PowerMAX
Cross-Development Packages
Version 1.4 Release Notes

February 2004

0891088-1.4

CONCURRENT
COMPUTER
CORPORATION

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

NightStar, PowerMAXION, PowerMAX OS, TurboHawk, and Power Hawk 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.

OSF/Motif is a registered trademark of The Open Group.

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 Software 3

3.2 Hardware 3

4.0 System Installation 4

4.1 Installation Datastreams 5

4.1.1 DAT Installation 5

4.1.2 CD Installation 6

4.2 Installation Instructions 6

4.3 Removing Datastream Packages 9

4.4 Cross-Development Compilation Environments 9

4.4.1 MAXAda 10

4.4.2 Concurrent C/C++ 12

5.0 Direct Software Support 13

1.0. Introduction

The PowerMAX Cross-Development Packages allow users to develop applications for various versions of PowerMAX OS™ from a single system. Various target machine platforms are supported.

Supported operating system revisions include:

- PowerMAX OS 4.3
- PowerMAX OS 5.1
- PowerMAX OS 6.1

Supported machine platforms include:

System type	*architecture*
PowerMAXION™-4	**nh**
PowerMAXION	**nh**
Night Hawk® 6800	**nh**
Night Hawk 6800 Plus	**nh**
TurboHawk™	**nh**
Power Hawk™ 610	**moto**
Power Hawk 620	**moto**
Power Hawk 640	**moto**
PowerStack™	**moto**
PowerStack II	**moto**
Power Hawk 710	**synergy**
Power Hawk 720	**synergy**
Power Hawk 740	**synergy**
Power Hawk 910	**synergy**
Power Hawk 920	**synergy**

where *architecture* is the specification used by the MAXAda and Concurrent C/C++ compilation environments. See *Cross-Development Compilation Environments* on page 9 for more information.

All combinations of the above host and target operating system revisions and platforms are supported.

2.0. Documentation

Table 2-1 lists the PowerMAX Cross-Development Packages 1.4 documentation available from Concurrent.

Table 2-1. PowerMAX Cross-Development Packages Version 1.4 Documentation

Manual Name	Pub. Number
PowerMAX Cross-Development Packages Version 1.4 Release Notes	0891088-1.4

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 X Window System utility, **`nhelp`**
- on the Concurrent Computer Corporation web site at www.ccur.com

3.0. Prerequisites

Prerequisites for PowerMAX Cross-Development Packages Version 1.4 are as follows:

3.1. Software

- PowerMAX OS 4.3 or later
- MAXAda Version 3.3.3 *(for Ada program development)*[*]
- Concurrent C/C++ Version 5.4 or later *(for C/C++ program development)*

3.2. 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

* MAXAda Version 3.3.1 (w/ patch 002) or later is sufficient for targeting PowerMAX OS 4.3 and 5.1.

4.0. System Installation

The PowerMAX Cross-Development Packages support building applications for various versions of PowerMAX OS from a single system. In addition, a number of target machine platforms are supported (see “Introduction” on page 1 for a list of supported systems).

The PowerMAX Cross-Development Packages are grouped by both the platform of the target system and the version of the operating system running on the target. The packages are further subdivided into a base package and optional product packages.

Each base package contains libraries and headers which correspond to a particular version and patch level of the operating system. PowerMAX Cross-Development Packages Version 1.4 contains base packages for the following versions/patch levels of PowerMAX OS:

PowerMAX OS Version	Patch Level
PowerMAX OS 4.3	P13
PowerMAX OS 5.1	SR7
PowerMAX OS 6.1	---

For example, the following packages provide cross-compilation to a Power Hawk 710 series machine running PowerMAX OS 5.1:

Base package	
xdev51synergy	PowerMAX OS 5.1 Libraries and Headers
Optional product packages	
dmn331S51	Datamon 3.3.1 Libraries and Headers for PowerMAX OS 5.1
f7741S51	Fortran 77 4.1 Libraries and Headers for PowerMAX OS 5.1
ntr53S51	NightTrace 5.3 Libraries and Headers for PowerMAX OS 5.1
x11642S51	X11 6.4.2 Libraries and Headers for PowerMAX OS 5.1
xdevc51synergy	Domestic Encryption Libraries and Headers for PowerMAX OS 5.1

The optional product cross-development packages may not be required for all user applications. However, installation of certain packages may be required if your application utilizes features in those packages.

The optional product cross-development packages require that their corresponding native optional product packages are already installed on the host system (in addition to the appropriate base cross-development package).

Thus, in order to install the **ntr53S51** package, the **xdev51synergy** package as well as the **ntracelog** version 5.3 package must be installed on the host system.

The optional product cross-development packages consist of symbolic links to the libraries and headers contained in the corresponding product files installed on the host machine. The symbolic links are required for proper operation during cross-compilation and linking.

4.1. Installation Datastreams

For convenience, the PowerMAX Cross-Development Packages are separated into distinct datastreams, one for each target OS version and platform.

The installation commands differ slightly depending on the distribution media, and the datastreams may or may not be in compressed form. See "DAT Installation" on page 5 to install from DAT. For installation via CD, see "CD Installation" on page 6.

If you already have a previous version of the PowerMAX Cross-Development Packages installed on your system, you will first need to remove all of the existing packages corresponding to the specific datastream you want to upgrade to. See "Removing Datastream Packages" on page 9 for details.

4.1.1. DAT Installation

The following datastreams are provided as compressed files in **`tar(1)`** format on the DAT:

- **`cross_dev_nh_4.3.Z`**
- **`cross_dev_moto_4.3.Z`**
- **`cross_dev_nh_5.1.Z`**
- **`cross_dev_moto_5.1.Z`**
- **`cross_dev_synergy_5.1.Z`**
- **`cross_dev_synergy_6.1.Z`**

Each compressed file is approximately 10MB.

To install from DAT:

1. Insert the PowerMAX Cross-Development Packages 1.4 DAT into the tape drive.
2. Choose the appropriate datastream filename based on both the platform of the target system of interest and the version of the operating system running on it.
3. Issue the following command as the root user to extract the compressed datastream from the tape:

   `tar xf` *tape_device datastream_filename*

4. Uncompress and install the packages from the datastream file by issuing the following command as the root user:

   `zcat` *datastream_filename* **`| pkgadd -d -`**

For instance, to develop user applications targeted for a Power Hawk 710 running PowerMAX OS 5.1, issue the following commands on your host development system:

```
tar xf /dev/rmt/0h cross_dev_synergy_5.1.Z
zcat cross_dev_synergy_5.1.Z | pkgadd -d -
```

See “Installation Instructions” on page 6 for subsequent information during the installation process.

4.1.2. CD Installation

The following datastreams are provided in the root directory of the CD:

- **cross_dev_nh_4.3**
- **cross_dev_moto_4.3**
- **cross_dev_nh_5.1**
- **cross_dev_moto_5.1**
- **cross_dev_synergy_5.1**
- **cross_dev_synergy_6.1**

To install PowerMAX Cross-Development Packages Version 1.4 from CD:

1. Insert the PowerMAX Cross-Development Packages 1.4 CD into the CD-ROM drive.
2. As the root user, execute commands similar to the following to mount the CD-ROM device:

   mkdir /mnt/cdrom
   mount -F cdfs -r *cd_device* **/mnt/cdrom**

   (where *cd_device* is typically **/dev/cd/0**)
3. Choose the appropriate datastream filename based on both the platform of the target system of interest and the version of the operating system running on it.
4. Issue the following commands as the root user to install the packages from the datastream:

   zcat *datastream_filename* **| pkgadd -d -**

4.2. Installation Instructions

Regardless of the type of media (see “Installation Datastreams” on page 5), once the **pkgadd** command has been issued, you should see messages similar to the following:

```
The following packages are available:
  1  dmn331S51      Data Monitoring Cross-Development Environment for PMAX 5.1 (synergy)
                    (ppc) 3.3.1
  2  f7741S51       Fortran 77 Cross-Development Libraries for PMAX 5.1 (synergy)
                    (ppc) 4
  3  ntr53S51       NightTrace Cross-Development Environment for PMAX 5.1 (synergy)
                    (ppc) 5.3
  4  x11642S51      X11 Cross-Development Environment for PMAX 5.1 (synergy)
                    (ppc) 6.4.2
  5  xdev51synergy  Development Environment - Power Hawk Series 700
                    (ppc) 5.1
  6  xdevc51synergy Domestic Encryption DE - Power Hawk Series 700
                    (ppc) 5.1
  7  xdevreln       PowerMAX Cross-Development Release Notes
                    (ppc) 1.4

Select package(s) you wish to process (or 'all' to process
all packages). (default: all) [?,??,q]:
```

Even though the packages are listed in alphabetical order, the packages are actually included in the datastream in dependency order so that if you choose **`all`** to process all packages, they will be installed appropriately with respect to each other.

If you decide not to install all the packages, you *must* ensure that you install the Development Environment package *first* as all the other packages depend upon it. The Development Environment package is named:

`xdev`<*version*><*architecture*>

where <*version*> is an abbreviated form of the operating system (for instance, **`5.1`** is abbreviated to **`51`**) and <*architecture*> corresponds to the architectures listed in the *Introduction* on page 1.

Therefore, the Development Environment for a Power Hawk 710 running PowerMAX OS 5.1 would be:

`xdev51synergy`

You may install a subset by specifying a comma-separated list of packages by their corresponding number. For example, based on the above sample output from the **`zcat`** command, you would enter:

`5,4`

at the prompt to install the **`xdev51synergy`** and **`x11642S51`** packages.

NOTE

The optional product cross-development packages will not install if their corresponding native packages are not already installed.

Since each datastream includes the package **xdevreln** (which contains the online version of *PowerMAX Cross-Development Packages Version 1.4 Release Notes*), attempts to install more than one datastream will result in the following diagnostic:

```
PowerMAX Cross-Development Release Notes
(ppc) 1.4

A version of the <xdevreln> package is already installed on this machine.
Current administration does not allow new instances of an existing package to be
created, nor existing instances to be overwritten.

No changes were made to the system.
```

This message may be ignored. Installation of the remaining packages will continue normally.

4.3. Removing Datastream Packages

If you already have a previous version of the PowerMAX Cross-Development Packages installed on your system, you will first need to remove all of the existing packages corresponding to the specific datastream you want to upgrade to. See **pkgrm(1M)** for more information.

This will include the following packages:

xdev<*version_abbrev***><***architecture***>**
xdevc<*version_abbrev***><***architecture***>**
dmn331<*architecture_abbrev***><***version_abbrev***>**
f7741<*architecture_abbrev***><***version_abbrev***>**
ntr53<*architecture_abbrev***><***version_abbrev***>**
x11642<*architecture_abbrev***><***version_abbrev***>**

where

<*version_abbrev***>** is

- **43** for 4.3
- **51** for 5.1
- **61** for 6.1

<*architecture***>** is

- **synergy**
- **moto**
- **nh**

<*architecture_abbrev***>** is

- **S** for synergy
- **N** for nh
- **M** for moto

For example:

```
pkgrm dmn331S51 f7741S51 ntr53S51 x11642S51
pkgrm xdevc51synergy xdev51synergy
```

4.4. Cross-Development Compilation Environments

The PowerMAX Cross-Development Packages support building PowerMAX OS applications for various versions of PowerMAX OS and various systems.

The architecture/platform-specific files are installed in:

/pmax/os/*os_ver***/***architecture***/usr/include**
/pmax/os/*os_ver***/***architecture***/usr/lib**

For example, the headers and libraries for a Power Hawk 710 running PowerMAX OS 5.1 would be installed in:

```
/pmax/os/5.1/synergy/usr/include
/pmax/os/5.1/synergy/usr/lib
```

The MAXAda and Concurrent C/C++ compilation environments both provide easy-to-use interfaces to these packages (as described in the following sections). These interfaces are the preferred method of referencing the headers and libraries as opposed to making specific references by `#include`-ing the full pathnames in source files or by specifying the full pathnames to **`-I`** or **`-L`** options in Makefiles.

In addition, the files located under **`/usr/include`** and **`/usr/lib`** on the host development system are native files and may be incompatible with the corresponding files for the target system. Do not attempt to utilize files from those directories when building the applications to run on the target system.

Therefore, remove any explicit references to those directories in:

- source files (e.g. `#include "/usr/include/unistd.h"`)
- Makefiles (e.g. **`cc -I/usr/include`** or **`cc -L/usr/lib`**)
- build scripts

However, `#include` file references of the form:

```
#include <unistd.h>
```

or

```
#include "unistd.h"
```

need not be changed.

4.4.1. MAXAda

To utilize the PowerMAX Cross-Development Packages with MAXAda, you should have MAXAda version 3.3.3.*

Use the following link options:

```
-osversion
-arch
```

The **`-osversion`** link option partially determines which libraries are included and/or referenced when linking partitions. Its syntax is:

`-osversion` *os_ver*

where *os_ver* is the target PowerMAX OS version and can be one of:

- **`4.3`**
- **`5.1`**
- **`6.1`**

* MAXAda Version 3.3.1 (w/ patch 002) or later is sufficient for targeting PowerMAX OS 4.3 and 5.1.

The **-arch** link option partially determines which libraries are included and/or referenced when linking partitions. Its syntax is:

-arch *architecture*

where *architecture* is the target architecture, and can be one:

- **nh**
- **moto**
- **synergy**

which correspond to the systems listed in the *Introduction* on page 1.

If specified for a particular partition or for its containing environment, the partition is linked so that it will execute properly on the specified architecture.

To obtain a list of target architectures and the systems associated with each of them, issue any of the following commands with the **-HA** option:

- **a.mkenv**
- **a.partition**
- **a.link**

You can change the **osversion** and **arch** settings in several ways:

- Set the **arch** and **osversion** when creating an environment using **a.mkenv**:

  a.mkenv -arch *architecture* **-osversion** *os_ver*

- Set the **arch** and **osversion** for an environment after it has been created using **a.options**:

  a.options -default -oset "-arch *architecture* **-osversion** *os_ver***"**

- Set the **arch** and **osversion** for a specific partition using **a.partition**:

  a.partition -oappend "-arch *architecture* **-osversion** *os_ver***" main**

4.4.2. Concurrent C/C++

To utilize the PowerMAX Cross-Development Packages with Concurrent C/C++, you must have Concurrent C/C++ version 5.4 or later.

Use the following compilation and linking options:

```
--osversion
--arch
```

The current versions of PowerMAX OS (**osversion**) that are supported are:

- **4.3**
- **5.1**
- **6.1**

The current architectures (**arch**) that are supported are:

- **nh**
- **moto**
- **synergy**

which correspond to the systems listed in the *Introduction* on page 1.

You can change the **osversion** and **arch** settings in several ways:

- Specify the options on the **ec** or **ec++** command line:

  ec -o main main.c --arch=*architecture* **--osversion=***os_ver*

- Change the default for your user on a specific system using the Concurrent C/C++ command line utility **c.release**:

  c.release -arch *architecture* **-osversion** *os_ver*

- When using the Concurrent C/C++ PDE utilities (**c.build**, etc.), you can:
  - Set the **arch** and **osversion** for an environment using **c.mkenv**:

    c.mkenv -arch *architecture* **-osversion** *os_ver*

  - Set the **arch** and **osversion** for a specific partition using **c.partition**:

    c.partition -oset "--arch=*architecture* **--osversion=***os_ver***" main**

5.0. 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.