Oracle® Solaris 10 9/10 What's New

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Contents

Preface

Oracle Solaris 10 9/10 What's New summarizes all features in the Solaris 10 operating system (OS) that are new or have been enhanced in the Oracle Solaris 10 9/10 OS.

Note – This Solaris release supports systems that use the SPARC and x86 families of processor architectures. The supported systems appear in the Solaris OS: Hardware Compatibility Lists (`http://www.sun.com/bigadmin/hcl`). This document cites any implementation differences between the platform types.

In this document these x86 related terms mean the following:

- "x86" refers to the larger family of 64-bit and 32-bit x86 compatible products.
- "x64" relates specifically to 64-bit x86 compatible CPUs.
- "32-bit x86" points out specific 32-bit information about x86 based systems.

For supported systems, see the *Solaris OS: Hardware Compatibility Lists*.

Who Should Use This Book

This book provides introductory descriptions of the new Oracle Solaris features for users, developers, and system administrators who install and use the Oracle Solaris OS.

Optional Feature Licensing

Certain optional features and products that are described in this document might require individual licensing for use. Refer to the Software License Agreement.

Related Books

For further information about the features that are summarized in this book, refer to the Oracle Solaris 10 documentation at `http://docs.sun.com/app/docs/prod/solaris.10`.

Related Third-Party Web Site References

Third-party URLs are referenced in this document and provide additional, related information.

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Documentation, Support, and Training

See the following web sites for additional resources:

- Documentation (`http://docs.sun.com`)
- Support (`http://www.oracle.com/us/support/systems/index.html`)
- Training (`http://education.oracle.com`) – Click the Sun link in the left navigation bar.

Oracle Welcomes Your Comments

Oracle welcomes your comments and suggestions on the quality and usefulness of its documentation. If you find any errors or have any other suggestions for improvement, go to `http://docs.sun.com` and click Feedback. Indicate the title and part number of the documentation along with the chapter, section, and page number, if available. Please let us know if you want a reply.

Oracle Technology Network (`http://www.oracle.com/technetwork/index.html`) offers a range of resources related to Oracle software:

- Discuss technical problems and solutions on the Discussion Forums (`http://forums.oracle.com`).
- Get hands-on step-by-step tutorials with Oracle By Example (`http://www.oracle.com/technology/obe/start/index.html`).
- Download Sample Code (`http://www.oracle.com/technology/sample_code/index.html`).

Typographic Conventions

The following table describes the typographic conventions that are used in this book.

TABLE P–1 Typographic Conventions

Typeface	Meaning	Example
`AaBbCc123`	The names of commands, files, and directories, and onscreen computer output	Edit your `.login` file. Use `ls -a` to list all files. `machine_name% you have mail.`
`AaBbCc123`	What you type, contrasted with onscreen computer output	`machine_name%` **`su`** `Password:`
aabbcc123	Placeholder: replace with a real name or value	The command to remove a file is `rm` *filename*.
AaBbCc123	Book titles, new terms, and terms to be emphasized	Read Chapter 6 in the *User's Guide*. A *cache* is a copy that is stored locally. Do *not* save the file. **Note:** Some emphasized items appear bold online.

Shell Prompts in Command Examples

The following table shows the default UNIX system prompt and superuser prompt for shells that are included in the Oracle Solaris OS. Note that the default system prompt that is displayed in command examples varies, depending on the Oracle Solaris release.

TABLE P–2 Shell Prompts

Shell	Prompt
Bash shell, Korn shell, and Bourne shell	`$`
Bash shell, Korn shell, and Bourne shell for superuser	`#`
C shell	`machine_name%`
C shell for superuser	`machine_name#`

◆ ◆ ◆ CHAPTER 1

What's New in the Oracle Solaris 10 9/10 Release

This document summarizes all features that are new or have been enhanced in the current Oracle Solaris 10 9/10 release.

For a summary of all features in the Oracle Solaris OS that were introduced or enhanced since the Solaris 9 OS was originally distributed in May 2002, see *Solaris 10 What's New*.

Installation Enhancements

The following installation features have been added to the Oracle Solaris 10 9/10 release.

Oracle Solaris Auto Registration

Oracle Solaris Auto Registration is new in the Oracle Solaris 10 9/10 release. A new Auto Registration screen has been added to the interactive installer to facilitate registering your system using your Oracle support credentials. Oracle Solaris JumpStart installations and network installations require a new `auto_reg` keyword in the `sysidcfg` file to control settings during the installation. For details, see "auto_reg Keyword" in *Oracle Solaris 10 9/10 Installation Guide: Network-Based Installations*.

With Auto Registration, during the initial reboot, after you install or upgrade your system, configuration data about your system is automatically communicated through the existing service tag technology to the Oracle Product Registration System. The service tag data about your system is used, for example, to help Oracle enhance customer support and services. You can learn about service tags at `http://wikis.sun.com/display/ServiceTag/Sun+Service+Tag+FAQ`.

By registering with your support credentials using one of the registration options, you have a straightforward way to inventory your systems and the major software components on those

systems. For instructions about tracking your registered products, see `https://inventory.sun.com/inventory`. See also, `http://wikis.sun.com/display/SunInventory/Sun+Inventory`.

You can elect to have your configuration data sent to the Oracle Product Registration System anonymously. An anonymous registration means that the configuration data sent to Oracle has no link to the name of a customer. You also have the option to disable Auto Registration.

For further information, see "Oracle Solaris Auto Registration" in *Oracle Solaris 10 9/10 Installation Guide: Planning for Installation and Upgrade*.

SPARC: Support for ITU Construction Tools on SPARC Platforms

In this release, the `itu` utility has been modified to support booting a SPARC based system with the install-time updates (ITU) process. Third-party vendors can now deliver driver updates on diskette, CD or DVD, and USB storage. In addition, new tools that enable you to modify the Oracle Solaris installation media with new packages and patches have been introduced. These tools can be used to deliver software updates for hardware platforms and to produce customized installation media.

For more information, see the following man pages:

- `itu`(1M)
- `mkbootmedia`(1M)
- `pkg2du`(1M)
- `updatemedia`(1M)

See also, "How to Boot a System With a Newly Created ITU" in *System Administration Guide: Basic Administration*.

Oracle Solaris Upgrade Enhancement for Oracle Solaris Zone– Cluster Nodes

This feature enables you to upgrade the Oracle zone– cluster node, which is a cluster brand zone, via DVD or JumpStart. Prior to this feature, only Oracle Solaris Live Upgrade could be used for this purpose.

Virtualization Enhancements for Oracle Solaris Zones

The following Oracle Solaris Zones features have been enhanced in the Oracle Solaris 10 9/10 release.

Migrating a Physical Oracle Solaris 10 System Into a Zone

A physical–to–virtual (P2V) capability can now be used to directly migrate an existing Oracle Solaris 10 system into a native non-global zone on a target system.

For more information about migrating a physical Oracle Solaris system into a zone, see *System Administration Guide: Oracle Solaris Containers-Resource Management and Oracle Solaris Zones*.

Host ID Emulation

When a physical Oracle Solaris system is migrated into a non-global zone on a new system, the hostid changes to be the hostid of the new machine. If an application is licensed by the hostid on the original system and you cannot update the application configuration, you can set the hostid in the zone configuration to match the hostid of the original system.

For more information about hostid emulation and about how to configure a zone, see *System Administration Guide: Oracle Solaris Containers-Resource Management and Oracle Solaris Zones*.

For more information about the `hostid` command, see the `hostid(1)` man page.

Updating Packages by Using the New `zoneadm attach -U` Option

The `zoneadm attach` subcommand has a new `-U` option. This option updates all of the packages for the zone so that these packages match what would be seen with a newly installed non-global zone on this host. To update patches on a system with zones, the zones can be detached while the global zone is patched, and then reattached with the `-U` option to match the level of the global zone.

For more information, see "How to Migrate A Non-Global Zone" in *System Administration Guide: Oracle Solaris Containers-Resource Management and Oracle Solaris Zones*. Also see, "Using Update on Attach as a Patching Solution" in *System Administration Guide: Oracle Solaris Containers-Resource Management and Oracle Solaris Zones*.

Virtualization Enhancements for Oracle VM Server for SPARC

The following Oracle VM Server for SPARC features have been enhanced in the Oracle Solaris 10 9/10 release.

Memory Dynamic Reconfiguration Capability

This feature adds support in the Oracle Solaris OS for system administrators to dynamically add and delete memory from logical domains.

For more information, see the *Oracle VM Server for SPARC 2.0 Administration Guide*.

Virtual Disk Multipathing Enhancements

Virtual disk multipathing enables you to configure a virtual disk on a guest domain to access its back–end storage by more than one path. The paths lead through different service domains that provide access to the same back–end storage, such as a disk LUN. This feature enables a virtual disk in a guest domain to remain accessible even if one of the service domains goes down.

For more information about this feature, see the *Oracle VM Server for SPARC 2.0 Administration Guide* and the `ldm`(1M) man page in the *Oracle VM Server for SPARC 2.0 Reference Manual*.

Static Direct I/O

The Oracle VM Server for SPARC 2.0 software and the Oracle Solaris 10 9/10 OS introduce the Static Direct I/O feature. This feature enables you to assign an individual PCIe endpoint device to a guest domain, which provides higher granularity when you assign PCIe devices to guest domains.

For more information about this feature, see the *Oracle VM Server for SPARC 2.0 Administration Guide* and the `ldm`(1M) man page in the *Oracle VM Server for SPARC 2.0 Reference Manual*.

Virtual Domain Information Command and API

The `virtinfo` command enables you to gather information about a running virtual domain. You can also use the Virtual Domain Information API to create programs to gather information related to virtual domains.

The following list shows some of the information that you can gather about a virtual domain by using the `virtinfo` command or the API:

- Domain type (implementation, control, guest, I/O, service, root)
- Domain name determined by the Virtual Domain Manager
- Universally unique ID (UUID) of the domain
- Network node name of the domain's control domain
- Chassis serial number on which the domain is running

For more information, see the `virtinfo`(1M), `libv12n`(3LIB), and `v12n`(3EXT) man pages in the *Oracle VM Server for SPARC 2.0 Reference Manual*.

System Administration Enhancements

The following system administration features and enhancements have been added to the Oracle Solaris 10 9/10 release.

Oracle Solaris ZFS Features and Enhancements

The following list summarizes new features in the ZFS file system. For more information about these new features, see the *Oracle Solaris ZFS Administration Guide*.

- **ZFS device replacement enhancements** – In this release, a system event, or *sysevent* is provided when an underlying device is expanded. ZFS has been enhanced to recognize these events and adjusts the storage pool based on the new size of the expanded LUN, depending on the setting of the `autoexpand` property. You can use the `autoexpand` property to enable or disable automatic pool expansion when a dynamic LUN expansion event is received.

  This feature enables you to expand a LUN, and the resulting pool can access the expanded disk space without requiring to export and import the pool or reboot the system. The `autoexpand` property is disabled by default, so you can decide whether you want the LUN expanded. Or, you can use the `zpool online -e` command to expand the full size of a LUN.
- **Changes to the zpool list command** — In this release, the `zpool list` output provides better space allocation information. For example:

  ```
  # zpool list tank
  NAME    SIZE  ALLOC   FREE    CAP  HEALTH  ALTROOT
  tank    136G  55.2G  80.8G    40%  ONLINE  -
  ```

  The previous `USED` and `AVAIL` fields have been replaced with `ALLOC` and `FREE`.

  The `ALLOC` field identifies the amount of physical space that is allocated to all datasets and internal metadata. The `FREE` field identifies the amount of unallocated disk space in the storage pool.

- **Holding ZFS snapshots** – If you implement different automatic snapshot policies such that older snapshots are being inadvertently destroyed by the `zfs receive` command because they no longer exist on the sending side, you might consider using the snapshots hold feature new in this release.

  Holding a snapshot prevents it from being destroyed. In addition, this feature allows a snapshot with clones to be deleted pending the removal of the last clone by using the `zfs destroy -d` command.

  You can apply the `keep` hold tag with the `zfs hold` command to hold a snapshot or a set of snapshots.
- **Triple parity RAID-Z (raidz3)** – In this release, a redundant RAID-Z configuration can now have either single-parity, double-parity, or triple-parity, which means that one, two, or three device failures can be sustained respectively, without any data loss. You can specify the `raidz3` keyword for a triple-parity RAID-Z configuration when the storage pool is created.
- **ZFS log device enhancements** – The following log device enhancements are available in this release:
  - The `logbias` property – You can use this property to instruct ZFS about how to handle synchronous requests for a specific dataset. If `logbias` is set to `latency`, ZFS uses the storage pool's separate log devices, if any, to handle the requests at low latency. If `logbias` is set to `throughput`, ZFS does not use the pool's separate log devices. Instead, ZFS optimizes synchronous operations for global pool throughput and for the efficient use of resources. The default value is `latency`. For most configurations, the default value is optimal. However, the `logbias=throughput` value might improve performance for writing database files.
  - Log device removal – You can now remove a log device from a storage pool by using the `zpool remove` command. A single log device can be removed by specifying the device name. A mirrored log device can be removed by specifying the top-level mirror for the log device. When a separate log device is removed from the system, ZFS intent log (ZIL) transaction records are written to the main pool.

    Redundant top-level virtual devices are now identified with a numeric identifier. For example, in a mirrored storage pool of two disks, the top level virtual device is `mirror-0`.
  - **ZFS storage pool recovery** – A storage pool can become damaged if underlying devices become unavailable, if a power failure occurs, or if more than the supported number of devices fail in a redundant ZFS configuration. This release provides new command features for recovering your damaged pool. However, using this recovery feature means that the last few transactions that occurred prior to the pool outage might be lost.

    Both the `zpool clear` and `zpool import` commands support the `-F` option to possibly recover a damaged pool. In addition, the `zpool status`, `zpool clear`, and `zpool import` commands automatically report a damaged pool. These commands also describe how to recover the pool.

- **New ZFS system process** – In this release, each storage pool has an associated process, `zpool-`*poolname*. The threads in this process are the pool's I/O processing threads that are used to handle I/O tasks, such as compression and checksum validation. The purpose of this process is to provide visibility into each storage pool's CPU utilization. Information about these processes can be reviewed by using the `ps` and `prstat` commands. These processes are only available in the global zone. For more information, see the `SDC(7)` man page.
- **Splitting a mirrored ZFS storage pool (zpool split)** – In this release, you can use the `zpool split` command to split a mirrored storage pool, which detaches a disk or disks in the original mirrored pool to create another identical pool.

Fast Crash Dump

The fast crash dump facility enables the system to save crash dumps in less time, while using less space. The time that is required for a crash dump to complete is now 2 to 10 times faster, depending on the platform. The amount of disk space that is required to save crash dumps in the `savecore` directory is reduced by the same factors.

To accelerate the creation and compression of a crash dump file, the new crash dump facility utilizes lightly used CPUs on large systems. A new crash dump file, `vmdump.n`, is a compressed version of the `vmcore.n` and `unix.n` files. Compressed crash dumps can be moved over the network more quickly and then analyzed offsite. Note that you must uncompress the dump file before it can be used with tools such as the `mdb` utility. You can use the `savecore` command, either locally or remotely, to uncompress the dump file.

In addition, a new `-z` option has been added to the `dumpadm` command. This option enables you to specify whether to save dumps in a compressed or an uncompressed format. Note that the default format is compressed.

For more information, see the `dumpadm(1M)` and `savecore(1M)` man pages. Also, see "Managing System Crash Dump Information" in *System Administration Guide: Advanced Administration*.

x86: Support for the `IA32_ENERGY_PERF_BIAS` MSR

The Intel Xeon processor 5600 series supports the `IA32_ENERGY_PERF_BIAS` Model Support Register (MSR). You can set the MSR to the desired energy and performance bias on the hardware. In this release, you can set the register at boot time. To set the register, add the following line to the `/etc/system` file and reboot the system:

```
set cpupm_iepb_policy = ‘value‘
```

where `value` is a number from 0 to 15.

For more information, see *Intel 64 and IS-32 Architectures Software Developer's Manual Volume 3A: System Programming Guide, part 1* (`http://www.intel.com/products/processor/manuals`).

Support for Multiple Disk Sector Size

The multiple disk sector size enables the Oracle Solaris OS to run on a disk where the sector size is 512 bytes, 1024 bytes, 2048 bytes, or 4096 bytes.

In addition, this feature supports the following:

- Correct labeling on large sector size disks
- Perform I/O (raw & block)
- Support for a ZFS non–root disk
- Support for Xen and Oracle VM Server for SPARC to identify large sector size disks

iSCSI Initiator Tunables

iSCSI initiator tunables enable you to tune several parameters that are specific for an iSCSI initiator to access a given iSCSI target. This feature greatly improves the iSCSI initiator connection response time for various network scenarios. In particular, this feature is effective when the network between the iSCSI initiator and the target is slow or unstable. These tunable parameters can be managed by using the `iscsiadm` command or the library `libima` interface.

Sparse File Support in the `cpio` Command

The `cpio` command in pass mode preserves holes in sparse files. In this release, administrative tools that utilize `cpio` in pass mode, such as Oracle Solaris Live Upgrade, will no longer fill holes. Instead these tools will precisely copy holes in sparse files.

For more information, see the `lseek(2)` and `cpio(1)` man pages.

x86: 64-Bit `libc` String Functions Improvements With SSE

64-bit `libc` string functions have been enhanced with streaming SIMD extensions (SSE) instructions that provide significant performance improvements in the common `strcmp()`, `strcpy()`, and `strlen()` functions for 64-bit applications running on x86 platforms. However, note that applications that copy or compare strings of 2 mbytes or more should use the `memcpy()` and `memmove()` functions instead.

Automated Rebuilding of `sendmail` Configuration Files

In this release, new properties have been added to the `sendmail` service to provide for the automatic rebuilding of the `sendmail.cf` and `submit.mc` configuration files. In addition, the sendmail instance is split into two instances to provide better management of the traditional daemon and the client queue runner.

For more information about these enhancements, see "What's New With Mail Services" in *System Administration Guide: Network Services*.

Automatic Boot Archive Recovery

Starting in this release, boot archive recovery on the SPARC platform is automatic.

To support automatic recovery of the boot archives on the x86 platform, a new auto-reboot-safe property has been added to the boot configuration service, `svc:/system/boot-config:default`. By default, the property's value is set to `false` to ensure that the system does not automatically reboot to an unknown boot device. However, if your system is configured to point to the BIOS boot device and the default GRUB menu entry on which the Oracle Solaris 10 OS is installed, you can set the property's value to `true`. This value enables an automatic reboot of the system for the purpose of recovering an out-of-date boot archive.

To set or change this property's value, use the `svccfg` and `svcadm` commands. See the `svccfg`(1M) and `svcadm`(1M) man pages for more information about configuring SMF services.

For more information about automatic boot archive recovery, see the `boot`(1M) man page.

For instructions on clearing failure with automatic boot archive recovery, see "Automatic Boot Archive Recovery" in *System Administration Guide: Basic Administration*.

Security Enhancements

The following security enhancements have been added to the Oracle Solaris 10 9/10 release.

`net_access` Privilege

The `net_access` privilege has been added to the basic privilege set. This privilege enables processes to create a network endpoint. By denying this privilege, an administrator can restrict network access and interprocess communication (IPC).

For more information, see the `privileges(5)` man page.

x86: Intel AES-NI Optimization

The Advanced Encryption Standard (AES) is a widely used encryption standard adopted by the U.S. government in 2001. Intel accelerated the AES cryptographic algorithm by introducing the AES New Instructions (AES-NI) into its instruction set beginning with the Intel Xeon processor 5600 series. These six new instructions offer a significant increase in performance on AES. For example, AES-NI significantly reduces CPU overhead when a system is using IPsec. Preliminary testing on Oracle Solaris systems shows that when IPsec is enabled, there is approximately a 50 percent decrease in CPU utilization in a system based on Intel Xeon processor 5600 series as compared to a similar system based on the previous generation Intel Xeon processor 5500 series.

The AES-NI instructions are automatically detected and used by the Oracle Solaris Cryptographic Framework, which provides seamless services to the end user through the industry-standard PCKS#11 API, command–line interfaces (CLIs), and kernel modules.

For more information about the instruction set, see Intel Advanced Encryption Standard (AES) Instruction Set (2010) by Shay Gueron (`http://software.intel.com/en-us/articles/intel-advanced-encryption-standard-aes-instructions-set`).

Language Support Enhancements

The following language support enhancement has been added to the Oracle Solaris 10 9/10 release.

New Oracle Solaris Unicode Locales

The following unicode locales have been added in this release:

- `af_ZA.UTF-8` (South Africa)
- `en_SG.UTF-8` (English, Singapore)
- `zh_SG.UTF-8` (Chinese, Singapore)
- `ms_MY.UTF-8` (Malaysia)
- `id_ID.UTF-8` (Indonesia)
- `bn_IN.UTF-8` (Bengali, India)
- `en_IN.UTF-8` (English, India)
- `gu_IN.UTF-8` (Gujarati, India)
- `kn_IN.UTF-8` (Kannada, India)
- `mr_IN.UTF-8` (Marathi, India)
- `te_IN.UTF-8` (Telugu, India)

- `ta_IN.UTF-8` (Tamil, India)

Device Management Enhancements

The following device management features have been added to the Oracle Solaris 10 9/10 release.

iSER Initiator

iSCSI Extensions for RDMA (iSER) accelerates the iSCSI protocol by mapping the data transfer phases to Remote DMA (RDMA) operations. As a result, an iSER initiator can read and write data from an iSER target at high data rates with relatively low CPU utilization compared to iSCSI using TCP/IP.

For more information, see the `iser(7D)` man page.

New Hot-Plugging Features

In this release, the `hotplug` command is available to manage hot-pluggable connections on PCI EXPRESS (PCIe) and PCI SHPC (Standard Hot Plug Controller) devices. This feature is not supported on other bus types, such as USB and SCSI buses.

You can still use the `cfgadm` command to manage hot-pluggable USB and SCSI devices as in previous releases. The benefit of using the `hotplug` command in this release is that in addition to being able to enable and disable operations, the `hotplug` command provides offline and online capabilities for your supported PCI devices.

For more information, see *System Administration Guide: Devices and File Systems*.

AAC RAID Power Management

AAC RAID power management is a new feature of the AAC driver that supports intelligent power management provided by Adaptec Hardware RAID cards. This feature reduces the power consumption of RAID disks.

For more information about the Adaptec Hardware RAID cards, see `http://www.adaptec.com/en-us/`.

Driver Enhancements

The following driver enhancements have been added to the Oracle Solaris 10 9/10 release.

x86: HP Smart Array HBA Driver

This project integrates HP's x64 Smart Array RAID Controller HBA driver, `cpqary3`, into the Oracle Solaris OS. With this driver, you can install the Oracle Solaris OS on systems that are connected to HP Smart Array HBA controllers.

For more information about this driver, see `http://h18006.www1.hp.com/products/servers/proliantstorage/arraycontrollers/index.html`.

x86: Support for Broadcom NetXtreme II 10 Gigabit Ethernet NIC Driver

`bnxe` is a GLDv3 based driver for Broadcom NetXtreme II 10 Gigabit Ethernet controllers. This driver supports Broadcom BCM57710/57711/57711E devices on x86 based systems.

For more information, see *System Administration Guide: Network Services*.

x86: New SATA HBA Driver, `bcm_sata`, for Broadcom HT1000 SATA Controllers

`bcm_sata` is a new SATA HBA driver for Broadcom HT1000 SATA controllers. This driver provides basic functionality and hot–pluggable capabilities for the following devices:

- SATA disks
- SATA ATAPI devices such as CDs and DVDs
- Removable device called RD1000 from DELL

SATA controllers and devices connected to this driver on systems equipped with Broadcom HT1000 chipset will be able to work in QDMA mode instead of the traditional PATA mode. This capability results in improved performance in data access to the connected devices.

Support for SATA/AHCI Port Multiplier

The SATA/AHCI port multiplier has been enhanced to support new devices including the SATA Port Multiplier and SATA-to-CF adapter. This driver now also supports AMD SB700/750 chipsets and nVidia nForce 780a chipsets.

For more information, see the ahci(7D) man page.

Support for Netlogic NLP2020 PHY in the nxge Driver

This feature provides 10G QSFP support for the nxge driver using Netlogic PHY on RF platforms, T3–2 and T3–4. With QSFP, you can get 40G from 4 10G NIU ports, using just one QSFP connector and cable, instead of 4 10G SFP+/XFP connectors and cables.

Freeware Enhancements

The following freeware enhancements have been added to the Oracle Solaris 10 9/10 release.

GNU TAR Version 1.23

GNU tar (gtar) is a utility that is used to store, back up, and transport files. This utility has been upgraded from version 1.17 to version 1.23.

gtar version 1.2.3 has the following changes:

- Two security vulnerabilities, CVE-2010–0624 and CVE–2007–4131, have been fixed.
- Several new options have been introduced.
- Bug fixes have been included.

For more information about all the changes in the new version, see http://www.gnu.org/software/tar/.

Firefox 3.5

Firefox 3.5 provides the latest browser for the Oracle Solaris platform.

For more information about Firefox 3.5, see http://www.mozilla.com/en-US/firefox/3.5/releasenotes/.

Thunderbird 3

Thunderbird 3 includes major architectural changes that provide improved performance, stability, web compatibility, code simplification, and sustainability.

For more information about Thunderbird, see http://www.mozillamessaging.com/en-US/thunderbird/features/.

Less Version 436

In this release, `less`, a file pager utility, is upgraded from version 381 to version 436.

This upgrade fixes many bugs and includes the following new features:

- Better compatibility with POSIX
- Improved behavior of history list for search and shell commands
- Improved performance when a file contains very long lines

Networking Enhancements

The following networking enhancements have been added to the Oracle Solaris 10 9/10 release.

BIND 9.6.1 for the Oracle Solaris 10 OS

BIND 9.6.1 updates the Solaris Domain Name System Server. The relevant tools provides the following new features:

- Full NSEC3 [RFC 5155] support
- Automatic zone re-signing
- New update policy methods, `tcp-self` and `6to4-self`
- GSS-TSIG support [RFC 3645]
- Dynamic Host Configuration Protocol Information (DHCID RR) support [RFC 4701]
- Name Server Identifier (NSID RR) support [RFC 5001]
- Experimental HTTP server and statistics support
- New commands.

  For information about the new commands, see the `dnssec-dsfromkey(1M)` and `dnssec-keyfromlabel(1M)` man pages.

GLDv3 Driver APIs

In this release, a core subset of the GLDv3 (Generic LAN Driver version 3) driver APIs are made public, and available for use by 3rd party device driver writers.

For information about how to write an Ethernet driver using the GLDv3 framework, see Chapter 19, "Drivers for Network Devices," in *Writing Device Drivers*.

IPoIB Connected Mode

IP over Infiniband (IPoIB) connected mode introduces an improved capability of the IPoIB driver. Instead of using UD datagrams to communicate, this new feature allows Oracle Solaris nodes to establish connected mode channels to peer nodes that can also support connected mode. This feature improves latency and bandwidth, and lowers CPU utilization for IPoIB. If the peer nodes cannot support connected mode, the driver automatically reverts to the UD datagram mode, thereby assuring connectivity comparable to the original UD-only version of the driver.

Open Fabrics User Verbs Primary Kernel Components

This feature delivers the Open Fabrics Enterprise Edition (OFED) RDMA CM kernel KPIs. It allows kernel modules and drivers to use the OFED defined Infiniband connection management KPIs. It also delivers the kernel components required to interface OFED libraries into the InfiniBand Transport Framework (IBTF).

InfiniBand Infrastructure Enhancements

The InfiniBand infrastructure has been enhanced to improve the user experience and resiliency to fabric errors. Enhancements are as follows:

- The initial installation of InfiniBand nodes on a fabric has been modified to allow IPoIB instances to join the appropriate partition without intervention.
- The enhancement in this release detects and responds quickly to failures of the subnet manager to assure a smooth transition when errors occur.

This feature improves the performance of IPoIB in the UD datagram mode. As a result, you will notice improved throughput in the UD mode and decreased CPU utilization of the IPoIB driver in general. The enhancement, combined with doubling the size of the MTU that can be used on the InfiniBand fabric, greatly improves the usability of IPoIB in both UD and connected modes. Memory registration and speed have also been improved.

X11 Windowing Enhancements

The following X11 windowing feature has been added to the Oracle Solaris 10 9/10 release.

Support for the `setxkbmap` Command

The `setxkbmap` command allows switching the keyboard layout dynamically when using the Xorg server. This command maps the keyboard using the layout determined by the options specified in the command line.

For more information, see the `setxkbmap` man page.

New Chipset Support

The following chipset support features have been added to the Oracle Solaris 10 9/10 release.

`ixgbe` Driver to Integrate Intel Shared Code Version 3.1.9

The following new devices are supported in Intel Shared Code Version 3.1.9:

- Oplin card
- Niantic card

Broadcom Support to `bge` Networking Driver

The `bge` driver now supports systems using Broadcom 5718, 5764, and 5785 network devices.

x86: Fully Buffered DIMM Idle Power Enhancement

In this release, there is now support for the Intel 5000/7000 Memory Controller Hub (MCH) chipset to provide additional power savings when the CPU is idle. This feature allows savings of up to 1 watt per Gigabyte on supported chipsets which will translate into lower energy bills. Oracle's Sun Fire x4450, Sun Fire x4150, and Sun Fire x6250 servers are equipped with the Intel 5000/7000 MCH chipset. Other systems equipped with Intel 5000/7000 MCH chipset will obtain similar power savings.

Fault Management Architecture Enhancements

The following Fault Management Architecture (FMA) enhancements have been added to the Oracle Solaris 10 9/10 release.

FMA Support for AMD's Istanbul Based Systems

The Oracle Solaris OS now recognizes the model corresponding to Advanced Micro Devices Istanbul. With FMA support for Istanbul, the Generic AMD FM topology has been enabled for Model 8 of AMD Family 0x10. All features relating to FMA's error reporting and diagnosis that are available for the earlier Family 0x10 CPUs accommodates the Istanbul CPUs.

Oracle Solaris FMA Enhancement

The Oracle Solaris FMA software has been updated to support the memory errors of the DDR2 DIMMs of the Oracle Netra CP3250 blade server. The existing generic Intel FMA provides support for CPU error reporting and diagnosis of this new blade. The Oracle Solaris OS and FMA diagnosis rules have been updated to generate e–reports of the memory errors of DDR2 DIMMs. The topology has been updated to generate the memory configuration and the rules diagnose memory e–reports.

Diagnostic Tools Enhancements

The following diagnostic tools have been enhanced in the Oracle Solaris 10 9/10 release.

Sun Validation Test Suite 7.0ps9

The Sun Validation Test Suite (SunVTS) is a comprehensive hardware diagnostic tool that tests and validates the connectivity and functionality of most controllers and devices on Oracle platforms. The SunVTS tests are targeted for each hardware component or function in a system. The tool supports three user interfaces (UIs), a graphical UI (GUI), a terminal-based UI, and a command line interface (CLI).

Enhancements to the SunVTS infrastructure include the following:

- The GUI has been modified to display the `vtsreportgenerate` option.
- The Oracle logo replaces the Sun and Java logos on the GUI windows.
- The SunVTS harness has been modified to handle memory resource crunches gracefully.
- The `startsunvts` script has been enhanced to have more default testing options.

Enhancements to memory and CPU diagnostics include the following:

- `fputest` has been enhanced with new subtests for the `FMOV`, `FNEG`, `FABS`, `FADD`, and `FSUB` instructions.
- `pmemtest` has been modified to use a multi-process approach.
- `pmemtest` has been modified to manage its own instances. Previously, the SunVTS harness managed the instances.
- Messaging clean-up in tests.
- A new message type, `ALERT`, has been added for errors that are not caused by hardware faults.

Enhancements to input/output diagnostics include the following:

- `iobustest` has been modified to dump the buffers on failure and will not spawn 8 threads on USB targets with `stress=MAX`.

- New disk test for SunVTS.

Enhancements to the `mdb` Command to Improve the Debugging Capability of `kmem` and `libumem`

The following debugger subcommands have been added to the `mdb` command to enhance the debugging capability of `kmem` and `libumem`, along with a summary of threads running on a panicked system:

- `o ::whatis \226` – Is faster and works better with pipelined commands
- `o ::whatthread` – Prints threads whose stack contains the given address
- `o ::stacks \226` – Groups similar stacks
- `o ::kmem_slabs`– Displays slab usage per `kmem` cache

For more information, see the `mdb(1)` man page.