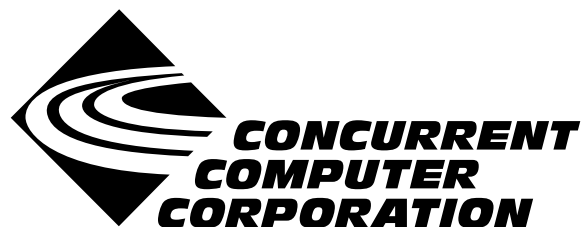


NightTrace

Version 5.2 Release Notes (PowerMAX)

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1.0. Introduction

NightTrace™ is used for debugging and analyzing multiprocess and multiprocess real-time applications and their interaction with the operating system.

The NightTrace toolset consists of an interactive debugging and performance analysis tool, trace data collection daemons, and an Application Programming Interface (API) allowing user applications to log data values:

NightTrace API	libraries and include files for use in user applications that log trace events to shared memory
ntrace	a graphical tool that controls daemon sessions and displays user and kernel trace events in trace event file(s)
ntraceud	a daemon program that copies user applications' trace events from shared memory to trace event files
ntracekd	a daemon program that copies operating system trace events from kernel memory to trace event files.

NightTrace is flexible. As a user, you control:

- selection of user tracing of your application and/or kernel tracing
- selection of timestamp source
- trace-point placement within your application
- the source language of the trace application
- the number of processes and CPUs you gather data on
- the amounts and types of information you display
- trace event searches and summaries

2.0. Documentation

Table 2-1 lists the NightTrace 5.2 documentation available from Concurrent.

Table 2-1. NightTrace Version 5.2 Documentation

Manual Name	Pub. Number
<i>NightTrace Manual</i>	0890398-100
<i>NightTrace Version 5.2 Release Notes (PowerMAX)</i>	0890398-5.2

Copies of the Concurrent documentation can be ordered by contacting the Concurrent Software Support Center. The toll-free number for calls within the continental United States is 1-800-245-6453. For calls outside the continental United States, the number is 1-954-283-1822 or 1-305-931-2408.

Additionally, the documentation listed above is available:

- online using the X Window System utility, **nhelp**
- on the Concurrent Computer Corporation web site at www.ccur.com

3.0. Prerequisites

Prerequisites for NightTrace Version 5.2 are as follows:

3.1. Software

- PowerMAX OS 4.3 Patch 9 (P9) or later

or

PowerMAX OS 5.1 Service Release 3 (SR3) or later

NOTE

The aforementioned prerequisites are suggested in order to fully utilize the new kernel daemon capabilities provided by NightTrace. Otherwise, the following capabilities are unavailable and may cause unexpected behavior:

- **Pause/Resume** operations for kernel daemons will be unavailable
- **Flush** operation for kernel daemons will be unavailable
- statistics listed under the **Buffer** and **Lost** columns in the Daemon Details Area of the NightTrace Session Manager will be unavailable
- NightTrace Daemon Server package (**nstar**) (see “Target Installation” on page 5)
- X Window System (X11 Version 6.3 or later)¹
- Élan License Manager™ 5.0.1 or later

3.2. Hardware

- Computer Systems:
 - Power Hawk™ 620 and 640
 - Power Hawk 710, 720 and 740
 - PowerStack™ II and III
 - Night Hawk® Series 6000
 - TurboHawk™
 - PowerMAXION™
- Board-Level Products:
 - Motorola MVME2604
 - Motorola MVME4604
- An X Window System display device, such as an X™ terminal¹

1. This is a prerequisite only for the NightTrace Event Analysis package (**ntrace**). It is not required by the NightTrace Event Logging package (**ntracelog**). See “System Installation” on page 4 for more information about these packages.

4.0. System Installation

The NightTrace product is installed as two standard PowerMAX OS software packages and utilizes the standard PowerMAX OS product installation mechanism, **pkgadd** (see **pkgadd(1)**).

The package names are **ntrace** and **ntracelog**. These names are case-sensitive.

ntrace the NightTrace Event Analysis package. It consists of everything necessary to display trace event data.

ntracelog the NightTrace Event Logging package. It consists of everything necessary to collect trace event data.

The **ntrace** and **ntracelog** packages can be installed together or separately because there are no package dependencies between them. The **ntracelog** package was designed for installation on minimally configured systems that do not have the X11 packages installed and which will be used for event logging but not event analysis.

NOTE

In order to perform kernel tracing, the **trace** package, as shipped with PowerMAX OS, must be installed on the system. Once installed, the **trace** module needs to be activated via the **config(1)** command.

In addition, for proper execution of the NightTrace Session Manager, the PowerMAX OS package **nstar** (shipped with the NightTrace product) must be installed on the NightTrace host and any NightTrace target system (see “Target Installation” on page 5).

Please refer to the “Installing Add-on Software” chapter in the *System Administration Volume I* (0890429) manual and the *PowerMAX OS Release Notes* for instructions on software installation.

NightTrace may be installed in either the root directory or elsewhere. When you run **pkgadd(1M)** to install NightTrace, you are prompted to enter the name of the directory for installation. If you want to install in the root directory, just press the <return> key at the prompt. Otherwise, enter the name of the directory where you want NightTrace installed. If this directory does not exist, the installation procedures attempt to create it for you.

NightTrace *requires* the Élan License Manager. Follow the steps in the "Obtaining Licenses" section of the *Élan License Manager Release Notes* (0891055); the *feature alias* is NightTrace. If you are not already running the Élan License Manager, if you do not have a copy of the *Élan License Manager Release Notes*, or if you need a license key, contact Concurrent Software Distribution at 1-800-666-5405 (or 1-954-283-1836 outside the continental United States).

4.1. Target Installation

For proper operation of the session management features in NightTrace 5.2, the following software package must be installed on the NightTrace host and on any target system:

NightStar Tool	Package	Version
NightStar Daemon Server	nstar	1.2

This package is shipped with the NightTrace product.

5.0. Overview of NightTrace 5.2

5.1. Changes in This Release

5.1.1. Qualified state and event information saved in session file

Information regarding qualified states and events are no longer saved in page configuration files.

NightTrace 5.2 separates this information out of the page configuration files from previous versions of NightTrace and saves it as part of the session when those page configuration files are loaded.

NightTrace 5.2 backs up the original page configuration files before these modifications are made.

5.1.2. Renamed app-defaults file

The app-defaults file associated with NightTrace has been renamed from:

Ntsess

to

Ntrace

If a user has a modified version of **Ntsess** from a previous version of NightTrace that they would like to use with NightTrace 5.2, they should rename it to **Ntrace** and change all occurrences of **Ntsess** to **Ntrace** in the file.

5.1.3. Command-line options

NightTrace 5.2 contains changes to the command-line options to **ntrace**. See the **ntrace(1)** man page for complete information.

This release of NightTrace incorporates the GNU style of options, as shown in the following example:

```
-l
--long_name
--long_name=value
```

For backward compatibility, however, NightTrace 5.2 maps the following options without complaint.

-help	--help
-filestats	--stats
-nohardclock	--notimer
-process	--process
-listing	--listing
-start	--start=
-end	--end=
-flat	--flat

In addition, a new **--summary=criteria** option has been added which provides a textual summarization of specified trace events using the supplied *criteria*. See the **ntrace(1)** man page for a complete listing of valid criteria values.

Also, the **--hide-main-window** option has been added so that users can start NightTrace with the main window hidden. When this option is used, only display pages are shown. This option can be abbreviated as **-hm**.

5.1.4. Auto-loading of previous session

NightTrace no longer automatically loads the last session when it is invoked. In NightTrace 5.2, this behavior only occurs if the **--use-session** (or **-u**) option is provided to the **ntrace** command.

5.1.5. Multiple selection

Multiple selection is now done with the right mouse button (click and drag), not the left.

5.2. Enhancements

5.2.1. --wait option to ntracekd

Normal operation of **ntracekd** requires two invocations; one to start the daemon and one to stop the running daemon.

The **--wait=delay** option merges these activities into a single command. With the **--wait** option, the daemon is started while the command waits for the specified number of seconds, then the daemon is stopped and the command returns.

5.2.2. Enhanced summary and search dialogs

The search and summary dialogs have been significantly reworked to provide faster configuration for searching and summarization of common items (e.g. events, qualified states, system calls, interrupts, exceptions, etc) while retaining all of the power of user-customization.

In addition, graphical display of state summaries is optionally provided.

Search and summary configurations are retained in the session file for possible use in subsequent NightTrace sessions.

5.2.3. Batch summarization

The **--summary** option now provides several built-in summary criteria that provide textual summaries of kernel data or user data. Additionally, users can specify their own (predefined) summary criteria for batch-mode processing.

For example,

```
ntracekd --wait=5 data
ntrace --summary=k data
```

provides a summary of the five seconds of kernel activities that **ntracekd** captures.

5.2.4. Enhanced qualified state, qualified event and macro dialogs

The dialogs for defining qualified states, qualified events, and macros were redesigned for ease of use.

5.2.5. Streaming Improvements

The following enhancements have been made with respect to streaming:

- streaming no longer uses temporary files to buffer data
- the user can now specify limits on the amount of memory used to collect streaming data
- streamed data segments can now be saved directly from within the NightTrace Main Window

5.2.6. Initialization Performance

When data segments are saved with the NightTrace Main Window **Save Data Segments...** button, the resultant file format offers significant performance improvements for subsequent invocations of NightTrace with that data set.

5.2.7. Accelerator keys

Accelerator keys have been added for ease and convenience on the NightTrace Main Window as well as the Display Pages.

Main Window	
ctrl-d	new daemon dialog
ctrl-l	launch daemon (previously start)
ctrl-h	halt daemon (previously stop)
ctrl-p	pause daemon
ctrl-r	resume daemon
ctrl-w	close the NightTrace Main Window
Display Pages	
up-arrow	zoom out
down-arrow	zoom in
left-arrow	scroll left
right-arrow	scroll right
ctrl-f	open search dialog
>	search forward with last criteria
<	search backward with last criteria

Display Pages	
ctrl-z	open summary dialog
ctrl-m	display NightTrace Main Window
ctrl-w	close current display page

NOTE

It is not necessary to press the Shift key to use the > or < accelerator.

5.3. Common Problems and Limitations

5.3.1. Privileges and Capabilities

A common problem when using the NightTrace API is that the `trace_begin()` (or `trace_start()`) call may fail if the lacks sufficient privileges to lock pages or utilize appropriate spin lock protection in which case no events are logged.

The application should be sure to check the return codes from `trace_begin()` (or `trace_start()`) and `trace_open_thread()` to ensure that subsequent `trace_event()` calls will actually log data.

6.0. Cautions

6.1. TCP High-Water Mark Settings

If you experience kernel event loss while streaming, it may be due to insufficient TCP high-water mark settings on your PowerMAX OS system. By default, the TCP high-water marks are ~36K, which is an extremely low value, and can cause delays during I/O read and write operations of significant sizes.

We recommend adding the following commands to the **/etc/rc2.d/S69inet** script to raise the high-water mark settings.

```
$NDD -set /dev/tcp tcp_recv_hiwater_def 4194304  
$NDD -set /dev/tcp tcp_xmit_hiwater_def 4194304
```

Add the above lines to the script *after* the existing lines of the form:

```
$NDD -set /dev/tcp tcp_old_urp_interpretation 1  
$NDD -set /dev/ip ip_respond_to_timestamp 1  
$NDD -set /dev/ip ip_respond_to_timestamp_broadcast 1
```

7.0. Direct Software Support

Software support is available from a central source. If you need assistance or information about your system, please contact the Concurrent Software Support Center at 1-800-245-6453. Our customers outside the continental United States can contact us directly at 1-954-283-1822 or 1-305-931-2408. The Software Support Center operates Monday through Friday from 8 a.m. to 7 p.m., Eastern Standard time.

Calling the Software Support Center gives you immediate access to a broad range of skilled personnel and guarantees you a prompt response from the person most qualified to assist you. If you have a question requiring on-site assistance or consultation, the Software Support Center staff will arrange for a field analyst to return your call and schedule a visit.

