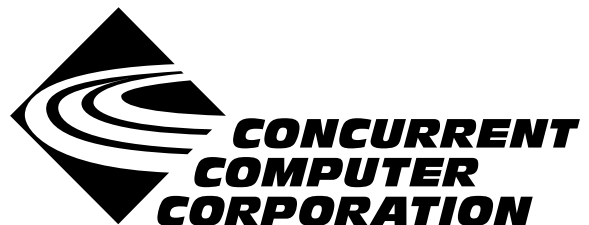


NightSim

Version 3.1 Release Notes

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0890480-3.1



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1.0. Introduction

NightSim™ is a real-time tool that is part of the NightStar™ development environment. It provides an X Window System™ and OSF/Motif™ graphical user interface (GUI) to the frequency-based scheduler (FBS) and performance monitor real-time facilities.

The frequency-based scheduler is a task synchronization mechanism that allows you to run processes at frequencies that you specify. Frequencies can be based on high-resolution clocks, an external interrupt source, or completion of a cycle. The frequency-based scheduler provides a mechanism for initiating processes at the specified frequency, allowing users to execute portions of their code cyclically, synchronizing the beginning of each cycle with other programs on the scheduler.

The **Scheduler** window allows you to perform the full range of functions associated with the FBS. Functions include configuring a scheduler, selecting a timing source, scheduling programs, saving and restoring scheduler configurations, running a simulation, and viewing scheduling data.

The performance monitor is a mechanism that enables you to monitor FBS-scheduled processes' utilization of a CPU. The performance monitor provides you with the ability to obtain performance monitor values by process or processor, including the minimum, maximum, and average amounts of real-time used per program per cycle.

The **Monitor** window provides a comprehensive interface to the performance monitor facilities. Functions include selecting a scheduler, enabling and disabling monitoring for each process, clearing performance values, setting the timing mode, and sending performance data either to the screen or to a text file. Data that is to be sent to the screen can be filtered and sorted in a variety of ways.

2.0. Documentation

Table 2-1 lists the NightSim 3.1 documentation available from Concurrent.

Table 2-1. NightSim Version 3.1 Documentation

Manual Name	Pub. Number
NightSim User's Guide	0890480-010
NightSim Version 3.1 Release Notes	0890480-3.1

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 1-954-977-5554.

Additionally, the NightSim User's Guide and NightSim 3.1 Release Notes are available online by using the X Window System utility, **nhelp**.

Further, the NightSim User's Guide and NightSim 3.1 Release Notes are also available on Concurrent Computer Corporation's web site at www.ccur.com.

3.0. Prerequisites

Prerequisites for NightSim Version 3.1 are as follows:

3.1. Software

- PowerMAX OS™ operating system release 4.3 or later
- The Frequency-Based Scheduler (**fbs**) kernel module
- X Window System (X11 Version 6.3 or later)
- Élan License Manager™ 5.0.1 or later

There are additional configuration requirements for NightSim to fully function. See the chapter titled “Establishing the NightSim Environment” in the *NightSim User’s Guide* (0890480) for these requirements.

3.2. Hardware

- Any Night Hawk® Series 6000, Power Hawk™, TurboHawk™, PowerMAXION™, PowerStack™ or PowerStack™ II system
- An X Window System display device, such as an X™ terminal

4.0. System Installation

The NightSim 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

nsimserv	the NightSim server - must be installed on each <i>target system</i> (i.e. any system on which processes will be scheduled) and performs system-level actions on behalf of NightSim
nsim	the NightSim graphical user interface - must be installed on the NightSim host

These names are case-sensitive.

NOTE

The user may wish to only run the NightSim graphical user interface, but not schedule processes, on a particular system. In this case, only the **nsim** package is required. However, if **nsim** is installed before **nsimserv**, the installation procedure issues a warning message. This serves as a reminder that NightSim cannot schedule processes on a system without the **nsimserv** package installed.

Please refer to the "Installing Add-on Software" chapter in the *System Administration Volume I* (0890429) manual and the *PowerMAX OS Release Notes* (0890454) for instructions on software installation.

You should have already installed the **fb**s package before installing NightSim. The **fb**s package contains the kernel module that provides FBS and performance monitor functions.

NOTE

The **fb**s package **must** be installed on each target system.

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

The Élan License Manager **must** be installed on the NightSim host since the graphical user interface acquires licenses. However, since the target systems do not use any licenses, the Élan License Manager does not need to be installed on any of the target systems. Follow the steps in the "Obtaining Licenses" section of the *Élan License Manager Release Notes* (0891055); the *feature alias* is NightSim. 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 NightSim 3.1

5.1. Enhancements

5.1.1. Closely-Coupled System Support

NightSim Version 3.1 introduces support for frequency-based scheduling on closely-coupled systems. *Closely-coupled systems* (or *clusters*) consist of a set of single-board computers (SBCs) which share the same VMEbus. NightSim provides the user with a single point-of-control, a *distributed FBS*, for managing the distributed scheduling of processes on any of the SBCs within the cluster. In reality, however, it creates an individual FBS on each SBC and manipulates them in a synchronized manner.

See the *Diskless Systems Administrator's Guide* (0891080) and the *Closely-Coupled Programming Guide* (0891081) for more information about closely-coupled systems.

5.1.2. RCIM Support

NightSim Version 3.1 introduces partial support for the Real-Time Clock and Interrupt Module (RCIM). An RCIM is an optional hardware module, attached to an SBC, which contains the following interrupt-generating devices:

- real-time clocks (RTCs)
- edge triggered interrupts (ETIs)
- programmable interrupt generators (PIGs)

Any of these devices may be used as the timing source for an FBS.

RCIMs may be connected via RCIM cables such that interrupts from one RCIM may be distributed to other SBCs in the RCIM chain.

Each interrupt device on an RCIM module may be configured either as a

- *cluster-distributed device* (interrupts are distributed **within** a cluster using VME), or an
- *RCIM-distributed device* (interrupts are distributed **within** or **between** clusters using the RCIM cable).

Currently, NightSim only supports distributed frequency-based scheduling **within** a cluster, regardless of the configuration of the interrupt device.

However, in a *loosely-coupled system* (two or more clusters connected via Ethernet or RCIM cables), it is possible to synchronize scheduling of processes **between** clusters by defining an individual FBS on each SBC and specifying a common RCIM-distributed interrupt device as the timing source for each individual FBS. However, only the start of each frame is synchronized due to the common timing device; all other scheduling activities, such as stop and overrun detection, operate independently on each individual FBS on each SBC. Manipulation and performance monitoring of each FBS must be done within separate NightSim Scheduler and Monitor windows.

NOTE

In this release, NightSim cannot currently differentiate between the two different types of RCIM device configurations and may present the user with an improper set of choices for the timing source and target system. For example, NightSim may present target choices which include systems outside the cluster associated with the selected timing source or systems which cannot field interrupts from the selected timing source. If the user inappropriately selects such targets, the initialization of the distributed frequency-based scheduler will fail.

5.1.3. Online Help

5.1.3.1. NightSim User's Guide

The *NightSim User's Guide* is now available in an online version using the HyperHelp™ viewer that is shipped as part of the X Window System (**x11**) product.

The online *NightSim User's Guide* can be accessed using the **nhelp** utility shipped with the X Window System. The manual name is **nsim**. For example:

```
nhelp nsim
```

will bring up the most recently installed version of the *NightSim User's Guide*.

In addition, the manual can be accessed using the Help->On Window or Help->On Context menu items from the NightSim Scheduler and Monitor windows.

5.1.3.2. Context-Sensitive Help

NightSim has integrated context-sensitive help with the online manual for easy point-and-click access to complete help for any area within the NightSim environment. Use the Help->On Window or Help->On Context menu items from the NightSim Scheduler and Monitor windows.

5.1.3.3. Error Message Support

NightSim has enhanced its error-processing capabilities such that detailed error messages are displayed using the HyperHelp viewer. Hyperlinks to related topics provide the user with information that may aid in resolving any problems that might occur when using NightSim.

5.1.4. Enhanced Configuration File Format

NightSim 2.4 and earlier versions supported configuration files consisting of a sequence of **rtcp** commands. While NightSim still retains the ability to generate a script containing **rtcp** commands, the "configuration" is now saved to a file with an enhanced format that supports closely-coupled systems.

A script is provided in order to convert these older configuration files to the format that NightSim now uses.

The syntax for using this conversion script is:

```
convert_rtcp old_configuration_file
```

It is invoked with the name of the script you want to convert and produces the converted script on **stdout**. It assumes that *old_configuration_file* is a NightSim 2.4 or earlier configuration file that has not been modified by the user. Errors or other strange behavior may occur otherwise.

Old configuration files should be converted using this utility and the newly-converted configuration files should be used instead.

See the appendix title “Configuration Files” in the *NightSim User’s Guide* (0890480) for more details about the new format for configuration files and about the conversion utility.

5.2. Known Deficiencies

5.2.1. Redirection of stdin, stdout, stderr

NightSim currently redirects the **stdin**, **stdout**, and **stderr** file descriptors to **/dev/null** for processes that it schedules.

5.2.2. Incorrect values for idle and spare time if FBS restarted

The performance monitor provides the capability of monitoring a processor’s *idle* (unused CPU cycles) and *spare* (CPU cycles not used by FBS processes) time. This is accomplished by adding the processes **/idle** and **/spare** to a frequency-based scheduler and scheduling them on the desired processor for a particular target system (see “Monitoring Idle and Spare Time” in the *NightSim User’s Guide*). The performance monitor will then show, for those processes, the amount of “idle” and “spare” resources on the CPU to which they are assigned.

If the associated FBS is stopped and then restarted, the values reported for these processes by the performance monitor will be incorrect, showing percent-usage numbers higher than they should be, and in some cases, exceeding 100%.

5.2.3. Modified CPU bias may not appear in Monitor

A Monitor window associated with a frequency-based scheduler may not show the correct CPU bias for a process if the CPU bias for that process was modified (via the **Edit Process** dialog). The CPU bias will only be incorrectly displayed if NightSim attempted to get the new CPU bias **after** the CPU bias had been changed but **before** the process had run.

6.0. 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). Our customers outside the continental United States can contact us directly at 1-954-977-5554. 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.

Concurrent provides a Software Action Request (SAR) form which our customers can fill out and submit to their local field analyst or the Software Support Center. This procedure ensures that your request is entered into our SAR database for follow-up and action.

To obtain copies of SAR forms, call the Software Support Center and request form number CSD1833B.

