

NightView

Version 5.9 Release Notes (Linux)

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1.0. Introduction

NightView™ is a general-purpose, graphical source-level debugging and monitoring tool specifically designed for real-time applications written in C, C++, and Fortran. NightView can monitor, debug, and patch multiple real-time processes running on multiple processors on the local system or on different targets with minimal intrusion. In addition to standard debugging capabilities, NightView supports application-speed eventpoint conditions, hot patches, synchronized data monitoring, exception handling and loadable modules.

2.0. Documentation

Table 2-1 lists the NightView 5.9 documentation available from Concurrent.

Table 2-1. NightView Version 5.9 Documentation

| Manual Name | Pub. Number |
|--|-------------|
| <i>NightView User's Guide</i> | 0890395-280 |
| <i>NightView Version 5.9 Release Notes (Linux)</i> | 0898395-5.9 |
| <i>NightView Pocket Reference</i> | 0890475-080 |

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 above manuals are available:

- online using the **nhelp** utility (*NightView User's Guide* and *NightView Version 5.9 Release Notes (Linux)* only)
- 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 NightView Version 5.9 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.

- NightStar™ Tools

| Capabilities | RPMs providing these capabilities |
|--|---|
| <code>ccur-HyperHelp</code> <code>ccur-HyperHelp-scripts</code> <code>ccur-elanlm</code> | <code>ccur-x11progs-6.4.2-007</code> <code>ccur-HyperHelp-scripts-6.4.2-002</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 1.3, 1.4, and 2.1 as well as Red Hat Linux 8.0. 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 1.3 or later
- Required RedHawk Linux RPMs (see “RedHawk Target Installation” on page 6 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

To use watchpoints, you must have PowerMAX OS 4.3 patch-level 6 (base-006) or PowerMAX OS 5.1 or later. NightView disables the use of watchpoints if it doesn't detect the corresponding support in the kernel.

- Required PowerMAX OS packages (see “PowerMAX Target Installation” on page 7 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 NightView 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) NightView independently for those rare cases when this is necessary.

NOTE

NightView requires that certain packages are installed on the target systems. See “Target Installation” on page 6 for more information.

4.1. Separate Host Installation

At times, it may be necessary to install (or uninstall) NightView 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 NightView 5.9 is:

ccur-NightView

and the file associated with this RPM is:

ccur-NightView-5.9-000.i386.rpm (*Intel*)
ccur-NightView-5.9-000.x86_64.rpm (*AMD64*)

which can be found in the **RPM** 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 NightView 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 NightView RPM

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

4. Install the RPM

```
rpm -Uvh ccur-NightView-5.9-000.i386.rpm (Intel)
rpm -Uvh ccur-NightView-5.9-000.x86_64.rpm (AMD64)
```

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 NightView RPM, use the following command:

```
rpm -e ccur-NightView
```

4.2. Target Installation

4.2.1. RedHawk Target Installation

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

| NightStar Tool | RPM |
|----------------------|--|
| NightView server | <code>ccur-Nviewp-5.9-000.i386.rpm</code> (Intel) <code>ccur-Nviewp-5.9-000.x86_64.rpm</code> (AMD64) |
| Élan License Manager | <code>ccur-elanlm-5.0-9.i386.rpm</code> |

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** subdirectory on the installation CD and may be installed separately. See “Separate Host Installation” on page 5 for the procedure to install an individual RPM.

4.2.2. PowerMAX Target Installation

When targeting a PowerMAX system, NightView requires that the following software package is installed on that target system:

| NightStar Tool | Package | Version |
|----------------|---------------|---------|
| NightView | Nviewp | 5.9 |

This package is normally installed during the installation of NightView on the PowerMAX OS system. However, this package is also included on the PowerWorks Linux Development Environment Installation CD and may be installed by following the procedures below if the package listed above 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 -
```

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 NightView 5.9

5.1. Enhancements

5.1.1. Customizable Buttons and Keys

NightView 5.9 lets you customize the command buttons and the source keys in the Debug Window by specifying resources. The number of buttons and their arrangement and the commands that they run may all be changed. Two special macros are provided to refer to the position of the text cursor in the source pane and to the highlighted text. See the sections titled “Customizing Command Buttons” and “Customizing Source Keys” in Appendix D of the *NightView User’s Guide*.

5.1.2. Series 870 Support

NightView 5.9 supports iHawk Series 870 systems.

5.1.3. Data Window

The default scroll region size has changed from 20 lines to 10000 lines. See the section titled “Data Window Default Scroll Lines” in Chapter 9 of the *NightView User’s Guide*.

Some Data Window dialog boxes have checkboxes to determine if the changes should be applied to existing items. The default is now for the box to be checked: existing items will be changed. See the section titled “Data Window Dialog Boxes” in Chapter 9 of the *NightView User’s Guide*.

5.1.4. Tabs in Source Files

Tabs are expanded when displaying source files to make the files look more like when they are being viewed in a text editor. Tab stops are assumed to be every 8 columns. See the section titled “Debug Source Display” in Chapter 9 of the *NightView User’s Guide*.

5.2. Changes in this Release

The following changes are included in NightView 5.9:

- The new **edit** command, which edits the current source file, is intended to be used primarily from customized buttons and source keys. See the section titled “edit” in Chapter 7 of the *NightView User’s Guide*.
- When a Debug Window command button is clicked, or a key is pressed in the source pane, a corresponding command is echoed to the window's message area. Some menu items also echo a command to the message area. See the section titled “Debug Command Buttons” in Chapter 9 of the *NightView User’s Guide*.
- Some eventpoint commands have been enhanced to take location specifiers in addition to name and number eventpoint specifiers. This is intended to make those commands useful from command buttons. See the section titled “Debug Command Buttons” in Chapter 9 of the *NightView User’s Guide*.

The commands are **name**, **commands**, **delete**, **enable**, **disable**, **mcon-**

trol, **info eventpoint**, **info breakpoint**, **info tracepoint**, **info agentpoint**, **info monitorpoint** and **info patchpoint**. See Chapter 7 of the *NightView User's Guide* for information about these commands.

- The Tools menu now shows only one menu item for the NightBench™ Builder tool. A menu item appears for NightTune™ if that tool is installed on the system. See the section titled “Debug Tools Menu” in Chapter 9 of the *NightView User's Guide*.
- Unlike other command streams, an on restart command stream continues if it gets errors. See the sections titled “Restarting a Program” and “Command Streams” in Chapter 3 of the *NightView User's Guide*.
- If an eventpoint-setting command gets an error, the special eventpoint name '!' is cleared. See the section titled “Eventpoint Specifiers” in Chapter 7 of the *NightView User's Guide*.
- In the remote debug login popup dialog, the CPU binding can select from up to 16 CPUs.
- Internal changes moved some utility routines from the user's stack to allocated patch regions. NightView may need to create additional patch regions in your process for these utilities, particularly to create monitorpoints. See the appendix titled “Implementation Overview” (Appendix E) in the *NightView User's Guide*.
- NightView now reads the program name out of **/proc**. This is usually more reliable than the previous method, which involves examining the program arguments. This also usually avoids the need for patching utility routines into your process. If the name cannot be determined from **/proc**, the previous method is used.
- Debug command buttons now become disabled (dimmed) when no process is being debugged. See the section titled “Debug Command Buttons” in Chapter 9 of the *NightView User's Guide*.
- The **set-disassembly** command has a new parameter to set the level of comments that appear with the instructions. The comments give additional information about the instructions. See the section titled “set-disassembly” in Chapter 7 of the *NightView User's Guide*.
- The **\$ftag** register is now treated as a read-only register. You should now use the **\$fxtag** pseudo-register for this function. See the section titled “iHawk Series 860 Registers” in Chapter 7 of the *NightView User's Guide*.
- The **refresh** command has been modified to re-read source files in addition to clearing the terminal screen and redrawing it. See the section titled “refresh” in Chapter 7 of the *NightView User's Guide*.

NightView 5.9 fixes these problems:

- A **watchpoint** command with no arguments would abort NightView. See the section titled “watchpoint” in Chapter 7 of the *NightView User's Guide*.
- Listing a region of size 1 in disassembly mode would abort NightView. See the section titled “Debug View Menu” in Chapter 9 of the *NightView User's Guide*.
- Some links in the HyperHelp error messages would take you to the glossary. Those links now take you to a description of the command. See the section titled “help” in Chapter 7 of the *NightView User's Guide*.

- When the current context is in a C++ member function, you no longer need to explicitly use “`this->`” to refer to member functions for that class. See the section titled “Expression Evaluation” in Chapter 3 of the *NightView User's Guide*.
- NightView would sometimes show duplicated fields in a structure, or duplicated arguments to a subprogram call.
- NightView can now refer to C++ static member variables.
- NightView 5.9 fixes problems with calling functions that returned structs and functions that returned double.
- NightView 5.9 fixes problems with walking back from the fast system call code in a dynamically linked program.

6.0. Cautions

Special consideration should be given to the following areas:

6.1. Next over Fork

If you **next** over a routine that creates a child process and waits for it to finish (e.g., `system()`), the **next** command will not complete because the debugger has the child process stopped. You cannot switch to the child process to resume it because you cannot switch away from the parent process while it is doing the **next** command. In this case, you need to interrupt the **next** operation with the **Interrupt** button. Then you can switch to the child process and control it.

This does not happen if the debugger does not stop the child process. See the section titled “nodebug” in Chapter 7 of the *NightView User’s Guide*. See the section titled “set-children” in Chapter 7 of the *NightView User’s Guide*.

6.2. Fortran 77 Arrays

There is currently a problem with Fortran 77 arrays passed as formal arguments on PowerMAX OS systems. The compiler generates a temporary variable to optimize references to the array. This temporary variable is then used in place of the original array argument. If the original array argument is not used later in the routine, then the lifetime of the argument is very short and its value is discarded. If you try to use the debugger to reference the argument later in the routine, the results are undefined. You can do two things to avoid running into this problem:

- Use the array later in the routine. For example, pass the array as an argument to another routine. This extends the lifetime of the original argument.
- Use the debugger to look at the array at the first executable line of the routine. The value of the original argument probably still exists at this point.

6.3. Scroll Bars

Some users have had a problem using the scroll bars in the graphical user interface. When the up-arrow button on a scroll bar is clicked, the window scrolls the length of the entire window contents, rather than just one line. This problem is caused by an inappropriate X resource, which has apparently been copied from one user to another in much the same way as `$HOME/.profile` files are often copied:

```
*XmScrollBar*translations: <Btn1Down>: Select()
```

You should remove this resource from your `$HOME/.Xdefaults` or whatever other means you use for setting X resources. This resource affects any Motif application, not just NightView.

6.4. Accessing Variables While in Subprogram Prologue

Because the compilers generate line-number information for code that comprises the prologue of a subprogram, you may inadvertently set an eventpoint or stop your program at such a location. The prologue is the code that the compiler generates to set up the execution environment for a subprogram; until that code completes execution, the environment is incomplete. Attempts to access variables while in the context of the prologue may result in errors from NightView or may result in erroneous values.

If you suspect such a problem, you can determine whether you are in the prologue by doing the following:

- Stop the program at the point where the referencing problem occurs.
- Enter the command **info frame**.
- If the output from this command says something like “Could not obtain frame description information”, then you are probably stopped in the prologue.

To try and avoid this problem, do not set an eventpoint on the lines containing a subprogram heading. If you want to set the eventpoint at the beginning of the subprogram, use the *unit_name* (for Ada) or *function_name* form of location specifier, rather than a *file_name* and *line_number*. See the section titled “Location Specifiers” in Chapter 7 of the *NightView User’s Guide*.

6.5. Telnet Protocol

NightView uses telnet to establish a connection for remote debugging. Any RedHawk systems that will be the target for remote debugging should not be using the Kerberos telnet protocol. Here are example commands to disable Kerberos telnet and enable regular telnet:

```
chkconfig krb5-telnet off
chkconfig telnet on
```

6.6. Reattach Not Supported

Attaching to a process from which you have detached is not supported. Avoid detaching from processes unless you are sure you will not want to debug them further. See the section titled “Detaching” in Chapter 3 of the *NightView User’s Guide*.

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.

