

# UNICOS® Installation Guide for Cray SV1™ SuperCluster™ Systems

004-5310-003

---

© 2000 Silicon Graphics, Inc. All Rights Reserved. This document or parts thereof may not be reproduced in any form unless permitted by contract or by written permission of Silicon Graphics, Inc.

---

#### LIMITED AND RESTRICTED RIGHTS LEGEND

Use, duplication, or disclosure by the Government is subject to restrictions as set forth in the Rights in Data clause at FAR 52.227-14 and/or in similar or successor clauses in the FAR, or in the DOD, DOE or NASA FAR Supplements. Unpublished rights reserved under the Copyright Laws of the United States. Contractor/manufacturer is Silicon Graphics, Inc., 1600 Amphitheatre Pkwy., Mountain View, CA 94043-1351.

---

Autotasking, CF77, Cray, Cray Ada, CraySoft, Cray Y-MP, Cray-1, CRInform, CRI/*TurboKiva*, HSX, LibSci, MPP Apprentice, SSD, SUPERCLUSTER, UNICOS, UNICOS/mk, and X-MP EA, are federally registered trademarks and Because no workstation is an island, CCI, CCMT, CF90, CFT, CFT2, CFT77, ConCurrent Maintenance Tools, COS, Cray Animation Theater, Cray APP, Cray C90, Cray C90D, Cray C++ Compiling System, CrayDoc, Cray EL, Cray J90, Cray J90se, CrayLink, Cray NQS, Cray/REELlibrarian, Cray S-MP, Cray SSD-T90, Cray SV1, Cray T90, Cray T3D, Cray T3E, CrayTutor, Cray X-MP, Cray XMS, Cray-2, CSIM, CVT, Delivering the power . . ., DGauss, Docview, EMDS, GigaRing, HEXAR, IOS, ND Series Network Disk Array, Network Queuing Environment, Network Queuing Tools, OLNET, RQS, SEGLDR, SMARTE, SUPERLINK, System Maintenance and Remote Testing Environment, Trusted UNICOS, and UNICOS MAX are trademarks of Cray Research, L.L.C., a wholly owned subsidiary of Silicon Graphics, Inc.

---

Documenter's Workbench is a trademark of Novell, Inc. DynaText and DynaWeb are registered trademarks of Inso Corporation. Kerberos is a trademark of Massachusetts Institute of Technology. NFS is a trademark of Sun Microsystems, Inc. PostScript is a trademark of Adobe Systems, Inc. Silicon Graphics is a registered trademark of Silicon Graphics, Inc. UNIX is a registered trademark in the United States and other countries, licensed exclusively through X/Open Company Limited. X/Open is a trademark of X/Open Company Ltd. The X device is a trademark of the Open Group.

---

The UNICOS operating system is derived from UNIX® System V. The UNICOS operating system is also based in part on the Fourth Berkeley Software Distribution (BSD) under license from The Regents of the University of California.

---

# Record of Revision

---

<i><b>Version</b></i>	<i><b>Description</b></i>
10.0.0.5	April 1999 Original Printing. This printing supports the UNICOS 10.0.0.5 release.
002	July 1999 This revision supports the UNICOS 10.0.0.6 release.
003	February 2000 This revision supports the UNICOS 10.0.0.7 release.



# Contents

---

	<i>Page</i>
<b>Preface</b>	<b>v</b>
Related Publications . . . . .	v
Obtaining Publications . . . . .	v
Conventions . . . . .	vi
Reader Comments . . . . .	vii
<b>Overview [1]</b>	<b>1</b>
Introduction . . . . .	1
Related Information . . . . .	1
Hardware Components . . . . .	2
System Workstation (SWS) . . . . .	2
Scalable I/O (SIO): GigaRing Channel . . . . .	2
SuperCluster System . . . . .	2
Software Components . . . . .	5
Cray SV1 SuperCluster Systems and UNICOS Issues . . . . .	6
<b>Cray SV1 SuperCluster Initial Installation [2]</b>	<b>7</b>
Cray SV1 SuperCluster Initial Installation . . . . .	7
Tasks to Be Completed before Going to Multiuser Mode . . . . .	20
<b>Cray SV1 SuperCluster Upgrade Installation [3]</b>	<b>21</b>
Prepare for the Upgrade . . . . .	21
Get Superuser, MLS, and Network Privileges . . . . .	22
Allocate Disk Space for New File Systems . . . . .	22
Prepare for the UNICOS Upgrade Installation . . . . .	24
Start the UNICOS Upgrade Installation . . . . .	29
<b>004-5310-003</b>	<b>iii</b>

	<i>Page</i>
List Revision and Update Mods in This Release (Source Systems Only) . . . . .	30
Apply Local Mods (Source Systems Only) . . . . .	30
Tasks to Be Completed before Going to Multiuser Mode . . . . .	30
<b>Documenter's Workbench (DWB) Installation [4]</b>	<b>33</b>
Setup for Loading DWB 10.0 . . . . .	33
Building DWB for UNICOS 10.0 . . . . .	35
Tasks to Be Completed before Going to Multiuser Mode . . . . .	36
<b>Index</b>	<b>39</b>
<b>Figures</b>	
Figure 1. Cray SV1–4 SuperCluster System . . . . .	3
Figure 2. Cray SV1–8 SuperCluster Layout . . . . .	4
Figure 3. SuperCluster UNICOS Initial Install GUI . . . . .	13
Figure 4. SuperCluster Building Block Upgrade Install GUI . . . . .	26
<b>Tables</b>	
Table 1. Cray SV1 Channel Definitions . . . . .	12
Table 2. UNICOS 10.0 file system sizes . . . . .	23
Table 3. Disk space required for /usr/src . . . . .	23

# Preface

---

This document is written for system administrators and operators of Cray SV1 SuperCluster systems. It shows you how to install the UNICOS operating system on the SuperCluster system. For last minute changes that may affect the UNICOS installation process, refer to the corresponding UNICOS Errata.

## Related Publications

The following documents contain additional information that may be helpful:

- *UNICOS Release Letter*
- *Common Installation Tool (CIT) Reference Card*
- *UNICOS Administrator Commands Reference Manual*
- *UNICOS Basic Administration Guide for Cray J90se and Cray SV1 GigaRing based Systems*
- *UNICOS Configuration Administrator's Guide*
- *UNICOS System Configuration Using ICMS*
- *Cray SV1 SuperCluster Administrator's Guide*

## Obtaining Publications

The *User Publications Catalog* describes the availability and content of all Cray hardware and software documents that are available to customers. Customers who subscribe to the Cray Inform (CRInform) program can access this information on the CRInform system.

To order a printed Cray document, call +1 651 683 5907. SGI employees may also order documents by sending their orders via e-mail to [orderdsk@sgi.com](mailto:orderdsk@sgi.com).

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, pathnames, signals, messages, programming language structures, and e-mail addresses) and items that appear on the screen.																				
<code>manpage(x)</code>	<p>Man page section identifiers appear in parentheses after man page names. The following list describes the identifiers:</p> <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>	<p>Some internal routines (for example, the <code>_assign_asgcmd_info()</code> routine) do not have man pages associated with them.</p> <p>Italic typeface denotes variable entries and words or concepts being defined.</p>																				



<b>user input</b>	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 default shell in the UNICOS and UNICOS/mk operating systems, referred to 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.

Cray UNICOS Version 10.0 is an X/Open Base 95 branded product.

## Reader Comments

If you have comments about the technical accuracy, content, or organization of this document, please tell us. Be sure to include the title and part number of the document with your comments.

You can contact us in any of the following ways:

- Send e-mail to the following address:  
`pubs@cray.com`
- Send a fax to the attention of "Software Publications" at: +1-651-683-5599.
- File an SPR; use PUBLICATIONS for the group name, PUBS for the command, and NO-LICENSE for the release name.
- Call the Software Publications Group, through the Technical Assistance Center, using one of the following numbers: 1-800-950-2729 (toll free from the United States and Canada) or +1-651-683-5600.
- Send mail to the following address:

Software Publications  
Cray Research  
655F Lone Oak Drive  
Eagan, MN 55121

We value your comments and will respond to them promptly.

This document is written for system administrators and operators of Cray SV1 SuperCluster computer systems. It shows you how to install the UNICOS operating system on the SuperCluster. For last minute changes that may affect the UNICOS installation process, refer to the corresponding UNICOS Errata.

With the UNICOS 10.0 release, 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

The system workstation operating system includes a windows interface that simplifies and streamlines UNICOS installation. Also, the workstation's hard drive and connections to the I/O subsystems via private Ethernet give you single-point control for your installation or upgrade of the SuperCluster building block.

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

- Overview of the Cray SV1 SuperCluster and the software installation process
- Cray SV1 SuperCluster UNICOS initial installation
- Cray SV1 SuperCluster UNICOS upgrade installation
- Documenter's Workbench (DWB) installation

## 1.2 Related Information

Before you begin any of the procedures outlined in this guide, you should read the entire chapter that relates to the procedure you intend to perform.

You should have the following documentation available:

- *Common Installation Tool (CIT) Reference Card*
- *UNICOS Administrator Commands Reference Manual*

- *UNICOS Basic Administration Guide for Cray J90se and Cray SV1 GigaRing based Systems*
- *UNICOS Configuration Administrator's Guide*
- *UNICOS System Configuration Using ICMS*
- *Cray SV1 SuperCluster Administrator's Guide*

**Note:** Before you proceed with your system installation or upgrade, read the *Read Me First for Cray SV1 System Installation* document that was shipped with your system.

## 1.3 Hardware Components

The minimum hardware configuration for each Cray SV1 SuperCluster system includes a system workstation (SWS), a scalable I/O (SIO) GigaRing channel, and four Cray SV1 mainframes with two peripheral cabinets (referred to as a *SuperCluster building block*).

### 1.3.1 System Workstation (SWS)

The system workstation (SWS) is a Sun workstation running the Solaris operating system.

The workstation serves as the system console for each SIO device and the Cray SV1 SuperCluster building block. The workstation also runs management and maintenance software for the Cray SV1 system and SIO devices. This console is connected via a private Ethernet connection to each SIO. It is shipped with a DAT tape device for backups.

### 1.3.2 Scalable I/O (SIO): GigaRing Channel

The Cray scalable I/O (SIO) architecture consists of a system of I/O nodes (IONs) connected to a high-speed channel called the *GigaRing* channel. This channel connects multiple clients with high-speed, point-to-point links to support I/O peripherals.

### 1.3.3 SuperCluster System

The smallest SuperCluster system is a Cray SV1-4 SuperCluster (SuperCluster building block), which is made up of four Cray SV1 mainframes, with either 4 x

4 or 8 x 8 processor module backplane types, and two peripheral cabinets. See Figure 1, page 3. This configuration is referred to as a *SuperCluster building block*.

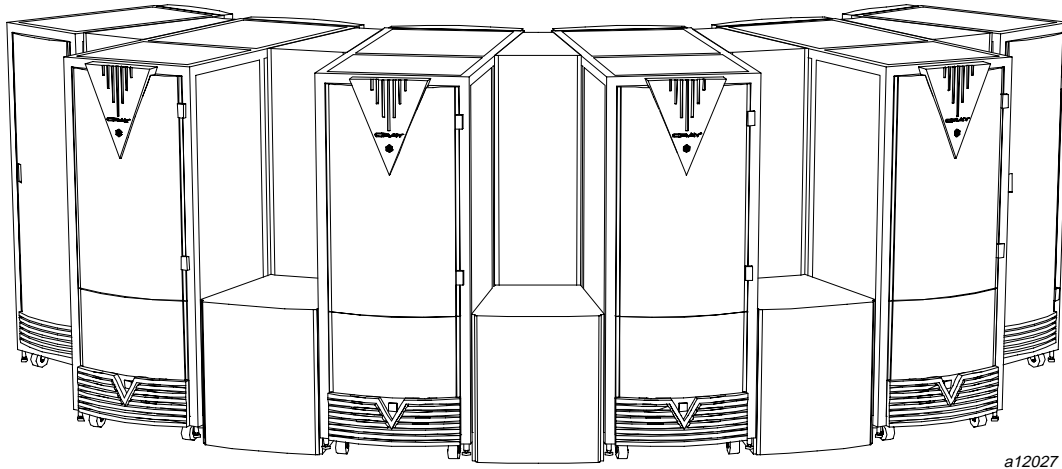


Figure 1. Cray SV1-4 SuperCluster System

To create a Cray SV1-8 SuperCluster system, two SuperCluster building blocks are combined, with inter-node GigaRing connections between specific systems in the SuperCluster building block.

The Cray SV1 system node can be configured with a mix of 1-Gflops and 4-Gflops CPUs. The 1-Gflops CPU is called a *single-streaming processor (SSP)*.

**Note:** This manual uses the term *SSP* interchangeably with the term *CPU* when referring to a 1-Gflops processor.

The Cray SV1 SuperCluster is available in the following configurations:  
Cray SV1-4, Cray SV1-8, Cray SV1-12, Cray SV1-16, Cray SV1-20,  
Cray SV1-24, Cray SV1-28, and Cray SV1-32.

Figure 2, page 4 shows an example of the SuperCluster configuration for a Cray SV1-8 SuperCluster and illustrates the various terms used to describe the ring interconnection between the two Cray SV1-4 SuperCluster building blocks.

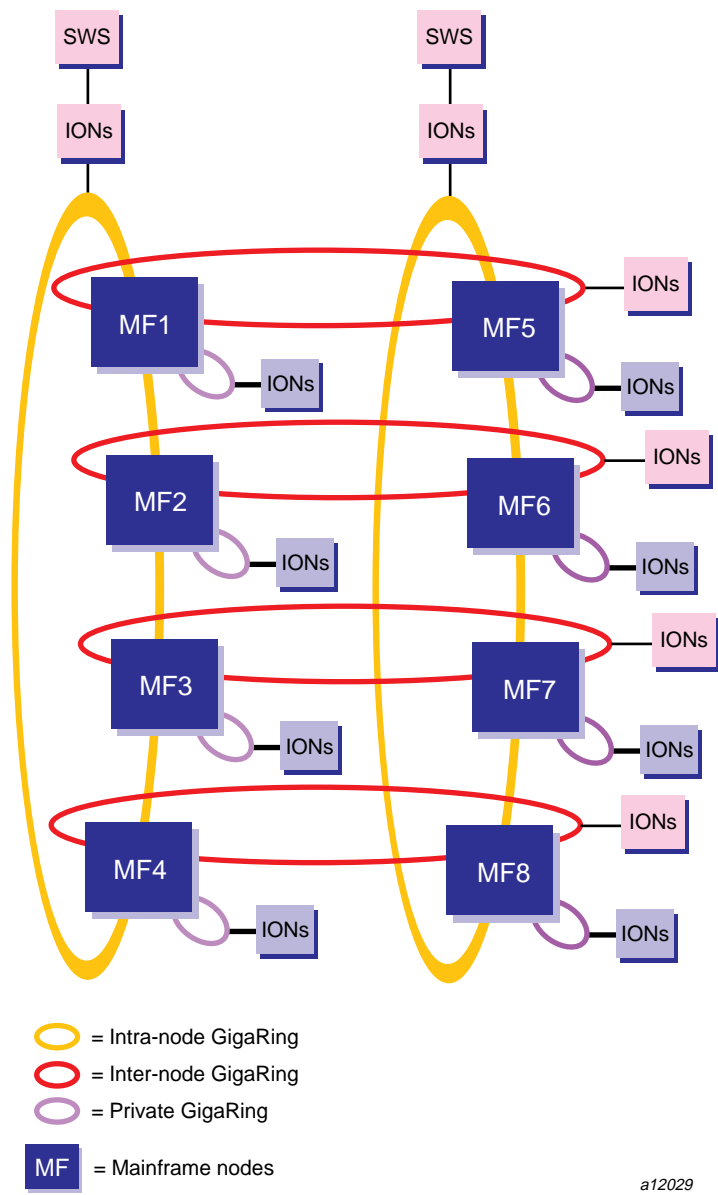


Figure 2. Cray SV1-8 SuperCluster Layout

Figure 2, page 4 shows that *intra-node* GigaRing connections are made between the four Cray SV1 systems that make up a SuperCluster building block, while *inter-node* GigaRing connections are made between two or more SuperCluster building blocks. The intra-node and inter-node GigaRing connections are used to provide common disk and network I/O capabilities to the SuperCluster system.

Each system in the cluster has a private GigaRing connection that contains at least one ION containing the system's primary and secondary `root`, `usr`, and `src` file systems. The private GigaRing may contain additional IONs to provide unique disk and network I/O capabilities to the single Cray SV1 system.

## 1.4 Software Components

Cray SV1 systems include the components described in this section.

**Note:** All software required to run your system is initially installed by SGI. Your console, I/O subsystem, and Cray SV1 mainframes are fully operational when you receive them.

The Cray SV1 UNICOS CD contains the UNICOS operating system that can be used for either initial or upgrade installations. The path to these packages after the UNICOS CD has been mounted on a Sun SWS is `/cdrom/cdrom0`.

Sites that wish to NFS mount the UNICOS CD from another system should make sure that the mount point is either world-readable or owned by `crayadm`.

Three types of UNICOS packages are distributed for the Cray SV1 SuperCluster system. These packages can be loaded by 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 software, sites should select all UNICOS packages contained on the Cray SV1 UNICOS CD for their initial or upgrade installation. Be sure **not** to include Documenter's Workbench (DWB) during the UNICOS installation. Installation of DWB is performed at a separate point in the UNICOS installation process.

## 1.5 Cray SV1 SuperCluster Systems and UNICOS Issues

This section highlights Cray SV1 SuperCluster enhancements, and compatibilities and differences with previous UNICOS releases.

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



# Cray SV1 SuperCluster Initial Installation [2]

---



**Caution:** Your Cray SV1 SuperCluster UNICOS operating system software was installed at the factory prior to shipping. Unless you need to reinstall the operating system for whatever reason, do not perform an initial installation; the procedures in this document may destroy the pre-installed system software.

This chapter describes the procedures to perform an initial UNICOS software installation on your Cray SV1 SuperCluster, or to perform a reinstallation of your current UNICOS software.

**Note:** These procedures assume that SWS-ION package release 6.0 or later is installed on your system. If you are unsure which version you are running, execute the following command: `/opt/CYRIops/bin/siorev`. If you do not have the correct SWS-ION release, refer to the *SWS Operating System and Devices Installation Guide*.

Before you begin, make sure that you are logged into your SWS with your `crayadm` account. If the UNICOS operating system is currently running, perform a system shutdown by entering the `/etc/shutdown` command from the system console. Make sure that there are no current `mfcon` connections to the Cray mainframe so that the operating system console is not in use. Also, make sure that there are no current logins to any of the multipurpose nodes (MPNs) or Fibre channel nodes (FCNs) in the configuration.

## 2.1 Cray SV1 SuperCluster Initial Installation

The following is the initial installation procedure for a Cray SV1-4 SuperCluster or a SuperCluster building block. This procedure may be done serially or in parallel on each SWS of the building block(s) that make up the total SuperCluster configuration.

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

- Replace *snSuperClusterSerialNumber* with your Cray SV1 SuperCluster system name.
- Replace *snSerialNumber* with your Cray system name.
- Replace *CrayHostName* with your Cray network node name.
- Replace *cdrom\_mount* with your CD-ROM mount point. The default CD-ROM mount point on a Sun SWS is usually */cdrom/cdrom0*.

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

1. Insert the UNICOS CD-ROM into the SWS.
2. Log into the SWS as *crayadm*.
3. Execute the following commands to set up the */opt/CYRIos/SuperCluster* directory, to copy the *SuperClusterMap* file from the UNICOS CD-ROM to the SWS, and to create an environment variable to define the location of the *SuperClusterMap* file:

```
sws% mkdir /opt/CYRIos/snSuperClusterSerialNumber
sws% chmod 755 /opt/CYRIos/snSuperClusterSerialNumber
sws% cd /opt/CYRIos/snSuperClusterSerialNumber
sws% cp /cdrom_mount/UNICOS_exe/SuperClusterMap SuperClusterMap
sws% chmod 640 SuperClusterMap
sws% chown -R crayadm:crayops /opt/CYRIos/snSuperClusterSerialNumber
sws% export SUPERCLUSTERMAP=/opt/CYRIos/snSuperClusterSerialNumber/SuperClusterMap
```

4. Allocate disk space for file systems. If the UNICOS CD-ROM being used has the *UNICOS\_Relocatables* (*UNICOS\_bin* directory) and/or the *UNICOS\_Source* (*UNICOS\_src* directory) packages present, the default source file system partition size will need to be increased.

The following commands are required to make sure the partition sizes are correct:

- If the *UNICOS\_Relocatables* package is present, and the *UNICOS\_Source* package is not present, execute the following commands:

```
sws% export SYS_Srca_SIZE=440000
sws% export SYS_Srcb_SIZE=440000
```

- If the UNICOS\_Relocatables and UNICOS\_Source packages are both present, execute the following commands:

```
sws% export SYS_Srca_SIZE=660000
sws% export SYS_Srcb_SIZE=660000
```

5. Verify that the following information is present. This information is required for the initial install process to be successful.



**Caution:** Before installing UNICOS, verify that the `~crayadm/.rhosts` file on the SWS is set up to allow a login from `root` on the Cray mainframes in the SuperCluster building block to the SWS without a password, for example:

```
CrayHostName1 root
CrayHostName2 root
CrayHostName3 root
CrayHostName4 root
```

Also, verify that `CrayHostName#` is the first name listed in the corresponding `/etc/hosts` entry, and not an alias (second or third name).

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

6. Edit the `SuperClusterMap` file. Update the file's parameters to match your site's SuperCluster building block. Execute the following command on the SWS:

```
sws% vi $SUPERCLUSTERMAP
```

This file contains information that is needed to create a topology file for the SWS. Any entry with a `[#]` entry means that there are four entries of this type that need to be provided in the map file. All array entries with the same number identify information for the same machine in the SuperCluster building block (that is, all array entries with the number 1 refer to the first system's related information).

**Note:** If there are multiple private GigaRings in this Cray SV1–4 SuperCluster, the private GigaRing information to be provided below should be for the private GigaRing that contains the MPN that is part of the SuperCluster building block. Additional private GigaRing connections that may be attached to the system can be added in step 8, before substep c, during the installation process.

The critical parts of the `SuperClusterMap` file that are needed for initial installation and used to create a draft version of the `topology` file are as follows:

<code>SYS_CDROM</code>	Path to the CD-ROM image on the SWS after being mounted (be sure to include <code>UNICOS_exe</code> at the end of the path).
<code>SC_SERIALNO</code>	SuperCluster serial number.
<code>SC_SYS</code>	SuperCluster system name.
<code>SYS_SWSIP</code>	SWS IP address.
<code>SWSHOST</code>	SWS network node name.
<code>SC_CRAYHOST</code>	SuperCluster network node name.
<code>SYS_ROUTERID</code>	Network router IP address.
<code>SYS_ROUTERHOST</code>	Network router node name.
<code>CREATE_PARAM</code>	Keyword to create a paramfile automatically. Set to YES.
<code>SYS_SC_COUNT</code>	Number of mainframes controlled by this SWS. The value should be 2, 3, or 4. Any other value is not valid.
<code>SN[#]</code>	System serial number.
<code>CRAYIP[#]</code>	Cray IP address.
<code>CRAYHOST[#]</code>	Cray network node name.
<code>PRIV_CONN</code>	CONNECTION number to correspond to the octal mainframe channel for the mainframe entries in the <code>topology</code> file. See Table 1, page 12 for the Cray SV1 channel definitions.
<code>PRIV_IONS[#]</code>	List of ION names attached to the private GigaRing for mainframe #. The list is a comma-separated list. The ION upon which the OS will be installed must be in the list. If

	they are not present, the SuperCluster building block initial installation will fail.
INTRA_CONN[ # ]	Intra node GigaRing CONNECTION number to correspond to the octal mainframe channel for the GigaRing connecting the four systems in the SuperCluster building block. See Table 1, page 12 for the Cray SV1 channel definitions.
INTRA_RING	GigaRing number for the intra node GigaRing connection for the SuperCluster building block.
INTRA_IONS	List of ION names attached to the intra node GigaRing connections. The list is a comma-separated list.
INTRA_NETION	The name of one MPN that has four Ethernet cards inside to facilitate the installation of UNICOS on each system in the SuperCluster.
INTER_CONN[ # ]	Inter node GigaRing CONNECTION number to correspond to the octal mainframe channel for the GigaRing connecting mainframe # in one SuperCluster building block to mainframe # in another SuperCluster building block.
INTER_RING[ # ]	Inter node GigaRing connection ring number for mainframe # in one SuperCluster building block to mainframe # in another SuperCluster building block.
INTER_IONS[ # ]	List of ION names attached to mainframe # via the inter node GigaRing connections. The list is a comma-separated list.

Table 1. Cray SV1 Channel Definitions

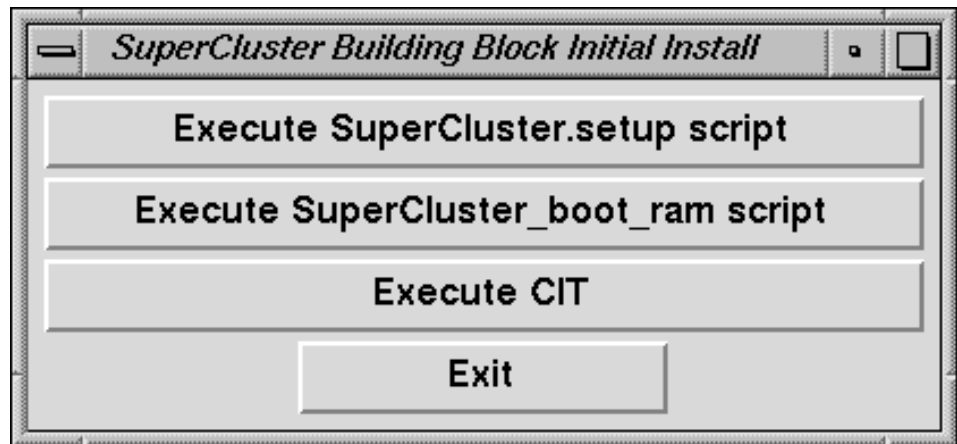
Cray/GigaRing node connection	Octal mainframe channel number
0	024
1	034
2	044
3	054
4	064
5	074
6	104
7	114

7. Execute the following commands to start the SuperCluster UNICOS Initial Install GUI as shown in Figure 3, page 13. 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 the next step.



**Caution:** Once you choose either the GUI or the text-based installation method, you must use that method through 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.

```
sWS% cd /cdrom_mount/UNICOS_exe  
sWS% ./SuperCluster.initial -l root
```



a11362

Figure 3. SuperCluster UNICOS Initial Install GUI

8. Make the SWS, IONs, and mainframes in the SuperCluster building block ready for the initial install. Either select `Execute SuperCluster.setup script` from the GUI, or execute the following text-based command:

```
sws% /cdrom_mount/UNICOS_exe/SuperCluster.setup
```

This script takes approximately 10 minutes to complete. It creates the following files for each system in the SuperCluster building block:

- console
- boot.ram
- param
- param.ram

It also creates the following files for the SuperCluster building block:

- options
- options.ram
- topology
- boot.ions\_rings

This script will also perform the following actions on the SuperCluster building block: run `haltsys` on the mainframes, boot the I/O node(s) and GigaRings, create the mainframe hardware files, and unpack and rename the UNICOS generic kernel.

- a. During execution of the `SuperCluster.setup` script, you will be taken into a `vi` session to update the parameters for each mainframe. The critical parts of the `sysinfo` file that are needed for the initial installation are as follows:

<code>SYS_SERIALNO</code>	System serial number.
<code>SYS_SWSIP</code>	SWS IP address.
<code>SWSHOST</code>	SWS network node name.
<code>SYS_CRAYIP</code>	Cray IP address.
<code>SYS_CRAYHOST</code>	Cray network node name.
<code>SYS_IFNAME</code>	Network interface name.
<code>SYS_NETMASK</code>	Network mask ID.
<code>SYS_ROOT_FS</code> , <code>SYS_USR_FS</code> , and <code>SYS_SRC_FS</code>	New <code>root/usr/src</code> partitions.
<code>SYS_CDROM</code>	Path to the CD-ROM image on the SWS after being mounted (be sure to include <code>UNICOS_exe</code> at the end of the path).
<code>CREATE_PARAM</code>	Keyword to create a paramfile automatically. Set to <code>YES</code> .
<code>OS_ION</code>	Name of the MPN or FCN on which to install UNICOS. The ION specified must be on a system's private GigaRing, not on a shared ION.
<code>SYS_CPUS</code>	Number of CPUs.
<code>SYS_MEMORY</code>	Amount of memory in Mwords.
<code>SYS_BPTYPE</code>	SV1 backplane type.
<code>SYS_CPUBITMAP</code>	SV1 CPU bitmap.
<code>SYS_CPTYPES</code>	SV1 CPU type list.
<code>SYS_MEMBITMAP</code>	SV1 memory bitmap.
<code>SYS_MEMLST</code>	SV1 memory type list.



- b. After entering information for the four mainframes in each system's `sysinfo` file, it is necessary to provide similar information to the SuperCluster's `sysinfo` file.

During execution of the `SuperCluster.setup` script, you will be taken into a `vi` session to update the parameters for the SuperCluster. The critical parts of the `sysinfo` file are as follows:

<code>SYS_SERIALNO</code>	SuperCluster serial number.
<code>SYS_NAME</code>	SuperCluster system name.
<code>SYS_CRAYHOST</code>	SuperCluster network node name.
<code>SYS_CDROM</code>	Path to the CD-ROM image on the SWS after being mounted (be sure to include <code>UNICOS_exe</code> at the end of the path).

- c. The `SuperCluster.setup` step will produce the `param` and `param.ram` files that contain non-shared IONs. Disk devices will be provided by MPN and FCN IONs, and network devices are provided by MPN and HPN IONs. Only IONs on the private GigaRing connection for each mainframe will be used. All other possible ION devices that may exist inside the SuperCluster building block will not appear automatically; these will need to be added manually. This `param` file is a starting point and should be customized to suite a site's needs.

If `CREATE_PARAM` from the `sysinfo` file is set to `NO`, it is assumed that a valid parameter file for the system has been provided in `/opt/CYRIos/snSerialNumber/param`. If the file is missing, the Cray SV1 SuperCluster setup will produce an error.

**Note:** The UNICOS software will be installed on the ION specified by `OS_ION` from the `sysinfo` file. If no disks are present on the specified ION, the creation of a parameter file will fail.



**Warning:** If the ION named in `OS_ION` is an FCN, the disks that are used to hold the OS have their FCN disk labels removed. In addition, any disks that could be combined with the selected OS disks also have their FCN disk labels removed to ensure that these disks cannot be combined into a RAID configuration. Be careful when an FCN is selected as the ION on which the OS is installed. It is prudent to review the `param` file before continuing to make sure the desired disks are being used in the `param` file

9. Boot the mainframes in the SuperCluster building block with a RAM file system. Either select `Execute SuperCluster_boot_ram` script from the GUI, or execute the following text-based command:

```
sws% /cdrom_mount/UNICOS_exe/SuperCluster_boot_ram
```

This script takes approximately 20 minutes to complete. It boots the UNICOS generic kernel with the RAM root and brings up the mainframe console window for each mainframe in the SuperCluster building block.

After the system has successfully booted RAM root, exit the mainframe console window so that the Common Installation Tool (CIT) can be used to load the UNICOS operating system.

```
unicos# ctrl-] <CR>
```

**Note:** If there are any problems bringing up the mainframe console window, run the following command to get a status and to list the UNICOS system message buffer.

```
sws% checksv1 -b snSerialNumber
```

10. Use CIT to install the UNICOS operating system by loading it from the SWS to each Cray SV1 mainframe. Either select `Execute CIT` from the GUI, or execute the following text-based command for each mainframe in the SuperCluster building block in a separate `xterm` window as user `crayadm`:

```
sws% export SYSINFO=/opt/CYRIos/snSerialNumber/sysinfo
sws% /cdrom_mount/setup -i -c CrayHostName -m CrayHostName -l root
```

This will allow four initial installs to take place simultaneously, rather than doing one after another install finishes.

The installation log files are located on the SWS as  
`/tmp/cit.crayadm.CrayHostName/*.log`.

For more information about using CIT, see the *Common Installation Tool (CIT) Reference Card*, which can be printed from the  
`/cdrom_mount/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:** Sites should select all UNICOS packages contained on the UNICOS CD-ROM during the package selection process for installation (that is, in step a below). Do not select or install DWB (Documenter's Workbench) at this time. The installation of DWB is discussed in Chapter 4 after you have initially installed UNICOS on each 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, then correct the data.
- d. Quit CIT when you have finished loading the UNICOS release(s).



**Warning:** During installation, the file systems being used, `SYS_*_FS`, will be labeled with the minimum security level set to 0, the valid security compartment set to 0, and the maximum security level set to 0.

11. Exit the SuperCluster Initial Install GUI by selecting `Exit`.
12. Remove the root entries from the `~crayadm/.rhosts` file on the SWS for each mainframe. Remove the `crayadm` entry from the `/.rhosts` file on each Cray mainframe. This should undo the changes made in step 5 of section 2.1.
13. For Cray SV1-8 or larger SuperCluster configurations, the following tasks should be completed prior to booting the entire SuperCluster with the new UNICOS system. If the SuperCluster is a Cray SV1-4 system, you may skip this task and proceed to step 14.

It is recommended to choose one SWS to be the master SWS where the following changes will be made. Once the changes have been made, it will be necessary to propagate the changes made to the other SWSs in the SuperCluster.

- a. Merging the SuperCluster building block topology files. The SuperCluster has one large topology file that covers all mainframes and IONs that make up the complete SuperCluster. It will be necessary to merge the topology files created during the installation of UNICOS on each SuperCluster building block. If the information is entered correctly in the `SuperClusterMap` file on each SWS, the inter GigaRing connection information should not have to be changed.

The information in the intra GigaRing connection and the non-shared GigaRing connection sections of the topology from each of the SWS topology files will need to be merged into the master SWS topology file. The end result is that each SuperCluster building block's intra GigaRing mainframes and IONs, along with the private GigaRing IONs, will be present in the master topology file without duplication.

Once the master SWS topology file is ready, it should be copied to each SWS in the SuperCluster.

- b. Merging the SuperCluster options files. The SuperCluster should have one large options file that covers all mainframes and IONs that make up the complete SuperCluster. It will be necessary to merge the options file created during the installation of UNICOS on each SuperCluster building block.

The options file from each of the SWS options files will need to be merged into the master SWS options file. The end result is that each mainframe will have an entry in the master SWS options file.

Once the master SWS options file is ready, it should be copied over to each SWS in the SuperCluster.

- c. Each system will need to have the `/etc/gr#.arp` file updated to contain the network node name and arp address for each mainframe on the inter GigaRing connections between two or more SuperCluster Building blocks.

The arp address for a mainframe is as follows:

***hostname***    0:0:0:0:***ring#***:***node#***

where *hostname* is the first entry for the system in the `/etc/host` file, and the *ring#* and *node#* must be in hexadecimal format. For more information on this file and its contents see the *UNICOS Networking Facilities Administrator's Guide*.

14. Next it is necessary to update each system's `param` file to allow for sharing file systems inside the SuperCluster and to review the network section of the `param` file for adequate mbufs and GigaRing host-to-host communication information (that is, using the `gr` interface for GigaRing for TCP/IP communication between the mainframes in the SuperCluster).
  - a. During the initial installation process, the initial `param` file created for each system contains only the devices that are present on the private GigaRing connection's IONs from MPNs and FCNs. The disks and network devices of MPNs and FCNs on the inter GigaRing and intra GigaRing connections will not be present in the default `param` file, and will need to be added accordingly.

The minor numbers for each slice and logical device in the filesystem section will need to be modified to avoid possible conflicts with the existing filesystem minor numbers. In the `unicos` section, the `XDDMAX`,

XDDSLMAX, and LDDMAX will need to be increased so as to allocate proper space in the UNICOS kernel for all the new disk devices being added to each mainframe's param file.



**Caution:** The sharing of network devices between multiple systems in the SuperCluster can cause problems. The sharing of network interfaces is not recommended.

- b. With the customization of each system's param file in the SuperCluster having the intra GigaRing information added, it is now necessary to add the inter GigaRing connection information to each system that is part of each inter GigaRing present in the entire SuperCluster. (This step should be done for SuperCluster systems that are Cray SV1-8 or larger configurations.)

An inter GigaRing param file was not created during the installation process. Sites will need to modify each system's param file to properly access IONs that are part of the inter GigaRing connections between SuperCluster building blocks.

- c. The network node names for all the systems that make up the SuperCluster were not added to the /etc/hosts file on each system. Each system's IP address, name, and aliases should be added to each system's /etc/hosts file. For a Cray SV1-4 SuperCluster, three entries need to be added to each system's /etc/hosts file. For a Cray SV1-8 SuperCluster, seven entries need to be added to each system's /etc/hosts file.
- d. Each system will need to have the /etc/gr#.arp file updated to contain the network node name and arp address for each mainframe on the SuperCluster Building block's intra GigaRing connection.

The arp address for a mainframe is as follows:

**hostname**    0:0:0:0:ring#:node#

where *hostname* is the first entry for the system in the /etc/host file, and the *ring#* and *node#* must be in hexadecimal format. For more information on this file and its contents see the *UNICOS Networking Facilities Administrator's Guide*.

15. Execute the following command for each system in the SuperCluster building block to boot the new UNICOS system:

```
sws% bootsys -c snSerialNumber
```

## 2.2 Tasks to Be Completed before Going to Multiuser Mode

At this point, you have completed enough tasks to get your system into single-user mode for system configuration.

If you have DWB on your UNICOS CD-ROM, proceed to Chapter 4 to install DWB. Otherwise, refer to *UNICOS System Configuration Using ICMS* for information regarding the following tasks that need to be completed prior to making your upgraded system available for production use.

**Note:** The UNICOS 10.0 release includes changes and enhancements to the process for completing many of these final configuration tasks.

- Customize your system configuration with ICMS.
  - Import system configuration files into ICMS.
  - Update system configuration files into ICMS.
  - Configure features and subsystems of UNICOS in ICMS.
  - Activate system configuration in ICMS.
- See Cray 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 multiuser mode.
- Restart NQE checkpointed jobs or processes.
- Access accounting data from previous systems.

# Cray SV1 SuperCluster Upgrade Installation [3]

---

This chapter guides you through a UNICOS upgrade from UNICOS 10.0.0.5 or a later release.

To determine which versions of SWS or asynchronous software work with the version of UNICOS that you are installing, see the following documents included in this release package: *UNICOS Release Overview* and *UNICOS Release Letter*.

The following sections will help you prepare for the upgrade from the UNICOS 10.0.0.5 release to UNICOS 10.0.0.6 and start the automated upgrade.

**Note:** These procedures assume that SWS-ION package, release 6.0 or later, is installed on your system. If you are unsure which version you are running, execute the following command: `/opt/CYRIops/bin/siorev`. If you do not have the correct SWS-ION release, refer to the *SWS Operating System and Devices Installation Guide*.

The intent of the upgrade installation is for it to be performed on a running system that is in multiuser mode. However, certain security configurations may require dedicated system time as outlined below.

## 3.1 Prepare for the Upgrade

Before you start the installation process, you must go through several preparation steps. The basic steps in this section are:

- Get superuser, appropriate MLS, and network privileges.
- Allocate disk space for the new UNICOS 10.0 file systems.
- Prepare for the UNICOS upgrade installation.

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

### 3.1.1 Get Superuser, MLS, and Network Privileges

UNICOS 10.0 runs with the 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 system is running UNICOS without the `NETW_RCMD_COMPAT` bit set in the `SECURE_NET_OPTIONS` bitmask, you will need to reboot your system with this bit enabled as CIT uses `.rhosts` to facilitate the transfer of packages from the SWS to the Cray mainframe.

If your system is running Trusted UNICOS, you must reboot with the `PRIV_SU` kernel to install UNICOS 10.0. Once rebooted, you will need superuser (`root`) privileges to perform the install.

**Note:** This may require dedicated 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. Table 2 lists the required file systems and their minimum sizes. Table 3, page 23 lists the size requirements for the `/usr/src` file system, which are dependent upon the type of UNICOS release that your site is going to install.

If your site has insufficient disk space for both the current UNICOS release and a later UNICOS release `/usr/src` file systems, you may use a single source file system (note the special option available in Section 3.1.3 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 you have a backup copy of the source file system before using this upgrade option.

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



**Note:** The numbers in the following tables are estimates. Partition size can vary greatly depending on the `NPROC` setting, the optional products 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` was set to 8, and no optional products were loaded. The high water meter was found, 15% was added, and then the numbers were rounded up to the next thousand.

Table 2. UNICOS 10.0 file system sizes

File system	Size in 4-Kbyte blocks by device sector size
<code>/</code>	150,000
<code>/usr</code>	205,000
<code>/tmp</code>	80,000
<code>/usr/src</code>	See Table 3.

The following are recommended partition sizes for the source file systems. Your site's needs may vary.

Table 3. Disk space required for `/usr/src`

UNICOS release package type	Corresponding CD-ROM directory name(s)	Size in 4-Kbyte blocks by device sector size
Executable	UNICOS_exe	220,000
Executable and Relocatable	UNICOS_exe and UNICOS_bin	440,000
Executable and Relocatable and Source	UNICOS_exe and UNICOS_bin and UNICOS_src	660,000

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

**Note:** The following information regarding `ldcache` is given as a recommendation and is not a required action.

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 `ldcache`, see the `ldcache(8)` man page or the *UNICOS Configuration Administrator's Guide*.

### 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 the configuration information is obtained. This can take from 25 minutes to 45 minutes to complete.

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

- Replace `snSuperClusterSerialNumber` with your Cray SV1 SuperCluster system name.
- Replace `snSerialNumber` with your Cray system name.
- Replace `CrayHostName` with your Cray network node name.
- Replace `cdrom_mount` with your CD-ROM mount point. The default CD-ROM mount point on a Sun SWS is usually `/cdrom/cdrom0`.

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

1. Insert the UNICOS CD-ROM into the SWS.
2. Log into the SWS as `crayadm`.
3. Create an environment variable to define the location of the `SuperClusterMap` file:

```
sws% export SUPERCLUSTERMAP=/opt/CYRIos/snSuperClusterSerialNumber/SuperClusterMap
```

4. Edit the `SuperClusterMap` file. Update the file's parameters to match your site's SuperCluster building block. Execute the following command on the SWS:

```
sws% vi $SUPERCLUSTERMAP
```

This file contains information that is needed to automatically load the UNICOS software onto the SuperCluster building block. Any entry with a `'[#]'` entry means that there are four entries of this type that need to be provided in the map file. All array entries with the same number identify

information for the same machine in the SuperCluster building block (that is, all array entries with the number 1 refer to the first system's related information.)

<code>SYS_CDROM</code>	Path to the CD-ROM image on the SWS after being mounted. Make sure to include <code>UNICOS_exe</code> at the end of the path.
<code>SYS_SC_COUNT</code>	Number of mainframes controlled by the SWS. The value should be 2, 3, or 4. Any other value is not valid.
<code>SN[ #]</code>	System serial number.
<code>CRAYIP[ #]</code>	Cray IP address.
<code>CRAYHOST[ #]</code>	Cray network node name.

5. Verify that the networks are set up correctly to allow the upgrade process to run properly on the SuperCluster building block.
  - a. Verify that the `~crayadm/.rhosts` file on the SWS allows `root` to send remote shell commands to the SWS from each mainframe.
  - b. Verify that the `/.rhosts` file on each Cray mainframe allows `crayadm` to send remote shell commands to the mainframe from the SWS.

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

6. If you have been maintaining your parameter file manually on the SWS, you should copy that file to `/oldroot/etc/config/param` on each mainframe in the SuperCluster building block now. `oldroot` is the specific file system mount point from which the configuration information will be obtained during the upgrade process.
7. Execute the following commands to start the SuperCluster Building Block Upgrade Install GUI as shown in Figure 4. 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 the next step.



**Caution:** Once you choose either the GUI or the text-based installation method, you must use that method through 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 8) 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.

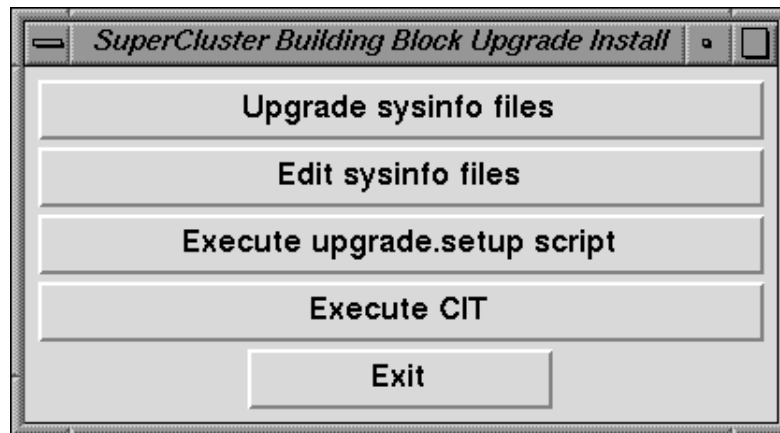
If you do **not** include the `-b` option on the command line, the old `root/usr` file systems mounted on `SYS_OLDROOT` (specified in step 8) will be dumped and restored on the new `SYS_*_FS` systems mounted on `SYS_MNT` (specified in step 9).

- 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.

```
SWS% cd /cdrom_mount
```

```
SWS% ./UNICOS_exe/SuperCluster.upgrade [-b] [-s] -l root
```



a12132

Figure 4. SuperCluster Building Block Upgrade Install GUI

8. Upgrade to the new `sysinfo` file on the UNICOS CD-ROM for each mainframe in the SuperCluster building block. Either select Upgrade

`sysinfo` files from the GUI, or execute the following text-based command:

```
sws% /cdrom_mount/UNICOS_exe/SuperCluster.sysinfo
```

This script will make a backup copy of each system's `sysinfo` file as `sysinfo.old`. The script will then copy the `sysinfo.default` file from the UNICOS CD-ROM to the SWS for each mainframe. During the copying, the data from the backed-up `sysinfo` file will be inserted into the new `sysinfo` file.

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

```
sws% 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>	SWS IP address.
<code>SWSHOST</code>	SWS 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 <code>root/usr/src</code> partitions.
<code>SYS_OLDROOT</code>	Old root system mount point from which the configuration information will be obtained during the upgrade process.
<code>UPGRADE</code>	Upgrade install keyword. Set to <code>YES</code> .
<code>SYS_CDROM</code>	Path to the CD-ROM on the SWS after being mounted (be sure to include <code>UNICOS_exe</code> at the end of this path).

10. For each 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 command:

```
sws% /cdrom_mount/UNICOS_exe/SuperCluster.dump -l root [-b] [-s]
```



**Warning:** During the execution of `SuperCluster.dump`, the `SYS_OLDROOT` file system labels will be propagated to `SYS_*_FS` by default. If no security labels exist, `SYS_*_FS` will be labeled with the minimum security level set to 0, the valid security compartment set to 0, and the maximum security level set to 0. If the `-b` option is used on `upgrade.setup`, it is assumed that the `SYS_*_FS` are already properly labeled.

`SuperCluster.dump` executes `upgrade.setup` on each mainframe in parallel and takes approximately 35 minutes to complete.

`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.



**Warning:** Symbolic links on the file systems used during the upgrade may have unintended consequences on other file systems, such as the production root or the source root used during the `dump/restore`. If a symbolic link exists on the upgrade root and the link points to another file system, the file's permissions or contents may be changed during the software installation.

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 each 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 on each mainframe. This information is required for the upgrade process to be successful.

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 8 to `SYS_OLDROOT`.

13. At this time, you can allocate `ldcache` on each mainframe for the upgrade process if desired.

## 3.2 Start the UNICOS Upgrade Installation

You have prepared each mainframe in the SuperCluster building block for the upgrade process; now load the new UNICOS release onto each mainframe. This process takes about 80 minutes to complete.

1. Use CIT to install the UNICOS operating system by loading it from the SWS to each mainframe in the SuperCluster building block. Either select `Execute CIT` from the GUI, or execute the following text-based commands for each mainframe:

```
sws% export SYSINFO=/opt/CYRIos/snSerialNumber/sysinfo
sws% /cdrom_mount/setup -i -m CrayHostName -c CrayHostName -l root
```

The installation log files are located on the SWS as  
`/tmp/cit.crayadm/*.log`.

For more information about using CIT, see the *Common Installation Tool (CIT) Reference Card*, which can be printed from the `/cdrom_mount/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:** Sites should select all UNICOS packages contained on the UNICOS CD-ROM during the package selection process for installation (that is, in step a following). Sites should not select DWB (Documenter's Workbench) at this time. The installation of DWB is discussed in Chapter 4 after completion of the UNICOS installation.

- 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, then correct the data.
  - d. Quit CIT when you have finished loading the UNICOS release(s).
2. Exit the SuperCluster Building Block Upgrade Install GUI by selecting `Exit`.
3. Remove the root entries from the `~crayadm/.rhosts` file on the SWS for each mainframe. Also remove the `~crayadm` entry for the `/.rhosts` file on each Cray mainframe. This should undo the changes made in step 5 of section 3.1.3.

**Note:** Verify that the following files were automatically transferred back to the SWS from `/newroot/etc/src/uts/cl/stand .` `/newroot` is the upgrade mount point given in step 9 to `SYS_MNT` for each mainframe in its `sysinfo` file. The system administrator is responsible for renaming these files so that they can be used when using the new operating system.

`unicos.Release Number`

`grsysdmp.Release Number`

### 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` option 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 to the new upgrade partitions now.

### 3.5 Tasks to Be Completed before Going to Multiuser Mode

At this point, you have completed enough tasks to get each system in the SuperCluster building block into single-user mode for system configuration.



If you have DWB on your UNICOS CD-ROM, proceed to Chapter 4 to install DWB. Otherwise, refer to *UNICOS System Configuration Using ICMS* for information regarding the following tasks that need to be completed prior to making your upgraded system available for production use.

**Note:** The UNICOS 10.0 release includes changes and enhancements to the process for completing many of these final configuration tasks.

- Customize your system configuration with ICMS.
  - Import system configuration files into ICMS.
  - Update system configuration in ICMS.
  - Configure features and subsystems of UNICOS in ICMS.
  - Activate system configuration in 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 multiuser 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 on to each system of the Cray SV1 SuperCluster building block.

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

- Replace *snSuperClusterSerialNumber* with your Cray SV1 SuperCluster system name.
  - Replace *CrayHostName* with your Cray network node name.
  - Replace *cdrom\_mount* with your CD-ROM mount point. The default CD-ROM mount point on a Sun SWS is usually */cdrom/cdrom0*.
1. It is assumed that the */mnt/usr/src* partitions have already been made and mounted on each mainframe in the SuperCluster building block. If not, do so before continuing.
  2. Verify that the networks are set up correctly to allow the upgrade process to run properly on each mainframe in the SuperCluster building block.
    - a. Verify that the *~crayadm/.rhosts* file on the SWS allows *root* to send remote shell commands to the SWS from each mainframe in the SuperCluster building block.
    - b. Verify that the */.rhosts* file on each Cray mainframe in the SuperCluster building block allows *crayadm* to send remote shell commands to the mainframe from the SWS.

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

3. Find the `SuperClusterMap` file, which should be located on the SWS in `/opt/CYRIos/SuperClusterName`, and create an environment variable to define the location of the `SuperClusterMap` file for future use:

```
sws% export SUPERCLUSTERMAP=/opt/CYRIos/snSuperClusterSerialNumber/SuperClusterMap
```

4. Edit the `SuperClusterMap` file. Update the file's parameters to match your site's SuperCluster building block. Execute the following command on the SWS:

```
sws% vi $SUPERCLUSTERMAP
```

This file contains information that is needed to automatically load the Documenter's Workbench software onto the Supercluster building block. Any entry with a `[#]` entry means that there are four entries of this type that need to be provided in the map file. All array entries with the same number identify information for the same machine in the SuperCluster building block (that is, all array entries with the number 1 refer to the first system's related information).

<code>SYS_CDROM</code>	Path to the CD-ROM image on the SWS after being mounted (be sure to include <code>UNICOS_exe</code> at the end of the path).
<code>SYS_SC_COUNT</code>	Number of mainframes controlled by the SWS. The value should be 2, 3, or 4. Any other values are not valid.
<code>CRAYHOST[#]</code>	Cray network node name.

5. On the SWS, load the CD-ROM that contains the 10.0 DWB release.
6. On the SWS (as the user name you chose in step 2), change directories to the CD-ROM mount point and run the setup script. This script will start a CIT invocation for each mainframe in the SuperCluster building block.

```
sws# cd /cdrom_mount/UNICOS_exe
sws# ./SuperCluster.load -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 `~crayadm/.rhosts` file.

The preceding script will allow four installations of DWB to take place simultaneously, rather than doing one install after another install finishes.

The installation log files are located on the SWS as  
`/tmp/cit.crayadm.CrayHostName`.

For more information about CIT, see the *Common Installation Tool (CIT) Reference Card*, which can be printed from the  
`/cdrom_mount/CYRIinstall/2218.ps` PostScript file. You may also select the Help button from the GUI, or enter the following command at the command-line prompt:

```
help all
```

7. Select the `Documenters_Workbench` package in CIT and install it in each CIT invocation, one for each mainframe in the SuperCluster building block.
  - 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 each mainframe in the SuperCluster building block.
8. Remove the root entries from the `~crayadm/.rhosts` file on the SWS for each mainframe. Remove the `crayadm` entry from the `/.rhosts` file on each Cray system. This should undo the changes made in step 2 of section 4.1.
9. Eject the CD-ROM after quitting each invocation of CIT.

```
sws# cd /  
sws# eject cd
```

## 4.2 Building DWB for UNICOS 10.0

**Note:** The installation process for DWB described in this chapter is a single system install. If DWB is to be present on all systems, these procedures will need to be done for each system in the SuperCluster building block.

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 Multiuser 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* to:

- Customize your system configuration with ICMS.
  - Import system configuration files into ICMS.
  - Update system configuration files into ICMS.
  - Configure features and subsystems of UNICOS in ICMS.
  - Activate system configuration in 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 multiuser mode.

- Restart NQE checkpointed jobs or processes.
- Access accounting data from previous systems.





## B

Base releases, 1

## C

CD, 5

Configurations, 3

Console, 2

Cray SV1

building block, 3

configurations, 3

issues, 6

rings

inter-node GigaRing, 5

intra-node GigaRing, 5

private GigaRing, 5

## D

Documentation, related, 1

DWB

building, 35

loading, 33

## G

GigaRing channel, 2

## H

Hardware

components, 2

console, 2

GigaRing scalable I/O channel, 2

mainframe, 2

minimum configuration, 2

SuperCluster system, 2

## I

Installation

initial software, 7

upgrade software, 21

inter-node GigaRing, definition, 5

intra-node GigaRing, definition, 5

## O

Overview, 1

## P

Private GigaRing, definition, 5

Publications

related information, 1

## S

Scalable I/O, 2

Single-streaming processor (SSP), 3

SIO, 2

Software

components, 5

SSP, 3

SuperCluster

Building block, definition of, 2

configurations, 3

connections

inter-node GigaRing, 5	initial install, 6
intra-node GigaRing, 5	issues, 6
private GigaRing, 5	packages, 5
SuperCluster layout example, 4	upgrade install, 6
SWS, 2	UNICOS CD, 5

## U

UNICOS