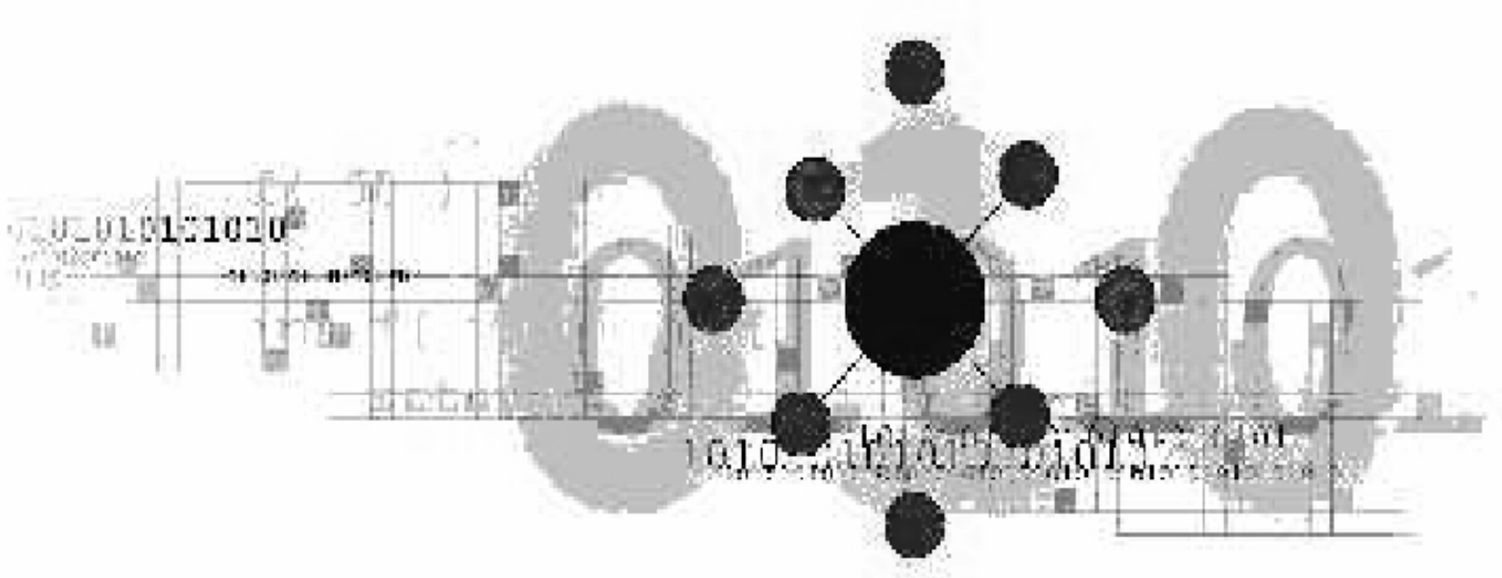
IRIX® 6.5.16 Update Guide



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Dear Valued Customer,

SGI® is pleased to present the new IRIX® 6.5.16 maintenance and feature release. Starting with IRIX® 6.5, SGI created a new software upgrade strategy, which delivers both the maintenance (6.5.16m) and feature (6.5.16f) streams. This upgrade is part of a family of releases that periodically enhances IRIX 6.5.

There are several benefits to this release strategy: it provides periodic fixes to IRIX, it assists in managing upgrades, and it supports all platforms. Additional information on this strategy and how it affects you is included in the updated *Installation Instructions* manual contained in this package. If you need assistance, please visit the Supportfolio™ Online Web site at `http://support.sgi.com` or contact your local support provider.

In conjunction with the release of IRIX® 6.5.15, SGI added to the existing life cycle management categories the Limited Support Mode that customizes services we deliver to our users. This new support mode is targeted for open source products. We now offer eight (8) modes of

service for software supported by SGI : Active, Maintenance, Limited, Legacy, Courtesy, Divested, Retired, and Expired.

Active Mode is our highest level of service. It applies to products that are being actively developed and maintained and are orderable through general distribution. Software fixes for all levels of problems can be expected.

Maintenance Mode software is maintained and is still an important part of our product mix. No new functionality is added to products in this support mode. Functional fixes for severe problems are generally available. Products in this support mode category are still orderable through general distribution. Software usually stays in this category about 18 months before being moved to a mode of lesser support.

Limited Mode is a restricted level of service developed mainly for products developed and maintained by open source organizations and that are distributed by SGI.

Legacy Mode software generally runs on out-of-production operating system versions or system platforms that are no longer in active development or maintained. These products are usually distributed with limited availability. New support contracts may be offered and renewed. Services provided with Legacy Mode are limited to providing existing fixes and “workarounds” for reported problems. IRIX® 6.2, IRIX® 6.3, and IRIX® 6.4 operating system revisions are examples of major operating system releases that are supported in this category.

Courtesy Mode software is not officially part of the software support offerings. Courtesy mode software is not covered by software support contracts, and call center support is not available. An e-mail alias may be provided to facilitate customer communications and to address any technical questions. Response times will vary according to availability of resources. The e-mail alias may be terminated at any time without advance notice. IRIS Showcase™ and Cosmo Worlds™ are examples of products with Courtesy Mode support.

Divested Mode software has been turned over to a third party who assumes all responsibility for support. SGI no longer distributes these products. Calls received at the SGI Call Center for support on divested products will be redirected to the applicable third party. CA Unicenter® TNG and Syntax TAS™ are examples of divested products.

Retired Mode provides restricted support for older software products which are no longer generally distributed by SGI. This level of support has severe limitations on portability to new platforms. Availability of support at this level is limited to existing customers with whom we have existing contractual obligations. This is the final stage before a product is completely removed from the SGI product set.

Expired Mode software products have reached the end of their useful life. These products are not supported or distributed in any form by SGI. Examples are: IRIX® 5.3, IRIXPro™, and Proconf.

The Web page at
`http://support.sgi.com/irix/news/index.html#swmodes`
contains a link to a Web page where the eight software support modes are described in more detail. This Web page also contains links to the latest customer letters, which provide a list of the various software products that have changed support modes. We thank you for your continued commitment to SGI.

Terry Oberdank

Vice President, Global Services
SGI

Welcome to your SGI IRIX 6.5.16 update. This booklet contains:

- A list of key features in IRIX 6.5.16
- A list of CDs contained in the IRIX 6.5.16 update kit
- A guide to SGI Web sites

IRIX 6.5.16 Key New Features

The following changes have been incorporated into the core IRIX 6.5.16 overlay CDs and the Applications CD.

New Software Features - Feature Stream Only

Filesystems

- **New option for XVM show command**
  For the IRIX 6.5.16f release, the `-extend` option has been added to the XVM `show` command. Specifying this option will display additional information about physvols, slices, stripes and foreign disks than the show command alone. The *XVM Volume Manager Administrator's Guide* and the XVM help screens have been updated with examples that use this option.
- **CXFS new features**
  For IRIX 6.5.16f, CXFS features include the following:
  - Support for multiple operating system (multiOS) clients, such as Solaris nodes and Windows NT nodes. The CXFS GUI and `cmgr`(1M) command now allow you to specify the operating system for a given node.

- I/O fencing, which allows a problem node to be isolated from the storage area network (SAN) so that it cannot corrupt data in the shared CXFS filesystem; this is required for Solaris nodes and Windows NT nodes. A Brocade switch is required to support I/O fencing.
- Support for a two-node CXFS cluster running with FailSafe and an L1 controller on Origin 300 and Origin 3200 systems.

See the CXFS Software Installation and Administration Guide for more information.

- **CXFS upgrade: filesystem definitions**
The structure of the CXFS filesystem configuration was changed with the release of IRIX 6.5.13f. Backward compatibility with earlier versions is no longer maintained as of IRIX 6.5.14f, since all nodes in the cluster must be running the same or adjacent releases.
  - If you are upgrading from 6.5.13f to 6.5.14f or later, there is no further impact.
  - If you are upgrading from 6.5.12f or earlier, you must perform a one-time manual conversion of your CXFS filesystem definitions.

  See the *CXFS Software Installation and Administration Guide* for more information.
- **CXFS upgrade: cluster nodes**
For CXFS customers, if you install IRIX 6.5.16f including `sysadm_base` on a cluster node where the 6.5.13f or earlier version

of CXFS is installed, you will need to upgrade to the 6.5.16f version CXFS (`sysadm_cxfs`) and install 6.5.16f `sysadm_cluster`.

System Performance and Tuning

- **New joblimitsign kernel tunable parameters group**
  The IRIX 6.5.16 release adds the `joblimitsign` group of kernel tunables that can be used to specify that specific job limit resource accumulation and enforcement should be ignored by the kernel. Setting the kernel tunable value to 1 indicates the specific limit should be ignored. Setting the value to 0 will re-enable the limit for newly created jobs.

  The following kernel tunable parameters have been added:

  - `jlimit_cpu_ign` parameter
    The `jlimit_cpu_ign` parameter specifies that the accumulation and enforcement of CPU time limits for jobs should be ignored.
  - `jlimit_data_ign` parameter
    The `jlimit_data_ign` parameter specifies that the accumulation and enforcement of data memory limits for jobs should be ignored.
  - `jlimit_nofile_ign` parameter
    The `jlimit_nofile_ign` parameter specifies that the accumulation and enforcement of limits for the number of open files in jobs should be ignored.

- `jlimit_numproc_ign` parameter
  The `jlimit_numproc_ign` parameter specifies that the accumulation and enforcement of limits for the number of processes in jobs should be ignored.
- `jlimit_pmem_ign` parameter
  The `jlimit_pmem_ign` parameter specifies that the accumulation and enforcement of physical memory limits for jobs should be ignored.
- `jlimit_pthread_ign` parameter
  The `jlimit_pthread_ign` parameter specifies that the accumulation and enforcement of limits for the number of pthreads should be ignored.
- `jlimit_rss_ign` parameter
  The `jlimit_rss_ign` parameter specifies that the accumulation and enforcement of resident set size (RSS) memory limits for jobs should be ignored.
- `jlimit_vmem_ign` parameter
  The `jlimit_vmem_ign` parameter specifies that the accumulation and enforcement of virtual memory limits for jobs should be ignored.

For more information on kernel tunable parameters, see the `setjusage`(2) entry in Appendix A in *IRIX Admin: Resource Administration*.

– New `setjusage` system call
  The `setjusage` system call is used to update resource usage for jobs in the kernel. The system call can only be used to update usage information if the limit accumulation and enforcement for the specified resource is being ignored. This function can be used by sites to implement a site-specific solution for resource accumulation and enforcement. Using this system call allows the various job limit status commands to display usage values as reported from the site-specific implementation. For more information, see the `setjusage`(2) man page and the `setjusage`(2) entry in Appendix A in *IRIX Admin: Resource Administration*.

Comprehensive System Accounting (CSA)

- **Change to csa.conf file**
  The IRIX 6.5.16 release removes the `ACCT_FS` parameter in the `/etc/csa.conf` file. The `MIN_BLKS` parameter now determines the minimum number of free 1K blocks needed on the file system on which the `/var/adm/acct` directory resides. The default is 2000. To ensure that the `MIN_BLKS` variable has been set correctly, check the value in the `/etc/csa.conf` configuration file.

  For more information, see Chapter 5, “Comprehensive System Accounting”, in *IRIX Admin: Resource Administration*.

Kernel Configuration

- **New interrupt thread control interface**
  IRIX 6.5.16 supports a new XThread Control Interface (XTCI) that allows users to control many interrupt thread parameters, including cpu binding. System administrators can use this interface to control kernel thread properties separate from the physical interrupts they service. For information on this interface, see the **realtime**(5) man page.

Performance Monitoring Tools

- **Enhanced rtmond performance for large systems**
  For the IRIX 6.5.16 release, performance improvements have been made to the `rtmond` system monitoring daemon. These improvements will be most noticeable on systems with 128 CPUs and larger. For information on the `rtmond` daemon, see the `rtmond`(1) man page.

Array Services

- **Features added to Array Services**
  For the IRIX 6.5.16 release, Array Services scaling support has increased from a maximum of 8 hosts to 64 hosts. Array Services also provides increased interoperability with job limits and new functions such as `askillash`. For more information, see the Array Services

release notes and the `array_services`(5) man page and the "Array Services" chapter in *IRIX Admin: Resource Administration*.

Graphic Workstations

- **Enhanced mouse support**
  IRIX 6.5.16 provides support for mice with more than three buttons and mice with wheels. Users with Microsoft Intellimouse or Intellimouse Explorer can use this expanded functionality in many IRIX and Open Source applications. For information on this feature, see the `pcmouse`(7) man page.

CPU Management

- **New option to mpadmin(1) command**
  The IRIX 6.5.16 release adds an `-x`[*processor*] option to the `mpadmin`(1) command that allows you to exclude the specified CPU from performing any work. This functionality is useful in a situation in which you suspect a CPU may have a hardware error but you do not want to shut down your entire system.

  For more information, see the "Excluding a CPU from Performing Work" section in *IRIX Admin: System Configuration and Operation* and the `mpadmin`(1) man page.

Checkpoint and Restart

- **New options to cpr command**
  The IRIX 6.5.16 release includes two new options to the `cpr` command:
  - The IRIX 6.5.16 release includes the `cpr -w` option that allows you to use the attribute file located in the current working directory (versus `$HOME/.cpr`). For more information, see the *IRIX Checkpoint and Restart Operation Guide* and the `cpr`(1) man page.
  - The IRIX 6.5.16 release includes a new `-m` memory migration option to the `cpr` command, which allows you to migrate the checkpointed memory to the location in the system topology where the restart operation is executing; for example, within a specific cpuset or within the global cpuset. In addition, a new `CKPT_RESTART_MIGRATE` restart-related flag has been added for use with the `ckpt_restart`() library interface function.

    These enhancements to the `cpr` command and `ckpt_restart`() library interface provide better functionality when restarting processes within cpusets. For more information on the `cpr -m` option, see the *IRIX Checkpoint and Restart Operation Guide* and the `cpr`(1) man page.

- **New CONTENTS action keyword for FILE policy of CPR attribute file**
  The IRIX 6.5.16 release adds a `CONTENTS` action keyword for the FILE policy of a CPR attribute file. This causes the system to calculate `checksum` (currently `MD5`) on the file at checkpoint. Upon restart, the system detects if the file has been modified between begin-of-file and file-size-at-checkpoint; if the file has been modified in this area, the process is refused restart, otherwise, it seeks to the previous offset and continues. For more information, see the *IRIX Checkpoint and Restart Operation Guide*.

System Availability

- **IRIX 6.5.16 and FailSafe 2.1.2**
  For FailSafe customers, if you install IRIX 6.5.16, including `sysadm_base`, on a cluster node where FailSafe 2.1.1 is installed, you will need to upgrade to FailSafe 2.1.2 (`sysadm_failsafe2`) and install 6.5.16 `sysadm_cluster`.

Scalability

- **New functions in Cpuset library**
  The IRIX 6.5.16 release adds two new functions in the Cpuset library called `cpusetMove`(3x) and `cpusetMoveMigrate`(3x). These Cpuset library routines can be used to move processes between cpusets and optionally migrate their memory. They allow you to move specific processes, or groups of processes, between existing

cpusets, and out of a named cpuset into the pool of CPUs not assigned to any specific named cpuset.

Using this functionality, you can easily destroy existing cpusets to free resources to run a prime job and then easily reconstitute cpusets to continue prior jobs. Because memory used by a process can be migrated to the node associated with the new cpuset, memory locality is improved.

For more information on the `cpusetMove`(3x) and `cpusetMoveMigrate`(3x) routines, see Chapter 4, "Using the cpusetMove and cpusetMoveMigrate Functions" in the *IRIX Admin: Resource Administration* manual and the `cpusetMove`(3x) and `cpusetMoveMigrate`(3x) man pages.

Semaphore Devices

- **New systune variable in usopenpollsema(3P) library call**
  The IRIX 6.5.16 release adds a `disable_uspollsema_chk` systune variable for the `usopenpollsema`(3P) library call. This variable turns off the standard access mode checking on `usopenpollsema`(3P) (set on the first call to `usopenpollsema`(3P) via the `acc` parameter). Some older IRIX applications that were written to work with `usopenpollsema`(3P) may now require this variable.

  For more information, see the `usopenpollsema`(3P) man page and the `/var/sysgen/mtune/kernel` configuration file.

System Performance and Tuning

- **New kernel tunable parameters**
  The IRIX 6.5.16 release adds documentation for the following kernel tunable parameters:
  - `min_bufmem` general parameter
    `min_bufmem` specifies the minimum amount of memory held by filesystem metadata that is cached in the buffer cache when the system runs into low memory conditions.
  - `rtcpus` dispatch parameter
    `rtcpus` controls the quality of the real-time scheduler.
  - `bdflush_interval` filesystem parameter
    `bdflush_interval` specifies the interval at which the `bdflush` function executes to push dirty file data to disk.

  For more information on kernel tunable parameters, see Appendix A in *IRIX Admin: System Configuration and Operation*.

Licensing Software

- **Upgrading to the FLEXlm 8.1a release from Globetrotter Software, Inc.**
  IRIX 6.5.16 provides support for upgrading `license_eoe` to the FLEXlm 8.1a release from Globetrotter Software, Inc. The license manager daemon is built in V5 compatibility mode. For more information see the *FLEXlm End User Manual* and the associated man pages.

IRIX 6.5.16 also provides support for upgrading `license_dev` to include new optional thread-safe FLEXlm 8.1a client side libraries and headers. For more information see the `license_dev` release notes.

Online Documentation

- **Planned Online Documentation Tools/Books Upgrade in IRIX 6.5.17**
  For the IRIX 6.5.17 release, the online documentation tools (InSight) and books will undergo some changes. A more open, standards-based technology will be utilized to create HTML books from industry-standard DocBook XML markup. This same technology will be provided to ISVs and customers, allowing them to create similar books. An update process will be supplied to make existing books available in the new format. InfoSearch will become the primary documentation viewing tool and will be modeled after the SGI TechPubs Library (`http://techpubs.sgi.com`), which already utilizes the new book format. Books will also be viewable directly from the filesystem using any available web browser. More detailed information regarding this upgrade will be made available in the IRIX 6.5.17 Welcome web page.

SGI software product life cycle management

- **IRIX support policy**
  In accordance with the SGI software product life cycle management

strategy announced in November 2000, SGI will announce support mode changes for various software products on a quarterly basis. To view customer letters containing support mode changes announced since November 2000, as well as the latest IRIX Support Policy documents, visit the IRIX Support Policy Web page located at:

`http://support.sgi.com/news/support/index.html`

Applications CD

The following products were updated with bug fixes only:

- Impressario Printing Tools
- IRIX Interactive Desktop
- IRIX Interactive Desktop Administration
- IRIX Interactive Desktop Tools
- SGImeeting 2.0.2

The following products contain enhancements or new features:

- Array Services 3.5
- Information Searching Execution Environment
- License Tools 3.4.6
- NEdit 5.2
- Xinet Appletalk 10.02

IRIX OS Bundled Software

For information about the bundled software that is included with this release, see CD Contents and the Bundled Software and Licenses web page that you can access from the Welcome web page.

Freeware CD

The May 2002 update to the SGI IRIX Freeware Project contains over 380 freeware packages built for IRIX 6.5. The following changes have been incorporated for the IRIX 6.5.16 release time frame.

New products for this release:

- SDL-1.2.3 - Simple DirectMedia Library
- antiword-0.32 - Convert MSWord documents to text or PS
- cdk-4.9.10 - Curses Development Kit
- cdrdao-1.1.5 - CD recording with Disk-at-Once support
- cups-1.1.14 - Common UNIX Printing System
- ethereal-0.9.2 - Network Protocol Analyzer
- exif-0.2 - JPEG/EXIF image handler
- gphoto2-2.0 - Digital camera access library
- libdockapp-0.4.0 - DockApp Making Standard Library
- libexif-0.5.0 - EXIF tag parsing library

- openslp-1.0.8a - Service Location Protocol (SLP)
- pcnfsd.93.02.16-cert - PC auth. and print service
- qt.3.0.3 - C++ toolkit from TrollTech
- securitylite-1997.10.08 - Security Camera
- skipstone.0.8.2 - Skipstone Gecko browser (beta 1)
- t1utils - Type 1 font conversion utilities
- ucd-snmp-4.2.1 - UCD-SNMP 4.2.1 Libraries Only
- wmakerconf-2.8.1 - Window Maker configuration tool
- xlockmore-5.03 - X11 screen locking program
- xosview.1.8.0 - X11 based system status meter
- xpp-1.1 - X Printing Panel for CUPS

Updated products for this release:

- PAM.0.75 - Pluggable Authentication Modules
- audiofile-0.2.3 - audio file access library
- autoconf-2.53 - source configuration tool
- automake-1.6 - autoconf file generator
- enscript-1.6.3 - convert text files to PostScript
- exim-3.34 - sendmail replacement

- fileutils-4.1 - GNU file utilities
- fltk-1.0.11 - C++ GUI toolkit
- fortune-mod-1.2.1 - fortune cookie program
- gcc-3.0.4 - GNU Compiler Suite
- gd-1.8.4 - Graphics library for fast image creation
- gdb-5.1.1 - GNU debugger
- gettext-0.11 - GNU message catalog utilities
- ghostscript-7.04 - PostScript viewer with fonts
- gimp-1.2.2 - GNU Image Manipulation Program
- groff-1.17.2 - Document Formatting System
- htdig-3.1.6 - WWW indexing and searching system
- htmldoc-1.8.17 - convert HTML to PostScript or PDF
- imap-2001a - UW imap and pop daemons
- libpcap-0.7.1 - User level packet capture
- libxml2-2.4.17 - XML manipulation library
- zlib-1.1.4 - compression library
- licq-1.0.4 - ICQ clone
- lyx-1.1.6fix4 - X11 based LaTeX editor
- mozilla.0.9.9 - Mozilla for IRIX (beta 1)

- mutt-1.2.5.1 - curses-based mail client w/MIME
- ncurses-5.2 - GNU curses package
- ntop-2.0 - Network Analysis tool
- openldap-2.0.21 - LDAP server and client tools
- openssh-3.1p1 - secure rsh, rcp replacements
- openssl-0.9.6c - Secure Sockets Layer Toolkit
- php-4.0.6 - PHP: Hypertext Processor http-server scripting
- pine-4.44 - email/news client
- python-2.1.1 - Python Language Interpreter
- rsync-2.5.4 - replacement for rcp
- rxvt-2.7.8 - VT102 emulator for the X Window System
- screen-3.9.11 - GNU virtual terminal manager
- sfront-0.79 - MPEG-4 Structured Audio compiler
- sudo-1.6.5p2 - restricted configurable ‘su’
- tcpdump-3.7.1 - network packet sniffer
- tcpslice-1.2a1 - filter tcpdump packet traces
- tcsh-6.11 - Enhanced C shell with file completion
- teTeX-1.0.7 - TeX/LaTeX et al.
- transfig.3.2.3d - xfig image format converters

- vera-1.8 - Info acronym dictionary
- vim-6.0.156 - Vi IMproved vi editor clone
- w3c-libwww-5.3.2 - W3C Protocol Library
- wget-1.8.1 - WWW site mirroring tool
- xephem-3.5.2 - Astronomy program for UNIX and Linux
- xmms-1.2.7 - X11-based sound module player
- xscreensaver-4.01 - Screen Saver and Locker
- samba - Samba Version 2.2.3a

Products that were omitted for this release:

- mozilla-src-0.9.4 - Mozilla source code

For more information about the freeware that is included with this release, including a complete list of the freeware packages, see `http://freeware.sgi.com/`.

For more information about the bundled software that is included with this release, see CD Contents and the Bundled Software and Licenses web page that you can access from the Welcome web page.

Documentation

The following manuals have been revised for the significant new features incorporated into this release.

IRIX operating system

- 007-3700-011, *IRIX Admin: Resource Administration*, was updated to include information about the `cpusetMove` and `cpusetMoveMigrate` functions in the `Cpuset` library. Information was added to the descriptions of the `JLIMIT_CPU` and `JLIMIT_PMEM` job limit parameters and the `cpulimit_gracetime` process parameter.
- 007-2859-019, *IRIX Admin: System Configuration and Operation*, was updated to include updated to include information on the `mpadmin`(1) command, the `min_bufmem` parameter, the `trcpus` dispatch parameter, the `bdflush_interval` filesystem parameter, and the `process_core_cpu_logging` parameter. The description of the `/etc/csa.conf` file was also updated.
- 007-3236-005, *IRIX Checkpoint and Restart Operation Guide,* includes a new section on the memory migration option and new information on the `CKPT_RESTART_MIGRATE` flag.
- 007-3723-010, *Upgrading an IRIX Operating System on a /target_root*, was updated with some clarifications to the procedures it provides.

Filesystems and Volume Managers

- 007-4016-013, *CXFS Software Installation and Administration Guide*, was updated to include information on support for Solaris and Windows NT systems in a multiple operating system (multiOS) cluster and support for the L1 controller. The CXFS GUI documentation was also updated.
- 007-4003-009, *XVM Volume Manager Administrator's Guide,* was updated to include information on the new `-extend` option of the XVM `show` command.

Key New Features from IRIX 6.5.1 to IRIX 6.5.15

Hardware Platforms and Features Supported

Introduced in IRIX 6.5.15:

- Support for the SGI Origin 300 server series. This includes support for the Origin 300 Base Module in 2, 4, and 8 processor sizes, the addition of a NUMAlink Module for scaling up to 32 processors, and the TP900 Storage Module.

Introduced in IRIX 6.5.13:

- Support for the 500MHz R14K processor on SGI Origin 2000 and Onyx2 systems

Introduced in IRIX 6.5.12:

- Support for the 500MHz R14K processor on SGI Origin 3000 series and Onyx 3000 systems

Introduced in IRIX 6.5.9:

- Support for the SGI 3000 series of servers, including the SGI 3200, SGI 3400, and SGI 3800 servers
- Support for the TVO digital video option board for Silicon Graphics Onyx2 systems
- Support for the QED RM7000 processor on O2 systems

Introduced in IRIX 6.5.8:

- Support initiated for VPro Graphics, the next generation graphics for Silicon Graphics Octane systems Introduced in IRIX 6.5.7
- Support for Silicon Graphics Onyx2 InfiniteReality3 systems
- R12000S CPU on SGI 2200, SGI 2400, SGI 2800, SGI 2100, and Origin 200

Introduced in IRIX 6.5.5:

- QLA2200 (copper and optical) is supported for FC-AL, FC-AL via the Emulex hub, or fabric attach via the Brocade Silkworm 2000 switches

Introduced in IRIX 6.5.4:

- 270-MHz processor for Silicon Graphics O2 and Silicon Graphics Octane visual workstations
- HDTV XIO Board for Silicon Graphics Onyx2 and SGI Origin 2000 systems (this now includes the former Cray Origin 2000 system)

Introduced in IRIX 6.5.3:

- Systems using the MIPS R12000 processor
- Digital Video Multiplexer option board (DPLEX) for Silicon Graphics Onyx2 systems
- Redundant Power Supply (RPS)
- 21" Monitor Support for O2 and Octane systems

Introduced in IRIX 6.5.2:

- Flat Panel Monitor for O2 systems
- 16-pipe Onyx2 InfiniteReality systems
- GSN network adapter

Introduced in IRIX 6.5.1:

- Gigabit Ethernet for Octane and SGI Origin systems
- 128p Metarouter for Origin 2000 systems (formerly known as Cray Origin 2000 systems)
- Dual Channel Display option for O2 systems
- Onyx2 InfiniteReality2 systems
- 225QC for SGI Origin 200 systems

New Software Features-Feature Stream Only

Introduced in IRIX 6.5.15

- For the IRIX 6.5.15f release, the default naming convention for XVM subvolumes in the `/dev/lxvm/` and `/dev/cxvm` directories is *volname*, *subvolume*.

  Older releases of XVM created a directory entry for a subvolume of the form *volname_subvolname*. This convention can yield potential problem. For example, since `vol1_data` is a legal name for a volume

it is impossible to determine whether `/dev/lxvm/vol1_data` refers to the data subvolume of the volume `vol1` or to a volume named `vol1_data`. The *volname_subvolname* form of subvolume directory entries is still supported in IRIX 6.5.15f, but its use is not recommended.

For information on XVM device directories and pathnames, see the *XVM Volume Manager Administrator's Guide*.

- For the 6.5.15f release of IRIX, you can implement disk quotas on XFS filesystems according to group ID. Previous releases of IRIX supported implementing quotas according to user and project ID. Project and group accounting are mutually exclusive. This feature is on-disk compatible with Linux-XFS group accounting, where this feature is already active. For information on administering XFS quotas, see *IRIX Admin: Disks and Filesystems*.

  Caution: Group quotas are supported in the feature stream only. If you implement group quotas on a disk and, subsequently, mount that disk with the `pquota mount` option on a machine running the maintenance stream or an earlier release of the feature stream on which group quotas are not supported, the quota accounting could be corrupted.

- IRIX 6.5.15f provides the following new features for CXFS.
  - Support has been added for clients of other operating systems such as Solaris as defined in *CXFS Client Administration Guide*. These clients are released asynchronously from the IRIX release. This support requires IRIX 6.5.15f plus appropriate patches. For more information, contact your SGI support contact.
  - Default scripts are now provided in the `/var/cluster/clconfd-scripts` directory to permit NFS-exporting of CXFS filesystems listed in `/etc/exports`.
  - Changes have been made to the `rotatelogs` script syntax. The root `crontab` file now has an entry to run the `rotatelogs` script weekly. If you run the script twice in one day, it will append the current log file

Introduced in IRIX 6.5.14

- The CXFS GUI was enhanced in the IRIX 6.5.14 release as follows:
  - **CXFS Manager** and **CXFS Cluster View** windows are now combined into one window called **CXFS Manager.**
  - Tasks can now be launched by clicking the right mouse button over the tree-view area, or by selecting **Tasks** on the menu bar.
  - Command line interfaces (CLIs) that the GUI runs can be viewed from a new **File > Show SALog** menu item.

  - You can now partially mount filesystems on just a subset of nodes, using the **Define Filesystem** and **Modify Filesystem** tasks.
  - A new **Find** text field helps you find items within the displayed tree-view area. Filesystem status and cluster status update faster.

  For more information, see the *CXFS Software Installation and Administration Guide*.

- The structure of the CXFS filesystem configuration was changed with the release of IRIX 6.5.13f. Backward compatibility with earlier versions is no longer maintained as of IRIX 6.5.14f, since all nodes in the cluster must be running the same or adjacent releases.
  - If you are upgrading from 6.5.13f to 6.5.14f or later, there is no further impact.
  - If you intend to run a mixture of 6.5.13f and 6.5.14f nodes, you must turn off backward compatibility.
  - If you are upgrading from 6.5.12f or earlier without first installing and running 6.5.13f, you must perform a one-time manual conversion of your CXFS filesystem definitions.

  See the *CXFS Software Installation and Administration Guide* for more information.

- For CXFS customers, if you install IRIX 6.5.14f including `sysadm_base` on a cluster node where the 6.5.13f version of CXFS is installed, you will need to upgrade to the 6.5.14f version CXFS (`sysadm_cxfs`) and install 6.5.14f sysadm_cluster.

Introduced in IRIX 6.5.13

- With 6.5.13, the structure of the CXFS filesystem configuration has been changed. CXFS filesystems can now be defined, modified, managed and deleted independently of each other, and of the cluster definition.

  (Previously, the CXFS filesystems were defined as attributes to the cluster definition.) To accommodate clusters mixing nodes running 6.5.12 and 6.5.13, backwards compatibility is enforced by default in 6.5.13.

  For more information, see the *CXFS Software Installation and Administration Guide.*

- The XVM Volume Manager can be used when layered with the CXFS filesystem. The XVM Volume Manager can also be used as a standalone volume manager; this requires that you be running the 6.5.13f release leg of the IRIX operating system. The 6.5.13m leg does not support XVM as a standalone volume manager; this support will be added in a later release. For information on CXFS filesystems, see *CXFS Software Installation and Administration Guide*.

- Added support for the use of mirrors in XVM logical volumes. The mirroring feature of XVM requires the XFS Volume Plexing software option. Customers running CXFS and who want to run mirrors will need to purchase this license. XLV customers with plexing licenses can upgrade to XVM without having to acquire a new license.

Introduced in IRIX 6.5.12

- Supports the labeling of disks as XVM system disks in the XVM Volume Manager. For information on XVM system disks, see the *XVM Volume Manager Administrator's Guide*.

Introduced in IRIX 6.5.10:

- XVM installed with CXFS is now qualified on IP35 (Origin 3000) systems in addition to the existing qualification on the IP27 (Origin 200, Origin 2000, and Onyx2) and IP30 (Octane) systems.

Introduced in IRIX 6.5.9:

- CXFS supports the use of hierarchical storage management (HSM) products through the data management application programming interface (DMAPI).
- CXFS and IRIS FailSafe 2.1 can be installed and run on the same system, which is known as coexecution.

  Note: The CXFS and FailSafe coexecution feature is not available in the IRIX maintenance stream. IRIS FailSafe 2.1 is an independently shipped product and is not shipped with IRIX.

- Support for the Scheduled Transfer Protocol (STP). For more information, see the `stp`(7P) man page or `http://www.hippi.org`.
- Support for disk quotas that can now be set by project ID.

  For more information on disk quotas and their administration, see *IRIX Admin: Disks and Filesystems*. For more information on project IDs, see *IRIX Admin: Backup, Security, and Accounting*. For more information on the administration of disk quotas by project, see the `edquota`(1M), `find`(1M), `quota`(1M), `repquota`(1M), and `fstab`(4) man pages.
- Support for the waitjob feature, which includes the new functions `setwaitjobpid`() and `waitjob`(). For more information, see *IRIX Admin: Resource Administration* and the `waitjob`(1M) and `setwaitjobpid`(1M) man pages.

Introduced in IRIX 6.5.8:

- Support for Comprehensive System Accounting (CSA). For more information, see *IRIX Admin: Resource Administration* and the `csa`(1M) man page.

Introduced in IRIX 6.5.7:

- Support for job limits

  Job limits allow system administrators to manage user access to system resources by setting limits on different system usage parameters. For more information on the usage of the different system usage parameters, see the *IRIX Admin: Resource Administration Guide* and the following man pages: `jstat`(1), `jlimit`(1), `job_limits`(5) `genlimits`(1M), and `showlimits`(1).

- Support for the CXFS product

  CXFS provides a cluster file system that allows file sharing between machines. CXFS requires a new volume manager, XVM. The IRIX 6.5.7 release version of CXFS contains metadata server recovery. See the *CXFS Software Installation and Administration Guide* for the administrative shutdown procedures and additional troubleshooting information.

  The Caveat and Release Note Updates link at `http://support.sgi.com/6.5/caveat_updates.html` should be checked periodically for information on the latest CXFS and XVM patches, descriptions of implemented CXFS and XVM features, updated Release Notes, or any late-breaking caveats.

Introduced in IRIX 6.5.6:

- Support for the Scheduled Transfers (ST) protocol. In this initial release of ST, only the Gigabyte System Network (GSN) network adapter is supported.

Introduced in IRIX 6.5.2:

- Motif 2.1/IRIS ViewKit 2.1
- IRIX Oplock support
- Support for non EUC encoding and locales (`sjis/big5/gbk/utf8`)

Maintenance and Feature Streams

Introduced in IRIX 6.5.15:

- XFS inode numbers are 64-bit values containing an encoded disk location. For large filesystems (1 Terabyte plus), the inode numbers can overflow into the top 32 bits of the number. Certain backup applications which use the inode number only allow 32 bits of space, and thus have severe problems dealing with very large XFS filesystems.

  As of IRIX 6.5.15, XFS has been changed to allocate inodes only within the lower portion of the filesystem to avoid this overflow issue. Other allocation policies in the filesystem will make this lower order space preferred for inodes and reduce the risk of a filesystem refusing to create new inodes when it still has space available.

For existing large filesystems with high numbered inodes this does not solve the problem, but it does solve it for new filesystems, and for new files created on existing filesystems.

For backwards compatibility a new mount option is available, inode64, this will allow xfs to place inodes anywhere in the filesystem and follow exactly the original placement policies. Filesystems which were small enough not to be able to overflow 32 bits of inode number also retain the old behavior.

- The 6.5.15 release of IRIX adds support for disks that have a capacity of 2 terabytes. Previously, the maximum was 1 terabyte. The maximum disk capacity had become an issue with the introduction of 180GB drives, multiples of which can be combined into a single logical unit (lun) behind a RAID controller.

  The maximum capacity of a logical unit for both of our current RAID controllers is 2 terabytes, so this change allows us to support that maximum.

- For the IRIX 6.5.15 release, Chapter 5 “System Administration in a Multiuser Environment” in *IRIX Admin: System Configuration and Operation* has been updated with a new section on Project ID numbers and the `chproj`(1) command that changes the project ownership of a file. The project ID may be either a project name found in the project file, or a decimal project ID. For more information, see the `chown`(1) man page and the *IRIX Admin: System Configuration and Operation* manual.

- In IRIX 6.5.15, the systune parameter `gang_sched_off` is turned on by default. This means that gangs will not be running on the system unless the system administrator sets `gang_sched_off` to 0. This differs from previous IRIX releases, for which gangs ran on the system automatically.

  This change has been made per field request because we have discovered that having gang scheduling on by default greatly diminishes system performance. Most customers have been running with it off.

- The IRIX 6.5.15 release adds a coremask parameter set in the `/var/sysgen/mtune/kernel` file to determine what kind of permissions a core file will receive. Currently, when a process creates a core file, it uses the umask of the owner of the process to determine the permissions. This can lead to core files containing sensitive information being created with world readable permissions. This systune variable allows the system administrator to limit access to core files. The default is 0, which is the current behavior. However, if the coremask variable is set to some other value, it uses that number as the umask and ignores the umask of the owner of the process. For example, if coremask is set to 0177 and the owner of the process has a umask of 022, the permissions set on the core file will be 600 instead of 644. This variable assumes that the number entered is octal. The default setting is 0. The minimum setting is 0. The maximum setting is 0177.

For more information on the coremask parameter, see Appendix A, “IRIX Kernel Tunable Parameters”, in *IRIX Admin: System Configuration and Operation*.

- A new partitioning administration command, `partmgr`(1M), is available to define and store partition definitions. For more information, see *IRIX Admin: System Configuration and Operation*.
- The IRIX 6.5.15 release adds support for the `/dev/poll` interface for scalable and efficient event notification. For information on `/dev/poll`, see the `poll`(7M) man page.
- For the IRIX 6.5.15 release, the DHCP client (`proclaim`) has been updated to include options to allow DHCP clients to capture changes to DNS, NIS, or GATEWAY in your environment. For more information, see the `proclaim`(1M) man page and *IRIX Admin: Networking and Mail*.
- The IRIX 6.5.15 release provides the ability to designate one or more CPUs or a range of CPUs on a single line in the `cpuset` configuration file. The CPUs in a `cpuset` configuration file do not have to be specified in a particular order.

  The following is a sample configuration file that describes an exclusive `cpuset` containing 7 CPUs:

```
# cpuset configuration file
EXCLUSIVE
MEMORY_LOCAL
MEMORY_EXCLUSIVE

CPU 16
CPU 17-19, 21
CPU 27
CPU 25
```

For more information on the `cpuset` configuration file, see Chapter 4, “Cpuset System”, in *IRIX Admin: Resource Administration*.

- For the 6.5.15 release, the `systune`(1M) man page has been updated to describe a situation where the system segment size value (`syssegsz`) reported by the `systune` command is different than the value set in the `/unix` file. **Origin 300 Systems**
- The IRIX 6.5.15 release introduces support for the PCI Expansion Module to Origin 300 systems. The PCI Expansion Module allows PCI expansion on an Origin 300 independent of the addition of additional CPUs and memory. Each PCI Expansion Module adds 12 PCI slots and up to 4 PCI Expansion Modules to the system overall.
- Starting with the IRIX 6.5.15 release, each partition of a partitioned Origin 3000 system will have a new unique FLEXlm host ID (`lmhostid`). Any FLEXlm license based on the old non-partitioned `lmhostid` value will no longer work and a new license key must be generated. See the following web page for additional details: `http://www.sgi.com/support/licensing/`.

  - Contact the applicable software product vendor and provide the `lmhostid` number of the partition to generate a new license key. For nodelock licenses, provide the `lmhostid` for all partitions of the software installed and operating.
  - For software licensed by SGI, see the following web page for more details: `http://www.sgi.com/support/licensing/`.
  - For email and telephone contact information, see the IRIX 6.5.16 Welcome page and follow the "Bundled software and licenses" link.

- For IRIX 6.5.15 we added HOTPLUG attach and detach support for SGI Gigabit Ethernet Network adapters. This feature is supported on IP35 Origin 3000 series systems only; it is not supported on IP35 0300 systems. For information on this feature, see *IRIX Admin: Networking and Mail*.
- The IRIX 6.5.15 release supports the `lmparthostids` and `lmbasehostid` commands. The `lmparthostids` command generates a list of all 63 partition specific `hostids` and the unpartitioned id. This list can be passed to a license key generation tool for nodelock licenses so that the license works across all partitions or an unpartitioned system. The `lmbasehostid` command takes any arbitrary `lmhostid` (this could be a partition specific value) and generates the base unpartitioned id. That number could be used when the base `lmhostid` is required, even from a partition.

- The IRIX 6.5.15 release provides updated FLEXlm v7.2i support from GLOBEtrotter Software, Inc. The license manager daemon and the floating license server are built in V5 compatibility mode. For backwards compatibility, the client libraries and header files are still based on FLEXlm v6.1g. For more information, see the *FLEXlm End User Manual* and the associated man pages.

Introduced in IRIX 6.5.14:

- In the IRIX 6.5.5 release, SGI introduced a new optional directory format for XFS filesystems, referred to as the "version 2" directory format in `mkfs` output.

  XFS filesystems with a version 2 directory format can provide improved reliability and performance over filesystems with a version 1 directory format in some applications, particularly for applications that use NFS exported XFS filesystems.

  The directory format for an XFS filesystem is specified with the -n parameter of the mkfs command. The default directory format is currently the original version 1 directory format.

  Beginning with the IRIX 6.5.14 release, version 2 directories of XFS will be the default for all new filesystems created with `mkfs`.

  Version 1 directory filesystem creation will still be supported, but this will require that you specify the `-n version=1` parameter of the `mkfs` command.

SGI recommends that all new XFS filesystems be created with version 2 directories. IRIX releases older than IRIX 6.5.5, however, will not be able to mount a filesystem created with a version 2 directory and will issue the following message when a mount is attempted:

Wrong filesystem type: xfs

Many SGI customers are currently running production servers with version 2 directories. If you want to format filesystems with the version 2 directory format prior to the 6.5.14 release, you can specify the following option of `mkfs`:

```
mkfs -n version=2
```

There is no means for converting a filesystem, in place, between version 1 and version 2 directories. A filesystem can be converted between version 1 and version 2 directories by means of an `xfsdump/mkfs/xfsrestore` sequence.

For more information, see *IRIX Admin: Disks and Filesystems*.

- A `-q` *cpuset_name* `-p` option was added to the `cpuset` command that allows you to see the properties of particular cpuset, such as, the number of processes and CPUs associated with the specified cpuset.
- The `cpusetGetProperties()` and `cpusetFreeProperties()` functions were added to the Cpuset System library. The `cpusetGetProperties()` function allows you to retrieve various properties associated with a cpuset. The `cpusetFreeProperties()` functions allows you to release the

memory used by a `cpuset_Properties_t` structure. Any programmer that uses the cpuset API from Irix 6.5.14, and later, can use these functions. For information, see chapter 4, "Cpuset System", in the *IRIX Admin: Resource Administration* manual and the `cpusetGetProperties`(3x) and `cpusetFreeProperties`(3x) man pages.

- Parts of the *IRIX Interactive Desktop* were refreshed in IRIX 6.5.14. While functionality has not changed, the navigation, imagery, and graphics design have been enhanced in the following areas:
  - The main IRIX login window (clogin) has a new design using new SGI colors, font, and logo. The product is called sysadmdesktop and appears automatically at boot when root has `chkconfig noiconlogin on`.
  - **EZsetup** has a new layout and login icon using new SGI colors, font, and logo. The product is called sysadmdesktop and is launched by logging into **EZsetup account** from main IRIX login window.
  - The **System Manager** main window uses new SGI colors, font, and logo. The product is sysadmdesktop and is launched from the **System toolchest**.
  - The Welcome to SGI web pages have new navigation and new SGI colors, font, and logo. The product is Welcome. Launch from **Find toolchest**, select **WhatsNew**, double-click the **Welcome_to_SGI** icon.

– The Background Setting panel includes seven new desktop patterns using the new SGI logo and font: Camouflage, Citrus Citrus, Iron, Midnight, Reef, Sand, and Sprinkle. Note: You may notice slow performance when previewing all but the Sprinkle background, but not when switching desks (see the `background`(1) man page). Old backgrounds are still available. The product is desktop_eoe and is launched from the **Desktop toolchest**, select **Customize**, then **Backgrounds**.

Introduced in IRIX 6.5.13

- The `xfsrestore` command returns an `incorrect` exit code when it encounters a media error; improving this process lets a system administrator intelligently react to these conditions.
- Improved exit codes for the `xfsrestore` and `xfsdump` commands. This lets a system administrator correctly respond to end-of-media or operator interrupt conditions.
- Changed the `mkfs` command to allow you to specify the size of an XFS allocation group, as an alternative to specifying the total number of allocation groups. You use the `-d agsize= option` for this. For information, see the `mkfs_xfs` man page and *IRIX Admin: Disks and Filesystems*.
- Changed the `mkfs` command to allow you to specify the size of a stripe unit and the size of a stripe width in bytes or in filesystem blocks, as an alternative to specifying these values in 512-byte block

units. You use the `-d su=` and the `-d sw= options` for this. For information, see the `mkfs_xfs` man page and *IRIX Admin: Disks and Filesystems*.

- Changed the default size of an XFS allocation group; larger filesystems will result in larger default allocation group sizes.
- The `xfsdump` and `xfsrestore` commands will provide the VSN of the tape that reached its end-of-volume (or the VSN of a new tape that needs to be mounted) and pass this VSN to the `media_change_alert_program` specified with the `-c` option. This lets system administrators send commands to a tape jukebox to mount the next tape.
- Changed the default size of an XFS log. The default log size grows with the size of the filesystem up to the maximum log size, 128 megabytes, on a 1 terabyte filesystem. For information on the default values of XFS allocation groups and XFS log sizes, see *IRIX Admin: Disks and Filesystems*.
- Added `cpusetAttachPID()` and `cpusetDetachPID()` functions to the Cpuset System library. The `cpusetAttachPID()` function allows a programmer to attach a currently running program to an existing cpuset. The `cpusetDetachPID()` function allows a programmer to detach a currently running program to an existing cpuset. Any programmer that uses the cpuset API from Irix 6.5.13, and later, can use these functions. For information, see chapter 4, "Cpuset System", in the *IRIX Admin: Resource Administration* manual

and the `cpusetAttachPID`(3x)and `cpusetDetachPID`(3x) man pages.

- The following features have been moved from Enhanced DHCP to standard DHCP:
  - Ping check before an address is leased to insure it is not already in use
  - MAC address filtering; clients whose MAC address is listed in a file will be unable to obtain a lease and/or accesses from these clients will be logged.

  For more information, see the `dhcp_bootp` man page.
- Added implementation of End Sequence to Scheduled Transfer Protocol. The upper layer protocol or applications can now terminate a transfer and restart another one without taking down virtual connection.
- VPro for Octane/OpenGL performance improvements have been added as follows:
  - Improved X window performance by 25 percent based on `x11perf`
  - Improved performance of OpenGL `glCopypixel()` function
- The following new system controller features have been implemented for the SGI Origin 3000 server series:

  - Enabled router port security, which prevents unauthorized enabling of additional router ports on router bricks in the SGI Origin/Onyx 3400 server series
  - Enabled system serial number security, which prevents unauthorized changes to the system serial number
  - Completely redesigned the graphical interface for the front-panel display of the SGI 3400 and 3800 servers

- Added hotplug attach feature that allows Gigabit Ethernet cards to be installed on a running system. A system administrator can use the `pciconfig` command to add cards to an Origin 3000 system and the `ifconfig` command to configure the cards for networking. For more information, see the `pciconfig` and `ifconfig` man pages.
- Added Origin 3000 system partitioning support in the `eoe.sw.partition` software package. This feature improves how system partitioning software is installed, enabled, and disabled. It also eliminates the need to manually edit configuration files.
- Efficiency improvements have been made to the BTE driver layer to reduce both latency and contention. This feature is a performance improvement to the existing functionality that is used internally by the system.
- The tools that report CPU utilization have been modified to correct the sampling of %WIO to omit idle time in line with industry standards. See the `sar(1)` man page for details.

- Updated FLEXlm v7.2f support from GLOBEtrotter Software, Inc. The license manager daemon and the floating license server are built in V5 compatibility mode. For backwards compatibility, the client libraries and header files are still based on FLEXlm v6.1g. For more information, see the *FLEXlm End User Manual* and the associated man pages.

Introduced in IRIX 6.5.12

- OpenGL Performer 2.4.1 execution environment
- The IRIX tape-support feature consists of a tape support driver, personality daemons, and a daemon that manages the personality daemons.This release supports various devices including the Fibre Channel implementation on the StorageTek 9840 and T9940A tape drives. The `reserve`, `release`, `preempt`, `clear`, and `prsv` commands are available for these tape drives on the `mt` command. For more information, see the `mt`(1), `tsarchive`(1M), `tsdaemon`(1M), `tserrpt`(1M), `tsset`(1M), `tsstop`(1M), `ts.config`(4), and `ts`(7) man pages.
- Updated FLEXlm v7.2e support from GLOBEtrotter Software, Inc. The license manager daemon and the floating license server are built in V5 compatibility mode. For backwards compatibility, the client libraries and header files are still based on FLEXlm v6.1. For more information, see the *FLEXlm End User Manual* and the associated man pages.

- The Scheduled Transfer Protocol (STP) has moved from the feature stream to the maintenance and feature stream. STP is now a mature supported protocol and it includes TRIX support.

Introduced in IRIX 6.5.11:

- Support for the use of a reserved area of memory; this reserved area is between virtual addresses 0x30000000 and 0x40000000. This feature disables the reserved area of memory that the kernel provides for applications to place their mmap and shmat mappings. For more information, see the `mmap`(2), `shmat`(2), `syssgi`(2), and `sgi_use_anyaddr`(1) man pages.
- Support for weightless pthreads; they allow you to lower the priority of a process by using the `npri -w` command. For more information, see the `npri`(1) man page.
- Support for upgrading license_eoe to the FLEXlm 7.1 release from Globetrotter Software, Inc. The license manager daemon will be built in V5 compatibility mode. For more information, see the *FLEXlm End User Manual* and the associated man pages.
- Support for an increased maximum number of logical unit numbers (LUNs) in the SCSI infrastructure from 64 to 255. This change impacts only the fcadp and qlfc fibre channel drivers and they will now enforce this LUN limit. If a LUN is greater than 255, it will be ignored after issuing a message to this effect. If you use large numbers of LUNs, you can exhaust the hardware graph. You may need to use the

`systune` command to increase the hwgraph_num_dev parameter to let the kernel build larger hardware graphs.

- Support for licensing of partitioned environments. For more information, see *IRIX Admin: Software Installation and Licensing*.
- Support for the PCI Hot Plug infrastructure on the SGI 3200, SGI 3400, and SGI 3800 servers.For more information, see the `pciconfig`(1) man page for specific administrative options.
- Support for HP LaserJet 4050 and HP LaserJet 8100 printers
- OpenGL Performer Runtime 2.2.11 overlay incorporates the latest fixes. The Performer 2.2.11 overlay can be installed from the `/CDROM/dist/` directory of the IRIX 6.5.11 Overlays CD (3 of 3), February 2001.

Introduced in IRIX 6.5.10:

- Support for point-to-point connections between the QLogic 2200 fibre channel controller and the Brocade switch.
- Support for the IRIX SCSI tape driver (TPSC) enhancements that let system administrators and privileged applications specify a persistent reservation on shared tape drives. For more information, see the `mt`(1) and `mtio`(7M) man pages.
- Support for the new Fortran, C++, and base compiler runtime libraries packaged under the `ftn_eoe`, `c++_eoe` and `compiler_eoe` overlay images. These libraries are based on the

MIPSpro 7.3.1.2m compilers and contain new interfaces released under the MIPSpro 7.3 compilers. The libraries are backward compatible with the libraries that were released in previous versions of IRIX 6.5. For more information, see the `ftn_eoe`, `c++_eoe`, and `compiler_eoe` release notes.

- OpenGL Performer Runtime 2.2.10 overlay incorporates the latest fixes.

Introduced in IRIX 6.5.9:

- Support for Embedded Support Partner 2.0 (ESP2.0). The Embedded Support Partner Overview and the Embedded Support Partner User Guide have been combined. The new document is called the Embedded Support Partner User Guide and will contain overview and usage information for the ESP 2.0 command line and graphical user interfaces.
- Support for the SCSI Enclosure Services (SES). A new subsystem that manages the Fibre Channel drive enclosures has been added. The new daemon, `sesdaemon`, supports the Xyratex 12-slot enclosure and the Clarion 10-slot enclosure. The new client application, `sesmgr`, uses a command set similar to the set used by the previous `fcagent/fccli` subsystem. For more information, see the `sesdaemon`(1M) and `sesmgr`(1M) man pages.
- OpenGL Performer Runtime 2.2.9 overlay incorporates the latest fixes.

Introduced in IRIX 6.5.8:

- Embedded Support Partner (ESP) patch 3895 migrates ESP 1.0 to ESP 2.0. This patch release includes new features and bug fixes.
- Support for 32-bit direct mapping to any node on the system. For more information, see the *IRIX Device Driver Programmer's Guide* and the `pcibr_get_dmatrans_node`(D3) man page.
- Support for the Cpuset System programming interface application (previously known as `miser_cpuset`). For more information, see *IRIX Admin: Resource Administration* and the `cpuset`(5) and related man pages,
- Support for new Miser cpuset options. These options allow the creation of restrictive memory pools from the nodes that contain the CPUs listed in the configuration file.For more information on these options, see the `cpuset`(4) man page.
- OpenGL Performer Runtime 2.2.8 overlay incorporates the latest fixes.
- Documenter's Workbench with the latest Y2000 bug fixes can be installed from the `/CDROM/dist/unbundled` directory of the IRIX 6.5.8 (or above) Overlays CD (2 of 3), May 2000.

Introduced in IRIX 6.5.7:

- Updating `sendmail` to version 8.9.3

The version of the IRIX sendmail mail system supplied on this release and previous IRIX 6.5.*x* releases is based on `sendmail` version 8.8.8. Due to customer demand, the current sendmail.org release, `sendmail` version 8.9.3 (see `http://www.sendmail.org`), will be supplied via patch 3865 or its successor. SGI intends to support `sendmail` 8.9.3 (or above) as the standard released `sendmail` in a future IRIX release, target 6.5.10.

For more information on the 8.9.3 version of `sendmail`, see the *IRIX Administration: Networking and Mail Guide* provided with the patch. For more information on how to configure `sendmail` 8.9.3, see `http://www.sendmail.org/m4/readme.html`.

- Open Inventor Runtime 2.1.6 overlay incorporates fixes included in versions 2.1.4 and 2.1.5. This overlay requires that the base Inventor 2.1.4 image be installed already, or with the overlay during the same install session. The Inventor 2.1.6 overlay can be installed on IRIX 6.5.5 and later.
- OpenGL Performer Runtime 2.2.7 overlay incorporates the latest fixes.

Introduced in IRIX 6.5.6:

- Support for a multithreaded version of the automatic filesystem mount daemon `autofsd`.

Introduced in IRIX 6.5.5:

- Embedded Support Partner, which is an integral part of the IRIX operating system, provides system administrators with a way to monitor various events (such as system events, changes in system hardware and software configuration, and system performance) on their systems. For more information, see the *Embedded Support Partner Overview*, the *Embedded Support Partner User Guide*, and the Embedded Support Partner man pages.
- Support for the version 2 XFS directory format; this format lets you choose a filesystem block size to match the distribution of data file sizes without adversely affecting directory operation performance. The directory format is specified with the `-n` parameter of the `mkfs` command. For more information, see *IRIX Admin: Disks and Filesystems* and the `mkfs_xfs`(1M) man page.
- Support for the math and scientific library SCSL 1.3. SCSL 1.3 will replace `Challengecomplib` on all supported system platforms at the time of the next major IRIX Release.

  SCSL 1.3 can be downloaded from the SGI Download Cool Software Web page at `http://www.sgi.com/Products/Evaluation`. If you do not have Web access and are a current support customer, you can request CD media free of charge through your local support center. Non-contract customers can contact their sales representatives to order SCSL 1.3.

For more information on SCSL, see `http://www.sgi.com/software/scsl.html`

- Support for Automated Performance Monitoring. For more information, see the `pmie`(1) and `pmieconf`(1) man pages, and the *Performance Co-Pilot IRIX Base Software Administrator's Guide*.
- Two new options were added to the `miser_create_cpuset` command. These options allow additional restrictions on memory assignment for processes running on a CPU set. These options are documented in the `miser_cpuset`(4) man pages.

Introduced in IRIX 6.5.4:

- Support for the Miser queue repack policy. For more information, see the `miser`(4) and `miser`(5) man pages, and *IRIX Admin: System Configuration and Operation*, Chapter 7 "Managing User Processes."
- Distributed Computing Environment (DCE) Client for accessing shared resources in distributed computing DCE/DFS serving environments
  - Kernel libraries only
  - Requires installation of DCE/DFS 1.2.2a software for full functionality

Introduced in IRIX 6.5.3:

- (Octane systems only) The worst-case interrupt response time is guaranteed to be less than one millisecond on properly configured Octane systems
- Support for the X security and appgroup extensions (combined with a new Netscape plug-in, these allow the embedding of X applications in Web pages)
- Support for European fonts, including the Euro currency symbol
- New Software Manager and Inst commands to simplify selections for upgrades
- New Software Manager and Inst configuration variable to more easily handle cases where configuration files are upgraded. See the *smart_config_handling* preference in `inst` or `swmgr` for more information.
- Support for LDAP 3.0

Introduced in IRIX 6.5.2:

- AutoFS extended to use UNS for map information
- Support for DCShare application sharing extension
- Fibre channel support to Dmnet
- Three new HP printer drivers: HP4000, HP5000 and HP4500 (Color LaserJet 4500DN)

Documentation changes

Manuals in the IRIX Admin document set are updated when necessary to document new features at each IRIX release. The front of each manual includes a description of new features and major documentation changes for the current revision, as well as a record of when the manual was revised. The most recent version of an IRIX Admin document available on the Technical Publications Library includes information for features available in the current IRIX release.

The Techpubs Library is available at: `http://techpubs.sgi.com`.

Applications CD changes

Note: Applications take two forms: full images and overlays. The base versions of each can be found on the Applications CD. When full images are updated, new versions are placed on the Applications CD. Upgrades of overlay products, however, are located on the Overlay.

Introduced with IRIX 6.5.15

- Netscape Communicator 4.79 was updated with bug fixes.

  By default, Netscape Communicator version 4.79 will install the new N32 version of the browser. Any existing third-party plugins for the browser that are O32 will no longer function. Support for the O32 Macromedia Flash plugin is also included but requires the O32

Netscape client which must be manually selected for installation. For more information on the features of the Netscape client, see `http://browsers.netscape.com/browsers/main.tmpl`.

- IRIX Interactive Desktop System Administration, Information Searching Execution Environment, Impressario 2.10.5, NEdit 5.1.1c, and Webviewer 3.0.2 were updated with bug fixes.
- InSight Online Doc Viewer 4.4.1 is now N32 for better performance.
- SGI Web Server is now based on the Apache 1.3.22 release.

Introduced with IRIX 6.5.14

- SGImeeting 2.0.1, Color Management, Internet Gateway 3.2 , NEdit 5.1.1b, Appletalk 10.01 and Netscape Communicator 4.78 were updated to incorporate bug fixes.

Introduced with IRIX 6.5.13

The following products were updated with bug fixes only:

- SGI Web Server, based on the Apache 1.3.20 release, IRIX Interactive Desktop System Administration, Information Searching Execution Environment, InSight Online Doc Viewer 4.4, Netscape Communicator 4.77 were updated to incorporate bug fixes.
- WebSetup 3.3 was updated to support the SGI web server based on Apache 1.3.20 and an administration GUI was added.

- Impressario 2.9.5 supports a new HP6300 Scanner driver and an Epson PPD bug fix.

Introduced with IRIX 6.5.12

- SGI web server, based on the Apache web server version 1.3.17, replaces the Netscape FastTrack web server.
- WebSetup 3.2 has been updated to support the SGI web server based on Apache
- NEdit version 5.1.1a has added extensions to the regular expression syntax, an improved international character set input, new macro subroutines, and improved syntax highlighting for several programming languages
- Impressario 2.8.5 provides support for two new HP printer drivers, HP4050 and HP8100
- Runtime Plug-in for IRIX, Java Edition 1.1.1b has added support for the Netscape N32 plugin and the O32 plugin
- The following products from the Isogon Corporation have been removed: LicensePower/iFOR IS4.0.1 ARK and LicensePower/iFOR IS4.0.1 CRK. Sales and support has been divested to the Isogon Corporation at `http://www.isogon.com`. For more information on support modes, see the Support Policy page at `http://www.support.sgi.com/news/support/index.html#support_policy`.

Introduced with IRIX 6.5.11

- Cosmo Player, IRIX Interactive Desktop, Impressario, IRIX Interactive Desktop Tools, IRIX Interactive Desktop Administration, IRIS InSight Viewer, IRIS InSight Developer, and IRIS InSight Dynaweb Server, Netscape Communicator, Netscape Developer, and IRIS Showcase have been updated to incorporate bug fixes.
- AccessX has been updated with the latest revision of the help book. It can be viewed after installation of the product.
- Graphics Demonstration Programs, Graphics Demonstration Programs for O2, Octane Demos, and Octane Demos 2 software have been removed from the IRIX Apps CD and incorporated into existing platform specific Demonstration Program CDs that ship with new systems.
- Nedit GUI style editor has been updated from version 4.0.3 to the latest freeware version, 5.1.1.
- Netware 1.1.1 is now compatible with SGI 3000 systems.
- Webviewer has been revised to prepend the new threaded Cosmo Player plugin directory to the default webviewer plugin search path.

Introduced with IRIX 6.5.10:

- IRIX Interactive Desktop, IRIX Interactive Desktop Tools, IRIX Interactive Desktop Administration, IRIS InSight Viewer,

IRIS InSight Developer, and IRIS InSight Dynaweb Server have been updated with bug fixes.

- Cosmo Player 2.1.4 release has added support for the Netscape N32 plugin.
- CustomerLink Client Software will no longer be supported. Its key features have been migrated to the SupportFolio Online site (`http://support.sgi.com`).
- Customer Support Services Base Software will no longer be supported. Its key features have been migrated to the SupportFolio Online site (`http://support.sgi.com`).
- Impressario 2.6.5 has added 1000 new PPD files to the `/usr/spool/lp/PPD_untested/` directory. The README file in this directory contains details on how to use the new drivers.
- Netscape Communicator 4.75
- Netscape FastTrack Server 3.03 contains an updated version of the Administration Server 3.52 (initially added in 6.5.5)
- Demonstration Programs, Octane2 demos added
- Runtime Plug-in for IRIX, Java Edition 1.1.1a has added support for the Netscape N32 plugin
- SGImeeting Collaboration Environment with Extensions, 2.0, Net-based data-conferencing, application-sharing software. A 30-day evaluation license is included. SGImeeting 2.0 is an update release to

SGImeeting 1.4. For more information on SGImeeting, see `http://www.sgi.com/software/sgimeeting`. For additional assistance, contact your local SGI sales representative.

- Xinet Macintosh Connectivity Software, also referred to as Xinet Appletalk, now includes K-AShare, K-FS, and K-Spool software. For more information on Xinet products, see `http://www.xinet.com`. For technical or sales questions, please contact Xinet at `sales@xinet.com` or 1.510.845.0555.

Introduced with IRIX 6.5.9:

- AccessX, Acrobat, Appletalk, Cosmo Player, IRIX Interactive Desktop System Administration, Impressario InSight, and Java have been updated with bug fixes.
- SGIMeeting 1.4 has been added back to the Apps CD and is provided with a 30 day Evaluation License that allows a demo collaborative session to run for 10 minutes. For more information on SGImeeting, see `http://www.sgi.com/software/sgimeeting`. For additional assistance, contact your local SGI sales representative.

Introduced with IRIX 6.5.8:

- AccessX, Desktop Runtime, Impressario, Infosearch, InSight, License Runtime, Sysadmin Desktop updated with bug fixes

Introduced with IRIX 6.5.7:

- SGImeeting and SGImeeting Extensions are now both licensed products and are no longer available on the Applications CD. Future revisions of the base SGImeeting product and the Extensions will be distributed on separate CDs and licensed separately. For additional information or assistance, contact your local SGI sales representative.
- Netscape 4.7A provides additional localization and the Flash plug-in since the 4.7 release.

Introduced with IRIX 6.5.6:

- Upgrade to Netscape Communicator 4.7.

Note: Netscape Radio is implemented only for systems with the G2 player installed.

Introduced with IRIX 6.5.5:

- WebViewer Library Execution Only Environment 3.0

Changes with IRIX 6.5.14:

- SCSL 1.4

  SCSL is a collection of high-performance mathematical and numerical libraries that are widely used in scientific and technical compute intensive applications. An iterative solver for sparse systems of linear equations, as well a direct solver for sparse complex symmetric systems of linear equations, were added to the SCSL 1.4 release. Additional features added to SCSL for this release are as follows:

  – A thread-safe parallel random number generator
  – Fortran90 interfaces to the BLAS
  – A parallel implementation of the solve phase for the out-of-core sparse solver
  – Removal of all entry points to the `CHALLENGEcomplib FFT` routines
  – Performance enhancements and rollup bug fixes from SCSL 1.3.

  SCSL can also be downloaded free of charge from the Download Cool Software page at `http://www.sgi.com/products/evaluation/`.

  For more information on SCSL, see `http://www.sgi.com/software/scsl.html`

For customers who do not have web access and are enrolled under a valid support contract, CD media can be requested free of charge from their local support center. Non-contract customers can order SCSL from their local sales representative.

Bundled Applications (ASE/AWE)

Changes with IRIX 6.5.8:

- Syntax TAS and CA Unicenter TNG Framework no longer included with IRIX 6.5 ASE

  SGI no longer bundles the Syntax TAS software with Origin systems as of June 2000. For interoperability solutions with PCs, Macintosh, and other systems, customers can contact Syntax at `www.syntax.com` or evaluate some of the solutions from SGI such as Samba (SC4-SAMBA-2.0.7). For Macintosh interoperability, SGI offers a demo version of Xinet's KAShare (Appletalk) product (`www.xinet.com`) on the IRIX Applications CD.

- SGI no longer includes CA Unicenter TNG Framework with IRIX ASE. A free CD of CA Unicenter TNG Framework is now available from `www.ca.com/fw_reg.htm`.

  For more information about the bundled software that is included with this release, see CD Contents and the Bundled Software and Licenses web page that you can access from the Welcome web page.

IRIX 6.5.16 Update Kit Contents

The IRIX 6.5.16 Update Kit contains the following items for both server and workstation system configurations:

- CD Name:
    1. IRIX 6.5.16 (1 of 4) Installation Tools & Overlays CD, May 2002
    2. IRIX 6.5.16 (2 of 4) Installation Tools & Overlays CD, May 2002
    3. IRIX 6.5.16 (3 of 4) Overlays CD, May 2002
    4. IRIX 6.5.16 (4 of 4) Overlays CD, May 2002
    5. IRIX Applications for 6.5.16, May2002
- The IRIX CD booklet *Installation Instructions: Installing an Intermediate (Overlay) Release, Installing Applications, Installing Software Licenses*

SGI Web Sites

IRIX 6.5-Related Web Sites

- SGI product information

  `http://www.sgi.com/products`

- IRIX 6.5 datasheet

  `http://www.sgi.com/software/irix6.5/datasheet.pdf`

- Start Here: Installing IRIX 6.5.14

  `http://support.sgi.com/6.5/installing.html`

- To view all qualified applications compatible with IRIX 6.5 releases, see `http://support.sgi.com/6.5/spk`

Services

- Customer Education Services

  `http://www.sgi.com/support/custeducation/`

- Professional Services

  `http://www.sgi.com/services`

Online Tools

- Customer Registration

  `http://www.sgi.com/support/custreg.html`
- Software Licensing/Key-O-Matic

  `http://www.sgi.com/Support/Licensing`
- Supportfolio Online

  `http://support.sgi.com`
- Online documentation - Technical Publications Library

  `http://techpubs.sgi.com`

Other Sites

- Download Cool Software

  `http://www.sgi.com/Products/Evaluation`
- Free Software

  `http://freeware.sgi.com`

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