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 Sub-Systems and Roll Server Information

- Natural Thread Usage Statistics

- Natural License Information

Natural Monitoring (SYSMON)

The Natural monitoring function can be used to view statistics about the Natural programs and terminals used during the current Natural session.

The scope of the Natural monitor is determined by the area in which the statistical data is collected:

- When a global or local monitor buffer pool is used (as assigned by the `BPI` profile parameter or the `NTBPI` macro of the `NATPARM` parameter module; see the *Parameter Reference* documentation), program and terminal statistics of all Natural sessions that share this buffer pool are collected.

- When a monitor buffer is used within the thread (as determined by the `MONSIZE` profile parameter; see the *Parameter Reference* documentation), only program statistics and information about the terminal of the current Natural session are collected. For a monitor buffer, we recommend a minimum value of 64 KB.

In addition to defining the scope for the Natural monitor, you have to set the `RDCSIZE` profile parameter, which activates the Natural Data Collector.

Caution:
When active, the monitoring function can affect overall system performance.

When you invoke the **Natural Monitoring (SYSMON)** function, the **Natural Monitor Menu** appears, which provides the following functions:

- Activate/Deactivate Monitor

- Monitor Status Information

- Display Program/Terminal 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 session(s). Once the monitor function is deactivated, a statistical summary is written to the system log file.

Monitor Status Information

This function provides statistical information about whether monitoring data is collected in a monitor buffer pool and/or the space allocated with the MONSIZE parameter, and indicates the size and the address of the allocated space.

Display Program/Terminal Statistics

You can view statistical information about all Natural programs that have been executed since the monitor was started and the terminals that have been activated since then.

▶ **To execute the program or terminal statistics function**

1. In the **Code** field of the **Natural Monitor Menu**, enter P (for program statistics) or T (for terminal statistics).

   You can specify selection criteria for the programs/terminal and/or libraries to be viewed:
   In the **Name of LTERM or Program** field and/or the **Name of Library** field, enter the name of the required item or specify a range of names by using asterisk (*) and/or a wildcard (?). If you leave the fields empty or only enter an asterisk (*), all programs/terminals and libraries are selected.

   Examples of Name Ranges:

   *CD selects ABCD, ACD.
   AB* selects AB, AB1, ABC, ABEZ.
   ABC? selects ABCA, ABCZ.
   A?C*Z selects ABCZ, AXCBBBZ and ANCZ.

2. When you have finished specifying selection criteria and press ENTER, a statistics overview screen similar to the example below appears:

```
 13:44:35                   ***** NATURAL SYSTP UTILITY *****              2008-08-29
 User SAG              - Natural Monitor Program Statistics -        TID TCK8

 C Program Library      NAT- ADA- Ext- Mean- Screen I/O  User   Sys  Fetch
   *       *            time time time  time   No   KB   Acc    Acc
 -----------------------------------------------------------------------------
 _ MONMNU1M SYSTP          0    0    0   0.0    18    9     6     0     19
 _ SYSMAP0M SYSTP          0    0    0   0.0     0    0     0     0     52
 _ S2SCOM01 SYSTP          0    0    0   0.0     0    0     0     0     36
 * MONMNU1P SYSTP          0    0    0   0.0     1    0    28     0      6
 _ MONLST1P SYSTP          0    0    0   0.0     3    0    21     0     12
 _ SYSMAP1M SYSTP          0    0    0   0.0    19   13     2     0     20
 _ NAT00059 SYSTP          0    0    0   0.0     0    0     0     0    346
 _ STPMNU1P SYSTP          0    0    0   0.0     4    0    30     4      8
 _ NAT42004 SYSTP          0    0    0   0.0     0    0     0     0      9
 _ STPMMM1M SYSTP          0    0    0   0.0     7    5     4     0      9
 _ SYSTPRET SYSTP          0    0    0   0.0     0    0    13     0      4
 _ NAT00030 SYSTP          0    0    0   0.0     0    0     0     0      4
 _ NSCC0002 SYSTP          0    0    0   0.0     0    0    14     0      7
 _ LOGON    SYSTP          0    0    0   0.0     0    0     0     0      1
   Top of List                                                     1 of 3
 Command ===>
 Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
 Cont  Help  Menu  Exit  Sel         --    -     +    ++    Term        Canc
```

This screen lists all programs/terminals and libraries that have been active in your current Natural session.

PF4 invokes a **Selection** window that can be used to specify selection criteria (see Step 1) to reduce the list of items displayed on the screen.

You can use PF10 to toggle between the program statistics and terminal statistics screen.

The columns contained on a statistics overview screen and the corresponding field names on a detailed statistics screen (see column **C** below) are explained in the following table:

Column	Corresponding Field	Explanation
C	-	Only applies to the statistics overview screen. This input field can be used to invoke a detailed statistics screen for a selected program/terminal: Next to the list item about which you require more detailed statistics information, enter any character and press ENTER. **Note:** If the statistics overview of active programs/terminals is displayed repeatedly, an asterisk (*) appears in the **C** column next to the program/terminal most active since the last repetition.
Program	**Name of program**	Only applies to program statistics. Name of the active program.

Column	Corresponding Field	Explanation
Terminal	**Name of terminal**	Only applies to terminal statistics. Name (ID) of the active terminal.
Current Program	**Current program / library**	Only applies to terminal statistics. Name of the executed program and the name of the library that contains this program.
Library	**Name of library**	Only applies to program statistics. Name of the library that contains the program that is executed.
NAT-time	**Time in Natural**	Time in the 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 the detailed statistics screen for a terminal. Percentage of evaluation time longer than 3 seconds.
-	**Evaluation time > 6 sec**	Only applies to the detailed statistics screen for a terminal. Percentage of evaluation time 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.

Natural Print/Work Files (SYSFILE)

This function provides information about available work files and print files.

You can also invoke this function with the system command SYSFILE described in the *System Commands* documentation.

This function can also be used in batch mode for CICS sessions.

When you invoke this function, the **Work File Information** screen appears with a list of all work and print files defined. The following information is provided for each file:

Column	Explanation
No.	Number of the work/print file.
Type	Type of assignment; that is, the operating system, TP monitor or Natural product file to which the work/print file is assigned.
Name	Name of the work/print file.
Recfm	Record format of the work/print file.
Lrecl	Logical record length of the work/print file (if applicable).
Blksz	Block size of the work/print file.

Status	One of the following statuses:
	
	`Available for Input/Output`
	
	or
	
	`Open for Input/Output`

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

Commands for Natural Print/Work Files

In addition to the commands described in *Using SYSTP Utility Screens*, the **Work File Information** screen provides the following PF keys and line command:

PF Key	Line Command	Function
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 (for internal use by Software AG technical support).

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 further information about the operation of the Natural swap pool, see *Natural Swap Pool* in the *Operations* documentation.

When you invoke this function, the **Natural Swap Main Menu** appears, which provides the following functions:

- Administration

- Debugging Facilities

- Information

- Maintenance Services

- Status Information

Administration

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 **Maintenance Services** function).

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

For further information, see the online help about 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 information, see the online help about this function.

Update Reorg Control Data

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

For further information, see the online help about this function.

Debugging Facilities

This function is only available under UTM.

⚠   **Warning:**
Do not use this function without prior consultation of Software AG technical support.

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 about 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 information, see the online help about this function.

Information

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 (see MAXSIZE in the *Operations* documentation). 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 required.

The buffers displayed are the same as those displayed by the function **Buffer Usage Statistics (BUS)**.

Show Swap Pool Information

This function displays information about 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 about 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 about it.

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

Show Reorg Control Data

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

The swap pool reorganization table is displayed in the left half of the screen. The table contains cumulative statistics about 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 that 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 about this function.

Show Swap Pool Usage

This function displays information about 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 about this function.

Create Statistics List

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

- Under UTM, the swap pool statistics are written to SYSLIST.

- Under CICS, the swap pool statistics are written to the CICS destination specified with the MSGDEST parameter of the NCMPRM macro described in the *TP Monitor Interfaces* documentation.

Maintenance Services

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 about 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 Maintenance** 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 about the usage of Natural buffers: which buffers are allocated for the current Natural 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 on the **Buffer Usage Statistics** screen:

Column	Explanation
No.	Buffers are numbered sequentially in order of allocation.
Name	Name of the buffer. Only those buffers which have actually been requested in the current session are listed.
Type	Type of the buffer: *blank* Fixed/static Natural buffer. V Variable buffer allocated in the Natural thread. O Variable buffer currently allocated outside the Natural thread. The buffer is copied and compressed into the thread at the next terminal I/O. P Physical buffer allocated in a Natural work pool (see also the WPSIZE profile parameter described in the *Parameter Reference* documentation). The buffer is released at the next terminal I/O.
Size	Size of the buffer (in bytes).
Used	Number of bytes currently being used. This value is used for buffer compression in environments using threads (for example, CICS or UTM).
Perc. (**Used**)	Percentage currently being used; that is, the value of the **Used** column in relation to the value of the **Size** column.
MaxUsed	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**)	Percentage of current session usage; that is, the value of the **MaxUsed** column in relation to the value of the **Size** column.
MaxSize	Maximum size (in bytes) that has been allocated to the buffer in the course of the current session so far (applies to variable buffers only).
Perc. (**MaxSize**)	Maximum size allocated so far (value of the **MaxSize** column) in relation to the current size (value of the **Size** column; applies to variable buffers only). A percentage of 10000 or more is indicated by 9999.9 displayed intensified.
At the end of the list, the following information is displayed:	
ThrdSize	Current size (in KB) of the Natural thread.

Column	Explanation
Total	Sums of all buffer sizes (in both bytes and KB) and percentages used/allocated. These totals can also be displayed with PF10 (see below). For **MaxSize**, the total shows the maximum additional amount of thread size that would have been needed in the course of the session so far.

Commands for Buffer Usage Statistics

In addition to the commands described in *Using SYSTP Utility Screens*, the **Buffer Usage Statistics** screen provides the following PF keys and line command:

PF Key	Line Command	Function
PF4	D	Displays the contents of the buffer marked with the cursor/command in dump format (for internal use by Software AG technical support).
-	S	Displays details of the selected buffer in a tabular overview, for example **Thread Offset** , **Address** or **Buffer Size**.
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).
PF12	-	Displays the buffer compression optimization degree for all buffers in a separate column **CmprOpt**. **Note:** By pressing PF12 twice the table is reverted to the original state.

Natural Sub-Systems and Roll Server Information

This function displays a list of the Natural subsystems available in your environment and the current status (active or inactive) of authorized service managers and roll servers associated with the subsystems.

In addition to the commands described in *Using SYSTP Utility Screens*, the **Natural Sub-Systems** screen provides the following line commands:

Line Command	Function	Operating System
B	Displays information about the buffer pool and buffer pool cache (if available) such as name, type and size.	z/OS and z/VSE
D	Displays server directory entries from the Session Information Pool (SIP) in dump format (for internal use by Software AG technical support). For information about SIP, refer to *Authorized Services Manager under z/OS* in the *Operations* documentation.	z/OS
L	Displays and resets entries in the roll server file directory.	z/OS
R	Displays roll server statistics, such as the number of roll server slots and roll server files, roll-out and roll-in activities, as well as roll file I/O. This information can help tune the roll server as described in *Roll Server Performance Tuning* in the *Operations* documentation. For example, you can use the statistics data to determine an optimum thread size or roll file size for a Natural application.	z/OS
S	Displays a list of Zaps applied to the Authorized Services Manager.	z/OS
U	Displays server directory entries from the Session Information Pool (SIP). For information about SIP, refer to *Authorized Services Manager under z/OS* in the *Operations* documentation.	z/OS
Z	Displays a list of Zaps applied to the roll server.	z/OS

Natural Thread Usage Statistics

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

▶ To execute the Natural Thread Usage Statistics function

1. Define an oversized thread in the range of 512 to 1024 KB for your Natural application. Take into account the number of Natural add-on products used.

2. Start your Natural application, either in production or in test mode.

3. Invoke the SYSTP utility and choose the **Natural Thread Usage Statistics** function by entering T in the **Code** field of the SYSTP **Main Menu**.

    The **Thread Usage Statistics** screen appears.

    The columns contained on this screen are described in the following table.

4. Enter A in the **Code** field to activate the function.

    A message appears indicating that the **Thread Usage Statistics** function has been activated.

5. Use your Natural application under typical production conditions.

    The **Thread Usage Statistics** function runs in the background and logs the buffer sizes used.

6. When you want to view the statistics, again, invoke the **Thread Usage Statistics** screen and enter one of the following in the **Code** field:

    S

    to show the statistics, or

    P

    to print the statistics, or

    G

    to show GETMAIN statistics (see *Show Physical GETMAIN Statistics*), or

    D

    to print the statistics and deactivate the function.

    We recommend that use function code D after function completion to free buffer pool space.

The following information is displayed on the **Thread Usage Statistics** screen:

Column	Explanation
No.	Buffers are numbered sequentially in order of allocation.
Ext. Buffer	Sizes of these buffers are defined externally (in the `NATPARM` parameter module).
Defined Size	Buffer size as defined in the `NATPARM` parameter module.
Max. Allocated Size	Maximum buffer size allocated. Note that for the internal BB area, 14368 bytes are added to the value of the `ESIZE` profile parameter (see the *Parameter Reference* documentation).
Max. Used Size	Maximum buffer size used.
Sum of external buffer sizes	Total of all buffer sizes defined in the `NATPARM` parameter module.
Sum of internal buffer sizes	Total of all buffer sizes requested by Natural internally.
Sum of physical GETMAINs	Total of all physical `GETMAIN`s for the Natural work pools and the variable Natural buffers outside the Natural user threads.
Max. used thread length	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. compressed thread length	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 about all physical `GETMAIN`s relevant for the Natural work pools and the variable Natural buffers outside the Natural user threads. They indicate the original buffer sizes (**Org. Size**) during the startup of a Natural session, the number of physical `GETMAIN`s, (**No.**) the buffer length for the physical `GETMAIN` (**Bytes**) and the buffer position (**P**), 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 can be overwritten through the wrap-around procedure. The highest number equals the maximum number of the physical `GETMAIN`s 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 `GETMAIN`s 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

freed before each of the following physical `GETMAIN`s. That is, the sum of all physical `GETMAIN`s 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.

Natural License Information

This function invokes a screen that displays the contents of the license key file in XML format.