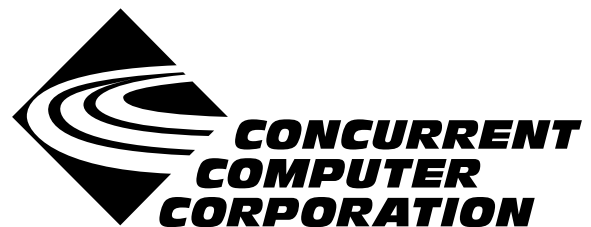


NightView

Version 5.4 Release Notes (Linux)

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1.0. Introduction

NightView™ is part of the PowerWorks™ Linux Development Environment (PLDE) and is a general-purpose, graphical source-level debugging and monitoring tool specifically designed for real-time applications written in Ada, 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.

NightView 5.4 has these new features:

- The Data Window provides a convenient graphical method for browsing data.
- You can attach to a process via a menu and popup showing the processes on the system, or by using an option when you invoke NightView.
- More buttons have been added to the Debug Window.
- The number of watchpoints allowed in a process has changed.

2.0. Documentation

Table 2-1 lists the NightView 5.4 documentation available from Concurrent.

Table 2-1. NightView Version 5.4 Documentation

Manual Name	Pub. Number
<i>NightView User's Guide</i>	0890395-230
<i>NightView Version 5.4 Release Notes (Linux)</i>	0898395-5.4
<i>NightView Pocket Reference</i>	0890475-050

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 *NightView User's Guide* and *NightView Version 5.4 Release Notes (Linux)* 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

3.0. Prerequisites

Prerequisites for NightView Version 5.4 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>ccur-HyperHelp</code> <code>ccur-HyperHelp-scripts</code>	<code>ccur-x11progs-6.4.2-003</code> <code>ccur-HyperHelp-scripts-6.4.2-002</code>

* This product has been extensively tested on Red Hat Linux 7.1 and 7.2. However, this product has not been tested with versions of Linux supplied by other vendors.

- Red Hat Linux

Capabilities	RPMs providing these capabilities
ld-linux.so.2 libICE.so.6 libSM.so.6 libX11.so.6 libXext.so.6 libXmu.so.6 libXp.so.6 libXt.so.6 libc.so.6 libc.so.6(GLIBC_2.0) libc.so.6(GLIBC_2.1) libm.so.6 libm.so.6(GLIBC_2.0) libncurses.so.4 libpthread.so.0 libpthread.so.0(GLIBC_2.0) libpthread.so.0(GLIBC_2.1) libstdc++-libc6.1-1.so.2	<i>Red Hat 7.1:</i> compat-glibc-6.2-2.1.3.2 compat-libstdc++-6.2-2.9.0.14 glibc-2.2.4-19.3 ncurses4-5.0-2 XFree86-libs-4.1.0-15 <i>Red Hat 7.2:</i> compat-glibc-6.2-2.1.3.2 compat-libstdc++-6.2-2.9.0.16 glibc-2.2.4-13 ncurses4-5.0-4 XFree86-libs-4.1.0-3

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 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.

- **Nviewp** 5.4 (see “Target Installation” on page 8 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

4.0. System Installation

Installation of the host portion of NightView 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) NightView separately from the PLDE suite for those cases when this is necessary.

In addition, NightView requires that certain packages be installed on the PowerMAX OS target systems. See “Target Installation” on page 8 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 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 NightView 5.4 is:

```
ccur-NightView
```

and the file associated with this RPM is:

```
ccur-NightView-5.4-000.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 NightView 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 NightView RPM

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

4. Install the RPM

```
rpm -i ccur-NightView-5.4-000.i386.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 PowerWorks Linux Development Environment 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

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

NightStar Tool	Package	Version
NightView	Nviewp	5.4

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 -
```

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 5.4

5.1. Enhancements

5.1.1. Data Window

The Data Window lets you browse through your program's data.

You can display:

- variables and other expressions
- all the local variables for the current frame
- registers
- the call stack
- threads

You can access the Data Window with the **Data Display** button or through the **Display** menu in the Debug Window.

See the sections titled “Debug Command Buttons”, “Debug Display Menu”, and “Data Window” in Chapter 9 of the *NightView User's Guide* (0890395).

5.1.2. Attach Enhancements

In addition to using the **attach** command, you can now attach to existing processes through the graphical user interface. The **Attach...** button in the **Dialogue** menu of the Dialogue Window pops up a dialog that lets you select processes by PID, by user name, and by command name. See the section titled “attach” in Chapter 7 of the *NightView User's Guide* (0890395). See the section titled “Dialogue Menu” in Chapter 9 of the *NightView User's Guide* (0890395).

You can also attach to an existing process with an option when you invoke NightView. See Chapter 9, “Invoking NightView”, in the *NightView User's Guide* (0890395).

5.1.3. New Debug Window Buttons

Up and **Down** buttons let you move within the call stack. The **Data Display** button lets you add an expression to a Data Window. See the section titled “Debug Command Buttons” in Chapter 9 of the *NightView User's Guide* (0890395).

5.1.4. Watchpoints

You can now have more than one watchpoint in a process, as long as no more than one watchpoint is enabled in each process. See the section titled “Watchpoints” in Chapter 3 of the *NightView User's Guide* (0890395).

5.2. Changes in This Release

5.2.1. No Ada License

On systems that require a run-time license, NightView no longer requires a separate Ada license to debug Ada programs. See Chapter 6, “Invoking NightView”, in the *NightView User’s Guide* (0890395).

5.2.2. Eventpoints

NightView 5.4 fixes these problems:

- Monitorpoints did not work for bit-packed Ada types. See the section titled “Monitorpoints” in Chapter 3 of the *NightView User’s Guide* (0890395).
- Monitorpoint field widths were wrong for some expression types.
- NightView would abort if you entered an **mcontrol off** command before the Monitor Window existed. See the section titled “mcontrol” in Chapter 7 of the *NightView User’s Guide* (0890395).
- NightView would abort if you entered an invalid **watchpoint** command. See the section titled “watchpoint” in Chapter 7 of the *NightView User’s Guide* (0890395).
- Setting a breakpoint at the beginning of a function, where the function begins with an inline function call, would set a breakpoint at every instance of that inline. See the section titled “Inline Subprograms” in Chapter 3 of the *NightView User’s Guide* (0890395).
- Attempting to set a tracepoint, while the process was running, when no eventpoints had been set in the process before, would cause NightView to be unable to set any eventpoints in that process. See the section titled “Tracepoints” in Chapter 3 of the *NightView User’s Guide* (0890395).

5.2.3. Location Lists

NightView 5.4 has improved support for location lists generated by the compiler. Location lists give detailed information about the location of variables by code address.

5.2.4. Core Files

info memory is now implemented for core files. See the section titled “info memory” in Chapter 7 of the *NightView User’s Guide* (0890395). NightView no longer incorrectly warns that the stack pointer is out of range for core files.

This release fixes a problem with reading from core files if the read crossed segment boundaries.

5.2.5. Language Support

The default value of **set-overload routine** is now on. See the section titled “set-overload” in Chapter 7 of the *NightView User’s Guide* (0890395).

NightView 5.4 fixes these problems:

- NightView would hang when printing very large arrays in a remote debug session.
- NightView would sometimes show a type name in the local variables list. See the section titled “info locals” in Chapter 7 of the *NightView User’s Guide* (0890395).
- NightView would abort when doing **info locals** on some Ada programs.
- NightView would give an unclear message if you tried to print an expression which was a function returning `void`.

- NightView could not call out-of-line copies of inline member functions in C++.
- NightView would not get the right results comparing an unsigned value and a signed value.
- The performance of printing large arrays is improved.
- Ada enumeration constants are now considered candidates for overloading. See the section titled “Overloading” in Chapter 3 of the *NightView User’s Guide* (0890395).
- Floating-point literals now work when the language is Ada.
- More space is allocated for processing complex expressions.

5.2.6. Remote Debugging

C++ is no longer required to be installed on the target system when you are using remote debugging and you specify a time quantum. See the section titled “Remote Login Dialog Box” in Chapter 9 of the *NightView User’s Guide* (0890395).

NightView 5.4 fixes a problem that would cause NightView to hang when writing large amounts of data between NightView and NightView.p during remote debugging.

5.2.7. Miscellaneous

NightView 5.4 fixes a problem that would sometimes cause NightView to abort on exit.

The `dabr` register is no longer printed by **info registers** by default. See the section titled “info registers” in Chapter 7 of the *NightView User’s Guide* (0890395).

NightView 5.3 would fail to dump out the remainder of the log for **set-log** if you did not do a **set-log close** before exiting NightView. NightView 5.4 dumps out the remainder of the log when it exits.

6.0. Cautions

6.1. SFNOLIM Kernel Tunable

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

6.2. Breakpoint Command Streams

The current implementation of breakpoint command streams does not include protection against concurrent access of data structures internal to the debugger. Avoid referencing other processes within breakpoint command streams. In practice, this is rarely a problem.

6.3. Fortran 77 Arrays

There is currently a problem with Fortran 77 arrays passed as formal arguments. 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.

6.4. 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.

6.5. Accessing Variables While in Prologue of Subprogram

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* (0890395).

6.6. Shared Objects

For core files, NightView cannot always find correct stack description information (tdesc) for shared objects. This problem occurs when the shared objects are built without position-independent code. This problem can cause NightView to display the wrong results for any routine other than the most recently called routine. For example, a **backtrace** command may print the wrong information, or an **up** command may fail. This is true for any release of NightView, not just 5.4. This is not a problem for running processes, only for core files.

We recommend that you build shared objects with position-independent code if you plan to debug programs that use them. For C and Fortran, use the **-zpic** option. See **cc(1)** or **f77(1)**. For Ada, use **-sm shared** or **-sm both**. For HAPSE Ada, see "Shared Libraries and Shared-Objects" in the *HAPSE Reference Manual* (0890288). For MAXAda, see "Compile Options" and "Shared Objects" in the *MAXAda Reference Manual* (0890516).

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.

