GL2-W3.5 Workstation Release Notes

Version 1.0

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GL2-W3.5 Workstation Release Notes
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GL2-W3.5 Workstation Release Notes

These release notes describe Software Release GL2-W3.5 for IRIS series 3000 workstations and IRIS series 2000 workstations with the Turbo Option upgrade. The six sections of this document cover these topics:

- Major enhancements

- Installing software updates and options

- Additions to graphics, systems, and options

- Changes to graphics, systems, and options

- Bug fixes to graphics, systems, and options

- Known problems

You will receive an update package for your *UNIX Programmer's Manual, Volumes IA and IB*. The introduction in this update lists all the commands that have changed, are new, or are obsolete with this software release.

1. Major Enhancements

The GL2-W3.5 workstation release provides these major enhancements:

- Complete TCP/IP implementation based on the 4.3 BSD implementation

- A new electronic mail implementation

- Graphics Library tutorial

- Network File System (NFS) option

- A new printing environment with support for these printers:

  - Apple LaserWriter

  - Mitsubishi G500 Color Printer/plotter

  - Versatec ECP42 Color Plotter

  - Tektronix 4692 Color Plotter

  - Seiko CH-5300 Color Printer

1.1 TCP/IP Implementation

Silicon Graphics, Inc. now supports 4.3 BSD TCP/IP, which is a kernel-based implementation. This replaces the Excelan-based TCP/IP that was offered in the GL2-W2.4, GL2-W3.4, GL2-T2.4, and GL2-T3.4 workstation and terminal software releases. TCP/IP is now the standard communication protocol for IRIS workstations and terminals. The TCP/IP kernel also supports the IEEE 488 and IBM communications options.

New features of TCP/IP include:

- Faster performance.

- Maintainable 4.3 BSD sockets.

- New user programs and configuration files including *arp*(1M), *ifconfig*(1M), *sendmail*(1M), *services*(4), and *ping*(1M).

- Network statistics through the *netstat* command.

- Ethernet 4.3 TCP/IP/UDP including gateways.

Changes in IRIS communication protocol:

- All customers ordering new IRIS systems will automatically receive Ethernet with TCP/IP.

- Customers may purchase XNS as an option. The XNS kernel also supports the IEEE 488 and IBM communications options. The IRIS can run Ethernet with TCP/IP or Ethernet with XNS, but not both simultaneously.

  Current customers with maintenance contracts running Ethernet with XNS will receive TCP/IP with the standard update and will receive XNS at no extra charge.

- Sun Microsystems, Inc.'s Network File System (NFS) has been modified to run on the IRIS and can be ordered as an option for the IRIS.

Features that are not supported:

- XNS and TCP/IP both running simultaneously on the same IRIS.

- BSD XNS (NETNS) protocols.

- AF_UNIX domain sockets.

- The *ud* network applications utility.

Certain demonstration programs, including *dog*, will not run on TCP/IP or NFS machines.

1.2 New Electronic Mail Implementation

The new electronic mail implementation uses UNIX System V.0 */bin/mail* and 4.3 BSD *sendmail* and *Mail*. See the *IRIS Communications Guide* for more information about setting up and using the new electronic mail system.

1.3 Graphics Library Tutorial

The new directory */usr/people/tutorial* contains the software programs that accompany me *IRIS Programming Tutorial*. See Section 2.4 of this document for the procedures for installing the tutorial.

The software together with the *IRIS Programming Tutorial* is a hands-on learning experience that will teach you how to write a simple graphics program in C. If you have the FORTRAN 77 option on your IRIS, you will also receive FORTRAN versions of the *IRIS Programming Tutorial* and software.

1.4 Network File System Option

If your IRIS 3020, IRIS 3030, IRIS 2400 Turbo, or IRIS 2500 Turbo is configured for Ethernet communication using the TCP/IP protocol, you can run Sun Microsystem's Network File System (NFS) on your workstation. You can run NFS on an IRIS only if you have Silicon Graphics, Inc.'s implementation of NFS. NFS allows file sharing in a heterogeneous environment of computers, operating systems, and networks. File sharing is accomplished by mounting a remote file system, then reading or writing files on the local system. You don't need to copy files from one computer to another, so you eliminate the possibility of having duplicate, conflicting copies of the same file throughout the your organization.

With the NFS option, you can also use Yellow Pages (YP), which is a distributed network lookup service containing network-wide databases. These databases control access to each machine on the network, easing system administration.

1.5 New Printing Options

Two new printing options are offered with this software release. You can print black-and-white text and images using the Apple LaserWriter connected to an IRIS serial port, or you can send color screen images to a color printer through a parallel interface with the IRIS.

With the Apple LaserWriter you can:

- Create high-quality text, using Documenter's Workbench software.

- Generate black-and-white, shaded images from the IRIS screen.

- Mix text and images, using Transcript software.

With any of the supported color printers, you can generate full-color screen images from the IRIS.

1.6 Documentation

You should receive the following documents as part of your GL2-W3.5 software update package:

Document Title	Part Number
GL2-W3.5 Release Notes	007-3204-010
IRIS Programming Tutorial, C Edition	007-1103-010
IRIS User's Guide, Version 3.0	007-1101-030
IRIS Series 3000 Owner's Guide, Version 2.0	007-5220-020
IRIS Communications Guide	007-0390-010
TCP/IP User's Guide, Version 2.0	007-0330-020
UNIX Volume I update package, Version 2.1	007-0101-021
UNIX Volume IIB, Version 2.0	007-0104-020

Depending on which options you have purchased, you may also receive these manuals:

Document Title	Part Number
NFS User's Guide	007-0350-010
IBM Terminal Emulation, Version 2.0	007-0340-020
IRIS FORTRAN Manual	007-0210-010
IRIS Programming Tutorial, FORTRAN Edition	007-1104-010
IRIS XNS User's Guide	007-0321-010
Using Your Laser Printer	007-6103-010
Documenter's Workbench Software User's Guide	007-0510-010
Documenter's Workbench Software Reference Manual	007-0511-010
Using Your Color Printer	007-6104-010

2. Installing Software Updates

If you have a new IRIS, you may not need to install the software – this version of the software may already be installed on the hard disk. These instructions are only for updating the software on an IRIS. Before installing updates, back up your user files onto tape and make sure you have a bootable back-up tape on hand.

NOTE
If you have a problem during the update procedure, resolve it before continuing. Failure to perform certain steps successfully can render the system unusable. If you encounter a problem that you cannot resolve, contact the toll-free Geometry Hotline at 800/345-0222 in California, 800/252-0222 elsewhere in the U.S., or 800/443-0222 from Canada.

2.1 Installing from Tape

The standard update tape contains all the UNIX utilities, the new TCP/IP kernel, the on-line manual pages, games, demonstration programs, the graphics library tutorial, new electronic mail, and gifts. Any options, such as XNS, NFS, Pascal, or FORTRAN 77 are on separate tapes. Install the new software in two passes. In the first pass install the standard update; in the second pass install the options and compile the programming tutorial.

The basic procedure assumes that only one machine is involved. If the tape drive is on a remote machine to be accessed using TCP/IP or XNS, go directly to Section 2.3, "Installing over the Network". TCP/IP is the standard communication kernel for this software release. XNS can be purchased as an option.

CAUTION
Before you begin the installation, make sure you are the only person logged onto the IRIS. It is also important that no other users are on the IRIS during the installation, and that you can do the entire installation without interruption in one pass. If you interrupt the installation procedure, or if you do not follow the installation instructions, you may leave the IRIS in a state that requires recovery from backup tapes.

1. Log in as *root* and make sure no one else is on the IRIS:

        IRIS login: root
        who

    The *who* command should report that *root* is the only user on the IRIS. Check the consistency of the file system:

        single
        fsck

    Correct any problems reported by *fsck* before proceeding.

2. Put the IRIS in multi-user mode and log in as *root*:

        multi
        IRIS login: root

3. Change your working directory to the *root* directory:

        cd /

4. If there is an old copy of the distribution directory present, remove it:

   ```
   rm -rf dist
   ```

5. Put the standard distribution tape in the tape drive and retension it.

   ```
   mt rewind
   mt retension
   ```

   Wait a few minutes for the tape to finish rewinding. You know it is rewound when the tape drive stops whirring.

6. Read in the distribution tools with *cpio*:

   ```
   cpio -ivhmud1
   ```

7. To see the names of the entries on tape, use the *cat* command to examine the table of contents file *toc*:

   ```
   cat /dist/toc
   ```

   To find out what each entry name means, examine the description file *desc*:

   ```
   cat /dist/desc
   ```

   Most of the distribution tools accept an *entryname* argument that determines which of the entries listed in *toc* will be processed. If you are concerned about using disk space for entries that you don't really need (e.g., the *games* entries), then you should install only the entries that you want by using the *entryname* argument.

   To process all of the entries listed in *toc*, omit the *entryname* argument To process a subset of the available entries, list the entry names as the *entryname* argument, in the same order as they are given in the *toc* file.

8. Check the disk space to ensure that the new entries will fit on
    the disk. To do this, use the *Spchk* and *df* commands. *Spchk*
    reports the disk usage of a single entry if it is given the
    entryname of the entry. *Spchk* with no arguments reports the
    projected disk usage of all the entries in *toc*.

    ```
    /dist/Spchk        or       /dist/Spchk entryname
    ```

    The *Spchk* command reports the projected change in disk usage
    for each file system (/ and */usr*) as plus or minus some number
    of disk blocks.

    If the number of disk blocks reported by *Spchk* is positive,
    compare the increase with the number of available blocks
    reported by the df command:

    ```
    df
    ```

    Remember that the increase projected by *Spchk* is approximate,
    so be generous – allow 300-500 extra blocks if possible. The
    following table shows which entries will take up space on *root*
    (/) and which ones will take up space on */usr*:

Entry	Location
upd	/ and /usr
man	/usr
games	/usr
demos	/usr
gifts	/usr
gltut	/usr
mail	/ and /usr

    If there are not enough free blocks on */usr*, back up some user
    files to tape and delete them from the disk. If there are not
    enough free blocks on *root*, you may want to delete all the files
    in */lost+found* or in */tmp*. If you have the IBM or IEEE 488
    options, you can remove */kernels/3000.488* and
    /kernels/3000.ibm to make room for the new software. When
    you have installed the software, you can reorganize the disk to

make room for restoring the files that you deleted. (See Chapter 6 of the *IRIS Series 3000 Owner's Guide*.)

Remember that the disk is divided into *root* and *usr* file systems. If the space problem is on */usr*, for example, only deleting files from */usr* will help.

9. Read in the entries from the tape:

    `/dist/Read -v`   or   `/dist/Read -v` *entryname*

    The verbose (**–v**) option gives you feedback while the command progresses. This procedure takes approximately 30 minutes to complete.

10. Perform the installation details:

    `/dist/Install`   or   `/dist/Install` *entryname*

    This command indicates its progress and the names of the affected files. As the *Install* command runs, it reports the names of updated configuration files. The old configuration files are saved under a different name, i.e., with a trailing equal sign (=), and are replaced by the new configuration files.

    While you are running the *Install* command, you may receive a message indicating that you need to run the *Install -cleanup* command after the system is rebooted. Do not reboot until you have completed steps 11 and 12.

11. After the *Install* command is finished, use the *diff* command to compare the changes made to configuration files with this update. Compare the files with a trailing equal sign (=) to the same files without the trailing equal sign to determine what information you need to keep in the new version of the file.

    This is particularly important if you were running TCP/IP on your workstation and have now updated to the new TCP/IP kernel. You will want to use the information in the "old" files */etc/rc.tcp*,   */etc/inittab*,   */etc/hosts*,   */etc/hosts.equiv*,   and */etc/group*.

Here is a list of the files that probably have your local or customized information in them:

/.cshrc	*/etc/ttytype*
/.profile	*/usr/lib/crontab*
/.login	*/usr/lib/aliases*
/etc/TZ	*/usr/lib/uucp/USERFILE*
/etc/bcheckrc	*/usr/lib/uucp/L-dialcodes*
/etc/brc	*/usr/lib/uucp/L.cmds*
/etc/cshrc	*/etc/hosts*
/etc/gettydefs	*/etc/hosts.equiv*
/etc/group	*/etc/networks*
/etc/inittab	*/etc/rc.tcp*
/etc/ioctl.syscon	*/etc/rebootrc*
/etc/powerfail	*/etc/termcap*
/etc/profile	*/usr/lib/uucp/L.sys*
/etc/rc	*/usr/lib/uucp/L-devices*
/etc/rc.s0	

For example, to compare */etc/bcheckrc=* to */etc/bcheckrc*, issue these commands:

```
cd /etc
diff bcheckrc bcheckrc=
```

Transfer site-specific information from the old files to the new files. Do not substitute any old files for the new ones (e.g., by using the *mv* command); only the new files are compatible with the update.

The new configuration file */etc/fstab* replaces the files */etc/checklist* and */etc/rc.fs*. You may have to edit *fstab* to describe the file systems and swapping partitions used by your IRIS. *fstab* describes what file systems are mounted on which partitions of the hard disk, and what names are associated with the partitions.

For example, */etc/fstab* on an IRIS 3030 will look like this:

```
/dev/si0a / efs rw,raw=/dev/rsi0a 0 0
/dev/si0f /usr efs rw,raw=/dev/rsi0f 0 0
```

If your IRIS has two disks, and your second disk is mounted as **/d**, the file */etc/fstab* looks like this:

```
/dev/si0a / efs rw,raw=/dev/rsi0a 0 0
/dev/si0f /usr efs rw,raw=/dev/rsi0f 0 0
/dev/si0q /d efs rw,raw=/dev/rsi0q 0 0
```

12. Before you reboot the IRIS, make sure that the critical files have been installed with the *Verify* command:

```
/dist/Verify
```

The *Verify* command will give you a message that all the critical files are in place and that you can reboot the IRIS. If you need assistance correcting problems that *Verify* reports, call the Geometry Hotline.

13. Reboot the system and log in as root:

```
reboot
iris> b
multi
(if prompted, enter the model of your IRIS)
IRIS login: root
```

14. If you were instructed to do so (see step 10), perform the installation cleanup details:

```
/dist/Install -cleanup
```

Read the message displayed on your screen after the */dist/Install -cleanup* step. It will tell you which configuration files were installed. This message will also tell you if you should run */dist/Install* again. If so, go to step 10 and repeat instructions 10 through 14.

15. If you are not installing the XNS communications option delete the old XNS software by typing:

```
/dist/Remove xns
```

If you purchased the XNS communications option, you do not need to delete the old XNS software because the new version overwrites the old version.

16. Delete the distribution directory:

```
rm -rf /dist
```

17. Remove the standard distribution tape from the tape drive. If you want to use the tutorial now, go to Section 2.4.

2.2 Installing the Options

You may now install any options you purchased. Each option is on a separate tape. You will not have a separate tape for the IEEE 488 or IBM communications options. These are included in the TCP/IP and XNS kernels.

For each option you install, insert the tape in the tape drive and repeat steps 2 through 12 of Section 2.1. When you are finished installing all the options, follow the steps below.

1. Specify which kernel you want as *defaultboot* and reboot the system:

```
kernel tcp or kernel xns or kernel nfs
reboot
iris> b
multi
```

2. Log in as root

3. Perform the installation cleanup details:

    ```
    /dist/Install -cleanup
    ```

4. Delete the distribution directory:

    ```
    rm -rf /dist
    ```

5. If you deleted user files to make room on the disk, restore them. See the manual pages for *tar*(1) or *cpio*(1) for information on how to restore the files.

If you want to use the tutorial now, go to Section 2.4.

2.3 Installing over the Network

If you are installing the distribution on a workstation that does not have a tape drive, use a remote workstation with a tape drive and either the TCP/IP or XNS network protocol.

If you are using XNS protocol, you must install the XNS option **before** you install the standard software update. If you are using TCP/IP protocol, install the standard update first, then install the options.

In the following instructions, *remote* refers to the IRIS that has a tape drive, and *local* refers to the IRIS that does not have a tape drive.

1. Log in as *root* on the remote IRIS. Make sure the IRIS is in multi-user mode:

    IRIS login: `root`
    `multi`

2. Change your working directory to the *root* directory:

    ```
    cd /
    ```

3. If there is an old copy of the distribution directory present, remove it:

        rm -rf dist

4. Put the tape in the tape drive and retension it.

   TCP/IP users: use the standard distribution tape for this step on the first pass

   XNS users: use the XNS option tape for this step on the first pass

        mt rewind

   If you get an error message that says, "qic0:no cartridge in drive" or "/dev/rmt2:I/O error", ignore it and type:

        mt retension

   Wait a couple of minutes for the tape to finish rewinding.

5. Read in the distribution tools with *cpio*:

        cpio -ivhmud1

6. Log in as *root* on the local IRIS and make sure no one else is on the local IRIS:

        IRIS login: root
        who

   The *who* command should report that *root* is the only user on the IRIS.

7. Check the consistency of the file system:

    ```
    single
    ```
    (it takes about 30 seconds for the INIT: SINGLE USER MODE
    prompt to come up)
    ```
    fsck
    ```

    Put the IRIS in multi-user mode before proceeding:

    ```
    multi
    ```

    If you get a login prompt, log in as *root*.

8. Change your working directory to the *root* directory:

    ```
    cd /
    ```

9. If there is an old copy of the distribution directory present,
    remove it:

    ```
    rm -rf dist
    ```

10. Copy the distribution tools onto the local IRIS using these
    commands (remote is the name of the IRIS with the tape drive):

    for TCP/IP users:

    ```
    cd /
    rcp -r remote.guest:/dist .
    ```

    for XNS users:

    ```
    cd /
    xcp -r remote:/dist .
    ```

11. To see the names of the entries on tape use the *cat* command to
    examine the table of contents file *toc*:

    ```
    cat /dist/toc
    ```

To find out what each entry name means, examine the description file *desc*:

```
cat /dist/desc
```

Most of the distribution tools accept an *entryname* argument that determines which of the entries listed in *toc* will be processed. (If you are installing the software using XNS protocol, remember to use *xns* as the *entryname* option for the next steps.)

To process all of the entries listed in *toc*, omit the *entryname* argument. To process a subset of the available entries, list the entry names as the *entryname* argument, in the same order as they are given in the *toc* file.

12. Check the disk space to ensure that the new entries will fit on the disk. To do this, use the *Spchk* and *df* commands. *Spchk* reports the disk usage of a single entry if it is used with the *entryname* of the entry. *Spchk* used by itself reports the projected disk usage of all the entries in *toc*.

```
/dist/Spchk      or      /dist/Spchk entryname
```

The *Spchk* command reports the projected change in disk usage for each file system (/ and */usr*) as plus or minus some number of disk blocks.

If the number of disk blocks reported by *Spchk* is positive, compare the increase with the number of available blocks reported by the *df* command:

```
df
```

Remember that the increase projected by *Spchk* is approximate, so be generous — allow 300-500 extra blocks if possible.

See step 8 in "Installing from Tape" for more information about the entries and where they are installed on the IRIS.

13. Issue the *Read* command with the **–x** or **–t** option. This option tells the *Read* command the protocol and the name of the remote machine.

    for TCP/IP users:

        /dist/Read -t *remote entryname*

    for XNS users:

        /dist/Read -x *remote entryname*

    This procedure takes approximately 30 minutes to complete.

14. On the local IRIS, perform the installation details:

        /dist/Install   or   /dist/Install *entryname*

    While you are running the *Install* command, you may receive a message indicating that you need to run the *Install -cleanup* command after you reboot the system. Do not reboot until you have completed steps 15 and 16 below.

    See step 11 of "Installing from Tape" for more information on which configuration files you will want to look at for saving local or customized information.

15. After the *Install* command is finished, use the *diff* command to compare old files to the new ones. This is particularly important if you were running TCP/IP on your workstation and have now updated to the new TCP/IP kernel. You will want to use the information in the "old" files */etc/rc.tcp*, */etc/inittab*, */etc/hosts*, */etc/hosts.equiv*, and */etc/group*.

    For example, to compare */etc/bcheckrc=* to */etc/bcheckrc*, issue these commands:

        cd /etc
        diff bcheckrc bcheckrc=

Transfer site-specific information from the old files to the new files. Do not substitute any old files for the new ones (e.g., by using the *mv* command); the new files are compatible with the update.

16. Verify that certain critical files (see "UNIX Configuration Files" in the *IRIS Series 3000 Owner's Guide*) are present before you reboot the system. The command *Verify* performs an incomplete check, but does catch some of the more significant problems. You will get a message that all the critical files are in place if there are no problems. If any of these problems exist, you must correct them before the system is rebooted.

Failure to do so may make it impossible to bring the system back up again. To verify that the critical files are present, type:

```
/dist/Verify
```

If you need assistance correcting problems that *Verify* reports, call the Geometry Hotline.

for XNS users:

Verify may report that the files */etc/rc.s0* and */etc/rc.tcp* are missing. You may ignore this message, because these files are not required for running the XNS protocol.

17. Reboot the system and log in as *root*:

    for TCP/IP users:

    ```
    kernel tcp
    reboot
    ```
    iris> b
    ```
    multi
    ```
    (if prompted, enter the model number of your IRIS)
    IRIS login: root

    for XNS users:

    ```
    kernel xns
    reboot
    ```
    iris> b
    ```
    multi
    ```
    (if prompted, enter the model number of your IRIS)
    IRIS login: root

18. If you were instructed to do so (see step 14), perform the installation cleanup details:

    ```
    /dist/Install -cleanup
    ```

    Read the message displayed on your screen after the */dist/lnstall -cleanup* step. It will tell you which configuration files were installed. This message will also tell you if the installation was done properly or if you should run */dist/lnstall* again. If so, go to step 10 and repeat instructions 10 through 14.

19. If you are installing the update using XNS protocol, install the standard update first by repeating steps 1–18 with the standard update tape, then install any other options you may have by repeating steps 1–18 with the option tapes.

    If you are installing the update with TCP/IP protocol, you may now install any options you have by repeating steps 1–18 with each option tape.

20. If you are not installing the XNS communications option, delete the old XNS software by typing:

```
/dist/Remove xns
```

If you purchased the XNS communications option, you do not need to delete the old XNS software because the new version overwrites the old version.

21. Delete the distribution directory:

```
rm -rf /dist
```

22. Remove the tape from the tape drive.

2.4 Compiling Your IRIS Programming Tutorial

You need to compile the software that accompanies the *IRIS Programming Tutorial* before you use it The tutorial software uses 5 megabytes of disk space in */usr* after it is compiled. If you have a new IRIS, you do not need to add the special *tutor* account in the */etc/passwd* file. If you are updating the software on your IRIS, you must add a special account for the tutorial software.

2.4.1 Compiling the Tutorial in C

Follow these steps to add an account called *tutor* to the */etc/passwd* file and compile the software for the IRIS programming tutorial:

1. Log in as *root*.

2. At the end of the *passwd* file in the *etc* directory, add this line:

    (Note: this is actually one line)

    ```
    tutor::993:997:Tutorial User:
    /usr/people/tutorial/c.graphics:/bin/csh
    ```

3. Log out, and log in as *tutor*:

    ```
    logout
    login: tutor
    ```

4. You are now in the */usr/people/tulorial/c.graphics* directory. To set up the directory, type:

    ```
    make clean
    ```

5. To compile and install the software, type:

    ```
    make install
    ```

6. If you want to use the tutorial right now, type:

```
source .login
```

The C software for the *IRIS Programming Tutorial* is now installed.

2.4.2 Compiling the Tutorial in FORTRAN

If you have the FORTRAN 77 option, the FORTRAN tutorial software resides in a new directory called */usr/people/tulorial/f.graphics*.

To complete the installation of the IRIS Programming Tutorial, you need to add a special account called *tutorf*, and compile the tutorial programs.

1. Log in as *root*.

2. At the end of the *passwd* file in the *etc* directory, add this line:

    (Note: this is actually one line)

    ```
    tutorf::994:997:Tutorial User:
    /usr/people/tutorial/f.graphics:/bin/csh
    ```

3. Log out, and log in as *tutorf*:

    ```
    logout
    login: tutorf
    ```

4. You are now in the */usr/people/tulorial/f.graphics* directory. To set up the directory, type:

    ```
    make clean
    ```

5. To compile and install the software, type:

    ```
    make install
    ```

6.   If you want to use the tutorial right now, type:

```
source .login
```

The FORTRAN software for the *IRIS Programming Tutorial* is now completely installed.

3. Additions

This section lists additions since the GL2-W3.4 software release.

3.1 System Additions

Item	Description
cc(1)	The variable class "signed" has been added to the C language on the IRIS in compliance with the ANSI C standard. This means you can declare variables as signed *char*, *int*, *long*, or *short*. If you use the identifier "signed" in your program, you must change it to another name, or your program will not compile.
/etc/rc.local	You can customize your machine initialization procedures by putting local start-up commands or daemons in this file instead of */etc/rc*. This file will not change with each software update. */etc/rc* runs */etc/rc.local* every time you put the IRIS in multi-user mode.
fstab(4)	The file */etc/fstab* describes the file systems and swapping partitions used by the local IRIS. The system administrator can change *fstab* with a text editor. *fstab* is read by commands that mount, unmount, dump, restore, and check the consistency of file systems. *fstab* encompasses the files */etc/checklist* and */etc/rc.fs* used in previous IRIS software releases.

gethostident(3)	*gethostident* returns the unique identifier for the given processor. It is provided to support software protection schemes.
IBM	Support for the IBM communications option is included in the TCP/IP and XNS kernels.
IEEE 488	Support for the *IEEE 488* communications option is included in the TCP/IP and XNS kernels.
KERMIT	KERMIT is a public-domain file transfer program for transferring files between computers. The program is located in the directory */usr/people/gifts/kermit*. Please be sure to read or print out the "README" file for copyright information and a more complete description of KERMIT. Silicon Graphics, Inc. does not actively support KERMIT, even though it is distributed as part of the */usr/people/gifts* software.
mtio(7)	Tapes with VAX byte ordering can now be read and written through the special device files */dev/bsrmt3* and */dev/bsrmt4*.
sendmail(1M)	The program *sendmail* sends messages to one or more recipients over the internet. This program is case insensitive, so avoid using capital letters in user names and host names. If you must use capital letters, include a lowercase alias in the files */usr/lib/aliases* and */etc/hosts*.
sginap(2)	The *sginap* system call is a timed sleep and processor yield function. You can change the priority of a process or suspend a process with *sginap*.

3.2 Graphics Additions

Item	Description
scrsave	This routine replaced `capture` and `rcapture`. See the "Changes" section for detailed information on scrsave.
scrsav	This routine replaced `captu` and `rcaptu`. See the "Changes" section for detailed information on scrsav.
textcolors(1G)	*textcolors* sets the color index to be used for printed text, the background, highlighted text, and the cursor.

4. Changes

This section lists changes since the GL2-W3.4 software release.

4.1 System Changes

Item	Description
adb(1)	The sizes of the symbol tables have been increased in *adb*.
as(1)	The assembler *as* no longer optimizes the **jsr** instruction. It is now a constant length. The **jbsr** and **bsr** instructions are still subjected to span optimization.
capture(1G)	*capture*(1G) has been replaced with *capture*(1W). *capture*(1G) was used to create a representation of the IRIS screen and put it into the file *dest* in a format compatible only with a Tektronix 4692 color printer.
capture(1W)	*capture*(1W) creates a representation of the IRIS screen and puts it into the file *dest* in a format compatible with all printers the IRIS supports.
cc(1)	The C compiler now generates in-line integer multiply and divide instructions. The sizes of the symbol tables have been increased in the C compiler.

colord(1M)	*colord* is now obsolete. To send images to a color printer, see the manual *Using Your Color Printer*, if you have the optional color printer driver.
configuration files	The following configuration files have changed and may require more changes specific to the local user's environment:
	/usr/lib/crontab - various TCP/IP commands have been added, it deletes temporary files, and it gives the date when executed.
	/etc/group - group 4 is now reserved for *mail*.
	/.login and */.profile* - */usr/etc* has been added to the search path, and the directory contains various TCP/IP and NFS commands.
cpp(1)	The maximum number of include directories for *cpp* has been increased from 8 to 16.
Emacs option	The Emacs option is located in the */usr* tree. In previous releases it was located in the */usr/local* tree.
/etc/ttytype	The entries in */etc/ttytype* for terminal lines *ttyT0* through *ttyT7* are obsolete and can be removed. You may leave these entries in */etc/ttytype*, but they are used only by the GL2-W3.4 software version of TCP/IP.
f77(1)	The FORTRAN compiler now interprets backslashes (\) as special characters in character strings. For example, the string "fo\o" causes an error or causes unexpected results. In order to insert a single backslash in a string, you must double the backslash, i.e., "fo\\o".
	The maximum number of continuation lines has been increased from 19 to 100.

The runtime checks imposed on character substring operations have been relaxed.

Options to initialize local variables to zero upon subroutine entry and to insert a SAVE statement at the entry to each subroutine have been added.

An option has been added to use a less efficient but more precise hardware floating-point division algorithm.

A command-line option which performs the same function as the in-line option $F66DO has been added.

Character constants may be delimited by matching single or double quotes.

A special syntax has been added to specify integer constants in data statements in either octal or hexadecimal radix.

The record length of internal files has been increased from 512 to 4096.

language tools

A number of language tools have larger internal table sizes.

mkf2c(1)

An option has been added to the programs *mkf2c* and *mkc2f* to allow full 31-character entrypoint names. In support of this option, when *mkf2c* is invoked by *make*, it is passed the contents of the make variable F2CFLAGS. Similarly, *make* passes *mkc2f* the contents of the make variable C2FFLAGS. (See the manual page *mkf2c*(1).)

phys(2)	The *phys*(2) command has been replaced by the *ip2mapio*, *ip2mapmem*, and *ip2unmap* system calls. For more information, see the manual page *ip2mapio*(2). Be aware that this system call is very hardware dependent and will not be supported in future products.
ranlib(1)	The sizes of symbol tables have been increased in *ranlib*.
read(2)	The *read* system call cannot be used to read the contents of a directory in an NFS file system. Programs that need to read directories must be converted to use the *directory*(3) routines if they need to function on NFS file systems. Programs that read directories as files will still work properly on local file systems. Refer to the *directory*(3) manual page and the *NFS User's Guide* for more information.
rc.tcp(1M)	*rwho* is the TCP/IP version of the UNIX command *who*. Small networks can use rwho, but if there are more than 20 IRIS workstations on a network, it can become saturated. You may want to disable *rwho* by following the instructions in the file */etc/rc.tcp*.
rc.xns(1M)	The file *rc.xns* can be changed by the system administrator to disallow certain network operations. See the *xnsd*(1M) manual page.
sag(1G)	The program *sag* is no longer supported.
sar(1), *sar*(1M)	The programs *sar*(1) and *sar*(1M) are no longer supported.
serial ports	There is a new serial I/O package in this software release that fixes many previous baud rate and flow control problems.

system(3S)	The *system* function will now return the error code from the *fork*(2) function.
timex(1)	The program *timex* is no longer supported.
TCP/IP	All the TCP/IP programs and related programs (for example, *ftp*(1C) and *telnet*(1C)) are UNIX 4.3 BSD compatible, and many bugs in the related programs have been fixed.
	Sample entries for TCP/IP communication were added to the files */usr/lib/uucp/L.sys* and */usr/lib/uucp/L-devices*.
wsiris(1C)	The parity bit generated by the host is now ignored when using serial communications with the Remote Graphics Library (except when in fast mode).
xnsd(1M)	The start-up message for *xnsd*(1M) is now more explicit.

4.2 Graphics Changes

capture

The Graphics Library routines capture, rcapture, captur, and rcaptur are no longer used to produce screen images for a file or hard copy device. . Use the routines scrsave and scrsav to create hard copies of IRIS screen images. If you are already using capture or rcapture in your programs, when you recompile or relink under the GL2-W3.5 software, you will not get errors until run time. At that time, you will get an error message suggesting that you use scrsave.

scrsave

The routines scrsave and scrsav save a rectangular region of the IRIS into an image file that can be printed with the *lp* command. The IRIS can be in RGB, single-buffer, or double-buffer mode. If the IRIS is in double-buffer mode, scrsave saves the information from the back buffer. scrsave is a *libimage.a* routine, and is located in */usr/people/gifts/mextools/imglib*. You must *make* the library before you use it, because it is in *gifts*. Here is a command description of scrsave:

C version

scrsave(name,cmap,left,right,bottom,top)
char *name;
long cmap;
Screencoord left,right,bottom,top;

FORTRAN version

scrsav(name,len,cmap,left,right,bottom,top)
char *name;
long len;
long cmap;
Screencoord left,right,bottom,top;

The definitions of the arguments are:

name – the file name used to store the information. If "name" is not specified, the generated file name will be named "image.rgb" if it is generated in RGB mode, and "image.sc" if it is generated in colormap mode.

len – the number of characters in "name" (FORTRAN only).

cmap – a Boolean, used to designate the name of the generated file. If it is non-zero, the file name will be generated as "name" with a suffix of ".map" .

left, right, bottom, top – these are the screen coordinates that specify the rectangle to save.

After you create an image file (and its map file), use the lp command to send it to a printer. For example, if you create a file called "myimage" while you were in colormap mode, to print it, type:

```
lp myimage myimage.map
```

select

The `select` routine in the Graphics Library has been renamed to `gselect` in this software release. For this release it is also present in the Graphics Library under its original name, but the `select` entry point will be removed in the next software update.

The change was made because there is a system call named *select*(2) in the new TCP/IP version of the operating system. Refer to the manual page *select*(2) for more information about the select system call. If you want to reference both routines from the same program, you must rename your reference to the graphics call to `gselect` and then make sure that library */usr/lib/libbsd.a* appears in the list of files to link *before* the Graphics Library. This is necessary in order to link the *select* system call instead of the `select` compatibility routine in the Graphics Library. Here is an example of this link command:

```
% cc <program.c> -lbsd -Zg
```

5. Bug Fixes

These sections list bugs fixed in graphics and systems software since the GL2-W3.4 software release.

5.1 Systems Bug Fixes

This section lists bug fixes to UNIX, FORTRAN 77, the C compiler, TCP/IP, and the disk and tape drivers since the GL2-W3.4 software release.

Bug	Description
adb(1)	Single-stepping over the less common forms of the **jsr** instruction no longer dumps core.
booting	An IRIS with a disconnected Ethernet board will now boot.
cc(1)	Three bugs have been fixed in the C compiler which caused incorrect code to be generated for some complex floating-point expressions, usually involving comparison. These may have caused a compiler abort with the message "faulty register move".
dbx(1)	Several bugs in *dbx* have been fixed.
drand48(3C)	The declaration for *drand48* is now included in */usr/include/math.h*.

f77(1)	The FORTRAN compiler now recognizes the FHALT intrinsic.
	A bug that caused raising complex zero to an integral power to give incorrect results has been fixed.
getty(1M)	Request to send (RTS) and *data terminal ready* (DTR) now become inactive when the *getty* for the port is killed.
gettydefs(4)	*gettydefs* no longer enters a loop when selecting baud rates.
make(1)	*make* can now handle very large Makefiles.
mkfs(1M)	The routine *mkfs*(1M) now zeros out root directory data blocks that it creates.
printing	A printer connected to `port 2` using *XON/XOFF* protocol no longer stops printing when you open another window with *mex*(1G).
rmail(1)	*rmail* now delivers mail when executed remotely.
RGL serial communications	The parity bit generated by the host is now ignored when using serial communications with the RGL (except when in fast mode).
tar(1)	*tar* can now write multi-volume 1/2" tapes.
TCP/IP	All the TCP/IP programs and related programs are UNIX 4.3 BSD compatible, and many bugs have been fixed.

5.2 Graphics Bug Fixes

This section lists graphics bugs fixed since the GL2-W3.4 release.

Bug	Description
fast immediate mode macros	The file */usr/include/gl2/glerro.h* is now included in */usr/include/gl2/fastimmed.h* so that the programs that access the fast immediate mode macros will now load.
getmem()	getmem() now returns the correct value for the amount of memory left on the IRIS.
gexit()	gexit now flushes communication buffers for ⌞port 4⌟ (*ttyd3*).
greset()	The default cursor writemask set now enables writing into all bitplanes instead of just the lowest order one.
objdelete()	After using objdelete() and reopening the object for editing, you can now put commands into the empty space.

6. Known Problems

This list contains known problems with this release and, where possible, suggested work-arounds.

Bug	Description
cc(1)	When you use hardware floating point, autoincrementation and decrementation of pointers to floats is performed incorrectly if the pointer is declared as *register*. A simple work-around is to remove the register declaration.
	Autoincrementing or autodecrementing bitfields passed as parameters does not work correctly. Alter the bitfield outside of the argument list.
check(1)	*check* −1 [rcsdir] does not work.
ci(1)	*ci* will not let you interrupt out of a check-in when performing a check-in on more than one file.
ctype(3C)	The macro *isascii*() does not function properly for values outside the range −127 ... 255.
cu(1C)	The BREAK key will cause *cu* to hang.

dbx(1)	Given the command print p+1 where p is a pointer, you will get literal p+1 rather than p + 1 * sizeof(p).
	Tracing multi-dimensional array elements in a FORTRAN program is not possible. See the *dbx*(1) manual page for more information on bugs.
diff(1)	When comparing files, *diff* ignores incomplete fragments of lines at the end of either file. All the characters between the last line feed and the end of the file are ignored. This means that *diff* occasionally gives false information that differing files are identical.
dog(1D)	The demonstration program *dog* will not work on an IRIS running TCP/IP or NFS.
DSD controller	Swapping the DSD controller for a Storager on a 2400T or a 3020 and adding an ESDI disk causes device name linking problems, since */etc/model* is used to determine the controller type, but there is no longer a correlation between the model number and the controller type.
exp(3M)	The math function **pow**() will give incorrect results if the base is negative.
f77(1)	FORTRAN code compiled with the **–Zf** option expects the result of a real function to be on the FPA board. If you use FORTRAN real functions make sure that both the function and the caller use the same medium for floating point (either hardware or software).
	FORTRAN leading zeros will not print on a formatted real write statement.

floppy incompatibility   A floppy disk formatted on a 3030 is not readable on a 3010 or 3020. A floppy disk formatted on a 3010, however, is readable and writable on a 3030 or 3020. To transfer information via floppy disk from a 3030 to a 3010 or 3020, format the floppy disk on the 3010, then write to it on the 3030 or 3020. Information can also be transferred from a 3030 to a 3010 or 3020 over a network, and then be saved to a floppy disk on the 3010 or 3020.

font RAM   When large fonts are repeatedly defined and deleted, the space in the font RAM is sometimes not cleaned up correctly, and a font cannot be defined correctly, even though there ought to be enough space to hold it.

ftp(1C)   The *ftp* function **mput** transfers only two files at a time from a local host to a remote host.

getpwent(3C)   The declarations of the return values of the functions described in *getpwent* are missing from "<pwd.h>".

lines   Wide lines do not work correctly in depth cue mode.

man(1)   If you interrupt the output of the *man* command by typing "q" in response to the "--More--" prompt, the "cat" version of the manual page will be truncated at that point if it didn't already exist. Future attempts to display that manual entry will stop at the same point.

The work-around is to delete the "cat" image of the manual entry. The commands to delete all of the "cat" images are:

```
cd /usr/man/u_man
rm cat?/*
cd /usr/man/a_man
rm cat?/*
```

If you want to be more selective in your deletes, use *whereis*(1) to find the pathname of the *nroff* source for the manual entry, then substitute "cat*n*" for "man*n*" in the pathname and append ".z" to designate the corresponding "cat" image file to delete. Here is an example:

```
% whereis cp
cp: /bin/cp /usr/man/u_man/man1/cp.1
% rm /usr/man/u_man/cat1/cp.1.z
```

mex(1G)

The `textcolor()` and `pagecolor()` commands do not work correctly under *mex*. Sometimes the color of the wrong textport is changed, and sometimes the commands appear to have no effect

pc(1)

Pascal double precision will not work when compiled with **–Zf**.

Pascal Graphics Library

The Graphics Library commands `readRGB()` and `writeRBG()` do not work in the Pascal version of the Graphics Library.

A Pascal program cannot be used to generate pictures on the color printer.

picking

Picking sometimes fails when objects are nested to a depth of more than six or seven.

tar(1)	Multi-volume backup with *tar* will not work with 1/4" tapes.
termcap(4)	The "vt100" *termcap* entry does not work very well with some vt100 emulator terminals.
tset(1)	When using the Bourne shell, the **–S** option produces the same output as **–s**.
xx(1C)	When you *xlogin* to a remote workstation you must type "~." (tilde dot) after logging out to be disconnected if you have a process running in the background.