which are found in the self defining section documented above.

Offset
SMF98_8_Bucket1OF

Length
SMF98_8_Bucket1LN

Number
SMF98_8_Bucket1ON

<table>
<tr><th>Offset (Dec)</th><th>Offset (Hex)</th><th>Name</th><th>Length</th><th>Format</th><th>Description</th></tr>
<tr><td>0</td><td>0</td><td>SMF98_8_Bucket1</td><td>0</td><td></td><td>Section – Aggregate bucket 1 header</td></tr>
<tr><td>0</td><td>0</td><td>SMF98_8_Bucket1_Header</td><td>6</td><td>Binary</td><td>Aggregate bucket 1 header</td></tr>
<tr><td>0</td><td>0</td><td>SMF98_8_Bucket1_
CpuType</td><td>2</td><td>Binary</td><td>CPU Type of this output. Can be one of:<table><tr><th>Value</th><th>Meaning</th><th>Constant</th></tr><tr><td>0</td><td>CP</td><td>SMF98_ProcClass_CP</td></tr><tr><td>4</td><td>zIIP</td><td>SMF98_ProcClass_zIIP</td></tr></table></td></tr>
<tr><td>2</td><td>2</td><td>SMF98_8_Bucket1_
PriorityBucket</td><td>2</td><td>Binary</td><td>Job priority, can be one of:<table><tr><th>Value</th><th>Meaning</th><th>Constant</th></tr><tr><td>FFFF</td><td>All</td><td>SMF98_kPriorityBucket_All</td></tr><tr><td>1</td><td>Critical</td><td>SMF98_kPriorityBucket_1</td></tr><tr><td>2</td><td>High</td><td>SMF98_kPriorityBucket_2</td></tr><tr><td>3</td><td>Low</td><td>SMF98_kPriorityBucket_3</td></tr><tr><td>4</td><td>Discretionary</td><td>SMF98_kPriorityBucket_4</td></tr></table></td></tr>
<tr><td>4</td><td>4</td><td>SMF98_8_Bucket1_
JobSizeBucket</td><td>2</td><td>Binary</td><td>Custom job group number 1 to 32.</td></tr>
<tr><td>6</td><td>6</td><td>SMF98_8_Bucket1_Contents</td><td>26</td><td>Binary</td><td>Mapped by SMF98_8_Bucket1_Data</td></tr>
<tr><td>6</td><td>6</td><td>SMF98_8_Bucket1_Data</td><td>26</td><td>Binary</td><td>Aggregate Bucket 1 Data</td></tr>
<tr><td>6</td><td>6</td><td>SMF98_8_Bucket1_Jobs</td><td>2</td><td>Binary</td><td>Number of address spaces in this analysis</td></tr>
<tr><td>8</td><td>8</td><td>SMF98_8_Bucket1_TotBytes</td><td>8</td><td>Binary</td><td>Total bytes written</td></tr>
<tr><td>16</td><td>10</td><td>SMF98_8_Bucket1_Writes</td><td>8</td><td>Binary</td><td>Number of write invocations</td></tr>
<tr><td>24</td><td>18</td><td>SMF98_8_Bucket1_AvgBytes</td><td>8</td><td>Binary</td><td>Average number of bytes per written invocation</td></tr>
</table>

Job Index Section
The SMF type 98 subtype 8 Job Index section contains job list information for the most exceptional metrics for each of the CPU type, Job Priority, and Custom Job Group combinations. This section is mapped by SMF98_8_JobIndex

Triplet Information:
To locate this section in the record use the following triplet fields which are found in the self defining section documented above.

Offset
SMF98_8_JobIndexOF

Length
SMF98_8_JobIndexLN

Number
SMF98_8_JobIndexON

<table>
<tr><th>Offset (Dec)</th><th>Offset (Hex)</th><th>Name</th><th>Length</th><th>Format</th><th>Description</th></tr>
<tr><td>0</td><td>0</td><td>SMF98_8_JobIndex</td><td>8</td><td></td><td>Job index data area</td></tr>
<tr><td>0</td><td>0</td><td>SMF98_8_JobIndex_CpuType</td><td>2</td><td>Binary</td><td>CPU Type of this output. Can be one of:
<table>
<tr><th>Value</th><th>Meaning</th><th>Constant</th></tr>
<tr><td>0</td><td>CP</td><td>SMF98_ProcClass_CP</td></tr>
<tr><td>4</td><td>zIIP</td><td>SMF98_ProcClass_zIIP</td></tr>
</table></td></tr>
<tr><td>2</td><td>2</td><td>SMF98_8_JobIndex_PriorityBucket</td><td>2</td><td>Binary</td><td>Job priority, can be one of:
<table>
<tr><th>Value</th><th>Meaning</th><th>Constant</th></tr>
<tr><td>FFFF</td><td>All</td><td>SMF98_kPriorityBucket_All</td></tr>
<tr><td>1</td><td>Critical</td><td>SMF98_kPriorityBucket_1</td></tr>
<tr><td>2</td><td>High</td><td>SMF98_kPriorityBucket_2</td></tr>
<tr><td>3</td><td>Low</td><td>SMF98_kPriorityBucket_3</td></tr>
<tr><td>4</td><td>Discretionary</td><td>SMF98_kPriorityBucket_4</td></tr>
</table></td></tr>
<tr><td>4</td><td>4</td><td>SMF98_8_JobIndex_JobSizeBucket</td><td>2</td><td>Binary</td><td>Custom job group number 1 to 32.</td></tr>
</table>

6	6	SMF98_8_JobIndex_ TopTotBytes	2	Binary	Job index of the job with the highest number of bytes written for this CPU type, job priority and custom job group. See SMF98_8_Job with the matching SMF98_8_Job_ID for details

Job List Section
The SMF type 98 subtype 8 Job List section contains a list of the jobs (identified by their ASID and jobname) that contain the "most" exceptional activity for a given activity. This section is mapped by SMF98_8_Job.

Triplet Information:
To locate this section in the record use the following triplet fields which are found in the self defining section documented above.

Offset
SMF98_8_JobOF

Length
SMF98_8_JobLN

Number
SMF98_8_JobON

Offset (Dec)	Offset (Hex)	Name	Length	Format	Description
0	0	SMF98_8_Job	0		Job information area
0	0	SMF98_8_Job_ID	2	Binary	Address space id number
2	2	SMF98_8_Job_Name	8	Character	Name of the address space
10	A	SMF98_8_Job_TSO	1	Character	TSO Userid. Can be one of: Value: Y — User profile allows TSO Value: N — User profile does not allow TSO
11	B	Reserved	13	Binary	Reserved area for IBM use only
24	18	SMF98_8_Job_TotBytes	8	Binary	Total number of bytes this job has written
32	20	SMF98_8_Job_Writes	8	Binary	Total number of write invocations
40	28	SMF98_8_Job_AvgBytes	8	Binary	Average number of bytes written for this job
48	30	SMF98_8_Job_TopDSStats	96	Binary	Stats for top data sets

<table>
<tr><td>48</td><td>30</td><td>SMF98_8_Job_DSTotal</td><td>8</td><td>Binary</td><td>Total bytes written</td></tr>
<tr><td>56</td><td>38</td><td>SMF98_8_Job_DSWrites</td><td>8</td><td>Binary</td><td>Total number of writes</td></tr>
<tr><td>64</td><td>40</td><td>SMF98_8_Job_DSSize</td><td>8</td><td>Binary</td><td>Data set size at open, in bytes.
<table><tr><td>Value</td><td>Meaning</td></tr><tr><td>nnnnnnnn</td><td>Data set size in bytes</td></tr><tr><td>FFFFFFFF FFFFFFFF</td><td>Size not available</td></tr></table></td></tr>
<tr><td>72</td><td>48</td><td>SMF98_8_Job_DSName</td><td>44</td><td>Character</td><td>Data set name</td></tr>
<tr><td>116</td><td>74</td><td>SMF98_8_Job_DSVolser</td><td>6</td><td>Character</td><td>First volume that data set resides on</td></tr>
<tr><td>122</td><td>7A</td><td>SMF98_8_Job_DSUserid</td><td>8</td><td>Character</td><td>Userid that opened the data set</td></tr>
<tr><td>130</td><td>82</td><td>SMF98_8_Job_DSOrg</td><td>1</td><td>Binary</td><td>Data set organization.
<table><tr><td>Value</td><td>Meaning</td><td>Constant</td></tr><tr><td>0</td><td>Other</td><td></td></tr><tr><td>1</td><td>PS</td><td></td></tr><tr><td>2</td><td>PDS</td><td></td></tr><tr><td>3</td><td>PDSE</td><td></td></tr><tr><td>4</td><td>Direct</td><td></td></tr><tr><td>5</td><td>ISAM</td><td></td></tr><tr><td>6</td><td>EXCP</td><td></td></tr><tr><td>7</td><td>Extended Format</td><td></td></tr><tr><td>10</td><td>HFS</td><td></td></tr><tr><td>16</td><td>KSDS Data</td><td></td></tr><tr><td>17</td><td>KSDS Index</td><td></td></tr><tr><td>18</td><td>Var RRDS Data</td><td></td></tr><tr><td>19</td><td>Var RRDS Index</td><td></td></tr><tr><td>20</td><td>Fixed RRDS</td><td></td></tr><tr><td>21</td><td>Linear</td><td></td></tr><tr><td>22</td><td>ESDS</td><td></td></tr></table></td></tr>
</table>

<table>
<tr><td>131</td><td>83</td><td>SMF98_8_Job_DSFlag</td><td>1</td><td>Bitstring</td><td>Data set flag.<table><tr><th>Value</th><th>Meaning</th><th>Constant</th></tr><tr><td>b'11000000'</td><td>VSAM GSR</td><td></td></tr><tr><td>b'10000000'</td><td>VSAM LSR</td><td></td></tr><tr><td>b'01000000'</td><td>VSAM RLS</td><td></td></tr><tr><td>b'00100000'</td><td>Encrypted</td><td></td></tr><tr><td>b'00010000'</td><td>EXCP</td><td></td></tr><tr><td>b'00001000'</td><td>Fixed length</td><td></td></tr><tr><td>b'00000100'</td><td>Program Library</td><td></td></tr><tr><td>b'00000010'</td><td>Extended Format</td><td></td></tr><tr><td>b'00000001'</td><td>Compressed</td><td></td></tr></table></td></tr>
<tr><td>132</td><td>84</td><td>Reserved</td><td>12</td><td>Binary</td><td>Reserved for IBM Use</td></tr>
</table>