

---

## Cheryl Watson's SMF Reference Summary

---



Watson & Walker, Inc.  
Publishers of **Cheryl Watson's TUNING Letter**  
2130 Bispham Road  
Sarasota, FL 34231  
800-553-4562 • 941-924-6565  
Fax: 941-924-4892  
[www.watsonwalker.com](http://www.watsonwalker.com)

Updated by Clark Kidd  
1/2006 (Includes z/OS 1.7)

## Index of SMF Record Types and Subtypes

Type (Dec)	Type (Hex)	Sub-type	Description	Exit
0	0		IPL	IEFU84
2	2		SMF Dump Header	
3	3		SMF Dump Trailer	
4	4		Step Termination (use type 30 instead)	IEFU84
5	5		Job Termination (use type 30 instead)	IEFU84
6	6		Printer Output	
		0	External Writer	
		2	JES2 Output Writer	
		5	JES3 Output Writer	IEFU83
		7	PSF (Print Services Facility) Output	IEFU83
		9	IP PrintWay Output	IEFU83
7	7		SMF Data Lost	IEFU84
8	8		I/O Configuration	IEFU84
9	9		Vary Device Online	IEFU83
10	0A		Allocation Recovery	IEFU83
11	0B		Vary Define Offline	IEFU83
14	0E		Input Data Set Activity	
15	0F		Output Data Set Activity	
16	10		DFSORT Statistics	
17	11		Scratch Data Set Status	
18	12		Rename (Non-VSAM) Data Set Status	
19	13		Direct Access Volume	
20	14		Job Initiation (use type 30 instead)	IEFU84
21	15		Tape Error Statistics by Volume	
22	16		Configuration	
		1	IPL	IEFU84
		2	Vary Online	IEFU84
		3	Vary Offline	IEFU84
		7	Vary Channel Path Online/Offline	IEFU84
		8	3990 State Change	IEFU84
		9	Activate	IEFU84
		99	Continuation Record	IEFU84
23	17		SMF Statistics	IEFU84
24	18		JES2 Spool Offload	
		1	Job Transmitted	
		2	Job Received	
		3	SYSOUT Transmitted	
		4	SYSOUT Received	
25	19		JES3 Device Allocation	IEFU83
26	1A	2	Job Purge: JES2	
		5	Job Purge: JES3	IEFU83
28	1C		NPM (NetView) Statistics	
30	1E		Common Address Space Work	
		1	Job or Task Initiation	IEFU84
		2	Interval Termination	IEFU84
		3	Last Interval Termination	IEFU84
		4	Step Termination	IEFU84
		5	Job or Task Termination	IEFU84
		6	System Address Space Interval Termination	IEFU84
31	1F		TIOC (TCAM) Initialization	
32	20		TSO/E User Work Accounting	
		1	Interval Termination	IEFU84
		2	Session Termination	IEFU84
		3	Detailed Interval Termination	IEFU84
		4	Detailed Session Termination	IEFU84
33	21		APPC/MVS TP Accounting	
		1	Transaction Record	IEFU84
		2	Conversation Record	IEFU85
34	22		TSO Step Termination (use type 30 instead)	IEFU84
35	23		TSO Logoff (use type 30 instead)	IEFU84
36	24		ICF Catalog Export	
37	25		NetView Hardware Monitor	
39	27		NetView (NLDM) Response Time	
		1	RTM Collection	

Type (Dec)	Type (Hex)	Sub-type	Description	Exit
		2	Session End	
		3	Session Start	
		4	Accounting and Availability	
		5	Session Start/End	
		6	Bind Failure	
		7	Init Failure	
		8	Storage and Event Counter	
40	28		Dynamic DD (use type 30 instead)	IEFU83
41	29		DIV Objects and VLF Statistics	
		1	DIV Object Accessed (Opened)	IEFU84
		2	DIV Object Unaccessed (Closed)	IEFU84
		3	VLF Statistics	IEFU84
42	2A		DFSMS Statistics and Configuration	
		1	Storage Class Summary & Buffer Management	IEFU84
		2	Cache Control Unit (3990-3) Statistics	IEFU84
		3	SMS Configuration Change	IEFU84
		4	System Data Mover Statistics	IEFU84
		5	Storage Class I/O Statistics	IEFU84
		6	Data Set I/O Statistics	IEFU84
		7	NFS File Timeout Statistics	IEFU84
		8	NFS User Logout Statistics	IEFU84
		9	Out of Space ABEND (Sx37)	IEFU84
		10	Allocation Volume Selection Failure	IEFU84
		11	XRC Interval Statistics	IEFU84
		14	ADSM Accounting	IEFU84
		15	VSAM RLS Storage Class Statistics	IEFU84
		16	VSAM RLS Data Set Statistics	IEFU84
		17	VSAM RLS CF Lock Statistics	IEFU84
		18	VSAM RLS CF Usage Statistics	IEFU84
		19	VSAM RLS Buffer LRU Statistics	IEFU84
		20	All PDSE Members Deleted	IEFU84
		21	PDS/PDSE Member Deleted	IEFU84
43	2B		JES Started	
		2	JES2 Started	
		5	JES3 Started	IEFU83
45	2D		JES Stopped	
		2	JES2 Stopped	
		5	JES3 Stopped	IEFU83
47	2F		JES Signon / Line Started	
		2	JES2 Line Started	
		5	JES3 Line Started	IEFU83
48	30		JES Signoff / Line Stopped	
		2	JES2 Line Stopped	
		5	JES3 Line Stopped	IEFU83
49	31		JES Integrity	
		2	JES2 Integrity	
		5	JES3 Integrity	IEFU83
50	32		VTAM Tuning Statistics	
52	34		JES2 Line Started (SNA)	
53	35		JES2 Line Stopped (SNA)	
54	36		JES2 Integrity (SNA)	
55	37		JES2 Network Started	
56	38		JES2 Network Integrity	
57	39		JES Network Transmission	
		2	JES2 SYSOUT Transmission	
		5	JES3 Networking Transmission	IEFU83
58	3A		JES2 Network Signoff	
59	3B		MVS/BDT File-to-File Transmission	
60	3C		VSAM Volume Data Set Updated	
61	3D		ICF Catalog Define Activity	
62	3E		VSAM Component or Cluster Opened	IEFU83
63	3F		VSAM Catalog Entry Defined (obsolete)	
64	40		VSAM Component or Cluster Status	IEFU83
65	41		ICF Catalog Delete Activity	
66	42		ICF Catalog Alter Activity	
67	43		VSAM Catalog Entry Deleted (obsolete)	

Type (Dec)	Type (Hex)	Sub-type	Description	Exit
68	44		VSAM Catalog Entry Renamed (obsolete)	
69	45		VSAM Data Space Modified (obsolete)	
70	46		RMF/CMF Processor Activity	
		1	CPU, PR/SM and ICF Activity	IEFU83
		2	Cryptographic Hardware Activity	IEFU83
71	47		RMF/CMF Paging Activity	IEFU83
72	48		RMF/CMF Workload Activity & Storage Data	
		1	Workload Activity / Compatibility (obsolete)	IEFU83
		2	Storage Data / Compatibility (obsolete)	IEFU83
		3	Workload Activity	IEFU83
		4	Storage Data	IEFU83
73	49		RMF/CMF Channel Path Activity	IEFU83
74	4A		RMF/CMF Resource Activity	
		1	Device Activity	IEFU83
		2	XCF Activity	IEFU83
		3	OMVS Resource Activity	IEFU83
		4	Coupling Facility Activity	IEFU83
		5	Cache Subsystem Device Activity	IEFU83
		6	HFS Statistics	IEFU83
		7	FICON Director Statistics	IEFU83
		8	Enterprise Disk System Statistics	IEFU83
75	4B		RMF/CMF Page Data Set Activity	IEFU83
76	4C		RMF/CMF Trace Activity	IEFU83
77	4D		RMF/CMF Enqueue Activity	IEFU83
78	4E		RMF/CMF Virtual Storage & I/O Activity	
		2	Virtual Storage Activity	IEFU83
		3	I/O Queuing Activity	IEFU83
79	4F		RMF/CMF Monitor II Activity	
		1	Address Space State Data	IEFU83
		2	Address Space Resource Data	IEFU83
		3	Storage/Processor Data	IEFU83
		4	Paging Activity	IEFU83
		5	Address Space SRM Data	IEFU83
		6	Reserve Data	IEFU83
		7	Enqueue Contention Data	IEFU83
		8	Transaction Activity	IEFU83
		9	Device Activity	IEFU83
		10	Domain Activity	IEFU83
		11	Page Data Set Activity	IEFU83
		12	Channel Path Activity	IEFU83
		14	I/O Queuing Activity	IEFU83
		15	IRLM Long Lock Detection	IEFU83
80	50		Security Product Processing	
81	51		RACF Initialization	
82	52		ICSF (Cryptography) Record	
		1	ICSF Started	IEFU83
		2	CUSP Activity	
		3	Change in Number of Processors	IEFU85
		4	ICSF Error Condition	IEFU85
		5	Security Mode Change	IEFU85
		6	Key Part Entered via Key Entry Unit (KEU)	IEFU85
		7	Key Part Entered via Key Entry Unit (KEU)	IEFU85
		8	In-Storage CKDS Refreshed	IEFU85
		9	Dynamic CKDS Update	
		10	PKA Master Clear Key Part Entered	
		11	DES Master Clear Key Part Entered	
		12	CSFSPKSC Request/Reply	
		13	PKDS Dynamic Update	
		14	PCI Master Key Clear Key Part Entered	
		15	PCI Retain Key Created or Deleted	
		16	CSIPCI Request/Reply	
		17	PCI Usage Statistics	
		18	Cryptographic Processor Online/Offline	
		19	PCI X Operation	
		20	PCIXCC/CEX2C Processing Times	
		21	ICSF Join/Leave Sysplex	

Type (Dec)	Type (Hex)	Sub-type	Description	Exit
82	52		Programmed Cryptographic Facility Record	
		1	PCF Start/Stop/Initialization/Key Functions	
83	53		RACF Audit Record for Data Sets	
84	54		JES3 Monitoring Facility (JMT)	
		1	FCT Analysis	
		2	FCT Summary and Highlight	
		3	Spool Data Management	
		4	Cellpool and Control Block Utilization	
		5	Job Analysis	
		6	Hot Spot Analysis	
		7	Internal Reader DSP Analysis	
		8	SSI Response Time Analysis	
		9	SSI Destination Queue Analysis	
		10	Workload Manager Analysis	
85	55		OAM Transaction Performance	
88	58		System Logger Data	
		1	Log Stream Activity	
		11	Coupling Facility Structure Altered	
89	59		Licensed Product Usage Data	
		1	Product Usage Data	IEFU84
		2	Product State Data	IEFU84
90	5A		System Status Change	
		1	SET TIME	
		2	SET DATE	
		3	SETDMN	
		5	SET SMF	IEFU84
		6	SWITCH SMF	IEFU84
		7	HALT EOD	IEFU83
		8	IPL PROMPT	IEFU84
		9	IPL SMF	IEFU84
		10	IPL SRM	
		11	SET OPT	
		13	SETSMF	IEFU84
		14	SET MPF	
		15	SET SMF (restart SMF)	IEFU84
		16	SET DAE	
		17	SET PFK	
		18	SET GRSRNL	
		19	SET APPC	
		20	SET ASCH	
		21	SET SCH	
		22	SET CNGRP	
		23	IPL WLM	
		24	VARY WLM	
		25	MODIFY WLM	
		26	IPL LOGREC	
		27	SETXCF START (restart management)	
		28	SETXCF STOP (restart management)	
		29	SET PROG (LNKLST activation)	
		30	RESET	
		31	SET PROG (LPALST activation)	
		32	WLM Policy Change	
91	5B		BatchPipes/MVS Statistics	
		1	Subsystem Started	
		2	Subsystem Interval Statistics	
		3	Subsystem Stopped	
		11	Pipe Opened	
		12	Pipe Interval Statistics	
		13	Pipe Closed	
		14	Pipe Created	
		15	Pipe Deleted	
92	5C		z/OS UNIX File System Activity	
		1	File System Mounted	
		2	File System Suspended/Quiesced	
		4	File System Resumed/Unquiesced	
		5	File System Unmounted	

Type (Dec)	Type (Hex)	Sub-type	Description	Exit
		6	File System Remounted	
		7	File System Moved	
		10	File Opened	
		11	File Closed	
		12	Memory Map Started (MMAP)	
		13	Memory Map Ended (MUNMAP)	
94	5E		Tape Library Dataserver Statistics	
96	60		Cross Memory Service Provider Charge Back	
		1	Detail Statistics	
		2	Summary Statistics	
97	61		Foreign Enclave Resource Data	
99	63		System Resource Manager Decisions	
		1	System Level Data	
		2	Service Class Activity	
		3	Service Class Period Plot Data	
		4	Device Cluster	
		5	Monitored Address Spaces	
		6	Service Class Period Summary	
		7	ESS/PAV Statistics	
		8	LPAR/CPU Management Statistics	
		9	Dynamic Channel Path Summary	
		10	Dynamic Processor Speed Change	
100	64		DB2 Statistics	
101	65		DB2 Accounting	
102	66		DB2 Performance	
103	67		HTTP Server Statistics	
		1	Configuration Statistics	
		2	Performance Statistics	
108	6C		Domino Server Statistics	
		1	Server Load	IEFU83
		3	Monitoring and Tuning	IEFU83
109	6D		TCP/IP Statistics	
110	6E		CICS/ESA Statistics	
		0	Journaling Data	
		1	Monitoring Data	
		2	Statistics Data	
115	73		MQSeries Statistics	
		1	System Information	
		2	Resource Usage Statistics	
116	74		MQSeries Accounting Statistics	
118	76		TCP/IP Statistics	
		1	TCP API Initialization	
		2	TCP API Termination	
		3	FTP Client	
		4	TN3270 Client	
		5	TCP/IP Statistics	
		20	TN3270 Server Initialization	
		21	TN3270 Server Termination	
		70	FTP Server Append Subcommand	
		71	FTP Server Delete Subcommand	
		72	FTP Server Logon Failures	
		73	FTP Server Rename	
		74	FTP Server Retrieve	
		75	FTP Server Store	
119	77		TCP/IP Statistics	
		1	TCP Connection Initiation	
		2	TCP Connection Termination	
		3	FTP Client Transfer Completion	
		5	TCP/IP Statistics	
		6	Interface Statistics	
		7	Server Port Statistics	
		8	TCP/IP Stack Start/Stop	
		10	UDP Socket Close	
		20	TN3270 Server SNA Session Initiation	
		21	TN3270 Server SNA Session Termination	
		22	TSO Telnet Client Connection Initiation	

Type (Dec)	Type (Hex)	Sub-type	Description	Exit
		23	TSO Telnet Client Connection Termination	
		70	FTP Server Transfer Completion	
		72	FTP Server Login Failure	
120	78		WebSphere Performance Statistics	
		1	Server Activity	
		3	Server Interval	
		5	J2EE Container Activity	
		6	J2EE Container Interval	
		7	WebContainer Activity	
		8	WebContainer Interval	
208	D0		SyncSort Statistics	
240	F0		CMF Monitor	

### SMF Control Parameters SYS1.PARMLIB(SMFPRMxx)

Parameter	Description	Default	Range
ACTIVE / NOACTIVE	Record data to SMF file	ACTIVE	
BUFSIZMAX(value)	Memory limit for in-storage buffers	128MB	128MB-1024MB
BUFUSEWARN(value)	Buffer warning message percent	25%	10%-90%
DDCONS(YES/NO)	Consolidate EXCP sections in type 30 records	YES	
DSNAME(name1, name2, ...)	Define names of SMF data sets	SYS1.MANX, SYS1.MANY	
DUMPABND(RETRY/NORETRY)	Action on SMF ABEND	RETRY	
INTVAL(mm)	Global interval length	30 minutes	1-60
JWT(hhmm)	Job/TSO maximum wait before S522	0010 (10 minutes)	0001-2400
LASTDS(MSG/HALT)	Action when all data sets are full	MSG	
LISTDSN/NOLISTDSN	List data set names	LIST	
MAXDORM(mmss)/ NOMAXDORM	Wait time before SMF buffer flushed	3000 (30 minutes)	0001-5959
MEMLIMIT(size)	Default task memory limit	0M	
MULCFUNC/NOMULCFUNC	IFAUSAGE service option requirements	MULCFUNC	
NOBUFFS(MSG/HALT)	Action when SMF buffers are full	MSG	
PROMPT(option)/NOPROMPT (option = IPLR/LIST/ALL)	Specify operator prompting options	ALL	
REC(ALL/PERM)	Deleted data set monitoring options	PERM	
SID(yyyy)	Defines SMF System ID (SID) unconditionally	Use processor model number	
SID(yyyy,ser#,ser#) -or- SID(yyyy,COMBIN(ser#,ser#))	Defines SID based on processor ID		
SID(yyyy,SYSNAME(ssssssss))	Defines SID based on system name		
STATUS(option)/NOSTATUS (option = hhmmss or SMF,SYNC/NOSYNC)	SMF buffer statistics interval option	010000 (1 hour)	000001-240000
SUBPARM(subsys(options))	Pass options to a subsystem		
SUBSYS(subsys,options) (subsys = JESx/TSO/STC/ASCH)	Same as SYS but for subsystems	Use values from SYS	
SYNCVAL(mm)	Global synchronization value	00	00-59
SYS(DETAIL/NODETAIL)	Detail option for TSO & STC tasks	NODETAIL	
SYS(EXITS(names)/NOEXITS)	Exits to invoke	All exits active	
SYS(INTERVAL(option)/ NOINTERVAL)	Interval length for types 30 & 32	NOINTERVAL	000001-240000
SYS(TYPE(option)/NOTYPE)	SMF record and subtype retention options	Keep all	0-255 (records) 0-32767 (subtypes)

## SMF Exits

Exit Name	Description
IEFACTRT	Accounting Routine
IEFUAV	User Account Validation (APPC/MVS and z/OS UNIX)
IEFUJI	Job Initiation
IEFUJP	Job Purge
IEFUJV	Job Validation
IEFUSI	Step Initiation
IEFUSO	SYSOUT Limit Exceeded
IEFUTL	Time Limit Exceeded (CPU or wait)
IEFU29	SMF Dump
IEFU83	SMF Record Written
IEFU84	SMF Record Written (Branch Entry, no cross memory)
IEFU85	SMF Record Written (Branch Entry, cross memory)

## SMF Bibliography

Reference Manual	Number	Date
z/OS V1R7.0 MVS System Management Facilities (SMF)	SA22-7630-11	13Jul2005
z/OS V1R6.0 MVS System Management Facilities (SMF)	SA22-7630-09	13Jul2004
z/OS V1R5.0 MVS System Management Facilities (SMF)	SA22-7630-08	8Jan2004
z/OS V1R4.0 MVS System Management Facilities (SMF)	SA22-7630-07	18Aug2003
z/OS V1R3.0 MVS System Management Facilities (SMF)	SA22-7630-03	23Apr2002
z/OS V1R2.0 MVS System Management Facilities (SMF)	SA22-7630-01	20Jun2001
z/OS V1R1.0 MVS System Management Facilities (SMF)	SA22-7630-00	16Jan2001
OS/390 V2R5.0 MVS System Management Facilities (SMF)	GC28-1783-04	8Jan1998
OS/390 V2R4.0 MVS System Management Facilities (SMF)	GC28-1783-03	21Oct1997
OS/390 V1R3.0 MVS System Management Facilities (SMF)	GC28-1783-02	17Apr1997
OS/390 V1R2.0 MVS System Management Facilities (SMF)	GC28-1783-01	27Oct1996
OS/390 V1R1.0 MVS System Management Facilities (SMF)	GC28-1783-00	24Apr1996
MVS/ESA SP V5 System Management Facilities (SMF)	GC28-1457-02	22Oct1996
MVS/ESA SP V4 System Management Facilities (SMF)	GC28-1628-04	28Apr1995

## Sample Job to Dump SMF Records

This sample JCL uses the SMF dump program to extract all SMF record types (0-255) to a tape data set. The example does not clear the input file after the extract:

```
//STEP1 EXEC PGM=IFASMFDP,REGION=xxM
//SYSPRINT DD SYSOUT=*
//IN DD DSN=smf.dataset,DISP=OLD
//OUT DD DSN=output.tape,UNIT=TAPE,DISP=(,CATLG)
//SYSIN DD *
  INDD(IN,OPTIONS(DUMP))
  OUTDD(OUT,TYPE(0:255))
  START(hhmm)
  END(hhmm)
  DATE(yymmdd)
  SID(ssss)
//
```

If no DCB parameters are coded on the output file, the defaults will be:

```
RECFM=VBS
LRECL=32767
BLKSIZE=0 (use system determined block size)
```

You can override these in the JCL, but RECFM=VBS must be coded or defaulted. The BLKSIZE value may range from 4096 to the maximum allowed by the device. Because spanned records are specified, the LRECL can be larger than the BLKSIZE. In order to avoid problems reading the records, many experts advise overriding the LRECL to a value no larger than 32760. The SID, DATE, START, and END statements are optional.