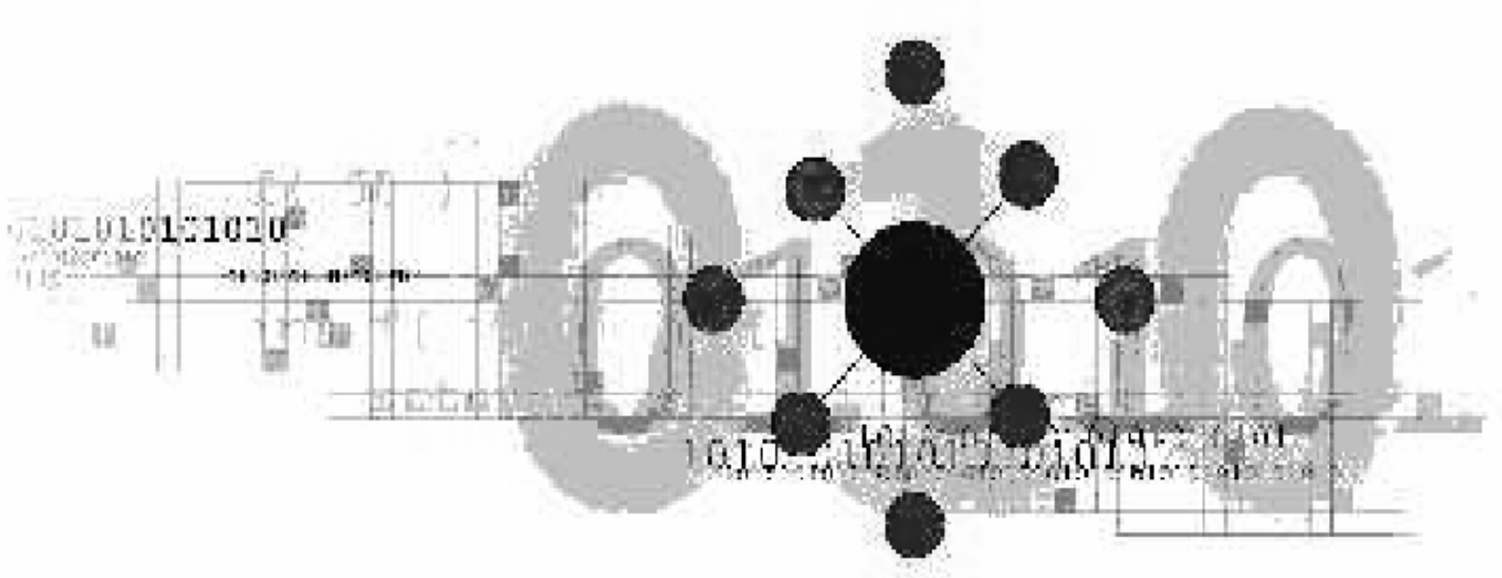
IRIX® 6.5.18 Update Guide



1600 Amphitheatre Pkwy.
Mountain View, CA 94043-1351
Telephone (650) 960-1980
FAX (650) 961-0595

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Dear Valued Customer,

SGI® is pleased to present the new IRIX® 6.5.18 maintenance and feature release. Starting with IRIX® 6.5, SGI created a new software upgrade strategy, which delivers both the maintenance (6.5.18m) and feature (6.5.18f) streams to our support contract customers. 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 website 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 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 until January 2003.

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. IRIX 6.2, IRIX 6.3, and IRIX 6.4 operating system versions are examples of major operating system releases that are supported in this category beginning January 2003.

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 webpage at
`http://support.sgi.com/irix/news/index.html#swmodes`
contains a link to a webpage where the eight software support modes are described in more detail. This webpage 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 6.5.18 update. This booklet contains:

- A list of key features in IRIX 6.5.18
- A list of CDs contained in the IRIX 6.5.18 update kit
- A guide to SGI websites

IRIX 6.5.18 Key New Features

The following changes have been incorporated into the core IRIX 6.5.18 overlay CDs and the Applications CD.

New Software Features - Feature Stream Only

Filesystems

- **XVM snapshot feature**
  The XVM snapshot feature provides the ability to create virtual point-in-time images of a filesystem without causing a service interruption. The snapshot feature requires a minimal amount of storage because it uses a copy-on-write mechanism that copies only the data areas that change after the snapshot is created. The XVM snapshot feature is supported in the CXFS and XVM GUIs. For information on the XVM snapshot feature, see the *XVM Volume Manager Administrator's Guide*, 007-4003-011.

  Use of the XVM snapshot features requires a FLEXlm license.

- **CXFS Manager GUI adds XVM GUI functionality**
  In IRIX 6.5.18f, the CXFS Manager graphical user interface (GUI) has been enhanced to contain all of the XVM GUI functionality. Using the CXFS GUI in IRIX 6.5.18f or later release, you can view and configure CXFS filesystems as well as use drag-and-drop to structure volume

topologies and administer XVM disks. Command buttons provide shortcuts to some tasks.

For information on the CXFS GUI, see the *CXFS Version 2 Software Installation and Administration Guide*. For details about XVM volume management, see the *XVM Volume Manager Administrator's Guide*.

- **XVM Volume Manager GUI as a standalone product**
  In an environment without cluster services enabled, you can set up and administer logical volumes with the XVM Manager GUI as a standalone product. For information on XVM volume management, see the *XVM Volume Manager Administrator's Guide*.

- **CXFS Supports IRIX Client-Only Nodes**
  As of 6.5.18f, IRIX nodes may now be CXFS client-only nodes, meaning that they run a minimal implementation of the CXFS and cluster services, and do not contain a copy of the CXFS cluster database. Client-only nodes are installed with the `cxfs_client` software product.

  Nodes that you want to run as potential metadata servers must be installed with the `cluster_admin` software product, allowing the node to perform cluster administration tasks and contain a copy of the cluster database. They must also be defined as metadata server-capable administration nodes.

A CXFS cluster is now supported with as many as 32 nodes. As many as 16 of those nodes can be CXFS administration nodes and all other nodes can be client-only nodes. SGI strongly recommends that only potential metadata servers be configured as CXFS server-capable administration nodes and that there be an odd number of server-capable nodes for quorum calculation purposes.

- **CXFS relocation disabled; CXFS recovery supported on standby nodes**
  In 6.5.18f, CXFS relocation is disabled by default and CXFS recovery is supported only when using standby nodes. This includes recovery (when using standby nodes) of hierarchical storage management (HSM) products using the data management application programming interface (DMAPI).

  A standby node is a metadata server-capable administration node that is configured as a potential metadata server for a given filesystem, but does not currently run any applications that will use that filesystem. To use recovery, you must not run any applications on any of the potential metadata servers for a given filesystem; after the active metadata server has been chosen by the system, you can then run applications that use the filesystem on the active metadata server and client-only nodes.

Relocation and recovery are fully implemented, but the number of associated problems prevents full support of these features in the current release. Although data integrity is not compromised, cluster node panics or hangs are likely to occur. Relocation and recovery will be fully supported in a future release when these issues are resolved.

For information on CXFS, see the *CXFS Version 2 Software Installation and Administration Guide*.

- **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 IRIX 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 Version 2 Software Installation and Administration Guide* for more information.

- **CXFS upgrade: cluster nodes**
  For CXFS customers, if you install IRIX 6.5.18f 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 6.5.18f version CXFS (`sysadm_cxfs`) and install 6.5.18f `sysadm_cluster`.

New Software Enhancements - Maintenance and Feature Stream

Filesystems

- **Support added for UDF filesystems**
  The IRIX 6.5.18 release includes read-only support for the UDF filesystems format typically used for DVDs and packet-written CD-RWs. IRIX support for UDF filesystems does not, however, include support for playing DVD movies. DVDs will be automatically mounted by `mediad` in the same way that CD-ROMs are automatically mounted. For further information on mounting UDF filesystems, see *IRIX Admin: Peripheral Devices*.

  To determine whether you have a DVD-ROM drive, run `scsicontrol -i /dev/scsi/`*scsi-device*. The device type will be displayed between the manufacturer's name and the model number.

  Note: Support for UDF filesystems requires that you install `eoe.sw.udf`.

Device Drivers

- **QLFC enhanced driver messages**
  QLFC has been enhanced to improve its output message format for messages logged to the console and SYSLOG. The name of the driver as it appears in messages has been changed from "QL" to "QLFC". The syntax of the messages has been modified to include the fabric port number in the message, in a form similar to the manner in which fabric devices are named.

For example, where the old driver would output this message:

```
ql11d(0x200400a0b80cd1ab): target has returned.
```

the new driver will output this message:

```
qlfc11: 200400a0b80cd1ab/c11p2: target has returned.
```

Networking/Security

- **List approved shells in the /etc/shells file**
  In IRIX 6.5.18, the `/etc/shells` file has been added to provide system administrators with the ability to define appropriate shells for users. The implementation of this feature includes the following ramifications:

  A user's shell, as defined in `/etc/passwd` or an NIS map, must be listed in `/etc/shells` for the user to change a password with `yppasswd` or `ypchpass`.

  A user's shell, as defined in `/etc/passwd` or an NIS map, must be listed in `/etc/shells` for sendmail to deliver a user's mail if the user's mail is piped to a process (such as `procmail` or `vacation`).

  Users are able to log in and use the system interactively, regardless of whether the shell is listed in `/etc/shells`. For more information see the `shells`(4) man page.

Hardware Inventory Command

- **New hinv command support**
  For the IRIX 6.5.18 release, the `hinv` command with the `-v` option displays the PCI/PCI-X bus speed of QLogic fibrechannel adapters. The `hinv -t scsictlr` command displays the SCSI/fibrechannel adapters.

Real-Time

- **Processor timer load management**
  Beginning with IRIX 6.5.18, a user is able to keep the interrupt and processing load generated by interval timers away from specific CPUs. This feature may reduce latency and jitter for real-time applications. For more information see the `sysmp`(2) and `mpadmin`(1) man pages.

Kernel Tunable Parameters

- **Revised reboot_on_panic parameter description**
  The `reboot_on_panic` parameter, when set to 1, specifies that the system should automatically reboot after a kernel panic. This is particularly useful for servers or other systems which frequently go unattended or are used remotely, where it may not be convenient to physically reset the system. The default for SGI servers and large graphical systems is to reboot after a kernel panic.

It is important to note that the rebound variable, an environment variable set in the PROM monitor for most processors, is always checked before the `reboot_on_panic` parameter and can override it. If the `reboot_on_panic` parameter is set to 0 and the rebound value is set to y, the `reboot_on_panic` parameter in effect becomes 1 and your system will automatically reboot.

For more information, see *IRIX Admin: System Configuration and Operation*.

Resource Administration

- **Job limits support clarified**
  Job limit values (`rlim_t`) are 64-bit in both n32 and n64 binaries. Consequently, n32 binaries can set 64-bit limits. o32 binaries cannot set 64-bit limits because `rlim_t` is 32-bits in o32 binaries. IRIX supports three Application Binary Interfaces (ABIs): o32, n64, and n32 (for more information on ABIs, see the `abi`(5) man page). *IRIX Admin: Resource Administration*, *IRIX Admin: System Configuration and Operation*, and the `setjlimit` (2) man page have been updated with this information.

Graphic Workstations

- **New Falls screen saver**
  IRIX 6.5.17 adds a new Falls screen saver that can be selected from the IRIX screen saver control panel. It is an OpenGL depiction of a waterfall.

Checkpoint and Restart

- **Enhancements to atcheckpoint() and atrestart()**
  At checkpoint time and at restart time, registered functions are called in the same order as the first-in-first-out order of their registration with `atcheckpoint`() or `atrestart`(), respectively. This is an important consideration for applications that need to register multiple callback handlers for checkpoint or restart events.

  Use of `atcheckpoint`() and `atrestart`() now ensures that registered signal handlers are invoked only when a checkpoint or restart of the application is actually in progress (as opposed to the user sending the signals directly via a function such as `sigsend`()).

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 webpage located at:

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

Applications CD

The following full images have been added to the IRIX 6.5 Applications CD for this release:

- Common Desktop Environment 5.3 (CDE)

  CDE 5.3 integrates Tooltalk v1.2 into the SGI environment.
- Java2 v1.3.1_02 JRE
- Java2 v1.3.1_02 JDK
- Java2 v1.3.1_02 plugin

The following full images have been revised with bug fixes for the IRIX 6.5 Applications CD for this release:

- Fulltest Indexing and Search Environment
- Information Searching Execution Environment
- InSight, InSight Dev, and InSight Glossary
- License Tools
- SCSL 1.4.1

The following full image has been revised with localization updates for the IRIX 6.5 Applications CD for this release:

- SGImeeting 2.0.3a

The following Overlays have been revised with bug fixes for the IRIX 6.5 Overlay CD for this release:

- IRIX® Interactive Desktop
- IRIX® Interactive Desktop Tools
- IRIX® Interactive Desktop Administration
- Impressario™ Printing Tools

In IRIX 6.5.18, several overlays have been revised to fix Section 508 bugs.

Starting with IRIX 6.5.18 the IRIS InSight Viewer (insight) has been converted to a full image rather than an overlay image and the Dynaweb product was removed.

I**RIX OS Bundled Software**

For information about the bundled software that is included with this release, see the Bundled software and licenses webpage that you can access from the Welcome webpage.

Freeware CDs

The following changes have been incorporated into the November 2002 update to the SGI IRIX Freeware Project.

New products for this release:

- ccache-1.9 - Compiler Cache
- galeon-1.2.5 - A gnome/gecko based web browser
- gnupg-1.0.6 - GNU Privacy Guard
- gperf-2.7.2 - Perfect Hash Function Generator
- libgeotiff-1.1.4 - Cartographic projection library
- mahogany-0.64 - cross-platfrom email client
- pam_ldap_auth-150 - PAM/LDAP authentication module.
- pam_radius_auth-1.3.15 - PAM/RADIUS authentication module.
- pidentd-3.0.14 - TCP/IP IDENT protocol server
- pkgconfig-0.13.0 - package configuration tool
- plugger-4.0 - Multimedia plugin for Netscape/Mozilla
- proj-4.4.5 - Cartographic projection library
- sane-backends-1.0.8 - SANE scanner library backends
- sane-frontends-1.0.8 - SANE scanner library frontends
- sylpheed-0.7.6 - GTK based email client
- wxGTK-2.3.3-M - Cross-Platform C++ framework
- xsane-0.88 - SANE graphical frontend
- zephyr.2.5.0 - chat client/server

Updated products for this release:

- blackbox-0.65.0 - blackbox window manager
- exif-0.5 - JPEG/EXIF image handler
- gcombust-0.1.52 - GUI for cdrtools/cdlabelgen
- gftp-2.0.13 - GTK+ based ftp client
- gimp-print-4.2.2 - print facility for GIMP and CUPS
- gphoto2-2.1.0 - Digital camera access library
- htmldoc-1.8.22 - convert HTML to PDF or PostScript
- libao-0.8.3 - simple portable audio output library
- libexif-0.5.6 - EXIF tag parsing library
- libogg-1.0 - Ogg streaming multimedia library
- libpng-1.0.14 - PNG image format library
- liptool-1.4.2 GNU generic library support
- libvorbis-1.0 - Ogg Vorbis audio codec
- mozilla 1.1 - a gtk based webbrowser
- mysql-3.23.52 - MySQL relational database
- openslp-1.0.9a - Service Location Protocol (SLP)
- openssl-0.9.6g - Secure Sockets Layer Toolkit
- php-4.2.3 - PHP: Hypertext Processor http-server scripting

- procmail-3.22 - mail processing package
- proftpd-1.2.6rc2 - FTP Daemon
- tar-1.13.25 - GNU tar
- tiff-v3.5.7 - Tag Image File Format (TIFF)
- vorbis-tools-1.0 - Ogg Vorbis audio compression tools
- xchat-1.8.10 - GTK+/GNOME IRC client
- xlockmore-5.05 - X11 screen locking program

Products that were omitted for this release:

- sane - Scanner Access Now Easy 1.00 (sane) replaced by sane-backends-1.0.8 and sane-frontends-1.0.8

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/`.

Documentation

The following manual is new for this release.

- *Memory Management Control Programmer's Manual*, 007-4533-001

This manual is a reference document for people who run applications on SGI computer systems running the IRIX operating system. It contains information about how you can take advantage of memory management features in IRIX to increase the performance of your application.

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

- *IRIX Admin: Resource Administration*, 007-3700-013, adds information about job limits support for IRIX ABIs.
- *IRIX Admin: System Configuration and Operation*, 007-2859-020, adds information about `reboot_on_panic` and `nbuf` kernel tunable parameters and information to the "Resource Limits Parameters about job limits support for various IRIX ABIs" section.
- *IRIX Admin: Disks and Filesystems*, 007-2825-011, adds information about UDF filesystem format.
- *IRIX Admin: Peripheral Devices*, 007-2861-004, adds information about support for UDF/CD-ROM filesystem format.
- *IRIX Checkpoint and Restart Operation Guide*, 007-3236-006, adds information about enhancements to the `atcheckpoint`() and `atrestart`() functions.
- *CXFS Version 2 Software Installation and Administration Guide*, 007-4016-015, adds information about CXFS client-only nodes, new

system tunable parameters, the enhanced CXFS GUI that includes XVM functionality, and information about the `cxfs_info`(1M) and `cxfsdump`(1M) commands.

- *XVM Volume Manager Administrator's Guide*, 007-4003-012, adds updated information on the XVM Manager GUI as a standalone product.

Key New Features from IRIX 6.5.1 to IRIX 6.5.17

Hardware Platforms and Features Supported

Introduced in IRIX 6.5.17:

- Support for Silicon Graphics Fuel visual workstation

Introduced in IRIX 6.5.17:

- Updated firmware for QLogic 2 Gbit fibre channel adapters

Introduced in IRIX 6.5.15:

- Support for PCI Expansion Module to Origin 300 systems

Introduced in IRIX 6.5.14:

- Support for the SGI Origin 300 server series.

Introduced in IRIX 6.5.13:

- Support for the 500MHz R14000 processor on SGI Origin 2000 and Onyx2 systems

Introduced in IRIX 6.5.12:

- Support for the 500MHz R14000 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 Silicon Graphics 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
- Support for the 66 MHz QLogic 2200 controller
- Support for the FC-Tape on a Storage Area Network (fabric) using the QLogic 2200 fibre channel controller to the tpsc driver

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 6.5.17

- The IRIX 6.5.17f release includes the XVM Manager GUI. The XVM Manager GUI provides access to the tasks that help you set up and administer XVM logical volumes and provides icons representing states and structure of the XVM volume elements.
- IRIX 6.5.17 includes support for the use of local XVM volumes as FailSafe resources. This requires FailSafe version 2.1.3. XVM volumes used in conjunction with CXFS should not be added as FailSafe resources. For information on configuring FailSafe resources, see the *IRIS FailSafe Version 2 Administrator's Guide*, 007-3901-006.

Introduced in IRIX 6.5.16

- For the IRIX 6.5.16f release, the `-extend` option was added to the XVM `show` command.
- For IRIX 6.5.16f, CXFS features include the following:
  - Support for multiple operating system (multiOS) clients.
  - I/O fencing.

  - Support for a two-node CXFS cluster running with FailSafe and an L1 controller on Origin 300 and Origin 3200 systems.

- The IRIX 6.5.16f release added 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.
- IRIX 6.5.16f added the `setjusage` system call, used to update resource usage for jobs in the kernel.
- The IRIX 6.5.16 release removed 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.

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*.
- For the 6.5.15f release of IRIX, you can implement disk quotas on XFS filesystems according to group 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.

  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*.
  - 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.

Introduced in IRIX 6.5.14

- The CXFS GUI was enhanced in the IRIX 6.5.14 release.

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. To accommodate clusters mixing nodes running 6.5.12 and 6.5.13, backwards compatibility is enforced by default in 6.5.13.
- The XVM Volume Manager is used in a clustered environment with CXFS filesystems. 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 or later.

- 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 Version 2 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 6.5.17

- With IRIX 6.5.17, the underlying documentation tools and books have undergone a major upgrade. These processes now allow for SGML or XML documents to be published directly into HTML (our delivery format). These same tools are available to you as part of the "SGI Book Building Tools" product; formerly the "IRIS InSight Professional Publisher".

  For viewing documentation on the IRIX Interactive Desktop, the following changes have been made: InfoSearch (the primary online documentation viewer) has been revamped to support the new document format, SGIHelp (the IRIX Desktop Help system) has undergone minor changes, and the Dynaweb product is no longer shipped (or required). In addition, the IRIS InSight Viewer (insight) now exists solely as an intermediate process that launches your standard desktop web browser to access InfoSearch. Online books can also be viewed using your standard desktop web browser by opening the (local) file:
  `/usr/share/Insight/library/SGI_bookshelves/index.html`

  Our goal is to deliver all online books to you in this new format. There are circumstances whereby some books may still exist on your local system in the "old format." Examples would include some of the SGI Developer documentation: the MIPSpro compiler books and

the ProDev WorkShop books fall into this category (books that require conversion). The online documentation tools will report a warning when encountering books in the “old format” that require conversion.

A conversion process is provided (the existing `insightAdmin` command). Various options for performing the conversion are available through this tool. It is important to note that the conversion only needs to be done once, unless additional products are installed that still contain books in the “old format”. Be advised that this process can be time consuming. Total time is based on the size and number of books that need to be converted, and the availability of system resources. On average, 1-3 minutes per book on an older desktop-class machine (R5000 O2) can be expected. For that reason, a system administrator may wish to perform this operation at an off-peak time.

For further details, see the insight and infosearch release notes, and the related man pages (`insightAdmin`(1), `insight`(1), `sgihelp`(1), `infosearch`(1)). Virtually all SGI documentation can be accessed from `http://docs.sgi.com`.

- In IRIX 6.5.17, the Remote Shell Daemon (`rshd`) has been enhanced to check for expired passwords.
- The overall behavior of the NFS Version 3 client has been modified to improve mixed and heavy load performance. Most casual users of NFS will probably notice little change. However, users should see a

marked improvement in performance under the following conditions:

- Running applications that write large amounts of data over NFS
- Heavy use of bi-directional NFS I/O
- Mixed heavy local disk and NFS I/O

To improve performance under heavy loads, a new set of behaviors have been added that perform the following actions:

- Enable full-duplex NFS traffic
- Prevent read and write starvations
- Provide resource limiting to make the NFS client a fairer user of system resources

These behaviors are based on the notion of fair scheduling of asynchronous NFS I/O to prevent starvations and provide more efficient use of network bandwidth and server disk resources. This also extends to prevent starvations between different NFS mounted directories.

- IRIX 6.5.17 adds a new `build_cmgr_script`(1M) command that generates a `cmgr`(1M) script from the cluster database. The script can be used later to recreate the cluster database after performing a `cdbreinit`.

- For the IRIX 6.5.17 release, device drivers can create kernel threads not associated with particular interrupts to act as daemons and do background processing.
- For 6.5.17, two new options were added to the `cpuset` command. The `-M` option allows the user to move a process or group of processes and their associated memory from one cpuset to another. The `-T` option allows the user to move a process or group of processes but not their memory from one cpuset to another.
- In IRIX 6.5.17, support for following interfaces has been added:
  - For nodename-to-address and address-to-nodename translations, `getaddrinfo`(3), `getnameinfo`(3), `gai_strerror`(3), `freeaddrinfo`(3), `getipnodebyname`(3), `getipnodebyaddr`(3) and `freehostent`(3)
  - For interface index-to-name and name-to-index conversions, `if_indextoname`(3), `if_nametoindex`(3), `if_nameindex`(3) and `if_freenameindex`(3)

Introduced in IRIX 6.5.16:

- IRIX 6.5.16 supports a new XThread Control Interface (XTCI) that allows users to control many interrupt thread parameters, including cpu binding. For information on this interface, see the `realtime`(5) man page.

- For the IRIX 6.5.16 release, performance improvements have been made to the `rtmond` system monitoring daemon. For information on the `rtmond` daemon, see the `rtmond`(1) man page.
- 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*.
- 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.
- 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.

- The IRIX 6.5.16 release includes two new options to the `cpr` command:
  - the `cpr -w` option that allows you to use the attribute file located in the current working directory (versus `$HOME/.cpr`).
  - the `cpr-m` memory migration option, which allows you to migrate the checkpointed memory to the location in the system topology where the restart operation is executing. In addition, a

  For more information, see the *IRIX Checkpoint and Restart Operation Guide* and the `cpr`(1) man page.
- The IRIX 6.5.16 release adds a `CONTENTS` action keyword for the FILE policy of a CPR attribute file. For more information, see the *IRIX Checkpoint and Restart Operation Guide*.
- 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. 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.
- 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.

- The IRIX 6.5.16 release adds documentation for the following kernel tunable parameters:
  - min_bufmem general parameter
  - rtcpus dispatch parameter
  - bdflush_interval filesystem parameter

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

- 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.

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.

- 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.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. 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.
- 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 webpage 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 webpage for more details: `http://www.sgi.com/support/licensing/`.
  - For e-mail 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.

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.

  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

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. For information, see chapter 4, "Cpuset System", in the *IRIX Admin: Resource Administration* manual and the c`pusetGetProperties`(3x) and `cpusetFreeProperties`(3x) man pages.
- Parts of the *IRIX Interactive Desktop* were refreshed in IRIX 6.5.14.

Introduced in IRIX 6.5.13

- Improved exit codes for the `xfsrestore` and `xfsdump` commands.
- 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. 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. 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. 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 and OpenGL performance improvements.
- 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 and 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. 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.

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.

- 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 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 webpage 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 webpages)
- 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://docs.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 6.5.17

- MPT 1.6 was added to the Applications CD. It was previously released on a separate CD.
- SCSL 1.4.0.1 was moved from the Overlay CD to the Applications CD.
- Teleffect 1.0 was moved from the Teleffect CD to the Applications CD.

- Impressario Printing Tools, Webviewer, IRIX Interactive Desktop, IRIX Interactive Desktop Tools , and IRIX Interactive Desktop were updated with bug fixes only.
- The Jot text editor was replaced with a wrapper to launch NEdit. The Desktop Utilities customization panel still allows Jot to be chosen as the desktop environment Text Editor.In IRIX 6.5.17, NEdit 5.2a added localized strings and messages.
- NEdit 5.2a added localized strings and messages.
- The SGImeeting 2.0.3 user interface was reworked to make it more compact and attractive.
- SGI Webserver 1.3.26 added Trusted IRIX, Kesanna, MediaBase, and base SSL (Secure Socket layer) support.
- In FLEXlm License Tools 3.4.7, the floating license server was upgraded to FLEXlm v8.1b.
- InSight, SgSearch, and InfoSearch changed from being overlay images to being full images. Because of the changes for InSight, AccessX, Gateway, Imgtools, Outbox, Showcase, and Sitemgr had their online books rebuilt with no other software changes.
- Dynaweb has been removed from the IRIX Applications CD since its functionality has been integrated into InSight and InfoSearch.

Introduced with IRIX 6.5.16

- Impressarion Printing Tools, IRIX Interactive Desktop, IRIX Interactive Desktop Administration, IRIX Interactive Desktop Tools, and SGImeeting 2.0.2 were updated with bug fixes.
- Array Services 3.5, Information Searching Execution Environment, License Tools 3.4.6, NEdit 5.2, and Xinet Appletalk 10.02 were updated with enhancements or new features.

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

- 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 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`
- 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
- 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. For more information on available Computer Associates products and support, see the `http://ca.com` webpage.

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

IRIX 6.5.18 Update Kit Contents

The IRIX 6.5.18 Update Kit contains the following items for both server and workstation system configurations:

- CD Name:
    1. IRIX 6.5.18 (1 of 4) Installation Tools & Overlays CD, November 2002
    2. IRIX 6.5.18 (2 of 4) Installation Tools & Overlays CD, November 2002
    3. IRIX 6.5.18 (3 of 4) Overlays CD, November 2002
    4. IRIX 6.5.18 (4 of 4) Overlays CD, November 2002
    5. IRIX Applications for 6.5.18, November 2002
- The IRIX CD booklet *Installation Instructions: Installing an Intermediate (Overlay) Release, Installing Applications, Installing Software Licenses*

SGI Websites

IRIX 6.5-Related Websites

- 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://docs.sgi.com`

Other Sites

- Download Cool Software

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

  `http://freeware.sgi.com`

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