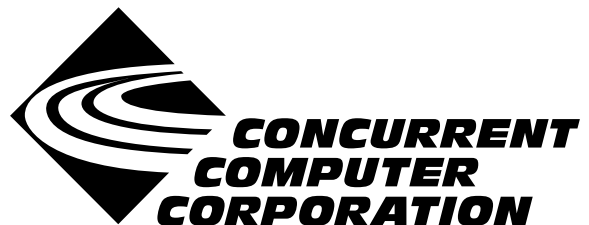


# NightSim

## Version 3.2.2 Release Notes (Linux)

April 2001

0898480-3.2.2



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## 1.0. Introduction

NightSim™ is part of the PowerWorks™ Linux Development Environment (PLDE) and provides a 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.

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## 2.0. Documentation

Table 2-1 lists the NightSim 3.2.2 documentation available from Concurrent.

**Table 2-1. NightSim Version 3.2.2 Documentation**

Manual Name	Pub. Number
<i>NightSim User's Guide</i>	0890480-020
<i>NightSim Version 3.2.2 Release Notes (Linux)</i>	0898480-3.2.2

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 manuals listed above are available:

- online using the PowerWorks Linux Development Environment utility, **nhelp**
- in PDF format in the **documentation** directory of the PLDE Installation CD
- on the Concurrent Computer Corporation web site at [www.ccur.com](http://www.ccur.com)

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## 3.0. Prerequisites

Prerequisites for NightSim Version 3.2.2 for both the host system and target system are as follows:

### 3.1. Host System

#### 3.1.1. Software

- Red Hat® Linux\*
- Required capabilities\*\*

#### NOTE

The following capabilities are normally installed as part of the standard installation of Red Hat Linux and the PowerWorks Linux Development Environment. During installation of the PLDE, the user will be notified if required capabilities do not exist on the Linux system.

- PowerWorks Linux Development Environment

Capabilities	RPMs providing these capabilities
<code>plde-HyperHelp</code> <code>plde-HyperHelp-scripts</code> <code>plde-ktalk</code>	<code>plde-x11progs-6.4.2-003</code> <code>plde-HyperHelp-scripts-6.4.2-002</code>

- Red Hat Linux

Capabilities	RPMs providing these capabilities
<code>/bin/sh</code> <code>ld-linux.so.2</code> <code>libICE.so.6</code> <code>libSM.so.6</code> <code>libX11.so.6</code> <code>libXext.so.6</code> <code>libXmu.so.6</code> <code>libXp.so.6</code> <code>libXt.so.6</code> <code>libc.so.6</code> <code>libc.so.6(GLIBC_2.0)</code> <code>libc.so.6(GLIBC_2.1)</code> <code>libm.so.6</code> <code>libm.so.6(GLIBC_2.0)</code>	<i>Red Hat 6.1:</i> <code>XFree86-libs-3.3.5-3</code> <code>bash-1.14.7-16</code> <code>glibc-2.1.2-11</code>  <i>Red Hat 6.2:</i> <code>XFree86-libs-3.3.6-20</code> <code>bash-1.14.7-22</code> <code>glibc-2.1.3-15</code>

\* This product has been extensively tested on Red Hat Linux 6.1 and 6.2. However, this product has not been tested with versions of Linux supplied by other vendors.

\*\* The “Capabilities” listed may be found in those versions of the RPMs listed under “RPMs providing these capabilities” or later versions.

### 3.1.2. Hardware

- an Intel®-based PC - 300Mhz or higher (recommended minimum configuration)
- 64MB physical memory (recommended minimum configuration)

## 3.2. Target System

### 3.2.1. Software

- PowerMAX OS 4.3 (w/ patch base-002) or later
- **nsimserver** 3.2.2 (see “Target Installation” on page 7 for more information)

### 3.2.2. 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



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## 4.0. System Installation

Installation of the host portion of NightSim is normally done as part of the general installation of the PowerWorks Linux Development Environment software suite. A single command installs (or uninstalls) all software components of the PLDE, as described in the *PowerWorks Linux Development Environment Release Notes* (0898000).

The following section describes how to install (or uninstall) NightSim separately from the PLDE suite for those cases when this is necessary.

In addition, NightSim requires that certain packages be installed on the PowerMAX OS target systems. See “Target Installation” on page 7 for more information.

### 4.1. Separate Host Installation

At times, it may be necessary to install (or uninstall) NightSim independent of the installation of the PowerWorks Linux Development Environment software suite. This may be done using the standard Linux product installation mechanism, **rpm** (see **rpm(8)**).

The RPM name associated with NightSim 3.2.2 is:

```
plde-nsim
```

and the file associated with this RPM is:

```
plde-nsim-3.2.2-000.i386.rpm
```

which can be found in the **linux-i386** directory on the PowerWorks Linux Development Environment Installation CD.

#### NOTE

The user must be root in order to use the **rpm** product installation mechanism on the Linux system.

To install the NightSim RPM, issue the following commands on your Linux system:

1. Insert the PowerWorks Linux Development Environment Installation CD in the CD-ROM drive
2. Mount the CD-ROM drive (assuming the standard mount entry for the CD-ROM device exists in **/etc/fstab**)

```
mount /mnt/cdrom
```

3. Change the current working directory to the directory containing the NightSim RPM

```
cd /mnt/cdrom/linux-i386
```

4. Install the RPM

```
rpm -i plde-nsim-3.2.2-000.i386.rpm
```

By default, the product is installed in **/usr/opt**. To install in a different directory, add

```
--relocate /usr/opt=directory
```

to the **rpm** command where *directory* is the desired directory.

5. Change the current working directory outside the **/mnt/cdrom** hierarchy

```
cd /
```

6. Unmount the CD-ROM drive (otherwise, you will be unable to remove the PowerWorks Linux Development Environment Installation CD from the CD-ROM drive)

```
umount /mnt/cdrom
```

To uninstall the NightSim RPM, use the following command:

```
rpm -e plde-nsim
```

## 4.2. Target Installation

NightSim requires that the following software package is installed on the PowerMAX OS target systems:

NightStar Tool	Package	Version
NightSim	<b>nsimserver</b>	3.2.2

This package is normally installed during the installation of the corresponding NightStar tool on the PowerMAX OS system. However, the package is also included on the PowerWorks Linux Development Environment Installation CD and may be installed by following the procedures below if the above package has not been installed on the target system, or if the version installed on the target system is not the same as that specified above.

### NOTE

The version of the required software package installed on the PowerMAX OS target systems must be the same as that listed above. If this is not the case, follow the procedures below.

If your PowerMAX OS system has a CD-ROM device:

```
mkdir /mnt/tmp
mount -F cdfs /dev/dev_name /mnt/tmp
cd /mnt/tmp/powermax-ppc604
```

If your PowerMAX OS system does not have a CD-ROM device:

On the Linux system, insert the PowerWorks Linux Development Environment Installation CD in the CD-ROM drive, mount the CD-ROM drive, and use NFS to export it to the PowerMAX OS system:

```
mount /mnt/cdrom
exportfs powermax_os_system:/mnt/cdrom
```

On the PowerMAX OS system, mount the CD-ROM as an NFS filesystem:

```
mkdir /tmp/cdrom
mount -F nfs linux_system:/mnt/cdrom /tmp/cdrom
cd /tmp/cdrom/powermax-ppc604
```

On the PowerMAX OS system, install the target portions of the NightStar tools via the following commands:

```
cp ./nightstar.Z /tmp/nightstar.Z
zcat /tmp/nightstar.Z | pkgadd -d -
```

#### NOTE

If the **nsimserver** package already exists on the PowerMAX OS system and its version is different from that specified in the table above, do NOT remove it, but instead supply the **-a check** arguments to the above **pkgadd** command. This will allow multiple versions of this package to coexist on the system. Use of the **-a check** arguments also causes the **pkgadd** command to become extra verbose.

If your PowerMAX OS system has a CD-ROM device:

```
cd /
umount /mnt/tmp
```

If your PowerMAX OS system does not have a CD-ROM device:

On the PowerMAX OS system, unmount the NFS filesystem:

```
cd /
umount /tmp/cdrom
```

On the Linux system, unexport the NFS filesystem, and then unmount the CD-ROM:

```
cd /
exportfs -u powermax_os_system:/mnt/cdrom
umount /mnt/cdrom
```

---

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## 5.0. Overview of NightSim 3.2.2

### 5.1. Enhancements

#### 5.1.1. On-Line/Off-Line Operation

NightSim now provides two modes of operation for a Scheduler, **On-Line** and **Off-Line**. You can toggle the current state by pressing the **On-Line/Off-Line** button on either the NightSim Scheduler window or the **Edit Process** window associated with it.

By placing a NightSim Scheduler into an **Off-Line** state, immediate checking of the information entered in either the NightSim Scheduler window or its associated **Edit Process** window can be avoided. When in **Off-Line** mode, the NightSim Scheduler will not communicate with any servers on any timing host or target system of the Scheduler.

This is useful when creating a configuration for future use that deals with target systems which may not currently exist or may not be currently accessible. The values entered while **Off-Line** will be checked when the mode is changed to **On-Line**.

There are two ways to request a transition to **On-Line** mode:

1. Press the **On-Line/Off-Line** button on either the NightSim Scheduler or its associated **Edit Process** window. This toggles the value on the face of the button.
2. Press the **Set Up** button on the Scheduler window.

In each of these cases, when going from **Off-Line** to **On-Line**, the information entered in the Scheduler window and its associated **Edit Process** window is examined for correctness given the current state of the timing host and target systems. NightSim servers are started if necessary, and all scheduled process attributes are checked for correctness.

If errors are found in the configuration, the user will be guided through the list of issues discovered in the examination via the **Verify Scheduler** dialog. For each issue, NightSim will highlight the label associated with the field most likely to be of use in correcting the problem. If that field is on a window that is not visible, NightSim will raise the appropriate window to the top of the display.

After making the appropriate changes, the user may retry the transition to **On-Line** mode or may choose to remain in **Off-Line** mode. If new problems are discovered when transitioning to **On-Line** mode, the **Verify Scheduler** window will re-appear.

In addition, NightSim reads configuration files into an **Off-Line** Scheduler. Once the entire configuration is read, NightSim will transition the Scheduler to **On-Line** mode unless the **-offline** option was used on the command line, or the **\*offline X** resource was set to **True** (see the section titled “X Resources” in the *NightSim User’s Guide* (0890480)). When this transition occurs, the new scheduler will be verified. Any errors encountered will be displayed in the **Verify Scheduler** dialog.

See the section titled “On-Line/Off-Line Operation” in the *NightSim User’s Guide* (0890480) for more information.

### 5.1.2. Improved Support for RCIM-coupled Configurations

NightSim now provides integrated support for scheduling programs distributed upon multiple loosely-coupled target computers using the facilities provided by the Real-Time Clock and Interrupts Module (RCIM). NightSim will automatically create individual frequency-based schedulers on each target and register an RCIM-distributed timing device, providing synchronized control of all the remote schedulers.

Programs on loosely-coupled targets may be started, stopped, and even debugged from a single point of control in a synchronous manner. Performance monitoring in a single window is supported as well, including consolidation of performance monitor data to a single output file.

NightSim users may select from three forms of distribution when defining a scheduler:

---

None	define a self-targeted scheduler for which the timing host is also the target.
Closely-Coupled	define a scheduler targeting one or more SBC's in a closely-coupled cluster.
RCIM-Coupled	define a scheduler targeting one or more target computers connected via a chain of RCIM modules as well as a VME or Ethernet network.

---

The selection of **Distribution**, along with the name of the **Timing host** is used to populate the target selection list under the **Edit Process** window as well as to determine the list of valid **Timing Sources** on the **Scheduler** window.

### 5.1.3. Improved Integration with other NightStar Tools

NightSim can now be launched directly from the NightBench Program Development Environment.

In addition, NightSim now provides the ability to schedule programs under the control of the NightView debugger. Breakpoints, monitorpoints, etc may be set before the program begins execution. When a breakpoint is hit, the scheduler is halted, including processes scheduled on other target computers.

### 5.1.4. Improved Support for Scheduling Interactive Programs

NightSim 3.2.2 provides the ability to schedule processes under an **xterm** window created when you press **Set Up**. This makes it possible to schedule programs that perform some interaction with the user, input or output.

### 5.1.5. Improved Support for I/O with Scheduled Programs

NightSim provides the ability to redirect the input or output of scheduled programs from or to a file. This gives explicit control over where the program output is sent whether the program is scheduled under NightView, **xterm**, or with the NightSim server.

### 5.1.6. NightSim Server Name Change

The NightSim server package on PowerMAX OS systems has been renamed from **nsimserv** to **nsimserver** in order to allow multiple instances of the NightSim server on target systems.

## NOTE

The NightSim server is a program that executes on a target system and performs system-level actions on behalf of NightSim.

The NightSim host requires that the matching NightSim server is installed on target systems.

Target systems may have multiple versions of NightSim servers but only a single version of the NightSim host.

See *Target Installation* on page 7 for more information about installing the NightSim packages on PowerMAX OS systems.

### 5.1.7. Privileges

NightSim allows the user to select privileges for scheduled processes. The **adminuser**, **adminrole**, and **filepriv** commands on the target system are utilized for initial privilege selection and subsequent privilege verification.

### 5.1.8. Program File Browsing

Program file browsing under the **Edit Process** window is now done on the target only if both the target is available on the network and the **Edit Process** window is in **On-Line** mode.

If the target is unavailable on the network when NightSim is used to edit the process information, then the **Edit Process** window is placed in **Off-Line** mode for the target, and interactive file browsing is unavailable. If a filename is entered in the text field while **Off-Line**, verification of the accessibility of the file from the target system is delayed until the scheduler is created (i.e. when the **Set Up** button is pressed on the **Scheduler** window).

### 5.1.9. Working Directory

NightSim 3.2.2 allows the user to specify the working directory in which the scheduled program will execute.

### 5.1.10. Automatic Population of Timing Host List

Closely-coupled hosts found in the `/etc/dtables/nodes.vmeboot` file are automatically used to populate the drop-down list associated with the **Timing host** field in the Scheduler Configuration Area of the **Scheduler** window when **Closely-Coupled** distribution is selected.

See “Using the Scheduler Configuration Area” in the “Using the Scheduler Window” chapter of the *NightSim User’s Guide* (0890480).

### 5.1.11. Persistent Knowledge

NightSim creates two files in the user's home directory to remember the names of timing hosts and target systems. The `~/NightSimHosts` and `~/NightSimTargets` files aid NightSim in presenting meaningful choices when NightSim is used at a later time on the same NightSim host.

If `~/NightSimTargets` is damaged or removed, NightSim will forget which targets have been used in a loosely-coupled configuration.

### 5.1.12. Improved Communication

Communication between the NightSim host and the NightSim server has been greatly improved and made more reliable.

At the same time, much has been done to improve the clarity and usefulness of error messages issued by NightSim when problems with initialization or communication occur.



## 5.2. Known Issues

The following sections describe NightSim issues which may be addressed in future patches and releases.

### 5.2.1. Scheduler Window

The following issues apply to the NightSim Scheduler window:

- Statistics on the Scheduler window may not be totally up-to-date once the scheduler stops.
- NightSim is unable to determine some of the information associated with scheduled processes when attaching to an existing scheduler. The following information associated with each process will be unavailable:
  - Input File/Output File information associated with the process
  - Whether or not the process is scheduled in an **xterm(1)** window
  - Whether or not the process is scheduled under the NightView debugger
  - Privileges associated with the process
- NightSim may misinterpret the priority of a scheduled process when attaching to an existing scheduler or refreshing a running scheduler, even to the extent of calculating a value outside the valid range for the process' scheduling class.
- NightSim may report syntax errors in a configuration file if **adminuser** on the target system reports an error. NightSim presumes that the user's roles and privileges are properly configured.
- If a configuration file containing syntax errors is read by NightSim, then all subsequent attempts to read configuration files will fail even if their contents are correct. You must exit and restart NightSim in order to correct the problem.
- When running NightSim under some third party X server software, NightSim may refuse to allow input in text fields. If the window is moved slightly when this occurs, the fields are restored and can be edited.
- If a Scheduler is saved as a script containing **rtcp(1)** commands, the script is only executable on the Linux host. To run the script on a PowerMAX OS target, change the first line of the script to use **/bin/ksh**, rather than **/bin/sh**.

### 5.2.2. Edit Process Window

The following issue is related to the Edit Process window:

- The size of the Edit Process window is too large for very small displays.

### 5.2.3. Monitor Window

The following issues apply to the NightSim Monitor window:

- NightSim may fail to update the screen one last time after the scheduler stops. Pressing **Query Now** after the scheduler stops will provide the most up-to-date data.
- If the simulation is stopped and then resumed, the operating system provides incorrect values to NightSim for **/idle** and **/spare** processor usage.

#### 5.2.4. NightView Integration

If multiple Scheduler windows schedule multiple processes under NightView on the same target system by the same user from a common DISPLAY, then some of the target processes will not be scheduled initially. They will wait for other target processes to exit before they are scheduled. This behavior only exists for multiple scheduler windows when at least one of the scheduler windows schedules a single process on the common target under NightView.

#### 5.2.5. Power Hawk 700 Series

NightSim does not currently support configurations requiring closely-coupled distribution on the Power Hawk 700 Series. Support will be added in a future patch or release.

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## 6.0. Cautions

### 6.1. SFNOLIM Kernel Tunable

The `SFNOLIM` kernel tunable should not be set above 1024; doing so may cause NightSim to fail during initialization or when communicating with other tools.

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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 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.



