

UNICOS[®] Release Letter

RL-5001 10.0.0.2

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Preface

This release letter describes the content of the Cray Research UNICOS 10.0.0.2 update revision to the UNICOS 10.0 major release. It gives a broad overview of new features, enhancements, and changes in the UNICOS 10.0.0.2 release, as well as compatibilities and differences with the previous, UNICOS 10.0.0.1, release.

Conventions

The following conventions are used throughout this document:

<u>Convention</u>	<u>Meaning</u>																				
command	This fixed-space font denotes literal items such as commands, files, routines, path names, signals, messages, and programming language structures.																				
manpage(<i>x</i>)	Man page section identifiers appear in parentheses after man page names. The following list describes the identifiers: <table><tbody><tr><td>1</td><td>User commands</td></tr><tr><td>1B</td><td>User commands ported from BSD</td></tr><tr><td>2</td><td>System calls</td></tr><tr><td>3</td><td>Library routines, macros, and opdefs</td></tr><tr><td>4</td><td>Devices (special files)</td></tr><tr><td>4P</td><td>Protocols</td></tr><tr><td>5</td><td>File formats</td></tr><tr><td>7</td><td>Miscellaneous topics</td></tr><tr><td>7D</td><td>DWB-related information</td></tr><tr><td>8</td><td>Administrator commands</td></tr></tbody></table> <p>Some internal routines (for example, the <code>_assign_asgcmd_info()</code> routine) do not have man pages associated with them.</p>	1	User commands	1B	User commands ported from BSD	2	System calls	3	Library routines, macros, and opdefs	4	Devices (special files)	4P	Protocols	5	File formats	7	Miscellaneous topics	7D	DWB-related information	8	Administrator commands
1	User commands																				
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5	File formats																				
7	Miscellaneous topics																				
7D	DWB-related information																				
8	Administrator commands																				
<i>variable</i>	Italic typeface denotes variable entries and words or concepts being defined.																				

user input	This bold, fixed-space font denotes literal items that the user enters in interactive sessions. Output is shown in nonbold, fixed-space font.
[]	Brackets enclose optional portions of a command or directive line.

The following machine naming conventions may be used throughout this document:

<u>Term</u>	<u>Definition</u>
Cray PVP systems	All configurations of Cray parallel vector processing (PVP) systems.

The default shell in the UNICOS and UNICOS/mk operating systems, referred to in Cray Research documentation as the *standard shell*, is a version of the Korn shell that conforms to the following standards:

- Institute of Electrical and Electronics Engineers (IEEE) Portable Operating System Interface (POSIX) Standard 1003.2–1992
- X/Open Portability Guide, Issue 4 (XPG4)

The UNICOS and UNICOS/mk operating systems also support the optional use of the C shell.

Definitions of Audiences

Chapters 2 and 3 of this release letter list types of users most affected by the described feature or compatibility issue. The following definitions are used for these audiences:

<u>Term</u>	<u>Definition</u>
End user	Those who use the UNICOS operating system, products, applications, or network software.
Programmer	Those who write or modify system or application code for the purpose of solving computer system, scientific, or engineering problems.
Administrator	Those who perform system administration tasks such as installation, configuration, and basic troubleshooting.

System analyst	Those who perform advanced troubleshooting, tuning, and customization.
Operator	Those who perform operational functions or administer the Cray Research system through an operator workstation.

Distribution of This Release Letter

A copy of this release letter is included with the UNICOS 10.0.0.2 update release package; you can also order it separately through the Cray Research Distribution Center. You can access this release overview electronically. ASCII and PostScript files are available on the following systems:

- The Cray Research CRInform system, which is an online information and problem-solving system for Cray Research customers. For more information, see Section 5.3, page 26.
- The Cray Research `craypark` system in the `/home/craypark/release_docs` directory. The `craypark` system is available to Cray Research service personnel.

If you do not have access to these systems but would like a copy of the files, contact your Cray Research representative.

Reader Comments

If you have comments about the technical accuracy, content, or organization of this document, please tell us. You can contact us in any of the following ways:

- Send us electronic mail at the following address:
`techpubs@sgi.com`
- Contact your customer service representative and ask that an SPR or PV be filed. If filing an SPR, use `PUBLICATIONS` for the group name, `PUBS` for the command, and `NO-LICENSE` for the release name.
- Call our Software Publications Group in Eagan, Minnesota, through the Customer Service Call Center, using either of the following numbers:
1-800-950-2729 (toll free from the United States and Canada)
+1-612-683-5600

- Send a facsimile of your comments to the attention of “Software Publications Group” in Eagan, Minnesota, at fax number +1-612-683-5599.

We value your comments and will respond to them promptly.

Introduction [1]

The *UNICOS Release Letter*, publication RL-5001, is a public document that provides an overview of the UNICOS 9.3 release, and highlights key differences between the UNICOS 9.2 release and the UNICOS 9.3 release.

1.1 Contents of this release letter

This release letter includes the following chapters:

- Chapter 2, *Software Enhancements*, describes new features and enhancements included since the UNICOS 9.2 release.
- Chapter 3, *Compatibilities and Differences*, describes compatibility issues and functionality changes involved in upgrading from UNICOS 9.2 to UNICOS 9.3. This chapter also includes early information about changes planned for future UNICOS releases.
- Chapter 4, *Documentation*, lists the printed and online documentation supporting this release.
- Chapter 5, *Customer Services*, describes the customer services that Cray Research offers to support the UNICOS 9.3 release, including software, training, problem reporting, and general service information.
- Chapter 6, *Release Package*, contains licensing information and a list of release package contents.

1.2 UNICOS 9.3: restricted release

UNICOS 9.3 is a restricted release which provides tape (ESCON, BMX, FES) support on GigaRing based systems plus other, miscellaneous features.

1.3 Hardware supported by the UNICOS 9.3 release

The UNICOS 9.3 release supports the following Cray Research GigaRing platforms:

- CRAY J90se series
- CRAY T90 series (including CRAY T94, CRAY T916, and CRAY T932 systems with Cray floating-point CPUs; and CRAY T941, CRAY T916I, and CRAY T932I systems with IEEE Std. 754 floating-point CPUs) as sites with UNICOS source licenses.

The UNICOS 9.3 release also supports the following Cray Research systems with Model-E IOS:

- CRAY T90 IEEE systems without GigaRing channel.

1.4 Related publications

This release letter only highlights differences between the UNICOS 9.2 and UNICOS 9.3 operating systems. For information about differences among other versions of the UNICOS operating system, see the following publications:

- The *UNICOS Release Letter*, publication RL-5001 9.0, describes differences between the UNICOS 8.0 and UNICOS 9.0 operating systems.
- The *UNICOS Release Letter*, publication RL-5001 9.1, describes differences between the UNICOS 9.0 and UNICOS 9.1 operating systems.
- The *UNICOS Release Letter*, publication RL-5001 9.2, describes differences between the UNICOS 9.1 and UNICOS 9.2 operating systems.

Introduction [1]

The *UNICOS Release Letter*, publication RL-5001 10.0.0.2 is a public document that provides an overview of the UNICOS 10.0.0.2 update release.

1.1 Contents of This Release Letter

This release letter includes the following chapters:

- Chapter 2, page 5, *Software Enhancements*, describes new features and enhancements since the UNICOS 10.0.0.1 update release. This chapter also includes plans for features to be supported in future releases of the UNICOS operating system.
- Chapter 3, page 7, *Compatibilities and Differences*, describes compatibility issues and functionality changes involved in upgrading from UNICOS 10.0.0.1 to UNICOS 10.0.0.2.
- Chapter 4, page 11, *Documentation*, lists the printed and online documentation supporting the UNICOS 10.0.0.2 operating system release.
- Chapter 5, page 17, *Customer Services*, describes the customer services that Cray Research offers to support the UNICOS 10.0.0.2 operating system release. This includes software training, problem reporting, and general service information.
- Chapter 6, page 21, *Release Package*, contains licensing information and a list of release package contents.

1.2 UNICOS 10.0.0.2: Second update release to UNICOS 10.0

UNICOS 10.0.0.2 is a general release. It is the second update release to follow the base UNICOS 10.0 operating system release.

1.3 Hardware supported by the UNICOS 10.0.0.2 release

The UNICOS 10.0.0.2 release supports the following Cray Research GigaRing platforms:

- CRAY J90se series
- CRAY T90 series with Cray floating-point CPUs
- CRAY T90 series with IEEE Std. 754 floating-point CPUs

The UNICOS 10.0.0.2 release also supports the following Cray Research systems with Model-E or Model-V IOS:

- Cray J90 series
- Cray C90 series
- CRAY T90 series with Cray floating-point CPUs
- CRAY T90 series with IEEE Std. 754 floating-point CPUs

1.4 Tested and Supported Upgrade Paths

If your site runs any version of the UNICOS 9.0, UNICOS 9.1, UNICOS 9.2, or UNICOS 9.3 operating system releases, you can upgrade directly to the UNICOS 10.0.0.2 release. The exception to this is if you have a *non*-GigaRing system and you wish to upgrade to a GigaRing-based system. In this case, you must perform an initial installation.

Initial installs of Model V-based and GigaRing-based systems are supported with this UNICOS release and beyond. Support for initial installs of Model E-based systems stopped after the UNICOS 9.1 operating system release.

1.5 Related Publications

This release letter only highlights new features released with the 10.0.0.2 update of the UNICOS operating system. For information about differences among other versions of the UNICOS operating system, see the following publications:

- The *UNICOS Release Overview*, publication RO-5000 10.0, describes differences between the UNICOS 9.0 and UNICOS 10.0 operating systems.
- The *UNICOS Release Letter*, publication RL-5001 9.1, describes differences between the UNICOS 9.0 and UNICOS 9.1 operating systems.

- The *UNICOS Release Letter*, publication RL-5001 9.2, describes differences between the UNICOS 9.1 and UNICOS 9.2 operating systems.
- The *UNICOS Release Letter*, publication RL-5001 9.3, describes differences between the UNICOS 9.2 and UNICOS 9.3 operating systems.

Software Enhancements [2]

This chapter describes the new features and enhancements included since the UNICOS 9.2 release.

For additional information about upgrading to this release, see Chapter 3, page 15.

Each section in this chapter lists the type of user and hardware affected by the software enhancement described. Consult the Preface of this document for definitions of the terms used.

Note: The documentation that supports the features described in this chapter was revised for the 9.3 release. For a list of publications that were revised only online or that were reprinted from a previous release, see Chapter 4, page 21.

2.1 Operating system

The following sections describe enhancements to the operating system since the UNICOS 9.2 release.

2.1.1 Support added for CRAY T90 asymmetric CPUs

Users affected: all

Hardware supported: CRAY T90 systems with Cray floating-point CPUs and with IEEE Std. 754 floating-point CPUs.

The CRAY T90 chassis now provides kernel support for a mixture of both Cray floating-point and IEEE floating-point CPUs within a single system.

In addition to kernel support, the following sections describe collateral changes to accommodate this feature.

2.1.1.1 Install tool changed

The install tool has been changed to make asymmetric CPUs a configurable option. This change switches the values in `/etc/config/config.mh`.

2.1.1.2 Library nmake files changed

All library nmake files, which previously provided cross-compatible version support for Cray floating-point CPUs on CRAY T90 systems, now provide IEEE floating-point support on CRAY T90 systems.

Only Cray floating-point versions will be supported on CRAY T90 systems with IEEE support.

2.1.1.3 Generation compiler environment changes

The generation compiler environments for the UNICOS operating system have been changed to support building alternate libraries for both CRAY T90 floating-point and CRAY T90 IEEE packages.

2.1.1.4 Programming environment support

Programming environments have been modified to include CRAY T90 asymmetric CPU support.

2.1.2 UNICOS under UNICOS (UUU) support for GigaRing based systems

Users affected: all

Hardware supported: all CRAY GigaRing based systems including CRAY J90se, CRAY T90, and CRAY T90 IEEE

UNICOS 9.3 extends UNICOS under UNICOS (UUU) support for the GigaRing architecture on CRAY J90se, CRAY T90, and CRAY T90 IEEE platforms. This includes support for the following:

- Network devices
 - ATM
 - HIPPI
 - Ethernet
 - FDDI
- Disks
 - DA-60
 - DA-61

DA-301

DA-302

DD-60

DD-61

DD-62

DD-301

DD-302

DD-304

DD-308

DD-316

DD-332

- Any tape drive supported on a CRAY Y-MP system

Note: For CRAY J90se systems, usage of memory HIPPI is not supported with this feature.

Note: For CRAY T90 and CRAY T90 IEEE systems, the following functions are not supported with this feature:

- Use of memory HIPPI
- Guest use of `ssdt` (solid state disk for CRAY T3E systems)

2.1.3 Added support for array services and MPI

Users affected: system administrators

Hardware supported: all Cray Research systems

The UNICOS 9.3 release includes the `libarray.a` library and the `arrayd` array services daemon, which provide support for the following asynchronous products:

- Array Services 3.0 for UNICOS, which uses `libarray.a` and `arrayd` for array service commands. This product, which contains all of the client commands for array services, will be available soon.
- Message Passing Toolkit (MPT), which needs `libarray.a` for its Message Passing Interface (MPI) in the 1.2 release.

Note: The following applies to modifications to the `/etc/hosts.equiv` and `/etc/config/daemons` files:

- When upgrading from UNICOS 9.x to 9.3, the system automatically copies any existing `/etc/hosts.equiv` file or `/etc/config/daemons` file to 9.3 when the system is built. If these files did not exist for the previously installed release, the default `/etc/hosts.equiv` and `/etc/config/daemons` files are automatically copied onto your system. In either case, you need to make the modifications described above in order to use array services and MPI.
- If 9.3 is your initial operating system, the default `/etc/hosts.equiv` and `/etc/config/daemons` files are automatically copied onto your system when the system is built. However, you still need to make the modifications described above in order to use array services and MPI.

For more information, refer to the following man pages: `arrayd(1M)`, `ascheck(1)`, `newarraysess(2)`, `syssgi(2)`, `getash(2)`, `setash(2)`, `arrayd.conf(4)`, and `array_sessions(5)`.

2.1.4 Automatic downing of CPUs on uncorrectable memory errors

Users affected: all

Hardware supported: all Cray Research systems.

A mechanism has been created to automatically down a CPU that is experiencing uncorrectable memory errors.

This mechanism is released in an “off” state and can be enabled as required. It allows you to select the following options, parameters for which have been added to the `secded(8)` command:

- The number of errors seen by a CPU before it is downed
- The lifetime of each error (for example, three errors in a rolling 24-hour period)
- The length of time the CPU should remain down before the system is returned to service.

Note: The system may also remain down indefinitely.

For more information, see the `secded(8)` man page.

2.1.5 Third party device for direct memory access (DMA) dump for GigaRing based systems

Users affected: analysts

Hardware supported: CRAY J90se and T90 GigaRing based systems

This feature allows you to configure a disk partition to use as a raw dump device, rather than using the `/opt/CYRIDump` directory on the system workstation (SWS).

This feature increases the speed of a postmortem dump.

2.2 Storage devices

The following section describes support for storage devices new to UNICOS 9.3.

2.2.1 SSD-T90 support

Users affected: system administrators and site analysts

Hardware supported: CRAY T90 systems

The UNICOS 9.3 release supports the GigaRing-based Solid State Disk storage device known as the SSD-T90. The files in `/dev/ssdt` are special files that allow read and write operations to the SSD-T90.

For information on the files in `/dev/ssdt`, see the `ssdt(4)` man page. For information about configuring the SSD-T90 for use as SDS memory, see the *UNICOS Configuration Administrator's Guide*, publication SG-2303.

2.3 Tape subsystem enhancements

The following section describes enhancements to tape subsystems since the UNICOS 9.2 release.

2.3.1 IBM ESCON 3590 supported

Users affected: system administrators

Hardware supported: all Cray Research systems

The UNICOS 9.3 release supports the IBM ESCON tape devices.

The `DEVICE` statement contains a new parameter, `timeout`, and the `type` parameter now accepts `3590` as a type. The `timeout` parameter specifies the time-out value in seconds that the ESCON IOP, which supports the IBM ESCON 3490, 3490E, and 3590 devices, waits for a response from the channel. The `errprt(8)` command contains the new `-t` option, which requests the formatted output of the buffered logs from the control units of the IBM ESCON 3490, 3490E, and 3590 devices.

For more information, see the `text_tapeconfig(5)` man page for the `DEVICE` statement, and the `errprt(8)` man page.

2.3.2 `xtpldr(8)` documentation

The `xtpldr(8)` command, which manages selected autoloader operations, is now documented as an administrator command. Previously it was documented as a user command. For more information, see the `xtpldr(8)` man page.

2.3.3 New tape daemon optimization feature

Users affected: system administrator

Hardware supported: all Cray Research systems

A tape daemon optimization feature has been created that consolidates device-specific child processes into a single-device support child process. This feature controls the device from the initial tape mount through the release sequence.

2.4 Networking and communication

The following sections describe enhancements to networking and communication since the UNICOS 9.2 release.

2.4.1 Network device and driver optimization for GigaRing systems

Users affected: all

Hardware supported: all Cray GigaRing based systems

The UNICOS 9.3 release includes performance optimization for the following network devices and network drivers on GigaRing based systems:

- Unified network drivers

- MPN network drivers
- HPN network drivers

For more information, see the `setionlink(8)` man page.

2.4.2 TCP/IP connections allowed over GigaRing channels

Users affected: all

Hardware supported: CRAY J90se and CRAY T90 GigaRing based systems.

The UNICOS 9.3 release supports a new feature that allows GigaRing based CRAY T90 and CRAY J90se systems to use TCP/IP for host-to-host communications.

2.4.3 New socket accounting feature

Users affected: system administrator, site analyst

Hardware supported: all Cray Research systems

A new socket accounting feature has been implemented with UNICOS 9.3 to track network usage from the perspective of sockets, wherein one process may use several sockets, and several processes may use the same socket.

The recorded accounting information tracks all of a socket's usage, but it can only be linked to the process which most recently closed the socket. This information can help an administrator resolve network problems and/or monitor system network usage.

This feature records the following information:

- Time a socket was created
- Time a socket was destroyed
- Socket user ID (UID)
- Socket group ID (GID)
- Socket family and domain
- Socket type
- Socket protocol

- Socket options
- The executing program
- Number of reads and writes performed
- Number of bytes read and written
- Foreign and local Internet addresses
- Foreign and local port numbers

Note: This feature does not include the ability to charge for network usage. The accounting records produced are only processed in order to make the data available to the site-supplied user exits.

You can use the standard accounting interface to turn this feature on or off. You can also use the `csasocket(8)` command to summarize and process the socket data.

For more information on this feature, see the `csaswitch(8)` and `csasocket(8)` man pages.

2.4.4 `named` (domain name service) granted all privileges to execute on a UNICOS system with MLS

Users affected: system administrator

Hardware supported: all Cray Research systems

The Internet domain name server command, `named`, is a service that controls the host information database that maps between host names and their internet addresses. With UNICOS 9.3, this service has been granted all privileges to execute on a UNICOS system with the multilevel security (MLS) feature. Previously, `named` privileges were restricted to `PRIV_SU` systems only.

Note: This feature will still function on a system that is not running `SECURE_MAC`.

For more information, see the `named(8)` man page.

2.5 File system enhancements

The following sections describe file system enhancements.

2.5.1 Bulk data service added as a supplement to the network file system (NFS)

Users affected: all

Hardware supported: all Cray Research PVP systems running UNICOS and NFS.

The Bulk Data Service (BDS) is a nonstandard enhancement to NFS that improves performance for large data transfers (100 megabytes or larger).

This enhancement includes modifications to the UNICOS kernel and the `mount` and `automount` commands, as well as a new `bds` daemon, and a new utility program called `lmd`, which is used primarily for timing I/O.

For more information, see the `mount(8)`, `automount(8)`, `bds(8)`, and `lmd(8)` man pages.

2.5.2 New configuration specification language (CSL) parameters

Users affected: system administrator

Hardware supported: all Cray Research systems

UNICOS 9.3 adds the following new configuration specification language (CSL) parameters:

- `nfs3_async_max` defines the maximum amount of data that will be written per file asynchronously
- `nfs3_async_time` defines the amount of time that data will be held in the NFS async write cache on the client

For more information, see the *UNICOS Configuration Administrator's Guide*, publication SG-2303 9.3.

2.6 On-line diagnostics

The following sections describes enhancements to the on-line diagnostics.

2.6.1 New `errpt` enhancements

Users affected: system administrator, site analyst

Hardware supported: all Cray Research systems with IOS-E and GigaRing based architectures

Before UNICOS 9.3, there were two methods to create reports for hardware errors, `errpt(8)` and `olhpa(8)`. `errpt` provided basic interpretation of data with few report format options. `olhpa`, on the other hand, included many features and report formatting options, but was difficult to maintain.

To eliminate a duplicated effort to maintain both utilities, `olhpa` is discontinued for GigaRing based architectures, and `errpt` functionality has been enhanced with some `olhpa` options as described in the following sections. (See also Section 2.3.1, page 8 for related information.)

2.6.1.1 One-line summary report for `errpt`

The short report format option has been added to the `errpt` utility. This 80-character format includes a one-line summary of each error, similar to the standard `olhpa` output.

Error reports can now be viewed in simple form, chronologically, and according to device type and date.

2.6.1.2 Enhanced `-s` option for `errpt`

An enhanced `olhpa`-style `-s` option will be added to `errpt` in UNICOS 9.3 to support the `-sl[0--n]` date format. This allows you to indicate a starting date `n` days prior to the current date, or an ending date (specified by the `-e` option).

2.6.2 New `vi` tagstack feature

Users affected: all

Hardware supported: all Cray Research systems

A new tagstack feature has been added for `vi` in UNICOS 9.3. Tagstack allows you to track backward through up to 20 tag jumps. This is very useful when examining unfamiliar C code.

Software Enhancements [2]

This chapter describes the new features and enhancements included since the UNICOS 10.0.0.1 operating system release.

For additional information about upgrading to this release, see Chapter 3, page 7.

2.1 Operating System

There are no enhancements to the operating system since the UNICOS 10.0.0.1 release.

2.2 Tape Subsystems

There are no enhancements to tape subsystems since the 10.0.0.1 release.

2.3 Networking and Communications

The following section describes enhancements to Networking and Communications that are new since the UNICOS 10.0.0.1 release.

2.3.1 Internet Protocol 6 (IPv6) supported with UNICOS 10.0.0.2 release

The UNICOS 10.0.0.2 operating system includes support for IPv6, the Internet Protocol version 6, also known as next generation internet protocol.

IPv6 is designed to be an evolutionary step from IPv4. It can be installed as an upgrade in internet devices and is interoperable with IPv4.

The following is a list of the main features of IPv6:

- expanded addressing capabilities
- header format simplification
- improved support for extensions and options
- flow labeling capability
- extensions to support authentication, data integrity, and data confidentiality

For more information on IPv6, see

<http://playground.sun.com/pub/ipng/html/ipng-main.html>

2.4 System Installation

There are no enhancements to system installation since the UNICOS 10.0.0.1 release.

2.5 File Systems

There are no enhancements to file systems since the UNICOS 10.0.0.1 release.

2.6 Diagnostics

The following section describes enhancements to diagnostics that are new since the UNICOS 10.0.0.1 release.

2.6.1 Memory Error Summation Option Added to `errpt`

A new `-m` memory option has been added to the `errpt(8)` error reporting utility. When this option is specified, `errpt` produces a memory error summation report, an extended one-line summary report of memory errors collected by the `errdemon(8)` error logging daemon.

This summation report is not limited to 80 characters per line, and repeating occurrences of the same error are summed in a count field.

For more information, see the `errpt(8)` and `errdemon(8)` man pages.

2.7 Disk and Storage Device Enhancements

There are no enhancements to disk and storage devices since the UNICOS 10.0.0.1 release.

Compatibilities and Differences [3]

This chapter describes compatibility issues and functionality changes involved in upgrading from the UNICOS 9.0 major release to the UNICOS 9.3 restricted release. This chapter also includes early information about changes planned for future UNICOS releases.

Because this release letter documents all features and compatibility issues since the UNICOS 9.0 base release, each compatibility issue also includes the UNICOS release in which the compatibility issue was introduced. This information is provided to help our customers focus on the compatibility issues that will specifically affect their upgrade.

3.1 Compatibility statement

To meet user requirements for compatibility between releases of Cray Research software, upward compatibility is provided in subsequent releases of the system and products in the following areas:

- UNICOS user commands
- Standard language syntax, semantics, and Cray Research extensions
- Absolute binary code
- Relocatable binary code

This chapter describes any incompatible changes that were introduced in this release for the following reasons:

- Hardware changes
- Third-party software changes
- Improved software design or numerical techniques
- Bugfixes

If possible, both the old and new software are provided for one release. In other cases, compatibility bridging is provided through special compatibility software for the duration of one major release.

3.2 Operating system

The following sections describe compatibility issues affecting the UNICOS operating system.

3.2.1 Continued support for GigaRing nodes

Users affected: system administrators and site analysts

Hardware supported: Cray T90 systems with GigaRing-based I/O, Cray J90 systems with GigaRing-based I/O

The UNICOS 9.3 release supports the sending and receiving of message and Memory Mapped Register (MMR) packets to GigaRing I/O nodes. The `/dev/fmsg` directory contains the character special nodes that provide a general purpose interface from UNICOS to the GigaRing message complex. These nodes are created with the `mkfm(8)` command. For information on the files in `/dev/fmsg`, see the `fmsg(8)` man page.

The `fping(8)` command sends an echo packet to a GigaRing node. The `mmr(8)` command reads or writes a GigaRing MMR register. These commands use the files in the `/dev/fmsg` directory.

For more information, see the `fmsg(4)`, `fping(8)`, `mkfm(8)`, and `mmr(8)` man pages.

3.2.2 Ability to disable core files reinstated

Users affected: all

Hardware supported: all Cray Research systems

The `limit` command has been changed to allow you to disable the creation of core files. This feature was removed from UNICOS 8.0, but has been reinstated for UNICOS 9.3.

This feature adds an extra option to the `limit(1)` command and `limit(2)` system call. These options allow you to disable core file creation.

The `limit(1)` command syntax for this feature is as follows:

```
limit -d nocore
```


The `limit(2)` system call syntax has been enhanced to accept a new limit of `NO_CORE_FILES`. For example:

```
limit (C_PROC, 0, LCORE, NO_CORE_FILES)
```

For more information, see the `limit(1)` and `limit(2)` man pages.

3.2.3 Support removed for `libwatch.a` library

Users affected: all

Hardware supported: all Cray Research systems

The `libwatch.a` library and the `watchword(7)` man page are no longer supported. They have been removed with the CDBX debugger and CF77 compiler.

See Section 3.4.1, page 18 for more information.

3.3 Networking and communications

The following sections describe compatibility issues affecting network connectivity and communications.

3.3.1 X11 removed from the UNICOS source tree

Users affected: all

Hardware supported: all Cray Research systems

X11 release 6 has been removed from the UNICOS source tree in UNICOS 9.3. Now, binaries will first reside in `~unicos/93/adm/pend/X11R6`, and updates will follow the normal promote process.

The final destination for X11R6 will be `~unicos/93/net/X11R6`.

The X Consortium discontinued support of a number of programs as of X11, release 6. As a result, Cray Research discontinued support of the affected features in UNICOS 9.2. (See *UNICOS Release Letter*, publication RL-5001 9.2, for more information.)

3.3.2 Pre-UNICOS 9.2 `sendmail` queue files incompatible with UNICOS 9.2 and later

Note: This item applies only to sites upgrading to UNICOS 9.3 from a release prior to UNICOS 9.2.

Queue files generated by `sendmail` in UNICOS 9.2 are incompatible with those generated in previous releases of UNICOS. As a result, pre-UNICOS 9.2 `sendmail` queue files can be delivered by the new `sendmail`. Due to differences in options between the two versions, however, queue files generated by the new `sendmail` can not likewise be delivered by the older version.

For further information, see appendix C of the *UNICOS Networking Facilities Administrator's Guide*, publication SG-2304.

3.4 Programming environments

The following sections describe compatibility issues affecting programming environments.

3.4.1 CF77 `gen` compiler removed

Users affected: all

Hardware supported: all Cray Research systems

The `cf77 gen` compiler is no longer available with UNICOS operating system releases. This includes the removal of the `CONFIG_CFT77`, `CONFIG_FPP`, and `CONFIG_GPP` programming environment parameters from the `config.mh` file.

3.4.1.1 Fortran rules for `make` and `nmake` changed

As a result of the removal of the CF77 `gen` compiler, the fortran rules for `make` and `nmake` have been changed to use `f90` as the default.

Note: `nmake` must be re-created and promoted before the new Fortran rules can take effect.

For more information, see the `make(1)` and `nmake(1)` man pages.

3.5 Install tool

The following section describes changes to the install tool for UNICOS 9.3.

3.5.1 Common Installation Tool (CIT) supported on new platforms for UNICOS 9.3

Users affected: system administrators

Hardware supported: CRAY T90 Model-E, CRAY T90 GigaRing, and CRAY J90se GigaRing based systems

UNICOS 9.3 is the first release of UNICOS to support the Common Installation Tool (CIT) on the above-listed systems.

For more information, see *Common Installation Tool (CIT) Reference Card*, publication SQ-2218.

3.5.2 Build menu support for J90 source packages

Users affected: system administrators

Hardware supported: CRAY J90 systems

The install tool build menu has been modified in UNICOS 9.3 to allow full system builds for CRAY J90 systems from within the install tool. A new selection, `Release Type`, has been added to the main build menu for this purpose. This allows you to specify which system components have been installed in `/usr/src`, and to control which components will be built.

If you select `Executable`, only the `uts` component of the system will be built. Otherwise, all standard components of `/usr/src` are built whether or not the system is a CRAY J90.

On CRAY J90 systems, the default release type is `executable`. The default on all other systems is `source`.

3.6 Packaging

The following section describes changes in the media, licensing, or packaging.

3.6.1 Changes extended to PVP system in UNICOS 10.0

The following changes in packaging were applied to CRAY T90 systems in UNICOS 9.2. They will be applied to Cray PVP systems for the UNICOS 10.0 release.

The packaging changes can be broken down into three categories:

- Full replacement of `root` and `usr` files. Previously, these were installed by a build.
- Full replacement of source file relocatables. Previously, only partial replacement of source file relocatables was available.
- Full replacement of source code. Previously, only source code modifications (mods) were available.

Full replacement of `root` and `usr` impacts customers as follows:

- There is no need for a complete system build. This implies less margin for error. (The kernel, optional products, and local changes still require a build.)
- The files that are used for production can be verified, or assured to match what was shipped.
- Installation time and complexity is greatly reduced.
- Full replacement allows for the removal of obsolete files.

Full replacement of source code has the following customer impacts:

- A customer does not need to rely upon code to determine what mods were introduced in order to generate the modified source. Therefore, any errors associated with such mods are eliminated. (This is a packaging issue.)
- A customer does not require code to apply mods on site. Thus, such code related errors are eliminated.
- Local mods **must** be removed before the next release is loaded, and reapplied afterward. (This was required in the past, but not enforced. Now, it will be enforced.)

Please refer any comments, questions, or suggestions to ice@cray.com.

Compatibilities and Differences [3]

This chapter describes compatibility issues and functionality changes involved in upgrading from the UNICOS 10.0 major release and UNICOS 10.0.0.1 update release to the UNICOS 10.0.0.2 update release. This chapter also includes early information about changes planned for future UNICOS releases.

3.1 Compatibility Statement

To meet user requirements for compatibility between releases of Silicon Graphics / Cray Research software, upward compatibility is provided in subsequent releases of the system and products in the following areas:

- UNICOS user commands
- Standard language syntax, semantics, and Cray Research extensions
- Absolute binary code
- Relocatable binary code

This chapter describes any incompatible changes that were introduced in this release for the following reasons:

- Hardware changes
- Third-party software changes
- Improved software design or numerical techniques
- Bugfixes

If possible, both the old and new software are provided for one release. In other cases, compatibility bridging is provided through special compatibility software for the duration of one major release.

3.2 Operating System

The following section describes a compatibility issue that affects the UNICOS operating system beginning with the 10.0.0.2 release.

3.2.1 hpm Products Merged Beginning with UNICOS 10.0.0.2 Release

The source code for the High Performance Monitor products `hpm`, `hpmall`, and `hpmflop` have been merged into a single PL, `/usr/src/prod/c1/hpm`.

Formerly, these products had been maintained in separate PLs. They were merged because much of their code was common.

There is no change in functionality for these products with this merge.

3.3 Networking and Communications

There are no compatibility issues affecting network connectivity and communications for the UNICOS 10.0.0.2 operating system release from previous system releases.

3.4 Programming Environments

There are no compatibility issues affecting programming environments for the UNICOS 10.0.0.2 operating system release from previous system releases.

3.5 Installation

The following section describes changes to the UNICOS 10.0.0.2 installation process.

3.5.1 Automatic Removal of Older Versions of `emacs`

Beginning with the UNICOS 10.0.0.2 operating system release, the installation process will remove older copies of the natively-built `emacs` and `DOC` from version 1 to version $N-2$, where N is a version built during the installation process.

For further information, see the errata for your system:

- *UNICOS Notes/Errata for CRAY T90 Model E Systems*, publication ER-5301 10.0.0.2
- *UNICOS Notes/Errata for Cray GigaRing Based Systems*, publication ER-5302 10.0.0.2

- *UNICOS Notes/Errata for CRAY J90 Model V based Systems*, publication ER-5305 10.0.0.2

3.6 Packaging

There are no changes to media, licensing, or packaging for the UNICOS 10.0.0.2 operating system release from previous system releases.

This chapter describes the documentation that supports the UNICOS 9.3 release. It contains information about the following:

- No pre-release notice for the UNICOS 10.0 release
- Publications that support the UNICOS 9.3 release
- PostScript files of manuals available
- Online information access
- Ordering additional Cray Research publications

4.1 No release preview for UNICOS 10.0

The UNICOS 10.0 release is expected to be small compared to previous major UNICOS releases. As UNICOS has stabilized considerably over the past several major releases, the requirements for new features have lessened substantially. As a result, there will be no pre-release notice for UNICOS 10.0. Instead, pre-release materials will assume the following documents:

- *UNICOS Release Letter*, publication RL-5001, 9.1.
- *UNICOS Release Letter*, publication RL-5001, 9.2.
- *UNICOS Release Letter*, publication RL-5001, 9.3 (this document).

An additional pre-release document will be distributed on-line. This document will announce outstanding UNICOS 10.0 software features in conjunction with the aforementioned release letters.

4.1.1 Publications that support the UNICOS 9.3 release

Online documentation is now available through the Cray DynaWeb server. The Cray DynaWeb server allows users to access information by using a World Wide Web browser such as Netscape. Documentation for the Cray DynaWeb server includes the *Online Software Publications Installation Guide*, publication SG-6105, and the *Online Software Publications Administrator's Guide*, publication SG-6104.

4.1.2 Online documentation

The following UNICOS publications are available online through DynaWeb with the UNICOS 9.3 release package:

- *UNICOS Release Letter*, publication RL-5001 9.3
- *UNICOS Basic Administration Guide for CRAY J90se Systems*, publication SG-2210
- *UNICOS Configuration Administrator's Guide*, publication SG-2303
- *UNICOS Initial System Configuration Using ICMS*, publication SG-2412
- *Kerberos Enigma Installation Guide*, publication SG-5294
- *Online Maintenance Tools Guide for Cray PVP Systems*, publication SD-1012
- *General UNICOS System Administration*, publication SG-2301
- *UNICOS Resource Administration*, publication SG-2302
- *UNICOS Tape Subsystem Administrator's Guide*, publication SG-2307
- *UNICOS Tape Subsystem User's Guide*, publication SG-2051
- *OLNET Online Diagnostic Network Communications Program Maintenance Manual for UNICOS*, publication SD-1021
- *UNICOS under UNICOS Administrator's Guide*, publication SG-2156
- *Asynchronous Transfer Mode (ATM) Administrator's Guide*, publication SG-2193
- *Kerberos Administrator's Guide*, publication SG-2306
- *Kerberos User's Guide*, publication SG-2409
- *UNICOS Multilevel Security (MLS) Feature User's Guide*, publication SG-2111
- *Segment Loader (SEGLDR) and ld Reference Manual*, publication SR-0066
- *TCP/IP Network User's Guide*, publication SG-2009
- *Remote Procedure Call (RPC) Reference Manual*, publication SR-2089
- *UNICOS Message System Programmer's Guide*, publication SG-2121
- *UNICOS X Window System Reference Manual*, publication SR-2101

- *Cray Assembly Language (CAL) for Cray PVP Systems Reference Manual*, publication SR-3108

4.1.3 Printed documentation

The following UNICOS publications are available in printed form with the UNICOS 9.3 release package:

- *UNICOS Basic Administration Guide for CRAY J90se Systems*, publication SG-2210
- *UNICOS Configuration Administrator's Guide*, publication SG-2303
- *UNICOS Initial System Configuration Using ICMS*, publication SG-2412
- *UNICOS Release Letter*, publication RL-5001 9.3
- *Kerberos Enigma Installation Guide*, publication SG-5294
- *UNICOS Installation Guide for CRAY J90se GigaRing based Systems*, publication SG-5296
- *UNICOS Installation Guide for CRAY T90 and CRAY T90 IEEE Model E based Systems*, publication SG-5297
- *UNICOS Installation Guide for CRAY T90 and CRAY T90 IEEE GigaRing based Systems*, publication SG-5298
- *UNICOS 9.2.x Notes/Errata for CRAY T90 Model E Systems*, publication ER-5301
- *UNICOS 9.2.x Notes/Errata for Cray GigaRing Based Systems*, publication ER-5302

4.1.4 Documents for separately licensed products

The following documents are for separately licensed products. They are available in online format only.

- *Shared File System (SFS) Administrator's Guide*, publication SG-2114
- *ONC+ Technology for the UNICOS Operating System*, publication SG-2169

4.2 PostScript files of manuals available

PostScript files of all manuals supported by a particular release are now available on the DynaWeb CD that accompanies that release.

4.3 Online information access

The following types of online information products are available to UNICOS 9.3 release customers:

- The *User Publications Catalog*, publication CP-0099, which describes Cray Research product documentation available to customers. Cray Research customers who subscribe to the Cray Inform (CRInform) program can access this information on CRInform. For additional information about the CRInform program, see Section 5.3, page 26. Cray Research personnel can access the catalog through the World Wide Web at the following URL:

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

- The Cray DynaWeb server, which allows users to view manuals online using a World Wide Web browser such as Netscape or Mosaic. See your Cray Research system administrator for the local URL of the Cray DynaWeb server.
- Man pages, which describe a particular element of the UNICOS 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.
- Cray Research online glossary, which explains the terms used in a manual. To get a definition, use the `define(1)` command.

4.4 Ordering additional Cray Research publications

To order additional copies of the UNICOS publications that are available in printed form, either call the Distribution Center in Mendota Heights, Minnesota, at +1-612-683-5907, or send a facsimile of your request to fax number +1-612-452-0141. Cray Research employees may send electronic mail to `orderdsk` (UNIX system users).

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

This chapter describes the documentation that supports the UNICOS 10.0.0.2 release.

4.1 Printed Documentation — All Platforms

The following is a list of publications that are packaged in printed form with the UNICOS 10.0.0.2 operating system release package. These publications apply to all platforms.

- *UNICOS Release Letter*, publication RL-5001 10.0.0.2
- *Common Installation Tool (CIT) Reference Card*, publication SQ-2218 4/98
- *Kerberos Enigma Installation Guide*, publication SG-5294 10.0
- *UNICOS System Configuration Using ICMS*, publication SG-2412 10.0.0.1

4.2 Printed Documentation — Platform-Specific

The following is a list of platform-specific publications that are packaged in printed form with the UNICOS 10.0.0.2 operating system release package.

- *UNICOS Notes/Errata for CRAY T90 Model E Systems*, publication ER-5301 10.0.0.2
- *UNICOS Installation Guide for CRAY C90, CRAY T90, and CRAY T90 IEEE Model E based Systems*, publication SG-5297 10.0.0.2
- *UNICOS Notes/Errata for CRAY J90 Model V based Systems*, publication ER-5305 10.0.0.2
- *UNICOS Installation Guide for CRAY J90 Model V based Systems*, publication SG-5271 10.0.0.2
- *UNICOS Notes/Errata for Cray GigaRing Based Systems*, publication ER-5302 10.0.0.2
- *UNICOS Installation Guide for CRAY J90se GigaRing based Systems*, publication SG-5296 10.0.0.2

- *UNICOS Installation Guide for CRAY T90 and CRAY T90 IEEE GigaRing based Systems*, publication SG-5298 10.0.0.2

4.3 Online Documentation — All Platforms

The UNICOS 10.0.0.2 release package includes a DynaWeb documentation CD which includes documentation written for all platforms supported by this release. The following publications are included on this CD in PostScript and PDF format.

Note: For further information about the Cray DynaWeb documentation CD, see *Online Software Publications Installation Guide*, publication SG-6105, and *Online Software Publications Administrator's Guide*, publication SG-6104.

- *UNICOS Release Overview*, publication RO-5000 10.0
- *UNICOS Release Letter*, publication RL-5001 10.0.0.2
- *Common Installation Tool (CIT) Reference Card*, publication SQ-2218 4/98
- *OLNET Online Diagnostic Network Communications Program Maintenance Manual for UNICOS*, publication SD-1021 10.0
- *UNICOS under UNICOS Administrator's Guide*, publication SG-2156 10.0
- *Asynchronous Transfer Mode (ATM) Administrator's Guide*, publication SG-2193 1.0
- *General UNICOS System Administration*, publication SG-2301 10.0
- *UNICOS Resource Administration*, publication SG-2302 10.0.0.2
- *UNICOS Networking Facilities Administrator's Guide*, publication SG-2304 10.0.0.2
- *UNICOS Configuration Administrator's Guide*, publication SG-2303 10.0
- *UNICOS Basic Administration Guide for CRAY J90 Model V based Systems*, publication SG-2416 10.0
- *UNICOS Basic Administration Guide for CRAY J90se GigaRing based Systems*, publication SG-2210 10.0
- *Tape Subsystem User's Guide*, publication SG-2051 10.0
- *Tape Subsystem Administration*, publication SG-2307 10.0

- *Kerberos Administrator's Guide*, publication SG-2306 9.0
- *Kerberos User's Guide*, publication SG-2409 9.0
- *UNICOS Multilevel Security (MLS) Feature User's Guide*, publication SG-2111 10.0
- *Segment Loader (SEGLDR) and ld Reference Manual*, publication SR-0066 9.0
- *TCP/IP Network User's Guide*, publication SG-2009 9.0
- *Remote Procedure Call (RPC) Reference Manual*, publication SR-2089 9.0
- *Cray Message System Programmer's Guide*, publication SG-2121 9.0
- *UNICOS X Window System Reference Manual*, publication SR-2101 8.0
- *Cray Assembly Language (CAL) for Cray PVP Systems Reference Manual*, publication SR-3108 9.1

4.4 Man Page Manuals

Man pages changed for releases following the UNICOS 10.0 release are available only online through the <man> command. To view a man page, enter the following:

```
% man <command>
```

PostScript and PDF files of the following man page manuals are included on the UNICOS 10.0.0.2 Dynaweb CD. You may also order them in printed form from the Cray Research Distribution Center.

- *UNICOS User Commands Reference Manual*, publication SR-2011 10.0
- *UNICOS System Calls Reference Manual*, publication SR-2012 10.0
- *UNICOS File Formats and Special Files Reference Manual*, publication SR-2014 10.0
- *UNICOS Administrator Commands Reference Manual*, publication SR-2022 10.0
- *UNICOS System Libraries Reference Manual*, publication SR-2080 10.0

4.5 Man Page Ready References

The following are UNICOS man page ready references that support the UNICOS 10.0.0.2 operating system release. These may be ordered from the Cray Research Distribution Center.

- *UNICOS User Commands Ready Reference*, publication SQ-2056 10.0
- *UNICOS System Libraries Ready Reference*, publication SQ-2147 10.0
- *UNICOS System Calls Ready Reference*, publication SQ-2215 10.0
- *UNICOS Administrator Commands Ready Reference*, publication SQ-2413 10.0

4.6 Documents for Separately Licensed Products

The following documents are for separately licensed products. They are available in online format only.

- *Shared File System (SFS) Administrator's Guide*, publication SG-2114
- *ONC+ Technology for the UNICOS Operating System*, publication SG-2169

4.7 Online Information

The following online information sources are available to UNICOS 10.0.0.2 update release customers:

- The *User Publications Catalog*, publication CP-0099, describes Cray Research product documentation available to customers. Cray Research customers who subscribe to the Cray Inform (CRInform) program can access this information on CRInform. For additional information about the CRInform program, see Section 5.3, page 18. Cray Research personnel can access the catalog at:

`http://wwsdiv.cray.com/PUBLIC/pubs`
- The Cray DynaWeb server enables you to view manuals on the World Wide Web. See your Cray Research system administrator for the local URL of the Cray DynaWeb server.
- Man pages, which describe a particular element of the UNICOS 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.
- Cray Research online glossary, which explains the terms used in a manual. To get a definition, use the `define(1)` command.

4.8 Ordering Additional Cray Research Publications

To order additional copies of the UNICOS publications that are available in printed form, call the Distribution Center in Mendota Heights, Minnesota, at +1-612-683-5907, or send a facsimile of your request to fax number +1-612-452-0141. Silicon Graphics employees may send electronic mail to `orderdisk` (UNIX system users).

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

Customer Services [5]

This chapter describes the following customer services that Cray Research offers to support the UNICOS 9.3 release:

- Training support
- Software problem reporting and resolution process
- Cray Research CRInform program
- *Cray Research Service Bulletin (CRSB)*

5.1 Training support

The *Software Training Catalog for Customers*, publication TR-CUSTCAT, describes all Cray Research Software Training support. The catalog lists Cray Research training office locations, contains the current class schedule and outline for each course, describes the available training services and facilities, and provides curriculum charts.

Customers may access this catalog on the public Cray Research World Wide Web site at the following URL:

<http://www.cray.com/education>

The Software Education Services group has training coordinators available to all Cray customers. They can assist in arrangements for delivery of courses at a site, for registration in courses throughout the world, or in determining a training program suited to your specific needs. To register for a class, discuss special needs, or get additional information, consult our web page or contact the appropriate registrar:

For customer in the United States customers:

Kathy Hicks
Telephone: +1-301-595-2642
email: usareg@cray.com

For international customers:

Reba East
Telephone: +1-713-297-7830
email: intlreg@cray.com

5.2 Software problem reporting and resolution process

If you experience problems with the UNICOS operating system, contact your Cray Research 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 the call center 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.

5.3 Cray Research CRInform program

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

- Report software problems
- Request technical assistance
- Communicate directly with other Cray Research customers
- 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 *Cray Research Service Bulletin* (CRSB), 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 electronic mail (email) notification of any or all of the news items.

Version 4.0 of the CRInform program is available through the World Wide Web. You need access to the CRInform Web server and a browser (such as Mosaic, Netscape, or Lynx), 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.

5.4 Cray Research Service Bulletin (CRSB)

The *Cray Research Service Bulletin* (CRSB) is a monthly publication that supplies information about the software products and services of Cray Research. It includes information about new software releases, new features, new software tools, usage, tuning and performance enhancements, training and documentation, and symptoms of software problems and how to resolve them.

The *Cray Research Service Bulletin* is intended for those who administer Cray Research systems and for those who support users. To subscribe to the *Cray Research Service Bulletin*, contact your Cray Research service representative.

The *Cray Research Service Bulletin* is available on the World Wide Web through the CRInform program.

Customer Services [5]

This chapter describes the following customer services that Cray Research offers to support the UNICOS 10.0.0.2 release:

- Training support
- Software problem reporting and resolution process
- Cray Research CRInform program
- *Cray Research Service Bulletin* (CRSB)

5.1 Training Support

The *Software Training Catalog for Customers*, publication TR-CUSTCAT, describes all Cray Research Software Training support. The catalog lists Cray Research training office locations, contains the current class schedule and outline for each course, describes the available training services and facilities, and provides curriculum charts.

Customers may access this catalog on the public Cray Research World Wide Web site at the following URL:

<http://www.cray.com/education>

The Software Education Services group has training coordinators available to all Cray customers. They can assist in arrangements for delivery of courses at a site, for registration in courses throughout the world, or in determining a training program suited to your specific needs. To register for a class, discuss special needs, or get additional information, consult our web page or contact the appropriate registrar:

For customer in the United States customers:

Kathy Hicks
Telephone: +1-301-595-2642
email: usareg@cray.com

For international customers:

Reba East
Telephone: +1-713-297-7830
email: intlreg@cray.com

5.2 Software Problem Reporting and Resolution Process

If you experience problems with the UNICOS operating system, contact your Cray Research 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 the call center 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.

5.3 Cray Research CRInform program

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

- Report software problems
- Request technical assistance
- Communicate directly with other Cray Research customers
- 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 *Cray Research Service Bulletin* (CRSB), 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 electronic mail (email) notification of any or all of the news items.

Version 4.0 of the CRInform program is available through the World Wide Web. You need access to the CRInform Web server and a browser (such as Mosaic, Netscape, or Lynx), 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.

5.4 Cray Research Service Bulletin (CRSB)

The *Cray Research Service Bulletin* (CRSB) is a monthly publication that supplies information about the software products and services of Cray Research. It includes information about new software releases, new features, new software tools, usage, tuning and performance enhancements, training and documentation, and symptoms of software problems and how to resolve them.

The *Cray Research Service Bulletin* is intended for those who administer Cray Research systems and for those who support users. To subscribe to the *Cray Research Service Bulletin*, contact your Cray Research service representative.

The *Cray Research Service Bulletin* is available on the World Wide Web through the CRInform program.

Release Package [6]

This chapter contains the following information about the UNICOS 9.3 release package:

- UNICOS 9.3 release hardware and software requirements
- Licensing information
- Optional software
- Release package contents
- Ordering UNICOS 9.3 release package

6.1 UNICOS 9.3 release hardware and software requirements

This section lists the following:

- Cray Research hardware systems supported with this release
- Programming environments supported with the UNICOS 9.3 release package
- Software required by the UNICOS 9.3 release
- Tested and supported upgrade paths
- Cray Research software products supported

6.1.1 Cray Research systems supported

The UNICOS 9.3 release supports the following platforms:

- CRAY T90 GigaRing based series, including CRAY T90 CFP IEEE systems
- CRAY T90 IEEE *non*-GigaRing based systems
- CRAY J90se GigaRing based systems

6.1.2 OWS and IOS-E software

For Cray Research systems with an IOS-E and for the CRAY T90 series, it is recommended that you upgrade to the IOS-E 9.0.1.3/015 and the OWS 9.0.1.3/015 releases. For information about ordering the IOS-E 9.0 and OWS 9.0

releases, see the *Support System and IOS-E Release Overview*, publication RO-5060 9.0.

6.1.3 Fortran run-time libraries

Sites that install the UNICOS 9.3 release must upgrade to a Programming Environment 1.2 or later release to obtain Fortran run-time libraries. This is because these libraries were no longer released with the UNICOS system beginning with UNICOS 9.0.

Note: Sites running the UNICOS 8.3 *restricted* release also have this requirement. These libraries were not released with UNICOS 8.3.

6.1.4 Tested and supported upgrade paths

If your site runs any version of the UNICOS 9.1, or UNICOS 9.2 release, you can upgrade directly to the UNICOS 9.3 release. The exception to this is if you have a *non*-GigaRing system and you wish to upgrade to a GigaRing-based system. In this case, an initial installation is required.

Initial installs of GigaRing-based systems are supported with UNICOS 9.2 and beyond, while support of initial installs of Model-E based systems stopped after UNICOS 9.1.

6.1.5 Cray Research asynchronous software products supported

The following sections list the software products most commonly used in conjunction with the UNICOS operating system. The product release level required with UNICOS 9.3, if any, is specified. For information about other products, contact your Cray Research representative.

6.1.5.1 Programming environments supported

The UNICOS 9.3 release supports the following Cray Research programming environments, which are released asynchronously or otherwise separately from the UNICOS 9.3 release.

Note: For each programming environment release after the release level designated below, ensure your Cray Research system is supported before ordering an upgrade programming environment release package.

- CF90 Programming Environment 3.0 or later for Cray PVP and MPP systems. See the *Programming Environment Releases Overview*, publication RO-5212 3.0, for additional information.
- Cray C++ Programming Environment 3.0 or later for Cray PVP and MPP systems. This package includes Cray Standard C. See the *Programming Environment Releases Overview*, publication RO-5212, for additional information.
- C++ MathPack 3.0 for Cray PVP and MPP systems. See the *Cray C++ Library Products Technical Note*, publication SN-2129 3.0, for additional information.
- C++ Tools 3.0 for Cray PVP and MPP systems. See the *Cray C++ Library Products Technical Note*, publication SN-2129 3.0, for additional information.
- CAM 2.2 (Cray Assembler for MPP). See the *Cray Assembler for MPP (CAM) Reference Manual*, publication SR-2510 2.1, for additional information.

6.1.5.2 Distributed computing and networking software supported

The UNICOS 9.3 release supports the following Cray Research distributed computing and networking software products, which are released asynchronously or otherwise separately from the UNICOS 9.3 release.

- Distributed Computing Environment

Customers wishing to use the Cray Distributed Computing Environment (DCE) Client Services, must purchase a DCE license. DCE 1.1 is the level of DCE required with UNICOS 9.3. For more information about DCE licensing or to purchase a DCE license, contact your Cray Research representative. For information describing this product, see the *Cray DCE Client Services/Cray DCE DFS Server Release Overview*, publication RO-5225 1.1, or contact your Cray Research representative.

- Network Queuing Environment

The Cray Network Queuing Environment (NQE) is a set of clients and servers that allow batch requests to be executed across a load-balanced network of hosts. UNICOS 9.3 supports NQE version 3.2 or later. For more information about NQE or to purchase an NQE license, contact your Cray Research representative, or see the *NQE Release Overview*, publication RO-5237.

- Distributed File System

To use the Cray DCE Distributed File System (DFS), sites must purchase a DFS license, as well as a DCE Client Services prerequisite license. For more information about DFS licensing or to purchase a DFS license, contact your Cray Research representative. For information describing this product, see the *Cray DCE Client Services/Cray DCE DFS Server Release Overview*, publication RO-5225 1.1, or contact your Cray Research representative.

- SUPERLINK/VMS

SUPERLINK for DEC VAX/VMS Systems provides a link between DEC VAX/VMS systems and the UNICOS operating system on Cray Research PVP systems. UNICOS 9.3 supports the 1.4 version of SUPERLINK/VMS. For information describing this product, see the *SUPERLINK for DEC VAX OpenVMS and Alpha AXP Systems 1.4 Release Overview*, publication RO-5090.

- Cray Visualization Toolkit (CVT)

The Cray Visualization Toolkit is a collection of tools that allows users to create visual interfaces for Cray Research-based applications. CVT software is appropriate for all CRAY Y-MP, CRAY M90, CRAY C90, CRAY T90, CRAY EL92, CRAY EL94, CRAY EL98, CRAY J90 and CRAY T3E computer systems. UNICOS 9.3 supports the 3.1 version of CVT.

- Remote Queuing System (RQS/VMS)

The Remote Queuing System (RQS) for DEC VAX/VMS Systems is used for remote job submission and control to Cray Research PVP systems from a DEC VAX/VMS running VMS 5.4 or later. UNICOS 9.3 supports the 1.1 release of RQS/VMS. For information describing this product, see the *RQS for DEC VAX/VMS Systems 1.1 Release Overview*, publication RO-5105

- Front End Servicing for IBM/MVS Systems (FES MVS)

The Front End Servicing for IBM/MVS Systems (FES MVS) integrates UNICOS on-line tape management on CRAY Y-MP, CRAY J90, CRAY C90 or CRAY T90 systems running UNICOS with tape management system for other computer systems running the IBM/MVS operating system. UNICOS 9.3 supports the 1.0 version of this product. For information on FES MVS see the *FES MVS 1.0 Installation and Administration Guide*, publication SG-5251.

6.1.5.3 Other software supported

The UNICOS 9.3 release supports the following Cray Research software products, which are released asynchronously or otherwise separately from the UNICOS 9.3 release.

- Data Migration Facility 2.4.8 or 2.5.4.2

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. DMF 2.4.8 or 2.5.4.2 is the level of DMF required with UNICOS 9.3. For information on ordering DMF, contact your Cray Research representative.

- HIPPI disk support software

Cray Research will supply HIPPI disk software free of charge to customers purchasing disks from Cray Research. If customers choose to purchase their disks from another vendor, HIPPI disk software will be separately available and licensed for those customers. For more information about HIPPI licensing or to purchase a HIPPI license, contact your Cray Research representative. For information describing this product, see the *UNICOS 9.0 Release Letter*, publication RO-5000, or contact your Cray Research representative.

- Cray REELibrarian (CRL)

CRL is a client/server volume management system that controls a centrally stored library of tapes (or volumes) and allows requests for tape mounts. UNICOS 9.3 supports the 2.0.8 release of CRL. For more information on ordering CRL, contact your Cray Research representative.

For additional software availability, contact your Cray Research representative.

6.2 Licensing information

The UNICOS operating system is licensed under a software contract by Cray Research to its customers. The UNICOS 9.3 release is available as follows:

- For CRAY T90 systems, UNICOS 9.3 is available in source code format only.
- For CRAY J90se systems, UNICOS 9.3 is available in binary format only. CRAY J90se customers may, however, obtain an optional J90 UNICOS Source Materials package, providing they obtain a separate J90 UNICOS Source Materials license.

Note: UNICOS 9.3 release package requires a UNICOS System Software license; customers with a UNICOS System Software license do not need additional Cray Research licenses to receive the standard UNICOS 9.3 release package (see Section 6.2.2, page 36 for information on UNIX license requirements). Software for programming environments (compilers) and the Data Migration Facility (DMF) are licensed separately from the UNICOS System Software license. Other functionality is also offered as separately licensed products.

Customers outside the United States and Canada must sign a Letter of Assurance before software can be shipped. Address all questions regarding which customers have signed a Letter of Assurance, or which software requires this letter to Christine Miller, at the following address:

Christine Miller
Cray Research, Inc.
655F Lone Oak Drive
Eagan, MN 55121
Telephone: +1-612-683-7476
Fax: +1-612-683-7297

6.2.1 Products that require Flexible License Manager keys

The UNICOS 9.3 release includes the Flexible License Manager (FLEXlm), which controls the use of certain products in the UNICOS operating system. In UNICOS 9.3, the following products are licensed through FLEXlm:

- ONC+
- UNICOS shared file system
- CRSTK/STKRED
- CRIBM/IBM 3495 (implementation of IBM 3495 Tape Library Dataserver support is deferred)
- CREMS/DTDLD and CREMS/ER90
- BDS (Bulk Data Services)
- NQE (Network Queuing Environment)

Whether products are packaged with the UNICOS operating system or separately packaged, the license keys are generated by the Cray Research order desk during the product order cycle. After the order desk has received notice of

the order, it issues the contracted license keys. The license keys and installation instructions are sent by electronic mail.

For a complete list of Cray Research products that operate with UNICOS software, contact your Cray Research representative.

If a licensed product has been installed and a problem arises that is suspected to be related to the license key, it is possible to get an emergency key from the Customer Service Call Center in the United States or from the service organization in other countries.

6.2.1.1 ONC+

To use ONC+ technology, sites must purchase an ONC+ license. For more information about ONC+ licensing or to purchase an ONC+ license, contact your Cray Research representative.

For information describing this product, see the *UNICOS 9.0 Release Letter*, publication RO-5000, or contact your Cray Research representative.

6.2.1.2 UNICOS Shared File Systems

To use UNICOS shared file systems (SFS), sites must purchase an SFS license. For more information about SFS licensing or to purchase an SFS license, contact your Cray Research representative.

For information describing this product, see the *UNICOS 9.0 Release Letter*, publication RO-5000, or contact your Cray Research representative.

6.2.1.3 CRSTK/STKRED

To use StorageTek RedWood drive autoloader cartridge system support, sites must purchase a CRSTK/STKRED license. For more information about CRSTK/STKRED licensing or to purchase a CRSTK/STKRED license, contact your Cray Research representative.

For additional information, see the *UNICOS 9.0 Release Letter*, publication RO-5000, or contact your Cray Research representative.

6.2.1.4 CRIBM/IBM 3495

To use IBM 3495 support software, sites must purchase a CRIBM/IBM 3495 license. For more information about CRIBM/IBM 3495 licensing or to purchase a CRIBM/IBM 3495 license, contact your Cray Research representative.

Implementation of IBM 3495 Tape Library Dataserver support is deferred.

6.2.1.5 CREMS/DTDLD and CREMS/ER90

To use the EMASS robotic and ER90 device products, sites must purchase a CREMS/DTDLD license. For more information about CREMS/DTDLD licensing or to purchase a license, contact your Cray Research representative.

For information describing this product, see the *UNICOS 9.0 Release Letter*, publication RO-5000, or contact your Cray Research representative.

6.2.1.6 BDS (Bulk Data Services)

BDS will be available for Cray PVP systems for the first time starting with UNICOS 9.3. BDS is controlled by FLEXlm and requires a separate license for access.

6.2.1.7 NQE (Network Queuing Environment)

UNICOS 9.3 supports the 3.2 release of NQE. You are required to have a FLEXlm license for NQE 3.2 only if you did not purchase NQE 3.1.

For information describing this product, see the *NQE Release Overview*, publication RO-5237, or contact your Cray Research representative.

6.2.2 UNICOS source code license

To receive a UNICOS 9.3 source code license, customers must first obtain a UNIX source code license for the UNIX System V, Release 4.0 (SVR 4.0). Customers can obtain these rights through Cray Research, or through The Santa Cruz Operation, Inc. (SCO).

Note: Customers with UNIX rights that allow them to receive the UNICOS 9.0 release do not need additional UNIX licensing for the UNICOS 9.3 release.

For information on who to contact if you have licensing questions, or if your site has not signed all appropriate Cray Research software license agreements, see Section 6.2.3 or Section 6.2.4.

For information about available optional software products that are included with your UNICOS license but which you must order to receive them with your UNICOS 9.3 release package, see Section 6.2.1, page 34.

For more information about the FLEXlm license manager, or for information about products that are included in the UNICOS 9.3 release software but which require a FLEXlm license key to access the product, see Section 6.2.1, page 34.

6.2.2.1 UNIX System V licenses for CRAY J90 systems

CRAY J90 customers that have a standard binary release of UNICOS 9.3 must have a UNIX System V, Release 4.0 *binary* license, available only through Cray Research.

CRAY J90 customers with the J90 Source Materials Option need an additional UNIX System, Release 4.0 *source* license, available only through Cray Research.

6.2.3 Licensing contact for customers in the U.S. and Canada

For more information on the licensing and pricing of the UNICOS 9.3 release, customers in the United States and Canada should see their account representative or contract administrator, or contact Sarah White at the following address:

Sarah White
Cray Research
655F Lone Oak Drive
Eagan, MN 55121 USA
Telephone: +1-612-683-5604
Fax: +1-612-683-7145

6.2.4 Licensing contacts for customers outside the U.S. and Canada

Customers outside the U.S. and Canada may obtain further licensing and export information by contacting their account representative or the individuals listed in the following sections.

6.2.4.1 Cray European Regional Contract Negotiators

Customers in Europe can direct licensing inquiries to the following Regional Contract Administrators:

Europe North Sales Region (including UK / Ireland / Russia / Poland / Denmark / Finland / Norway / Sweden / Netherlands)
Nick Jacobs
Cray Research (UK) Ltd.
Oldbury

Bracknell
Berkshire, RG12 4TQ, England
Telephone: +44-1189-257041
Fax: +44-1189-257106
Email: niknik@cray.com

Rest of Europe and South Africa
Simon Locke
Cray Research (UK) Ltd., c/o SGI Ltd
1530 Lakeside, Arlington Bus. Park
Theale Berkshire
Reading, RG7 4SB, England
Telephone: 44-1189-257049
Fax: 44-1189-257946
Email: srl@cray.com

Europe Central (including Germany and Austria)
Christian Schaub
Silicon Graphics GmbH
Am Hochacker 3
85630 Grasbrunn-Neukeferloh
Germany
Telephone: +49-89-14903
Fax: +49-89-1415959
Email: chs@cray.com

Europe South Sales Region (including France)
Cecile Goachet / Patricia Guillerm-Brillet
Silicon Graphics France
21, rue Albert Calmette
78351 Jouy en Josas
France
Telephone: +33-01-34-88-82-51
Fax: +33-01-34-65-96-19
Email: cecile@cray.com and pguiller@paris.sgi.com

6.2.4.2 Cray Japan Contracts / Legal

Customers in Japan can direct licensing inquiries to Yuko Hizume at the following address:

Yuko Hizume
Nihon Silicon Graphics Cray K.K.
P.O. Box 5011 Yebisu Garden Place Tower

4-20-3, Ebisu
Shibuya-ku, Tokyo 150
Japan
Telephone: +81-3-5488-1819
Fax: +81-3-5420-7020
Email: hizume@nsg.sgi.com

6.2.4.3 Other customers

International customers outside Europe and Japan can direct licensing inquiries to Rodgers Naylor at the following address:

Rodgers Naylor
Director of Contracts
Cray Research, a Silicon Graphics Company
655F Lone Oak Drive
Eagan, MN 55121 USA
Telephone: +1-612-683-7403
Fax: +1-612-683-7297
Email: naylorgr@cray.com

6.3 Optional software

You can order the following software products on your UNICOS 9.3 software order form as optional software when you order your UNICOS 9.3 release package.

Note: These products are included with your UNICOS license, but they are not automatically shipped as part of the UNICOS 9.3 release package. If you want any of the following products, you must order them on the UNICOS 9.3 order form.

The products described are as follows:

- Kerberos Enigma software
- DWB

For a complete list of Cray Research products that operate with the UNICOS 9.3 operating system, contact your Cray Research representative.

6.3.1 Kerberos Enigma software

The Kerberos Enigma software contains software for CRYPT and Kerberos. The Kerberos Enigma tape replaces the CRYPT and RPC Enigma tapes. The Kerberos Enigma software is available in both binary and source code, depending on the license terms with each customer and on-site location.

6.3.1.1 Kerberos Enigma software shipped within the U.S. and Canada

For shipments of Kerberos Enigma software within the United States and Canada, order it as optional software on the UNICOS 9.3 software order form.

Customers in the United States and Canada receive tapes that include versions of the Kerberos programs that support data stream encryption. The software is available in either source or binary form, depending on the license terms with each customer.

6.3.1.2 Kerberos Enigma software shipped outside of the U.S. or Canada

Customers outside the United States and Canada receive binary software regardless of whether their site has a source or binary UNICOS license. With this software, customers outside the United States and Canada can run Kerberos without support for data stream encryption. To order this software, use the UNICOS 9.3 software order form.

An export license from the U.S. Department of State is required for software shipments outside the United States or Canada. This export license is required in addition to the Department of Commerce export license necessary for Cray Research hardware. If a U.S. Department of State export license is **not** in place for the customer serial number for which the Kerberos Enigma software is desired, a U.S. Department of State Application Request for Kerberos Enigma is required before an export license can be processed. If an export license already exists, the statement is **not** required. The Kerberos Enigma binary software order form contains a U.S. Department of State Application Request for Kerberos Enigma.

You can obtain a U.S. Department of State export licenses for UNICOS from Christine Miller at the following address:

Christine Miller
Cray Research, Inc.
655F Lone Oak Drive
Eagan, MN 55121
Telephone: +1-612-683-7476

Fax: +1-612-683-7297
Email: millercm@cray.com

6.3.2 DWB

DWB is based on Documenter's Workbench from Novell, Inc. Only binary software is provided.

DWB is packaged separately from the UNICOS operating system. To receive DWB, order it using the "Additional Software" section of the UNICOS 9.3 software order form.

Note: A separate license is not required for DWB. UNICOS System Software and UNICOS Set licenses include binary licenses for DWB.

6.4 Release package contents

The UNICOS 9.3 release package includes the following:

- Software media that contains the UNICOS 9.3 release. IOS-E sites automatically receive the OWS 9.0.1.3/015 and IOS 9.0.1.3/015 release package when the UNICOS 9.3 release is ordered.

Note: If your site is licensed for supported UNICOS source code, you will receive a source code package, which lets you modify your code locally. For major releases, you can load source code into your system together with binary code packages before generation.

- Online man page files. To display these files, use the man(1) command.
- A CD-ROM that contains the DynaWeb server and the UNICOS publications.
- A set of printed publications.

6.5 Ordering the UNICOS 9.3 release package

UNICOS is distributed by order only to sites that have signed a Cray Research software license agreement for the 9.3 release of the product. The most current revision of the release package is supplied.

Please make sure your site has signed a Cray Research software license agreement before you order the UNICOS 9.3 release package (see Section 6.2, page 33, for details).

You can order the UNICOS 9.3 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 Cray Research Distribution Center by telephone (+1-612-683-5907 or 1-800-284-2729 extension 35907), through electronic mail (orderdsk@cray.com), or by fax (+1-612-452-0141).
- 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 Christine Miller at the following address:

Christine Miller
International Administration
Cray Research, Inc.
655F Lone Oak Drive
Eagan, MN 55121
Telephone: +1-612-683-7476
Fax: +1-612-683-7297
Email: millercm@cray.com

6.5.1 Further information

If you have questions, or if your site has not signed a Cray Research software license agreement, either contact your regional contract administrator or contact Barbara Easterly, Sarah White, or Jenny Gross at the following addresses:

Barbara Easterly
Cray Research
655F Lone Oak Drive
Eagan, MN 55121 USA
Telephone: +1-612-683-5662
Fax: +1-612-683-7145
Email: easterly@cray.com

Sarah White
Cray Research
655F Lone Oak Drive
Eagan, MN 55121 USA
Telephone: +1-612-683-5604
Fax: +1-612-683-7145
Email: whitess@cray.com

Jenny Gross
Cray Research
655F Lone Oak Drive
Eagan, MN 55121 USA
Telephone: +1-612-683-5661
Fax: +1-612-683-7145
Email: jenny@cray.com

Release Package [6]

This chapter contains the following information about the UNICOS 10.0.0.2 release package:

- UNICOS 10.0.0.2 release hardware and software requirements
- Licensing information
- Optional software
- Release package contents
- Ordering UNICOS 10.0.0.2 release package

6.1 UNICOS 10.0.0.2 Release Hardware and Software Requirements

The following sections cover the hardware platforms that support the UNICOS 10.0.0.2 release, and the software required with this release.

6.1.1 Cray Research Systems Supported

The UNICOS 10.0.0.2 release supports the following Cray Research GigaRing platforms:

- CRAY J90se series
- CRAY T90 series with Cray floating-point CPUs
- CRAY T90 series with IEEE Std. 754 floating-point CPUs

The UNICOS 10.0.0.2 release also supports the following Cray Research systems with Model-E or Model-V IOS:

- Cray J90 series
- Cray C90 series
- CRAY T90 series with Cray floating-point CPUs
- CRAY T90 series with IEEE Std. 754 floating-point CPUs

6.1.2 Tested and Supported Upgrade Paths

If your site runs any version of the UNICOS 9.0, UNICOS 9.1, UNICOS 9.2, or UNICOS 9.3 operating system releases, you can upgrade directly to the UNICOS 10.0.0.2 release. The exception to this is if you have a *non-GigaRing* system and you wish to upgrade to a GigaRing-based system. In this case, you must perform an initial installation.

Initial installs of Model V-based and GigaRing-based systems are supported with this UNICOS release and beyond. Support for initial installs of Model E-based systems stopped after the UNICOS 9.1 operating system release.

For more information, see the following platform-specific installation and upgrade publications:

- *UNICOS Installation Guide for CRAY J90 Model V based Systems*, publication SG-5271 10.0
- *UNICOS Installation Guide for CRAY J90se GigaRing based Systems*, publication SG-5296 10.0
- *UNICOS Installation Guide for CRAY C90, CRAY T90, and CRAY T90 IEEE Model E based Systems*, publication SG-5297 10.0
- *UNICOS Installation Guide for CRAY T90 and CRAY T90 IEEE GigaRing based Systems*, publication SG-5298 10.0

Contact your Cray Research representative for further information.

6.1.3 OWS, IOS-E, and SWS-ION Software

For Cray Research systems with an IOS-E and for the CRAY T90 series, it is recommended that you upgrade to the IOS-E 9.0.1.3/015 and the OWS 9.0.1.3/015 releases, plus the getfix package for FN2547.

For information about ordering the IOS-E 9.0 and OWS 9.0 releases, see the *Support System and IOS-E Release Overview*, publication RO-5060 9.0.

UNICOS 10.0.0.2 supports SWS-ION version 3.7 or later for GigaRing sites.

6.1.4 Fortran Run-time Libraries

Sites that install the UNICOS 10.0.0.2 release must upgrade to Programming Environment 1.2 or later release to obtain Fortran run-time libraries. This is

because these libraries were no longer released with the UNICOS system beginning with UNICOS 9.0.

Note: Sites running the UNICOS 8.3 *restricted* release also have this requirement. These libraries were not released with UNICOS 8.3.

6.2 Asynchronous Software Products Supported with This Release

The following sections list the software products most commonly used in conjunction with the UNICOS operating system. The product release level required with UNICOS 10.0.0.2, if any, is specified. For information about other products, contact your Silicon Graphics / Cray Research representative.

6.2.1 Programming Environments Supported

The UNICOS 10.0.0.2 release supports the following Cray Research programming environments, which are released asynchronously or otherwise separately from the UNICOS 10.0.0.2 release.

- CF90 Programming Environment 3.0 or later for Cray PVP and MPP systems. See the *Programming Environment Releases Overview*, publication RO-5212 3.0, for additional information.
- Cray C++ Programming Environment 3.0 or later for Cray PVP and MPP systems. This package includes Cray Standard C. See the *Programming Environment Releases Overview*, publication RO-5212, for additional information.
- C++ MathPack 3.0 for Cray PVP and MPP systems. See the *Cray C++ Library Products Technical Note*, publication SN-2129 3.0, for additional information.
- C++ Tools 3.0 for Cray PVP and MPP systems. See the *Cray C++ Library Products Technical Note*, publication SN-2129 3.0, for additional information.
- CAM 2.2 (Cray Assembler for MPP). See the *Cray Assembler for MPP (CAM) Reference Manual*, publication SR-2510 2.1, for additional information.

6.2.2 Distributed Computing and Networking Software Supported

The UNICOS 10.0.0.2 release supports the following Cray Research distributed computing and networking software products, which are released asynchronously or otherwise separately from the UNICOS 10.0.0.2 release.

- Distributed Computing Environment (DCE) 1.1 or later

Customers wishing to use the Cray Distributed Computing Environment (DCE) Client Services, must purchase a DCE Client Services license. DCE 1.1 or later required with UNICOS 10.0.0.2. For more information about DCE licensing or to purchase a DCE license, contact your Silicon Graphics / Cray Research representative.

For information describing this product, see the *Cray DCE Client Services/Cray DCE DFS Server Release Overview*, publication RO-5225 1.1, or contact your Silicon Graphics / Cray Research representative.

- Distributed File System (DFS) 1.1 or later

To use the Cray DCE Distributed File System (DFS), sites must purchase a DFS Server license, as well as a DCE Client Services prerequisite license. For more information about DFS licensing or to purchase a DFS license, contact your Silicon Graphics / Cray Research representative.

For information describing this product, see the *Cray DCE Client Services/Cray DCE DFS Server Release Overview*, publication RO-5225 1.1, or contact your Silicon Graphics / Cray Research representative.

- Network Queuing Environment (NQE) 3.3 or later

The Cray Network Queuing Environment (NQE) is a set of clients and servers that allow batch requests to be executed across a load-balanced network of hosts. UNICOS 10.0.0.2 supports NQE version 3.3 or later.

For more information about NQE or to purchase an NQE license, contact your Silicon Graphics / Cray Research representative, or see the *NQE Release Overview*, publication RO-5237.

- SUPERLINK/VMS 1.4

SUPERLINK for DEC VAX/VMS Systems provides a link between DEC VAX/VMS systems and the UNICOS operating system on Cray Research PVP systems. UNICOS 10.0.0.2 supports the 1.4 version of SUPERLINK/VMS.

Note: You must purchase a SUPERLINK / VMS license to use this product.

For information describing this product, see the *SUPERLINK for DEC VAX OpenVMS and Alpha AXP Systems 1.4 Release Overview*, publication RO-5090.

- Cray Visualization Toolkit (CVT) 3.1

The Cray Visualization Toolkit is a collection of tools that allows users to create visual interfaces for Cray Research-based applications. CVT software is appropriate for all CRAY Y-MP, CRAY M90, CRAY C90, CRAY T90, CRAY EL92, CRAY EL94, CRAY EL98, CRAY J90 and CRAY T3E computer systems. UNICOS 10.0.0.2 supports the 3.1 version of CVT.

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

- Remote Queuing System (RQS/VMS) 2.0

The Remote Queuing System (RQS) for DEC VAX/VMS Systems is used for remote job submission and control to Cray Research PVP systems from a DEC VAX/VMS running VMS 5.4 or later. UNICOS 10.0.0.2 supports the 2.0 release of RQS/VMS.

Note: You must purchase an RQS/VMS license to use this product.

For information describing this product, see the *RQS for DEC VAX/VMS Systems Release Overview*, publication RO-5105

- Front End Servicing for IBM/MVS Systems (FES MVS) 2.0

The Front End Servicing for IBM/MVS Systems (FES MVS) integrates UNICOS on-line tape management on CRAY Y-MP, CRAY J90, CRAY C90 or CRAY T90 systems running UNICOS with tape management system for other computer systems running the IBM/MVS operating system. UNICOS 10.0.0.2 supports the 2.0 version of this product.

Note: You must purchase an FES/MVS license to use this product.

For information on FES MVS see the *FES MVS Installation and Administration Guide*, publication SG-5251.

6.3 Storage Management Software Supported

The UNICOS 10.0.0.2 release supports the following Silicon Graphics / Cray Research storage management software products. These are released asynchronously or otherwise separately from the UNICOS 10.0.0.2 release.

- Data Migration Facility 2.5 or later

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. DMF 2.5 or later is the level of DMF required with UNICOS 10.0.0.2.

- HIPPI disk support software

Silicon Graphics / Cray Research will supply HIPPI disk software free of charge to customers purchasing disks from Silicon Graphics / Cray Research. If customers choose to purchase their disks from another vendor, HIPPI disk support software must be licensed and purchased from Silicon Graphics / Cray Research.

- Cray REELibrarian (CRL)

CRL is a client/server volume management system that controls a centrally stored library of tapes (or volumes) and allows requests for tape mounts. UNICOS 10.0.0.2 supports the 2.0.8 release of CRL.

For additional software availability, contact your Silicon Graphics / Cray Research representative.

6.4 Licensing Information

The UNICOS operating system is licensed under a software contract by Silicon Graphics / Cray Research to its customers. The UNICOS 10.0.0.2 release is available as follows:

- For CRAY T90 and CRAY C90 systems, UNICOS 10.0.0.2 is available in both source and binary code formats.
- For CRAY J90 systems (including J90se systems), UNICOS 10.0.0.2 is available in binary format only. CRAY J90se customers may, however, obtain an optional J90 UNICOS Source Materials package, providing they obtain a separate J90 UNICOS Source Materials license.

Note: UNICOS 10.0.0.2 release package requires a UNICOS System Software license; customers with a UNICOS System Software license do not need additional Silicon Graphics / Cray Research licenses to receive the standard UNICOS 10.0.0.2 release package (see Section 6.4.2, page 29 for information on UNIX license requirements). Software for programming environments (compilers) and the Data Migration Facility (DMF) are licensed separately from the UNICOS System Software license. Other functionality is also offered as separately licensed products.

Customers outside the United States and Canada must sign a Letter of Assurance before software can be shipped. Address all questions regarding which customers have signed a Letter of Assurance, or which software requires this letter to Christine Miller, at the following address:

Christine Miller
Silicon Graphics / Cray Research, Inc.
655F Lone Oak Drive
Eagan, MN 55121
Telephone: +1-612-683-7476
Fax: +1-612-683-7297

6.4.1 Products That Require Flexible License Manager Keys

The UNICOS 10.0.0.2 release includes the Flexible License Manager (FLEXlm), which controls the use of certain products in the UNICOS operating system. In UNICOS 10.0.0.2, the following products are licensed through FLEXlm:

- ONC+
- UNICOS shared file system
- CRSTK/STKRED
- CRIBM/IBM 3495 (implementation of IBM 3495 Tape Library Dataserver support is deferred)
- CREMS/DTDLE and CREMS/ER90
- BDS (Bulk Data Services) Client
- BDS (Bulk Data Services) Server
- NQE (Network Queuing Environment)

Whether products are packaged with the UNICOS operating system or separately packaged, the license keys are generated by the Silicon Graphics / Cray Research order desk during the product order cycle. After the order desk has received notice of the order, it issues the contracted license keys. The license keys and installation instructions are sent by electronic mail.

For a complete list of products that operate with UNICOS software, contact your Silicon Graphics / Cray Research representative.

If a licensed product has been installed and a problem arises that is suspected to be related to the license key, it is possible to get an emergency key from the Customer Service Call Center in the United States or from the service organization in other countries.

6.4.1.1 ONC+

To use ONC+ technology, sites must purchase an ONC+ license. For more information about ONC+ licensing or to purchase an ONC+ license, contact your Silicon Graphics / Cray Research representative.

For information describing this product, see the *UNICOS 9.0 Release Letter*, publication RO-5000, or contact your Silicon Graphics / Cray Research representative.

6.4.1.2 UNICOS Shared File Systems

To use UNICOS shared file systems (SFS), sites must purchase an SFS license. For more information about SFS licensing or to purchase an SFS license, contact your Silicon Graphics / Cray Research representative.

For information describing this product, see the *UNICOS 9.0 Release Letter*, publication RO-5000, or contact your Silicon Graphics / Cray Research representative.

6.4.1.3 CRSTK/STKRED

To use StorageTek RedWood drive autoloader cartridge system support, sites must purchase a CRSTK/STKRED license. For more information about CRSTK/STKRED licensing or to purchase a CRSTK/STKRED license, contact your Silicon Graphics / Cray Research representative.

For additional information, see the *UNICOS 9.0 Release Letter*, publication RO-5000, or contact your Silicon Graphics / Cray Research representative.

6.4.1.4 CRIBM/IBM 3495

To use IBM 3495 support software, sites must purchase a CRIBM/IBM 3495 license. For more information about CRIBM/IBM 3495 licensing or to purchase a CRIBM/IBM 3495 license, contact your Silicon Graphics / Cray Research representative.

Implementation of IBM 3495 Tape Library Dataserver support is deferred.

6.4.1.5 CREMS/DTDLD and CREMS/ER90

To use the EMASS robotic and ER90 device products, sites must purchase a CREMS/DTDLD license. For more information about CREMS/DTDLD licensing or

to purchase a license, contact your Silicon Graphics / Cray Research representative.

6.4.1.6 BDS (Bulk Data Services) Server

BDS Server data transfer product is available for Cray PVP systems for UNICOS 10.0.0.2. BDS Server is controlled by FLEXlm and requires a separate license for access.

For more information on this product, see the `bds(8)` man page, or contact your Cray Research representative.

6.4.1.7 BDS (Bulk Data Services) Client

BDS Client data transfer product is available for Cray PVP systems for UNICOS 10.0.0.2. BDS Client is controlled by FLEXlm and requires a separate license for access.

For more information on this product, see the `bds(8)` man page, or contact your Cray Research representative.

6.4.1.8 NQE (Network Queuing Environment)

UNICOS 10.0.0.2 supports the 3.3 release of NQE. You are required to have a FLEXlm license for NQE 3.3 only if you did not purchase NQE 3.1.

For information describing this product, see the *NQE Release Overview*, publication RO-5237, or contact your Silicon Graphics / Cray Research representative.

6.4.2 UNICOS Source Code License

To receive a UNICOS 10.0.0.2 source code license, customers must first obtain a UNIX source code license for the UNIX System V, Release 4.0 (SVR 4.0). Customers can obtain these rights through Silicon Graphics / Cray Research, or through The Santa Cruz Operation, Inc. (SCO).

Note: Customers with UNIX rights that allow them to receive the UNICOS 9.0 release do not need additional UNIX licensing for the UNICOS 10.0.0.2 release.

For information on who to contact if you have licensing questions, or if your site has not signed all appropriate Silicon Graphics / Cray Research software license agreements, see Section 6.4.3 or Section 6.4.4.

For information about available optional software products that are included with your UNICOS license but which you must order to receive them with your UNICOS 10.0.0.2 release package, see Section 6.5, page 33.

For more information about the FLEXIm license manager, or for information about products that are included in the UNICOS 10.0.0.2 release software but which require a FLEXIm license key to access the product, see Section 6.4.1, page 27.

6.4.2.1 UNIX System V Licenses for CRAY J90 Systems

CRAY J90 customers that have a standard binary release of UNICOS 10.0.0.2 must have a UNIX System V, Release 4.0 *binary* license, available only through Silicon Graphics / Cray Research.

CRAY J90 customers with the J90 Source Materials Option need an additional UNIX System V, Release 4.0 *source* license, available through Silicon Graphics / Cray Research, or through the Santa Cruz Operation, Inc. (SCO).

6.4.3 Licensing Contact for Customers in the U.S. and Canada

For more information on the licensing and pricing of the UNICOS 10.0.0.2 release, customers in the United States and Canada should see their account representative or contract negotiator, or contact Sarah White at the following address:

Sarah White
Silicon Graphics / Cray Research
655F Lone Oak Drive
Eagan, MN 55121 USA
Telephone: +1-612-683-5604
Fax: +1-612-683-7145

6.4.4 Licensing Contacts for Customers outside the U.S. and Canada

Customers outside the U.S. and Canada may obtain further licensing and export information by contacting their account representative or the individuals listed in the following sections.

6.4.4.1 Cray European Regional Contract Negotiators

Customers in Europe can direct licensing inquiries to the following Regional Contract Negotiators/Specialists:

Europe North Sales Region (including UK / Ireland / Russia / Poland / Denmark / Finland / Norway / Sweden / Netherlands)

Nick Jacobs
Silicon Graphics Limited
1530 Arlington Business Park
Theale
Reading
Berkshire, RG7 4SB, England
Telephone: +44-118-925 7041
Fax: +44-118-925 7716
Email: niknik@reading.sgi.com

Rest of Europe and South Africa

Simon Locke
Silicon Graphics Limited
1530 Arlington Business Park
Theale
Reading
Berkshire, RG7 4SB, England
Telephone: 44-118-925 7049
Fax: 44-118-925 7946
Email: srl@cray.com

Europe Central (including Germany and Austria)

Thomas Wegener
Silicon Graphics GmbH
Am Hochacker 3
85630 Grasbrunn-Neukeferloh
Germany
Telephone: +089-46108-321
Fax: +089-46108-322
Email: thomasw@munich.sgi.com

Europe South Sales Region (including France)

Cecile Goachet / Patricia Guillerm-Brillet
Silicon Graphics France
21, rue Albert Calmette
78351 Jouy en Josas
France
Telephone: +33-01-34-88-82-51
Fax: +33-01-34-65-96-19
Email: cecile@cray.com and pguiller@paris.sgi.com

6.4.4.2 Cray Japan Contracts / Legal

Customers in Japan can direct licensing inquiries to Shinji Uekusa or Yuko Hizume at the following addresses:

Shinji Uekusa
Nihon Silicon Graphics Cray K.K.
31F, Yebisu Garden Place, 4-20-3
Ebisu, Shibuya-ku
Tokyo
Japan 150
Telephone: +81-3-5488-5692
Fax: +81-3-5420-1867
Email: uekus@nsg.sgi.com

Yuko Hizume
Nihon Silicon Graphics Cray K.K.
P.O. Box 5011 Yebisu Garden Place Tower
4-20-3, Ebisu
Shibuya-ku, Tokyo 150
Japan
Telephone: +81-3-5488-1819
Fax: +81-3-5420-7020
Email: hizume@nsg.sgi.com

6.4.4.3 Other Customers

International customers outside Europe and Japan can direct licensing inquiries to Rodgers Naylor at the following address:

Rodgers Naylor
Director of Contracts
Cray Research, a Silicon Graphics Company
655F Lone Oak Drive
Eagan, MN 55121 USA
Telephone: +1-612-683-7403
Fax: +1-612-683-7297
Email: naylorgr@cray.com

6.5 Optional Software

You can order the following software products on your UNICOS 10.0.0.2 software order form as optional software when you order your UNICOS 10.0.0.2 release package.

Note: These products are included with your UNICOS license, but they are not automatically shipped as part of the UNICOS 10.0.0.2 release package. If you want any of the following products, you must order them on the UNICOS 10.0.0.2 order form.

The products described are as follows:

- Kerberos Enigma software
- DWB

For a complete list of Cray Research products that operate with the UNICOS 10.0.0.2 operating system, contact your Silicon Graphics / Cray Research representative.

6.5.1 Kerberos Enigma Software

The Kerberos Enigma software contains software for CRYPT and Kerberos. The Kerberos Enigma tape replaces the CRYPT and RPC Enigma tapes. The Kerberos Enigma software is available in both binary and source code, depending on the license terms with each customer and on-site location.

6.5.1.1 Kerberos Enigma Software Shipped Within the U.S. and Canada

For shipments of Kerberos Enigma software within the United States and Canada, order it as optional software on the UNICOS 10.0.0.2 software order form.

Customers in the United States and Canada receive tapes that include versions of the Kerberos programs that support data stream encryption. The software is available in either source or binary form, depending on the license terms with each customer.

6.5.1.2 Kerberos Enigma Software Shipped outside of the U.S. or Canada

Customers outside the United States and Canada receive binary software regardless of whether their site has a source or binary UNICOS license. With this software, customers outside the United States and Canada can run

Kerberos without support for data stream encryption. To order this software, use the UNICOS 10.0.0.2 software order form.

An export license from the U.S. Department of Commerce is required for software shipments outside the United States or Canada. This export license is required in addition to the Department of Commerce export license necessary for Cray Research hardware. If a U.S. Department of Commerce export license is **not** in place for the customer serial number for which the Kerberos Enigma software is desired, a U.S. Department of Commerce Application Request for Kerberos Enigma is required before an export license can be processed. If an export license already exists, the statement is **not** required. The Kerberos Enigma binary software order form contains a U.S. Department of Commerce Application Request for Kerberos Enigma.

Note: Jurisdiction for exporting Kerberos has recently changed from the U.S. Department of State to the U.S. Department of Commerce. Customers who currently hold export licenses with the Department of State do not need to reapply for new licenses with the Department of Commerce. Current Department of State licenses are still valid through the expiration date listed on the license, or until we have shipped the maximum number of copies of Kerberos allowed under the license.

You can obtain a U.S. Department of Commerce export licenses for UNICOS from Christine Miller at the following address:

Christine Miller
Cray Research, Inc.
655F Lone Oak Drive
Eagan, MN 55121
Telephone: +1-612-683-7476
Fax: +1-612-683-7297
Email: millercm@cray.com

6.5.2 DWB

DWB is based on Documenter's Workbench from Novell, Inc. Only binary software is provided.

DWB is packaged separately from the UNICOS operating system. To receive DWB, order it using the "Additional Software" section of the UNICOS 10.0.0.2 software order form.

Note: A separate license is not required for DWB. UNICOS System Software and UNICOS Set licenses include binary licenses for DWB.

6.6 Release Package Contents

The UNICOS 10.0.0.2 release package includes the following:

- Software media that contains the UNICOS 10.0.0.2 release. IOS-E sites automatically receive the OWS 9.0.1.3/015 and IOS 9.0.1.3/015 release package when the UNICOS 10.0.0.2 release is ordered.

Note: If your site is licensed for supported UNICOS source code, you will receive a source code package, which lets you modify your code locally. For major releases, you can load source code into your system together with binary code packages before generation.

- Online man page files. To display these files, use the man(1) command.
- A CD-ROM that contains the DynaWeb server and the UNICOS publications.
- A set of printed publications.

6.7 Ordering the UNICOS 10.0.0.2 Release Package

UNICOS is distributed by order only to sites that have signed a Cray Research software license agreement for the UNICOS product. The most current revision of the release package is supplied.

Please make sure your site has signed a Cray Research software license agreement before you order the UNICOS 10.0.0.2 release package (see Section 6.4, page 26, for details).

You can order the UNICOS 10.0.0.2 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 Cray Research Distribution Center by telephone (+1-612-683-5907 or 1-800-284-2729 extension 35907), through electronic mail (orderdesk@cray.com), or by fax (+1-612-452-0141).
- 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 Christine Miller at the following address:

Christine Miller
International Administration
Cray Research, Inc.
655F Lone Oak Drive
Eagan, MN 55121
Telephone: +1-612-683-7476
Fax: +1-612-683-7297
Email: millercm@cray.com

6.7.1 Further Information

If you have questions, or if your site has not signed a Cray Research software license agreement, either contact your regional contract negotiator or contact Barbara Easterly, Sarah White, or Jenny Gross at the following addresses:

Barbara Easterly
Silicon Graphics / Cray Research
655F Lone Oak Drive
Eagan, MN 55121 USA
Telephone: +1-612-683-5662
Fax: +1-612-683-7145
Email: easterly@cray.com

Sarah White
Silicon Graphics / Cray Research
655F Lone Oak Drive
Eagan, MN 55121 USA
Telephone: +1-612-683-5604
Fax: +1-612-683-7145
Email: whitess@cray.com

Jenny Gross
Silicon Graphics / Cray Research
655F Lone Oak Drive
Eagan, MN 55121 USA
Telephone: +1-612-683-5661
Fax: +1-612-683-7145
Email: jenny@cray.com