

# NightTrace

## Version 5.5 Release Notes (PowerMAX)

April 2005

0890398-5.5



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## 1.0. Introduction

NightTrace™ is used for debugging and analyzing applications and their interaction with the operating system. While useful for simple programs, NightTrace can be used to analyze complex multiprocess or multiprocessor programs with time-critical or real-time constraints.

The NightTrace toolset consists of an interactive debugging and performance analysis tool, trace data collection daemons, an Application Programming Interface (API) allowing user applications to log data values, and an API allowing user applications to subsequently analyze data that has been collected.

NightTrace APIs	libraries and include files for use in user applications that log trace events to shared memory
	libraries and include files for use in user applications that want to analyze data collected from user or kernel daemons
<b>ntrace</b>	a graphical tool that controls daemon sessions and displays user and kernel trace events from trace event files
<b>ntraceud</b>	a daemon program that copies user applications' trace events from shared memory to trace event files
<b>ntracekd</b>	a daemon program that copies operating system trace events from kernel memory to trace event files

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## 2.0. Documentation

Table 2-1 lists the NightTrace 5.5 documentation available from Concurrent.

**Table 2-1. NightTrace Version 5.5 Documentation**

Manual Name	Pub. Number
<i>NightTrace User's Guide</i>	0890398-130
<i>NightTrace Version 5.5 Release Notes (PowerMAX)</i>	0890398-5.5

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.

Additionally, the documentation listed above is available:

- online using the **nhelp** utility
- in PDF format in the **documentation** directory of the installation CD
- on the Concurrent Computer Corporation web site at **www.ccur.com**

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## 3.0. Prerequisites

Prerequisites for NightTrace Version 5.5 are as follows:

### 3.1. Software

- *any of the following:*
  - PowerMAX OS 4.3 Patch 9 (P9) or later
  - PowerMAX OS 5.1 Service Release 3 (SR3) or later
  - PowerMAX OS 6.1
  - PowerMAX OS 6.2

#### 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)<sup>1</sup>
- Élan License Manager™ 5.0.1 or later

### 3.2. Hardware

- Computer Systems:
  - Power Hawk™ 620 and 640
  - Power Hawk 710, 720 and 740
  - Power Hawk 900 Series
  - 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™ terminal<sup>1</sup>

<sup>1</sup> This is a prerequisite only for the NightTrace Event Analysis package (**ntrace**). It is not required by the NightTrace Event Logging package (**ntracelog**).

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## 4.0. System Installation

The NightTrace product is installed as three 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.

<b>ntrace</b>	the NightTrace Event Analysis package. It consists of everything necessary to display trace event data.
<b>ntracelog</b>	the NightTrace Event Logging package. It consists of everything necessary to collect trace event data.
<b>ntraceapi</b>	the NightTrace API package. It consists of everything necessary for user applications to analyze data collected from user or kernel daemons.

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 5.5, the following software package must be installed on the NightTrace host and on any target system:

<b>NightStar Tool</b>	<b>Package</b>	<b>Version</b>
NightTrace	<b>ntracelog</b>	5.5
NightStar Daemon Server	<b>nstar</b>	1.3

This package is shipped with the NightTrace product.

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## 5.0. Overview of NightTrace 5.5

NightTrace 5.5 is primarily a maintenance release. It includes all patches released to NightTrace 5.4 as well as additional bug fixes and the enhancements described below.

### 5.1. Process-Specific Kernel Display Pages

The **Pages** menu of the main NightTrace window has been enhanced with a **Process-Specific Page** menu item which allows you to select individual processes from a list of current processes associated with kernel trace data. A new display page is constructed which provides kernel-style event and state graphs filtered to include only the processes you selected. See the section titled “Process-Specific Page” in the *NightTrace User’s Guide (0890398)* for more information.

### 5.2. Additional Operations on Active Segments

NightTrace 5.5 allows the following operations on data segments associated with actively streaming daemons:

- data can be trimmed from an active segment
- data associated with a stopped or closed daemon can now be closed even if other daemons are active

## 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.

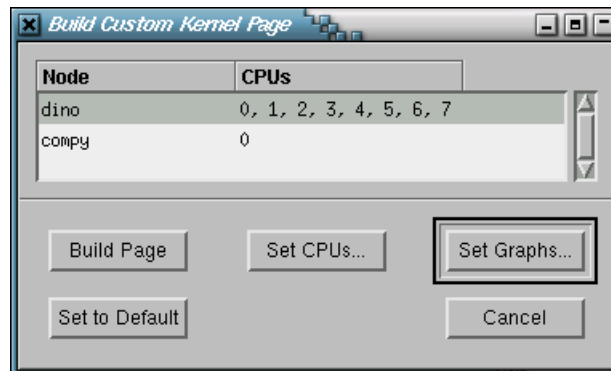
### 5.3.2. Multithreaded Programs and the NightTrace API

The NightTrace API has been changed to provide enhanced functionality with multi-threaded user programs.

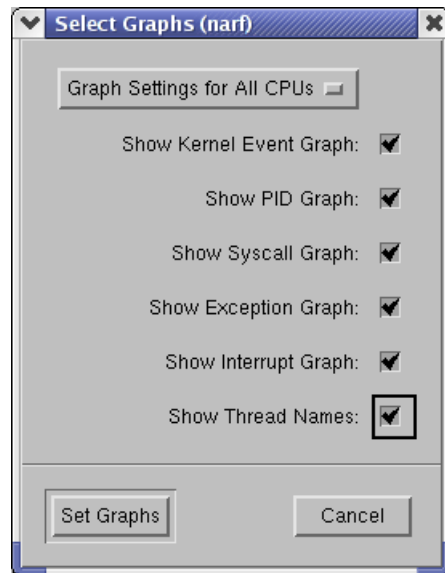
The following improvements have been made in this release:

- The thread associated with kernel trace events can be identified by name during data analysis if user and kernel data is included in the same analysis session.
- Kernel display pages have been enhanced to optionally display both the program name and thread name.

From the **Pages** menu of the NightTrace main window, click on **Custom Kernel Page...**



Click on **Set Graphs...** to bring up the **Select Graphs** dialog:



and click on **Show Thread Names**. Thread names on kernel events are only available for threads which have user trace data in the same NightTrace session.

- Textual descriptions from **ntrace** have been changed. The **tid=** description has been replaced by a **thr=** description, which is the name of the thread associated with the event or the value of the thread ID in decimal when a name cannot be located.

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## 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
```

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## 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 our toll free number 1-800-245-6453. For calls outside the continental United States, the number is 1-954-283-1822. The Software Support Center operates Monday through Friday from 8 a.m. to 5 p.m., Eastern Standard Time. You may submit a request for assistance at any time by using the Concurrent Computer Corporation web site at **[http://www.ccur.com/isd\\_support\\_contact.asp](http://www.ccur.com/isd_support_contact.asp)**.

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.



