General SYSTP Functions

This section describes the SYSTP functions which are available under most TP monitors:

- Natural Monitoring - SYSMON
- Natural Print/Work Files - SYSFILE
- Natural Swap Information
- Buffer Usage Statistics - BUS
- Natural Subsystems and Roll Server Information
- Natural Thread Usage Statistics

Natural Monitoring - SYSMON

This function provides statistics related to Natural programs and screen transactions of Natural sessions.

When you invoke this function and the monitoring function is **not active**, a menu is displayed from which you can select the following function:

- Activate Monitor

When you invoke this function and the monitoring function is **active**, a menu is displayed from which you can select the following functions:

- Deactivate Monitor
- Display Monitor Terminal Statistics
- Display Monitor Program Statistics

Activate/Deactivate Monitor

With these functions you can activate or deactivate the monitor function.

When the monitor function is activated, it begins collecting statistical information of current sessions. Once the monitor function is deactivated, a statistical summary is collected and written to the system log file.

Note:
When active, the monitoring function requires additional memory pool space and therefore may affect overall system performance. Set the RDCSIZE parameter to a minimum value of 2 KB (see also Profile Parameters in the Natural Parameter Reference documentation).

Display Monitor Terminal Statistics

Terminal statistics can be displayed for all active terminals or for a single terminal.

- For all active terminals: enter **T** in the Code field.
- For a single terminal: enter **T** in the Code field and the terminal ID in the field Name of LTERM or Program.

The following screen is used to display statistics for all active terminals:

```
17:03:13              ***** NATURAL SYSTP UTILITY *****             2000-11-27
   User VR000001      - NATURAL Monitor Terminal Statistics -      TID 0756


  Cm Name     Current       NAT- ADA- Ext- Mean-  Screen I/O   User    Sys  Fetch
                            time time time  time     No   KB    Acc    Acc
  ------------------------------------------------------------------------------
   _ 0756     S2SCENT1         0    0    0   0.0      1    0      0      0      5
                               0    0    0    .0      0    0      0      0      0
                               0    0    0    .0      0    0      0      0      0
                               0    0    0    .0      0    0      0      0      0
                               0    0    0    .0      0    0      0      0      0
                               0    0    0    .0      0    0      0      0      0
                               0    0    0    .0      0    0      0      0      0
                               0    0    0    .0      0    0      0      0      0
                               0    0    0    .0      0    0      0      0      0
                               0    0    0    .0      0    0      0      0      0
  ------------------------------------------------------------------------------
  Function :  _           (   +  next page  /   . Exit  /  ? Help  )
  ------------------------------------------------------------------------------
  Select, mark with function or mark for additional information
  Command ===>
  Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
        Help  Menu  Exit                          +                      Canc
```

Note:
If the overview of active terminals is displayed repeatedly, an asterisk is set to the terminal most active since the last repetition.

To display statistics for a single terminal, you mark the desired terminal on the screen above.

The following statistics are provided for terminals and programs:

Column	Statistics	Explanation
NAT-time	Time in Natural	Time in Natural nucleus and in the interface.
ADA-time	Time in Adabas	Time waiting for response from Adabas.
Ext-time	Time in external program	Time needed by a user-written module.
Mean-time	Mean evaluation time	Elapsed time of one Natural screen transaction.
Screen I/O No	Number of Screen I/Os	Number of screen I/Os.
Screen I/O KB	Amount of data transmitted	Amount of data transferred to or from the screen.
	Evaluation time > 3 sec	Only applies to statistics for a single terminal. Percentage of evaluation times longer than 3 seconds.
	Evaluation time > 6 sec	Only applies to statistics for a single terminal. Percentage of evaluation times longer than 6 seconds.
User Acc	Number of user file accesses	Counter for accesses to Adabas user files.
Sys Acc	Number of system file accesses	Counter for accesses to Natural system file, including fetches.
Fetch	Number of fetches	Counter for total number of fetches.

Display Monitor Program Statistics

Program statistics can be displayed for all active programs or for a single program:

- For all active programs: enter **P** in the Code field.
- For a single program: enter **P** in the Code field and the program name in the field Name of LTERM or Program, and the library name.

The following screen is used to display statistics for all programs:

```
 08:56:53              ***** NATURAL SYSTP UTILITY *****             2000-11-28
 User VR000001      - NATURAL Monitor Program Statistics -      TID 0807


Cm Name     Current       NAT- ADA- Ext- Mean-  Screen I/O   User    Sys  Fetch
                          time time time  time     No   KB    Acc    Acc
-------------------------------------------------------------------------------
 _ SMMMEN01 SYSTP            0    0    0   0.0      1    0      0      0      2
 _ S2MRAHM1 SYSTP            0    0    0   0.0      0    0      0      0      0
 _ S2SCOM01 SYSTP            0    0    0   0.0      0    0      0      0      0
 * SMPMEN01 SYSTP            0    0    0   0.0      0    0      3      0      1
 _ SMPSTA01 SYSTP            0    0    0   0.0      0    0      0      0      1
 _ S2SCENT1 SYSTP            0    0    0   0.0      0    0      0      0      0
                             0    0    0    .0      0    0      0      0      0
                             0    0    0    .0      0    0      0      0      0
                             0    0    0    .0      0    0      0      0      0
                             0    0    0    .0      0    0      0      0      0
-------------------------------------------------------------------------------
Function :  _            (   +  next page  /   . Exit  /  ? Help  )
-------------------------------------------------------------------------------
Select, mark with function or mark for additional information
Command ===>
Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help  Menu  Exit                          +                     Canc
```

For an explanation of the screen output, see the table above.

Note:
If the overview of active programs is displayed repeatedly, an asterisk is set to the program most active since the last repetition.

To display statistics for a single program, you mark the desired program on the screen above.

Natural Print/Work Files - SYSFILE

This function provides information on the available work files and print files.

You can also invoke this function with the system command SYSFILE (Natural Command Reference documentation).

This function can also be used in batch mode.

When you invoke this function, a list of the defined work and print files is displayed, showing the following information for each file:

No.	The number of the work/print file.
Type	The type of assignment; that is, the operating system, TP monitor or Natural product file to which the work/print file is assigned.
Name	The name of the work/print file.
RECFM, LRECL, BLKSZ	The record format, logical record length and block size of the work/print file (if applicable).
Status	The status can be: available for input and/or output, open for input and/or output.

Under VSE/ESA, the logical-unit assignments are also displayed.

With the following keys and commands (which you enter in the first column of the list), you can scroll the list or display additional information:

Key	**Command**	**Function**
PF4	S	Displays various additional items of information on the file marked with the cursor/command.
PF5	P	Scrolls the file marked with the cursor/command to the top of the page (same as command /).
	/	
PF6 / PF9		Scrolls to the beginning/end of the list.
PF7 / PF8		Scrolls one page backward/forward.
PF10		Scrolls to the list of print files.
PF11		Scrolls to the list of work files.
	D	Displays the corresponding Natural control block (work file area) in dump format.

Natural Swap Information

This function is only available under CICS and UTM.

The swap pool manager enables online monitoring and control of the Natural swap pool. This section describes how the swap pool manager is used rather than how the swap pool operates. For detailed information on the operation of the Natural swap pool, see The Natural Swap Pool in the Natural Operations for Mainframes documentation.

From the swap pool manager main menu, you invoke the following functions and sub-functions for the controlling and monitoring the swap pool:

- Administration
- Debugging Facilities
- Information
- Parameter Service
- Status Information

Each of these functions can be invoked by either Function Code or PF key.

Administration

- Slot Size Calculation
- Change Swap Pool Status
- Update Reorg Control Data

Slot Size Calculation

This function displays the optimum values for the layout of the swap pool based on the current usage.

You can store these values to be used for a later initialization/reorganization (once they have been stored, they can also be maintained with the Parameter Service function.

You can also initiate a swap pool reorganization using these values.

For further details, see the online help of this function.

Change Swap Pool Status

This function is used to activate or deactivate the Natural swap pool. In addition, you can modify the wait time and the number of waits for swap pool synchronization.

For further details, see the online help of this function.

Update Reorganization Control Data

With this function, you can modify the most important parameters in swap pool management. To modify the values you must enter a valid password.

For further details, see the online help of this function.

Debugging Facilities

Note:
Do not use this function without prior consultation of Software AG’s Natural support.

This function is only available under UTM

With this function it is possible to activate or deactivate an internal screen debugging buffer. Activation of the screen debugging buffer is used to locate terminal I/O inconsistencies if they occur. The function records information on the last three terminal I/O sequences. The buffer has a size of 3 KB and is used in a wrap-around procedure.

In addition, you can activate/deactivate a trace function for asynchronous write operations to the Natural roll file.

For further details, see the online help of this function.

Information

- Show Addresses
- Show Summary of Buffer Usage
- Show Swap Pool Information
- Show Logical Swap Pools
- Show Reorg Control Data
- Show Swap Pool Usage
- Create Statistics List

Show Addresses

This function displays the addresses of various pools.

Show Summary of Buffer Usage

This function is used to optimize the sizes of the various Natural buffers and the Natural user threads (MAXSIZE). It activates, deactivates and displays a summary of Natural buffer usage.

The activation and deactivation of buffer statistics can only be performed with a valid password. For the display of buffer statistics, no password is necessary.

The buffers displayed are the same as those displayed by the function Buffer Usage Statistics.

Show Swap Pool Information

This function displays information on the swap pool currently in use, including control/statistics data, and memory sizes.

The individual items of information shown are explained in the online help of this function.

Show Logical Swap Pools

This function displays the current table of logical swap pools.

On the table, you can mark a specific logical swap pool with any character to get additional information on it.

The individual items of information shown are explained in the online help of this function.

Show Reorganization Control Data

This function displays all information related to the swap pool reorganization.

Displayed in the left half of the screen is the swap pool reorganization table. The table contains cumulative statistics on the comparative sizes between compressed Natural user threads and standard slot size. The table is cleared with each reorganization of the swap pool. The left half of the table shows how often and to what extent the user threads are larger than the standard slot size. The right half of the table shows how often and to what extent the user threads are smaller than the standard slot size. Sizes in this half of the table are expressed in units, which are dependent on the factor specified by the swap pool manager.

In the row labeled **n**, count is taken of user threads which exceed/fall short of the standard slot size by over 9 pages/units. The average length of these user threads is displayed in the row labeled **Av.+n**.

The individual items of information shown are explained in the online help of this function.

Show Swap Pool Usage

This function displays information on the usage of the swap pool since its initialization or the last reorganization.

The individual items of information shown are explained in the online help of this function.

Create Statistics List

This function is used to create a list of the current swap pool usage statistics.

Parameter Service

- Parameter Maintenance
- Password Maintenance

Parameter Maintenance

This function is used to change online the parameters for the initialization or reorganization of the swap pool.

The subfunctions as well as the individual items that can be modified are explained in the online help of this function.

The use of this function is password-protected (see below).

Password Maintenance

This function is used to change or recover the password used for the Parameter Service function.

The initial password is SYSTP.

Status Information

With this function, you can display the current status of the Natural swap pool, of the summary of buffer usage and of the UTM screen debugging.

Buffer Usage Statistics - BUS

This function provides statistical information on the usage of Natural buffers: which buffers are allocated for the current session, and how much buffer space is being used.

The Total figures at the end of the statistics list allow you to draw conclusions about the efficiency of buffer compression.

You can invoke this function either from the SYSTP menu or with the system command BUS.

When you invoke the function, a list is displayed showing all buffers which are actually being used in the current Natural session.

For each of these buffers, the following information is displayed:

M	In this column, you can mark a buffer with a command (see below).
No.	The buffers are numbered sequentially in order of allocation.
Name	The name of the buffer. Only those buffers which have actually been requested in the current Natural session are listed. The buffers are listed under The Individual Buffers.
Type	**V** indicates a variable buffer. The size of a variable buffer is increased automatically when necessary (even if it is allocated outside the Natural thread). If it is allocated outside the thread, it is copied into the thread at a terminal I/O; if it does not fit into the thread, it is truncated to its actually used length.
Size	The size of the buffer (in bytes).
Used	The number of bytes currently being used. This value is used for buffer compression in environments using threads (for example, CICS or UTM).
Perc. (Used)	The percentage currently being used; that is, the value of the Used column in relation to the value of the Size column.
MaxUsed	The maximum number of bytes which have been used in the course of the current session so far (**not** the size being used at present).
Perc. (MaxUsed)	The percentage of current session usage; that is, the value of the Max. Used column in relation to the value of the Size column.
MaxSize	The maximum size (in bytes) which been allocated to the buffer in the course of the current session so far (applies to variable buffers only).
Perc.(MaxSize)	The maximum size allocated so far (value of the Max. Size column) in relation to the current size (value of the Size column) (applies to variable buffers only). A percentage of 1000 or more is indicated by **999.9** displayed intensified.
At the end of the list, the following information is displayed:	
ThrdSize	The current size (in KB) of the Natural thread.
Total	The sums of all buffer sizes (in both bytes and KB) and percentages used/allocated. These totals can also be displayed via PF10 (see below). For Max. Size, the total shows the maximum additional amount of thread size that would have been needed in the course of the session so far.

With the following keys and commands (which you enter in the first column of the list), you can scroll the list or display additional information:

Key	Command	Function
PF4	D	Displays the contents of the buffer marked with the cursor/command in dump format (for internal use by Software AG support personnel).
PF5	P	Scrolls the buffer marked with the cursor/command to the top of the page.
	/	
PF6	- -	Scrolls to the beginning of the list.
PF7	-	Scrolls one page backward.
PF8	+	Scrolls one page forward.
PF9	++	Scrolls to the end of the list.
PF10		Displays the Total buffer usage figures.
PF11		Displays the relative addresses of the buffers, that is, relative to the input/output control buffer (IOCB).

Individual Buffers

The following table shows the names and functions/contents of all buffers, along with the parameters the buffers are influenced by.

Buffer Name	Function/Contents	Influencing Parameters
ADA_NUKE	Program load buffer	none
ADA_USER	Adabas user call buffer	none
ADASIZE	ADALNK reentrancy buffer	none
AIVDAT	Application-independent variables	none
ASIZE	Entire System Server auxiliary buffer	ASIZE
ASPSIZE	Adabas stored procedures and triggers	none
BB#ESIZE	Main buffer for data and runtime tables	ESIZE
BPMWORK	Buffer pool manager work area	NTBPI macro
BSIZE	Reserved for future use	BSIZE
CFWSIZE	Framework buffer	CFWSIZE
CMPRTSZ	Compression table buffer	none
COMPCGDA	Compiler, GDA Version 2.2 to 2.3 conversion	none
COMPDDMS	DDM loading and generation	none
COMPSYT	Compiler, symbol table	none
COMPTBLS	Compiler, generated object	none
COMPWARN	Compiler, warning messages	none
CONTEXT	Context variables buffer	none
CSIZE	Con-nect buffer	CSIZE
DATSIZE	Local data buffer	DATSIZE
DB2SIZE	Natural for DB2 and Natural for SQL/DS buffer	DB2SIZE
DB2SIZE 1 - 5	Natural for DB2 buffers	none
DLISIZE	Natural for DL/I buffer	DLISIZE
DSIZE	Debug buffer area	DSIZE
EDTPOOL	Editor auxiliary buffer	EDPSIZE
EPLTAB	External program list table	CDYNAM, CSTATIC
ERRMSG	Error messages buffer	none
ESQSIZE	Adabas SQL server buffer	none
ETPSIZE	EntireTransaction Propagator buffer	ETPSIZE
EXCSIZE	Natural Expert C interface buffer	EXCSIZE
EXPAFOBU	Expanded format buffer	none
EXRSIZE	Natural Expert rule tables buffer	EXRSIZE
EXTBUF	Extra Buffer for Adabas Version 4	EXTBUF

Buffer Name	Function/Contents	Influencing Parameters
GETPHTAB	Physical GETMAIN table	none
GLBSYS	System global data area buffer	none
GLBUSER	User global data area buffer	none
HELPBUF	Help message buffer	none
IDIR	Local program directory buffer	none
IDSIZE	IDMS buffer	IDSIZE
IOCB	Driver/frontend buffer	none
IOOATTR	Overlay attribute buffer	none
IOOVLY	Overlay buffer	none
IOPAGE	Page buffer	PS, LS
IOPATTR	Page attribute buffer	PS, LS
IOSATTR	Screen attribute buffer	none
IOSAVE	I/O debugging buffer	none
IOSCRN	Screen buffer	none
ISIZE	Initialization buffer	ISIZE
KAPRIBUF	Kanji buffer	none
MONSIZE	Natural monitor bufffer	MONSIZE
NAFSIZE	Natural Advanced Facilities buffer	NAFSIZE
NCPWORK	Command processor buffer	none
NDLADHOC	Natural for DL/I adhoc storage buffer	none
NETBUF	Network buffer	none
NOCBUF	Natural Optimizer Compiler buffer	none
NOCCODE	Natural Optimizer Compiler code buffer	none
NOCSTMT	Natural Optimizer Compiler statement buffer	none
NOCTRACE	Natural Optimizer Compiler trace buffer	none
NOCWBUF	Natural Optimizer Compiler work buffer	none
PRINT 00 - 31	Batch print file buffers	NTPRINT macro
PRNTWORK	Print and work file buffer	NTPRINT macro, NTWORK macro
PROFBUF	Natural profile work buffer	none
PSEUDORV	Pseudo register vector buffer	none
RCEXEC	Object runtime command buffer	none
RDCSIZE	SYSRDC buffer	RDCSIZE
REVWSIZE	Review buffer	none
RJESIZE	NATRJE buffer	RJESIZE
RPCSIZE	Remote procedure call buffer	none

Buffer Name	Function/Contents	Influencing Parameters
RSPOOL	Remote spool buffer	none
RUNSIZE	Runtime buffer	RUNSIZE
SFEXEC	RUN command execution buffer	none
SFSRCALF	System file interface buffer	none
SFSRCMF	System file interface buffer	none
SFSRCUS	System file interface buffer	none
SFSYT	System file interface buffer	none
SORTESM	External sort manager buffer	none
SORTSZE	Sort buffer	NTSORT macro
SPEXEC	Sysplex execution buffer	none
SSIZE	Buffer for NSPF editor	SSIZE
SUREBUF	Setup/return information buffer	none
SWPSSIZE	Swap pool statistics work buffer	none
TESTWORK	Test utilities buffer	none
TIOB	Terminal I/O buffer	none
TISIZE	SYSPARM parameter buffer	none
TRMIODEB	Terminal I/O debugging buffer	none
TSIZE	Text retrieval buffer	TSIZE
UDSSIZE 0 - 5	UDS buffers	none
USERBUF	User buffer	USERBUF
VSIZE 0 - 9	Natural for VSAM buffers	VSIZE
WORK 01 - 32	Batch work file buffers	NTWORK macro
WSISIZE	Natural Workstation Interface buffer	WSISIZE
WSIZE	Screen images buffer	WSIZE
XSIZE	Natural Connection buffer	XSIZE
ZSIZE	Entire DB buffer	ZSIZE

Natural Subsystems and Roll Server Information

This function is only available under OS/390.

You can use it to determine an optimum thread size or roll file size for a Natural application. It displays a list of the Natural subsystems together with the current status of the related authorized service manager and roll server.

The following commands are available for each listed subsystem:

Command	Function
B	Displays buffer pool information (name, size, type).
R	Displays roll server statistics.
S	Displays zaps applied to the authorized service manager.
Z	Displays zaps applied to the roll server.
L	Displays and resets entries in the roll file directory.

This information is useful for tuning the roll server, as described under Roll Server in the Natural Operations for Mainframes documentation.

Natural Thread Usage Statistics

This function is only available under CICS, Com-plete, IMS/TM and UTM. It is not available in a Sysplex environment.

This function allows you to determine an optimum thread size or roll file size for a Natural application.

You should activate this function only when needed, and deactivate it after you have determined your optimum thread size, because this function occupies space in the Natural buffer pool. When you deactivate it, the space in the buffer pool becomes available again.

Proceed as follows:

1. Define an oversized thread in the range of 512 to 1024 KB for your Natural application. Take into account the number of Software AG subproducts used.
2. Start your Natural application, either in production or in test mode.
3. Activate the Natural Thread Usage Statistics function: Invoke the SYSTP utility. On the SYSTP main menu, choose function T (Natural Thread Usage Statistics). On the menu that appears then, choose function A (Activate Statistics).
4. Use your Natural application under typical production conditions. TheThread Usage Statistics function runs in the background and logs the buffer sizes used.
5. Then invoke the SYSTP Thread Usage Statistics function again. On the menu that appears, choose function S (Show Statistics), P (Print Statistics) or D (Deactivate and Print Statistics). It is recommended that you use function D to free buffer pool space.

The Natural Thread Usage Statistics contain the following information:

Ext. Buffer	The sizes of these buffers are defined externally (in the Natural parameter module).
Defined Size	The buffer size as defined in the Natural parameter module.
Max. Allocated Size	The maximum buffer size allocated. Note that for the internal BB area, 14368 byters are added to the ESIZE profile parameter value.
Max. Used Size	The maximum buffer size used.
Sum of External Buffer Sizes	The total of all buffer sizes defined in the Natural parameter module.
Sum of Internal Buffer Sizes	The total of all buffer sizes requested by Natural internally.
Max. Used Thread Length	The maximum thread length used by Natural. Define this length as your minimum (optimum) Natural thread length. Round it up to the next KB number that can be divided by 2.
Max. Compresssed Thread Length	The maximum length of a compressed Natural thread that was written to the Natural roll file. Define this length as your minimum (optimum) Natural roll file length.

Show Physical GETMAIN Statistics

The physical GETMAIN statistics provide information on all physical GETMAINs relevant for the Natural work pools and the variable Natural buffers outside the Natural user threads.
They indicate the original buffer sizes (during the startup of a Natural session), the number of physical GETMAINs, the buffer length for the physical GETMAIN and the buffer position (above or below the 16-MB line).

The statistics data always refers to the buffers with the greatest lengths requested within a terminal I/O, for all users of the Natural application.
The statistics provides a maximum of six entries for each buffer. These entries may be overwritten through the wrap around procedure. The highest number equals the maximum number of the physical GETMAINs within a terminal I/O, for each buffer concerned.

The first two entries in the statistics refer to the Natural work pools (if available) above (WRKPOOLA), respectively, below (WRKPOOLB) the 16-MB line.
Here, the highest physical GETMAIN number refers to the amount of work pools simultaneously available during the terminal I/O. The sum of all work pool lengths amounts to the total storage requirement of the work pools within a terminal I/O.

All subsequent statistics entries refer to the physical GETMAINs for the variable Natural buffers, which either could not be defined in the Natural user thread due to insufficient space, or were increased outside the Natural user threads. For these buffers, the highest physical GETMAIN number indicates the greatest space requirement for each buffer within a terminal I/O. The total storage space requested earlier was deallocated before each of the following physical GETMAINs.
That is, the sum of all physical GETMAINs with the highest number shows the maximum storage requirement for the variable buffers outside the Natural user threads during a terminal I/O, for all users of the Natural application.

