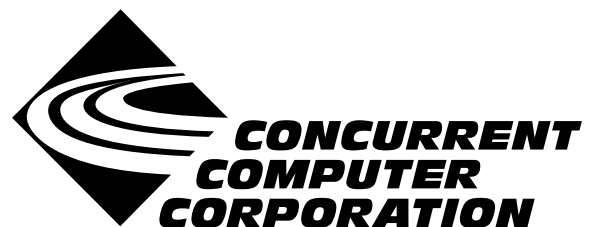


shmdefine

Version 1.2 Release Notes (Linux)

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1.0. Introduction

The **shmdefine** utility is designed to facilitate the use of shared memory by a set of cooperating programs. While most useful for sharing common blocks between Fortran programs, it helps Fortran, C, and Ada programs to effectively utilize the IPC shared memory services.

Input to the **shmdefine** utility defines the shared memory segment or segments that are to be used by the cooperating programs. The linker command script generated by **shmdefine** describes the shared memory regions to the linker.

shmdefine currently operates with the Concurrent native Ada and Fortran compilers (e.g., MAXAda™ and **cf77**), as well as the GNU C/C++ and Fortran compilers (e.g., **gcc**, **g++**, and **g77**) targeting RedHawk™ Linux® systems. It also operates with Concurrent C, C++, Fortran, and Ada cross-compilers (e.g., **ec**, **ec++**, **xf77**, and MAXAda) targeting PowerMAX OS™.

2.0. Documentation

Table 2-1 lists the **shmdfine** 1.2 documentation available from Concurrent.

Table 2-1. shmdfine Version 1.2 Documentation

Manual Name	Pub. Number
<i>Quick Reference for shmdfine</i>	0898010-020
<i>shmdfine Version 1.2 Release Notes (Linux)</i>	0898013-1.2

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 RedHawk Linux utility, **nhelp**
- in PDF format in the **documentation** directory of the RedHawk NightStar Tools Installation CD
- on the Concurrent Computer Corporation web site at www.ccur.com

3.0. Prerequisites

Prerequisites for **shdefine** Version 1.2 for both the host system and target system 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-x11progs-6.4.2-007</code> <code>ccur-HyperHelp-scripts-6.4.2-002</code>

3.1.2. Hardware

- any iHawk™ Series 860 system *or* iHawk Series 870 system
or
an Intel®-based PC - 300Mhz or higher (recommended minimum configuration)

3.2. Target System

3.2.1. RedHawk Systems

3.2.1.1. Software

- RedHawk Linux 1.4 or later

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

3.2.1.2. Hardware

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

3.2.2. PowerMAX Systems

3.2.2.1. Software

- PowerMAX OS 4.3 or later

3.2.2.2. 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

NOTE

shmdefine can be used to build programs for a variety of target systems, but not all host/target combinations are supported.

The following table shows the valid combinations:

Host System	Target System
Red Hat Linux (Intel-based PC)	RedHawk Linux (iHawk Series 860) PowerMAX OS
RedHawk Linux (iHawk Series 860)	RedHawk Linux (iHawk Series 860) PowerMAX OS
RedHawk Linux (iHawk Series 870)	RedHawk Linux (iHawk Series 870)

Use the appropriate compiler and linker for your host/target combination.

4.0. System Installation

Installation of **shmdefine** is normally done as part of the general installation of the RedHawk NightStar Tools software suite. A single command installs (or uninstalls) all software components of the RedHawk NightStar Tools, as described in the *RedHawk NightStar Tools Release Notes* (0898008).

The following section describes how to install (or uninstall) **shmdefine** separately from the RedHawk NightStar Tools suite for those cases when this is necessary.

4.1. Separate Host Installation

At times, it may be necessary to install (or uninstall) **shmdefine** independent of the installation of the RedHawk NightStar Tools software suite. This may be done using the standard Linux product installation mechanism, **rpm** (see **rpm(8)**).

The RPM name associated with **shmdefine** 1.2 is:

```
ccur-shmdefine-1.2-000
```

and the file associated with this RPM is:

```
ccur-shmdefine-1.2-000.i386.rpm
```

which can be found in the **RPM** directory on the RedHawk NightStar Tools Installation CD.

NOTE

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

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

1. Insert the RedHawk NightStar Tools 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 **shmdefine** RPM

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

4. Install the RPM

```
rpm -i ccur-shmdefine-1.2-000.i386.rpm
```

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 **shmdfine** RPM, use the following command:

```
rpm -e ccur-shmdfine-1.2-000
```

5.0. Changes in this Release

5.1. Support for Fortran Datapools

A new Variables clause has been added to support Fortran Datapools and has the following syntax:

```
Fortran Datapool poolname, "filename.o"
```

The variables from *poolname* listed in the Fortran datapool dictionary object file, *filename.o*, are included in the current region. Each datapool dictionary filename appearing in a Fortran Datapool variable clause must have been previously created from a datapool definition and must be present when running **shmdefine**. The object file is read by **shmdefine** to determine the members of the datapool and emit appropriate entries in the generated linker control file.

For instance, given the Fortran datapool definition source file **pool.dp**:

```
datapool/poolname/x, y, z
end
```

Compile it with the Concurrent Fortran compiler:

```
cf77 -c -g pool.dp
```

The following **shmdefine** input file, **shmdefine.input**, specifies that the datapool *poolname* should be associated with a shared memory segment identified by the `ftok()` filename **/tmp/key**:

```
SHARED REGION shared_pool
KEY="/tmp/key"
Fortran Datapool poolname, "pool.o"
END SHARED REGION
```

Invoke **shmdefine** and compile its output C source files as follow:

```
shmdefine shmdefine.input
cc -c -g shm_init.sm.c
```

Given the main Fortran program **main.f** which simply increments the shared variable *y* by 1 and prints the value:

```
program main
datapool/pool/y
call shm_init
y = y + 1
write *, "y =", y
end
```

Build the program with the following command:

```
cf77 -o main main.f shm_init.sm.ld shm_init.sm.o pool.o
```

Executing the program twice shows how the variable `y` is associated with a shared memory segment on the system:

```
> touch /tmp/key
> main
y = 0.0
> main
y = 1.0
```

The Fortran `Datapool` clause replaces the `INCLUDE` clause as the recommended means for sharing datapools using `shmdefine`. The `INCLUDE` clause has been deprecated on Linux targets, and will be removed in a future release. (Because the existing `INCLUDE` clause was non-functional on Linux, this should not cause a problem for existing users.)

5.2. Default Fortran Naming Conventions

`shmdefine` 1.2 uses Concurrent Fortran naming conventions by default.

If you are using GNU Fortran to compile common block definitions, specify the `-G/--gnu-f77` option to `shmdefine` in order to use GNU Fortran naming conventions for common blocks. This will ensure that the common block data is shared properly.

NOTE

This option is only valid on RedHawk Linux target systems since GNU Fortran is not supported on PowerMAX OS. When generating files for use on a PowerMAX OS target, the `-G/--gnu-f77` option is ignored.

In addition, `shmdefine` 1.2 provides a new variable clause in the `shmdefine` input file to specify the default naming convention. Its syntax is:

```
[FORTRAN COMPILER compiler]
```

where *compiler* can be GNU or CONCURRENT.

NOTE

The command-line option takes precedence over the variable clause.

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.

