Deutsch

Fujitsu Software BS2000

CAP

Benutzerhandbuch

Stand der Beschreibung:
CAP V21.0

Ausgabe November 2022

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CAP

COSMOS Analysis Program

Sequence Number		
Volume	**46**	Automated System Operations
Chapter	**52**	External Interface Specification
Section	**31**	COSMOS
Ident	**\C21**	COSMOS V21.0A / CAP
Version	**002**	2022-11-10
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Introduction

CAP (COSMOS Analysis Program) is a data reduction program developed to complement COSMOS by providing COSMOS trace file data analysis and statistics on system behaviour. CAP is a tool to provide a quick look as well as total analysis of COSMOS data. The following discussion presents terminology, techniques and steps related to the analysis of COSMOS data.

Input

Each particular data group on the COSMOS trace file represents a change in system conditions and is called an event. Input to CAP may be a PAM file or a tape.

CAP provides the ability to select task number, event code, a particular SVC, etc. Any combination of the above select conditions may be used.

The COSMOS file to be accessed must be passed to CAP via a SET-FILE-LINK command with link name COSTP.
A file with VM2000-Hypervisor events must be evaluated in a separate run of CAP.

The following commands must be used for BTAM-files or PAM-files.

BTAM:

```
/IMPORT-FILE SUPPORT=TAPE(VOLUME=...,DEVICE-TYPE=..., -
/ FILE-NAME=...)
/SET-FILE-LINK LINK-NAME=COSTP,FILE-NAME=...,        -
/ ACCESS-METHOD=BTAM
```

PAM:

```
/SET-FILE-LINK LINK-NAME=COSTP,FILE-NAME=...,        -
/ ACCESS-METHOD=UPAM


/START-CAP
...
Parameters
...
```

In case of multiple tape files the number of tapes must be specified if the file name is not in the catalog, e.g. a file command for 2 tapes may be:

```
/IMPORT-FILE SUPPORT=TAPE(VOLUME(XXXXXX,YYYYYY),    -
/ DEVICE-TYPE=XXX,FILE-NAME=...,PREMOUNT-LIST=1)
/SET-FILE-LINK LINK-NAME=COSTP,FILE-NAME=...,       -
/ ACCESS-METHOD=BTAM
```

Table of Events

The following table contains the code, name and type of all events recorded by COSMOS.

Type:

MAN: mandatory event

TDE: task-dependent event

NTD: task-independent event

Sel:

X: the SELECT parameter can be used for the event

Code	Name	Type	Sel	
4	INIT	MAN		COSMOS initiation
8	STAT	MAN		task status
12	PTSK	MAN		activation of periodic task PT5
16	SDV	TDE	X	start device instruction
20	EIA2	TDE		program independent interrupt occurred during SIH state
24	IDLE	NTD		system idles
28	EIA3	TDE		interrupt occurred in program state TU or TPR
32	CREA	MAN	X	creation of a task
36	DEST	MAN	X	destruction of a task
40	HAL	NTD		HAL performance data
44	CHTM	TDE	X	channel termination
48	TSKI	TDE		initiation of a task
52	PEND	TDE	X	task pended
56	ACF	NTD		activation control function
60	INTR	TDE		interval timer runout
64	RELM	TDE		release memory
68	REQM	TDE		request memory
72	RSCS	NTD	X	RSC-IO start
76	RSCT	NTD	X	RSC-IO termination
80	UTM	TDE		universal transaction monitor
84	BOUR	TDE		bourse call
92	PAGE	TDE	X	page fault
96	LOCK	TDE		nucleus lock request or release
100	IONQ	TDE	X	enqueue IO-slot
104	CMS	TDE	X	catalog access via CMS
112	UPND	TDE	X	task unpended
116	PAM	TDE	X	IO via DQPAM
124	SLOT	TDE		use of dedicated slot pools
128	SWSR	NTD	X	system working set replacement
132	WSCT	NTD	X	change of the working set control
136	PRTY	TDE	X	internal priority change
140	TINF	TDE		change of task attributes
144	PDEA	NTD	X	page deactivation
148	TLT	TDE	X	call of a TLT-lock-function
156	SNAP	TDE		snapshot dump
160	DCAM	TDE		DCAM access method
164	BCAM	TDE		BCAM teleprocessing
168	BCPT	TDE		BCAM port service
172	TLM	TDE		call of the task lock manager
180	MSG	TDE		system message handling
184	PCCC	NTD		PCS category control
188	PCTC	TDE		PCS task control
192	CMD	TDE		SDF command handling
196	FITC	TDE		fast intertask communication
200	DAB	TDE		disc access buffer
204	PIO	NTD		paging IO

208	BLS	TDE	X	dynamic program loading/unloading
216	LGON	MAN		logon processing of a task
220	PRGS	TDE		program start
224	PRGT	TDE	X	program termination
228	ISPL	TDE		ISAM pool access
232	ISEV	TDE		ISAM internal block lock modification
236	TICS	TDE	X	task initiation event
240	TICE	TDE	X	task deinitiation event
244	STD1	NTD		user program event
248	STDI	NTD		standard event, interruptible
252	STDN	NTD		standard event, non-int.
256	DSM	TDE	X	data space manager
260	PMIO	TDE	X	file name for IO via DQPAM
264	KPST	TDE	X	KAI $POST request
268	KCOL	TDE	X	KAI $COLL request
280	TSVC	TDE	X	subfunctions of SVC's
284	VMHS	NTD	X	VM: start hypervisor mode
288	VMHE	NTD	X	VM: end hypervisor mode
292	DLM1	TDE	X	DLM is called for enqueue
296	DLM2	TDE	X	DLM is called for convert, dequeue or cancel
300	DLM3	TDE	X	DLM returns to caller after asynchronous call
308	TGMT	TDE	X	task joining or leaving a group
312	TGMA	TDE	X	assignment of a task group to CPU
316	TGMP	TDE	X	info. about the loads on the single processors
320	MMRC	MAN	X	main memory reconfiguration
324	DABI	TDE	X	DAB: Completion of data transfer request
328	DABC	TDE	X	DAB: Completion/Deletion of a cache buffer
332	DABF	TDE	X	DAB: Start/Stop of caching a file
336	DABE	TDE	X	DAB: Start/Stop of caching a volume extent
340	DABS	TDE	X	DAB: intermediate saving of cached data
344	NSMA	TDE	X	NSM: synchronous/asynchronous return to DLM
348	NSMB	TDE	X	NSM writes an lock request into the token container
352	NSMC	TDE	X	NSM sends the token to its successor node
356	NSMD	TDE	X	NSM: at token arrives at a specific node
360	NSME	TDE	X	NSM: a request is transferred to function unit lock server or is sent from lock server
364	DABA	TDE	X	DAB: Information on access to files
368	VMIS	NTD	X	VM: start hypervisor idle
372	VMIE	NTD	X	VM: end hypervisor idle
376	VMSS	NTD	X	VM: start scheduling
380	VMSE	NTD	X	VM: end scheduling
384	VMPD	NTD	X	VM: pend queue transition
388	VMLK	NTD	X	VM: lock
392	VMPR	NTD	X	VM: periodic routine
396	VMCH	NTD	X	VM: change (add, del, mod VM)
400	GSAC	TDE	X	Access to Global Storage

Event codes 4 and 8 are special events as these events provide vital initialization and termination data.

Some events have sub-events. They are differentiated from one another by a sub-event code. The sub-event names may not be given as operands for the event parameter, with the result that it is not possible to turn on individual of this sub-events selectively. Furthermore these sub-events are not listed separately when the sum parameter is given.

Description of Parameters

The signs '<' and '>' mean optional parameters and are themselves not part of the parameters.

All numerical values contained in the following parameters must be specified in decimal format! Each parameter consists of the parameter name followed by additional options. On checking for the parameter name at most 4 characters are used, e.g. EVEN is equivalent to EVENT.

No continuation lines are possible. Each parameter has to be given in a single line (max. length 80 bytes).

With the CAP parameters one can specify two kind of functions:

event trace: selected events are printed as described below

statistics : special statistics (see point 3 in this section) are printed

Both functions can be combined.

The input of the parameter "HELP" supplies a list of all CAP parameters.

HELP,<parameter> provides a description of the specified parameter.

1.11 Global Parameters

Following parameters restrict the set of events to be evaluated and apply to both event trace and statistics.

1. SNAP,n,n1<,n2,n3,...,...>
   Process record # n to n1, n2 to n3.
   A maximum of 10 record#s is possible (= 5 intervals).
   The intervals must be in ascending order.
   SNAP without record# is treated as parameter error.
   Default: 1 to end of file
2. STAT,n
   n=4 or n=6.
   Special selection depending on the machine state; it concerns the events EIA3 (#28), TSKI (#48), INTR (#60). Only events referring to the specified machine state are selected.
   n=4 : state TPR
   n=6 : state TU
   Default: off
3. TSN,x,y,z,...
   Process only the task dependent events (TDE's) related to TSN's x,y,z,...
   Up to 64 TSN's (without leading blanks) may be specified.
   Default : all tasks

The so selected events are the base for the statistics evaluation.
Exception: COSMOS internal events (event 4 and 8) which will be always printed and the PTSK event which will be printed in the selected SNAP intervals.

1.12 Trace Parameters

Following trace parameters define those of the selected events which are to be printed (event trace).

1. EVENT<,x,y,z,...>
   Print events x,y,z,...
   The events can be specified by the event name or the event code. If the parameter is entered without events, all events are printed.
   Default: mandatory events
2. IC,x<,y,z,...>
   Special selection only applied to EIA3 (#28) event on CFCS/3-hardware. This event is printed only if the interruption code is equal to one of the specified ones. Up to 8 different interruption codes may be specified. The interruption codes must be specified in decimal

format.
Default: off

3. IW,x<,y,z,...>
   Special selection only applied to events EIA2 (#20) and EIA3 (#28). These events are printed only if the interrupt weight is equal to one of the specified ones. Up to 10 different interrupt weights may be specified. The interruption weight must be one the following characters: E, I, M, P, S.
   Default: off
4. NOEVENT,x<,y,z,...>
   Suppress events x,y,z,...
   The events can be specified by the event name or the event code.
   This parameter must be entered after the EVENT parameter.
   Default: off
5. NONTD
   Previously selected not-task-dependent events (e.g. by parameter EVENT,) are not printed.
   NTD events are marked in column „Type“ in *Table of Events* (see page 10).
6. SELECT,event,name1=val1,....,namen=(val1,...,val5)
   Select an event for printing only if measured values are equal to values defined in this parameter.
   event: event name or event code
   namex: Name of measurement variable as printed by CAP.
   valx: Value in the format printed by CAP. Up to 5 values can be specified for each name.
   An event will be printed if for every defined name at least one of the defined values is equal to the measured value. The event has to be selected by parameter EVENT.
   Restriction: Not all events can be used. Available events are marked in column „Sel“ in *Table of Events* (see page 10). See also example 5.
7. SVC<,x,y,z,....>
   Special selection only applied to events EIA2 (#20) and EIA3 (#28). These events are printed only if the interrupt weight is SVC and the SVC number is equal to one of the specified ones. If no SVC numbers are specified, all SVC's are printed. The SVC numbers must be specified in decimal format.
   Default : off
8. TBASE,n
   n=0 or n=1.
   Select base of time-stamps.
   n=0 means base of time stamps is the start of the measurement taken as "0". The time-stamps are output in the format SSSSSS.ssssss (S=seconds, s=microseconds since start of measurement).
   On reaching 999999.999999 the time stamps restart with 000000.000000.
   n=1 means base of time-stamps is the time of day of the start of the measurement. The time stamps are output in the format HHMMSS.ssssss (H=hours, M=minutes, S=seconds, s=microseconds). On reaching the end of a day (e.g. 240000.000000), the clock is not reset to zero, but continues to increase the value for HH. On reaching 995959.999999, the time-stamps restart with 000000.000000.
   Default : n=0
9. TIME,n,n1<,n2,n3...>
   Process only the events with time stamps between n and n1, n2 and n3.
   A maximum of 5 intervals is possible.
   The interval must be in ascending order.
   n,n1<,n2,n3...> are interpreted dependent on the parameter TBASE (see examples on page 15).
   TBASE,0: n,n1<,n2,n3...> must be specified in milliseconds since start of measurement
   TBASE,1: n,n1<,n2,n3...> must be specified in the format HHMMSSsss (H=hours, M=minutes, S=seconds, s=milliseconds).
10. PMR
    Special selection only applied to HAL (#40) event.

If this parameter is specified additional lines with the contents of the performance monitor registers are printed.

If the parameters IW, IC and SVC are specified, they are linked as follows: SVC OR (IW AND IC). Otherwise there is no dependency between these parameters. The set of selected and printed events is the sum of the sets specified by each trace parameter. If for instance only event 48 and SVC are selected event 28 (EIA) is internally selected to print SVC interrupts. In other words is not necessary to specify event 28 to print SVC's.

1.13 Statistic Parameters

1. INTR
   Requests a summary of all interrupts over the range of events specified by the global parameters.
   Default : off
2. QUSTSN<,x,y,z,...>
   Requests the printing of queue-transitions for tasks with TSN's x,y,z,...
   Up to 64 TSN's (without leading blanks) may be specified.
3. SVCT
   Requests a summary of all SVC's over the events specified by the global parameters.
   Default : off

1.14 Other Parameters

1. CONF
   Requests output of the configuration.
2. HEX
   The contents of the events are printed in hexadecimal format instead of normal CAP output.
3. LONG
   Only one line with all data is output for each event. The timestamps are output in nano seconds.
4. MAP
   Requests system map to be printed (modules, load addresses, module lengths).
5. NOWARN
   Supresses the output of a warning message if there are missed events.
6. PARAM
   Requests output of the measuring parameters.
7. REPEAT
   Event counter, time stamp, event name, task sequence number and logical machine number are printed also in the 2nd and following output lines of an event.
8. RUN
   End parameter input and start processing.
9. SHORT
   Only one line with the most important data is output for each event.
10. SUM
    provides SVCT, INTR, QUSTSN for all events as well as PARAM.
    It may be used with any of the selecting parameters, provided they precede the SUM parameter. After this command the parameter input is closed and the processing will be started immediately.

1.15 Remarks

1. For each of the parameters it is only possible to specify up to 10 values in a parameter. If more than 10 values are needed, the parameter should be repeated.
2. Values for parameters must be separated by a "," (comma). blank means end of parameter list and the rest of the line is considered as comment !

3. In parameters TSN and QUSTSN the TSN's have to be given without blanks. E.g. TSN,s selects the TDE's for TSN s, TSN, selects the TDE's for TSN " " (4 blanks).
4. For parameters TSN and QUSTSN up to 64 TSN's may be given. If there are more values the message

   *** MORE THAN 64 TSNS GIVEN !!! SURPLUS ONES SKIPPED !!! ***

   is issued.
5. For statistics parameters the corresponding events need not to be turned on by trace parameters.
6. There is no parameter to select the event summary which is always output. The set of events taken for this summary is specified by the global parameters.
7. The statistics of the average SIH-, TPR-, TU- and IDLE-times at the end of a CAP evaluation represent the average of the times delivered by the PTSK-events accumulated from the start of the COSMOS-file till the last PTSK-event selected by the SNAP parameter.
8. It is evident that in order to print statistics and trace information, the relevant events must be present in the COSMOS file for the set specified by the global parameters. For instance the PEND event is needed to print the queue transitions.

1.16 Examples

1. /START-CAP
   SUM — print a summary

2. /START-CAP
   SNAP,1,1000 — evaluate the first 1000 events
   EVENT — evaluate all event codes
   NOEVENT,STAT — suppress STAT events (# 8)
   RUN — start evaluation

3. /START-CAP
   SNAP,100,1000 — evaluate between event 100 and 1000
   EVENT,28,60 — print only events 28 (EIA3) and 60 (INTR)
   IW,P — print events 28 only if IW=P
   SVC,66 — print SVC=X'42'
   MAP — print system map
   SVCT — print SVC-statistics
   INTR — print IW-statistics
   RUN — start evaluation

4. /START-CAP
   SNAP,100000,105000 — evaluate between event 100000 and 105000
   EVENT,TSKI — print only TSKI events
   STAT,6 — print only TSKI events of state TU
   RUN — start evaluation

5. /START-CAP
   EVENT — evaluate all event codes
   TIME,1000,300000 — evaluate from second 1 to 300 since start of measurement
   SELECT,PAM,OPC=(WRITE,WR_WT),FILE=:ABC:$XYZ. — print PAM events only if OPC= WRITE or WR_WT and FILE=:ABC:$XYZ.
   RUN — start evaluation

6. /START-CAP
   TBASE,1 — select time-stamps in the time of day format
   EVENT — evaluate all event codes
   TIME,130000000,133000000 — evaluate from 13:00:00 until 13:30:00

7. /START-CAP
   CONF — print configuration
   EVENT — evaluate all event codes
   NONTD — suppress not-task-dependent events
   TSN, — print only events for TSN " "

QUSTSN,4711,WUTZ	print queue transitions for TSN 4711 and WUTZ
RUN	start evaluation

8. /START-CAP

EVENT	evaluate all event codes
TBASE,1	select time-stamps in the time of day format
TIME,124515150,124515300	evaluate 150 milliseconds between 12:45:15.150
and	
	12:45:15.300

DMS-IO-Error Handling

If a file-error occurs on reading the input-file the DMS-error-code, the exit-byte and the status information will be output.

*** DMS-ERROR. ERR-CODE=XXXX; EX=YY; STATUS=AABBCCDDEE ***

XXXX is the hexadecimal FCB error-code. For details see the DMS reference manual.
YY is the error exit byte of the FCB. For details see dummy-section IDFCB.

The status information contains the status bytes of the TU-FCB:
AA : standard device byte
BB : sense byte 1
CC : sense byte 2
DD : sense byte 3
EE : executive flag-byte

After a DMS error CAP does the final evaluation, i.e. CAP assumes that there is no further COSMOS data.

Output

The following is a description of all possible output from CAP. The output is written to SYSLST. The amount of output is determined by input parameters. Each page contains the title from the COSMOS monitoring file, the date and time when the measurement was started, the size of the available main memory in MB, the processor type (see NEGET description, event INIT) and the BS2000 version of the monitored system.
For printing the CAP output a character set with 15 cpi must be used, e.g. CHAR-SETS=203.

1. Map
   A system map is provided in two forms, one in ascending order of module addresses and one in lexical order of module names. For each module its name, starting address and length are provided.
2. Configuration
   The configuration is output in hierarchical form. The first hierarchical levels are formed by the IO-sides (if available), followed by the channels, the device controllers and the attached devices.

   The following information is output in the headers for the individual levels:

   IOSIDE#: nn
   where nn is the number of the IO-side.

   CHANNEL PATH-ID: nn (ct)
   where nn is the hexadecimal channel number and ct the channel type.

   CONTROLLER: mn
   where mn is the mnemonic name of the device controller.

   DIRECT ATTACHED DEVICES
   in case of devices directly attached to the channel this header appears at the same level as the controllers.

   ATTACHED DEVICES
   devices attached to the controller.

   The individual devices are then listed.

   The following data is output for each device:

   DEVICE MNEM
   mnemonic device name

   VOLUME (VSN)
   volume sequence number of device (if available)

   PATH INFO
   IO path (channel and device address)

   DEVICE TYPE
   external device type

   INTERNAL CODE
   TSOS device type code

   The rest of the columns are marked with an asterix if the device has the corresponding attribute:

   DETACHED DEVICE
   the device exists within the configuration, however it is not available at the present time

   PAGING DEVICE
   the device is used for paging

   PRIVATE DEVICE
   the device is exclusively assigned to a task

   SHARED PRIVATE
   the device is a private disk, which can be used from several systems

SYSTEM PRIVATE
the device is a private disk, which can be used from several tasks

BLOCK FORMAT
block format of disks (K2, NK2, NK4)

PAV
PAV flag (B = base device, A = alias device)

BASE MN
mnemonic of base device for alias device

3. Measuring Environment
   Some information about the measuring environment are given. These will always be printed.

4. Queue Transitions
   For each task a table is provided showing the number of transitions from and to the relevant scheduler queues.

5. SVC Summary
   Summary of SVC calls

6. TSVC Summary
   Summary of SVC subfunctions

7. Interrupt Summary
   A summary for the interrupt weights

8. Events
   A list of events that are specified by input parameters. Each event printed contains an event counter (sequential event number on the COSMOS file), a time stamp (in a format depending on the TBASE parameter), the event name, the sub-event name (if applicable), the task sequence number of the task in control at the time of the event (if available) and the logical machine number (for BS2000/OSD < V9.0) resp. the CPU number (for BS2000/OSD ≥ V9.0) of the processor on which the event took place (if available), followed by the event-specific data.

   For the event counter there is a precision up to 10 digits in the output line. This means that at most 9.999.999.999 events can be output without overflow.

   The events PTSK (#12), CREA (#32), DEST (#36), LGON (#216) and MMRC (#320) are always printed even if the event parameter wasn't given. The PTSK event is always printed in a specified snap interval.

List of Events and their CAP Output

1.17 INIT (# 4)

Part of the information gathered in the INIT event will be output as the Measuring Environment (always printed).
The measuring environment is self-explanatory.

1.18 STAT (# 8)

The information gathered in the STAT event at the start and end of the measurement will be output in form of a table printed before and after the output of the other events. The following is an explanation of the mnemonics in the first line of this table.

TID	task id
TSN	task sequence number
Q#	current queue number of task (hexadecimal)
TT	task type X'10'= class 1 task X'20'= class 2 batch task X'40'= dialog task X'80'= interrupt driven task X'81'= cam task X'84'= preallocated task
UPG	number of pages in task's working set
PPC	number of pages allowed for task's working set
CPU-TIME	task's used CPU time (in interval timer units)
/390-TIME	task's used emulated /390 time (in interval timer units, also included in CPU-TIME)
PRI	task's external priority
CTG#	task's category number
CTGNAME	name of category

The following information will only be printed if it is available for this task.

USER-ID	user id
JOBNAME	job name
PROGRAM NAME	program name

1.19 PTSK (# 12)

1.19.1 PTSK event for BS2000/OSD < V3.1

PTSK event with CPU data:

SIH	SIH time in % of total time since last PTSK event (average in case of a multiprocessor)
TPR	TPR time in % of total time since last PTSK event (average in case of a multiprocessor)
TU	TU time in % of total time since last PTSK event (average in case of a multiprocessor)
IDLE	IDLE time in % of total time since last PTSK event (average in case of a multiprocessor)
ACT	activator : "PCS" if PCS is active

NPP	number pageable pages (4 kb units)
#ALM	number of active logical machines
PGARD	paging area defined (4 kb units)
PGARF	paging area free (4 kb units)

The next lines are only printed in case of a multiprocessor

SIH	SIH time in % of total time since last PTSK event for LM#1
TPR	TPR time in % of total time since last PTSK event for LM#1
TU	TU time in % of total time since last PTSK event for LM#1
IDLE	IDLE time in % of total time since last PTSK event for LM#1

Analogous lines are printed for all logical machines of the system.

The SIH-, TPR-, TU- and IDLE-time delivered on the first occurrence of the PTSK event are marked with '???'. If one PTSK event is missed the following PTSK event has also wrong times (marked with '???'). These values are not accounted for average values.

There will be an output of additional lines if PCS was running when the event was gathered. The format is as follows:

#ADx	number of admitted tasks of category x (x is the category number)
#NAx	number of not admitted tasks of category x (x is the category number)

This output will be repeated for all defined categories (min 4, max 16; min 1 line, max 4 lines).

PTSK event with IO data:

DIO	disk IO's since last PTSK event
TIO	tape IO's since last PTSK event
PIO	paging IO's since last PTSK event
OIO	other IO's since last PTSK event

Analogous lines are printed for all active logical machines of the system.

Additional data since BS2000/OSD V3.0:

VM-HYPERVISOR

ACTIVE-TIME	active time in % of total time since last PTSK event
IDLE-TIME	idle time in % of total time since last PTSK event
USED CPU'S	# of used CPU's

For each active virtual machine:

CPU-QUOTA	planned CPU quota
CPU-TIME	CPU time in % of total time since last PTSK event

1.19.2 PTSK event for BS2000/OSD ≥ V3.1

PTSK event with global system data:

ACT	activator : PCS if PCS is active
NPP	# physical pageable pages (decimal)
#ALM	# of active logical machines
PGARD	paging area defined
PGARF	paging area free

VM-HYPERVISOR:

ACTIVE	active time in % of total time since last PTSK event
IDLE	idle time in % of total time since last PTSK event
USED CPU'S	# of used CPU's

There will be an output of additional lines if PCS was running when the event was gathered. The format is as follows:

#ADx	number of admitted tasks of category x (x is the category number)
#NAx	number of not admitted tasks of category x (x is the category number)

This output will be repeated for all defined categories (min 4, max 16; min 1 line, max 3 lines).

For each active virtual machine:

CPU-QUOTA	planned CPU quota
CPU-TIME	CPU time in % of total time since last PTSK event

PTSK event with CPU and IO data:

LM# / SUMMARY	logical machine number or average
SIH	SIH time in % of total time since last PTSK event
TSK	TU + TPR time in % of total time since last PTSK event
390	emulated /390 time in % of total time since last PTSK event (RISC processors only) (also included in TSK)
IDL	IDLE time in % of total time since last PTSK event
HAL	HAL time in % of total time since last PTSK event (RISC processors only)
DIO	disk IO's since last PTSK event
TIO	tape IO's since last PTSK event
PIO	paging IO's since last PTSK event
OIO	other IO's since last PTSK event

Analogous lines are printed for all active logical machines of the system.

1.19.3 PTSK event for BS2000/OSD ≥ V6.0

PTSK event with global system data:

ACT	activator: PCS if PCS is active
#ALM	number of active logical machines
NPP	number of physical pageable pages
PGARD	size of defined paging area in 4kB units
PGARF	size of free paging area in 4kB units

VM2000 data for BS2000/OSD < V8.0:

VM-HYPERVISOR:	(only printed if the monitored system was running under control of VM2000)
ACTIVE	active time in % of total time since last PTSK event
IDLE	idle time in % of total time since last PTSK event
USED CPU'S	number of used CPU's
MSIZE	size of main memory in MB
MMIN	minimum size of main memory in MB
PEQ	number of frames in page empty queue
ROQ	number of frames in read only queue
RWQ	number of frames in read write queue
FP	number of frames in free pool
SWS	number of frames in system working set
DOMSIZE	size of domains in MB
#DOM	number of existing domains
#BD<2	number of bound domains ≤ 2 GB

#UD<2	number of unbound domains ≤ 2 GB
#BD>2	number of bound domains > 2 GB
#UD>2	number of unbound domains > 2 GB

The following data are output for all defined categories if PCS was running when the event was gathered:

#ADx	number of admitted tasks of category x (x is the category number)
#NAx	number of not admitted tasks of category x (x is the category number)

VM2000 data for BS2000/OSD ≥ V8.0:

HPV ACTIVE	hypervisor active time in % of total time since last PTSK event

resp.:

ALL DOMS	all domains active time in % of total time since last PTSK event
HPV IDLE	hypervisor idle time in % of total time since last PTSK event

resp.:

ALL BS2	all BS2 VM's active time in % of total time since last PTSK event
#ATT REAL CPU'S	number of attached real CPU's
%ATT REAL CPU'S	percentage of attached real CPU's

PTSK event with VM-specific data:

This event will only be output if the monitored system was running under control of VM2000. If COSMOS was running on a VM2000 monitor system this event will be repeated for all virtual machines, else only one event with the data of the concerned guest system is output.

VM#	VM index
CPU-QUOTA	normalized CPU quota
CPU-TIME	CPU time in % of total time since last PTSK event
#CPU	number of assigned processors
MSIZE	size of main memory in MB

PTSK event with LM-specific data:

This event will be repeated for each logical machine.

LM# / SUMMARY	logical machine number or average
SIH	SIH time in % of total time since last PTSK event
TSK	TU + TPR time in % of total time since last PTSK event
390	emulated /390 time in % of total time since last PTSK event (SPARC processors only) (also included in TSK)
IDL	IDLE time in % of total time since last PTSK event
HAL	HAL time in % of total time since last PTSK event (SPARC processors only)
DIO	disk IOs since last PTSK event
TIO	tape IOs since last PTSK event
PIO	paging IOs since last PTSK event
OIO	other IOs since last PTSK event
#DOM	number of existing LM domains
#BD<2	number of bound LM domains ≤ 2 GB
#UD<2	number of unbound LM domains ≤ 2 GB
#BD>2	number of bound LM domains > 2 GB
#UD>2	number of unbound LM domains > 2 GB
PEQ	number of frames in page empty queue of LM
ROQ	number of frames in read only queue of LM

RWQ	number of frames in read write queue of LM
FP	number of frames in free pool of LM
SWS	number of frames in system working set of LM

PTSK event with domain-specific data:

This event will be repeated for each memory domain.

DOM#	domain number
TYPE	domain type BD<2: bound domain ≤ 2 GB UD<2: unbound domain ≤ 2 GB BD>2: bound domain > 2 GB UD>2: unbound domain > 2 GB
LM#	number of logical machine domain belongs to
PEQ	number of frames in page empty queue of domain
ROQ	number of frames in read only queue of domain
RWQ	number of frames in read write queue of domain
FP	number of frames in free pool of domain
SWS	number of frames in system working set of domain

1.20 SDV (# 16)

DEV	device mnemonic		
CC	condition code (CC) after SDV-instruction (in SPM-format, only bits 2**4 and 2**5 are relevant) X'FF' means: virtual SDV for streaming tape mode		
SDB	standard device byte, only printed if CC=X'10'		
CSB	channel status byte, only printed if CC=X'10'		
DVT	device type		
TC	trial counter: it gives how often the SDV was repeated up to a maximum or CC=0		
OP	operation type: contents of field DJFLAG5 of PDT e.g. X'40'=CCW chain remains unchanged X'10'=CCW chain split up for arm motion optimization X'04' or X'05' sense required		
PATH	path information bits	2**0 - 2**7 2**8 - 2**11 2**12 - 2**13 2**15 2**15	device address channel # IOC # (only for extended mode else meaningless) set means bmux-channel reset means selector channel

For machines with dynamic channel subsystem (DCS) the bits 2**8 - 2**15 of path indicator are set to X'FF' as DCS indicator, the bits 2**0 - 2**7 are a mask for possible paths.
The path indicator of event 44 (CHTM) contains the selected path.

CCWAD	CCW address
CYL#	seek address: cylinder
HD#	seek address: header
REC#	seek address: record

The fields CYL#, HD# and REC# are only filled in case of a ra-device and if the 1st instruction is SEEK (operation type: X'27' or X'07').

In case of swallow discs as paging device CYL# is the cylinder# of the 1st paging-IO block. HD# and REC# are X'FF' if this values are not known.

BLOCK#	block number accessed (hexadecimal)
PAV	PAV indicator (since BS2000/OSD V5.0): N: not relevant B: base device A: alias device

1.21 EIA2 (# 20)

IW	interrupt weight (hexadecimal)

1.22 IDLE (# 24)

ACB	activator control byte for details see ACF event (# 56)
NPP	number of pageable pages
#CTG	number of categories
#ATx	number of active tasks of category x (x is the category number)
#IRx	number of inactive ready tasks of category x
#NAx	number of not admitted tasks of category x

This output will be repeated for all defined categories (min 4, max 16; min 1 line, max 4 lines)

The fields for not admitted tasks are only valid if PCS was active when the event was gathered.

1.23 EIA3 (# 28)

TU or TPR	interrupted state
PCTR	program counter of interrupted state
IW	interrupt weight: E: external interrupt I: IO interrupt M: machine check interrupt P: program interrupt R: restart interrupt S: SVC interrupt
SVC	SVC number (hexadecimal) and SVC mnemonic (only in case of IW=S)
IC	interrupt code (only valid in case of IW≠S) the interrupt code contains additional information about the interrupt (see /370 principles of operations)

Extended output in case of XEIA for IW=S and IW=P:

R0	R0 of interrupted state
R1	R1 of interrupted state
R13	R13 of interrupted state
R15	R15 of interrupted state
PCBAD	address of interrupted PCB
LSF	lock status field of interrupted task
PSW	first 4 bytes of old PSW
ISR-TU	ISR for local TU audit (1st byte)
ISR-TPR	ISR for local TPR audit (1st byte)
ISR-PCB	ISR for PCB audit (1st byte)
#AI1	number of TU audit interrupts since last XEIA
#AI2	number of TPR audit interrupts since last XEIA

1.24 CREA (# 32)

TSN	task sequence number of new task (since BS2000/OSD V3.0)
TASK-ID	task id of new task
TASK-TYPE	task type of new task (see event # 8 STAT)
CATEGORY	category of new task

1.25 DEST (# 36)

1.25.1 DEST event for BS2000/OSD < V3.0

----------	sub-event: DESTROY LOGOFF LOGOFF BUT
TID	task id of destroyed task
CATEGORY	category of destroyed task
CPT	CPU time in interval timer units (0.1 milliseconds)
SUM-SU	sum of all accumulated service units
CPU-SU	accumulated CPU service units
IO-SU	accumulated IO service units
MEM-SU	accumulated memory service units

1.25.2 DEST event for BS2000/OSD ≥ V3.0

----------	sub-event: DESTROY LOGOFF LOGOFF BUT
TSN	task sequence number of destroyed task
TASK-ID	task id of destroyed task
TASK-TYPE	task type of destroyed task (see event # 8 STAT)
CATEGORY	category of destroyed task
CPU-TIME	CPU time in interval timer units (0.1 milliseconds)
/390-TIME	emulated /390 time in interval timer units (0.1 milliseconds)
SUM-SU	sum of all accumulated service units
CPU-SU	accumulated CPU service units
IO-SU	accumulated IO service units
MEM-SU	accumulated memory service units

1.26 HAL (# 40)

1.26.1 HAL event for BS2000/OSD < V5.0

HAL event with BS2000 data:

SSCH	Start Subchannel (1/s)
SIGP	Signal Processor (1/s)
SPC+LPC	Switch Processing Control + Load Processing Control (1/s)
STCK	Store Clock (1/s)
MDEBUG	MDEBUG Break Point (1/s)
MPCCG	Make Primary Cache Consistent Global (1/s)

IPTEG	Invalidate Page table Entry Global (1/s)
ISTE	Invalidate Segment table Entry Global (1/s)
PTLBGU	Purge TLB of Dirty Global TU pages (1/s)
IOH_MVIO	Send PCIB to SINIX (1/s)
IOH_RMSG	Try and get PCIB from SINIX (1/s)
SVC	BS2000 SVC Interrupts (1/s)
PRG	BS2000 Program Interrupts (1/s)
EXINTR	BS2000 External Interrupts (1/s)
IOINTR	BS2000 IO Interrupts (1/s)
IOSINTR	IO Termination Interrupts for IOS (1/s)
D_IOSINT	Dummy BS2000 IO Termination Interrupts for IOS (1/s)
IOHINTR	IO Termination Interrupts for IOH (1/s)
D_IOHINT	Dummy BS2000 IO Termination Interrupts for IOH (1/s)
IP7CLOCK	HW Clock Interrupts (1/s)
IP2INTR	HW SP-Bus Interrupts (1/s)
TLBDMISS	TLB Double Misses (1/s)
TLBMOD	TLB Modification Interruptions (1/s)
BS2INTR	HW Interrupts (1/s)
BS2SYSCL	BS2000 MIPS-only SVCs (1/s)
ADDR_ACF	Address alignment correction for MIPS code (1/s)
ADDR_ACE	Address alignment correction for /390 code (1/s)
LWL	A LWL/SLL Hanger sequence has been replaced (1/s)
JIT_MOD	JIT Modification Event (1/s)
JIT_OFL	JIT MOD Table overflow PRG interrupt (1/s)
JIT_WTCH	JIT sets watch bits (1/s)

HAL event with SINIX data:

S_IDLE	Processor Truly idle (%)
S_USER	Processor in User mode (%)
S_KERNEL	Processor in Kernel mode (%)
S_WAIT	Processor waiting (%)
S_PREAD	Number of Physical Read Transfers (1/s)
S_PWRITE	Number of Physical Write Transfers (1/s)
S_CH_R	Number of characters read (1/s)
S_CH_W	Number of characters written (1/s)
S_SYSCAL	Number of System calls (1/s)
S_FORK	Number of forks (1/s)
S_EXEC	Number of executes (1/s)
S_FREE_M	Amount of Free memory (in clicks / 16k)

1.26.2 HAL event for BS2000/OSD ≥ V5.0

HAL event with BS2000 data:

SVC	BS2000 SVC interrupts (1/s)
IO	BS2000 IO interrupts (1/s)
EXT	BS2000 external interrupts (1/s)
PRG	BS2000 program interrupts (1/s)
ACF_SPARC	BS2000 ASSTRAN alignment correction interrupts (1/s)

ACF_390	BS2000 EMUL390 alignment correction interrupts (1/s)
IPTEG	invalidate page table entry global (1/s)
ISKE	insert storage key extended (1/s)
ISTE	invalidate segment table entry (1/s)
LCTL	load control (1/s)
LCTXT	load context (1/s)
LPSW	load PSW (1/s)
SCKC	set clock comparator (1/s)
SIGP	signal processor (1/s)
CRAS	create address space (1/s)
SSKE	set storage key extended (1/s)
DESAS	destroy address space (1/s)
SSCH	start subchannel (1/s)

Additional data for parameter PMR:

VER	contents of version register from SPARC V9 processor

Performance Monitor Register data in BS2000/OSD V5.0:

PM_VIEW	view number
SCR	contents of state control register
PERFxx	contents of performance register xx ($0 \leq xx \leq 54$)

Performance Monitor Register data since BS2000/OSD V6.0:

NCNT	number of counters
CNTMOD	count mode 1 = user 2 = system
CNTINF	counter number (1 byte) for each counter
PERF0x	contents of performance register x ($0 \leq x \leq 7$)

HAL event with Solaris data:

IDLE	processor truly idle (%)
USER	processor in user mode (%)
KERNEL	processor in kernel mode (%)
WAIT	processor waiting (%)
WTIO	processor waiting for IO (%)
WTSWAP	processor waiting for SWAP (%)
PSWITCH	number of process switches (1/s)
TRAP	number of traps (1/s)
INTR	number of device interrupts (1/s)
SYSCALL	number of system calls (1/s)
FORK	number of forks (1/s)
EXEC	number of executes (1/s)
READCH	number of characters read (1/s)
WRITCH	number of characters written (1/s)
INTTHR	number of interrupts as threads (1/s)
XCALLS	number of cross calls (1/s)
PGIN	number of page ins (1/s)
PGOUT	number of page outs (1/s)
SWAPIN	number of swap ins (1/s)

SWAPOUT	number of swap outs (1/s)

1.27 CHTM (# 44)

DEV	device mnemonic
AC	action byte X'80'= IO completed X'40'= IO virtual (streaming) X'20'= PPAM IO X'10'= write IO X'08'= SDV-frm gets error X'04'= device is a disc device X'02'= SCD path extension X'01'= paging IO
SDB	standard device byte 2 bytes are provided, SDB1 and SDB2. SDB2 is only meaningful for x-machines and attention interrupt (AC=X'FF').
CSB	channel status byte
SB	sense bytes
PATH	path indicator (see event #16 SDV)
CCWAD	CCW address. Pointer to address immediately after the last executed CCW
IOE-BIT	ioe-bit: if '02' is printed, the ioe-bit is set.
#TR	number of transferred blocks (disk IO) or bytes (other IO)
PAV	PAV indicator (since BS2000/OSD V5.0): N: not relevant B: base device A: alias device

Additional data for DCS:
(only valid for devices for which the SM2 service time statistics was started)

FPT	function pending time (hexadecimal)
DCT	device connect time (hexadecimal)
DDT	device disconnect time (hexadecimal)

1.28 TSKI (# 48)

TU or TPR	program state initiated
RTS	remaining time slice (interval timer units, i.e. 0.1 milliseconds)
TLS	task lock state (filled with blanks in case of monoprocessor)
TI-PATH	indicator for task initiator path (short or long)
P2-CONT	scheduled P2 contingency
LM#L	local LM# of task activation area, zero, if not Fremd-Vor-IDLE
MODE	program mode RISC: native on RISC HW /390: native on /390 HW or emulated on RISC HW

1.29 PEND (# 52)

PC	pend code (hexadecimal)
: sq → dq	queue transition from source queue (sq) to destination queue (dq)
RTS	task's remaining time slice (interval timer units, i.e. 0.1 milliseconds)
PPC	allowed number of pages in task's working set
UPG	number of pages in task's working set

CPT	used CPU time since task creation (in interval timer units)
390	used emulated /390 time since task creation (in interval timer units)
IOS	number of IO operations since task creation
CTG	category number
XPR	external priority (decimal)
PRI	internal priority (decimal)
LM#L	local LM# of task activation area
NPP	number of pageable pages
MTS	micro time slice (in microseconds)

1.30 ACF (# 56)

sub-event	type of ACF invocation: SHORT: short ACF invocation LONG: long ACF invocation
ACB	activator control byte: X'00': no action X'01': activate a task X'02': deactivate a task X'04': overactivation allowed X'08': a task has been linked to a category head X'10': a task with fixed priority has been linked to a category queue or a task has been linked to a category which has not reached min mpl or in case of deactivation if number of ready inactive tasks > 0 and min mpl not reached combination of values is possible
MEM-UT	memory utilization: L (low) / M (medium) / H (high)
PPC-ACT	global working set (for all active tasks)
NPP	number pageable pages (4 kb units)
PAG-UT	paging utilization: L (low) / M (medium) / H (high)
CPU-UT	CPU utilization: L (low) / M (medium) / H (high)
CPU-UT%	CPU utilization in percents

Following data are category dependent and will be printed for each category:

CTG#	category number
#ACT	number active tasks of this category
IRT	number inactive ready tasks of this category
IND	index of this category
WGT	weight of this category
MINMPL	min mpl of this category
MAXMPL	max mpl of this category

1.31 INTR (# 60)

TU or TPR	interrupted state
RTS	task's remaining time slice in interval timer units (i.e. 0.1 milliseconds)
----	runout type: MICRO: micro slice runout DLAP2: delayed P2 micro runout SSSR: system service slice runout
#IOS	number IOs since task creation
CPTIM	CPU time since task creation (in interval timer units)
CPU-SU	accumulated CPU service units
IO-SU	accumulated IO service units
MEM-SU	accumulated memory service units
TOT-SU	sum of all accumulated service units

1.32 RELM (# 64)

CLASS	memory class
BYTES	number bytes released or ‘ALL’ (i.e. all class 5 or class 6 memory of a task is released)

ADDR	virtual address of first byte released.
PC	pcounter of releaser

Following data are only printed for release of memory pool pages:

SIZE	size of memory pool (number pages)
FLAG	information about type of memory pool (see DSECT DPDR, equates for EPDRFLG)
ID	short pool id
NAME	memory pool name

1.33 REQM (# 68)

CLASS	memory class
BYTES	number bytes requested
ADDR	virtual address of first byte requested
PC	pcounter of requestor

Following data are only printed for request of memory pool pages:

SIZE	size of memory pool (number pages)
FLAG	information about type of memory pool (see DSECT DPDR, equates for EPDRFLG)
ID	short pool id
NAME	memory pool name

1.34 RSCS (# 72)

MN	device mnemonic
PATH	path ID
OP	write/read flag: W: write R: read
CALLER	event producer flag: B: BCAM C: CRYPT
ID	event identifier

1.35 RSCT (# 76)

MN	device mnemonic
PATH	path ID
OP	write/read flag: W: write R: read
CALLER	event producer flag: B: BCAM C: CRYPT
ID	event identifier
#BYTES	number of bytes

1.36 UTM (# 80)

UTM is an (universal) TP-monitor, using the KDCS-interface, and is based on BCAM. Data collection by these sub-events occurs in the system module KDCSVCS on entrance and exit of this module.

The UTM event-handler lists events with non privileged operation-codes (mget,mput,...) as well as events with internal operation-codes (wait,asi,cont,...).

To correctly interpret the CAP output the user should be aware of the fact that UTM does not check user parameters which are irrelevant for a certain application.

So it can happen that a certain information specified as printable will contain non printable characters. the same may happen during UTM initialisation.

For further details concerning the meaning of the output fields refer to 'UTM-Benutzerhandbuch Planen und Entwerfen'.

UTM sub-event UTEN

UID	user identification (allows to use UTM: to sign on)
TCV	transaction code/transaction (the same code during one transaction; a transaction of several transaction steps may exist)
TCA	transaction code/transaction step (transaction code of this transaction step)
TML	logical UTM station name
COP	operation code of the UTM call
COM	operation modifier, completing cop
CLA	length of user message area
CLM	message length
CRN	reference name
CMF	message format/logical terminal name
CDF	device feature

UTM sub-event UTEX

RCC	standardized KDCS return-code after a KDCS-call
RCD	special UTM return-code, completing RCC
UID	user identification (*) allows to use UTM: to sign on)
TCV	transaction code/transaction (*) (the same code during one transaction ; a transaction of several transaction-steps may exist)
TCA	transaction code/transaction step (*) (transaction code of this transaction-step)
TML	logical UTM station-name (*)

(*) only available for operation code "WAIT"

1.37 BOUR (# 84)

sub-event	1CREA:	$NBCREA call
	1DEST:	$NBDEST call
	1CHK2:	$NBCHK call TPR
	1CHK3:	$NBCHK call SIH
	1CAN:	$NBCAN call
	1TIME:	time out check by PT5/ETBOTIM
	1RPLY:	$NBREPLY call
	1DQ1C:	$NDEQBO call for 1-ch-bourse
	1IMRY:	implicit $NBREPLY (P3REXIT)
	1RSIG:	$NBRSIG call
	1SSIG:	$NBSSIG call TPR
	1SSG3:	$NBSSIG call SIH
	1RORD:	$NBRORD call
	1SORD:	$NBSORD call
	1EQ1C:	$NENQBO call for 1-ch-bourse
	2EQAR:	ENQUEUE ADMISSION REQ.
	2ADMT:	admit action
	2EXP:	expel action
	3WAIT:	wait

	3UNWT: unwait 3SCON: schedule contingency 3NONE: synchronisation with arp=(none) req. 3SAPP: schedule appendage
----	bourse type: 1-CH: one chamber bourse SIGNAL: signal bourse ORDER: order bourse
BOAD	bourse address
CHECK	check pattern (hexadecimal)
@AREQ	address of admission request / PCB
@CA	pcounter of caller

Sub-event specific data :

sub-event 1CREA:

@CREA	pcounter of bourse creator

sub-event 1DEST:

@DEST	pcounter of bourse destroyer

sub-events 1CHK2, 1CHK3, 1CAN:

QUEUE	requested queue (S or R)
#AREQ	number of admission requests in specified queue

sub-events 1RPLY, 1DQ1C:

MODE	$NBREPLY mode (normal or force)
LENGTH	data length (send length in rightmost half byte, receive length in leftmost half byte)

sub-events 2ADMT, 2EXP:

HOLDER-CH-R	TSN of ch. r holder
HOLDER-CH-S	TSN of ch. s holder

sub-events 1RSIG, 1SSIG, 1RORD, 1SORD, 1EQ1C:

ARP	attached request processing: X'00': (arp=none) / send-signal request X'01': arp=(wait,uncond) X'02': arp=(wait,immed) X'04': arp=(cont,ntbocoid,ntbocom) X'08': arp=(append,...) for intern use
FLAG	different purpose flags: X'80': retry-parameter; set: retry=no, reset: retry=yes X'40': signal-parameter; set: signal=*nil, reset: signal=iar#sig X'20': com-parameter; set: com=specified, reset: com=default X'10': flag for synchronous enqueuing; set: affected task maybe not already enqueued ar's chain reset: ar is enqueued irrespectiv of tid X'08': internal flag for old interface; set: event=expel, reset: event=admit X'04': internal flag for old interface (1-ch-b); set: mode=share, reset: mode=exclusive X'01': ar-queue; set: queue s, reset: queue r
SIGNAL	signal (hexadecimal) or *NIL if FLAG=X'40'
@CONT	cont. start address

sub-events 1TIME, 2EQAR, 3WAIT:

	see fields ARP, FLAG, SIGNAL
EXP-TIME	expiration time (hexadecimal)

sub-events 3UNWT, 3NONE, 3SAPP:

	see fields ARP, FLAG, SIGNAL

	and field @CONT for sub-event 3SAPP
sub-event 3SCON:	
	see fields ARP, FLAG, SIGNAL, @CONT
CLEV	cont. level (hexadecimal)

1.38 PAGE (# 92)

sub-event	reason of page fault: 1ST-A: first access RECL: page reclaiming READ: page read CPY-A: copy on access
WS#	working set number of working set to which the page is assigned
----	type of working set: GLOB: system global LOC: task local
PPC	estimated working set for this working set
UPG	number active pages in this working set
FP	number of pages in free pool
PP#	physical page number of affected page
VPN	virtual page number of affected page
CL	memory class of affected page
ROQ	number of pages in read-only queue
RWQ	number of pages in read-write queue
CPT	used CPU time of task causing page fault in 0.1 ms
UPGL	number of active pages local part
UPGG	number of active pages global part
SWS	number of active pages in system working set
Additional data since BS2000/OSD V6.0:	
PEQ	number of frames in page empty queue of domain
DOM#	domain number
TYPE	domain type BD<2: bound domain ≤ 2 GB UD<2: unbound domain ≤ 2 GB BD>2: bound domain > 2 GB UD>2: unbound domain > 2 GB
LM#	number of logical machine domain belongs to

1.39 LOCK (# 96)

sub-event	processor state of caller: SI: SIH TP: TPR function: LS: seize of lock sharable SL: seize of lock exclusive RL: release of lock SW: begin of spin wait for lock SE: end of spin wait for lock
PC	pcounter of caller
ID	lock identification
RC	returncode (see dsect ETMLCKP)
LM#L	LM# of locked local queue

Snn	lock status field of CPU nn (01 ≤ nn ≤ 16)

1.40 IONQ (# 100)

DEV	device mnemonic
DVT	device type
SLTAD	enqueue SLOT address
CCB@	address of connection control block CCB
CYL#	cylinder
HD#	header
REC#	record

The fields CYL#, HD#, REC# are only filled in case of a ra-device.

For swallow discs as paging device see note in description of event #16 (SDV).

BLOCK#	block number of FBA device (hexadecimal)
PAV	PAV indicator (since BS2000/OSD V5.0): N: not relevant B: base device A: alias device

1.41 CMS (# 104)

In the following description requestor task means the task handling the CMS request (always situated in the local (home) host) and calling task means the task originating the CMS request (may be remote). In case of a local call, both tasks are identical.

sub-event	ENTRY: start of CMS processing EXIT: end of CMS processing
OP	name of CMS operation
C-PBN	callers primary block number
R-PBN	requested primary block number
R-CID	requested catalog id
R-UID	requested user id
FN	fully qualified file name (only provided for certain CMS operations)
C-TID	task id of caller
C-SYSID	sysid (hexadecimal) of caller
IND	mode of processing X'00': local call X'01': remote call X'02': only buffer requested X'10': f1-label write requested the other bits are internally used by CMS
LOCK-EXP	operation expects a CE-lock
PCTR	pcounter of requestor
RC	return code provided by CMS (only provided with sub-event exit)
#BLCKS	# of used blocks

1.42 UPND (# 112)

PC	pend code (hexadecimal)
: sq → dq	queue transition from source queue (sq) to destination queue (dq)
RTS	task's remaining time slice (interval timer units, i.e. 0.1 milliseconds)
PPC	allowed number of pages in task's working set
UPG	number of pages in task's working set

CPT	used CPU time since task creation (in interval timer units)
390	used emulated /390 time since task creation (in interval timer units)
IOS	number of IO operations since task creation
CTG	category number
XPR	external priority (decimal)
PRI	internal priority (decimal)
LM#L	local LM# of task activation area
NPP	number of pageable pages
MTS	micro time slice (in microseconds)

1.43 PAM (# 116)

OPC	PPAM opcode: READ: read operation WRITE: write operation CHECK: check operation WAIT: wait operation RD_WT: read and wait operation WR_WT: write and wait operation RD_CH_WT: read, check and wait operation WR_CH_WT: write, check and wait operation CR_RD: crypt read operation CR_WR: crypt write operation CR_CH crypt check operation CR_WT: crypt wait operation CR_RD_WT: crypt read and wait operation CR_WR_WT: crypt write and wait operation CR_RD_CH_WT: crypt read, check and wait operation CR_WR_CH_WT: crypt write, check and wait operation
#HP	number of accessed PAM pages
PCTR	pcounter of DQPAM caller; the pcounter is invalid (zero) in case of P1-eventing
1LHP	logical half page number of 1st accessed page or physical half page number if PAM call by a DAB task
FILE	file name

Note: in PAM calls by a DAB task dummy file names are supplied:
a. 'bei DAB-Grossblockeinlagerung' in case of DAB read-miss
b. 'bei DAB-Auftragsende-Behandlung' if an internal error is detected after a DAB call

1.44 SLOT (# 124)

sub-event	$OPNS: open slot pool $CLSS: close slot pool $GETS: get slot $RETS: return slot EXPAN: slot pool expansion REDUC: slot pool reduction
PCTR	pcounter of caller
P-ID	short pool id
RC	return code of slot-call
#SLT-PGS	number of slot pages
#FREE-SLOTS	number of free slots
SLOT-ADDR	slot address
SLOT-SIZE	slot size

MEM-CLS	class of memory used to satisfy slot request
P-OPT	pool options
MNSZ	min size (number of free slots tried to be kept available during slot pool lifetime)
EX-LM	expansion limit

1.45 SWSR (# 128) (BS2000/OSD ≥ V6.0)

TYPE	type of replacement D = demand replacement P = periodic replacement
MOVE	indicator for move of SWS queues Y = SWS queues moved N = SWS queues not moved
LM#	logical machine number
DOM#	domain number
PEQ	number of frames in page empty queue
ROQ	number of frames in read only queue
RWQ	number of frames in read write queue
FP	number of frames in free pool
SWS	number of frames in system working set
CTF	number of controlled frames
RPP	number of replaced frames
RFP	number of referenced pages
NRP	number of not-referenced pages

1.46 WSCT (# 132)

WS-CTRL	new value for working set control: SYSTEM: system working set SELECTIVE: selective working set TASK: task working set

1.47 PRTY (# 136)

CURRENT-QUEUE#	number of current queue
NEW-PRIORITY	changed priority

1.48 TINF (# 140)

CTSN	calling TSN
OP	change operation: X'01': tsn changed X'02': deact opt. changed X'04': dwtr opt. changed X'08': dssr opt. changed X'10': inhd opt. changed X'20': task type changed X'40': job priority changed
TSN	new TSN (OP=X'01')
TCBSW5	new task switch 5 (OP=X'02', X'04', X'08')
TCBSW4	new task switch 4 (OP=X'10')
TTYP	new task type (OP=X'20'):

	0: system task 1: dialog task 2: batch task 3: tp task
PRI	new job priority (OP=X'40')

1.49 PDEA (# 144)

sub-event	DEAC: page deactivation INVAL: page invalidation
WS#	working set number of deactivated page
----	type of working set: GLOB: system global LOC: task local
PPC	estimated working set for this working set
UPG	number of active pages in this working set
FP	number of pages in free pool
PP#	physical page number of deactivated page
VPN	virtual page number of deactivated page
STAT	state of deactivated page: MOD: page modified UNM: page not modified
CL	memory class of deactivated page
ROQ	number of pages in read-only queue
RWQ	number of pages in read-write queue
VT	virtual time page was unused
UPGL	number of active pages local part
UPGG	number of active pages global part
SWS	number of active pages in system working set
ASAM	ASAM state of deactivated page: NOT-SPEC UNDEFINED VIRTUAL IN_TRANSIT REALIZED ACCESSIBLE

Additional data since BS2000/OSD V6.0:

PEQ	number of frames in page empty queue of domain
DOM#	domain number
TYPE	domain type BD<2: bound domain ≤ 2 GB UD<2: unbound domain ≤ 2 GB BD>2: bound domain > 2 GB UD>2: unbound domain > 2 GB
LM#	number of logical machine domain belongs to

1.50 TLT (# 148)

TID	affected task id
ENTRY	function entry: 'G': get lock via $ACCTLT 'R': release lock via $ACCTLT 'N': scan TLT

FUNC	function: 'G': get TLT lock 'R': release TLT lock
SUCC	success of function call 'S': success 'N': no success
STATE	current state: '2': TPR '3': SIH 'X': unknown
ADDR	pcounter of caller

1.51 SNAP (# 156)

------	sub-event: COPY-BEGIN COPY-END

1.52 DCAM (# 160)

sub-event	BEGIN: begin of DCAM-call END: end of DCAM-call ASY: asynchronous DCAM-notification
------	sub-event specification: YOPEN YOPNCON YCLSCON YRESET YREJLOG YSETLOG YCHANGE YINQUIRE YPERMIT YFORBIT YSEND YRECEIVE YSENDREC YSESSION YSENDR/S YCLOSE YGENCB YMODCB YSHOWCB YTESTCB LOGON GO EXPRESS MESSAGE TACK TNACK
RC	DCAM return code
AID	DCAM application id
----	DCAM parameter 'ATTR=' NDISCO: ATTR = NDISCO DISCO: ATTR = DISCO NSHARE: ATTR = NSHARE SHARE: ATTR = SHARE

CID	DCAM connection id
BCAMCID	BCAM connection id
LN	message length
EDIT	DCAM parameter 'EDIT=' USER: EDIT = USER SYSTEM: EDIT = SYSTEM
TOS	DCAM parameter 'TOS=' BASIC: TOS = BASIC STD: TOS = STANDARD
OPTCD	DCAM parameter 'OPTCD =' ACC: OPTCD = ACCEPT ACQ: OPTCD = ACQUIRE NQ: OPTCD = NQ Q: OPTCD = Q SYN: OPTCD = SYN ASY: OPTCD = ASY SYSYN: OPTCD = SYSYN NORMAL: OPTCD = NORMAL EXPR: OPTCD = EXPRESS NTACK: OPTCD = NTACK TACK: OPTCD = TACK

1.53 BCAM (# 164)

sub-event	BEGIN: begin of BCAM call END: end of BCAM call ANNO: BCAM announcement DISAB: disabling of application or connection INPUT: input from remote processor OUTPT: output to remote processor SHIPM: transhipment
------	sub-event specification

$ENABAP	$IBCAM - Open TSAP
$DISABAP	$IBCAM - Close TSAP
$CREDIST	$IBCAM - Create a distributor table
$DESDIST	$IBCAM - Destroy a distributor table
$REQCON	$IBCAM - Request connection
$ACCON	$IBCAM - Accept connection
$REJCON	$IBCAM - Reject connection
$DISCON	$IBCAM - Terminate connection
$SETCREQ	$IBCAM - Set announcement or connection
$RECLET	request
$SENDLET	$IBCAM - Receive data
$SENDTEL	$IBCAM - Send data
$DISLET	$IBCAM - Send expedited data
T-TSAP-OPEN	$IBCAM - Receive disconnection letter
T-TSAP-CLOSE	ICO2000 - Open TSAP
T-CONN-REQ	ICO2000 - Close TSAP
T-CONN-ACC	ICO2000 - Request connection
T-CONN-TERM	ICO2000 - Accept connection request
T-CONN-RED	ICO2000 - Terminate connection / Reject connection request
T-TRANSFER-STOP	ICO2000 - Redirect connection to other task
T-TRANSFER-GO	ICO2000 - Block DATAIN/EXPDATIN event
T-EVENT-GET	ICO2000 - Unblock DATAIN/EXPDATIN event
T-EVENT-WAKE	ICO2000 - Look for events
T-EVENTGR-OPEN	ICO2000 - Resolve waiting state of event group
T-EVENTGR-CLOSE	ICO2000 - Open event group

	T-EVENTGR-CHANGE	ICO2000 - Close event group
	T-INFORMATION-GET	ICO2000 - Change event group
	T-INFORMATION-SET	ICO2000 - Get information from ICO
	T-DATA-RECEIVE	ICO2000 - Give information to ICO
	T-DATA-SEND	ICO2000 - Receive data
	T-EXPDATA-RECEIVE	ICO2000 - Send data
	T-EXPDATA-SEND	ICO2000 - Receive expedited data
	T-UNITDATA-REC	ICO2000 - Send expedited data
	T-UNITDATA-SEND	ICO2000 - Receive data (connectionless)
		ICO2000 - Send data (connectionless)
	COMP	
	TEL	
	ACKN	
	GO	
	LETT	
	REC-C	
	NET-B	
	NET-E	
	APPL	
	CONN	
	LETT	
	SHORT	
	TACK	
	TNACK	
----	kind of connection: REMOTE LOCAL	
RC	BCAM return code	
CID	connection id	
APID	application id	
LN	letter length	
APP	name of own application	
PRO	name of own processor / own IP address	
PTN	name of partner / partner IP address	
PTP	name of partner processor	
OPO	own port number	
PPO	partner port number	
TASKS	IBCAM return info	
GROS	IBCAM parameter ‘GROS=’ F: GROS=FULL B: GROS=BASIC or	
THRU	IBCAM parameter ‘THRU=’ N: THRU=NORMAL H: THRU=HIGH	
LANNO	IBCAM parameter ‘LANNO=’ N: LANNO=N Y: LANNO=Y	
PRIO	IBCAM parameter ‘PRIO=’ 1: PRIO=1 (high) 2: PRIO=2 (medium) 3: PRIO=3 (low)	
EVENT	IBCAM parameter ‘EVENT=’ L: EVENT=LOOK W: EVENT=WAIT C: EVENT=CONT	

RTACK	IBCAM parameter 'RTACK=' N: RTACK=N Y: RTACK=Y
SEQNO	IBCAM parameter: sequence number 'SEQ'
----	kind of BCAM shortage BEGIN: begin of shortage END: end of shortage
FROM	address of sender
TO	address of receiver
----	kind of GO signal LETT: GO letter TEL: GO telegram
----	kind of acknowledgement TACK: positive transport acknowledgement TNAK: negative transport acknowledgement
TERM	kind of REC-C termination LETTER: terminated by letter arrival TIMEOUT: terminated by timeout DISCON: terminated by DISCON
BCVER	IBCAM parameter 'BCVER=' / TSAP interface functionality 0: BCAM version less V8 8: BCAM version V8 9: BCAM with ISO 11: BCAM with streams
EVENT	type of event TSAP-TERM TSAP termination indication CON-REDIR connection redirection indication CON-REQ connection request indication CON-RSP connection response indication CON-TERM connection termination indication DISCON-REQ disconnect request indication DATA-IN normal data arrival EX-DATA-IN expedited data arrival UPD-IN UPD data arrival DATA-GO GO signal for normal data EX-DATA-GO GO signal for expedited data T-ACK transport acknowledgement XAF-MSG XAF message arrival XAF-END XAF reconfiguration end ERROR indication error report arrival

1.54 BCPT (# 168)

sub-event	kind of action: INPUT: input OUTPT: output
MN	device mnemonic
DTA	data of input / output (max. one line)

1.55 TLM (# 172)

------	sub-event GET-LK: task gets lock WAIT-LK: task must wait for lock REL-LK: task releases lock

	WAKEUP: task must wakeup other task CREA-LK: task creates lock DEST-LK: task destroys lock CAN-LK-R: cancel lock requests AR-CAN: AR cancelled CHK-LK: check lock LKHTERM: lock held during termination LKHNTERM: lock held during normal termination LKHATERM: lock held after termination TIMO-LKH: timeout of lock holder TIMO-LKW: timeout of lock waiter
LKNAM	lock name
ATTR	attributes of call and further attributes (hexadecimal)
RC	returncode
PC	pcounter of caller
#WTSH	number of waiting sharers
#WT	number of waiters –1: lock is free ≥ 0: lock is hold > 0: there are waiters
#SH	number of sharers
HTSN or SCQ@	TSN of lock holder (if #SH=0) address of SCB queue (if #SH>0)
CNT	sub-event counter
HTIM	lock holding or waiting time (hexadecimal)
LK@	address of (sub)lock
ID	(sub)lock identification

1.56 VPEV (# 176)

TYPE	event type: B: begin (vector process initiated) T: termination of vector program P: preemption of vector task S: save (vector register saved)
VU-TIME	vu-time of vector program (hexadecimal)

1.57 MSG (# 180)

MSGID	message number
TYPE	type of macro / command: MSG7_MACRO MSG_MACRO HELP_CMD FULL_HELP_CMD
LAN	language of message
SOURCE	source of message: SDLAM ISAM_NORMAL DLAM CACHE_MEMORY TASK_MSG_FILE SYS_MSG_FILE LOCAL_DLAM
DEST	destination of message:

SYSLST
SYSOUT
CONSOLE
USER_BF (user buffer)
BCAM_BF (BCAM buffer)

1.58 PCCC (# 184)

CTG	category number
----	category name
CPS	accumulated CPU service units
IOS	accumulated IO service units
MMS	accumulated memory service units
PSR	primary service rate request
SSR	secondary service rate request
TSRX	maximal task service rate
CDP	capacity distribution priority
RCP	resource control priority
JSI	global job start indicator
TSRN	minimal task service rate
DUR	duration
ADL	admission limit
LEV	category job start indicator
ACT-LIM	activation limit

1.59 PCTC (# 188)

CPS	accumulated CPU service units
IOS	accumulated IO service units
MMS	accumulated memory service units
PSR	primary service rate request
SSR	secondary service rate request
CDP	capacity distribution priority
RCPS	resource control priority system
INP	initiation priority
ACP	activation priority
CCT#	current category number
RCPC	resource control priority category
OCT#	original category number

1.60 CMD (# 192)

sub-event	INIT:	start of command processing
	INPUT:	input request
	RETRN:	return from command processor
------	macro type:	
	RDSTMT:	read and process statement
	RDCMD:	read and process command
	MCLP:	call by MCLP macro
	CORSTM:	error dialogue for statement
	CORCMD:	error dialogue for command
	TRSTMT:	process statement given by caller

	TRCMD: process command given by caller, the command execution module is not called
IT	input type: BATCH: input from batch PROC: input from procedure UNGUID: unguided input GUIDED: guided input OP-COR: unguided correction of command OP-INP: unguided operand input only for sub-event input
LNG	length of command printed (max. 240 char.) / length of command input
INT	internal command name
CMD	up to 232 char. of the command string input

The fields LNG, INT, CMD are provided for sub-event return only.

1.61 FITC (# 196)

The FITC event has several sub-events. Sub-events trace the entrance and exit of the procedures that handle the administration calls, the entrance and exit of the procedures that perform the transport functions, and the occurrence of some FITC internal actions (entering a wait state, the moment of communication (data transfer), and the collection of data provided by asynchronous operations via waitmsg).

sub-event	BEGIN: begin TRANS: transfer WAIT: wait UNWT: unwait PROV: provide FREE: free CANC: cancel EVAL: evaluate ERROR: error END: end
-------	function: SENDMSG COMMISN RCVMSG REPLY WAITMSG EVNTIND WTCHECK CONTING GETOPCB RETOPCB OPEN CLOSE DEFCLAS DEFPORT RELPORT CONNECT DISCONN DEFPACC RELPACC SLTPOOL
VERS	FITC function version
RC	return code
DOM	domain (function level): TU

	TPR SIH
WTCL	single wait class
EV#	number of events
CTL2	FITC function control info 2
CNTL	FITC function control info

Additional data for functions SENDMSG, RCVMSG, COMMISN, REPLY, WAITMSG, EVNTIND, GETOPCB, RETOPCB, OPEN, WTCHECK, CONTING, SLTPOOL:

PTSN	partner TSN
PDOM	partner domain (function level)
MSGI	message id
WTIM	wait time
PFCT	partner FITC function
HLID	port holder id
CNID	connection id
OPCI	caller opcb id
POCI	partner opcb id
WCLM	WAITMSG wait class mask
SAREA	sender area location
SLEN	sender area length with attributes
RAREA	receiver area location
RLEN	receiver area length with attributes
TRLEN	real transfer length
EVTYP	short message event type
WPCB/PSLT	address of wait PCB / address of PCB slot (short MSG)
CTCB	caller TCB
PTCB	partner TCB
UWORD	caller user word
SALET	sender ALET
SSPID	sender SPID
RALET	receiver ALET
RSPID	receiver SPID
EVMSG	short message data

Additional data for functions CLOSE, DEFCLAS, DEFPORT, RELPORT, CONNECT, DISCONN, DEFPACC, RELPACC:

HLID	port holder id
CNID	connection id
RTSN	requestor TSN
RTCB	requestor TCB location
PNAM	port name
PUSID	port owner user id
POID	port entry address
SUPP	port owner support guard
REQU	port owner request guard

1.62 DAB (# 200) (BS2000/OSD ≤ V2.0)

sub-event	COMMD: processing of a dab command ANLYS: analysis of a data transfer request CHECK: processing of a dab check operation END: end of processing of a data transfer request
IO-STAT	IO status (only for sub-events ANLYS, CHECK, END): CTRL : volume / range is monitored by DAB NOCTRL: volume / range wasn't defined in a START-DAB command SERV : normal service NOSERV: service impossible due to an internal DAB error the following indicators are only possible if CTRL and SERV are set : READ : read IO WRITE : write IO SYNC : synchronous IO ASYN : asynchronous IO ERROR : IO error occurred
CCB-AD	address of IO's CCB (only for sub-events ANLYS, CHECK, END)
A1LHP	accessed first lower half page (only for sub-event ANLYS)
T#PP	number physical pages to transfer (only for sub-event ANLYS)
#P-HIT	number pages with read hit (only for sub-event ANLYS)
VSN	volume sequence number of volume accessed / to be serviced (only for sub-events ANLYS and COMMD)
----	task id (only for sub-event COMMD)
BUFFSZ	size of DAB buffer (in kb) (only for sub-event COMMD)
S1LHP	first lower half page to be serviced (only for sub-event COMMD)
S#PP	number physical pages to be serviced (only for sub-event COMMD)

The fields S1LHP and S#PP are repeated for each range specified in the START-DAB command.

1.63 PIO (# 204)

OP	type of operation RECONF-WR: main memory reconfiguration write C-FRAME-WR: write of c-frames WRITE: normal write READ: normal read RECOVER-RD: recovery read PG-REC-RD: paging reconfiguration read PG-REC-WR: paging reconfiguration write
RD-TSN	TSN of reader
VSN	VSN of paging device accessed **ES** if expanded storage is used as paging device
CYL	cylinder number
#PGS	number pages accessed

Additional data since BS2000/OSD V6.0:

DOM#	domain number
TYPE	domain type BD<2: bound domain ≤ 2 GB UD<2: unbound domain ≤ 2 GB BD>2: bound domain > 2 GB UD>2: unbound domain > 2 GB

LM#	number of logical machine domain belongs to
PEQ	number of frames in page empty queue of domain
ROQ	number of frames in read only queue of domain
RWQ	number of frames in read write queue of domain
FP	number of frames in free pool of domain
SWS	number of frames in system working set of domain

The following information will be repeated for each page accessed by this operation (maximal 16):

FRAME	frame number
BLOCK	logical block number

1.64 BLS (# 208)

FCT	function: LD_BEG: load begin LD_END: load end without error LD_ERR: load end with error UNLOAD: unload OP_MOD: open module CL_MOD: close module
ADDR	entry's load address
LIB	name of library
VER	version of element
TYP	type of element
ELEM	name of element
ACT-NAME	program name

1.65 LGON (# 216)

TASK-ID	taskid of new task
USERID	user id
JOBNAME	job name

1.66 PRGS (# 220)

PROGR	program name

1.67 PRGT (# 224)

PROGR	program name

1.68 ISPL (# 228)

sub-event	NOP GET PUT PUTX SETL STORE GOTO GETFL INSRT ELIM GETKY GETR

	RETRY OSTAT ISREQ GETA GETRA GETKA SETLA PUTA
-------	pool event code: FIX-HIT: fix hit FIX-IO: fix IO FIX-WT: fix wait SLT-WT: reserve slots wait SLT-NWT: reserve slots nowait
T	page type: CONTRL: control block DATA: data block INDEX: index block OVERFL: overflow block INDEXD: indexdata block FREE: free block
PN	pool name
--	pool extent concerned: 2K: 2 kb extent of pool 4K: 4 kb extent of pool
----	pool scope: TASK: task USER: user id HOST: host UGRP: user group
TP	total number of pages in pool
P#	page number for that the sub-event occurred
LEV	index level in case of index block
FN	file name
USID	user id
CTID	catid of PVS for that the pool was created
FPGS	number of fixed pages
RPGS	number of reserved pages

1.69 ISEV (# 232)

----------	lock event code: LOCK-WAIT LOCK-NOWAIT CONV-WAIT CONV-NOWAIT
LOCK	lock type: RR: read lock for reader RW: read lock for writer A: analyse lock for writer X: exclusive lock for changes
LEVEL	page level
PAGE#	page number
FILE	file name

1.70 TICS (# 236) (BS2000/OSD ≥ V4.0)

---	state: TU TPR
MODE	program mode: RISC /390
XPR	external priority (decimal)
PRI	internal priority (decimal)
LM#L	logical machine number of task activation area

1.71 TICE (# 240) (BS2000/OSD ≥ V4.0)

PC	pend code (hexadecimal)
: 0 → dq	queue transition from queue 0 to destination queue (dq)
XPR	external priority (decimal)
PRI	internal priority (decimal)
CPUTIM	used CPU time since task creation (in interval timer units, i.e. 0.1 milliseconds)
/390TIM	used emulated /390 time since task creation (in interval timer units)
RTS	remaining time slice (in microseconds)

1.72 STD1 (# 244)

ADDR	address of SVC call in user program
ID	identification of user program (see description of COSMOS TU-SVC)
LNG	length of user data record
DATA	user data (hexadecimal); max. 240 bytes are output (incl. ident.)

1.73 STDI (# 248)

RET@	return address to the hook
LNG	length of user data record
DATA	user data (hexadecimal); max. 240 bytes are output

1.74 STDN (# 252)

RET@	return address to the hook
LNG	length of user data record
DATA	user data (hexadecimal); max. 240 bytes are output

1.75 DSM (# 256) (BS2000/OSD ≥ V6.0)

FCT	function CREA: create DEST: destroy EXT: extend CLR: clear RED: reduce GETA: get area RETA: return area
NAME	data space name
SCOPE	data space scope LOCAL: accessible for task of owner only (connect by task access list)

GROUP: accessible for all tasks of user id (connect by task access list)
GLOBAL: accessible for all tasks (connect by task access list)
USER-G: accessible for all tasks of user group (connect by task access list)
SYSTEM: accessible for all tasks (connect by system access list)

LT — life time
PROG: data space destroyed at program termination
TASK: data space destroyed at task termination

ATTR — data space attributes
PRIV: privileged
RES: resident
COMREAD: common readable
DIAPROT: diagnosis protection
SEMIRES: semi resident

KEY — memory key

SPID — SPID

MAX-SIZE — maximum size

INI-SIZE — initial resp. current size

AREA-ADDR — area address

AREA-SIZE — area size

TYPE — data space type
STCK: stack
HEAP: heap memory
POOL: slot pool

SLOT-SIZE — slot size

1.76 PMIO (# 260)

1.76.1 PMIO event for BS2000/OSD < V3.0)

---- — TSN

CCB@ — address of connection control block CCB

FILE — file name

1.76.2 PMIO event for BS2000/OSD ≥ V3.0)

OPC — operation code:
READ: read operation
WRITE: write operation
CHECK: check operation
WAIT: wait operation
RD_WT: read and wait operation
WR_WT: write and wait operation
RD_CH_WT: read, check and wait operation
WR_CH_WT: write, check and wait operation
CR_RD: crypt read operation
CR_WR: crypt write operation
CR_CH crypt check operation
CR_WT: crypt wait operation
CR_RD_WT: crypt read and wait operation
CR_WR_WT: crypt write and wait operation
CR_RD_CH_WT: crypt read, check and wait operation
CR_WR_CH_WT: crypt write, check and wait operation

MN — device mnemonic

1LHP — 1st logical half page number

1PHP — 1st physical half page number

#PHP	number of accessed PAM pages
FILE	file name
CCB@	address of connection control block CCB
1LHP_IO	1st logical half page number of IO
1PHP_IO	1st physical half page number of IO

1.77 KPST (# 264) (BS2000/OSD ≥ V4.0)

KCB	name of KAI control block
P-ADDR	address of $POST call

1.78 KCOL (# 268) (BS2000/OSD ≥ V4.0)

KCB	name of KAI control block

1.79 VMCC (# 272) (BS2000/OSD ≥ V6.0)

CPU-ID	id of CPU
CPU-POOL-NAME	name of CPU pool

1.80 VMGC (# 276) (BS2000/OSD ≥ V6.0)

VM-GROUP-NAME	name of VM group
CPU-QUOTA	CPU quota
MAX-QUOTA	max. CPU quota
GROUP-CREA	indicator for creation of group NO YES

1.81 TSVC (# 280)

SVC	SVC number (hexadecimal)
--------	SVC name
FCT	SVC subfunction number (hexadecimal)
--------	SVC subfunction name

1.82 VMHS (# 284) (BS2000/OSD ≥ V3.0 and VM2000 ≥ V5.0)

VM-INDEX	index of virtual machine
VIRT-PROC	virtual processor number
INT-CLASS	interruption class: NONE: none GLOB: global interrupt EMU: instruction interception INTV: interruption interception PSWW: PSW wait alteration PRIO: priority change interception
INT-CODE	interruption code
TIM-SLICE	residual time slice

1.83 VMHE (# 288) (BS2000/OSD ≥ V3.0 and VM2000 ≥ V5.0)

VM-INDEX	index of virtual machine
VIRT-PROC	virtual processor number

1.84 DLM1 (# 292) (BS2000/OSD ≥ V3.0)

sub-event	ENQ: enqueue lock CVT: convert lock DEQ: dequeue lock CAN: cancel lock request INF: info lock LSB: lock state block
NAM-ID	name id (first and second part)
MOD	lock mode NU: null mode CR: concurrent read CW: concurrent write PR: protected read PW: protected write EX: exclusive
RANGE	range of lock name: SYS: system local CLUS: cluster wide
LCTL	lock value block control: IGN: no lock value block handling MOV: read or write lock value block
LK-NAM	lock name (character)
TASK-ID	task id of task in control
LOCK-ID	id of the lock request belonging to a specific lock
LK-NAM-HX	lock name (hexadecimal)

1.85 DLM2 (# 296) (BS2000/OSD ≥ V3.0)

sub-event	ENQ: enqueue lock CVT: convert lock DEQ: dequeue lock CAN: cancel lock request INF: info lock LSB: lock state block
NAM-ID	name id (first and second part)
MOD	lock mode NU: null mode CR: concurrent read CW: concurrent write PR: protected read PW: protected write EX: exclusive
TASK-ID	task id of task in control
LOCK-ID	id of the lock request belonging to a specific lock
LCTL	lock value block control: IGN: no lock value block handling MOV: read or write lock value block

1.86 DLM3 (# 300) (BS2000/OSD ≥ V3.0)

sub-event	GRT: grant event after LKENQ or LKCVT call WTOT: wait timeout event after LKENQ or LKCVT call REL: release event HTOT: hold timeout event ERGT: error event after failing LKENQ or LKCVT call CANC: cancelled event after LKENQ or LKCVT call when a LKCAN was issued LSBR: general error event when lock state block was not accessible OKDQ: dequeue event after LKDEQ call ERDQ: error event after failing LKDEQ call OKCN: cancel done event after LKCAN call ERCN: error event after failing LKCAN call
NAM-ID	name id (first and second part)
MOD	lock mode NU: null mode CR: concurrent read CW: concurrent write PR: protected read PW: protected write EX: exclusive
TASK-ID	task id of task in control
LOCK-ID	id of the lock request belonging to a specific lock

1.87 TGMT (# 308) (BS2000/OSD ≥ V2.0)

ACTION	action: JOIN: join group LEAVE: leave group INFO: task information
#TASKS	number of tasks in group
GROUP-ID	task group identification
TSN	TSN of task

1.88 TGMA (# 312) (BS2000/OSD ≥ V2.0)

#TASKS	number of tasks in group
GRP-ID	task group identification
MASK	assigned processor bit mask
ACT/EXT[%]	actual/extrapolated CPU utilization of the task group in 1/100
INT-MOD	internal modus of ZA2/3: ‘+’ majority group ‘-’ minority group ‘s’/’S’ sapped back to state inactive ‘a’ active group: During the distribution of the load of this group the utilization of the CPUs could be kept under the average CPU utilization. ‘A’ active group: Same as 'a' but the number of necessary processors of a group is lower than the minimum number of processors for a group. ‘o’ over average: During the distribution of the load of this group the total utilization of at least one CPU was bigger than the average CPU utilization. ‘O’ same as 'o' and more CPUs than necessary would have to be assigned to distribute the load but have not been assigned

	‘M’	same as 'o' and more CPUs than necessary would have to be assigned to distribute the load.
	‘E’	same as 'M', but not enough CPUs could be assigned to distribute the load, because the limit of the maximum number of processors of this group is reached.
#PROC	number of assigned processors to this group	

1.89 TGMP (# 316) (BS2000/OSD ≥ V2.0)

LM#	logical machine number of following data
PROC-UTIL[%]	processor utilization (in 1/100).

1.90 MMRC (# 320) (BS2000/OSD ≥ V2.0)

sub-event	DUPLX: duplex reconfiguration SE: SE reconfiguration VM: VM reconfiguration
FCT	function: DET: detach ATT: attach RED: reduce EXP: expand UPD: update
OLD-MLM	old memory limit (4 kB)
NEW-MLM	new memory limit (4 kB)
OLD-MIN-MLM	old minimal memory limit (4 kB)
NEW-MIN-MLM	new minimal memory limit (4 kB)
OLD-#AFR	old number of available frames (4 kB)
NEW-#AFR	new number of available frames (4 kB)
Additional data since BS2000/OSD V6.0:	
OLD-DOM-SIZE	old memory domain size
NEW-DOM-SIZE	new memory domain size
OLD-#DOM	old number of memory domains
NEW-#DOM	new number of memory domains

1.91 DABI (# 324) (BS2000/OSD ≥ V3.0)

sub-event	HIT: read-write hit MISS: read-write miss UPDAT: update OVRUN: overrun
ID	cache identifier
MOD	cache mode: READ: read caching WRITE: write caching RD_WR: read write caching
OP	IO operation code: READ: read data WRITE: write data WR_CH: write and check data ERASE: erase data UPDAT: update data INVAL: invalidate data
LEN	length of data transfer

#P_HIT	number of PAM pages with cache hit
#P_EMB	number of PAM pages embedded from disk into cache
#P_OVR	number of PAM pages not embedded into cache due to cache overrun
#P_DIR	number of PAM pages directly transferred between main storage buffer and external storage without use of cache
#P_UPD	number of PAM pages updated in cache after a direct write to external storage
RADDR	file-specific record address
VSN	VSN of cached volume
ATTR	attribute specification PAMKEY
FN	file name

1.92 DABC (# 328) (BS2000/OSD ≥ V3.0)

sub-event	cache action: START STOP
ID	cache identifier
MOD	cache mode: READ: read caching WRITE: write caching RD_WR: read write caching
MED	cache medium MM: main memory ES: expanded storage GS: global store
AREA	data area specification: FILE VOL PFA
SIZE	cache size (KB)
SEGM-SIZE	cache segment size (KB)
SAVING	cache saving: NO_INTERMEDIATE AT_LOW_FILLING AT_HIGH_FILLING
SIZE-SPEC	size specification: BY_VALUE BY_FILE

1.93 DABF (# 332) (BS2000/OSD ≥ V3.0)

sub-event	cache action: OPEN CLOSE
ID	cache identifier
FN	file name

1.94 DABE (# 336) (BS2000/OSD ≥ V3.0)

sub-event	cache action: OPEN CLOSE
ID	cache identifier
VSN	VSN of volume extent

Following data will be printed for each extent entry (max. 16 entries):

LBnn	lower bound of extent entry nn (nn is the extent number)
UBnn	upper bound of extent entry nn

1.95 DABS (# 340) (BS2000/OSD ≥ V3.0)

ID	cache identifier
#PAGS	number of saved PAM pages
FN	file name

1.96 NSMA (# 344) (BS2000/OSD ≥ V3.0)

sub-event	DLMRQ: DLM request NSMEV: NSM event
NAME-ID	unique name id
RES-ID	unique resource id
REQ-MOD	requested lock mode NU CR CW PR PW EX --
REQ-TYP	type of lock request ENQUEUE: enqueue DLM_CONV: DLM convert USR_CONV: user convert DEQUEUE: dequeue CAN_ENQ: cancel enqueue CAN_CONV: cancel convert NO_ACT: no action
EVENT	event type: GRANTING BLOCKING DEADLOCK_WARN REJECT_IMMED REJECT_PERSIST CANCEL_DONE

	CANCEL_REJECTED ERROR REQUEST_REJECT GRANT_ENQ GRANT_CONV_UP GRANT_CONV_DOWN CAN_ENQ_DONE CAN_CONV_DONE REQ_ENQ_REJECT REQ_CONV_REJECT REQ_CAN_REJECT REQ_DEQ_REJECT NOT_SPECIFIED
GRANT	granted lock mode: NU CR CW PR PW EX --
BLOCK	blocked lock mode: NU CR CW PR PW EX --

1.97 NSMB (# 348) (BS2000/OSD ≥ V3.0)

NAM-ID	unique lock id
RES-ID	unique resource id
REQ-MOD	requested lock mode: NU CR CW PR PW EX --

1.98 NSMC (# 352) (BS2000/OSD ≥ V3.0)

%USED	percent of message record used
REQ-STAY	number of requests staying in wait queue
XCS-TIME	unique clusterwide timestamp

1.99 NSMD (# 356) (BS2000/OSD ≥ V3.0)

%USED	percent of message record used
XCS-TIME	unique clusterwide timestamp

1.100 NSME (# 360) (BS2000/OSD ≥ V3.0)

RES-ID	specified unique resource id
NODE-ID	node from/to request is sent
ACT	action: CONV_UP CONV_DOWN CANCEL NO_ACTION
REQ-MOD	requested lock mode: NU CR CW PR PW EX --
REQ-TYP	type of lock request: ENQUEUE: enqueue DLM_CONV: DLM convert USR_CONV: user convert DEQUEUE: dequeue CAN_ENQ: cancel enqueue CAN_CONV: cancel convert NO_ACT: no action
SERV	determine server queue: IMMEDIATE: immediate USER_ENQ: user enqueue IMM_USR_ENQ: immediate user enqueue EXPRESS: express EXP_USR_ENQ: express user enqueue NOT_SPEC: not specified
EVENT	event type: GRANTING: granting BLOCKING: blocking GRANT_BLCK: granting and blocking DEADL_WARN: deadlock warning CANCEL: cancel REJ_IMMED: reject immediate NOT_SPEC: not specified
GRANT	lock mode granted to node: NU CR CW PR PW EX --
BLOCK	lock mode requested which is blocked by still granted mode: NU CR CW PR PW EX --

1.101 DABA (# 364) (BS2000/OSD ≥ V3.0)

OP	IO operation code: READ: read data WRITE: write data WR_CH: write and check data ERASE: erase data UPDAT: update data INVAL: invalidate data
LHP	logical half page number
FN	file name

1.102 VMIS (# 368) (BS2000/OSD ≥ V3.0 and VM2000 ≥ V5.0)

No additional data

1.103 VMIE (# 372) (BS2000/OSD ≥ V3.0 and VM2000 ≥ V5.0)

No additional data

1.104 VMSS (# 376) (BS2000/OSD ≥ 3.0 and VM2000 ≥ V5.0)

VM-INDEX	index of virtual machine
VIRT-PROC	virtual processor number

1.105 VMSE (# 380) (BS2000/OSD ≥ V3.0 and VM2000 ≥ V5.0)

VM-INDEX	index of virtual machine
VIRT-PROC	virtual processor number
PREEMPTION	preemption indicator: NO: no preemption YES: preemption

1.106 VMPD (# 384) (BS2000/OSD ≥ V3.0 and VM2000 ≥ V5.0)

VM-INDEX	index of virtual machine
VIRT-PROC	virtual processor number
QUEUE-TYPE	type of queue: READY: ready-to-run queue PENDING: pending queue IDLE: idle queue INACTIVE: inactive queue WAIT: wait queue
ENTRIES	number of entries in queue
PRIO	priority (ready-to-run queue)

1.107 VMLK (# 388) (BS2000/OSD ≥ V3.0 and VM2000 ≥ V5.0)

LOCK-ID	lock identifier: READY: ready-to-run-queue lock DIAG: diagnose-processing-queue lock I/O: hypervisor-I/O-active-queue lock HPVC: HPVC-request-block-queue lock ALERT: VM-alert-free-queue lock PVCB: PVCB lock PENDING: pending-queue lock IDLE: idle-queue lock INACTIVE: inactive-queue lock WAIT: wait-queue lock
ACTION	SEIZE RELEASE SPIN_WAIT SPIN_END
LOCKWORD@	address of lock word

1.108 VMPR (# 392) (BS2000/OSD ≥ V3.0 and VM2000 ≥ V5.0)

VM-INDEX	index of virtual machine
VIRT-PROC	virtual processor number
PRIO	priority

1.109 VMCH (# 396) (BS2000/OSD ≥ V3.0 and VM2000 ≥ V5.0)

sub-event	state of VM: READY STOP
VM-INDEX	index of virtual machine
MP-GRADE	multiprocessor grade of VM
TIM-SLICE	time slice in ms
TOD-OFFSET	TOD offset base of VM
SIZE	size of VM in MB
CPU-QUOTA	CPU quota
MAX-QUOTA	max. CPU quota
IO-PRIORITY	IO priority: NO: no IO priority VM YES: IO priority VM

1.110 GSAC (# 400) (BS2000/OSD ≥ V3.0)

PART-MODE	partition mode of respective partition: MONO_GSU0 MONO_GSU1 DUAL
ACCESS	access to partition: READ WRITE
PART-NAME	name of partition
#BYTES	number of bytes transferred

Notes and Restrictions

1. The logical machine number is omitted in case of monoprocessor.
2. The values delivered on the first occurrence of the PTSK event are meaningless.
3. LOGOFF BUT causes a DEST event with sub-event LOGOFF BUT. A subsequent LOGON causes no CREA event.
4. There are no UPND events for Q1→Q0.
5. For measurements containing DCM specific events a file with link name COSBCAM and a file with link name COSDCAM or the files $TSOS.SYSLNK.BCAM.xxx.COSMOS and $TSOS.SYSLNK.DCAM.xxx.COSMOS must be present.
6. Measurements done in BS2000 < V11.0 are no longer evaluated.
7. If the COSMOS data of one measurement are written into more than one output file (COSMOS parameter FILE-NAME) then this files must be mixed together with COSMIX to one measuring file before evaluations are started.