

NightSim

Version 3.4 Release Notes (Linux)

September 2004

0898480-3.4



Copyright

Copyright 2004 by Concurrent Computer Corporation. All rights reserved. This publication or any part thereof is intended for use with Concurrent Computer Corporation products by Concurrent Computer Corporation personnel, customers, and end-users. It may not be reproduced in any form without the written permission of the publisher.

Disclaimer

The information contained in this document is subject to change without notice. Concurrent Computer Corporation has taken efforts to remove errors from this document, however, Concurrent Computer Corporation's only liability regarding errors that may still exist is to correct said errors upon their being made known to Concurrent Computer Corporation.

License

Duplication of this manual without the written consent of Concurrent Computer Corporation is prohibited. Any copy of this manual reproduced with permission must include the Concurrent Computer Corporation copyright notice.

Trademark Acknowledgments

NightSim, NightStar, PowerWorks, PowerMAXION, PowerMAX OS, Power Hawk, RedHawk, and TurboHawk are trademarks of Concurrent Computer Corporation.

Night Hawk is a registered trademark of Concurrent Computer Corporation.

Motorola is a registered trademark of Motorola, Inc.

PowerStack is a trademark of Motorola, Inc.

Linux is a registered trademark of Linus Torvalds.

Red Hat is a registered trademark of Red Hat, Inc.

Intel is a registered trademark of Intel Corporation.

X Window System is a trademark of The Open Group.

Contents

1.0 Introduction	1
2.0 Documentation	2
3.0 Prerequisites	3
3.1 Host System	3
3.1.1 Software	3
3.1.2 Hardware	3
3.2 Target Systems	4
3.2.1 RedHawk Systems	4
3.2.1.1 Software	4
3.2.1.2 Hardware	4
3.2.2 PowerMAX Systems	4
3.2.2.1 Software	4
3.2.2.2 Hardware	4
4.0 System Installation	5
4.1 Separate Host Installation	5
4.2 Target Installation	7
4.2.1 RedHawk Target Installation	7
4.2.1.1 Configuring PAM Capabilities	7
4.2.2 PowerMAX Target Installation	8
5.0 Overview of NightSim 3.4	10
5.1 Changes in this Release	10
5.2 Known Issues	11
5.2.1 Scheduler Window	11
5.2.2 Monitor Window	11
5.2.3 NightView Integration	12
6.0 Direct Software Support	13

1.0. Introduction

NightSim™ 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.

2.0. Documentation

Table 2-1 lists the NightSim 3.4 documentation available from Concurrent.

Table 2-1. NightSim Version 3.4 Documentation

Manual Name	Pub. Number
<i>NightSim User's Guide</i>	0890480-030
<i>NightSim Version 3.4 Release Notes (Linux)</i>	0898480-3.4

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

3.0. Prerequisites

Prerequisites for NightSim Version 3.4 for both the host system and target systems are as follows:

3.1. Host System

3.1.1. Software

- RedHawk™ Linux *or* Red Hat® Linux*
- Required capabilities**

NOTE

The following capabilities are normally installed by the installation script on the CD containing the NightStar tools. The user will be notified if required capabilities do not exist on the Linux system.

Capabilities	RPMs providing these capabilities
<code>ccur-HyperHelp-scripts</code> <code>ccur-HyperHelp</code> <code>ccur-ktalk</code> <code>ccur-elanlm</code>	<code>ccur-HyperHelp-scripts-6.4.2-002</code> <code>ccur-x11progs-6.4.2-008</code> <code>ccur-x11progs-6.4.2-008</code> <code>ccur-elanlm-5.0-9</code>

3.1.2. Hardware

- an Intel®-based PC - 300Mhz or higher (*recommended minimum configuration*)

or

any iHawk™ Series 860 *or* iHawk Series 870 system

* This product has been extensively tested on RedHawk Linux 1.4, 2.1, and 2.2; Red Hat Linux 8.0 and 9.0; and Enterprise 3.0 WS. 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 in later versions.

3.2. Target Systems

3.2.1. RedHawk Systems

3.2.1.1. Software

- RedHawk Linux 1.4 or later (*iHawk Series 860 systems*)
or
RedHawk Linux 2.2 or later (*iHawk Series 870 systems*)
- Required RedHawk Linux RPMs (see “RedHawk Target Installation” on page 7 for more information)

3.2.1.2. Hardware

- any iHawk Series 860 *or* iHawk Series 870 system

3.2.2. PowerMAX Systems

3.2.2.1. Software

- PowerMAX OS 4.3 or later
- Required PowerMAX OS packages (see “PowerMAX Target Installation” on page 8 for more information)

3.2.2.2. 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

Installation of the host portion of NightSim is normally done as part of the general installation of either the RedHawk NightStar Tools or the PowerWorks Linux Development Environment. A single command installs (or uninstalls) all required software components. See the *RedHawk NightStar Tools Release Notes* (0898008) or *PowerWorks Linux Development Environment Release Notes* (0898000) for more information.

The following section describes how to install (or uninstall) NightSim independently for those rare cases when this is necessary.

NOTE

NightSim requires that certain packages are installed on the 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 software suite in which it is normally distributed. This may be done using the standard Linux product installation mechanism, **rpm** (see **rpm (8)**).

The RPM name associated with NightSim 3.4 is:

ccur-nsim

and the file associated with this RPM is:

iHawk Series 860 (Intel):

ccur-nsim-3.4-000.i386.rpm

which can be found in the **RPM/i386** directory on the installation CD.

iHawk Series 870 (AMD64):

ccur-nsim-3.4-000.x86_64.rpm

which can be found in the **RPM/x86_64** directory on the 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 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

iHawk Series 860 (Intel):

```
cd /mnt/cdrom/RPM/i386
```

iHawk Series 870 (AMD64):

```
cd /mnt/cdrom/RPM/x86_64
```

4. Install the RPM

iHawk Series 860 (Intel):

```
rpm -Uvh ccur-nsim-3.4-000.i386.rpm
```

iHawk Series 870 (AMD64):

```
rpm -Uvh ccur-nsim-3.4-000.x86_64.rpm
```

By default, the product is installed in **/usr/opt**.

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 installation CD from the CD-ROM drive)

```
umount /mnt/cdrom
```

To uninstall the NightSim RPM, use the following command:

```
rpm -e ccur-nsim
```

4.2. Target Installation

4.2.1. RedHawk Target Installation

When targeting a RedHawk Linux system, NightSim requires that the following RPMs are installed on that target system:

NightStar Tool	RPM
NightSim server	<code>ccur-nsimserver-3.4-000-1.i386.rpm</code> (Intel) <code>ccur-nsimserver-3.4-000-1.x86_64.rpm</code> (AMD64)
KoalaTalk	<code>ccur-x11progs-6.4.2-008.i386.rpm</code>
Élan License Manager	<code>ccur-elanlm-5.0-9.i386.rpm</code> (Intel) <code>ccur-elanlm-5.0-9.x86_64.rpm</code> (AMD64)

These RPMs may be installed on the target system by installing the RedHawk NightStar Tools on that system. However, the individual RPMs can be found in the **RPM/i386** and **RPM/x86_64** subdirectories on the installation CD and may be installed separately. See “Separate Host Installation” on page 5 for the procedure to install an individual RPM.

In addition, in order to use the NightSim server on a RedHawk target, each NightSim user must be granted certain capabilities through the Pluggable Authentication Module. See “Configuring PAM Capabilities” below.

4.2.1.1. Configuring PAM Capabilities

RedHawk Linux provides a means to grant otherwise unprivileged users the authority to perform certain privileged operations. The **pam_capability(8)** (Pluggable Authentication Module) is used to manage sets of capabilities, called roles, required for various activities.

RedHawk systems are configured with an `fbscheduser` role which provides the capabilities required to perform real-time scheduling and performance monitor operations. In order to use the NightSim server on a RedHawk target, each NightSim user must be configured to use (at a minimum) the capabilities provided by the `fbscheduser` role by default. In addition, the `/etc/pam.d` configuration files associated with the `rsh` and `login` services must be modified.

To configure user capabilities, you must first become `root`. Edit the `/etc/pam.d/rsh` and `/etc/pam.d/login` files, adding the following line to each, if it is not already present:

```
session    required    /lib/security/pam_capability.so
```

Then edit `/etc/security/capability.conf` and, for each NightSim user on the target system, add the following line at the end of the file:

```
user    username    fbscheduser
```

where `username` is the login name of the user.

If the user requires capabilities not defined in the `fbscheduser` role, add a new role above which contains `fbscheduser` and the additional capabilities needed, and substitute the new role name for `fbscheduser` in the text above.

In order for the above changes to take effect, the user should log off and log back onto the target system.

4.2.2. PowerMAX Target Installation

When targeting a PowerMAX system, NightSim requires that the following software packages are installed on that target system:

NightStar Tool	Package	Version
NightSim	nsimserver	3.4
KoalaTalk	x11progs-008	6.4.2

These packages are normally installed during the installation of the corresponding NightStar tool on the PowerMAX OS system. However, the packages are also included on the PowerWorks Linux Development Environment Installation CD and may be installed by following the procedures below if the packages listed above have not been installed on the target system, or if the versions installed on the target system are not the same as those specified above.

NOTE

The versions of the required software packages installed on the PowerMAX OS target systems must be the same as those 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
```

5.0. Overview of NightSim 3.4

5.1. Changes in this Release

- NightSim supports iHawk Series 870 as either a host or target system.
- NightSim supports up to 16 CPUs.
- NightSim supports configuring and monitoring more processes on a single scheduler. This product has been tested with up to 250 processes on a single scheduler.
- Communication errors in the interface between the NightSim GUI and server have been fixed.
- NightSim now supports multiple versions of the NightSim server on a single RedHawk Linux target. Beginning with NightSim 3.4, the server package may be installed alongside previously released NightSim servers. For instance, installing the NightSim 3.4 server on a RedHawk Linux system with the NightSim 3.3.1 server installed leaves the 3.3.1 server on the target.
- NightSim now properly removes and reconfigures an existing scheduler that is running on a Red Hawk target system.
- NightSim no longer fails to draw the process filter window properly on Linux targets.
- The shell scripts created using the Scheduler menu's “Save as shell script...” now properly create the scheduler even when there are no processes scheduled.
- The `libccur_fbsched.so` and `libccur_rt.so` libraries are no longer required to run the GUI client on Red Hat systems.
- The items in the **TOOLS** menu have been updated to be consistent with other NightStar tools. Also, a **TOOLS** menu has been added to the Monitor window.
- NightSim no longer manipulates the value of the `DISPLAY` variable or ignores the value passed to `nsim` via the X11 `-display` option. NightSim will pass the value of the `DISPLAY` variable (or the value passed by the `-display` option on the `nsim` command line) to the NightSim server. The configured X11 display must be visible to the target system in order to successfully initialize the communications subsystem.
- NightSim no longer gives preference to non-loopback IP devices. NightSim will obtain the IP address of your host given the configured hostname. The configured hostname must have an entry in `/etc/hosts` or else available via an NIS server. This IP address will be passed to the NightSim server on the target system (which may also be the NightSim host). The NightSim client must be reachable from the target system using the configured IP address.

NOTE

If your hostname is configured to be `localhost` or `localhost.localdomain`, you will be unable to use NightSim to schedule programs on a remote target system because the configured IP address will be the loopback device, `127.0.0.1`.

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:

- The special process name **/spare** may only be scheduled on PowerMAX OS targets. **/spare** has no meaning on RedHawk targets, and is interpreted on such systems as a normal executable file name (which is most likely not present).
- 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
 - Linux PAM capabilities or PowerMAX OS 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.
- On PowerMAX OS systems, NightSim may report syntax errors in a configuration file if **admin-user** on the target system reports an error. NightSim presumes that the user's roles and privileges are properly configured.
- 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**.
- The width of the Scheduler window may exceed 1024 pixels. This may cause it to be too wide on some smaller monitors.
- The documentation for the redesigned **Edit Process** window is not yet complete.
- Changing the units associated with the **Clock period** on the Scheduler window modifies the value of the clock period. It has been noted that this is unexpected by some users, and this behavior may change in a future release of NightSim.

5.2.2. 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 a scheduler is stopped and then subsequently resumed, the operating system returns obviously incorrect values to NightSim for **/idle** processor usage. On PowerMAX OS targets, this is also a problem for the **/spare** process.

5.2.3. 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.

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 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.

