

# 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. If no monitor buffer pool has been created, additionally, you must set the MONSIZE parameter. For a description of these parameters, refer to the relevant sections in 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:

| <b>Column</b> | <b>Statistics</b>              | <b>Explanation</b>   |
|---------------|--------------------------------|--|
| 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.<br>Percentage of evaluation times longer than 3 seconds. |
|               | Evaluation time > 6 sec        | Only applies to statistics for a single terminal.<br>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 (\*) appears in the **Cm** column next 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 System Command Reference 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.                 | 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:<br><br>available for input and/or output,<br><br>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.                      |
|      | /       |  |
| PF6  |         | Scrolls to the beginning of the list.  |
| PF9  |         | Scrolls to the end of the list.  |
| PF7  |         | Scrolls one page backward.   |
| PF8  |         | Scrolls one page 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 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 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 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 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 on the Buffer Usage Statistics screen:

| Column   | Explanation   |
|--|---|
| 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.  |
| Type   | <b>V</b> 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.<br>(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 ( <b>not</b> the size being used at present).  |
| Perc.<br>(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) that has been allocated to the buffer in the course of the current session so far (applies to variable buffers only).   |
| Perc.<br>(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 <b>999.9</b> displayed intensified.   |
| <b>At the end of the list, the following information is displayed:</b> |   |
| 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).<br><br>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.  |

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).                           |

## 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. The Thread 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 following information is displayed on the Natural Thread Usage Statistics screen:

| <b>Column</b>                 | <b>Explanation</b>  |
|-------------------------------|---|
| No.                           | The buffers are numbered sequentially in order of allocation.   |
| 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.<br>Note that for the internal BB area, 14368 bytes 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.<br><br>Round it up to the next KB number that can be divided by 2. |
| Max. compressed thread length | The maximum length of a compressed Natural thread that was written to the Natural roll file.<br><br>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 freed 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.