

UNICOS/mk[®] 2.0.5 Release
Overview

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Introduction [1]

The *UNICOS/mk 2.0.5 Release Overview* is a public document that provides an overview of the key features of the UNICOS/mk 2.0.5 release.

1.1 Contents of This Release Overview

This release overview includes the following chapters:

- Chapter 2, page 3, provides an overview of the changed software features and functionality for the UNICOS/mk 2.0.5 operating system.
- Chapter 3, page 11, describes the printed and online documentation supporting this release.
- Chapter 4, page 17, describes the customer services offered for software support. This includes training, problem reporting, and general service information.
- Chapter 5, page 21, contains hardware and software requirements for this release, a list of the release package contents, and licensing information.

A copy of this release overview is included on the *Online Software Publications Library* CD that is included with your UNICOS/mk 2.0.5 release package. ASCII and PostScript files of this release overview are also available on the Cray Research CRInform system, which is an online information and problem-reporting system for Cray Research customers and Cray Research personnel. If you do not have access to the CRInform system but would like a copy of the files, contact your Cray T3E representative. For more information about CRInform, see Section 4.3, page 18.

1.2 UNICOS/mk 2.0.4 Release Support Policy

As per the standard UNICOS/mk support policy, the UNICOS/mk 2.0.4 operating system release will continue to be supported until May, 2000, which is 6 months after the UNICOS/mk 2.0.5 operating system release is available.

1.3 Reader Comments

If you have comments about the technical accuracy, content, or organization of this document, please tell us; send electronic mail to pubs@cray.com. Be sure to include the title and part number of the document with your comments. We value your comments and will respond to them promptly.

New and Changed Features [2]

This chapter highlights new features and changes added in the UNICOS/mk 2.0.5 operating system release. Differences from the UNICOS/mk 2.0.4 operating system release are also noted.

2.1 Resiliency Features

The following features were added in the UNICOS/mk 2.0.5 operating system release to enhance system resiliency:

2.1.1 New Mainframe `warmboot` Capability

Administrators now can perform a warmboot from the Cray T3E mainframe. The mainframe `warmboot(8)` command has been added because the SWS `t3epeboot(8)` command is not compatible with dynamic PE renumbering (for information about dynamic PE renumbering, see Section 2.1.2, page 3).

Note: In the UNICOS/mk 2.0.5 release, a warmboot can be performed from either the mainframe or from the SWS. As of the UNICOS/mk 2.0.6 release, a warmboot should be performed only from the mainframe—it will no longer be supported on the SWS.

Advantages of using the mainframe `warmboot(8)` command instead of the SWS `t3epeboot(8)` command are:

- A warmboot from the mainframe will take approximately 8 seconds to complete, compared with 2 to 3 minutes from the SWS.
- You can warmboot a group of PEs on the mainframe in parallel by writing a shell script to invoke the `warmboot(8)` command for each PE.

For more information about the `warmboot(8)` command, see *UNICOS/mk General Administration, SG-2601 2.0.5* (is also part number 004-2601-002), and the `warmboot(8)` man page. For information on the SWS `t3epeboot(8)` command, see the `t3epeboot(8)` man page.

2.1.2 Dynamic PE Renumbering

If an application processing element (PE) fails, it is desirable to keep the application space available without requiring a full reboot of the Cray T3E

system to remove the failed PE. *PE renumbering* is the swapping of logical PE numbers so that the system recovers the application space by giving up one or more other PEs.

The new `renumber(8)` command dynamically renumbers one or more Cray T3E logical processing elements (LPEs) to work around a failed processing element (PE). This allows administrators to replace a failed PE and reestablish a contiguous LPE application space. The `renumber(8)` command should be used only when a PE has failed because of a persistent hardware failure and when a reboot is impractical or inconvenient.

The `renumber(8)` command is not supported in conjunction with the SWS `t3epeboot(8)` command. If you use the `renumber(8)` command, then you **must** use only the mainframe `warmboot(8)` command to warmboot individual PEs. The mainframe `warmboot(8)` command is required because dynamically renumbered logical PE information is updated only in the mainframe resident Configuration Server. If you use the `t3epeboot` command after renumbering has occurred, the SWS `t3epeboot(8)` command will fail.

For more information about dynamic renumbering, see the `renumber(8)` man page.

2.2 New Dump Compression Functionality

To save disk space and time transporting Cray T3E system dumps, the FFIO layer has been modified to add a user layer that performs compression. This layer is utilized by the dump I/O routines to compress the Cray T3E system dump files after the dump is completed.

The `[-C]` option was added to the `cpdmp(8)` command. The `cpdmp [-C]` option compresses the output file (if the input file is already in compressed format, the `[-C]` option has no effect). The `-s` option, silent mode, was also added to the `cpdmp(8)` command. The `coredd(8)` and `sysdumpmf(8)` commands were modified to support the new `cpdmp(8)` dump compression functionality, and the `crashmk(8)` command was modified to read the compressed dump files so that dumps can remain compressed. See the `cpdmp(8)`, `coredd(8)`, and `sysdumpmf(8)` man pages for more information.

In addition, the following two new `rcoptions` file parameters were added to support the new Cray T3E dump compression functionality:

- `DUMPNPROC`, which specifies the number of concurrent `cpdmp(8)` compression processes (`DUMPNPROC`) that will be run when compressing a Cray T3E system dump when using the `coredd(8)` command or the

`sysdumpmf(8)` command. By default, four (4) processes will be run in parallel during the compression. Values from 1 to 4096 are possible, but site disk configuration (affecting the speed of the dump file system) may make values greater than 16 superfluous.

- `DUMPCMPAPP`, which specifies that the `cpdmp(8)` compression processes run by the `coredd(8)` command or the `sysdumpmf(8)` command will be run on application PEs using the `mpprun(1)` single PE application option (`-a`). You should enable this parameter **only** if your site configures one or more application PEs to run single PE applications. This parameter is disabled by default.

These two new `rcoptions` file parameters are documented in the UNICOS/mk Configuration Tool help, in *UNICOS/mk General Administration*, SG-2601 2.0.5 (is also part number 004-2601-002), and in *UNICOS/mk Configuration Reference Manual*, SG-2603 2.0.5 (is also part number 004-2603-002).

2.3 NIS DBM Algorithms Improved

Four hashing algorithms and the storing algorithm from the SGI IRIX operating system's `mdbm` database subroutine have been implemented in the UNICOS/mk system. The `dbm(3C)` man page was revised to include this new information.

2.4 `script(1)` Command on Systems Using Only `PRIV_PAL`

The `script(1)` command is now supported on systems using only `PRIV_PAL`.

2.5 UNICOS/mk Resource Administration Enhancements

The following sections describe UNICOS/mk 2.0.5 release resource administration enhancements.

For more information about these enhancements, see *UNICOS/mk Resource Administration*, SG-2602 2.0.5 (is also part number 004-2602-002).

2.5.1 Improved GRM Application Load-and-Go Capability

The Global Resource Manager (GRM) has been enhanced to automatically load and run an application if there are sufficient idle PEs available. With previous UNICOS/mk releases, an application's execution was dependent upon when `psched` checked system resources and scheduled the application to run. As a

result of this change, system resources are used more effectively, and users may notice their applications running sooner.

2.5.2 New GRM Application Mini-launch Capability

The GRM has been enhanced to automatically allocate the minimum PE resources required in only the base PE so that an application can launch without adversely affecting application scheduling. The application then waits until `psched` allows it to run before it completes its launch. With previous UNICOS/mk releases, in order to launch an application, running jobs were swapped out and even prime jobs had to be preempted. As a result of this change, system resources are used more effectively, and prime jobs are not preempted.

The `grmview(1)` command was enhanced to display applications in mini-launch state. For more information about the `grmview(1)` command, see the `grmview(1)` man page

2.5.3 Gang Scheduling Enhancements

The following gang scheduling parameters were added:

<code>PriorityChkpnt</code>	This value, if set to a non-zero value, causes the gang scheduler to schedule multi-PE applications that are checkpointing above all other applications (including prime applications). The default value of this parameter is zero (0).
<code>PriorityCoreDump</code>	This value, if set to a non-zero value, causes the gang scheduler to schedule multi-PE applications that are core dumping above all other applications (except checkpointing applications that have priority because the <code>PriorityChkpnt</code> parameter is set to non-zero). The default value of this parameter is zero (0).
<code>SwitchTimeFactor</code>	This value, if set to a non-zero value, specifies the actual time slice as calculated in the <code>Variation</code> parameter and is modified as follows:

$$RTS = ATS + ST * STF$$

The resulting time slice (RTS) is the sum of the actual time slice (ATS) and the current context

switch time (ST) multiplied by the specified switch time factor (STF).

This value is intended to adjust the time slice to a larger value if the context switch is slow due to complex swapping activities.

MaxHeartbeat

If this value is specified, it limits the maximum time slice to the specified value (in seconds).

The `psview(8)` command was enhanced for UNICOS/mk 2.0.5 so that the status display for the gang scheduler now includes the time slice range and the context switch time. See the `psview(8)` man page for more information.

2.5.4 Load Balancer Enhancements

The following migration-related load balancer enhancements were made with the UNICOS/mk 2.0.5 release:

- The `MigrationErrorDelay` load balancer parameter was added. If defined, this value specifies the time, in seconds, during which any object that was subject to a failed migration is ineligible for additional migrations.
- The `MigrationDelay` load balancer parameter was enhanced. This value specifies the time, in seconds, during which any migrated object is ineligible for additional migrations. This includes migrations that occur outside of `psched` (for example, through an operator or script).

The `psview(8)` command was enhanced for UNICOS/mk 2.0.5 so that the status display for the load balancer now includes information about migration error delay. See the `psview(8)` man page for more information.

2.5.5 Specifying the Number of Application PEs Allocated by Service Type

The `grmgr(8)` `global_service` directive lets you limit the number of application PEs that are allocated by the GRM based on the service type. The GRM keeps a count of the PEs in use by service type. If multiple service types are specified, the restrictions apply to all applications in the listed set of service types. You can specify either a valid service type keyword or a numeric value from 0 through 19. The new `ap_multi_max` attribute of the `grmgr(8)` `global_service` directive specifies the number of application PEs that can be in use by multi-PE applications for the specified service type. An unlimited number is specified by an asterisk (*).

The `grmview(1) -c` option now displays PE counts by service type.

For more information about these changes, see the `grmgr(8)` and `grmview(1)` man pages.

2.5.6 Specifying the Number of Multi-PE Applications on a Specified PE

The new `grmgr(8) ap_multi_max` attribute of the `pe` directive specifies the number of multi-PE applications that can run on a specified PE. This can be a numeric value greater than zero, which assigns that number of multi-PE applications to the PE.

The `grmview(1)` extended PE (`-l` option) `MPP-Lim` display field was added, which displays the maximum number of multi-PE applications that can be simultaneously allocated to the specified PE. Note: This limit can be oversubscribed if the prime job feature (`psmgr(8)`) is used.

For more information about these changes, see the `grmgr(8)` and `grmview(1)` man pages.

2.5.7 New Single-PE Applications `grmview(1)` extended PE (`-l` option) display fields

The following `grmview(1)` extended PE (`-l` option) display fields were added to display single-PE applications information:

- The `1PE-Lim` field displays the maximum number of single-PE applications that can be simultaneously allocated to the specified PE. This is the `ap_single_max` attribute. Note: This limit can be oversubscribed if the prime job feature (`psmgr(8)`) is used.
- The `1PE-Run` field displays the number of single-PE applications currently running on the specified PE.

2.6 Changes to the `ps(1) -M` and `-m` options

When displaying applications using the `ps(1) -M` or `-m` options, the time column displays the application's connect time, rather than the user time, for VPE0. For single PE applications that have not been connected by `psched`, this time will be 0 even though the user time is greater than 0.

2.7 Changes to the `mpprun(8)` Command

With the UNICOS/mk 2.0.5 release, the `-L label` option was added to the `mpprun(8)` command. The `mpprun(8) -L label` option allows users to specify a dynamic label for programs (a.out binary files) for which they have only read permission. The label is propagated across `fork(2)` and `exec(2)` system calls.

The `mpprun(8)` man page was revised to include this new option.

2.8 Compatible EMASS Software

The version of `esinet` supplied with this release for EMASS libraries was built with the vendor-supplied software interface, VolServ, version 2.3.2. If you are using `esinet` with your tape subsystem (`tpdaemon`), please ensure with your vendor that your server is running the 2.3.2 compatible version. If it is not running this version, please consult with your vendor concerning an upgrade. If an upgrade is not possible, contact your Cray T3E support person.

2.9 Y2K Compliant Version of the *Online Software Publications Library*

The Y2K compliant version of the *Online Software Publications Library* (version 2.0) CD is included with your UNICOS/mk 2.0.5 release package. The *Online Software Publications Library* server is based on DynaWeb software produced by Inso Corporation; 1.x versions of the server are not Y2K compliant because of the date-sensitive licensing file. If you use the *Online Software Publications Library* server application at your site, you should upgrade before the end of 1999.

2.10 New and Revised Documentation to Support this UNICOS/mk Release

As noted in the feature descriptions in this chapter, some publications and man pages were revised for this UNICOS/mk 2.0.5 release. For a complete list of the revised publications and man pages, see Section 3.1.1, page 11.

This chapter describes the documentation that supports the UNICOS/mk 2.0.5 release. It contains information about the following:

- Publications that support the UNICOS/mk 2.0.5 release
- Publications for other releases supporting Cray T3E systems
- Online information access
- Ordering additional documentation

3.1 Supported Publications

Online documentation is available through the *Online Software Publications Library*. This library (formerly referred to as Cray DynaWeb) allows users to access information by using a World Wide Web browser such as Netscape. Documentation for the *Online Software Publications Library* server includes the *Online Software Publications Installation Guide* and the *Online Software Publications Administrator's Guide*.

Note: The Y2K compliant version of the *Online Software Publications Library* (version 2.0) CD is included with your UNICOS/mk 2.0.5 release package. The *Online Software Publications Library* server is based on DynaWeb software produced by Inso Corporation; 1.x versions of the server are not Y2K compliant because of the date-sensitive licensing file. If you use the *Online Software Publications Library* server application at your site, you should upgrade before the end of 1999.

3.1.1 Revised Documentation

The following manuals were updated for the UNICOS/mk 2.0.5 release:

- *UNICOS/mk Release Overview* (this document); a printed copy is included with the UNICOS/mk 2.0.5 release package; also provided on the *Online Software Publications Library* CD included with the UNICOS/mk 2.0.5 release package.
- *UNICOS/mk Installation Guide for Cray T3E Series Systems*; a printed copy is included with the UNICOS/mk 2.0.5 release package; note this guide is not

provided on the *Online Software Publications Library* CD included with the UNICOS/mk 2.0.5 release package.

- *UNICOS/mk Configuration Reference Manual*; a printed copy is included with the UNICOS/mk 2.0.5 release package; also provided on the *Online Software Publications Library* CD included with the UNICOS/mk 2.0.5 release package.
- *UNICOS/mk General Administration*; provided on the *Online Software Publications Library* CD included with the UNICOS/mk 2.0.5 release package.
- *UNICOS/mk Resource Administration*; provided on the *Online Software Publications Library* CD included with the UNICOS/mk 2.0.5 release package.
- The following man page reference manuals were revised for the UNICOS/mk 2.0.5 release:

Note: These man page manuals are not orderable in printed book form. Instead, they are provided as printable PostScript files on the *Online Software Publications Library* CD, which is included with the UNICOS/mk 2.0.5 release package.

- *UNICOS/mk Administrator Commands Reference Manual*
- *UNICOS/mk File Formats and Special Files Reference Manual*
- *UNICOS/mk System Calls Reference Manual*
- *UNICOS/mk System Libraries Reference Manual*
- *UNICOS/mk User Commands Reference Manual*

Man pages are always provided in online form with the release package and may be accessed by using the `man(1)` command.

- *UNICOS/mk Troubleshooting Technical Note*; provided on the *Online Software Publications Library* CD included with the UNICOS/mk 2.0.5 release package.
- *UNICOS/mk Kerberos Enigma Installation Guide*; a printed copy is included only if the optional Kerberos product is ordered (for more information about the optional Kerberos product, see Section 5.1.4, page 23).

The following man pages were updated or added for this UNICOS/mk 2.0.5 release and may be accessed by using the `man(1)` command:

- man(1) pages: `acct.com(1)`, `cp(1)`, `grmview(1)`, `mpprun(1)`, and `ps(1)`
- man(2) pages: `chkpnt(2)`, `exec(2)`, `open(2)`, and `sitectl(2)`

- man(3) pages: dbm(3c), shmalloc(3f), shpalloc(3f), shpclmove(3f), shpdeallc(3f), and shmalloc(3c)
- man(8) pages: coredd(8), cpdmp(8), grmgr(8), ifconfig(8), psview(8), renumber(8)(new), sysdumpmf(8), warmboot(8)(new), and xdms(8)

3.1.2 Publications Provided on the *Online Software Publications Library* CD with the UNICOS/mk 2.0.5 Release Package

The following UNICOS/mk publications are provided on the *Online Software Publications Library* CD, which is included with the UNICOS/mk 2.0.5 release package:

Note: The most recent version of each publication is provided on the *Online Software Publications Library* CD. So that you can print copies of a publication at your site, PostScript and PDF files of each publication are also included on the *Online Software Publications Library* CD, unless otherwise noted. If a publication is not available in printed form for purchasing from SGI, that is also noted below.

- *UNICOS/mk 2.0.5 Release Overview*
- *UNICOS/mk Configuration Reference Manual* (provided as printable PostScript files); printed publication not orderable.
- *UNICOS/mk General Administration* (provided as printable PostScript files); printed publication not orderable.
- *UNICOS/mk Resource Administration*
- *UNICOS/mk Administrator Commands Reference Manual* (provided as printable PostScript files); printed publication not orderable.
- *UNICOS/mk File Formats and Special Files Reference Manual* (provided as printable PostScript files); printed publication not orderable.
- *UNICOS/mk System Calls Reference Manual* (provided as printable PostScript files); printed publication not orderable.
- *UNICOS/mk System Libraries Reference Manual* (provided as printable PostScript files); printed publication not orderable.
- *UNICOS/mk User Commands Reference Manual* (provided as printable PostScript files); printed publication not orderable.
- *UNICOS/mk Networking Facilities Administration*

- *ONC+ Technology for the UNICOS Operating System*
- *Remote Procedure Call (RPC) Reference Manual*; printed publication not orderable.
- *Asynchronous Transfer Mode (ATM) Administrator's Guide*
- *Tape Subsystem Administration*
- *Tape Subsystem User's Guide*
- *UNICOS Multilevel Security (MLS) Feature User's Guide*; printed publication not orderable.
- *UNICOS/mk Troubleshooting Technical Note*

3.1.3 Kerberos Publications

For sites licensed to run Kerberos, the following Kerberos publication is available from the SGI Minnesota Software Distribution Center:

- *UNICOS/mk Kerberos Enigma Installation Guide*; a printed copy is included only if the optional Kerberos product is ordered (for more information about the optional Kerberos product, see Section 5.1.4, page 23).

For sites licensed to run Kerberos, the following Kerberos publications are available on the *Online Software Publications Library* CD only, which is included with your Kerberos Enigma release package for the UNICOS/mk 2.0.5 release:

- *Kerberos Administrator's Guide*
- *Kerberos User's Guide*

3.1.4 Publications for Separately-Licensed Products

The following publication for a separately licensed product is available on the *Online Software Publications Library* CD only, which is provided with the UNICOS/mk 2.0.5 release package:

- *Shared File System (SFS) Administrator's Guide*; printed publication not orderable.

3.2 Publications for Other Releases Supporting SGI Cray T3E Systems

In addition to the UNICOS/mk operating system release, other software releases support SGI Cray T3E systems. These releases and the publications that support them are described in the following documents:

- *SWS-ION Release Overview*
- *Message Passing Toolkit: Release Notes*
- *NQE Release Overview*
- *Programming Environment Releases Overview*

3.3 Online Information Access

The following types of online information products are available to UNICOS/mk 2.0.5 release customers:

- The *User Publications Catalog*, which describes Cray systems documentation available to customers. Customers who subscribe to the Cray Inform (CRInform) program can access this information on CRInform. For additional information about the CRInform program, see Section 4.3, page 18. SGI personnel can access the catalog through the World Wide Web at the following URL:

<http://wwsdiv.cray.com/PUBLIC/pubs>

- The *Online Software Publications Library*, which allows users to view manuals online using a World Wide Web browser such as Netscape or Mosaic. See your systems administrator for your local URL of the *Online Software Publications Library*.
- Man pages, which describe a particular element of the UNICOS/mk operating system or a compatible product. To see a detailed description of a particular command or routine, use the `man(1)` command.
- Online message system, which provides explanations of error messages. To see an explanation of a message, use the `explain(1)` command.
- Online glossary, which explains the terms used in a manual. To get a definition, use the `define(1)` command.

3.4 Ordering Additional Publications

To order additional copies of the UNICOS/mk publications that are available in printed format, call +1 651 683 5907. SGI employees may send electronic mail to orderdsk@sgi.com (UNIX system users).

Customers outside of the United States and Canada should contact their local service organization for information on ordering documentation.

Customer Services [4]

This chapter describes the following customer services that SGI offers to support the UNICOS/mk 2.0.5 release:

- Customer Education Services support
- Software problem reporting and resolution process
- CRInform program
- *Pipeline Supercomputing Supplement*

4.1 Customer Education Services Support

SGI Customer Education provides both lecture/lab and self-paced training. You can attend one of several SGI education centers in the U.S. or Canada.

To view the online catalog, which contains a description and schedule of current courses held at the United States or Canadian Education Centers, visit the public SGI Education World Wide Web site at the following URL:

<http://www.sgi.com/support/custeducation>

You can also call one of the following:

U.S. Customer Education Hotline: 1 800 800 4SGI, option 4

Canadian Customer Education Hotline: 1 800 466 4308

On-site and customized courses are also available in the United States and Canada. Contact either the U.S. or Canadian Customer Education Hotline for more information on pricing and scheduling of on-site or customized courses.

4.2 Software Problem Reporting and Resolution Process

If you experience problems with the UNICOS/mk operating system, contact your SGI service representative: your service representative will work with you to resolve the problem. If you choose to have full-time or part-time on-site support, your on-site support personnel are your primary contacts for service. If you have elected not to have on-site support, please call your SGI Technical Assistance Center (SGI TAC) and report your problem to them or submit a request for technical assistance (RTA) through the CRInform program.

For current information on the status of all SPRs, see the CRInform / Software Problem Report (SPR) database.

4.3 The CRInform Program

The Cray Inform (CRInform) program is a World Wide Web-based information and problem-reporting service for SGI customers. Using the CRInform program, you can do the following:

- Report software problems
- Request technical assistance
- Communicate directly with other SGI customers with Cray products
- Read about software problems similar to yours reported at other sites
- Learn about solutions to various problems
- Find out about classes
- Read about new products, and more

The CRInform program automatically logs as news items those events that are pertinent to your site, so you do not have to search through the system for new information. The logged events include changes in Software Problem Report (SPR) or request for technical assistance (RTA) activity, new orderable software, new issues of the *Pipeline Supercomputer Supplement*, new field notices (FNs), new software release documents, new software problem fix information, new marketing information, and new CRInform program information. You can also get automatic e-mail notification of any or all of the news items.

Version 5.0 of the CRInform program is available through the World Wide Web. You need access to the CRInform web server and a browser, which allows you to view information or make service requests. You can use your own site's browser, or use either the Mosaic or Lynx browsers available on the CRInform system.

4.4 Pipeline and the Pipeline Supercomputing Supplement

Customers who have a support contract receive *Pipeline*, the SGI customer newsletter. Customers who have a support contract for a Cray system also receive the *Pipeline Supercomputing Supplement*. *Pipeline* provides product and support information about SGI workstations and servers, and the *Pipeline*

Supercomputing Supplement provides product and support information about Cray supercomputers.

Pipeline and the *Pipeline Supercomputing Supplement* are both published six times a year (January/February, March/April, and so on).

Pipeline is available on the World Wide Web in Supportfolio Online (<http://support.sgi.com/>), and the *Pipeline Supercomputing Supplement* is available in CRInform (<http://crinform.cray.com/>).

Release Package [5]

This chapter contains the following information about the UNICOS/mk 2.0.5 release package:

- UNICOS/mk 2.0.5 release hardware and software requirements
- Release package contents
- Licensing information

5.1 UNICOS/mk 2.0.5 Release Hardware and Software Requirements

The following sections list the systems supported with this release package, the SWS-ION requirements, and the software products supported by the UNICOS/mk 2.0.5 release.

5.1.1 SGI Systems Supported

The UNICOS/mk 2.0.5 release supports Cray T3E systems in the following configurations:

- Air-cooled systems with 6 to 128 processing elements (PEs); liquid-cooled systems with 6 to 2048 PEs
- All memory sizes per PE (64 Mbytes through 2 Gbytes), including systems with mixed memory sizes.
- All processor speeds (300 MHz, 375 MHz, 450 MHz, 600 MHz), including systems with mixed processor speeds.

For a comprehensive list of the specific peripherals supported for this UNICOS/mk release, see the *SWS-ION Release Overview*.

5.1.2 SWS-ION Requirements

The UNICOS/mk 2.0.5 release requires SWS-ION 4.0 or later. However, SWS-ION version 5.0 is recommended.

For information about ordering the SWS-ION release, see the *SWS-ION Release Overview*.

5.1.3 Asynchronous Software Products Supported with This Release

The following subsections list software products most commonly used in conjunction with the UNICOS/mk operating system. The product release level required with UNICOS/mk version 2.0.5 is specified. For information about other products, contact your SGI representative.

5.1.3.1 Programming Environments Supported

The UNICOS/mk 2.0.5 release supports the following SGI programming environments, which are released asynchronously or otherwise separately from the UNICOS/mk 2.0.5 release.

Programming Environment 3.3. Components of the Programming Environment 3.3 release, and later, include the following products:

- CF90 Programming Environment
- Cray C++ Programming Environment
- CrayTools (for either CF90 or Cray C++)
- CrayLibs (for either CF90 or Cray C++)

For more information on these products, refer to the *Programming Environment Releases Overview*.

5.1.3.2 Asynchronous Products Supported with This Release Package

The UNICOS/mk 2.0.5 release supports the following other software products, which are released separately from the UNICOS/mk 2.0.5 release:

- Data Migration Facility (DMF) 2.5.5.

The Cray Data Migration Facility (DMF) ensures the availability of file system space by moving selected files from online disk to an offline storage medium.

Note: You must purchase a DMF license to use this product.

- Network Queuing Environment (NQE) 3.3 or later.

The Cray Network Queuing Environment (NQE) is a set of clients and servers that allows batch requests to be executed across a load-balanced network of hosts. UNICOS/mk 2.0.5 supports NQE version 3.3 or later.

For more information about NQE or to purchase an NQE license, contact your SGI representative, or see the *NQE Release Overview*.

- Distributed Computing Environment (DCE) 1.1.0.1.

Customers wishing to use the Cray Distributed Computing Environment (DCE) Client Services must purchase a DCE Client Services license. DCE 1.1.0.1 is required with UNICOS/mk 2.0.5. For more information about DCE licensing or to purchase a DCE license, contact your SGI representative.

For information describing this product, see the *DCE/DFS Release Overview and Administration Guide for UNICOS/mk Systems* or contact your SGI representative.

Note: The Cray DCE Distributed File System (DFS) is not available for Cray T3E systems.

- Cray REELlibrarian (CRL) 2.0.9.

CRL is a client/server volume management system that controls a centrally stored library of tapes (or volumes) and allows requests for tape mounts.

Note: You must purchase a CRL Client or CRL Server license to use this product.

For more information on these products or on additional software availability, contact your SGI service representative.

5.1.4 Optional Software Orderable with the UNICOS/mk 2.0.5 Release Package

The following optional software product can be ordered with the UNICOS/mk 2.0.5 release package:

- Kerberos

Note: A U.S. Department of Commerce export license is required for each customer/serial number wishing to receive Kerberos before this optional software product can be shipped. For further assistance with the license, contact Alan Benfell as follows:

Alan Benfell
International Administration
SGI, Cray Research Business Unit
655F Lone Oak Drive
Eagan, MN 55121
Telephone: +1 651 683 7460
Fax: +1 651 683 7509
E-mail: benfa@sgi.com

For a complete list of products that operate with UNICOS/mk software, contact your SGI representative.

5.2 Release Package Contents

The UNICOS/mk 2.0.5 release package supports the Cray T3E series of SGI systems and includes the following:

- CDROM media that contains the UNICOS/mk 2.0.5 release.
- Online man page files. To display these files, use the `man(1)` command.
- A set of publications provided online through the *Online Software Publications Library* (which includes the DynaWeb server), which allows you to view manuals online with a web browser. Please see your system administrator for your local URL of the *Online Software Publications Library*.
- A set of the following printed publications:
 - *UNICOS/mk Release Overview* (this document)
 - *UNICOS/mk Installation Guide for Cray T3E Series Systems* and related notes and errata
 - *UNICOS/mk Configuration Reference Manual*
 - *Common Installation Tool (CIT) Reference Card* (for first-time customers)

For detailed information about documentation that supports the UNICOS/mk operating system release, see Chapter 4, Documentation.

5.3 Licensing Information

The UNICOS/mk operating system is licensed under a software contract by SGI to its customers. For all SGI systems running the UNICOS/mk system, sites may select only a binary license; only the binary version of the UNICOS/mk system is supported.

For more information on the licensing and pricing of the UNICOS/mk 2.0.5 release, customers in the United States should contact their account representative. Customers outside the United States may obtain further licensing and export information by contacting their account representative or their respective country attorneys.

5.3.1 UNICOS/mk and UNICOS FEES Binary Licenses

To receive binary UNICOS/mk rights, customers need to obtain a binary license for the UNICOS/mk system, as well as a UNICOS FEES binary license. No additional licenses are required to obtain the standard UNICOS/mk 2.0.5 release package.

5.3.2 UNICOS/mk Source Access License

Customers who must have access to the source code for the UNICOS/mk system must first obtain the binary licenses noted above as well as the source code rights to UNIX System V Release 4.0. UNIX source rights can be obtained through SGI or through The Santa Cruz Operation, Inc. The UNICOS/mk source code is licensed as UNICOS/mk Source Materials Option for SGI Cray T3E.

Note that **only** the binary version of the UNICOS/mk system will be supported.

5.3.3 Products That Require Flexible License Manager (FLEXlm) Keys

The UNICOS/mk 2.0.5 release includes the Flexible License Manager (FLEXlm), which controls the use of certain products packaged with the UNICOS/mk operating system. For this release, the following products are packaged with the UNICOS/mk system and licensed through FLEXlm:

- ONC+
- CRSTK/STKRED
- CRIBM/IBM3495

- TMF (Tape Management Facility)
- Cray MAC (Mandatory Access Control)
- BDS (Bulk Data Services) Client
- BDS (Bulk Data Services) Server

Other products may be adopting FLEXlm as a licensing mechanism in future releases of the UNICOS/mk system. If a licensed product has been installed and a problem arises that you suspect is related to the license key, it is possible to get an emergency key from the Technical Assistance Center in the U.S., or from the service organization in other countries.

For more information about the FLEXlm license manager, access the WWW page for GLOBEtrotter Software, Inc., at the following URL:

<http://www.globetrotter.com>

Also, the *Flexible License Manager End User Manual* is available from GLOBEtrotter Software, Inc.

5.4 Ordering the UNICOS/mk 2.0.5 Release Package

UNICOS/mk software is distributed by order only to sites that have signed an SGI software license agreement for the UNICOS/mk product. The most current revision of the release package is supplied.

Please make sure your site has signed an SGI software license agreement before you order the UNICOS/mk release package.

You can order the UNICOS/mk 2.0.5 release package using one of the following methods:

- Customers who subscribe to the CRInform program can order software release packages electronically by using the Order Cray Software option.
- Customers can contact the order desk at the SGI Minnesota Software Distribution Center by telephone (+1 651 683 5907 or 1 800 284 2729 extension 35907) or e-mail (orderdesk@sgi.com).
- Customers outside of the United States and Canada should contact their local service organization for ordering and documentation information.

Software will be shipped by ground service or 5-day international service unless otherwise requested.

Sites outside the United States may be required to provide a customer-signed Letter of Assurance before this software can be shipped. Address questions about which customers must sign Letters of Assurance or which software requires such a letter to Alan Benfell at the following address:

Alan Benfell
International Administration
SGI, Cray Research Business Unit
655F Lone Oak Drive
Eagan, MN 55121
Telephone: +1 651 683 7460
Fax: +1 651 683 7509
E-mail: benfa@sgi.com

5.4.1 Further Information

If you have questions, or if your site has not signed an SGI software license agreement, either contact your regional contract negotiator or contact Jenny Gross at the following address:

Jenny Gross
Software Licensing
SGI, Cray Research Business Unit
655F Lone Oak Drive
Eagan, MN 55121 USA
Telephone: +1 651 683 5661
Fax: +1 651 683 7145
E-mail: jennyg@sgi.com