SOS/3000 Performance Advisor Release Notes

Version G.03l Release

This set of release notes contains a brief history of the product, followed by important information about new features.

Product History

The SOS/3000 Performance Advisor product history lists all significant modifications and enhancements made to the product since the last major release. The product changes are grouped according to version number and ordered by Service Request number.

Version G.03l

Based on version G.03k with the following modifications.

Service Request #		Description
3742	Fix	The default process log limit was changed to 20 from 10 in all programs and job streams.
3801	Enhancement	Suppressed response time numbers for job and system processes.
3802	Fix	The Performance Gallery collection job, PERFCOLJ, was not collecting process data.

Version G.03k

Based on version G.03j with the following modifications.

Service Request #		Description
3796	Fix	The job, PERFCOLJ, was logging onto the PUB group rather than LOGFILES.

Version G.03j

Based on version G.03i with the following modifications.

Service Request #		Description
3794	Enhancement	Added new information to the online help files.

Version G.03i

Based on version G.03h with the following modifications.

Service Request #		Description
3775	Fix	Some large process data numbers could appear as negative numbers in a Performance Gallery Gold extract. The new version of SOSLOGX can be used to produce correct extracts.
3793	Fix	ScopeUtil could abort when the Scope extract headers were misaligned. This can occur when there are many fields.

Version G.03h

Based on version G.03g with the following modifications.

Service Request #		Description
3715	Fix	User keys could revert to the values they had prior to running SOS. This was caused by termination of the child arming process.

Version G.03g

Based on version G.03f with the following modifications.

Service Request #		Description
3710	Enhancement	The handler's mechanism was simplified and enhanced to provide more accurate data faster. The timing procedures were placed at the very end of the invocation handlers and at the beginning of the termination handlers.
3712	Enhancement	The Exit option is now listed with all other options for both ISPEUTIL and ISUTIL.
3713	Enhancement	In order to reduce the performance impact on the system, ISPEUTIL has been enhanced to (as an option) introduce pauses while arming and disarming. Also, it now displays a "Please be patient" message while doing these operations.
3714	Fix	In some cases a normal user (not OP or SM) could lose the ability to view ImageStats data.

Version G.03f

Based on version G.03e with the following modifications.

Service Request #		Description
3702	Fix	The operator message issued in case of a process abort was not displayed correctly.
3703	Enhancement	Added a new handler mode to prevent SOS from running when handler arming fails.
3706	Enhancement	Added a more comprehensive SOS error message for cases in which arming fails.
3708	Fix	Dataset performance data was not always computed correctly.

Version G.03e

Based on version G.03d with the following modifications.

Service Request #		Description
3657	Fix	Processes could have a negative CM CPU value for an interval. The problem is in the data provided by MPE though its measurement interface. SOS will now zero-out the negative values. There may still be negative values in old SL files, which could show up in some cases as large positive numbers.
3661	Fix	The screen menu in SOS is better organized with more logical screen names. Report names in SOSLOGX have been made more consistent with SOS screen names, and the function keys have been made more consistent with these names.

Version G.03d

Based on version G.03c with the following modifications.

Service Request #		Description
3657	Fix	Processes could have a negative CM CPU value for an interval. The problem is in the data provided by MPE though its measurement interface. SOS will now zero-out the negative values. There may still be negative values in old SL files, which could show up in some cases as large positive numbers.
3661	Fix	The screen menu in SOS is better organized with more logical screen names. Report names in SOSLOGX have been made more consistent with SOS screen names, and the function keys have been made more consistent with these names.

Version G.03c

Based on version G.03b with the following modifications.

Service Request #		Description
3627	Fix	Databases with names longer than 17 characters were sometimes displayed with garbage characters.
3648	Fix	ImageStats was not passing through the condition codes returned by the TurboImage intrinsics.
3649	Fix	The "local file access error- 33" message was sometimes generated in file listing of the Process Detail screen if the process closed a file just prior SOS's attempt to get information about it. Now, the error is ignored.
3650	Fix	Process aborts sometimes occurred when ImageStats was run concurrently from different accounts.
3651	Fix	The "CPU" and "Pre" wait states were missing on the Process Detail screen.

Version G.03b

Based on version G.03a with the following modifications.

Service Request #		Description
3637	Fix	Corrected bad CPU numbers and bad CPU queue length displayed on SOS Global Summary (main) screen. The problem had occurred only on a few systems on which MPE provides bad data.
3639	Fix	SOSLOGX will now properly interpret unsigned16-bit numbers from the SL file. Due to this correction, SOSLOGX and Performance Gallery Gold will no longer display negative numbers.
3641	Fix	Previously, under unusual circumstances, ImageStats data capture would not start. This problem has been corrected.

Version G.03a

Based on version G.02a with the following modifications.

Service Request #		Description
3642	Fix	New licenses sometimes would not properly merge with old licenses during installation. This has been corrected.

Version G.02a

Based on version G.01a with the following modifications.

Service Request #		Description
3626	Fix	ImageStats sometimes would not run from an account other than LPS. This has been corrected.
3640	Fix	Database names are now always qualified with the correct group and account names in the ImageStats screens.

Version G.01a

Based on version F.05d with the following modifications.

Service Request #		Description
3617	Enhancement	SOS now displays three new screens of TurboIMAGE statistics: • TurboIMAGE Database Main screen • TurboIMAGE Database Detail screen • TurboIMAGE Process Detail screen
3619	Fix	ScopeUtil will now restore function keys to the values they had at program entry.
3620	Fix	New licenses will now be properly merged to the existing license file during an installation.

SOS/3000 ImageStats Enhancement

Introduction

This section of the release notes describes the ImageStats enhancement to the SOS/3000 Performance Advisor product. The enhancement adds summarized TurboIMAGE performance information to the SOS Global screen, and detailed TurboIMAGE performance information to three new screens. The statistics show various timings and counts regarding data access for one or more databases/datasets and for one or more processes.

This section is divided into three major subsections: this introduction, a Quick Start Guide, and a Quick Reference Guide. We recommend reading the Introduction and Quick Start Guide before installing and operating the product.

Intended Audience

This document is intended for use by:

- Lund Performance Solutions managers, developers, testers, and support personnel
- Beta testers and purchasers

Suggested Reading

TurboIMAGE/XL Database Management System Reference Manual, HP Part No. 30391-90001. Printed in U.S.A. Edition Sixth E0897.

Terminology

Term	Description
DBI	Database Intrinsic(s) one or all of TurboIMAGE Intrinsics: DBOPEN, DBCLOSE, DBPUT, DBGET, DBBEGIN, DBEND, DBXBEGIN, DBXEND, DBXUNDO, DBUPDATE, etc.
TIDB	TurboIMAGE Database

Term	Description
TIDS	TurboIMAGE Dataset
current interval	In this document the term “current interval” refers to the time interval that is currently being displayed.

Conventions

The number outside the “[ ]” brackets is the value for the current interval and the value inside the brackets is the average or accumulated value since the collection was started.

Theory of Operation

This section provides a brief description of how the ImageStats feature is able to collect and display TurboIMAGE performance information.

Collecting Data

Any application that makes use of TurboIMAGE does so by calling TurboIMAGE intrinsics. SOS/3000 with ImageStats will, as an option, intercept all such calls for the purpose of taking statistics and reporting them. It does this by using a feature of MPE/iX called Procedure Exits. This feature enables SOS/3000 to execute functions, called handlers, both before and after the execution of each TurboIMAGE intrinsic. In this way the handlers can count the intrinsic calls, keep track of their success or failure, and measure the elapsed time and CPU time consumed.

The information obtained about intrinsic activity is stored by the handlers in an MPE file named ICOLL.PUB.LPS. This file is read and written using mapped file access, so it is very fast.

When SOS/3000 starts up with ImageStats enabled, it makes sure that the ICOLL.PUB.LPS file exists, and that the handlers are "armed" (enabled to be called when the intrinsics are called).

All of the handlers for all of the TurboIMAGE handlers must share access to the ICOLL.PUB.LPS file. A handler locks the file while it is being accessed. If another file tries to lock the file at the same time, it will be unable to do so, and it will not wait. In such a case, data will be lost. The percentage of intrinsic calls for which data was collected is displayed on the TurboImage Database Main screen as the data item **ISCol%**.

There is a mode wherein 100% of the data will be collected. However, this mode carries a somewhat greater risk to your system if there are program errors. Please contact Lund Performance Solutions for more information regarding this collection mode.

Displaying Data

In order to display data, SOS/3000 accesses the data collected by the handlers in ICOLL.PUB.LPS. It performs various computations on the data and then displays it on the ImageStats screens.

Stopping Data Collection

The handlers can tell whether the data they are collecting is being used; that is, they can tell whether there is any instance of SOS/3000 running that is using the data in ICOLL.PUB.LPS. If the data is not being used, they will quit collecting it. There will still be handler code that executes when an intrinsic is called, but it will do almost nothing. The handlers can be disabled altogether by running the program TIPEUTIL.PUB.LPS.

Quick Start Guide

This quick start guide is intended to provide a user with the information needed to get started viewing and interpreting the new ImageStats data as quickly as possible.

Warning! This is a beta release product. There are certain dangers in running any software, but especially a beta product such as this one that makes use of privileged mode and procedure exits. There is the danger of system abort, application abort and data corruption. We at Lund Performance Solutions have worked hard to minimize the possibility of such occurrences, but we strongly recommend and request that you test this product in an environment where problems will not cause serious damage.

Installation

The software is installed in the same way as prior versions of SOS/3000. If you are not familiar with that process, please follow the set of installation instructions sent with the software.

New ImageStats Collector Files

There are three new files included with this release:

- **ISPExxxx**

  The "xxxx" in the name stands for the Current SOS/3000 version. Thus, in this version (G.03g) the name of the handler file is ISPEG03G.

- **ISPEUTIL.PUB.LPS**

  This is a utility program for performing various procedure exits functions for ImageStats. Typically, there is no need to use it, though there might be occasion to disarm the ImageStats handlers.

New ImageStats Display Options

There are two new options in the SOS Main Options menu that control ImageStats collection. See Figure 1 for a list of the new options.

```
SOS/3000 MAIN OPTION MENU

   1) Screen refresh interval in seconds (60)
   2) Display Key Indicators of Performance (Y)
   3) Display advice messages (Y)
   4) Display informational advice messages (Y)
   5) Display option (2-Tabular)
   6) Display memory information on global screen (Y)
   7) Display disc information on global screen (Y)
   8) Collect process/workload information (Y)
   9) Display process information (Y)
  10) Display workload information (N)
  --- Display only active workloads
  --- CPU percentage required for workload display
  13) Terminal memory lock for process display (Y)
  14) Company name ()
  15) Detail display options (SUBMENU)
  16) Make Turbo Image performance data available (Y)
  17) Make Turbo Image detailed performance data available (Y)

Which Option: _
```

Option 16 -->
Option 17 -->

Figure 1 *SOS/3000 Main Option Menu*

Option 16 enables or disables the display of the ImageStats information. Option 17 enables or disables the collection of process activity on a per-dataset basis. Since there may be a lot of processes and datasets on the system, the memory space used by this option could be quite large and begin to affect the system's performance.

If any version of SOS/3000 is running with option 17 enabled, the statistics will be collected.

Only a user with SM or OP capabilities can change options 16 and 17. This is because of the unknown, but significant overhead associated with collecting data using procedure exits.

New ImageStats Data in the Global Screen

When ImageStats data is being collected, there will be new information on the Global screen. In both graphic mode and tabular mode there is information about the amount of CPU being consumed by TurboIMAGE intrinsics, and a count of the number of intrinsics being executed per second.

In graphic mode, look for the new line of bar graph information. There are two new bars. The one labeled "TI CPU" reports the percentage of machine CPU devoted to executing TurboIMAGE intrinsics. The one to the right of it labeled "I/10" gives a count of the number of TurboIMAGE intrinsics per second, divided by 10, being executed.

In tabular mode, the number labeled "TI CPU%" mode reports the percentage of machine CPU devoted to executing TurboIMAGE intrinsics. The number labeled "TI Intrinsic" is a count of the number of TurboIMAGE intrinsics per second being executed. For more information about the Global screen, see “SOS Global Screen” on page 8.

New ImageStats Screens

The new ImageStats screens and their command letters are described in the next table.

Screen Name	Screen Letter	Description
TurboIMAGE Database Main Screen	I	Summarizes activity of all processes against all databases. Lists activity by database of all processes.
TurboIMAGE Database Detail Screen	B	Summarizes activity of all processes against a single database. Lists activity by process against that database.
TurboIMAGE Process Detail Screen	N	Summarizes activity of a single process against all databases. Lists activity by database and dataset of that process.

To access any of the three ImageStats screens:

1. From the Global screen type **S** or **J**, then type:
   - **I** to display the TurboIMAGE Database Main screen
   - **B** to display the TurboIMAGE Database Detail screen
   - **N** to display the TurboIMAGE Process Detail screen
2. To go to the TurboIMAGE Database Detail Screen, you will need to know the name or the TIDBID (TurboIMAGE database ID) of the database. These are the first two items of each line in the database list at the bottom of the TurboIMAGE Database Main Screen.
3. To go to the TurboIMAGE Process Detail Screen, you will need to know the PIN (process identification number) of the process. This is the first item of each line in the process list at the bottom of the TurboIMAGE Database Detail Screen.

Interpretation Hints

- Become accustomed to what your performance numbers look like normally. That will help you identify what is wrong in problem situations.
- If all response times are slow, do the usual performance analysis of CPU, disk i/o and memory usage. If there is a hog process that seems to be responsible, the new ImageStats information may help identify what that process is doing.
- If a particular application has poor response, use the ImageStats feature to view activity against the databases used in that application. Look for processes that are doing abnormally large amounts of activity against those databases.
- Look for large DBLOCK "Ela/I" times (elapsed time per intrinsic) against a database to identify locking problems.
- Look for large "Ela/I" times for intrinsics like DBPUT, DBDELETE, DBUPDATE to identify possible database structure or capacity problems.

Reference Guide

ImageStats Options

Two options have been added to the SOS/3000 Main Option Menu (Figure 1) to display the TurboIMAGE performance statistics

Option 16 must be set to Y (yes) in order for the ImageStats data to be collected and shown. Option 17 must be set to Y (yes) in order to see detailed performance data—data about process access to data sets. Be careful about enabling Option 17. It consumes memory and CPU in proportion to the number of process-dataset combinations—this could be a very large number.

Screen Changes

In order to make the new ImageStats feature available, some of the screens currently implemented by SOS have been changed and new ones added.

SOS Global Screen

Two new items have been added to the tabular version of the SOS Global screen (Figure 1.1):

- **TI CPU% xxxx[yyyy]**

  The CPU time used for all DBI calls performed on the system by all processes expressed as a percentage of the entire CPU time. xxxx is the TICPU% for the current interval and yyyy is the TI CPU% for the system, since the collection was started.

Note TurboImage calculates CPU Utilization as the percentage of the utilized CPU.

- **TI Intrinsic xxxxx[yyyyy]/s**

The average number of DBI calls performed on the system by all processes. xxxxx – is average the number of DBI calls processed per second in the current interval and yyyyy is the number of DBI calls performed per second since the collection was started. This replaces the “Average First Resp” item from the “Global Misc Statistics” frame.

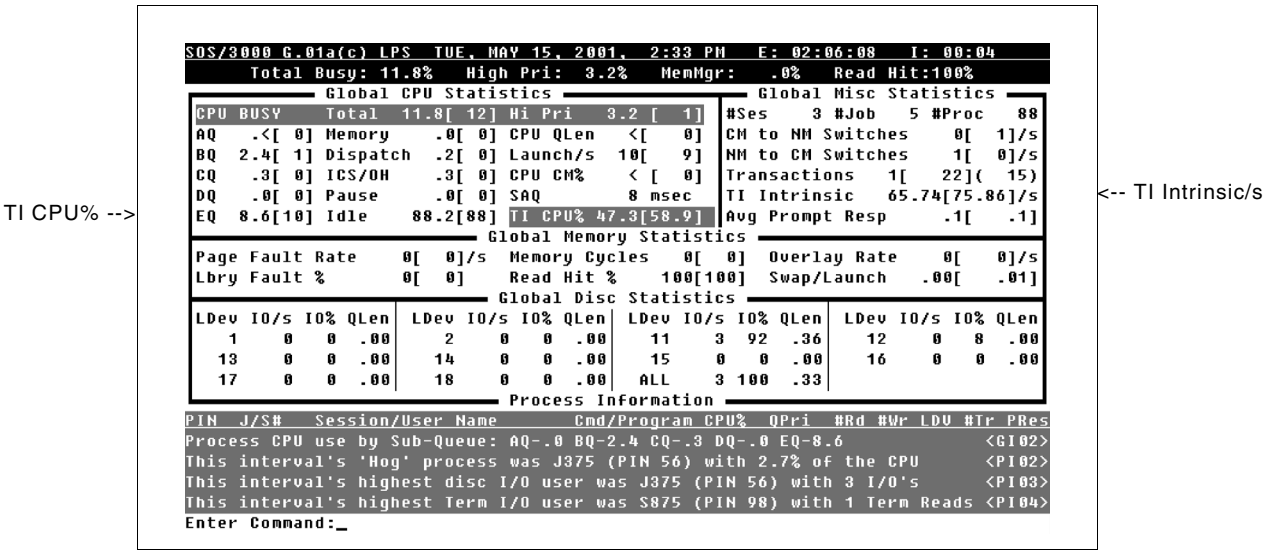

Figure 1.1 *SOS/3000 Global Screen (tabular display)*

When the “Display option”, from the “MAIN Option Menu”, is set to 1–Graphic, a line is to added to the SOS Global screen for TurboIMAGE performance data display.

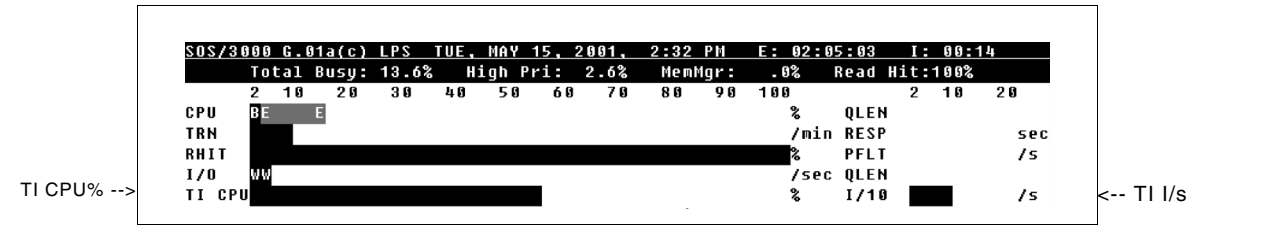

Figure 1.2 *SOS/3000 Global Screen (graphical display), CPU statistics*

TI CPU % is the percentage of total CPU time used to perform DBI calls, by all processes. TI I/s is the number of DBI calls (intrinsics) performed by all processes per second.

TurboIMAGE Database Main Screen

The new TurboIMAGE Database Main screen (Figure 1.3) will provide performance data for databases accessed by all process in the system. To access this screen, press **J** to receive a "Screen Code" prompt, or press **S** to access the Screen Selection Menu. Press **I** to access the Turbo Image Database Main screen.

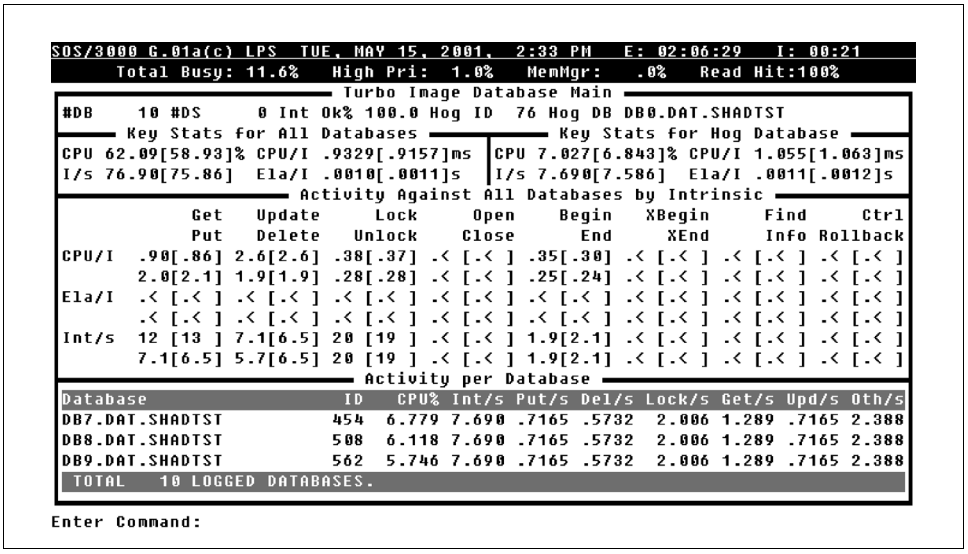

Figure 1.3 *SOS TurboIMAGE Database Main screen*

TurboIMAGE Database Main

The TurboIMAGE Database Main portion of the screen displays the following information.

Data Item	Description
#DB	The number of accessed (logged) databases since the collection was started.
#DS	The number of accessed (logged) datasets since the collection was started.
ISCol%	The percentage of intrinsic calls for which information was collected (see “Theory of Operation” on page 5).
Hog ID	The identification number of the database for which data access takes the greatest amount of resources.
Hog DB	The name of the database for which data access takes the greatest amount of resources.

Key Stats for All Databases

The Key Stats for All Databases portion of the screen displays the following information.

Data Item	Description
CPU%	The percentage of all utilized CPU time during the current interval used for DBI calls performed by all processes on any database.
CPU/I	The average CPU time during the current interval used per DBI call performed by all processes on any database (measured in milliseconds).
I/s	The average number of DBI calls per second performed by all processes on any database during the current interval.

Data Item	Description
Ela/I	The average completion time per DBI call performed by all processes on any database during the current interval.

Key Stats for Hog Database

The Key Stats for Hog Database portion of the TurboIMAGE Database Main screen displays the following information.

Data Item	Description
CPU%	The percentage of all utilized CPU time during the current interval used for DBI calls performed by all processes on the hog database.
CPU/I	The average CPU time during the current interval used per DBI call performed by all processes on the hog database (measured in milliseconds).
I/s	The average number of DBI calls per second performed by all processes on the hog database during the current interval.
Ela/I	The average completion time per DBI call performed by the any processes on the hog database during the current interval.

Activity Against All Databases by Intrinsic

The Activity Against All Databases by Intrinsic portion of the screen displays the following information.

Data Item	Item for which Data is Displayed
Get	DBGET intrinsic calls
Put	DBPUT intrinsic calls
Update	DBUPDATE intrinsic calls
Delete	DBDELETE intrinsic calls
Lock	DBLOCK intrinsic calls
Unlock	DBUNLOCK intrinsic calls
Open	DBOPEN intrinsic calls
Close	DBCLOSE intrinsic calls
Begin	DBBEGIN intrinsic calls
End	DBEND intrinsic calls
XBegin	DBXBEGIN intrinsic calls
XEnd	DBXEND intrinsic calls
Find	DBFIND intrinsic calls
Info	DBINFO intrinsic calls
Ctrl	DBCONTROL intrinsic calls
Rollback	DBXUNDO intrinsic calls

The counters and times for each of these data items are:

- **CPU/I** - The average CPU time during the current interval used per DBI call performed by all processes on the hog database (measured in milliseconds).
- **Ela/I** - The average completion time per DBI call performed by the any processes on the hog database during the current interval.
- **Int/s** - The average number of calls per second, calculated for DBI calls performed by all processes on any database—a separate count for each item.

Activity per Database

The Activity per Database portion of the TurboIMAGE Database Main screen contains performance data for all databases accessed by all processes. The databases are indexed by their name, however, the user will have to use TIDBID to refer to them.

Data Item	Description
Database	The database name.
ID	The database ID is the number uniquely assigned by SOS to the database. The user will have the option to use this ID instead of the database name in order to get to the database's detail screen.
CPU%	The percentage of all CPU time during the current interval used for DBI calls performed by all processes on the hog database.
Int/s	The average number of calls per second, calculated for DBI calls performed by all processes on any database—a separate count for each item.
Put/s	The average number of DBPUT intrinsic calls per second.
Del/s	The average number of DBDELETE intrinsic calls per second.
Lock/s	The average number of DBLOCK intrinsic calls per second.
Get/s	The average number of DBGET intrinsic calls per second.
Upd/s	The average number of DBUPDATE intrinsic calls per second.
Oth/s	The average number of other DBI calls.

TurboIMAGE Database Detail Screen

The TurboIMAGE Database Detail screen (Figure 1.4) will provide performance data for a specific database; times and counts for all calls issued by all processes against the database. Because of the structure of a database, this screen will also provide global performance data for all the datasets contained by the database.

This screen is available from within the SOS main screen and any other "SOS – TurboIMAGE" screen via shortcut key. From all other SOS screens the user can access this one via existing SOS Screen Selection menu.

The user is prompted for the TIDBID of the database in order to access this screen. Since the user might not know the TIDBID assigned by SOS to a database, this may most probably happen if the user accesses the screen from within any other screen then Database Global Screen, the option to enter the TIDBID to be 0 (zero) is available. If the TIDBID is set to be 0, then the user is prompted for the fully qualified database name in order to access the database detail screen.

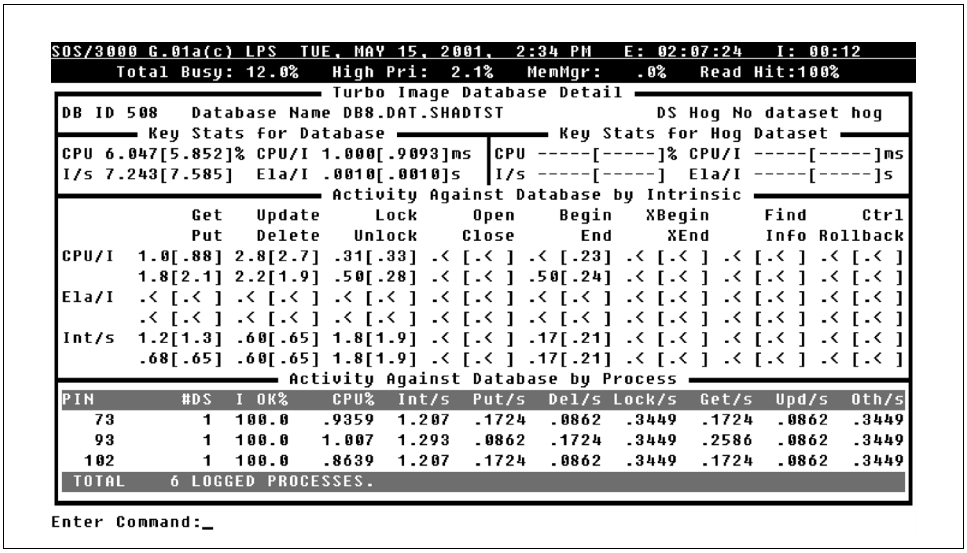

Figure 1.4 *SOS/3000 TurboIMAGE Database Detail screen*

TurboIMAGE Database Detail

The TurboIMAGE Database Detail portion of the screen displays the data items listed in the next table.

Data Item	Description
DBID	The database ID is the number uniquely assigned by SOS to the database.
Database Name	The name of the database for which the detailed information is displayed.
DS Hog	The database's dataset for which the data access takes the greatest amount of resources.

Key Stats for Database

The Key Stats for Database portion of the screen displays the data items listed in the next table.

Data Item	Description
CPU%	The percentage of all CPU time during the current interval used for DBI calls performed by all processes on the database.
CPU/I	The average CPU time during the current interval used per DBI call performed by all processes on the database (measured in milliseconds).
I/s	The average number of DBI calls per second performed by all processes on the database during the current interval.
Ela/I	The average completion time per DBI call performed by the any processes on the database during the current interval.

Key Stats for Hog Dataset

The Key Stats for Hog Dataset portion of the screen displays the data items listed in the next table.

Data Item	Description
CPU%	The percentage of all CPU time during the current interval used for DBI calls performed by all processes on the hog dataset.

Data Item	Description
CPU/I	The average CPU time during the current interval used per DBI call performed by all processes on the hog dataset (measured in milliseconds).
I/s	The average number of DBI calls per second performed by all processes on the hog dataset during the current interval.
Ela/I	The average completion time per DBI call performed by the any processes on the hog dataset during the current interval.

NOTE If dataset performance data collection is turned off, the values for the items in this screen are replaced by dashed lines (---).

Activity Against Database by Intrinsic

The Activity Against Database by Intrinsic portion of the TurboIMAGE Database Detail screen contains performance data for DBI calls performed by all processes on the database. Refer to “Activity Against All Databases by Intrinsic” on page 11 for information about this section.

Activity Against Database by Process

The Activity Against Database by Process portion of the screen contains performance data for all processes accessing the database for which the performance data is displayed. The entries in the list (processes) are indexed by their PIN.

Data Item	Description
PIN	The process identification number.
#DS	The number of accessed (logged) datasets since the collection was started.
Int OK%	The percentage of all DBI calls performed successfully by any process on any database. A successful call is defined in this context as an intrinsic call that returned 0 in the status parameter of the call.
CPU%	The percentage of all CPU time during the current interval used by the process for DBI calls.
Int/s	The average number of calls per second performed by the process on the database.
Put/s	The average number of DBPUT intrinsic calls performed by the process on the database per second.
Del/s	The average number of DBDELETE intrinsic calls per second.
Lock/s	The average number of DBLOCK intrinsic calls per second.
Get/s	The average number of DBGET intrinsic calls per second.
Upd/s	The average number of DBUPDATE intrinsic calls per second.
Oth/s	The average number of other DBI calls.

TurboIMAGE Process Detail Screen

The current process detail screen is also very crowded, meaning that there are no unused lines that could be used to display database access data without scrolling. The performance data for database access needs quite some amount of display space, so a new process detail screen is created for TurboIMAGE performance data per process.

The TurboIMAGE process detail screen will contain global information – regarding all databases and datasets accessed by the process and detailed information – regarding access of the process for a specific dataset and database.

In order to access this screen the user will have to press a shortcut key and to enter the PIN for the process that he needs to see data for. This screen is available through the shortcut key from within the SOS main screen or any “SOS – TurboIMAGE” screens and through the screen selection menu to the rest of SOS screens. The shortcut key is “N”.

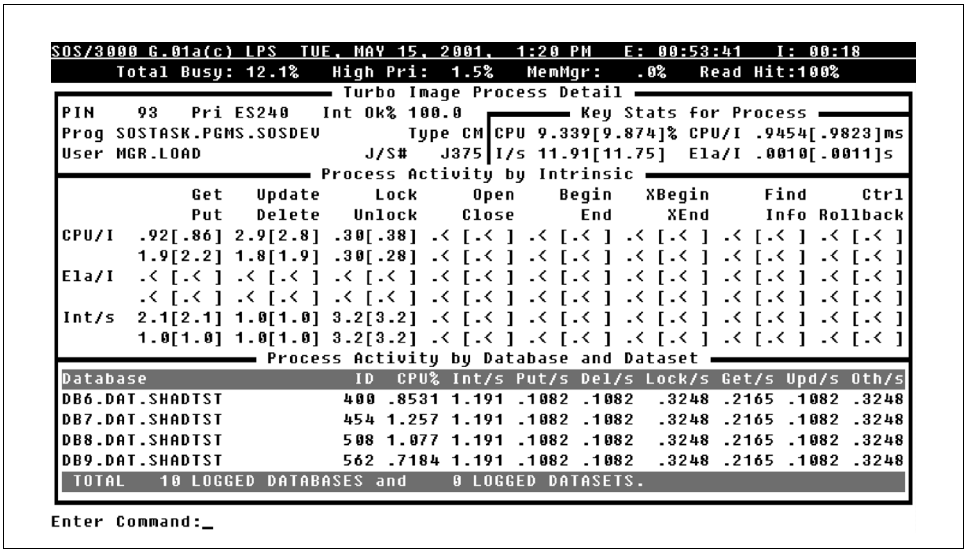

Figure 1.5 *SOS/3000 TurboIMAGE Process Detail Screen*

TurboIMAGE Process Detail

The TurboIMAGE Process Detail portion of the screen contains data currently available in the current Process detail screen (like PIN, SESS, PRI, TYPE, PROG, and USER).

The one TurboIMAGE item displayed here is Int OK%, which is the number of successfully performed intrinsic calls issued by the process. A successful call is defined in this context as an intrinsic call that returned 0 in the status parameter of the call. The item is percentage of all intrinsic calls issued by the process on any database or dataset.

Key Stats for Process

The Key Stats for Process portion of the screen contains the information listed in the next table.

Data Item	Description
TICPU%	The percentage of all CPU time during the current interval used by the process for DBI calls.
CPU/I	The average CPU time used per DBI call in the current interval, measured in milliseconds.
I/s	The average number of DBI calls per second performed by the process in the current interval.
Ela/I	The average completion time per DBI call performed by the process in the current interval.

Process Activity by Intrinsic

The Process Activity by Intrinsic portion of the screen displays the following information.

Data Item	Item for which Data is Displayed
Get	DBGET intrinsic calls
Put	DBPUT intrinsic calls
Update	DBUPDATE intrinsic calls

Data Item	Item for which Data is Displayed
Delete	DBDELETE intrinsic calls
Lock	DBLOCK intrinsic calls
Unlock	DBUNLOCK intrinsic calls
Open	DBOPEN intrinsic calls
Close	DBCLOSE intrinsic calls
Begin	DBBEGIN intrinsic calls
End	DBEND intrinsic calls
XBegin	DBXBEGIN intrinsic calls
XEnd	DBXEND intrinsic calls
Find	DBFIND intrinsic calls
Info	DBINFO intrinsic calls
Ctrl	DBCONTROL intrinsic calls
Rollback	DBXUNDO intrinsic calls

The counters and times for each of these data items are:

- **CPU/I** - The average CPU time during the current interval used per DBI call performed by this process on all databases (measured in milliseconds).
- **Ela/I** - The average completion time per DBI call performed by this process on all databases during the current interval.
- **Int/s** - The average number of calls per second, calculated for DBI calls performed by this process on all databases—a separate count for each item.

Process Activity by Database and Dataset

The Process Activity by Database and Dataset frame contains performance data for databases and datasets accessed by the process. It is a list like the “Process information” one, from the current SOS main screen.

The look of the frame depends of the amount of collected TurboIMAGE data. Dataset performance data is collected at user’s request and it is an option in the SOS Option Screen. This measure was taken as a result of increased resource usage that occurs when collecting all TurboIMAGE data. The user is able to collect dataset performance data if necessary and he is able to prevent it from being collected if such data presents no interest for him and its collection is an unnecessary overload for the system.

So, according to the option to collect or not the dataset performance data there are two ways to display this frame.

The common features to both frame types are:

The databases are indexed by their names, making them easy to find. The TIDBID is not placed to the left of the database name because it is used to refer the database and not as an index item. Within every database display block the datasets are indexed by their name.

The database data is computed for the last collection time interval, presenting current data.

For each database there is a database display block that is made of lines containing data about the database and its datasets. The performance data displayed on each line is computed for the entire database or one of its datasets. The data displayed on the first line is per entire database and the following lines (contained by this database display block) contain data for each one of the database’s logged datasets. The items displayed are described in the next table.

Data Item	Description
Database	The database name.
ID	The database ID is the number uniquely assigned by SOS to the database. The user will have the option to use this ID instead of the database name in order to get to the database's detail screen.
CPU%	The percentage of all CPU time during the current interval used for DBI calls performed by all processes on the hog database.
Int/s	The average number of calls per second, calculated for DBI calls performed by all processes on any database—a separate count for each item.
Put/s	The average number of DBPUT intrinsic calls per second.
Del/s	The average number of DBDELETE intrinsic calls per second.
Lock/s	The average number of DBLOCK intrinsic calls per second.
Get/s	The average number of DBGET intrinsic calls per second.
Upd/s	The average number of DBUPDATE intrinsic calls per second.
Oth/s	The average number of other DBI calls.

The differences between the two frame types/looks:

- Frame look 1 – is the frame used for displaying performance data when the dataset data collection is turned off.

  The data presented on the dataset display lines contains counts and percentages computed per the entire time interval since collection was started – accumulated data.

  The header of the frames is displayed on two different lines (for databases and datasets, because of the way that accumulated data is presented in SOS – that is enclosed in brackets.

  The database lines are underlined.

- Frame look 2 – is the frame used for displaying performance data when the dataset data collection is turned on.

  The data presented on the dataset display lines contains counts and percentages computed per the last collection time interval – just like database performance data.