

UNICOS[®] System Configuration
Using ICMS

004-2412-002

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Preface

This manual is for site analysts who install and maintain system software for Silicon Graphics computer systems. It explains how to use the UNICOS Installation/Configuration Menu System (ICMS).

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 will be removed from the UNICOS 10.0 documentation. See the *UNICOS Release Overview* for more information.

Related Publications

The following documents contain additional information that may be helpful:

- *UNICOS Installation Guide for CRAY J90, CRAY J90se, and CRAY SV1 Model V based Systems*
- *UNICOS Installation Guide for CRAY J90se and CRAY SV1 GigaRing based Systems*
- *UNICOS Installation Guide for CRAY C90, CRAY T90, and CRAY T90 IEEE Model E based Systems*
- *UNICOS Installation Guide for CRAY T90 and CRAY T90 IEEE GigaRing based Systems*
- *Common Installation Tool (CIT) Reference Card*
- *General UNICOS System Administration*
- *UNICOS Configuration Administrator's Guide*
- *UNICOS Networking Facilities Administrator's Guide*

- *UNICOS NQS and NQE Administrator's Guide*
- *Kerberos Administrator's Guide*
- *Tape Subsystem Administration*

Obtaining Publications

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

To order a printed Cray Research document, call +1-651-683-5907. Silicon Graphics employees may also order printed Cray Research documents by sending their orders via electronic mail to `orderdsk@sgi.com` (UNIX system users).

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>
command	This fixed-space font denotes literal items such as commands, files, routines, path names, signals, messages, and programming language structures.
manpage(x)	Man page section identifiers appear in parentheses after man page names. The following list describes the identifiers:
	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

Some internal routines (for example, the `_assign_asgcmd_info()` routine) do not have man pages associated with them.

variable 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.

KEY This convention indicates a key on the keyboard.

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.

Reader Comments

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Introduction [1]

This manual describes the process to configure the UNICOS operating system and build a new kernel. These steps should be done after you have successfully installed UNICOS on the mainframe. In this manual, the procedure for using the UNICOS Installation/Configuration Menu System (ICMS) (also called simply the *menu system*) to achieve a configured UNICOS operating system is described.

The manual is divided into the following chapters:

- "Introduction" describes the menu system functions and features of the menu system that are common to both the X Window System- and `curses(3)`-based interfaces. It also provides background information that can be helpful to your understanding of the configuration process.
- "Configuring the UNICOS System" describes the steps necessary to configure the UNICOS system. It also provides background information that can be helpful to your understanding of the configuration process.
- "Recommendations" provides recommendations that Silicon Graphics has found to be useful to sites.
- "Building the UNICOS System" describes the steps necessary to build the new UNICOS system by using ICMS. It also provides background information that can be used to build a UNICOS system manually, and discusses which files need to be kept synchronous between the workstation and the mainframe.
- "X Window System Interface" describes the X Window System version of the interface to the menu system.
- "curses Interface" describes the `curses` version of the interface to the menu system.
- "Other Menu System Features" describes other useful features of the menu system such as tailoring the menu system environment to your site, configuration editions, automatic `chroot(8)` capability for installations, a log file of actions, and context-sensitive input checking and messages.

1.1 Menu System Functions

The menu system provides a menu-driven interface for configuring and maintaining the UNICOS operating system. It simplifies and speeds the process of installing new configuration files, greatly reducing the amount of dedicated system time needed and knowledge required of site analysts.

The menu system performs the following functions:

- Facilitates executable, relocatable (that is, binary), or source code generation
- Imports existing UNICOS configuration information into the menu system configuration database
- Verifies configuration file installation steps
- Verifies the evaluated configuration for the trusted UNICOS system.

The menu system also provides features such as context-sensitive input checking and messages, online help files, a log file for tracking problems, and automatic `chroot(8)` capability for installations.

If you need background information about performing a UNICOS initial or upgrade installation, see the appropriate document for specific information:

- *UNICOS Installation Guide for CRAY J90, CRAY J90se, and CRAY SV1 Model V based Systems*
- *UNICOS Installation Guide for CRAY J90se and CRAY SV1 GigaRing based Systems*
- *UNICOS Installation Guide for CRAY C90, CRAY T90, and CRAY T90 IEEE Model E based Systems*
- *UNICOS Installation Guide for CRAY T90 and CRAY T90 IEEE GigaRing based Systems*

1.2 Common Features

This section discusses some basic features of the menu system that are common to both the X Window System- and `curses`-based interfaces to the menu system.

- Invoking the menu system
- Types of menus

- User theory of operation
- Top three menu levels
- Help files
- Entering numbers
- Entering character strings
- Selection line length limit

1.2.1 Invoking the Menu System

You invoke the X Window System version of the menu system by entering the following series of commands from your workstation:

```
$ cd /etc/install
$ ./install
```

You invoke the `curses` version of the menu system by entering the following series of commands from your workstation:

```
$ cd /etc/install
$ ./install -C
```

Note: Although the name of the command used to invoke the menu system is `install`, it is important to remember that this command is used only for configuring and building your system.

Note: The menu system program (`inmenu`) is a single binary that implements both the X Window System and `curses` versions of the menu system. Because of this, even if you select the `curses` version of the menu system, `inmenu` will try to contact `Xlib` and, if your `xserver` is disabled, you will receive an error message (which you can ignore) and then enter the `curses` version of the menu system. If your `xserver` is disabled with the goal of having secure X Window System access, we recommend that you use `xauth` to ensure that the X packets are secure between the mainframe and the workstation.

Note: The `inmenu` program cannot display the GUI interface on an X Window System version that is running with either the `TrueColor` or `DirectColor` visuals.

In the X Window System version, the main menu window shown in Figure 1 is displayed (the X Window System version of the menu system is opened automatically if your workstation or terminal has an X Window System display capability):

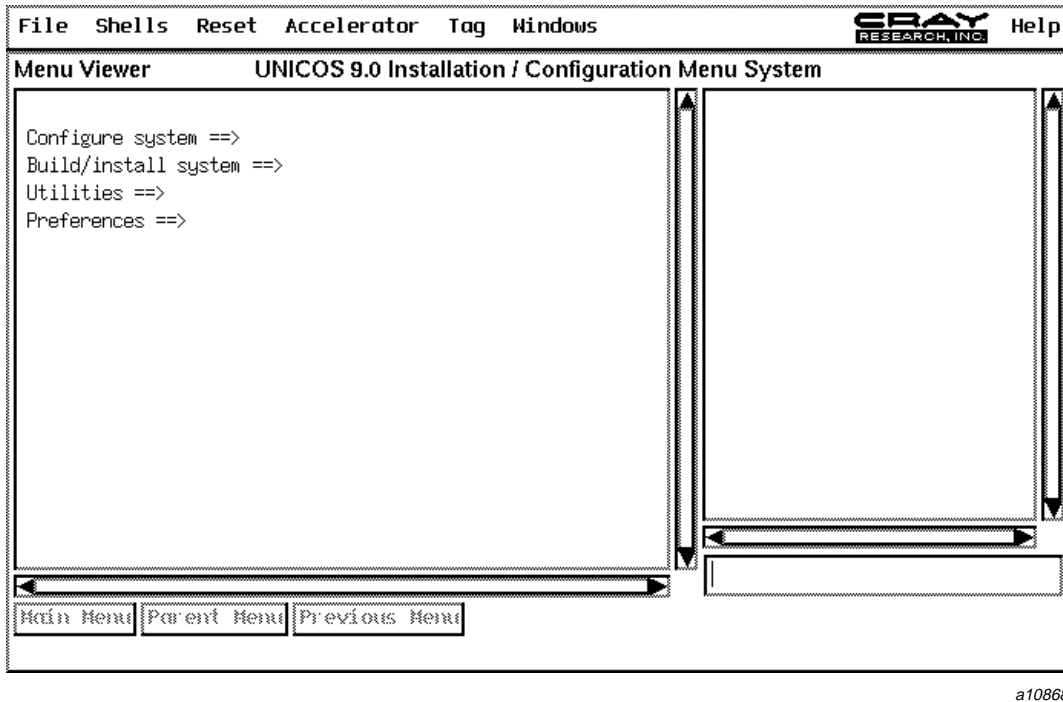


Figure 1. X Window System version of main menu window

In the curses version, the main menu shown in Figure 2 is displayed.

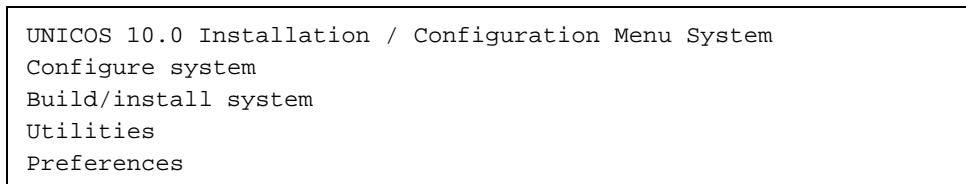


Figure 2. curses version of the main menu

If you want to browse through the menu system's menus and help files without doing an actual configuration, use the `install(8)` command's `-r` (read only) option to ensure that you do not make any inadvertent changes.

1.2.2 Types of Menus

The menus in the menu hierarchy are organized by product in a top-down fashion. Usually, items in menus are listed according to the order in which you will likely use them: first submenus, then selections, and then actions at the bottom of the menu.

Two distinct menu types exist. One permits rapid navigation of the menu system, the other permits modification of menu system database files (also called *configuration files*). The first type of menu organizes its items into three separate groups: menus, selections, and actions. This type of menu lets you navigate the menu hierarchy quickly by having all of the submenu definitions near the top of each menu. After you locate a specific menu, you can modify the selection values displayed or execute an action to perform a specific task.

The second type of menu contains only form-list items. This type of menu lets you manipulate individual menu system configuration-file entries (called *record lines*). Each form menu is treated as a single editable entity. Thus, when you exit a form menu, you will be asked if you want to update the form menu (if any changes were made). However, these changes will not be committed to the actual configuration file until an *activation* is performed. (An activation is a special action that will be discussed later in this manual.)

1.2.3 User Theory of Operation

This section provides background information that can be helpful to your understanding of the configuration process and how the Installation/Configuration Menu System (ICMS) fits into the configuration process. It discusses the following topics:

- Importing configuration files
- Configuring your system via activation
- Updating system and daemon configuration files
- Performing a UNICOS build

Figure 3, page 6 shows ICMS interaction with a UNICOS system configuration.

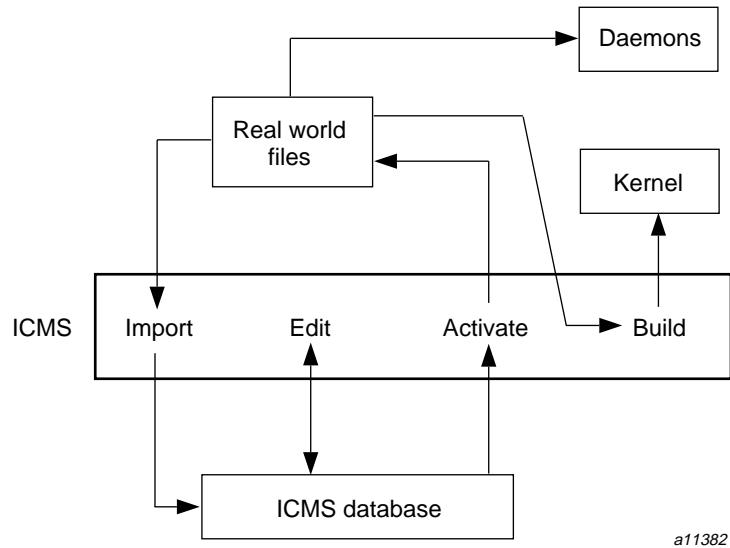


Figure 3. ICMS interaction with a UNICOS system configuration

ICMS (also called *the Install Tool*) can be divided into four major functions: Import, Edit, Activate, and Build. ICMS works upon the configuration of your machine. This configuration is described by the *Real World Files*. This will always be the true configuration of the machine. These Real World Files are used by the daemons to describe how the machine should run and the build process to create a kernel which, when run, will have a particular configuration.

To allow you to configure your machine, ICMS allows four major functions:

- Import the data from the Real World Files into the ICMS database (related sections in this publication are 2.2 and 7.2.1)
- Allow the user to edit the ICMS database information (the related section in this publication is 2.3)
- Activate (or export) the data from the ICMS database back to the Real World Files (related sections in this publication are 2.4 and 7.2)
- Build a new kernel using information from the Real World Files (the related section in this publication is 4.2)

Note: The information in the Real World Files is used in conjunction with the daemons when the system is booted, or when a particular daemon is started manually. It is useful to keep Figure 3, page 6 in mind when using ICMS to configure your system.

Note: Manual edits to various system configuration files do not appear in the ICMS database automatically. If manual edits have been done to a subsystem's configuration file, it is recommended that you reimport that configuration file into ICMS to make sure your changes do not remove the manually edited changes to the configuration file.

Generally, ICMS puts UNICOS configuration files in the `/etc/config` or `/etc` directory of the file system you are configuring. The following are notable exceptions:

- `segldr` directives, which are created under the `/lib/segdirs/` directory
- Device nodes, which are created under the `/dev` directory
- Configuration files that are compiled and linked into the UNICOS kernel, which are placed in the `/usr/src/uts/cf.Serial_Number` directory

1.2.3.1 Special Note for Systems Running MLS or ML-Safe

If you plan to run a Trusted UNICOS system, do not turn on Trusted UNICOS during the configuration process. Before you activate your Trusted UNICOS system, you must first configure a regular UNICOS system.

1.2.3.2 Other Helpful Administration Documents

Silicon Graphics recommends the following publications to aid in configuring the UNICOS operating system at your site. These publications provide insight into how various features affect the operation of UNICOS. If you do not wish to use ICMS to maintain your system's configuration, these publications will provide specific information on the configuration of various parts of the UNICOS operating system or features of the UNICOS operating system:

- *UNICOS Administrator Commands Reference Manual*
- *UNICOS Multilevel Security (MLS) Feature User's Guide*,
- *Cray/REELlibrarian (CRL) Administrator's Guide*
- *Cray Data Migration Facility (DMF) Administrator's Guide*
- *UNICOS System Security Overview for Administrators*

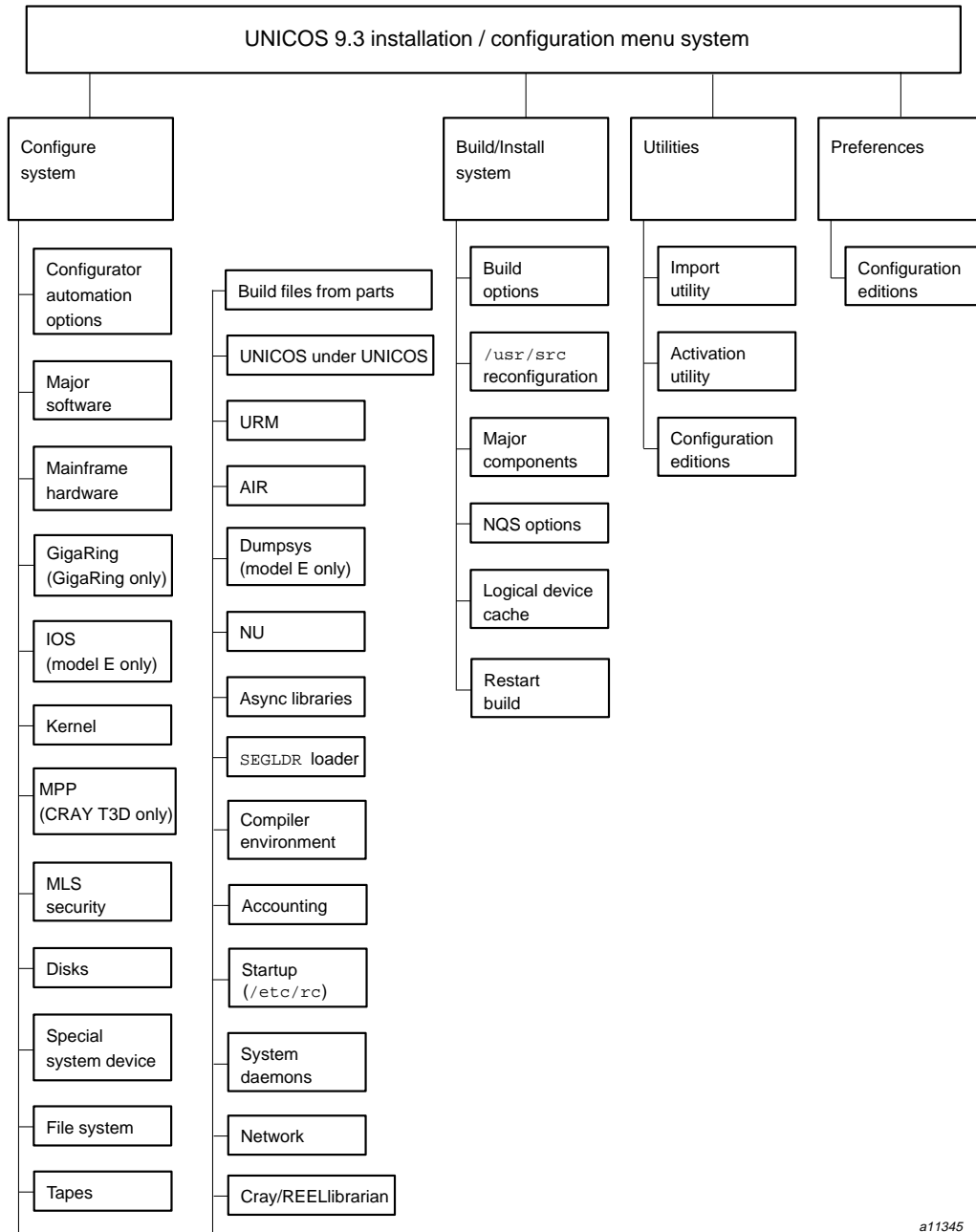
- *FTA User and Administrator Manual*
- *Asynchronous Transfer Mode (ATM) Administrator's Guide*
- *General UNICOS System Administration*
- *UNICOS Configuration Administrator's Guide*
- *UNICOS Networking Facilities Administrator's Guide*
- *UNICOS NQS and NQE Administrator's Guide*
- *Kerberos Administrator's Guide*
- *Tape Subsystem Administration*

For more information about CRAY J90se and CRAY SV1 systems, see the following publication:

- *UNICOS Basic Administration Guide for CRAY J90se and CRAY SV1 GigaRing based Systems*

1.2.4 Top Three Menu Levels

To help you visualize your position when using the menu system, Figure 4 shows the top three levels of the menu system.



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Figure 4. Top three levels of the menu system

1.2.5 Help Files

As additional documentation, explanatory help files are available in the menu system to answer questions and to refer you to specific administrator manuals for more detailed information. You can review the online help by clicking on the `Help` button (X Window System version) and then selecting `Help` from the pull-down menu, or by pressing the `h` key (`curses` version).

1.2.6 Entering Numbers

The menu system recognizes several different types of numbers. shows the correct format you must use when entering numbers.

Number type	Description	Examples
Floating point	Starts with an optional minus sign, followed by one or more digits (0-9) appearing on either side or both sides of the decimal.	-3.6 3.45
Hexadecimal	Starts with 0X or 0x, followed by one or more digits (0-9) or letters (a-f and A-F).	0X7A 0x35 0xfff
Octal	Starts with a 0, followed by one or more digits (0-7). Octal 0 is represented by two consecutive 0's.	045 07777 00
Integer	Starts with an optional minus sign, followed by one or more digits (0-9).	-456 0 6999

1.2.7 Entering Character Strings

The menu system does not distinguish between uppercase and lowercase entries. Therefore, when defining multiple entries in a form (for example, disk definitions or tape definitions), make sure that each entry has a unique name, regardless of the case used.

For example, each of the following strings appears the same to the menu system:

Operator

operator

OPERATOR

OperATor

1.2.8 Selection Line Length Limit

The menu system imposes a limit on the number of characters that can be part of a selection entry in either a menu or a form file. This limit is 255 characters, which for most selections is more than adequate to handle configuration. However, certain configurations may be affected by this limit for the amount of information. The following files may be affected by this limit if they are imported into ICMS with lines larger than 255 characters:

`/etc/hosts`

`/etc/exports`

If sites need to have lines longer than 255 characters in length, it may be wise to maintain those files by hand and outside of ICMS.

Configuring the UNICOS 10.0 System [2]

This chapter describes the steps necessary to configure the UNICOS 10.0 system. It also provides background information that can be helpful to your understanding of the configuration process, importing configuration files, and configuring your system. Table 1, page 13 briefly summarizes these steps, referencing the sections of this chapter that discuss each step in detail.

Table 1. Steps to basic configuration of UNICOS 10.0

Description	Section	Associated Menu(s)
Beginning configuration steps with ICMS	Section 2.1	Main and Configure System
Import the UNICOS 9.3 system configuration	Section 2.2	Import Utility
Configure ICMS information/support	Section 2.3	Major Software Configuration
Activate the UNICOS 9.3 system configuration	Section 2.4	Configure System

2.1 Beginning Configuration Steps with ICMS

If you do not have ICMS running, set your terminal definition and invoke the menu system with the following commands:

```
unicos# export TERM=xterm
unicos# resize
unicos# cd /newroot/etc/install
unicos# ./install
```

Note: To turn off the ICMS X Window System menus, enter the `install` command with the `-C` option.

Figure 5, page 14 shows the ICMS main menu.

```

                                UNICOS 9.2 Installation / Configuration Menu System
M->Configure system ==>
    Build/install system ==>
    Utilities ==>
    Preferences ==>

Keys:  ^? Commands  Q Quit  W WhereAmI
    
```

Figure 5. ICMS Main menu

2.2 Import the UNICOS 10.0 System Configuration

Note: Silicon Graphics recommends doing an import of all configuration files when doing an initial install, especially if your site wishes to use ICMS to configure the system. This is advisable because the information about the hardware and the current UNICOS kernel are not in ICMS by default.

Note: The configuration import utilities will fail if they do not find a valid Configuration Specific Language (CSL) parameter file in `/etc/config/param`. If you have been maintaining your parameter file manually on the SWS/OWS console, you should copy that parameter file to `/etc/config/param` now.

The steps described in this section copy the configuration information contained in the various UNICOS 10.0 configuration files into the underlying database used by ICMS.

The following step is not required to configure UNICOS 10.0. It is necessary only if you want to use ICMS to manage all or part of your system configuration.

Note: The import process may abort if files it requires do not exist on your system. To prevent the import process from aborting for all missing files, change the `Stop import on error?` selection in the `Import Options` menu to **NO**.

When `Stop import on error?` is set to **YES** to prevent the import process from aborting for particular files, turn off the importing of the specific items depending on those files in the `Import Table` menu.

2.2.1 Importing from Alternate Root File Systems

When your system has multiple root file systems, ICMS defaults to the running root for the import process. If you want to import files from a root file system other than the one under which ICMS is currently running, go to the Import Utility menu and change the Import root mount point selection:

```
UNICOS Installation / Configuration Menu System
.  ->Utilities
.  .  ->Import Utility
```

Note: The convention used above for describing ICMS paths corresponds to the output received when you enter a `whereAmI` command from within ICMS.

```
Import Options

S-> Import root mount point           /mnt
    Stop import on error?             YES
    Import host or guest versions?    host
    Reload default import table ...
```

2.2.2 Import the UNICOS Configuration

To import all the UNICOS 10.0 configuration files into the ICMS database, go to the Import Utility menu, shown following:

```
UNICOS Installation / Configuration Menu System
.  ->Utilities
.  .  ->Import Utility
```

Select the Run the import process action to begin the import.

```
Import Utility

Import options ==>
Import table ==>
Import class to run           ALL
A-> Run the import process ...
```

You will get responses similar to the following:

```

Import class "ALL" into menu system using root /93root.

- WARNING-
  This will overwrite all or parts (ALL) of the menu system database.

  Do you want to continue? (n/y) y

Commencing import process for "ALL" using root /93root.

Import will stop on error

== [FEATURES] Importing Config.mh.
+ configmh.sh -i /93root/etc/config/config.mh

== [HARDWARE] Importing Sn.h.
+ hdwsn.sh -i /93root/usr/src/uts/cf.7008/sn.h hdw.sav

== [HARDWARE] Importing Param.
+ hdwparam.sh -i /93root/etc/config/param hdw.sav cfdb/mflsp.cfg

== [IOS] Importing IOS Config.
+ iosparam.sh -i /93root/etc/config/param cfdb/ios_iop.cfg
  cfdb/ios_hsp.cfg cfdb/ios_mic.cfg

== [KERNEL] Importing Config.h uts.
+ utsconfh.sh -i /93root/usr/src/uts/cf.7008/config.h uts.sav
.
.
.
== [BBG] Importing BBG/ATM Adapter Configuration.
+ bbg.sh -a -i /93root/etc/config/bbg.config cfdb/bbgadap.cfg

== [BBG] Importing BBG/ATM PVC Configuration.
+ bbg.sh -p -i /93root/etc/config/bbg.pvc cfdb/bbgpvc.cfg

Import of "ALL" complete.

```

The information contained in the various UNICOS 10.0 configuration files has now been copied into the underlying ICMS database.

2.3 Configure ICMS Information/support

After you have imported any existing information from UNICOS 10.0 configuration files, you should configure ICMS to manage configuration of any subsystems you desire, and then use ICMS to update the configuration of those subsystems as appropriate.

Note: If you configure any portion of your system by using ICMS, you must activate the configuration (see Section 2.4, page 21) before your changes take effect for later steps of the configuration process.

2.3.1 Configuring Parts of UNICOS with ICMS or Manually

ICMS has default settings such that you want to use ICMS to automatically configure all the parts of the UNICOS configuration on your system. If you want to configure any portion of your system manually, you will need to disable the appropriate subsystem in the `Configurator Automation Options` menu.

```
UNICOS Installation / Configuration Menu System
.  ->Configure System
.  .  ->Configurator Automation Options
```

The `Configurator Automation Options` menu lets you select the specific subsystems (or components of subsystems) to be configured by ICMS. If you set a selection to **NO**, ICMS will not manage the configuration of that particular component, the corresponding menus in the system will be disabled, and you must maintain that component's configuration files manually. A subsystem commonly configured manually at some sites is the `Disk` configuration.

Configurator Automation Options		
Automate the :		
S->	Major software configuration?	YES
	Mainframe hardware configuration?	YES
	IOS configuration?	YES
	Kernel configuration?	YES
	Multilevel security (MLS) configuration?	YES
	Network-protocols security configuration?	YES
	Disk configuration?	YES
	Special system device configuration?	YES
	File system (fstab) configuration?	YES
	Tape configuration?	YES
	Cray/REELlibrarian configuration?	NO
	Host address configuration?	YES
	Network address configuration?	YES
	Services configuration?	YES
	Network interface configuration?	YES
	Network hardware address configuration?	YES
	TCP/IP configuration?	YES
	TCP/IP protocols configuration?	YES
	TCP/IP lookup configuration?	YES
	NFS configuration?	YES
	DCE DFS configuration?	YES
	NIS configuration?	YES
	System daemons configuration?	YES
	Startup (/etc/rc) configuration?	YES
	Accounting configuration?	YES
	SEGLDR loader configuration?	YES
	NU configuration?	YES
	Dumpsys utility configuration?	NO
	AIR configuration?	YES
	URM configuration?	YES
	UNICOS under UNICOS (guest configuration)?	YES
	Verify param/diskconfig file on activation?	YES

2.3.2 Configuring Features of UNICOS

After you have selected the subsystems that you want ICMS to configure automatically at your site, go to the Major Software Configuration menu. This menu lets you configure the UNICOS 10.0 features your site

requires in the UNICOS kernel during the UNICOS kernel build. The settings in this menu correspond to the settings in `/mnt/etc/config/config.mh`

Note: To build a feature into your UNICOS system, you must set it to **ON** in the Major Software Configuration menu. This differs from the Configurator Automation Options menu, which turns on or off the ability to configure features within ICMS.

```
UNICOS Installation / Configuration Menu System
.  ->Configure System
.  .  ->Major Software Configuration
```

```

Major Software Configuration

S-> Cray machine system name          unicos
    Cray machine node name            unicos
    System version name
    BMM functional unit support       off
    HIPPI device support               on
    File quotas                        off
    Ipi3 tape driver support           off
    TCP/IP network system (TCP)       on
    X11 window management system      off
    Remote Procedure Call (RPC)       off
    Kerberos network data encryption  off
    Network File System (NFS)         off
    Network File System Version 3 (NFS3) off
    Network File System Kerberos (NFSKRB) off
    Network Information Service (NIS)  off
    Online tape support               off
    DCE Distributed File Service (DFS) off
    Online diagnostics directory      /ce
    Cross-targeted (XLIBS) libraries  off
    Cross-targeted library characteristics
    Logical dev partition cache (pcache) off
    .
    .
    .
    Import the major configuration ...
    Activate the major configuration ...

The values below are updated by the
mainframe hardware configuration menu

```

2.3.3 Configuring Subsystems and Components of UNICOS

After you have selected the subsystems and components that you want to configure by using ICMS and included them in the UNICOS kernel, go to the Configure System menu, shown following:

```

UNICOS Installation / Configuration Menu System
. ->Configure System

```

You may now configure the various subsystems you have selected by entering the menus for those subsystems and changing values as appropriate for your desired configuration. Each menu has online help information available.

```
                                Configure System

M-> Configurator automation options ==>
    Major software configuration ==>
    Mainframe hardware configuration ==>
    IOS configuration ==>
    Kernel configuration ==>
    MPP configuration submenu ==>
    Multilevel security (MLS) configuration ==>
    Disk configuration ==>
    Special system device definitions ==>
    File system (fstab) configuration ==>
    Tape configuration ==>
    Cray/REELlibrarian configuration ==>
    Network configuration ==>
    System daemons configuration ==>
    Startup (/etc/rc) configuration ==>
    Accounting configuration ==>
    Compiler Environment configuration ==>
    SEGLDR loader configuration =>
    Asynchronous libraries configuration ==>
    NU configuration ==>
    Dumpsys utility configuration ==>
    AIR configuration ==>
    URM configuration ==>
    UNICOS under UNICOS (guest) configuration ==>
    Build Files From Parts ==>
    Import the configuration ...
    Activate the configuration ...
```

2.4 Activate the UNICOS 10.0 System Configuration

The steps described in this section write the UNICOS configuration contained in the underlying ICMS database to the actual UNICOS 10.0 configuration files.

Go to the `Configure System` menu.

```
UNICOS Installation / Configuration Menu System
. ->Configure System
```

Select the Activate the configuration action to write the configuration data from the ICMS database to the actual UNICOS configuration files:

```
                                Configure System

Configurator automation options ==>
Major software configuration ==>
.
.
.
Build Files From Parts ==>
Import the configuration ...
A-> Activate the configuration ...
```

This action first displays a list of configuration files that will be changed and asks you whether you want to continue. Respond with a **y**, as shown in the following example.

Note: The actual list of files shown will vary from site to site, depending on the hardware and software configuration.

```
Running the configuration generator.

Determining SYSTEM configuration files that require an update.

The following components require an update by the configuration generator:

FEATURES      (/mnt/etc/config/config.mh)
HARDWARE      (/mnt/usr/src/uts/cf.1234/sn.h)
HARDWARE      (/mnt/etc/config/param)
.
.
.
LOADERS       (/mnt/lib/segdirs/ld_Flib)

Do you want to proceed with the configuration update? (y/n)  y

Commencing configuration update (edition 1).

UNICOS Configuration Generator (70.11) - Tue Jun 18 17:28:47 CDT 1991
== [FEATURES] Building /mnt/etc/config/config.mh.
== [HARDWARE] Building /mnt/usr/src/uts/cf.1234/sn.h.
== [HARDWARE] Building /mnt/etc/config/param.
.
.
.
== [LOADERS] Building /mnt/lib/segdirs/ld_Flib.

Saving edition 1 to ConfigEd_1.

Configuration update completed.

Press RETURN to continue.
```

The configuration data has now been written to configuration files in the UNICOS 10.0 file systems.

2.4.1 Special Case of Disk Verification and Activation of Disks

You can activate the configuration from the `Configure System` menu or its submenus. Some steps that an activation performs are determined by the value

set for the Verify param/make disk nodes on activation? selection at the bottom of the Configurator Automation Options menu.

If you specify **YES** for the Verify param/make disk nodes on activation? selection, ICMS stops the activation when it finds an error in the generated `/etc/config/param` file. You must configure all subsystems before executing the Activate the configuration action in the Configure System menu.

Specifying **NO** for the Verify param/make disk nodes on activation? selection prevents ICMS from creating `/dev/dsk` nodes and using `econfig` to verify the parameter file. This means that the subsystems defined in the Configure System menu can be configured and then activated separately or all at once.



Caution: Note that making nodes without verification is dangerous as bad disk nodes can corrupt file systems.

Recommendations [3]

This chapter describes various recommendations from Silicon Graphics for customizing UNICOS to improve your system stability and performance. The following general recommendations are covered:

- Additional file system recommendations
- Caution about swap on disk array/network disk devices
- `lpr(1)` multilevel print spool directory issues with Security Enhancements
- Adding Flexlm license keys
- Future NFS usage
- `nslookup(1)` needs to be pointed at a name server
- Changing the value of `KM_UNITS` in `config.h` for CRAY J90 systems

3.1 Additional File System Recommendations

It is recommended that sites add the following file system partitions to their configurations to avoid problems. The size of these partitions depends upon how your system is configured, and how you manage your system.

During initial installs and upgrades, Silicon Graphics creates the lower directory structure for these partitions; so make sure that these are transferred to the new partitions after being made and before being used.

Partition	Used by
<code>/usr/adm</code>	accounting, <code>errdemon</code> , security, <code>syslog</code> , and URM
<code>/usr/spool</code>	accounting, air, CRL, diagnostics, disks, FTA, NQE, NQS, and tapes

If you do not add the these partitions under `/usr`, your `/usr` partition could fill up and cause a degradation of your system's performance and possibly panic the system, depending upon system security.

The size of these partitions varies greatly from site to site. If you are not sure of the size you need, check with Silicon Graphics support personnel.

For more information, refer to *General UNICOS System Administration*.

3.2 Caution about Swap on Disk Array/network Disk Devices

If your system is a CRAY T90 system or CRAY T90 IEEE system, you can skip this section and continue on to Section 3.3, page 27.

If you have configured your swap device to be on any of the following disk types, for optimum performance and less likelihood of a system panic, you should change the definition of MEMKLIK in `/usr/src/uts/include/sys/param.h`:

- DA60 disk array
- HIPPI disk arrays such as ND-12, ND-14, ND-30, or ND-40 network disk arrays

This change should be done through a site-specific mod to ensure that the change is appended after each upgrade. In this way the mod can be applied to upgrades without causing problems, and can continue to future releases automatically. A change to `param.h` is needed if the system that has the swap device on a disk array is any system other than a CRAY T90 or CRAY T90 IEEE system.

If this change is not made, the swap device will be cached in main memory, causing considerable extra system overhead and, possibly, a system panic.

Change the following text from `param.h`:

```
#ifdef_XCHG32
#define MEMKLIK 040 /* Memory allocation if new xchg */
#else
#define MEMKLIK 4 /* Memory is allocated in 4 sector units */
#endif
```

to appear as follows (this is how `param.h` should appear after the change):

```
#ifdef_XCHG32
#define MEMKLIK 040 /* Memory allocation if new xchg */
#else
#define MEMKLIK 16 /* Memory is allocated in 16 sector units */
#endif
```


3.3 lpr(1) Multilevel Print Spool Directory Issues with Security Enhancements

If a printer configured in the `/etc/printcap` file supports multiple security labels, its spooling directory must be created as a multilevel directory (MLD). To set up the spooling directory as an MLD, see `mlmkdir(8)`. The security label of the MLD defines the minimum security label that the printer supports (the `mi` `printcap` variable can also be used to define the minimum security label).

If a printer configured in the `/etc/printcap` file supports a single security label, its spooling directory does not have to be an MLD, although it may be created as an MLD. If the spooling directory is not created as an MLD, the directory's label must be set to the security label the printer supports.

If your system is configured with a single security level of zero and no compartments, you can create all of the print spooling directories using `mkdir(1)` (that is, you do not have to create multilevel directories).

3.4 Adding Flexlm License Keys

With the initial installation being done by Silicon Graphics prior to shipment, it is still necessary to enter the Flexlm license keys for various software-licensed products that may already be loaded on your system.

The following line needs to be added to the `/etc/craylm/license.dat` file:

```
DAEMON craylmd /etc/craylm/craylmd
```

After adding the previous line, obtain the license keys for the asynchronous products and add each key on a separate line. The following are examples of licenses added to `/etc/craylm/license.dat`:

```
FEATURE nqx craylmd 1.000 1-jan-00 0 XXXLICENSEXXXKEYXXXX "NQX" ANY
FEATURE onc craylmd 1.000 1-jan-00 0 XXXLICENSEXXXKEYXXXX "ONC+" ANY
```

3.5 Future NFS Usage

If you are not currently using the Network File System (NFS), but plan to do so in the future, it is recommended that you configure NFS into the kernel and simply do not turn NFS on in your startup scripts. You can do this by setting the value of the Network File system (NFS) selection in the Major Software Configuration menu to **on**:

```
UNICOS Installation / Configuration Menu System
.   Configure System
. .   Major Software Configuration
. .   S-> Network File System (NFS)
```

This builds NFS into the UNICOS kernel. To make sure you do not start NFS in your startup scripts, set the value of the Start the Network File System (NFS) selection to **NO**:

```
UNICOS Installation / Configuration Menu System
.   Configure System
. .   Startup (/etc/rc) Configuration
. .   S-> Start the Network File System (NFS)
```

By setting this to **NO**, you will not activate NFS during system startup. Although these steps slightly increase the size of the UNICOS kernel, they eliminate having to rebuild the system when you want to activate NFS.

3.6 nslookup(1) Needs to Be Pointed at a Name Server

If a site plans on using the `nslookup(1)` command to query name servers interactively, the site should configure the `/etc/resolv.conf` file.

The `nslookup` utility queries DARPA Internet domain name servers. `nslookup` can operate in interactive and noninteractive mode. Interactive mode lets users query the name server for information about various hosts and domains or print a list of hosts in the domain. Noninteractive mode prints only the name and Internet address of a host or domain.

The `/etc/resolv.conf` file can be configured in ICMS at the TCP/IP Domain Name Service Lookup (`resolver`) Configuration menu:

```
UNICOS Installation / Configuration Menu System
.   Configure System
. .   Network Configuration
. . .   TCP/IP Configuration
. . . .   TCP/IP Host/Address Lookup Configuration
. . . . .   TCP/IP Domain Name Service Lookup (resolver) Configuration
```

The following is a simple configuration `/etc/resolv.conf` file:

```
; /etc/resolv.conf
;
domain    domainname.com
search    subdomain.domainname.com domainname.com
nameserver    XXX.XXX.XX.XX
nameserver    XXX.XXX.XX.XX
```

For more information, refer to the *UNICOS Networking Facilities Administrator's Guide* and to the *UNICOS Administrator Commands Reference Manual*.

3.7 Changing the Value of `KM_UNITS` in `config.h` for CRAY J90 Systems

Certain CRAY J90 systems with Model V I/O may need to have their `KM_UNITS` in the `config.h` file raised from 640 to 1408. The most common reason for increasing the `KM_UNITS` is the presence of memory HIPPI.

The `/usr/src/uts/cf.SerialNumber/config.h` file can be configured in ICMS using the Dynamic Memory Allocator Parameters menu:

```
UNICOS Installation / Configuration Menu System
.   Configure System
.   .   UNICOS Kernel Configuration
.   .   .   Dynamic Memory Allocator Parameters
```


Building the UNICOS System [4]

This chapter describes the steps necessary to build and then boot your new UNICOS 10.0 system:

Table 2. Steps to build and boot the new UNICOS 10.0 system

Description	Section	Associated Menu(s)
Use changed root environment for UNICOS system builds	Section 4.1	
Build the UNICOS 10.0 system	Section 4.2	Build/Install System menu
Prepare to test your UNICOS 10.0 system*	Section 4.3	
Transfer UNICOS 10.0 files to the workstation/console*	Section 4.4	
Shut down the current UNICOS system*	Section 4.5	
Boot the UNICOS 10.0 system*	Section 4.6	
Turn off MLS security logging*	Section 4.7	
Run <code>instartup</code> script*	Section 4.8	
Run <code>/etc/privcmd</code> *	Section 4.9	
Complete the MLS configuration*	Section 4.10	
Turn on MLS security logging*	Section 4.11	
Enter multiuser mode*	Section 4.12	
Restart NQE checkpointed jobs or processes*	Section 4.13	
Access accounting data from previous system*	Section 4.14	

* Done outside ICMS

4.1 Changed-root Environment

In order that the new UNICOS 10.0 system be built using the proper generation compilers and utilities, the build tool performs all system builds in a changed-root (or `chroot(8)`) environment.

A `chroot` environment is one in which all commands take place using a specified file system as the `root` file system. This ensures that the compilers used to build the kernel, and all `include` files, are from the specified file system.

If you are still running on UNICOS 9.0, 9.1, 9.2, or 9.3, or if you are running UNICOS 10.0 but preparing an alternative root file system, the build tool detects this and automatically executes the `chroot(8)` command before invoking any build processes. Therefore, all directory references in the Build Options submenu are relative to the changed-root environment, not to the actual mount point. In other words, the path name selections in the Build Options submenu (Temporary file directory (TMPDIR), Location of UNICOS source, and Location of build output) must not include the mount point in the specified path name.

If you build the system manually, you must do the `chroot(8)` commands yourself.

4.2 Build the UNICOS 10.0 System

With the release of UNICOS 9.2, three types of releases of the UNICOS operating system are produced. The package types are executable, relocatable, and source.



Caution: If you do not use ICMS to maintain your system configuration, but plan to use it to build your system, you must still, in the Major Software Configuration menu, set the build value to `on` for the items your site wants built, or import `config.mh` into ICMS; and then execute the Activate the major configuration action in that menu.

The following is the path to the Major Software Configuration menu in ICMS:

```
UNICOS Installation / Configuration Menu System
.   Configure System
.   .   Major Software Configuration
```

The menu system needs this information to know which components to build. See Section 2.3 for this procedure.

The selection `Release Type` indicates what components of the system are installed in `/usr/src`. This selection controls which components will be built. If `executable` is selected, only the `uts` component of the system will be built. (This selection is appropriate if only the executable installation package has been loaded onto this system.) Otherwise, all standard components of `/usr/src` are built. On CRAY J90 systems, the default release type is `executable`; the default release type on all other systems is `source`.

4.2.1 Building a UNICOS Kernel from an Executable Release

Escape from ICMS by using `Escape` to a `chroot` shell ..., and then enter the following commands at the prompt to build Documenter's Workbench (DWB), the kernel, and Kerberos if they are installed:



Warning: It is extremely important that the `CONFIG_TARGET` entry in `/etc/config/config.mh` be set explicitly to the target `cray-sv1`. This setting is critical when installing and configuring a new UNICOS kernel to be used on CRAY SV1 CPUs. The `CONFIG_TARGET` entry should be set when building any software for a CRAY SV1 system.

```
# cd /usr/src
# nmake -j4 sparse_install
```

Note: The `rmubin nmake(8)` target removes executables; therefore, **do not use these targets or values if you do not have source code loaded.**

You should check `nmake` output for possible errors. Once you have rebuilt your kernel, proceed to Section 4.3, page 39.

4.2.2 Building a UNICOS Kernel from a Relocatable or Source Release

In this section, you will perform the following tasks:

- Set the release type
- Set the build options
- Select components to build
- Perform a build action

1. Go to the Build/Install System menu:

```
UNICOS Installation / Configuration Menu System
.   Build/Install System
```

2. Set the Release type to the UNICOS release package that was installed on the system.

Note: If you are performing an executable release installation, you cannot specify **all components** in the Build/Install System menu. Doing so will result in errors because required files are not installed.

```

                                     Build/Install System

S-> Release type                               source
    Build options ==>
    /usr/src reconfiguration files ==>
    Build action to take                       install
    Build object                               all objects
    Components to build                       all components
    Major components selection ==>
    Specific component to build
    Do the build in batch?                     NO
    NQS submission options ==>

    Assign cache during build?                 NO
    Logical device cache ==>

    Do the build ...
    Restart the build ==>
    Review last build summary ...
    Escape to a chroot shell ...

    Keys:   ^? Commands   Q Quit   W WhereAmI
```

3. Go to the Build Options menu:

```
UNICOS Installation / Configuration Menu System
.   Build/Install System
.   .   Build Options
```


4. Verify that the selections set in the Build Options menu are correct for your site.

File path names in the Build Options menu are relative to the new root environment because ICMS uses the changed-root feature, that is, `chroot(8)`. The first item in the Build Options menu shows the path to the changed-root environment (`/93root` in the following example).

```

                                Build Options
S-> Change root environment (chroot)           /93root
      Maximum generation processes (NPROC)      2
      Process scaling factor (NPROC_PERCENT)    100
      Temporary file directory (TMPDIR)         /tmp
      Conditionally cpset (handle busy text)    YES
Nmake options
Location of UNICOS source                     /usr/src
Location of build output                       /tmp/OUT
User ID of /usr/src owner                     root
Generation umask (UMASK)                      022
Stop build on error?                          YES
Assign a new output file each pass?           YES
Arrange output?                               YES
Arrange output timeout value (seconds)        300
Machine characteristics (TARGET)              host

Keys:  ^? Commands  Q Quit  W WhereAmI

```

Note: The Maximum generation processes (NPROC) selection specifies the number of simultaneous build processes generated at each directory level of the build. The default value of 2 permits system builds on small-memory (for example, 16 Mword), single-CPU systems. If your system has more memory or CPU resources, you may decrease the system build time by increasing the value of NPROC. The optimal value for your system depends on its exact hardware configuration (and the current workload if you are building a UNICOS upgrade during multiuser mode). A reasonable starting estimate is to set NPROC to the number of CPUs on your system plus one.



Warning: It is extremely important that the `CONFIG_TARGET` entry in `/etc/config/config.mh` and the Machine characteristics (TARGET) item in the Build Options menu be set explicitly to the target `cray-sv1`. This setting is critical when installing and configuring a new UNICOS kernel to be used on CRAY SV1 CPUs. These changes should be set when building any software for a CRAY SV1 system.

5. Return to the Build/Install System menu:

```
UNICOS Installation / Configuration Menu System
.   Build/Install System
```

6. Set the Components to build selection to **specific component**, and set the Specific component to build selection appropriately:
 - a. If you have loaded the optional product Documenter's Workbench, set the Specific component to build selection to **prod/text** and then Do the build
 - b. For an upgrade installation, ensure that the selections on this menu are set accordingly. Select Do the build, as shown, to build and install the UNICOS 10.0 software.

Note: The Components to build selection should be set to **all components** if you are performing an upgrade as shown following.

```
Build/Install System

Release type                                source
Build options ==>
/usr/src reconfiguration files ==>
Build action to take                        install
Build object                                all objects
Components to build                          all components
Major components selection ==>
Specific component to build
Do the build in batch?                      NO
NQS submission options ==>

Assign cache during build?                  NO
Logical device cache ==>

A-> Do the build ...
Restart the build ==>
Review last build summary ...
Escape to a chroot shell ...

Keys:  ^? Commands  Q Quit  W WhereAmI
```

- c. To build the kernel, set the Components to build to **specific component**, and then set the Specific component to build selection to **uts** and Do the build

```

Build/Install System

Release type                               source
Build options ==>
/usr/src reconfiguration files ==>
Build action to take                       install
Build object                               all objects
Components to build                       specific component
Major components selection ==>
Specific component to build               uts
Do the build in batch?                    NO
NQS submission options ==>

Assign cache during build?                NO
Logical device cache ==>

A-> Do the build ...
Restart the build ==>
Review last build summary ...
Escape to a chroot shell ...

Keys:  ^? Commands  Q Quit  W WhereAmI

```

Note: The `rmubin` `nmake(8)` target or **remove executables** and **remove relos/executables** value for Build action to take removes executables; therefore, **do not use these targets or values if you do not have source code loaded.**

7. Do the build action.

Note: Each build object must be completed for all components before moving on to the next object. For example, the **include** step must be completed for all components before the **sys** step can be successfully executed.

If the build aborts at any time with out-of-space errors, it is recommended that in the Build/Install System menu, you set the Build action to take selection to **remove relocatables/executables**, before continuing with the build. However, do not do this if you do not have source loaded. In this case, set the selection to **remove executables**.

4.3 Prepare to Test Your UNICOS 10.0 System

Now that you have successfully built your UNICOS 10.0 system, you need to prepare to test it. There are two ways you can do this:

- Test the system as a guest
- Test the system as a stand-alone system (requires dedicated time)

If you do not plan on using the UNICOS under UNICOS feature, proceed directly to Section 4.4, page 40 and test your system using dedicated system time.

With the introduction of the UNICOS under UNICOS feature (UNICOS 8.0.3), you now can run two copies of the UNICOS operating system concurrently on a single mainframe. One UNICOS system, *the host*, boots normally with most of the system resources. A second UNICOS system, *the guest*, can be started by an authorized user.

If you are not familiar with running a guest, see the *UNICOS under UNICOS Administrator's Guide*.

If you have previously run a guest, keep in mind that you must perform the following sequence of steps:

1. Run the `/etc/install/instartup.guest` script. This script performs essentially the same functions as the `/etc/install/instartup` script, but can be run in multiuser mode. It copies the current user database (UDB) to the guest root (`/mnt/etc/udb`) and installs the MLS commands on the guest root (`/mnt`).
2. Set up your `guest.rc` file.

The `guest.rc` file identifies the particular support files and program levels to use for your guest. Review this file, and ensure that the UNICOS version you plan to boot contains support for the UNICOS under UNICOS feature. For more information, see the *UNICOS under UNICOS Administrator's Guide*.

3. Boot your guest.

To start your guest operating system, use the following command while the mainframe is in multi-user mode:

```
unicos% guest -s
```

Now that your new UNICOS system is ready for production use, go to Section 4.4, page 40.

4.4 Transfer UNICOS 10.0 Files to the Workstation/console

Each time the UNICOS 10.0 system is built successfully, you must transfer the files discussed in this section back to the workstation/console. These files on the workstation/console must be kept concurrent with the versions that exist on the mainframe. These files change whenever you modify and relink/build the kernel or change the configuration specific language (CSL) param file.

It is recommended that you create backup copies of the older versions of the files on the workstation/console. Thus, if you have problems booting with the new UNICOS kernel and CSL param file, you can back out the changes and get your system up and running again.

The following sections indicate where the files reside on the mainframe and the workstation or console, depending on the I/O type of the system.

4.4.1 Model E Based System Files and Operator Workstation (OWS) Locations

This section shows where the files reside on a Model E based system and the OWS.

Location on system	Location on OWS
/usr/src/uts/cf.SerialNumber/unicos	/home/owse/cri/os/uts/unicos
/etc/config/param	/home/owse/cri/os/uts/param
/usr/src/cl/stand/clrymp	/home/owse/cri/os/uts/clrymp [YMP]
/usr/src/cl/stand/clrc90	/home/owse/cri/os/uts/clrc90 [C90]
/usr/src/cl/stand/clrt90	/home/owse/cri/os/uts/clrt90 [T90 CFP & IEEE]
/usr/src/cl/stand/mfboot	/home/owse/cri/os/uts/mfboot
/usr/src/cl/stand/mfsysdmp	/home/owse/cri/os/uts/mfsysdmp
/usr/src/cl/stand/mfchkye	/home/owse/cri/os/uts/mfchkye

4.4.2 CRAY J90 IOS-V Based System Files and Console Locations

This section shows where the files reside on a CRAY J90 IOS-V based system and the console.

Location on system	Location on console
<code>/usr/src/uts/cf.SerialNumber/unicos</code>	<code>/opt/ios/SerialNumber/sys/unicos.ymp</code>
<code>/etc/config/param</code>	<code>/opt/ios/SerialNumber/sys/param</code>

4.4.3 GigaRing Based System Files and System Workstation (SWS) Locations

This section shows where the files reside on a GigaRing based system and the SWS.

Location on system	Location on SWS
<code>/usr/src/uts/cf.SerialNumber/unicos</code>	<code>/opt/CYRIos/snSerialNumber/unicos</code>
<code>/etc/config/param</code>	<code>/opt/CYRIos/snSerialNumber/param</code>
<code>/usr/src/cl/stand/grsysdmp</code>	<code>/opt/CYRIos/snSerialNumber/grsysdmp</code>

4.5 Shut down the Current UNICOS System

You are now almost ready to shut down the currently running UNICOS system so that you can boot the new UNICOS 10.0 system that you have built.

4.5.1 Changing Daemons That Start Automatically during Multiuser Startup

1. Before you shut down the current system, however, check the daemons menu:

```

UNICOS Installation / Configuration Menu System
->Configure System
    ->System Daemons Configuration
  
```

2. Turn off daemons that you do not want running during the test phase of your UNICOS 10.0 system (for example, you may want to disable the `cron` daemon).

If you want to restrict the users who may log in to the UNICOS 10.0 system during the test phase, see the `udbrstrict(8)` man page.

Note: For an upgrade installation, you will need dedicated system time after finishing this step to complete the final step of installing UNICOS 10.0.

3. Select `Activate the daemons configuration ...` to update the daemons configuration file.
4. Exit ICMS by pressing `q`.

4.5.2 Model E IOS Microcode Requirements

If your system is connected to an IOS-E, you need to make sure that the proper IOP microcode resides in the `/etc/micro` directory on the mainframe before booting the system. If the `/etc/micro` directory does not yet exist, you will need to enter the following command:

```
unicos# mkdir /etc/micro
```

Then use `ftp(1)` or `rcp(1)` to transfer the microcode files (`*.ucode`) from `~cri/os/ios/micro` on the OWS to `/etc/micro` on the mainframe.

4.5.3 System Shutdown

A site may have a different shutdown procedure than the one described in this section. Use your site's shutdown procedure if one exists.

If your site does not have a shutdown procedure, perform the following procedure:

1. If there are any files in `/tmp` that you or others may want, and if you have set your start-up configuration option to remake (`mkfs`) the `/tmp` file system, then copy those files to another file system so that they are not destroyed.

Note: By default, build output files are put in `/tmp`. Silicon Graphics recommends that you save the build output files until the system build is verified.

2. Enter the following series of commands:

```
unicos# cd /
unicos# /etc/shutdown 0
.
.
.
INIT: SINGLE USER MODE

unicos# /bin/sync
unicos# /etc/ldsync
```

At this point the system is in single-user mode. You can now safely reboot the mainframe with a new UNICOS kernel and/or param file.

4.6 Boot the UNICOS 10.0 System

With the multilevel security (MLS) feature available by default in UNICOS 10.0, Silicon Graphics recommends that sites run with `PRIV_SU` and `PALs`. To support this, the `/etc/privcmd` command must be run when you make changes in which new system configuration files are created or in which new kernels are built.

The `privcmd` must be executed on the running `root` and `usr` file systems. If you need to use `privcmd` on backup `root` and `usr` file systems, you will need to run the `privcmd` in a `chroot(8)` environment. For more information on the `chroot` command, see the `chroot(8)` man page.

When the system is in single-user mode, follow the instructions in this section to boot your UNICOS 10.0 system.

For most sites, your normal boot procedures will work with UNICOS 10.0. ICMS makes certain new assumptions, however, so it is advisable to review this section, which describes booting UNICOS 10.0.

4.6.1 Model E Based System Boot

1. Disconnect from the UNICOS system by entering the following commands:

```
unicos#  
CONTROL-]    (breaks out of zip)  
zip> q      (exits zip)  
Connection closed  
ows#
```

2. Boot the new UNICOS kernel by entering the following command:

```
ows# bootsys -u unicos.suffix -p param.suffix
```

3. After the UNICOS 10.0 kernel begins execution, the system console displays a list of informational messages that describe the date and time that the UNICOS kernel was compiled, the mainframe memory size, and the number of CPUs available.

You should now see output similar to the following:

```
INIT: SINGLE USER MODE
```

```
This is a private computer facility.  Access for any reason must be  
specifically authorized by the owner.  Unless you are so authorized,  
your continued access and any other use may expose you to criminal  
and/or civil proceedings.
```

4.6.2 CRAY J90 IOS-V Based System Boot

1. Edit the /bin/boot script and update it to use the new UNICOS kernel and param file.
2. Boot the new UNICOS kernel by entering the following command:

```
console# /bin/boot
```

3. After the UNICOS 10.0 kernel begins execution, the system console displays a list of informational messages that describe the date and time that the

UNICOS kernel was compiled, the mainframe memory size, and the number of CPUs available.

You should now see output similar to the following:

```
INIT: SINGLE USER MODE
```

```
This is a private computer facility.  Access for any reason must be
specifically authorized by the owner.  Unless you are so authorized,
your continued access and any other use may expose you to criminal
and/or civil proceedings.
```

4.6.3 GigaRing Based System Boot

1. Halt the mainframe from the SWS by entering the following command:

```
sws# haltsys systemname
```

2. Update the `/opt/config/options` file so *systemname* boot uses the new UNICOS kernel and/or param file.
3. Boot the new UNICOS kernel by entering the following command:

```
sws# bootsys systemname
```

4. After the UNICOS 10.0 kernel begins execution, the system console displays a list of informational messages that describe the date and time that the UNICOS kernel was compiled, the mainframe memory size, and the number of CPUs available.

You should now see output similar to the following:

```
INIT: SINGLE USER MODE
```

```
This is a private computer facility.  Access for any reason must be
specifically authorized by the owner.  Unless you are so authorized,
your continued access and any other use may expose you to criminal
and/or civil proceedings.
```

4.7 Turn Off MLS Security Logging

You should turn off MLS security logging while in single-user mode, to avoid overflow of the `/dev/slog` buffer (and a resulting UNICOS panic). Use the following command to do this:

```
unicos# /etc/spaudit -d state
```

Be sure to turn security logging back on before going to multiuser mode (Section 4.11, page 49).

4.8 Run `instartup` Script

Before proceeding to multiuser mode, you must configure or transfer certain time-critical files while in single-user mode.

The `/etc/install/instartup` script copies these time-critical files, such as user database (UDB) files, from the previous system.

Note: Make sure that your `/usr` file system is mounted before running the `instartup` script.

Enter `/etc/install/instartup` at the single-user prompt, as shown in the following example.

Note: For an upgrade installation, you may bypass the prompt from the `instartup` script by specifying the name of the old UNICOS root file system device on the command line, as follows:

```
unicos# /etc/install/instartup /dev/dsk/oldroot
```

```
unicos# /etc/install/instartup
```

```
If this is an upgrade installation, you must access the old root
file system at this time in order to transfer time critical files
such as the user database (UDB).
```

```
If this is an initial installation, just press RETURN when asked for the
root file system name. If you do so, then the transfer will be skipped.
```

```
Name of the old root file system device? /dev/dsk/oldroot
```

```
***
```

```
*** WARNING
```

```
*** This must be run in single user mode only!
```

```
***
```

```
Current level status: s
```

```
This process will transfer information from the old root device
"/dev/dsk/oldroot".
```

```
Commencing single user mode data transfer process.
```

```
Do you want to continue? (y/n): y
```

```
Mounting UNICOS 10.0 environment
```

```
Root  (/)      is /dev/dsk/root.
```

```
User  (/usr)   is /dev/dsk/usr.
```

```
Mounting /dev/dsk/oldroot to /mnt.
```

```
UDB transfer.
```

```
Restricted list transfer.
```

```
Dump dates.
```

```
Labeling udb files.
```

```
Single user data transfer process completed.
```

```
The system is ready for multi-user mode!
```

When transferring the UDB during an upgrade from UNICOS 9.X to UNICOS 10.0, `instartup` may detect discrepancies between the previous UNICOS UDB and the UNICOS 10.0 UDB template. If so, `instartup` gives you the opportunity to decide which UDB entry is appropriate for your site.

After the `instartup` script has completed, if your site has other time-critical files that must be transferred to the UNICOS 10.0 system, you should transfer them now.

If the files that must be transferred from the previous UNICOS system are not maintained by ICMS, you should transfer them manually; that is, do not use ICMS.

4.9 Run `/etc/privcmd`

Because the system is in single-user mode, several file systems that contain files which are referenced in the privilege database need to be mounted. All sites must execute `/etc/privcmd` to apply the Privilege Assignment Lists (PALs) and file attributes. Execute the following commands to mount the appropriate file systems and then run `/etc/privcmd`.

```
unicos# /etc/mount /usr
unicos# /etc/mount /usr/src
unicos# /etc/mount /usr/spool # (if a separate file system exists)

unicos# /etc/mount /usr/adm # (if a separate file system exists)

unicos# /etc/mount /usr/adm/s1 # (if a separate file system exists)

unicos# /etc/privcmd
unicos# /etc/umountem
```

4.10 Complete the Multilevel Security Configuration

The steps in this section are necessary to complete configuration of your UNICOS 10.0 system with the multilevel security (MLS) feature active. If you are not configuring MLS for your site, skip to section 4.11.

For UNICOS 10.0 Security Enhancements, there are a number of configurable features. Some of the general features that need to be configured at this time include:

- New privilege mechanism available through Privilege Assignment Lists (PALs)
- System high/system low labeling of disks and other parts
- Multilevel directories
- ML-Safe mail
- Security classifications for each user account listed in the UDB
- Relabel home directories
- Set up the network access list and workstation access list
- Label network interfaces

Note: Note that this list of features is not exhaustive; there may be other features that need to be configured.

To configure or set up any of these security-related configuration items, refer to the "UNICOS Multilevel Security (MLS) feature" chapter in *General UNICOS System Administration*.

4.11 Turn on MLS Security Logging

If you are installing an MLS UNICOS 10.0 kernel, and you turned off security logging, be sure to reenale security logging now before going to multiuser mode. Use the following command to do this:

```
unicos# /etc/spaudit -e state
```

4.12 Enter Multiuser Mode

After the `/etc/install/instartup` script has been run (if appropriate), your UNICOS 10.0 system is ready to be brought up to multiuser mode.

Before going to multiuser mode, be sure to unmount any file systems you mounted while in single-user mode. You can use `/etc/umountem (8)` to do this.

Use the following command to put the UNICOS 10.0 system in multiuser mode:

```
unicos# /etc/init 2
```

This step completes the installation of your UNICOS 10.0 system; it is now ready for multiuser testing.

4.13 Restart Network Queuing Environment (NQE) Checkpointed Jobs or Processes

If you are upgrading from an earlier UNICOS release, are using a different root file system than in the previous release, and if you intend to restart any checkpointed jobs or processes, be sure to have the previous root file system mounted and available for use. Restarts will fail if the old root file system is not mounted, because the shared-text binaries for the user's previous shell will not be available.

During an upgrade process the old `root/usr/src` entries in the `/newroot/etc/fstab` file were automatically prepended with a `/root disk device name`.

For example, prior to the upgrade `/oldroot/etc/fstab` had the following entries:

```
/dev/dsk/root_b      /                NC1FS  rw,CRI_RC="NO"  1      1
/dev/dsk/usr_b       /usr             NC1FS  rw,CRI_RC="YES" 1      2
/dev/dsk/src_b       /usr/src         NC1FS  rw,CRI_RC="YES" 1      2
```

The `/newroot/etc/fstab` would have these entries after the upgrade process completes:

```
/dev/dsk/root_b     /root_h         NC1FS  rw,CRI_RC="NO"  1      1
/dev/dsk/usr_b      /root_h/usr     NC1FS  rw,CRI_RC="YES" 1      2
/dev/dsk/src_b      /root_h/usr/src NC1FS  rw,CRI_RC="YES" 1      2
```

If `CRI_RC` is set to `NO`, you can invoke the `mount(8)` command manually to add the old `root/usr/src` to the running system.

After mounting the old root file system, you will need to issue a `restart(1)` command to resume the checkpointed jobs or processes.

Note: Upgrading between two major releases, UNICOS 9.0 to UNICOS 10.0, cannot be checkpoint restarted. Sites will need to manage their migration from UNICOS 9.0 to UNICOS 10.0 to make sure this is not an issue.

4.14 Access Accounting Data from Previous System

If you need access to the accounting data from your previous system, that data must be available in the `/usr/adm/acct` directory. You can either mount your

previous `/usr/adm` file system on `/usr/adm`, or you can copy the accounting files from the previous `/usr/adm` to `/usr/adm`.

No conversion is required, as all accounting utilities perform the conversion automatically when an older style file is read.

X Window System Interface [5]

This chapter describes the X Window System version of the interface to the ICMS menu system.

When you enter the menu system, it automatically opens a new X window if your workstation or terminal has an X Window System display capability.

The X Window System menus are functionally identical to the `curses`-based menus, but allow you to select items by mouse point-and-click rather than by typing them. You no longer have to learn various key strokes to access features, but can use the pull-down menus to see all possibilities at a glance.

Note: Most menu keys that are available within the `curses` version are also available in the X Window System version. However, two rarely used keys were eliminated: the check key command (`c` or `C`) and the ability of the accelerator key (`a` or `A`) to jump into form menus. This capability has been replaced in part by the ability to traverse the menu tree through a visual representation (see Section 5.3.6, page 57).

5.1 Menu Screen

Figure 6 shows an example of the `inmenu` main window.

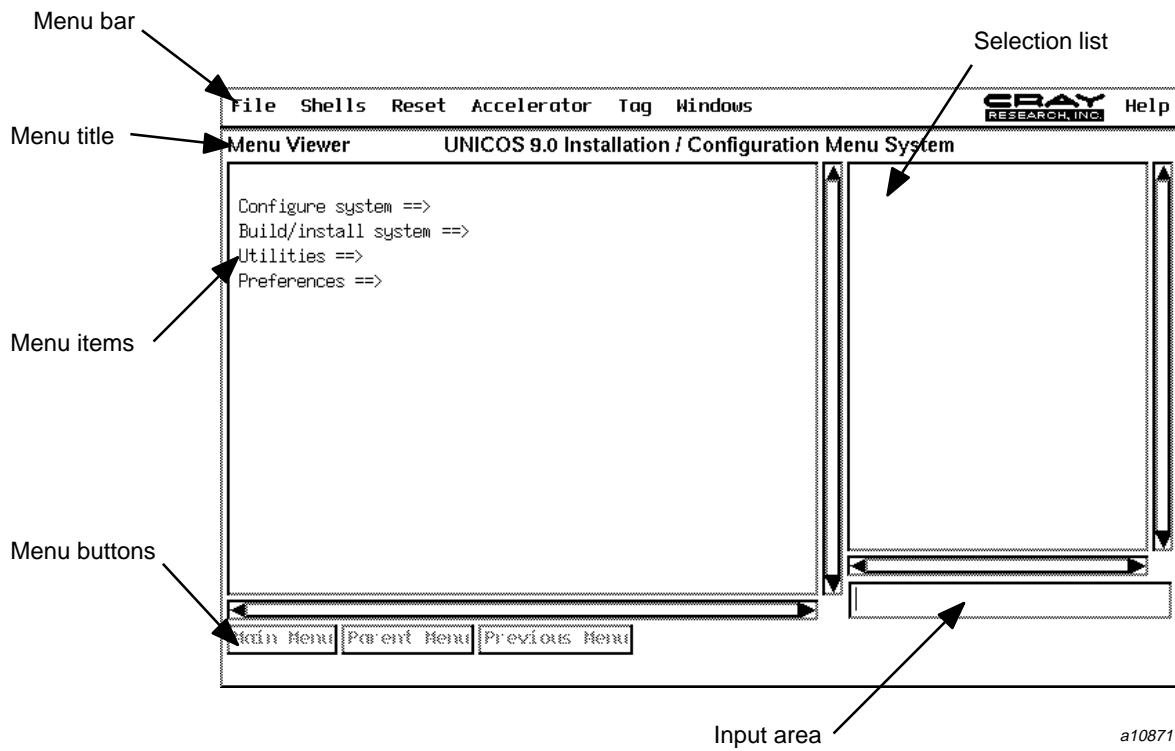


Figure 6. Main menu window

5.2 Menu Items

As shown in Figure 6, the menu title area displays the name of the current menu. The menu items window area displays menu items that can be selected. The current menu item selected is highlighted. Select another menu item by clicking on that item. The following types of menu items can be selected:

- An *action* executes a program. An action is followed by three dots (. . .). It initiates the action specified in a separate window and prevents you from doing other operations until the action completes.
- A *selection* is a configuration parameter with an associated value. It displays a list of valid selection values in the selection list window to the right of the menu items window. You can change the current value by clicking on any of the selection values shown or by entering the value in the input area located under the selection list.
- A *menu* leads to another menu, one level down in the menu tree structure. A menu is designated by ==>. Use the `Parent` button to return to the previous menu level.
- A *comment* is informational only; it does nothing.

5.3 Menu Bar

This window area contains menu system pull-down menus. To make a selection from the menu bar, click on an item to display the associated pull-down menu. Then click on the desired option from the menu. To make the pull-down menu disappear, just click on the menu bar. Available pull-down menus are as follows.

5.3.1 File Menu

The File pull-down menu contains the following option:

Exit <CTRL-Q>	Quits the menu system and prompts you to update changes applied to the current form menu, if any, before exiting.
---------------	---

5.3.2 Shells Menu

The Shells pull-down menu contains the following options:

Ksh	Creates a separate window running ksh (the standard shell).
Sh	Creates a separate window running sh (which should be ksh).
Csh	Creates a separate window running a C shell.
Preference shell	Creates a separate window running a shell defined by the Preferences menu option Type of Shell. The default is the standard shell.

5.3.3 Reset Menu

The Reset pull-down menu contains the following options:

Reset selections	Resets all selection values in the current menu (basically the same as an undo command).
Undo effects of last reset	Undoes the effects of the last Reset selections command. All selections that changed after the Reset command was executed are lost when this option is selected. This option restores selection values to the values they had before the Reset command was executed.

5.3.4 Accelerator Menu

The Accelerator pull-down menu contains the following options:

Assign accelerator key	Lets you assign current menu items to one of the keys 1 through <i>n</i> , where <i>n</i> is defined by the Preferences menu selection Maximum number of accelerator keys. With this option, you
------------------------	--

	can define time-saving shortcuts for moving around the menu tree.
Select accelerator key	Displays the list of accelerator keys you have already defined. If desired, you can select one to traverse the menu system to the menu defined by the chosen key.
Next accelerator key	Selects the next accelerator key in the displayed list and goes to the specified menu.
Previous accelerator key	Selects the previous accelerator key in the displayed list and goes to the specified menu.

5.3.5 Tag Menu

The Tag pull-down menu contains the following options:

Find selection tag	Searches the menu tree for the specified search string. If one or more matches for the string are found, this option traverses the menu system to get to the menu defined by the first match found. The maximum number of matches saved is defined by the Preferences menu selection Maximum number of search keys. This option is useful if you know what parameter you want to change, but do not know the menu on which it appears.
Select selection tag	Displays a list of all defined tags and lets you select one if desired.
Next selection tag	Finds the menu containing the selection defined by the next selection tag.
Previous selection tag	Finds the menu containing the selection defined by the previous selection tag.

5.3.6 Windows Menu

The Windows pull-down menu contains the Tree Viewer and Form Viewer options.

5.3.6.1 Tree Viewer

The `Tree Viewer` option displays or hides the menu tree. The menu tree shows all of the currently accessible menus.

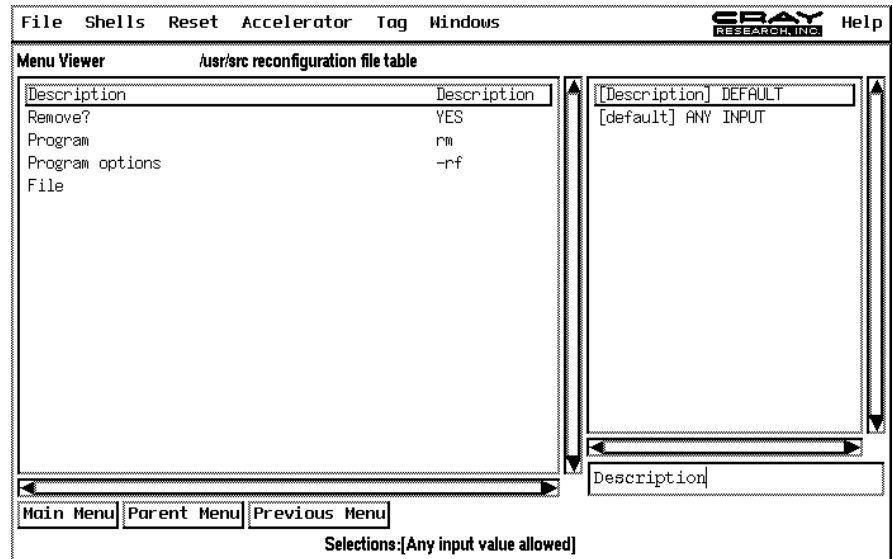
Besides the menu tree, the `Tree Viewer` window contains a panner window and a menu bar. The panner window quickly moves you to another part of the tree. The box in the panner window matches what is shown in the tree. Just move the panner window to another part of the tree to have it displayed in the `Tree Viewer` window.

You can go to any menu in the tree by clicking on the desired button. Clicking the left mouse button on the background of the tree and dragging the background also moves the view of the tree in the direction you drag the mouse.

The menu bar contains `Tree Viewer` pull-down menus. The only `Tree Viewer` menu option that is not described elsewhere in this chapter is the `Menu Viewer` option, which displays or hides the main menu and lets you edit a specific object.

5.3.6.2 Form Viewer

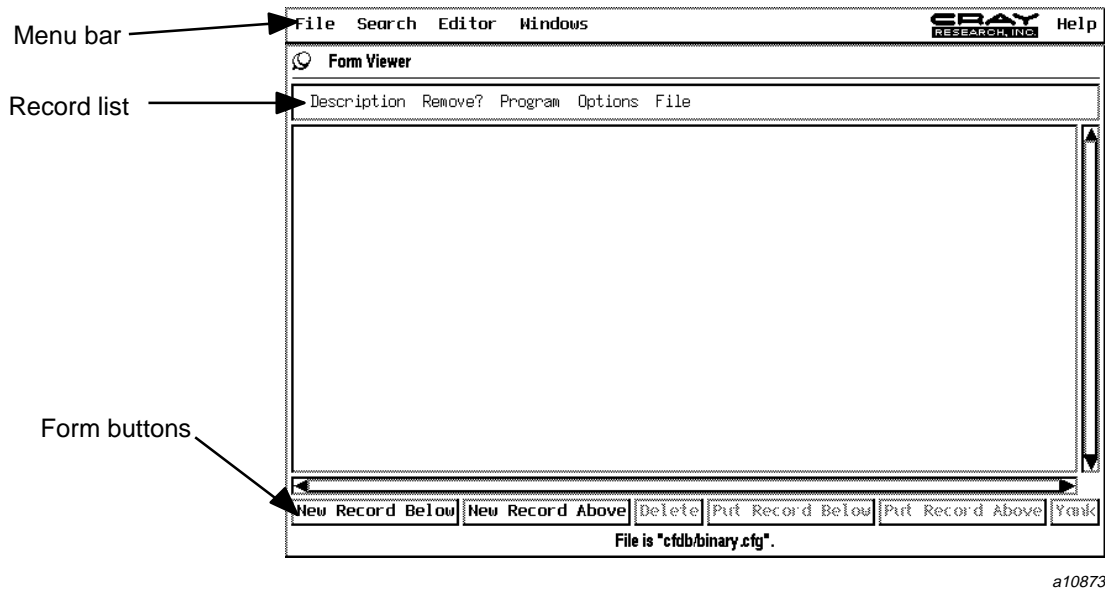
The `Form Viewer` option displays or hides the form viewer. A form or *form menu* is a screen representation of the record lines that make up a menu system configuration file. See Figure 7, page 59 for a sample configuration file, and Figure 8, page 60 for a sample form menu.



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Figure 7. Sample configuration file

The `Form Viewer` option displays or hides multiple objects that are the same type; that is, it displays a list of objects that have the same editable fields (in contrast to the `Menu Viewer`, which lets you edit a specific object). For example, the `Form Viewer` may display a list of disk slices. Clicking on a specific disk slice brings it up on the `Menu Viewer`, allowing you to edit that particular slice. Clicking on a different disk slice on the `Form Viewer` lets you edit it on the `Menu Viewer`.



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Figure 8. Form menu

The Form Viewer window contains a record list, a menu bar, and form buttons. The current record is highlighted in the record list. You can select another record by clicking on the appropriate entry. All of the form buttons operate on the current highlighted record.

The menu bar contains `Form Viewer` pull-down menus. Menu options that are unique to the `Form Viewer` are as follows:

<code>Save</code> (on <code>File</code> menu)	Updates the form file if needed, without exiting the form.
<code>Forward</code> (on <code>Search</code> menu)	Searches the form list for the specified string. The search starts from the current record in a clockwise direction.
<code>Backward</code> (on <code>Search</code> menu)	Searches the form list for the specified string. The search starts from the current record in a counterclockwise direction.
<code>Repeat</code> (on <code>Search</code> menu)	Repeats the last search in the same direction as before.
<code>Vi Emacs Emacs -nw</code> <code>Preference editor</code> (on <code>Editor</code> menu)	Edits the current form list using the specified editor. Note that the <code>Emacs -nw</code> option keeps <code>emacs(1)</code> from creating a separate window.
<code>Form Viewer</code> <code>Commands</code> (on <code>Help</code> menu)	Displays help file information about form menu bars and form buttons.

The form buttons are as follows:

<code>New Record Below</code>	Creates a new record, with default values in the fields, after the current line.
<code>New Record Above</code>	Creates a new record, with default values in the fields, before the current line.
<code>Delete</code>	Deletes the current line.
<code>Put Record Below</code>	Puts a yanked or deleted line after the current line.
<code>Put Record Above</code>	Puts a yanked or deleted line before the current line.
<code>Yank</code>	Copies the current line into a buffer for later use.

5.3.7 Help Menu

The Help pull-down menu contains the following options:

Help	Displays online help for the current menu screen.
About	Displays copyright and version information.
Man Page	Accesses UNICOS online man pages.
WhereAmI Viewer	Displays the location of the current menu within the menu system and the path through the menu system that you have traversed. You can go to a previous menu by clicking on the appropriate entry.
Tail install.log	Tails the log file install.log.
Viewer Commands (in menu menu bar)	Displays help file information about menu bars, menu buttons, and input keys.
Tree Viewer Commands (in Tree menu bar)	Displays help file information about Tree menu bars, menu buttons, and input keys.
Form Viewer Commands (in Form Viewer menu bar)	Displays help file information about Form Viewer menu bars, menu buttons, and input keys.

5.4 Menu Buttons

The menu buttons are as follows:

Main Menu	Returns to the main (top-most) menu.
Parent Menu	Returns to the menu one level up in the menu tree.
Previous Menu	Returns to the menu you just came from in the menu tree. This button is disabled if the last menu was a form.

5.5 Input Keys

Table 3 describes the input keys used to enter text from the keyboard into the input area (for the location of the input area, see Figure 6, page 54).

Table 3. Input keys

Key	Action
CONTROL-a	Moves cursor to beginning of input buffer.
CONTROL-b Left arrow	Moves cursor backward 1 character (nondestructive).
CONTROL-e	Moves cursor to end of input buffer.
CONTROL-f Right arrow	Moves cursor forward 1 character (nondestructive).
CONTROL-h Del BackSpace	Deletes previous character (to left of cursor).
CONTROL-k	Deletes from current cursor location to end-of-line.
CONTROL-u	Deletes entire input line.
CONTROL-w	Deletes previous word (to left of cursor).
RETURN ENTER	Verifies current input and accepts it, if valid.
CONTROL-j CONTROL-m	
INSERT	Inserts new text to right of cursor.

5.6 Changing Interface Colors

If desired, you can change the foreground (text) and background (panels) colors. The simplest way to change the color is to customize the colors of the menu system program (`inmenu`).

Add the following lines to your `.xdefaults` file:

```
inmenu*foreground    black
inmenu*background   white
```

or

```
inmenu*foreground    rgb:00/00/00
inmenu*background   rgb:ff/ff/ff
```

5.7 Printing a Screen Dump

We recommend using your local workstation to print out a dump. Either of the following command lines may be used to print screen dumps.

Generic `xwd`:

```
xwd | xpr -dev ps -gray 4 | lpr
```

Version that works with `tvtwm`:

```
xwdv | xpr -dev ps -gray 4 | lpr
```

After entering the preceding command, click the mouse on the window to complete the screen dump and start the printing.

Note: If your printed screen dumps are hard to read and do not have enough contrast, using the following command will often produce a legible printout:

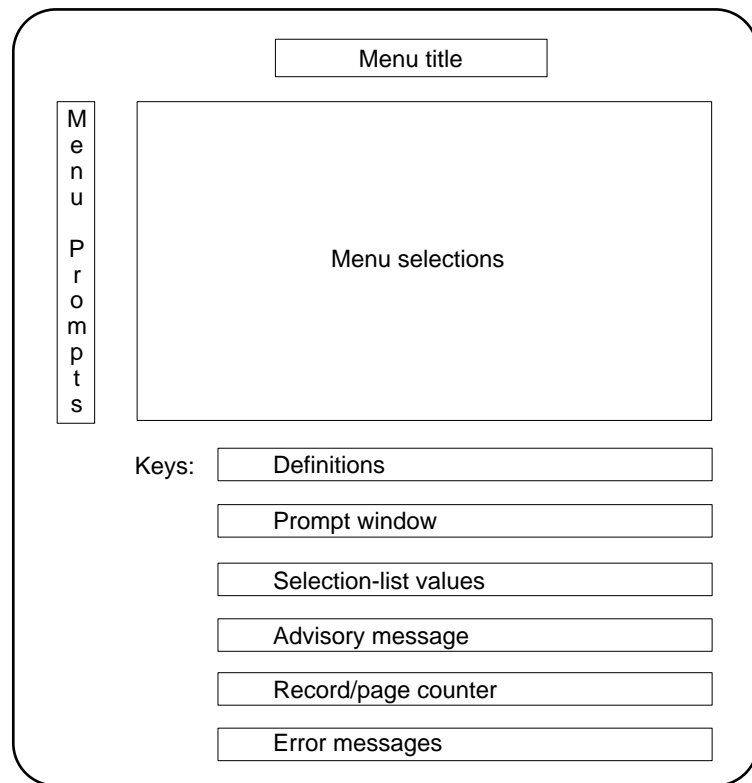
```
xwd -add 10
```

curses Interface [6]

This chapter describes the `curses(3)` version of the interface to the ICMS menu system.

6.1 Menu Screens

The menu system divides your screen into several areas, each of which displays a different type of information in each area, as shown in Figure 9, page 65.



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Figure 9. Sample `curses` menu screen

The screen information areas shown in Figure 9, page 65 contain the following types of information:

<u>Area</u>	<u>Description</u>
Menu title	Displays the menu title.
Menu prompts	Shows the menu item ready to be selected and its type.
Menu selections	Displays the items in this menu, one per line.
Key definitions	Shows general menu keys for the current menu or selection. (For more information about these keys, see the sections describing menu system keys (Section 6.5, page 68 through Section 6.11, page 75).
Prompt window	Displays prompts for information you must enter.
Selection-list values	<p>Displays one of the following when you are in input mode on a selection line:</p> <ul style="list-style-type: none"> • A list of the permissible values if the number is limited • The message <code>Any non-white-space input value allowed if only nonnull strings without spaces are allowed</code> (usually for UNICOS path names, file names, and so on) • The message <code>Any input value allowed if the number of permissible values is very large</code>
Advisory message	Displays informational messages that the menu system issues.
Record/page counter	<p>Shows the record to which the prompt currently points and the total number of records in a menu. It is displayed only when you are in a menu of record lines.</p> <p>This line also shows the page number and total number of pages, when you are in a multipage menu.</p>

Error messages Displays error messages that the menu system issues.

6.2 Terminology

You should be familiar with the following terms when reading this section:

<u>Term</u>	<u>Definition</u>
<i>action</i>	A menu item that executes a program. The A-> prompt indicates actions.
<i>form list</i>	A screen representation of the record lines that make up a configuration file.
<i>menu</i>	A menu item that leads to another menu, one level down in the menu tree structure. (See Figure 4, page 9 for a diagram of the menu tree.) The M-> prompt indicates menus.
<i>record line</i>	One line of a configuration file, consisting of one or more fields of information.
<i>selection</i>	A menu item that is a configuration parameter that has an associated value. The S-> prompt indicates selections.
<i>selection list</i>	A menu that contains the list of selection values allowed for the menu item.

6.3 Menu Selections

The menu selections are listed in each screen in the format shown in Figure 9, page 65. Each screen displays one menu at a time from the menu hierarchy, identified by the menu title, which is centered at the top of the menu.

A menu is divided into multiple pages (screens) if all of the entries cannot fit on one screen. The + and - keys, defined in Section 6.5, page 68, let you scroll through multipage menus.

6.4 Menu Prompts

The menu prompts indicate the type of a menu item and what you can do with it. The prompts are displayed on the left side of the screen. The following list describes the menu prompts and their meanings:

<u>Prompt</u>	<u>Meaning</u>
A->	Indicates an action item. The line specifies the action taken when you press RETURN on this line. Items that end with . . . are action items.
E->	Indicates a record line of a configuration file (one line of a form-list screen). Press RETURN on this line to change the values of the fields associated with this record line.
M->	Indicates a menu item. Press RETURN on this line to go to the menu one level lower in the menu hierarchy. (Figure 4, page 9 shows the top three levels of menus.) Items that end with ==> are menu items.
N/A	Indicates a menu item that is either not applicable for the current step or is disabled.
S->	Indicates a selection item. The item is a configuration parameter that requires a value. Press RETURN at this prompt to position the cursor in the value field, in input mode, where you can enter a value for the parameter (see Section 6.7, page 71).

The following is a common sequence of actions (based on these prompts as identifiers):

1. Go to a menu (press RETURN at the M-> prompt).
2. Change the value of a selection (press RETURN at the S-> prompt).
3. Perform an action (press RETURN at the A-> prompt).

6.5 General Menu Keys

The menu system supports some general-use keys that are available (active) in most screens. These keys perform the following actions:

<u>Key</u>	<u>Action</u>
RETURN	Depending on where you are located, RETURN performs the following functions:

- At the `A->` prompt, it initiates the action. (Usually this means invoking a program.)
- At the `M->` prompt, it moves you to the menu listed.
- At the `E->` prompt, it lets you edit the fields in the selected form record.
- At the `S->` prompt, it moves the cursor to the value field and puts you in input mode to enter a value.
- In input mode, if the value entered is valid, it saves the value and returns the cursor to the menu prompt area at the left of the screen. If the value is invalid, the system beeps and issues a message.

H	Displays online help for the menu screen in which you are currently working. This key is displayed only when online help information is available for the current screen.
W	Displays the path through the menu hierarchy that you have traversed. This helps you to remember where a particular menu is located in the menu hierarchy. You can use this key to determine the context of a menu accessed from two or more paths.
SPACE	Toggles through a list of predefined values for a selection if such a list exists (when the cursor is in the prompt column at the left of a menu). The <code>></code> key also does this.
Q	Quits the menu system after asking you whether this is really what you want to do.
CONTROL-L	Redraws the screen.
!	Escapes to a shell. The type of shell is specified in the Preferences menu (see Section 7.1, page 77).
CONTROL-?	Displays menu commands that are currently available and displays valid selections if the current menu item is a selection. AMPEX terminals use CONTROL-SHIFT- <code>_</code>

	(Control-shift-underscore). Other key combinations may be necessary to generate the proper 037 ASCII code.
<	Selects previous selection-list value.
>	Selects next selection-list value.
r	Resets all selection values in the current menu to their value before you entered the menu.
R	Undoes the effects of the last reset (r) command.

6.6 Movement Keys

The menu system provides the following keys for you to use in moving around the menu hierarchy and within individual menus. (See Figure 4, page 9, which shows the first three levels of menus.)

<u>Key</u>	<u>Movement</u>
M	Returns to the initial main menu screen.
E	Returns to the previous menu, one level up the menu hierarchy.
RETURN	At the M-> prompt, moves one level down the menu hierarchy.
+	Moves to the next screen of a multiscreen menu. This is displayed only when the menu consists of more than one screen.
-	Moves to the previous screen of a multiscreen menu. This is displayed only when the menu consists of more than one screen.
TAB	Moves down to the next line of the menu. If you are on the last item in the menu, this wraps to the top. You can also use the j key (comparable to the vi editor command) or CONTROL-i to perform this function.
BACKSPACE	Moves up to the previous line of the menu. If you are on the first item in the menu, this wraps to the bottom. You can also use the lowercase k

key (as in the `vi` editor) or `CONTROL-h` to perform this function.

6.7 Input Keys

To change the value of a selection item in a menu, use one of the input keys. These keys are set to emulate the functions of one of the text editors `vi` or `emacs`, which you choose in the Preferences menu (see Section 7.1, page 77). Table 4 describes the available input keys. The variable *n* indicates a number, 1 through 999, that you can specify for some `vi` command keys.

Table 4. `curses` version input keys

<code>vi</code> key	<code>emacs</code> key	Action
<code>^</code> or <code>0</code>	<code>CONTROL-a</code>	Moves cursor to beginning of input buffer.
<code>n h</code> or <code>n CONTROL-h</code>	<code>CONTROL-b</code>	Moves cursor backward 1 character (nondestructive). The optional <i>n</i> specifies multiple characters.
<code>n x</code>	<code>CONTROL-d</code>	Deletes the character on which the cursor is located. The optional <i>n</i> specifies multiple characters right of the cursor position.
<code><</code>	<code>CONTROL-e</code>	Moves cursor to end of input buffer.
<code>n l</code> or <code>n SPACE</code>	<code>CONTROL-f</code>	Moves cursor forward 1 character (nondestructive). The optional <i>n</i> specifies multiple characters.
<code>n X</code>	<code>CONTROL-h</code> or <code>DELETE</code>	Deletes previous character (to left of cursor). The optional <i>n</i> specifies multiple characters.
<code>D</code>	<code>CONTROL-k</code>	Deletes from current cursor location to end-of-line.
<code>CONTROL-u</code>	<code>CONTROL-u</code>	Deletes entire input line.
<code>nTAB</code> or <code>n></code>	<code>TAB</code>	Gets next selection value (toggle). <code>CONTROL-i</code> also performs this action. The optional <i>n</i> gets the <i>n</i> th value in a list.
<code><</code>		Gets previous selection value (toggle).

<i>vi</i> key	<i>emacs</i> key	Action
i		Inserts new text to left of cursor.
a		Appends new text to right of cursor.
A		Appends new text to end of input buffer.
I		Inserts new text at beginning of input buffer.
<i>ns</i>		Replaces the character under the cursor with input text until <code>ESCAPE</code> . The optional <i>n</i> replaces <i>n</i> characters.
S or <i>cc</i>		Replaces the entire line with input text until <code>ESCAPE</code> .
C or <i>c\$</i>		Replaces from cursor position to end-of-line with input text until <code>ESCAPE</code> .
<i>ncw</i>		Replaces word on which cursor is located. The optional <i>n</i> specifies multiple words.
<i>ndw</i>		Deletes word on which cursor is located. The optional <i>n</i> specifies multiple words.
r		Replaces character on which cursor is located.
R		Replaces existing characters by overstriking them; ends with <code>ESCAPE</code> .
RETURN	RETURN	Verifies current input and accepts it, if valid.
U		Undoes all changes, restoring original value.
u		Undoes last editing change.
CONTROL-1	CONTROL-1	Redraws screen.
CONTROL-?	CONTROL-?	Displays active keys.
DELETE		Moves cursor backward 1 character (nondestructive). Used only when in insert, append, or replace mode.
ESCAPE		Terminates input, append, or replace modes, returning you to command mode.

6.8 Accelerator Keys

The accelerator keys let you define time-saving shortcuts for moving around in the menu hierarchy. Pressing `CONTROL-?` displays the accelerator keys you have already defined.

<u>Key</u>	<u>Description</u>
a	Assigns the current location in the menu tree to one of the keys 1 through <i>n</i> , where <i>n</i> is defined by the selection <code>Maximum number of accelerator keys</code> in the Preferences menu (see Section 7.1, page 77).
<i>n</i> A	Traverses the menu system to get to the menu defined by accelerator key <i>n</i> . If you specify 0 for <i>n</i> , the previous menu is displayed, which lets you toggle between two menu locations anywhere in the menu tree. If <i>n</i> is omitted, the default is the next accelerator key.

6.9 Search Keys

The search keys let you define time-saving shortcuts to find selection values. Pressing `CONTROL-?` displays the search keys you have already defined.

<u>Key</u>	<u>Description</u>
t	Searches the menu tree for the specified expression, going to the menu containing the selection tag.
<i>n</i> T	Displays the menu associated with search key <i>n</i> . <i>n</i> is defined by the selection <code>Maximum number of search keys</code> in the Preferences menu (see Section 7.1, page 77). If <i>n</i> is omitted, the default is the next search key definition.

6.10 Form-list Keys

When you are in a form list (indicated by the `E->` prompt), you can search for, add, delete, copy, and move lines in the list. The form-list editing keys are as follows:

<u>Key</u>	<u>Action</u>
D	Deletes the current line.
n	Creates a new record, with default values in the fields, after the current line.
N	Creates a new record, with default values in the fields, before the current line.
p	Puts a yanked or deleted line after the current line.
P	Puts a yanked or deleted line before the current line.
< s	Requests a string or regular expression and searches the form list for it. You can also use / for this (comparable to the <code>vi</code> editor).
S	Repeats the last search.
U	Edits the current form list by using the editor specified in the Preferences menu (see Section 7.1, page 77). Initial installations that create new configuration files can use an editor to do so. Use this feature with caution; do not alter record fields that should not be modified.
Y	Copies the current line into a buffer for later use (comparable to the <code>vi</code> editor <code>y</code> (yank) command).
/	Searches forward for specified expression.
?	Searches backward for specified expression.
^	Displays the first column of the current form list.
\$	Displays the last column of the current form list.
<	Displays the previous column of the current form list.
>	Displays the next column of the current form list.

6.11 Record-line keys

Each line of a form-list screen is called a *record line*. A record line is a line from a file (usually a configuration file) that is being parsed by the menu system for display (but that cannot be edited). With the cursor on a record line, pressing RETURN moves you to a selection list, which is an editable list of all fields that make up a record line.

In a selection list, you can use the following keys to change a field's value:

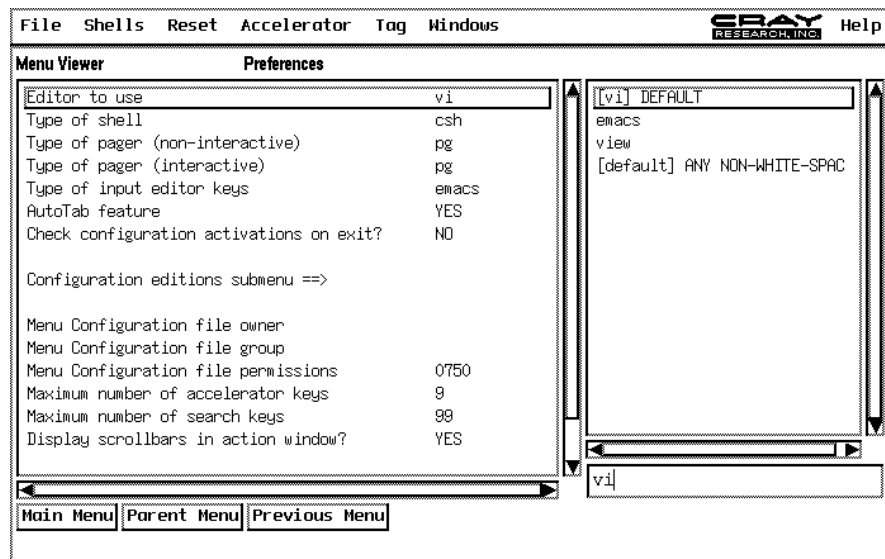
<u>Key</u>	<u>Action</u>
Input keys	You can use all input keys described in Section 6.7, page 71.
F	Moves you forward one record line so that you do not have to return to the form-list screen, one menu level up to select the next record line for editing. The <code>f</code> key also performs this function.
B	Moves you backward one record line so that you do not have to return to the form-list screen, one menu level up to select the previous record line for editing. The <code>b</code> key also performs this function.

Other Menu System Features [7]

The menu system provides other useful features such as tailoring the menu system environment to your site, import and activate interfaces, configuration editions, automatic `chroot(8)` capability for installations, and a log file of actions.

7.1 Preferences Menu

The Preferences menu lets you tailor the menu system environment to your site. You can define the programs used by the menu system to edit a configuration file, escape to a shell, scroll output on the screen, and define input keys used to modify a selection value. Figure 10 shows the X Window System version of the Preferences menu.



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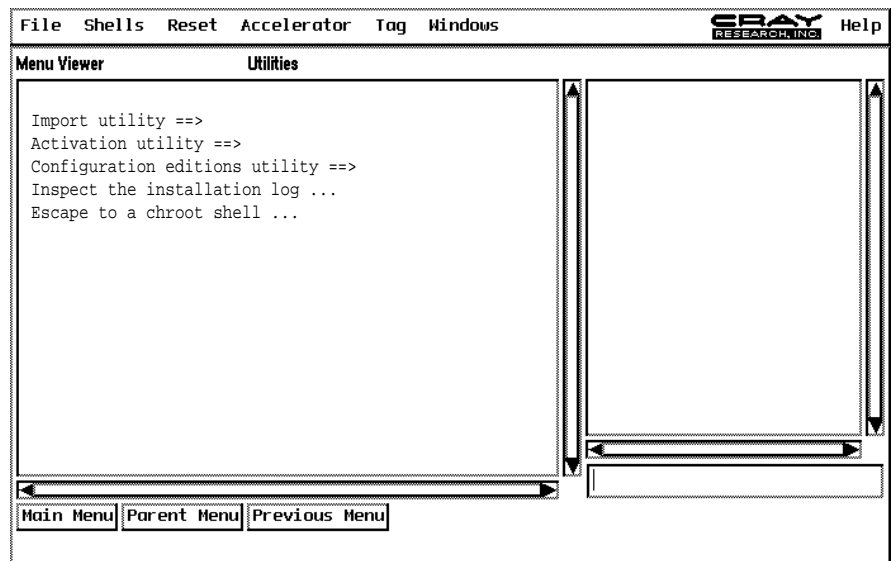
Figure 10. Preferences menu

For a description of all the options on the Preferences menu, review the online help for the menu by clicking on the `Help` button (X Window System version)

and then selecting `Help` from the pull-down menu, or by pressing the `h` key (curses version).

7.2 Utilities Menu

The Utilities menu is shown in Figure 11.



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Figure 11. Utilities menu

For a description of all the options on the Utilities menu, review the online help for the menu.

7.2.1 Import Utility

This section provides additional information about importing configuration data into the ICMS database. This section should be viewed as a complement to the process described in Section 2.2. The information provided allows a site to change how the import process works, which configuration files should be imported into the ICMS database, and to have the import process stop when an error is encountered.

The import utility takes configuration files from a specified mount point and places the configuration into the ICMS database so it can easily be displayed to a user. The interface to this feature provides flexibility and control to do the following:

- Import files from a `root` file system other than the current one under which ICMS is running, Section 7.2.1.1, page 79
- Prevent the import process from aborting for missing files, or when errors are encountered, Section 7.2.1.2, page 80
- Import host or guest configuration files (this is important when configuring the UNICOS under UNICOS feature on a mainframe), Section 7.2.1.3, page 80
- Reload a default import table, which is used to control how you import system configuration files, Section 7.2.1.4, page 81
- Select which system configuration files are imported into ICMS, Section 7.2.1.5, page 82
- Import all or selected system configuration files into ICMS, Section 7.2.1.6, page 83

Note: All of the changes discussed in the following sections will be used for all future imports of configuration files into the ICMS database. Before doing an import of the entire system configuration or of a particular configuration file, you may want to verify that the values in the `Import Options` selection match how and from where you want ICMS to import the configuration files.

```
UNICOS Installation / Configuration Menu System
. Utilities
. . Import Utility
. . . Import Options
```

7.2.1.1 Changing the Import Root

The ability to change the root mount point from which you are importing is important when your site has multiple roots that may be running different configurations at different times. The changing of the import root mount point at the `Import root mount point` selection in `Import Options` changes the location from which configuration data will be imported by ICMS into the database. If the selection is left blank, the import process uses the configuration files from the root in which ICMS is running. All future imports will use this location until the location is changed at this selection.

```

                                Import Options
S-> Import root mount point           /mnt
    Stop import on error?             YES
    Import host or guest versions?    host
    Reload default import table ...
    Keys:  ^? Commands  Q Quit  W WhereAmI
    
```

7.2.1.2 Stopping on Errors or Ignoring Errors during the Import Process

Under various circumstances, the import of a configuration will produce errors due to configuration file(s) missing, bad syntax, or some other circumstance. ICMS can be made to stop when an error is encountered, or it can be made to continue if an error is encountered.

It may be desirable to import all the configuration files at once and not stop when an error is encountered. Then when finished, to go back and review the import log and reimport the configuration files that had problems the first time.

To control whether ICMS stops on error, change the value of the `Stop import on error?` selection in `Import Options` to **YES** to stop the import process when an error is encountered.

```

                                Import Options
    Import root mount point           /mnt
S-> Stop import on error?             YES
    Import host or guest versions?    host
    Reload default import table ...
    Keys:  ^? Commands  Q Quit  W WhereAmI
    
```

7.2.1.3 Import Requirements When Running UNICOS under UNICOS

When running the UNICOS under UNICOS feature, ICMS knows how to import either the host UNICOS configuration or the guest UNICOS configuration. This is helpful to make changes to the guest UNICOS configuration while leaving the host alone.

To control which UNICOS under UNICOS configuration ICMS imports, change the value of `Import host or guest versions?` in `Import Options` to:

<p>host</p>	<p>For importing the host UNICOS configuration under which the guest UNICOS system will be running</p>
-------------	--

guest For importing the guest UNICOS configuration that will be running under the host UNICOS system

During the import process, the appropriate suffix is added to import file names that exist with that suffix.

Note: To import **both** host and guest versions, you must run the import/activate sequence twice:

1. Import host versions
2. Activate host versions
3. Import guest versions
4. Activate guest versions

See Section 2.4 and Section 7.2.2 for information about activating the system configuration.

```

                                Import Options
Import root mount point                mnt
Stop import on error?                  YES
S-> Import host or guest versions?     host
Reload default import table ...

Keys:  ^? Commands  Q Quit  W WhereAmI

```

7.2.1.4 Reloading a Default Import Table

At various times when you are doing system support, you may want to get back to the default version of the import table. It is recommended to reload a default import table whenever you perform a UNICOS upgrade.

By reloading the default import table each time you upgrade your system's UNICOS release, you will be sure to import new subsystem configuration files into ICMS.

To reload the default import table perform the Reload default import table ... action in the Import Options menu. When this action is finished, ICMS will have the default import table in its database, which you can then change to suit your site's needs.

```

                                Import Options
Import root mount point          /mnt
Stop import on error?           YES
Import host or guest versions?  host
A-> Reload default import table ...

Keys:  ^? Commands  Q Quit  W WhereAmI
```

7.2.1.5 Controlling Which System Configuration Files Are Imported into ICMS

At times you may not wish to reload a subsystem's configuration file by default. In these instances, you should change the default Import class to run value from **YES** to **NO**. When an import process has **NO** for the import? field, it is not performed.

When the Import class to run selection in the Import Utility menu is blank, the import utility goes through the entire import table and sees if each import class should be imported.

If the Import class to run selection has a valid import Class, it performs the import of that class if the Import? field is set to **YES**. An example of the default import table is shown following and is located at:

```

UNICOS Installation / Configuration Menu System
.  Utilities
.  .  Import Utility
.  .  .  Import Table
```


Import Table					
Class	Description	Import?	Program	Options	
-----	-----	-----	-----	-----	>
E-> FEATURES	Config.mh	YES	configmh.sh	-i	
HARDWARE	Sn.h	YES	hdwsn.sh	-i	
KERNEL	Config.h uts	YES	utsconfh.sh	-i	
KERNEL	Param uts	YES	utsparam.sh	-i	
KERNEL	Comm channels	YES	utsparam.sh	-i -f	
SECURITY	Config.h utssec	YES	secconfh.sh	-i \$RE	
SECURITY	Rcoptions	YES	secrcopts.sh	-i \$RE	
SECURITY	Seclabs.c	YES	seclabs.sh	-i \$RE	
SECURITY	Spnet.conf	YES	spnet.sh	-i \$RE	
FSTAB	Fstab	YES	fstab.sh	-i	
SPECIAL	Special disk devices	YES	special.sh	-i \$RE	
DISKS	Ldcache list	YES	ingenldc.sh	-i \$RE	
TAPES	Tape Config	YES	tapes.sh	-i	
CRL	Reelenv	NO	crl.sh	-i	

Keys: ^? Commands Q Quit W WhereAmI
Record 1 of 43

Press the RETURN key to select a record for editing.

7.2.1.6 Importing All or Selected System Configuration Files

To perform the import process on a selected import class or to import all desired import classes, go to the Import Utility menu and perform the Run the import process ... action.

Import Utility	
Import options ==>	
Import table ==>	
Import class to run	
A-> Run the import process ...	
Keys: ^? Commands Q Quit W WhereAmI	

7.2.2 Activation Utility

This section of the manual provides additional information about activating the ICMS configuration to update the system configuration files. This section is a

complement to the process described in Section 2.4, page 21. The information provided allows a site to change how the activation process works, and to have the activate process stop when an error is encountered.

The activation utility takes configuration information from inside the ICMS database and writes the configuration into appropriate system configuration files that UNICOS needs during mainframe booting, or daemon startup.

The interface to this feature provides flexibility and control to do the following:

- Create files for a `root` file system other than the current one under which ICMS is running, Section 7.2.2.1, page 84
- Prevent the activation process from aborting when errors are encountered, Section 7.2.2.2, page 85
- Create a host or guest configuration file, (note that this feature is important when configuring the UNICOS under UNICOS feature on a mainframe), Section 7.2.2.3, page 86
- Reload a default activation table, which is used to control how you create system configuration files, Section 7.2.2.4, page 87
- Select which system configuration files are created by ICMS, Section 7.2.2.5, page 87
- Activate all or selected system configuration files out of ICMS, Section 7.2.2.6, page 89

Note: All of the changes discussed below will be used for all future imports of configuration files into the ICMS database. Before doing an import of the entire system configuration or of a particular configuration file, you may want to verify that the values in the following match how and from where you want ICMS to import the configuration files.

```

UNICOS Installation / Configuration Menu System
.  Utilities
.  .  Activation Utility
.  .  .  Activation Options
    
```

7.2.2.1 Changing Activation Root

The ability to change the root mount point to which you are writing out the system configuration is important when your site has multiple roots that may be running different configurations at different times.

The changing of the activate mount point at the Old root mount point selection in Activation Options changes the location to which the resulting system configuration files are written.

If the selection is left blank, the activate process writes the files to the root mount point from which ICMS is running. All future activations will use this location until the location is changed at this selection.

```

                                Activation Options
S-> Activation root mount point      /
    Stop activation on error?        YES
    Activate host or guest versions  host
    Reload default activation table ...

Keys:  ^? Commands  Q Quit  W WhereAmI

```

7.2.2.2 Stopping on Errors or Ignoring Errors during the Activation Process

Under various circumstances, the activate process of a configuration produces errors due to bad configuration data, incorrect write permissions, or some other circumstances. ICMS can be made to stop when an error is encountered, or it can be made to continue if an error is encountered.

It may be desirable to activate the entire configuration at once and not stop when an error is encountered. Then when the activation is finished, to go back and review the activate log and reactivate the configuration files that had problems the first time.

To control whether or not ICMS stops on error, change the value of the Stop activation on error? selection in Activation Options to **YES** to stop the activate process when an error is encountered.

```

                                Activation Options
    Activation root mount point      /
S-> Stop activation on error?        YES
    Activate host or guest versions  host
    Reload default activation table ...

Keys:  ^? Commands  Q Quit  W WhereAmI

```

7.2.2.3 Activation Requirements When Running UNICOS under UNICOS

When running the UNICOS under UNICOS feature, ICMS knows how to activate either the host UNICOS configuration or the guest UNICOS configuration. This is helpful to make changes to the guest UNICOS configuration while leaving the host alone.

To control which UNICOS under UNICOS configuration ICMS activates against, change the value of `Activate host` or `guest version` in `Activation Options` to:

<code>host</code>	For activating the host UNICOS configuration under which the guest UNICOS system will be running
<code>guest</code>	For activating the guest UNICOS configuration that will be running under the host UNICOS system

During the activation process, the appropriate suffix is added to import file names that exist with that suffix.

If the root to which files will be exported is guest capable, `/etc/brc.guest` is run on that root before each activation to insure that files listed in `/etc/config/guest_config` on that root are linked to the desired versions. This selection lets you specify which versions (host or guest) you want to have linked before the activation occurs.

Note: In order to import BOTH host and guest versions, you must run the `import/activate` sequence twice:

1. Import host versions
2. Activate host versions
3. Import guest versions
4. Activate guest versions

See Section 2.2 and Section 7.2.1 for information about importing the system configuration into ICMS.

```

                                Activation Options
Activation root mount point          /
Stop activation on error?           YES
S-> Activate host or guest versions  host
Reload default activation table ...

Keys:  ^? Commands  Q Quit  W WhereAmI

```

7.2.2.4 Reloading a Default Activation Table

At various times when you are doing system support, you may want to get back to the default version of the activation table. It is recommended to reload a default activation table whenever you are performing a UNICOS upgrade.

By reloading the default activation table each time you upgrade your system's UNICOS release, you will be sure to activate new subsystem configuration files on the upgrade root.

To reload the default activation table, perform the Reload default activation table ... action in the Activate Options menu. When this action is finished, ICMS will have the default activation table in its database, which you can then change to suit your site's needs.

```

                                Activation Options
Activation root mount point          /
Stop activation on error?           YES
Activate host or guest versions      host
A-> Reload default activation table ...

Keys:  ^? Commands  Q Quit  W WhereAmI

```

7.2.2.5 Controlling Which System Configuration Files Are Updated

There are times when you may not wish to activate a subsystem's configuration files by default. In these instances, you should change the default Activate? value from **YES** to **NO**. When an activate process has **NO** for the Activate? field, it is not performed via the Activation Utility.

When the Activation class to run selection in the Activation Utility is set to **ALL**, the activate utility goes through the entire activation table and sees if each activate class should be activated.

If the Activation class to run has a valid activate Class, it performs the activation of that class if the Activate? field is set to **YES**. An example of the default activation table is shown below and is located at:

```
UNICOS Installation / Configuration Menu System
. Utilities
. . Activation Utility
. . . Activation Table
```

This table controls which files are to be checked to see if they need to be updated via looking at the related ICMS database files time stamps and the system configuration files time stamp. If the database has a newer time stamp, then the configuration file is updated.

Activate Table					
Class	Description	Activate?	Program	Options	
-----	-----	-----	-----	-----	
> E-> FEATURES	Config.mh major features	YES	inupdcfg.		
HARDWARE	Mainframe hardware configuration	YES	inupdcfg.		
KERNEL	Configure kernel	YES	inupdcfg.		
SECURITY	Configure security	YES	inupdcfg.		
FSTAB	File System Table	YES	inupdcfg.		
SPECIAL	Configure special disk devices	YES	inupdcfg.		
DISKS	Configure disks	YES	inupdcfg.		
TAPES	Configure tapes	YES	inupdcfg.		
CRL	Cray/REELlibrarian	NO	inupdcfg.		
NETWORKS	General Network configuration	YES	inupdcfg.		
TCP	TCP/IP network configuration	YES	inupdcfg.		
NFS	Network File Systems configuration	YES	inupdcfg.		
NIS	Network Information System configuration	YES	inupdcfg.		
DAEMONS	System Daemons configuration	YES	inupdcfg.		
STARTUP	Start Up (/etc/rc) configuration	YES	inupdcfg.		
ACCTNG	Accounting configuration	YES	inupdcfg.		
LOADERS	SEGLDR Loader configuration	YES	inupdcfg.		
NU	NU Configuration	YES	inupdcfg.		
DUMPINFO	Dumpsys Utility Configuration	YES	inupdcfg.		
AIR	AIR Configuration	NO	inupdcfg.		
URM	URM Configuration	YES	inupdcfg.		
GUEST	UNICOS under UNICOS (guest)	YES	inupdcfg.		
Keys: ^? Commands Q Quit W WhereAmI					
Press the RETURN key to select a record for editing.					
Record 1 of 22					

7.2.2.6 Activating All or Selected System Configuration Files

To perform the activation process on a selected activate class or to activate all desired import classes, go to the Activation Utility and perform the Run the activation process ... action.

```

                                Activation Utility
Activation options ==>
Activation table ==>
Activation class to run
A-> Run the activation process ...

Keys:  ^? Commands  Q Quit  W WhereAmI
    
```

7.2.3 Configuration Editions

The menu system creates a configuration edition, which is an archive of selected ICMS database files, system configuration files, and device nodes. This is done after successfully completing an activation inside ICMS.

The interface to this feature provides flexibility and control with the following features:

- Interactive database management menu, which provides information such as path and file name, a label describing the edition, the archive date, the UNICOS system level of an edition, user ID, and an identifier to signify if an edition is in a compressed or uncompressed state. See Section 7.2.3.1, page 91.
- The ability to compare one edition to another or to the current system configuration. See Section 7.2.3.2, page 92.
- The ability to extract the contents of a single edition to a specified path. See Section 7.2.3.3, page 94.
- ICMS menu system preference control of editions. See Section 7.2.3.7, page 99.
- Many other options.



Caution: Extracting a configuration edition overwrites the existing system configuration with the archived configuration information.

System administrators can retrieve previous editions to recreate a previous system configuration. To do this, they simply execute the `Extract edition` action in the `Edition Extraction` menu, activate the system, if you can extract ICMS's internal menu database, and, if necessary, perform a system build.

7.2.3.1 Edition Management Menu

The Edition Management menu provides an interface to label specific editions, see when an edition was created, who created it, the UNICOS revision under which the edition was created, and whether or not the edition was compressed to save space.

The following table shows a sample screen from Edition Management. The location is as follows:

```
UNICOS Installation / Configuration Menu System
.  Utilities
.  .  Configuration editions Utility
.  .  .  Edition Management
```

```

                                Edition Management
Edition file name                Description
----- >
E-> /etc/install/editions/ConfigEd_171  CREATED - Dec 10 12:23:41 CST
    /etc/install/editions/ConfigEd_172  CREATED - Dec 18 12:50:41 CST
    /etc/install/editions/ConfigEd_173  CREATED - Dec 27 17:33:12 CST
    /etc/install/editions/ConfigEd_174  CREATED - Dec 27 17:44:38 CST
    /etc/install/editions/ConfigEd_175  CREATED - Jan 6 14:06:21 CST 1
    /etc/install/editions/ConfigEd_176  CREATED - Jan 6 14:25:48 CST 1
    /etc/install/editions/ConfigEd_177  CREATED - Jan 6 14:33:30 CST 1
    /etc/install/editions/ConfigEd_178  CREATED - Jan 13 14:39:13 CST
    /etc/install/editions/ConfigEd_179  CREATED - Jan 13 14:47:38 CST
    /etc/install/editions/ConfigEd_180  CREATED - Jan 14 17:00:38 CST
    /etc/install/editions/ConfigEd_181  CREATED - Jan 28 12:17:39 CST
    /etc/install/editions/ConfigEd_182  CREATED - Jan 28 12:47:14 CST
    /etc/install/editions/ConfigEd_183  CREATED - Feb 11 09:44:03 CST
    /etc/install/editions/ConfigEd_184  CREATED - Feb 11 09:56:10 CST
    /etc/install/editions/ConfigEd_185  CREATED - Feb 20 10:35:49 CST
    /etc/install/editions/ConfigEd_186  CREATED - Feb 20 10:50:08 CST
    /etc/install/editions/ConfigEd_187  CREATED - Feb 27 07:58:36 CST
    /etc/install/editions/ConfigEd_188  CREATED - Feb 27 08:07:33 CST
    /etc/install/editions/ConfigEd_189  CREATED - Mar 6 11:03:12 CST 1
    /etc/install/editions/ConfigEd_190  CREATED - Mar 6 11:09:41 CST 1
    /etc/install/editions/ConfigEd_191  CREATED - Mar 6 13:52:13 CST 1
    /etc/install/editions/ConfigEd_192  CREATED - Mar 6 13:59:29 CST 1

Keys:  ^? Commands  H Help  Q Quit  W WhereAmI

Use the + and - keys to access other pages within this menu.
Record 1 of 37 Page 1 of 2

```

7.2.3.2 Edition Differences Menu

At times you may not remember the difference between an edition and a system's current configuration, or the difference between two editions created on the same day. The Edition differences menu provides a simple interface to perform either action. If you want to compare two editions, say 189 and 190, you can do so by setting the edition A to 189 and edition B to 190, and select the action Compare Edition A + Edition B ...:

```

                                Edition Differences
Edition A                        189
Edition B                        190
Compare file existence?         YES
File comparison command         cmp
File comparison options
Output file                      /tmp/diff.dat
Compare system and Edition A ...
A-> Compare Edition A and Edition B ...

Keys:  ^? Commands  Q Quit  W WhereAmI

```

The following is an example of performing an edition difference process:

```

Preparing data for analysis
Preparing work for configuration 189

Creating directory /tmp/Diff1_74491

Waiting for edition 189 to be de-archived \ cmd-1467 cpio: 3968 512-byte blocks.

Waiting for edition 189 disk structure to be attained |

Preparing work for configuration 190

Creating directory /tmp/Diff2_74491

Waiting for edition 190 to be de-archived \ cmd-1467 cpio: 3968 512-byte blocks.

Waiting for edition 189 disk structure to be attained |

Finding the differences between 190 and 189

Waiting to finish difference |

```

This is the difference between 190 and 189.

```

Comparing contents of edition '190' to edition '189'
-----

cmp between ./etc/config/config.mh in '/tmp/Diff2_74491' & '/tmp/Diff1_74491'
-----

/tmp/Diff2_74491/./etc/config/config.mh /tmp/Diff1_74491/./etc/config/config.mh differ:
char 38, line 2

cmp between ./etc/config/param in '/tmp/Diff2_74491' & '/tmp/Diff1_74491'
-----

/tmp/Diff2_74491/./etc/config/param /tmp/Diff1_74491/./etc/config/param differ:
char 30, line 1

cmp between ./etc/config/spnet.conf in '/tmp/Diff2_74491' & '/tmp/Diff1_74491'
-----

/tmp/Diff2_74491/./etc/config/spnet.conf /tmp/Diff1_74491/./etc/config/spnet.conf
differ: char 38, line 2

cmp between ./etc/config/text_tapeconfig in '/tmp/Diff2_74491' & '/tmp/Diff1_74491'
-----

```

7.2.3.3 Edition Extraction

At some point in the future you may wish to extract a file in a Configuration Edition archive. To do so, go to Configuration editions utility and then select Edition Extraction to start the extraction process.

```

UNICOS Installation / Configuration Menu System
. Utilities
. . Configuration editions utility

```

You will then see the following:

```

                                Edition Extraction
Destination directory
Edition from which to extract          1
Verbose?                               YES

Extract specific path names?          YES
M-> Path names to extract==>
Extract edition ...

Keys:  ^? Commands   Q Quit    W WhereAmI

```

Specify the `Destination directory`, which should be the top level of a root file system.

Specify the `Edition from which to extract` number. If you are unsure of the specific edition, you may want to see if there is a note in the `Edition Management` menu that will help you determine which edition to use for the extraction.

The `Verbose?` selection provides a lot of detail during the extraction process.

If you want to unarchive the entire edition archive, set `Extract specific path names?` to **NO**; otherwise, if you wish to specify the files that are extracted from an archive, set this selection to **YES**.

If you want to specify which files to extract, select `Path names to extract` to select the desired files.

Once you have finished selecting the edition and the files to be archived, select `Extract edition ...` to extract the select file(s) from the archive.

7.2.3.4 Edition Compression

To save space on your root file system, you may wish to compress various `Configuration` editions archives that you still want to keep. You can change the compression method by going to `Configuration Editions Preferences` and changing the following selections accordingly.

```

UNICOS Installation / Configuration Menu System
.  Preferences
.  .  Configuration Editions Preferences

```

The selection `Compression` command is the UNICOS command that will be used to compress the archive.

The selection `Uncompression` command is the UNICOS command that will be used to uncompress the archive during an Edition extraction action.

The selection `Compressed file suffix` is the UNICOS suffix that is used to make sure the compression/uncompression succeeds or fails.

After verifying that the preceding selections are set properly, go to Configuration editions utility.

```
UNICOS Installation / Configuration Menu System
. Utilities
. . Configuration editions utility
```

Select the `Edition compression` menu to select an edition(s) that you wish to compress/uncompress.

```
Configuration editions utility
Edition management ==>
Edition differences ==>
Edition extraction ==>
M-> Edition compression ==>

List output to named printer
List editions ...

Store complete system edition ...

Keys:  ^? Commands  Q Quit  W WhereAmI
```

By changing a specific edition's `Compress?` status, that edition will be compressed if set to **YES** when exiting the `Edition Compression` form.

7.2.3.5 Store a Complete System Edition

At various times you may wish to take a snapshot of the mainframe configuration that is being maintained by ICMS.

First, verify the files that will be contained in the edition are the ones you want. Go to the `Configuration Editions Preferences`.

```
UNICOS Installation / Configuration Menu System
. Preferences
. . Configuration Editions Preferences
```

Verify that the following selections are set accordingly:

- The selection `Store all config files in Editions?` makes sure that files that are maintained by ICMS are included in the edition archive. If you want to capture all files maintained by ICMS, set this selection to **YES**; otherwise, if you only want to capture the file that needs updating, set this selection to **NO**.
- The selection `Store device nodes in Editions?` includes all the devices in `/dev` in the edition archive. If you want to capture all the device nodes, set this selection to **YES**; otherwise, setting this selection to **NO** will **not** include the device nodes in the archive.
- The selection `Store menu system data in Editions?` includes all the ICMS database files in this archive if it is set to **YES**; otherwise, none of the ICMS database files will be included in the archive.

After you have verified the Configuration Editions Preferences, go to Configuration editions utility.

```
UNICOS Installation / Configuration Menu System
. Utilities
. . Configuration editions utility
```

Select the `Store complete system edition action` to create an up-to-date Configuration Edition archive:

```

                                Configuration editions utility
Edition management ==>
Edition differences ==>
Edition extraction ==>
Edition compression ==>

List output to named printer
List editions ...

A-> Store complete system edition ...

Keys:  ^? Commands  Q Quit  W WhereAmI
    
```

7.2.3.6 Configuration Editions Preferences

The menu Configuration Editions Preferences controls various options for the Configuration Edition utility and what happens during the Activation process.

The selection Create editions upon activation? creates an edition every time an activation is performed if its selection value is **YES**.

The Compress Configuration Editions? selection controls whether or not an edition is compressed automatically after being created. This can help reduce the amount of space taken up by Configuration Editions.

The Compression command and Uncompression command are the commands that should be used to compress or uncompress an edition respectively.

The Directory for Edition storage specifies the directory for which each new edition should be stored, while the Edition Prefix is the first part of the name for each new Edition created during an activation.

The Configuration Editions Preferences menu is located at:

```

UNICOS Installation / Configuration Menu System
.  Preferences
.  .  Configuration Editions Preferences
    
```


Configuration Editions Preferences	
S-> Create editions upon activation?	YES
Store all config files in Editions?	NO
Store device nodes in Editions?	YES
Store menu system data in Editions?	YES
Compress Configuration Editions?	NO
Compression command	pack
Uncompression command	unpack
Compressed file suffix	.z
Sys Admin label for compression	P
Directory for Edition storage	editions
Edition Prefix	ConfigEd
Keys: ^? Commands Q Quit W WhereAmI	

7.2.3.7 Configuration Edition Archive Format

A configuration edition contains the following files from the system's configuration or from the ICMS database, depending upon settings in the Configuration Editions Preferences menu.

- All files updated by the configuration generator, or all system configuration files maintained by settings in the Major Software Configuration portion of ICMS.

If Store all config files in Editions? is **YES**, then all system configuration files will be part of the configuration edition being created even if they were not created during this activation.

If Store all config files in Editions? is **NO**, then only system configuration files being changed by this activation will be archived in the edition being created.

- An entire copy of the /dev directory as it existed just after the activation. If Store device nodes in Editions? is **YES**, then all device nodes will be captured into the edition being created during this activation.
- The ICMS database (/etc/install/*.sav and /etc/install/cfdb/*.cfg) will be archived into an edition. If Store

menu system data in Editions? is **YES**, then all the ICMS database files will be part of the edition being created.

7.2.4 Log File

The menu system keeps a log file of actions, including any errors or problems, that is useful in tracking problems.

Within the X Window System interface, click on the `Utilities` option from the main menu and then click on `Inspect the installation log` to examine this file.

Within the `curses` interface, use the following menu sequence to examine this file:

```
UNICOS Installation / Configuration Menu System
.  Utilities
A->  Inspect the installation log
```

To examine the log file outside of the menu system, look at the `install.log` file in the `/etc/install` directory.

7.2.5 `chroot(8)` Capability

The menu system lets you escape to a `chroot(8)` shell when you are working out of an alternate root file system or subdirectory. (This feature cannot be used when you are in the active root's menu system, or when you are in ICMS read-only mode.) The `chroot` capability lets you work in the alternate root without interacting with (or overwriting) the active root. You must be the super user to enter a `chroot` environment .

```
UNICOS 10.0 Installation / Configuration Menu System
.  Utilities
.  .  Escape to a chroot shell ...
```

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