

UNICOS® Installation Guide for
CRAY C90™, CRAY T90™, and
CRAY T90 IEEE Model E based
Systems

SG-5297 10.0

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Record of Revision

Version	Description
9.2.0.1	February 1997 Original printing. This document describes the installation procedures for upgrades from the UNICOS 9.0 or 9.1 release to the UNICOS 9.2.0.1 release, and for upgrades from the UNICOS 9.2 release to later revisions of UNICOS 9.2. This document, along with the <i>UNICOS Installation Guide for CRAY T90 GigaRing based Systems</i> , publication SG-5298, replaces the <i>UNICOS Installation Guide</i> , publication SG-2112.
9.2.0.2	April 1997 Rewrite. This document describes the installation procedures for upgrades from the UNICOS 9.0 or 9.1 release to the UNICOS 9.2.0.2 release, and for upgrades from the UNICOS 9.2 release to later revisions of UNICOS 9.2.
9.2.0.3	May 1997 Rewrite. This document describes the installation procedures for upgrades from the UNICOS 9.0 or 9.1 release to the UNICOS 9.2.0.3 release, and for upgrades from the UNICOS 9.2 release to later revisions of UNICOS 9.2.
9.2.0.4	June 1997 Rewrite. This document describes the installation procedures for upgrades from the UNICOS 9.0 or 9.1 release to the UNICOS 9.2.0.4 release, and for upgrades from the UNICOS 9.2 release to later revisions of UNICOS 9.2.
9.3	August 1997 Rewrite. This document describes the installation procedures for upgrades from the UNICOS 9.0, 9.1, or 9.2 release to the UNICOS 9.3 release, and for upgrades from the UNICOS 9.3 release to later releases of UNICOS 9.3. Information on configuring, building, and booting your system has been deleted from this manual and moved to <i>UNICOS Initial System Configuration Using ICMS</i> , publication SG-2412.
9.3.0.1	October 1997 Rewrite. This document describes the installation procedures for upgrades from the UNICOS 9.0, 9.1, or 9.2 release to the UNICOS 9.3.0.1 release, and for upgrades from the UNICOS 9.3 release to later releases of UNICOS 9.3.

10.0 November 1997
Rewrite. This document describes the installation procedures for upgrades from the UNICOS 9.0, 9.1, 9.2, or 9.3 release to the UNICOS 10.0 release, and for upgrades from the UNICOS 10.0 release to later releases of UNICOS 10.0.

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Preface

This document is written for system administrators and operators of CRAY C90, CRAY T90, and CRAY T90 IEEE Model E based computer systems. It leads you through a UNICOS 10.0 upgrade installation from UNICOS 9.0, UNICOS 9.1, UNICOS 9.2, or UNICOS 9.3, and through an upgrade from UNICOS 10.0 to a later version of UNICOS 10.0.

Note: The Trusted UNICOS system is a configuration of the UNICOS MLS system that supports processing at multiple security labels and system administration using only non-super user administrative roles. The Trusted UNICOS system consists of the subset of UNICOS software that offers these capabilities. The Trusted UNICOS name does not imply maintenance of the UNICOS 8.0.2 security evaluation.

For the UNICOS 9.2 and 10.0 releases, the functionality of the Trusted UNICOS system will be retained, but the `CONFIG_TRUSTED` option, which enforces conformance to the strict B1 configuration, will no longer be available. All references to the Trusted UNICOS system have been removed from the UNICOS 9.2 (and later) documentation. See the *UNICOS 9.0 Release Overview*, Cray Research publication RO-5000 9.0, for more information.

Related publications

The following documents contain additional information that may be helpful:

- *Common Installation Tool (CIT) Reference Card*, Cray Research publication SQ-2218
- *UNICOS System Configuration Using ICMS*, Cray Research publication SG-2412
- *UNICOS Installation Guide for CRAY J90se GigaRing Based Systems*, Cray Research publication SG-5296
- *UNICOS Installation Guide for CRAY T90 and CRAY T90 IEEE GigaRing Based Systems*, Cray Research publication SG-5298
- *I/O Subsystem (IOS) Operator's Guide for UNICOS*, Cray Research publication SG-2005
- *General UNICOS System Administration*, Cray Research publication SG-2301
- *UNICOS Resource Administration*, Cray Research publication SG-2302

- *UNICOS Configuration Administrator's Guide*, Cray Research publication SG-2303
- *UNICOS Networking Facilities Administrator's Guide*, Cray Research publication SG-2304
- *Kerberos Administrator's Guide*, Cray Research publication SG-2306
- *UNICOS Tape Subsystem Administrator's Guide*, Cray Research publication SG-2307
- *UNICOS System Security Overview for Administrators*, Cray Research publication SG-2141
- *UNICOS Under UNICOS Administrator's Guide*, Cray Research publication SG-2156
- *UNICOS User Commands Reference Manual*, Cray Research publication SR-2011
- *UPDATE Reference Manual*, Cray Research publication SR-0013
- *Support System Administrator's Guide*, Cray Research publication SG-3079
- *Support System and IOS-E Release Overview*, Cray Research publication RO-5060
- *TCP/IP Network User's Guide*, Cray Research publication SG-2009
- *UNICOS Source Manager (USM) User's Guide*, Cray Research publication SG-2097
- *UNICOS File Formats and Special Files Reference Manual*, Cray Research publication SR-2014

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Customers who subscribe to the CRInform program can order software release packages electronically by using the `Order Cray Software` option.

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

Conventions

The following conventions are used throughout this document:

<u>Convention</u>	<u>Meaning</u>																				
<code>command</code>	This fixed-space font denotes literal items such as commands, files, routines, path names, signals, messages, and programming language structures.																				
<code>manpage(x)</code>	Man page section identifiers appear in parentheses after man page names. The following list describes the identifiers: <table><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></table>	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																				
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																				
<i>variable</i>	Some internal routines (for example, the <code>_assign_asgcmd_info()</code> routine) do not have man pages associated with them. 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.
...	Ellipses indicate that a preceding element can be repeated.

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, including the following: CRAY J90se series CRAY T90 series
Cray MPP systems	All configurations of the CRAY T3D series. The UNICOS operating system is not supported on CRAY T3E systems. CRAY T3E systems run the UNICOS/mk operating system.
All Cray Research systems	All configurations of Cray PVP and Cray MPP systems that support this release.

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.

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:
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- 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.

Overview [1]

This document is written for system administrators and operators of CRAY C90, CRAY T90, and CRAY T90 IEEE Model E based computer systems. It shows you how to install the UNICOS operating system on the Cray mainframe. For last minute changes that may affect the UNICOS installation process, refer to the corresponding UNICOS Errata.

This manual leads you through a UNICOS 10.0 upgrade installation from UNICOS 9.0, UNICOS 9.1, UNICOS 9.2, or UNICOS 9.3, and through an upgrade from UNICOS 10.0 to a later version of UNICOS 10.0 (Cray Research does not support upgrades to UNICOS 10.0 from versions of UNICOS older than UNICOS 9.0).

Note: Initial installations for CRAY T90 IEEE Model E systems are not supported after UNICOS 9.1. If an initial installation is required, the UNICOS 9.1 procedures should be followed (see the “Initial Installation Procedures” chapter in the *UNICOS Installation Guide*, Cray Research publication SG-2112 9.1.) Once the UNICOS 9.1 system is installed, it can be upgraded to UNICOS 10.0 using the procedures described in this manual.

Note: If you are performing an initial installation on either a CRAY C90 or a CRAY T90 system, contact Customer Service for additional information and procedures.

Starting with UNICOS 9.2, all releases are considered *base releases*. This means that updates and revisions are in the same format as the base release. Therefore, instructions for installing an update or revision are the same as for a base release.

1.1 Introduction

This guide includes three chapters. Each chapter focuses on a different operation, as follows:

- Overview of the CRAY C90 and CRAY T90 systems and the software installation process
- Upgrade installation of UNICOS 10.0 from UNICOS 9.0 or 9.1
- Upgrade installation of UNICOS 10.0 from UNICOS 9.2, 9.3, or 10.0

1.2 Related information

Before you begin any of the procedures outlined in this guide, you should read through the entire chapter that relates to the procedure you intend to perform. You should have the following documentation available:

- *UNICOS Administrator Commands Reference Manual*, Cray Research publication SR-2022
- *Common Installation Tool (CIT) Reference Card*, Cray Research publication SQ-2218
- *UNICOS Configuration Administrator's Guide*, Cray Research publication SG-2303
- *UNICOS System Configuration Using ICMS*, Cray Research publication SG-2412

1.3 Hardware components

The minimum hardware configuration of each CRAY T90 Model E based system includes a CRAY T90 Operator Workstation (OWS), possibly a CRAY T90 Maintenance Workstation (MWS), and a CRAY T90 mainframe.

The minimum hardware configuration of each CRAY C90 Model E based system includes a CRAY C90 OWS, possibly a CRAY C90 MWS, and a CRAY C90 mainframe.

1.3.1 CRAY T90 Operator Workstation (OWS)

The CRAY T90 Operator Workstation is a Sun workstation that runs the SunOS operating system. The workstation serves as the system console for the CRAY T90 mainframe. As of UNICOS 9.2, the console's CD-ROM drive has become the primary media device for installing software on the OWS and CRAY T90 mainframe.

1.3.2 CRAY T90 mainframe

The CRAY T90 mainframe runs the UNICOS operating system. There are three different mainframe types: CRAY T94, CRAY T916, and CRAY T932.

A CRAY T94 system can have up to 4 CPUs, and one IO01 module (I/O module) with valid connections of 0-07 for mainframe channels 0100 to 0116.

The central memory using CM02 and CM03 modules (central memory modules) has a size of 64 to 128 Mwords. Using CM04 modules for central memory has a size of 128 Mwords to 256 Mwords.

A CRAY T916 system can have up to 16 CPUs. Usually the system has one IO01 module with valid connections of 010-017 for mainframe channels 0120 to 0136. If a second IO01 module is present, its valid connections are 0-07 for mainframe channels 0100 to 0116. The central memory using CM02 and CM03 modules has a size of 256 to 512 Mwords. Using CM04 modules for central memory has a size of 512 Mwords to 1024 Mwords.

A CRAY T932 system can have up to 32 CPUs, and usually has two IO01 modules. The A side module has valid connections 010-017 for mainframe channels 0120 to 0136, and the B side module has valid connections 030-037 for mainframe channels 0160 to 0176. If an additional IO01 module is present on the A side, the valid connections are 0-07 for mainframe channels 0100 to 0116. If an additional IO01 module is present on the B side, the valid connections are 020-027 for mainframe channels 0140 to 0156. The central memory using CM02 and CM03 modules has a size of 512 to 1024 Mwords. Using CM04 modules for central memory has a size of 1024 Mwords to 2048 Mwords.

1.3.3 CRAY C90 Operator Workstation (OWS)

The CRAY C90 Operator Workstation is a Sun workstation that runs the SunOS operating system. The workstation serves as the system console for the CRAY C90 mainframe. As of UNICOS 9.2, the console's CD-ROM drive has become the primary media device for installing software on the OWS and CRAY C90 mainframe.

1.3.4 CRAY C90 mainframe

The CRAY C90 mainframe runs the UNICOS operating system. There are five different mainframe types: CRAY C92A, CRAY C94A, CRAY C94, CRAY C98, and CRAY C916.

A CRAY C92A system can have up to 2 CPUs, 2 IOCs, and is air-cooled. The central memory has a size of 64 to 128 Mwords.

A CRAY C94A system can have up to 4 CPUs, 3 IOCs, and is air-cooled. The central memory has a size of 128 Mwords.

A CRAY C94 system can have up to 4 CPUs and 4 IOCs. The central memory has a size of 128 to 256 Mwords.

A CRAY C98 system can have up to 8 CPUs and 8 IOCs. The central memory has a size of 256 to 512 Mwords.

A CRAY C916 system can have up to 16 CPUs and 16 IOCs. The central memory has a size of 128 to 1024 Mwords.

1.4 Software components

CRAY C90 and CRAY T90 Model E based systems include the software components described in this section.

1.4.1 CRAY C90 UNICOS CD and CRAY T90 UNICOS CD

The CRAY C90 UNICOS CD and CRAY T90 UNICOS CD contain the UNICOS operating system that can be used for upgrade installations. The path to these packages once the UNICOS CD has been mounted on the OWS is the mount point specified on the mount(1) command that mounts the CD-ROM. In the following example, the CD is mounted on */CDROM*.

```
ows# mount -t hsfs -r /dev/sr0 /CDROM
```

Three types of UNICOS packages are distributed for Cray Model E based systems. These packages can be loaded using the Common Installation Tool (CIT).

UNICOS_exe	UNICOS_Executables is the CIT name for this package, which is a binary-only release that contains user exits, restricted source relocatable files, and object files for relinking the kernel.
UNICOS_bin	UNICOS_Relocatables is the CIT name for this package, which is a binary release that contains restricted binary files.
UNICOS_src	UNICOS_Source is the CIT name for this package, which is a source-only release that contains UNICOS source files and source PLs.

When installing UNICOS, sites should select all UNICOS packages contained on the CRAY C90 UNICOS CD and CRAY T90 UNICOS CD for their upgrade installation. Be sure **not** to include Documenter's Workbench (DWB) during the UNICOS installation. Installation of DWB is performed during a separate point in the UNICOS installation process.

1.5 CRAY C90, CRAY T90, CRAY T90 IEEE Model E systems and UNICOS issues

This section highlights Model E based system enhancements, and compatibilities and differences with previous UNICOS releases.

At this time there are no enhancements, and compatibilities and differences that need to be documented.

Upgrade installation of UNICOS 10.0 from UNICOS 9.0 or 9.1 [2]

This chapter guides you through a UNICOS upgrade from UNICOS 9.0 or 9.1 to UNICOS 10.0.

To determine which versions of the IOS, OWS, or asynchronous software will work with the version of UNICOS that you are installing, see the following document included in this release package: *UNICOS Release Letter*, Cray Research publication RL-5001 10.0.

The following sections will help you prepare for the upgrade from a UNICOS 9.0 or 9.1 release to a revision of UNICOS 10.0 and start the automated upgrade.

If your site is upgrading to a UNICOS system running with the multilevel security (MLS) feature, the following are Cray Research's recommendations for the upgrade:

- Sites upgrading to a UNICOS MLS system are not required to run MLS prior to the upgrade (on their UNICOS 9.0 or 9.1 system).
- For UNICOS 10.0, it is recommended that you run with `PRIV_SU` with Privilege Assignment Lists (PALs).

2.1 Notes about upgrading to UNICOS 10.0

Several changes that occurred with the release of UNICOS 9.3 may create issues for sites going from UNICOS 9.0 or 9.1 to UNICOS 10.0. These changes are discussed in this section.

1. UNICOS 10.0 runs with the UNICOS multilevel security (MLS) features available. The two supported privilege mechanisms are `PRIV_SU` with privilege assignment lists (PALs) and the Trusted UNICOS configuration with PAL only.

If your site is upgrading to UNICOS 10.0 and did not have the MLS feature turned on previously, the UNICOS kernel parameters for MLS will automatically be converted as part of the upgrade process to values that attempt to keep the behavior of your system consistent between release levels.

2. With UNICOS 9.3, site changes to `conf.c` to configure parts of the UNICOS kernel are no longer valid. If `/usr/src/uts/cf.SerialNumber/conf.c` is present during the upgrade process, `conf.c` will not be copied over to the UNICOS 10.0 file system. If, however, someone manually copies `conf.c` to the UNICOS 10.0 file system, it will produce a build problem and will need to be renamed to some other name like `conf.c.old` so that this `conf.c` file will not be used during rebuilding of the UNICOS kernel.

If you were using `conf.c` for customization of your UNICOS kernel, at UNICOS 10.0 use `/etc/config/param` instead.

3. After loading the UNICOS upgrade software, you will need to make sure that file references in the following files are present on the UNICOS 10.0 file system. During the upgrade to UNICOS 10.0, these files are copied, but the files/commands that may be referenced inside these files are not copied.

`/etc/rc.pre`

`/etc/rc.mid`

`/etc/rc.pst`

`/usr/lib/sendmail.hf`

`/usr/lib/sendmail.cf`

4. If your site uses HIPPI devices, the `async hdd` binary key was renamed from `/usr/src/uts/lib/hddb.a` in UNICOS 9.0 and 9.1 to `/usr/src/uts/rlib/libhdd.a` in UNICOS 10.0. The conversion process will automatically copy the `async hdd` binary key to the UNICOS 10.0 file system and convert it to the proper name.
5. `/etc/config/rc` has several new options in `/etc/config/rcoptions`. Before going to multi-user mode, you should verify that the new `rcoptions` values are appropriate for your site.
6. Sites will need to copy their user exit code from `/usr/src/lib/libuex/local` to the new file system after successfully upgrading to UNICOS 10.0.

In addition, sites will need to copy Cray-provided template files from the *oldroot* to the *newroot* after successfully upgrading to UNICOS 10.0.

7. If you have `CONFIG_DFS` or `CONFIG_MPP` set to 1 in your current UNICOS `config.mh` file, these settings will be set to 0 automatically in the UNICOS 10.0 `config.mh` file during the UNICOS 10.0 upgrade.

After the UNICOS 10.0 automated upgrade process has completed and you have loaded the asynchronous software, change the `config.mh` parameters in the UNICOS 10.0 `config.mh` file back to their original values. Then rebuild your UNICOS 10.0 kernel.

2.2 Prepare for the upgrade

Before you start the installation process, you must go through several preparation steps, as follows:

- Get super-user privileges and appropriate MLS privileges.
- Allocate disk space for the new file systems.
- Prepare for the UNICOS upgrade installation

2.2.1 Get super-user and security privileges

Before starting to install UNICOS 10.0, you must get super-user privileges and appropriate MLS privileges.

- If you are not running MLS, or are running with MLS PRIV_SU with PALs, you only need super-user (root) privileges to perform the installation.
- If you are running MLS TFM, you must have super-user (root) privileges to perform the installation, along with the `reclsfy`, `install`, and `suidgid` permissions, authorized categories `secadm` and `sysfil`, and maximum integrity class 16.

To see whether you have these permissions, execute the `spget` command (see `spset(1)`) on your current UNICOS 9.0 or 9.1 system (`su` to `root`). If you do not have these secure permissions, contact your site security administrator to get them.

If the MLS feature is not enabled at your site, `spget` responds as follows:

```
unicos# spget
spget: security is not enabled!
```

If the MLS feature is enabled at your site, `spget` responds similarly to the following example (specific permissions at your site may differ):

```
unicos# spget

permits equal 04130
              reclsfy
              suidgid
              install
.
.
.
listing of other security levels
```

The login ID under which the installation is done cannot have system resource limitations, such as disk quotas, memory limits, or CPU usage.

- If you are running Trusted UNICOS, you must reboot your system with the PRIV_SU kernel before performing the installation. Note that rebooting your system may require dedicated system time. Once your system is rebooted, you will need super-user (root) privileges to perform the installation.
- If you are running UNICOS without the NETW_RCMD_COMPAT bit set in the SECURE_NET_OPTIONS bit mask, you will need to reboot your system with this bit enabled as CIT uses .rhosts to facilitate the transfer of packages from the OWS to the Cray mainframe.

2.2.2 Allocate disk space for new file systems

Before starting to install UNICOS 10.0, you must ensure that your site has enough disk space to contain the UNICOS 10.0 file systems. Table 1, page 11, and Table 2, page 12, list the required file systems and their minimum sizes for source, relocatable binary, and executable binary releases, including optional products. To get the total number of blocks your source partition needs, add up the number of blocks required for each piece of software that your site will use.

If your site has insufficient disk space for both the UNICOS 9.0 or 9.1 and the UNICOS 10.0 /usr/src file systems, you may go with a single source file system (note the special option available in Section 2.2.3 used to start the UNICOS Upgrade Install GUI).



Caution: Choosing to reuse your source file system will require deleting the old source files. Make sure that you have a backup copy of the source file system before using this upgrade option.

CIT can load the UNICOS system into a large temporary space and use that space until booting the new UNICOS system. At that time, you must transfer the UNICOS system to a usable UNICOS 10.0 root file system.

The installation build process can cause up to 100,000 program invocations. Be sure that the file system that contains your accounting files is big enough to accommodate the resulting amount of accounting information.

Note: The numbers in the following tables are estimates. Partition size can vary greatly depending on the NPROC setting, which optional products are loaded, and the number of user programs that will be put on the system.

These numbers were generated with a minimal root and /usr file system loaded, NPROC set to 8, and no optional products loaded. The high-water mark was found, 15% was added, and then the numbers were rounded up to the next thousand.

Note: A 16-Kbyte block device will require more space than indicated in Table 1, page 11 due to inefficient storage of small files.

Table 1. UNICOS 10.0 file system size

File system	Size in 4-Kbyte blocks by device sector size
/	150,000
/usr	205,000
/tmp	80,000
/usr/src	660,000*

* See Table 2.

Table 2. Disk space required for /usr/src

File system	Size in 4-Kbyte blocks by device sector size
UNICOS 9.3 (executable)	220,000
UNICOS 9.3 (source)	660,000
UNICOS 9.3 (relocatable binary)	440,000

The sizes shown in the preceding table include room to build the system and room for future revisions to UNICOS, so that reconfiguring disks is not necessary.

For upgrade installations you may want to use `ldcache` for the old file systems from which you are upgrading and the new UNICOS 10.0 file systems. Using `ldcache` can greatly reduce the amount of time spent during certain steps of the upgrade installation. For more information on the `ldcache` command, see `ldcache(8)` or the *UNICOS Configuration Administrator's Guide*, Cray Research publication SG-2303.

2.2.3 Prepare for the UNICOS upgrade installation

This section describes the steps that must be completed before you can load the UNICOS 10.0 release. You may upgrade from a specific mount point from which configuration information is obtained. This process can take from 10 minutes to 20 minutes to complete.

Note: Throughout this procedure, you must do the following:

- Replace *snSerialNumber* with your Cray system name.
- Replace *CrayHostName* with your Cray network node name.

snSerialNumber and *CrayHostName* may be the same name, depending on your site configuration.

1. Insert the UNICOS 10.0 CD-ROM into the OWS-E.
2. Log into the OWS-E as `root`.
3. Mount the UNICOS 10.0 CD-ROM on the OWS-E.

```
ows# mount -t hsfs -r /dev/sr0 /CDROM
```

4. Copy the `sysinfo` file from the UNICOS 10.0 CD-ROM to the OWS-E.

```
ows# cd /home/owse/cr/os/uts
ows# cp /CDROM/UNICOS_exe/sysinfo.default sysinfo
```

5. Set an environment variable to the location of the `sysinfo` file on the OWS-E.

```
ows# setenv SYSINFO /home/owse/cr/os/uts/sysinfo.
```

6. Verify that the networks are set up correctly to allow the upgrade process to run properly.
 - a. Verify that the `/.rhosts` file on the OWS allows root to send remote shell commands to the OWS from the mainframe.
 - b. Verify that the `/.rhosts` file on the Cray mainframe allows root to send remote shell commands to the mainframe from the OWS-E.

Note: For more information on the communications path between the SWS and the Cray mainframe, see the *Common Installation Tool (CIT) Reference Card*, Cray Research publication SQ-2218, which can be printed from the `/CDROM/CYRIinstall/2218.ps` PostScript file.

7. If you have been maintaining your parameter file manually on the OWS console, you should copy that file to `/oldroot/etc/config/param` now. `/oldroot` is the specific mount point from which the configuration information will be obtained during the upgrade process.
8. Execute the following commands to start the UNICOS Upgrade Install GUI as shown in Figure 1, page 14. If you prefer not to use the GUI and to perform the installation with a text-based interactive interface, skip this step and go on to step 9. Execute the text-based commands that are listed instead of selecting the specified GUI buttons.

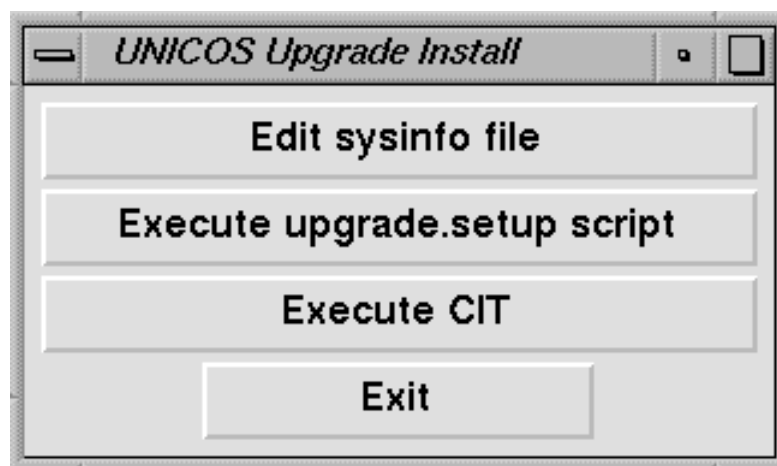


Caution: Once you have chosen either the GUI or the text-based installation method, you must use that method throughout the remainder of the installation process in order to avoid problems. Do not switch between the two methods of installation during the course of an install.

If you are planning on re-using your old source partition for the upgrade installation, include the `-s` option on the `upgrade.install` command line. This option implies that you are planning on loading source onto a partition that already contains the previous release's source.

If you do **not** include the `-s` option on the command line, the upgrade process assumes you have two source file systems for use.

```
ows# cd /CDROM
ows# ./UNICOS_exe/upgrade.install [-s] -DDO_90UPGRADE=1 -c CrayHostName -l root
```



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Figure 1. UNICOS Upgrade Install GUI

9. Edit the `sysinfo` file. Update the parameters to match your site's configuration. Either select `Edit sysinfo file` from the GUI, or execute the following text-based command:

```
ows# vi $SYSINFO
```

The critical parts of the `sysinfo` file that are needed for the upgrade installation are as follows:

<code>SYS_SERIALNO</code>	System serial number
<code>SYS_SWSIP</code>	OWS-E IP address
<code>SWSHOST</code>	OWS-E network node name
<code>SYS_CRAYIP</code>	Cray IP address
<code>SYS_CRAYHOST</code>	Cray network node name
<code>SYS_MNT</code>	New root system mount point
<code>SYS_ROOT_FS</code> , <code>SYS_USR_FS</code> , and <code>SYS_SRC_FS</code>	New root/usr/src partitions

<code>SYS_OLDROOT</code>	Old root system mount point from which configuration information is obtained during the upgrade process
<code>UPGRADE</code>	Upgrade install keyword, set to YES
<code>SYS_CDROM</code>	Path to the CD-ROM on the OWS-E after being mounted (be sure to include UNICOS_exe at the end of this path)
<code>SYS_OWSE_FILES</code>	OWS-E directory where the UNICOS kernel and mainframe binaries reside

10. On the Cray mainframe, prepare the mainframe and the upgrade file systems. Either select `Execute upgrade.setup` script from the GUI, or execute the following text-based commands:

```
ows# rcp $SYSINFO root@CrayHostName:/sysinfo
ows# rcp /CDROM/UNICOS_exe/upgrade.setup \
      root@CrayHostName:/upgrade.setup
ows# rsh CrayHostName -l root chmod 755 /upgrade.setup
ows# rsh CrayHostName -l root /upgrade.setup -D [-s]
```



Warning: During the execution of `upgrade.setup`, the file systems being used, `SYS_*_FS`, will be labelled with the minimum security level set to 0, the valid security compartment set to 0, and the maximum security level set to 0.

`upgrade.setup` performs a `mkfs(1)` command on the UNICOS 10.0 upgrade partitions, writes the file system labels, and mounts the upgrade partitions.

The `SYS_*_FS` devices in `sysinfo` are assumed not to be mounted when `upgrade.setup` is executed on the mainframe. If the file systems being used for the upgrade are mounted, `upgrade.setup` will exit with an error. If the single-source option, `-s`, is being used, then the source partition must be mounted as `/oldroot/usr/src`.

11. If you have any local mods applied to the source on the Cray mainframe, you must remove them now from the new upgrade partitions via `sm(1)` delete.

Cray recommends that sites should back up their local mods before their removal, especially if the local mods are to be applied to the upgrade version of UNICOS being installed.

The end result of `sm(1)` delete should be the removal of the local mods from the `/oldroot/usr/src/PLname/.USM/mods` directory on the source partition.

12. Verify that the following information is present. This information is required for the upgrade process to be successful.
 - a. Verify that the `/oldroot/usr/src/uts/cf.SerialNumber` directory is present, and that this directory contains the `sn.h` file along with other related kernel files. `/oldroot` is the upgrade mount point given in step 9 to `SYS_OLDROOT`.
13. At this time, you can allocate `ldcache` for the upgrade process if desired.

2.3 Start the UNICOS upgrade installation

You have prepared the mainframe for the upgrade process; now load the new UNICOS release on the mainframe. This process takes about 80 minutes to complete.

1. Use CIT to install the UNICOS operating system by loading it from the OWS-E to the Cray mainframe. Either select **Execute CIT** from the GUI, or execute the following text-based command:

```
ows# /CDROM/setup -i -c CrayHostName -l root -DDO_90UPGRADE=1
```

The installation log files are located on the OWS as `/tmp/cit.root/*.log`.

For more information about using CIT, see the *Common Installation Tool (CIT) Reference Card*, Cray Research publication SQ-2218, which can be printed from the `/CDROM/CYRIinstall/2218.ps` PostScript file. You may also select the **Help** button from the GUI, or enter **help all** at the interactive interface prompt.

Note: Do not select DWB (Documenter's Workbench) at this time. The installation of DWB is discussed in Chapter 4 after you have initially installed UNICOS on the mainframe.

- a. Select the UNICOS release(s).
- b. Install the UNICOS release(s).
- c. Verify that the Cray mainframe information is correct. If it is not, correct the information in CIT.

- d. Quit CIT when you have finished loading the UNICOS release.
2. Exit the UNICOS Upgrade Install GUI by selecting **Exit**.
3. Unmount and eject the CD-ROM. The */CDROM* directory name must match the one used in the `mount` command in step 3 of Section 2.2.3.

```
ows# cd /  
ows# umount /CDROM  
ows# eject cd
```

Note: Verify that the following files were automatically transferred back to the OWS-E from */mnt/usr/src/uts/c1/stand*:

```
UNICOS.Release Number  
clrt90.Release Number or clrc90.Release Number  
mfboot.Release Number  
mfsysdump.Release Number  
mfchkye.Release Number
```

It is the system administrator's responsibility to rename these files so that they can be used when using the new operating system.

2.4 List revision and update mods in this release (source systems only)

The */etc/conv/release_modinfo* script generates a list of mods that have gone into the current and previous releases. Run this script with the `-h` option for more specific information.

```
unicos# /newroot/etc/conv/release_modinfo -h
```

2.5 Apply local mods (source systems only)

If you install UNICOS from source code and have local mods, you may apply them now. After applying any local mods, continue with the steps described in *UNICOS System Configuration Using ICMS*, Cray Research publication SG-2412, to configure your system.

2.6 Tasks to be completed before going to multi-user mode

At this point in the installation of UNICOS, you have completed enough tasks to get the system to single-user mode. If you have Documenter's Workbench (DWB) on the UNICOS CD, proceed to Chapter 4 to install DWB. Otherwise, refer to *UNICOS System Configuration Using ICMS*, publication SG-2412, to:

- Customize your system's configuration using ICMS
- See Cray Research recommendations for this release
- Build a properly configured UNICOS system
- Turn off Security Enhancement logging while in single-user mode
- Copy time critical files such as UDB
- Assign PALs to the new file systems
- Complete configuring Security Enhancements
- Turn on Security Enhancement logging
- Go to multi-user mode
- Restart NQE checkpointed jobs or processes
- Access accounting data from previous systems

Upgrade installation of UNICOS 10.0 from UNICOS 9.2, 9.3, or 10.0 [3]

This chapter guides you through a UNICOS upgrade from UNICOS 9.2, UNICOS 9.3, or UNICOS 10.0 to a later release.

To determine which versions of the IOS, OWS, or asynchronous software will work with the version of UNICOS that you are installing, see the following document included in this release package: *UNICOS Release Letter*, Cray Research publication RL-5001 10.0.

The following sections will help you prepare for the upgrade from a UNICOS 9.2, 9.3, or 10.0 release to a revision of UNICOS 10.0 and start the automated upgrade.

3.1 Prepare for the upgrade

Before you start the installation process, you must go through several preparation steps, as follows:

- Get super-user, MLS, and network privileges.
- Allocate disk space for the new file systems.
- Prepare for the UNICOS upgrade installation

3.1.1 Get super-user, MLS, and network privileges

UNICOS 10.0 runs with the UNICOS multilevel security (MLS) features available. The two supported privilege mechanisms are PRIV_SU with privilege assignment lists (PALs) and the Trusted UNICOS configuration with PAL only.

If your site runs PRIV_SU with PALs, you must have `root` privileges to install the UNICOS upgrade. It is recommended that you run with the PRIV_SU privilege policy and PALS applied. At this point, you can continue on to Section 3.1.2, page 20.

If you are running UNICOS without the NETW_RCMD_COMPAT bit set in the SECURE_NET_OPTIONS bit mask, you will need to reboot your system with this bit enabled as CIT uses `.rhosts` to facilitate the transfer of packages from the OWS-E to the Cray mainframe.

If your system is running Trusted UNICOS, you must reboot your system with the `PRIV_SU` kernel before performing the installation. Once your system is rebooted, you will need super-user (`root`) privileges to perform the installation.

Note: Note that rebooting your system may require dedicated system time.

3.1.2 Allocate disk space for new file systems

Before starting to install UNICOS 10.0, you must ensure that your site has enough disk space to contain the UNICOS 10.0 file systems. Tables 3 and 4 list the required file systems and their minimum sizes for source, relocatable binary, and executable binary releases, including optional products. To get the total number of blocks your source partition needs, add up the number of blocks required for each piece of software that your site will use.

If your site has insufficient disk space for both the current UNICOS and a later UNICOS release `/usr/src` file systems, you may go with a single source file system (note the special option available in Section 3.1.3, page 21 used to start the UNICOS Upgrade Install GUI).



Caution: Choosing to reuse your source file system will require deleting the old source files. Make sure you have a backup copy of the source file system before using this upgrade option.

CIT can load the UNICOS system into a large temporary space and use that space until booting the new UNICOS system. At that time, you must transfer the UNICOS system to a usable UNICOS 10.0 root file system.

The installation build process can cause up to 100,000 program invocations. Be sure that the file system that contains your accounting files is big enough to accommodate the resulting amount of accounting information.

Note: The numbers in the following tables are estimates. Partition size can vary greatly depending on the `NPROC` setting, which optional products are loaded, and the number of user programs that will be put on the system.

These numbers were generated with a minimal root and `/usr` file system loaded, `NPROC` set to 8, and no optional products loaded. The high-water mark was found, 15% was added, and then the numbers were rounded up to the next thousand.

Table 3. UNICOS 10.0 file system sizes

File system	Size in 4-Kbyte blocks by device sector size
/	150,000
/usr	205,000
/tmp	80,000
/usr/src	660,000*

* See Table 4.

Table 4. Disk space required for /usr/src

File system	Size in 4-Kbyte blocks by device sector size
UNICOS 10.0 (executable)	220,000
UNICOS 10.0 (source)	660,000
UNICOS 10.0 (relocatable binary)	440,000

The sizes shown in the preceding table include room to build the system and room for future revisions to UNICOS, so that reconfiguring disks is not necessary.

For upgrade installations you may want to use `ldcache` for the old file systems from which you are upgrading and the new UNICOS 10.0 file systems. Using `ldcache` can greatly reduce the amount of time spent during certain steps of the upgrade installation. For more information on the `ldcache` command, see `ldcache(8)` or the *UNICOS Configuration Administrator's Guide*, Cray Research publication SG-2303.

3.1.3 Prepare for the UNICOS upgrade installation

This section describes the steps that must be completed before you can load the UNICOS 10.0 release. You may upgrade from a specific mount point from which configuration information is obtained. This process can take from 25 minutes to 45 minutes to complete.

Note: Throughout this procedure, you must do the following:

- Replace *snSerialNumber* with your Cray system name.
- Replace *CrayHostName* with your Cray network node name.

snSerialNumber and *CrayHostName* may be the same name, depending on your site configuration.

1. Insert the UNICOS 10.0 CD-ROM into the OWS-E.
2. Log into the OWS-E as root.
3. Mount the UNICOS 10.0 CD-ROM on the OWS-E.

```
ows# mount -t hfsfs -r /dev/sr0 /CDROM
```

4. Copy the *sysinfo* file from the UNICOS 10.0 CD-ROM to the OWS-E.

```
ows# cd /home/owse/cri/os/uts
ows# cp sysinfo sysinfo.old
ows# cp /CDROM/UNICOS_exe/sysinfo.default sysinfo
```

5. Set an environment variable to the location of the *sysinfo* file on the OWS-E.

```
ows# setenv SYSINFO /home/owse/cri/os/uts/sysinfo
```

6. Verify that the networks are set up correctly to allow the upgrade process to run properly.
 - a. Verify that the */.rhosts* file on the OWS allows root to send remote shell commands to the OWS from the mainframe.
 - b. Verify that the */.rhosts* file on the Cray mainframe allows root to send remote shell commands to the mainframe from the OWS-E.

Note: For more information on the communications path between the SWS and the Cray mainframe, see the *Common Installation Tool (CIT) Reference Card*, Cray Research publication SQ-2218, which can be printed from the */CDROM/CYRIinstall/2218.ps* PostScript file.

7. If you have been maintaining your parameter file manually on the OWS console, you should copy that file to */oldroot/etc/config/param* now. */oldroot* is the specific mount point from which the configuration information will be obtained during the upgrade process.

8. Execute the following commands to start the UNICOS Upgrade Install GUI as shown in Figure 2. If you prefer not to use the GUI and to perform the installation with a text-based interactive interface, skip this step and go on to step 9. Execute the text-based commands that are listed instead of selecting the specified GUI buttons.



Caution: Once you have chosen either the GUI or the text-based installation method, you must use that method throughout the remainder of the installation process in order to avoid problems. Do not switch between the two methods of installation during the course of an install.

- If the new `SYS_*_FS` file systems (specified in step 9) already contain a dump/restore copy of the previous release file systems, include the `-b` option on the command line to avoid performing a dump/restore copy of the file systems. If you are unsure, then do **not** include the `-b` option.

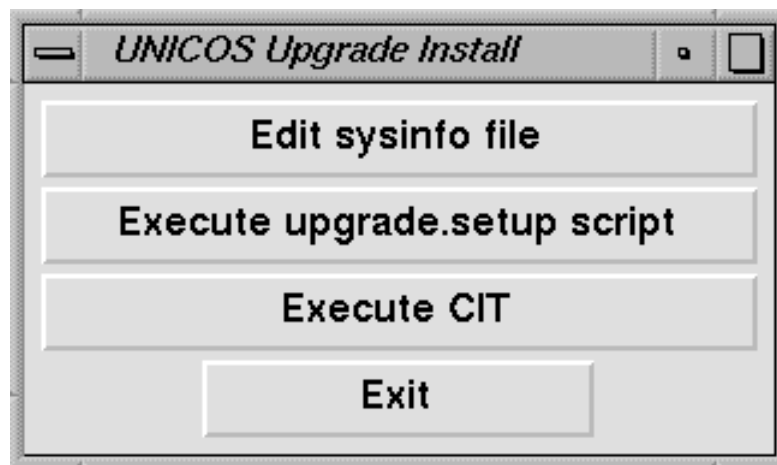
If you do **not** include the `-b` option on the command line, the old `root/usr` file systems mounted on `SYS_OLDROOT` (specified in step 9), will be dumped and restored on the new `SYS_*_FS` systems mounted on `SYS_MNT` (specified in step 9).

- If you are planning on re-using your old source partition for the upgrade installation, include the `-s` option on the `upgrade.install` command line. This option implies that you are planning on loading source onto a partition that already contains the previous release's source.

If you do **not** include the `-s` option on the command line, the upgrade process assumes you have two source file systems for use.

```
ows# cd /CDROM
```

```
ows# ./UNICOS_exe/upgrade.install [-b] [-s] -c CrayHostName -l root
```



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Figure 2. UNICOS Upgrade Install GUI

9. Edit the `sysinfo` file. Update the parameters to match your site's configuration. Either select `Edit sysinfo file` from the GUI, or execute the following text-based command:

```
ows# vi $SYSINFO
```

The critical parts of the `sysinfo` file that are needed for the upgrade installation are as follows:

<code>SYS_SERIALNO</code>	System serial number
<code>SYS_SWSIP</code>	OWS-E IP address
<code>SWSHOST</code>	OWS-E network node name
<code>SYS_CRAYIP</code>	Cray IP address
<code>SYS_CRAYHOST</code>	Cray network node name
<code>SYS_MNT</code>	New root system mount point
<code>SYS_ROOT_FS</code> , <code>SYS_USR_FS</code> , and <code>SYS_SRC_FS</code>	New root/usr/src partitions
<code>SYS_OLDROOT</code>	Old root system mount point from which configuration information is obtained during the upgrade process

UPGRADE	Upgrade install keyword, set to YES
SYS_CDROM	Path to the CD-ROM on the OWS-E after being mounted (be sure to include UNICOS_exe at the end of this path)
SYS_OWSE_FILES	OWS-E directory where the UNICOS kernel and mainframe binaries reside

10. On the Cray mainframe, prepare the mainframe and the upgrade file systems. Either select `Execute upgrade.setup` script from the GUI, or execute the following text-based commands:

```
ows# rcp $SYSINFO root@CrayHostName:/sysinfo
ows# rcp /CDROM/UNICOS_exe/upgrade.setup \
      root@CrayHostName:/upgrade.setup
ows# rsh CrayHostName -l root chmod 755 /upgrade.setup
ows# rsh CrayHostName -l root /upgrade.setup [-b] [-s]
```



Warning: During the execution of `upgrade.setup`, the file systems being used, `SYS_*_FS`, will be labelled with the minimum security level set to 0, the valid security compartment set to 0, and the maximum security level set to 0.

`upgrade.setup` performs a `mkfs(1)` command on the new UNICOS upgrade partitions (if needed), writes the file system labels, mounts the upgrade partitions, performs a dump/restore of the previous UNICOS system (if needed), and cleans up the new source directory by removing old executables and old `nmake(1)` `.mo` and `.ms` files.

The `SYS_*_FS` devices in `sysinfo` are assumed not to be mounted when `upgrade.setup` is executed on the mainframe. If the file systems being used for the upgrade are mounted, `upgrade.setup` will exit with an error. If the single-source option, `-s`, is being used, then the source partition must be mounted as `/oldroot/usr/src`.

11. If you have any local mods applied to the source on the Cray mainframe, you must remove them now from the new upgrade partitions via `sm(1)` `delete`.

Cray recommends that sites should back up their local mods before their removal, especially if the local mods are to be applied to the upgrade version of UNICOS being installed.

The end result of `sm(1)` delete should be the removal of the local mods from the `/oldroot/usr/src/PLname/.USM/mods` directory on the source partition.

12. Verify that the following information is present. This information is required for the upgrade process to be successful.
 - a. Verify that the `/newroot/usr/src/uts/cf.SerialNumber` directory is present, and that this directory contains the `sn.h` file along with other related kernel files. `/newroot` is the upgrade mount point given in step 9 to `SYS_MNT`.
13. At this time, you can allocate `ldcache` for the upgrade process if desired.

3.2 Start the UNICOS upgrade installation

You have prepared the mainframe for the upgrade process; now load the new UNICOS release on the mainframe. This process takes about 80 minutes to complete.

1. Use CIT to install the UNICOS operating system by loading it from the OWS-E to the Cray mainframe. Either select **Execute CIT** from the GUI, or execute the following text-based command:

```
ows# /CDROM/setup -i -c CrayHostName -l root
```

The installation log files are located on the OWS as `/tmp/cit.root/*.log`.

For more information about using CIT, see the *Common Installation Tool (CIT) Reference Card*, Cray Research publication SQ-2218 which can be printed from the `/CDROM/CYRIinstall/2218.ps` PostScript file. You may also select the **Help** button from the GUI, or enter **help all** at the interactive interface prompt.

Note: Do not select DWB (Documenter's Workbench) at this time. The installation of DWB is discussed in Chapter 4 after you have initially installed UNICOS on the mainframe.

- a. Select the UNICOS release(s).
- b. Install the UNICOS release(s).
- c. Verify that the Cray mainframe information is correct. If it is not, correct the information in CIT.

- d. Quit CIT when you have finished loading the UNICOS release.
2. Exit the UNICOS Upgrade Install GUI by selecting **Exit**.
3. Unmount and eject the CD-ROM. The */CDROM* directory name must match the one used in the `mount` command in step 3 of Section 3.1.3.

```
ows# cd /  
ows# umount /CDROM  
ows# eject cd
```

Note: Verify that the following files were automatically transferred back to the OWS-E from */mnt/usr/src/uts/c1/stand*:

```
UNICOS.Release Number  
clrt90.Release Number or clrc90.Release Number  
mfboot.Release Number  
mfsysdump.Release Number  
mfchkye.Release Number
```

It is the system administrator's responsibility to rename these files so that they can be used when using the new operating system.

3.3 List revision and update mods in this release (source systems only)

The */etc/conv/release_modinfo* script generates a list of mods that have gone into the current and previous releases. Run this script with the `-h` options for more specific information:

```
unicos# /newroot/etc/conv/release_modinfo -h
```

3.4 Apply local mods (source systems only)

If you install UNICOS from source code and have local mods, you may apply them now. After applying any local mods, continue with the steps described in *UNICOS System Configuration Using ICMS*, Cray Research publication SG-2412, to configure your system.

3.5 Tasks to be completed before going to multi-user mode

At this point in the installation of UNICOS, you have completed enough tasks to get the system to single-user mode. If you have Documenter's Workbench (DWB) on the UNICOS CD, proceed to Chapter 4 to install DWB. Otherwise, refer to *UNICOS System Configuration Using ICMS*, Cray Research publication SG-2412, to:

- Customize your system's configuration using ICMS
- See Cray Research recommendations for this release
- Build a properly configured UNICOS system
- Turn off Security Enhancement logging while in single-user mode
- Copy time critical files such as UDB
- Assign PALs to the new file systems
- Complete configuring Security Enhancements
- Turn on Security Enhancement logging
- Go to multi-user mode
- Restart NQE checkpointed jobs or processes
- Access accounting data from previous systems

Documenter's Workbench (DWB) Installation [4]

This chapter describes the procedures for installing Documenter's Workbench (DWB). If you received DWB on the UNICOS 10.0 CD, follow the instructions in this chapter to load and add DWB to UNICOS.

The installation of the DWB 10.0 release is treated as an upgrade. To avoid problems, **do not** load both UNICOS and DWB at the same time. Load DWB 10.0 onto a system on which UNICOS 10.0 has already been loaded.

4.1 Setup for loading DWB 10.0

The following steps are needed to load DWB using CIT.

1. It is assumed that the `/mnt/usr/src` partitions have already been made and mounted. If not, do so before continuing.
2. Verify that the networks are set up correctly to allow the upgrade process to run properly.
 - a. Verify that the `~crayadm/.rhosts` file on the OWS allows root to send remote shell commands to the OWS from the mainframe.
 - b. Verify that the `/.rhosts` file on the Cray mainframe allows `crayadm` to send remote shell commands to the mainframe from the OWS.

Note: For more information on the communications path between the SWS and the Cray mainframe, see the *Common Installation Tool (CIT) Reference Card*, Cray Research publication SQ-2218, which can be printed from the `/CDROM/CYRIinstall/2218.ps` PostScript file.

3. On the OWS, load the CD-ROM that contains the 10.0 DWB release.
4. On the OWS (as the user name you chose in step 2), mount the CD-ROM, change directories to the CD-ROM mount point and run the setup script. This script will start CIT.

```
ows# mount -t hsfs -r /dev/sr0 /CDROM
ows# cd /CDROM
ows# ./setup -c CrayHostName -l cray_user_name
```

`cray_user_name` must be `root`, unless you want to load it as a user other than `root` on the Cray system, in which case you would need to change the user name in the `/.rhosts` file.

The installation log files are located on the OWS as
`/tmp/cit.root/*.log`.

For more information about CIT, see the *Common Installation Tool (CIT) Reference Card*, Cray Research publication SQ-2218, which can be printed from the `/CDROM/CYRIinstall/2218.ps` PostScript file.

5. Select the `Documenters_Workbench` package in CIT and install it on the mainframe.
 - a. Verify that the Cray mainframe information is correct. If it is not, correct the data in CIT.
 - b. Quit CIT when the `Documenters_Workbench` package has finished loading on the Cray mainframe.
6. Eject the CD-ROM.

```
ows# cd /  
ows# unmount /CDROM  
ows# eject cd
```

4.2 Building DWB for UNICOS 10.0

If you have loaded the optional product, DWB, you can build it manually or by using ICMS.

To build DWB manually, enter the following commands:

```
unicos# /bin/chroot /mnt /usr/gen/bin/ksh  
unicos# cd /usr/src  
unicos# nmake Sparse_install  
unicos# exit
```

This command builds DWB, the kernel, and Kerberos, if they are all installed.

To build DWB by using ICMS, go to the following ICMS menu:

```
UNICOS Installation /Configuration Menu System  
->Build/Install System
```

Set the `Specific` component to build to **prod/text** instead of what appears. Selecting the `Do the build ...` action will build DWB.

4.3 Tasks to be completed before going to multi-user mode

At this point in the installation of UNICOS and DWB, you have completed enough tasks to get the system to single-user mode. Proceed to *UNICOS System Configuration Using ICMS*, Cray Research publication SG-2412, to:

- Customize your system's configuration using ICMS
- See Cray Research recommendations for this release
- Build a properly configured UNICOS system
- Turn off Security Enhancement logging while in single-user mode
- Copy time critical files such as UDB
- Assign PALs to the new file systems
- Complete configuring Security Enhancements
- Turn on Security Enhancement logging
- Go to multi-user mode
- Restart NQE checkpointed jobs or processes
- Access accounting data from previous systems

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