

NightProbe

Version 2.8 Release Notes (PowerMAX)

October 2004

0890465-2.8



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1.0. Introduction

NightProbe™ provides a graphical user interface that permits real-time recording, viewing, and modification of program data within one or more resources, including executing programs, shared memory, or memory mapped files on the target system. It can be used during development and operation of applications, including simulations, data acquisition, and system control.

The features and capabilities of NightProbe include:

- An X Window System™ and OSF/Motif™ graphical user interface provides data sampling control and a spreadsheet interface for data recording, monitoring, and modification.
- Several timing sources, including the system clock and the frequency-based scheduler, are provided for controlling the sampling rate. The user may explicitly start, suspend, and stop sampling using the graphical user interface.
- Any static memory location of any Ada, C, or Fortran process on any processor may be sampled by NightProbe. The Item Browser window's Interactive Variable Browser supports scalar, discrete, and composite types in those programming languages.
- Sampled data may be monitored interactively, written to a file for later analysis, logged via the NightTrace™ daemon, or streamed directly to a user-specified application.
- NightProbe can be run on a different processor from the target program, which minimizes NightProbe's impact on the target program's performance.
- NightProbe allows data locations to be specified using logical addresses or the symbolic names that appear in the program source code. The data addresses and data types are then located by searching the symbol table in the executable program file. NightProbe can present lists of the static variables in programs, and the user may select the variables of interest using the graphical user interface.
- Configuration files can be created, edited, and saved to retain target selections and display layout, allowing for fast start-up.
- No modifications to source code are required for use with NightProbe. Programs must be compiled with debug information (the `-g` compilation option).

2.0. Documentation

Table 2-1 lists the NightProbe 2.8 documentation available from Concurrent.

Table 2-1. NightProbe Version 2.8 Documentation

Manual Name	Pub. Number
<i>NightProbe User's Guide</i>	0890465-060
<i>NightProbe Version 2.8 Release Notes (PowerMAX)</i>	0890465-2.8

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 manuals listed above are 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 NightProbe Version 2.8 are as follows:

3.1. Software

- PowerMAX OS 4.3 or later
- X Window System (X11 Version 6.4.2 or later)
- Élan License Manager™ 5.0.2 or later

3.2. Hardware

- Computer Systems:
 - Power Hawk™ 620 and 640
 - Power Hawk 710, 720 and 740
 - Power Hawk 910 and 920
 - PowerStack™ II and III
 - Night Hawk® Series 6000
 - TurboHawk™
 - PowerMAXION™
- Board-Level Products:
 - Motorola® MVME2604
 - Motorola MVME4604

4.0. System Installation

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

The package names are

nprobe	the NightProbe graphical user interface - must be installed on the NightProbe host
nprobeserv	the NightProbe server - must be installed on each target system and performs system-level actions on behalf of NightProbe
nprobeapi	the NightProbe real-time data monitoring and recording API - must be installed on host system where applications which read NightProbe recorded data using the NightProbe API will be built. For applications which are dynamically linked and executed on the target system, the nprobeapi package must also be installed on the target.

These names are case-sensitive.

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.

NightProbe may be installed in either the root directory or elsewhere. When you run **pkgadd (1M)** to install NightProbe, 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 NightProbe installed. If this directory does not exist, the installation procedures attempt to create it for you.

Use of NightProbe requires a license which must be obtained from an Élan License Manager server. Follow the steps in the "Obtaining Licenses" section of the *Élan License Manager Release Notes* (0891055); the *feature alias* is NightProbe. 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).

5.0. Overview of NightProbe 2.8

5.1. Enhancements

5.1.1. NightProbe Main Window

The NightProbe Main Window (known in previous releases as the “Data Recording Window”) has been reorganized and updated.

The NightProbe Main Window features a “Session Overview” area which provides a tree-based graphical representation of each attribute of the current NightProbe session. You can view a menu associated with each of the attributes by clicking the right mouse button on that attribute. In addition, many of the roots of the tree have a corresponding item on the menu bar.

The **Connect**, **Disconnect**, **Start**, **Stop**, and **Sample** buttons have been given accelerator key assignments providing access to their functionality via the keyboard.

5.1.2. Resources

NightProbe now operates on resources instead of programs. A program is just one kind of resource NightProbe has the capability of probing. Other types of resources include:

- | | |
|---------------|---|
| Shared Memory | NightProbe supports access to IPC and POSIX shared memory regions on the target system. IPC shared memory regions may be located via their key, ID, or a key file (see ftok(3)) |
| Mapped Memory | NightProbe supports access to any file on the target system that can be used with mmap(2) , such as /dev/mem or /proc/\${PID}/mem , where \${PID} is the pid number of any process. |

The NightProbe Item Definition Window allow users to define artificial variables which are views into the non-program resources (see “Resources” above). A location within the resource can be viewed as a basic integer, real, character or string type, or else an array of such objects.

NightProbe also provides access to more complex data types if you specify a symbol file associated with a non-program resource. You may then create item views which are records or components, or even arrays of records, using the types defined in the symbol file. A symbol file is an executable program containing symbolic and debugging information. Not all types declared in your source code may appear in the debugging information in the symbol file. See the *NightProbe User's Guide* for details.

5.1.3. X Server Resource File Reorganization

All X server resources (i.e. color resources, text messages, widget resources) are now contained in:

`/usr/lib/X11/app-defaults/Nprobe`

The following files:

`Nprobe-mono`
`Nprobe-color`
`NightProbe-help`
`NightProbe-text`

are no longer used by NightProbe.

NOTE

Customized modifications made to X server resources in previous releases may not be valid in this release.

5.1.4. Error Message Customization

A new NightProbe configurable parameter is available in the X server resource file **`/usr/lib/X11/app-defaults/Nprobe`**:

`Nprobe.text.maxUnscrolledErrors: 15`

This configurable parameter specifies the number of lines in an error message that can be displayed without a scrolled error message window.

See "X Window System Resources" in the "GUI Customization" section of the *NightProbe User's Guide* for details on configuring X Window system resources.

5.1.5. Symbol Visibility from Shared Objects

As in the past, the NightProbe Item Browser displays types and variables from the statically linked portion of program resources. Variables and type information from shared libraries are not normally displayed.

However, in this release, when a valid PID is given for a program resource, NightProbe may include some types and variables from shared libraries.

This capability may be enhanced in a future release.

5.1.6. Item Browser

The Item Browser has been replaced with a newer, faster, graphical tree browser.

5.1.7. Symbol File Reader

The NightProbe Symbol File Reader has been upgraded to one based on the Concurrent Data Monitoring Library, providing better access to data format information encoded in the debugging information of the symbol files.

5.1.8. Array Expansions

NightProbe now properly writes and re-loads array expansions in spreadsheet layout files.

5.1.9. Displaying Ada Types

In previous versions of NightProbe, Ada95 enumeration values were printed as the underlying integer representation, not the textual image of the corresponding enumeration constant. In NightProbe 2.8, Ada enumeration data can be viewed symbolically.

Also, in previous versions, NightProbe would print Ada95 fixed point types using their underlying integer representation, not as a fractional number. In NightProbe 2.8, Ada fixed point values are now displayed in their proper format.

5.1.10. Command-Line Options

NightProbe 2.8 offers all command-line options to **nprobe** in both the GNU style format as made popular on Linux systems as well as a single letter abbreviation. For instance, to inform **nprobe** that you would like sampled data displayed in a List Viewer window, you could either use the **--list** option or the **-l** option. The option style from previous releases is maintained for backward compatibility. For our example, the **-list** option would still be accepted by **nprobe**.

There is a new command-line option to **nprobe** in NightProbe 2.8. Its syntax is:

--program=/path/name

This option specifies that data recording is to be activated and that data is to be piped to the program specified by */path/name*.

In addition, the **-autoupdate** option has been deprecated.

5.1.11. Client/Server Disconnect

In previous versions of NightProbe, orphaned **nprobe** and/or **np_serv** processes were sometimes left on the system if NightProbe exited while in the connected state.

NightProbe now disconnects the server on exit for an orderly shutdown.

5.2. Known Issues

The following items describe NightProbe issues which may be addressed in future patches and releases:

- Access to PCI device resources is available on RedHawk™ Linux targets only, and is therefore unavailable on this architecture.
- Some types appearing in the source code may not be available in the Interactive Type Browser Window. The availability of type information is dependent on the implementation choices made by the compiler which produced the debugging information. Some compiler versions only include type information if an object of that type is linked into your program.
- In the “Probing Devices Tutorial” in Appendix C of the *NightProbe User’s Guide*, the device to use when probing VME devices is incorrect. The appropriate device for probing VME devices should be **/dev/iomem**, NOT **/dev/mem**. Therefore, the text in that section should read:

*For example, VME devices may be probed on PowerMAX OS system by using the Mapped Memory window and mapping **/dev/iomem** with the appropriate physical address of the VME device.*

6.0. Cautions

Special consideration should be given to the following:

- NightProbe provides support for symbol files which are linked shared; however, this support is subject to the availability of the needed shared object files on the NightProbe host system. For maximum visibility to items, use statically linked symbol files.

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.

