



Logical Domains (LDoms) 1.0.3 Release Notes

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Logical Domains (LDoms) 1.0.3 Release Notes

These release notes contain changes for this release, supported platforms, a matrix of required software and patches, and other pertinent information about this release, including bugs that affect Logical Domains 1.0.3 software.

Changes for This Release

The major changes for this release of Logical Domains 1.0.3 software are as follows:

- Added DVD boot support. Refer to Chapter 5 in the *Logical Domains (LDoms) 1.0.3 Administration Guide*.
- Added support for the `format(1M)` command and unformatted disks. Refer to Chapter 5 in the *Logical Domains (LDoms) 1.0.3 Administration Guide*.
- Added support for the user SCSI command (USCSICMD) input/output control call (`ioctl`) pass-through and disk reset
- Added support for multihost disks
- Added device ID (DevID) for disk images
- Added support to use physical trunk devices for external connectivity
- Enabled statistics reporting using the interrupt statistics command, `intrstat(1M)`
- Improved Volume Manager support – You can now export a volume as a full disk and install on it.
- Added `timeout=` argument for virtual disks to `ldm add-vdisk` command. Added `set-vdisk` subcommand to set `timeout=` or `volume=` arguments for a virtual disk. Refer to the `ldm` man page or Chapter 5 in the *Logical Domains (LDoms) 1.0.3 Administration Guide*.

- Added `options=` argument to `ldm add-vdsdev` command to specify slice (`slice`), exclusive (`excl`), or read-only (`ro`) options. Added `set-vdsdev` subcommand to set options for a virtual disk server. Refer to the `ldm` man page or Chapter 5 in the *Logical Domains (LDoms) 1.0.3 Administration Guide*.
- Added support for Solaris™ Cluster software on a guest domain. See “[Software That Can Be Used With the Logical Domains Manager](#)” on page 9.
- Conformed the XML format produced by the `ldm ls-constraints -x` command to the new version 3 (v3) specification. The LDoms Manager continues to accept the version (v2) format XML files produced by previous versions of the `ls-constraints -x` subcommand, but it produces the new version only on output.

Supported Platforms

Logical Domains (LDoms) Manager 1.0.3 software is supported on the following platforms:

TABLE 1 Supported Platforms

Name	Reference
Sun UltraSPARC T2 Plus–based Servers:	
Sun SPARC Enterprise T5140 and T5240 Servers	<i>Sun SPARC Enterprise T5140 and T5240 Servers Administration Guide</i>
Sun UltraSPARC T2–based Servers:	
Sun SPARC Enterprise T5120 and T5220 Servers	<i>Sun SPARC Enterprise T5120 and T5220 Servers Administration Guide</i>
Sun Blade T6320 Server Module	<i>Sun Blade T6320 Server Module Product Notes</i>
Netra CP3260 Blade	<i>Netra CP3260 Board Product Notes</i>
Netra T5220 Server	<i>Sun Netra T5220 Server Product Notes</i>
Sun UltraSPARC T1–based Servers:	
Sun Fire™ or SPARC Enterprise T1000 Server	<i>Sun Fire or SPARC Enterprise T1000 Server Administration Guide</i>
Sun Fire or SPARC Enterprise T2000 Server	<i>Sun Fire or SPARC Enterprise T2000 Server Administration Guide</i>
Netra™ T2000 Server	<i>Netra T2000 Server Administration Guide</i>
Netra CP3060 Blade	<i>Netra CP3060 Board Product Notes</i>
Sun Blade™ T6300 Server Module	<i>Sun Blade T6300 Server Module Administration Guide</i>

Required, Recommended, and Optional Software and Required Patches

This section lists the required, recommended, and optional software for use with Logical Domains software.

Required and Recommended Software

If you want to use any of the features of LDOMs 1.0.3 software, use one of the following configurations of the Solaris 10 OS on the control domain and any dependent domain:

- Solaris 10 5/08 OS
- Solaris 10 8/07 OS with Patch ID 127127-11, which contains bug fixes and LDOMs 1.0.3 features
- Solaris 10 11/06 OS with Patch ID 127127-11, which contains bug fixes and LDOMs 1.0.3 features

Following is a matrix of required software to enable all the Logical Domains 1.0.3 features and bug fixes.

TABLE 2 Required Software to Enable Logical Domains 1.0.3 Features and Bug Fixes

Supported Servers	Logical Domains Manager	System Firmware	Solaris OS
Sun UltraSPARC T2 Plus-based servers	1.0.3	7.1.x	One of the configurations above
Sun UltraSPARC T2-based servers	1.0.3	7.1.x	One of the configurations above
Sun UltraSPARC T1-based servers	1.0.3	6.6.x	One of the configurations above

It is possible to run the Logical Domains 1.0.3 software along with previous revisions of the other software components. For example, you could have differing versions of the Solaris OS on the various domains in a machine. It is recommended to have all domains running Solaris 10 5/08 OS, but an alternate upgrade strategy could be to upgrade the control and service domains to Solaris 10 5/08 OS and to continue running the guest domains at the existing patch level.

Following is a matrix of the minimum versions of software required. The minimum software versions are platform specific and depend on the requirements of the CPU in the machine. The minimum Solaris OS version for a given CPU type applies to all domain types (control, service, I/O, and guest).

TABLE 3 Minimum Versions of Software

Supported Servers	Logical Domains Manager	System Firmware	Solaris OS
Sun UltraSPARC T2 Plus-based servers	1.0.3	7.1.x	Solaris 10 8/07*
Sun UltraSPARC T2-based servers	1.0.3	7.0.x	Solaris 10 8/07
Sun UltraSPARC T1-based servers	1.0.3	6.5.x	Solaris 10 11/06\

* Must also use patch ID 127111-08 at a minimum

\ Must also use patch IDs 124921-02, 125043-01, and KU 118833-36 at a minimum

Required System Firmware Patches

Following are the required system firmware patches at a minimum for use with Logical Domains 1.0.3 software on supported servers:

TABLE 4 Required System Firmware Patches

Patches	Supported Servers
136927-01	Sun Fire and SPARC Enterprise T2000 Servers
136928-01	Sun Fire and SPARC Enterprise T1000 Servers
136929-01	Netra T2000 Server
136930-01	Netra CP3060 Blade
136931-01	Sun Blade T6300 Server Module
136932-01	Sun SPARC Enterprise T5120 and T5220 Servers
136933-01	Sun Blade T6320 Server Module
136934-01	Netra T5220 Server
136935-01	Netra CP3260 Blade
136936-02	Sun SPARC Enterprise T5140 and T5240 Servers

Location of Patches

You can find the required Solaris OS and system firmware patches at the SunSolveSM site:

<http://sunsolve.sun.com>

Additional Recommended Software

Solaris Security Toolkit 4.2 software – This software can help you secure the Solaris OS in the control domain and other domains. Refer to the *Solaris Security Toolkit 4.2 Administration Guide* and *Solaris Security Toolkit 4.2 Reference Manual* for more information.

Optional Software

- **Logical Domains (LDoms) Management Information Base (MIB) software** – This software can help you enable third party applications to perform remote monitoring and a few control operations. Refer to the *Logical Domains (LDoms) MIB 1.0.1 Administration Guide* and *Release Notes* for more information.
- **Libvirt for LDoms software** – This software provides virtual library (`libvirt`) interfaces for Logical Domains (LDoms) software so that virtualization customers can have consistent interfaces. The `libvirt` library (version 0.3.2) included in this software interacts with the Logical Domains Manager software running on Solaris 10 Operating System (OS) to support Logical Domains virtualization technology. Refer to the *Libvirt for LDoms 1.0.1 Administration Guide* and *Release Notes* for more information.

Note – LDoms MIB software and Libvirt for LDoms software works with LDoms 1.0.1 software at a minimum.

Location of Documentation

The *Logical Domains (LDoms) 1.0.3 Administration Guide* and *Logical Domains (LDoms) 1.0.3 Release Notes* can be found at:

<http://docs.sun.com/>

The *Beginners Guide to LDoms: Understanding and Deploying Logical Domains* can be found at the Sun BluePrints™ site.

<http://www.sun.com/blueprints/0207/820-0832.html>

Note – Most of the concepts in the Beginner’s Guide are valid. Some of the details and examples refer only to LDoms 1.0 software.

Cards Not Supported

The following cards are *not* supported for this LDoms 1.0.3 software release:

- Sun XVR-200 Graphics Accelerator
- Sun XVR-300 Graphics Accelerator
- Sun Dual Port 4x IB Host Channel Adapter PCI-X Card
- Dual Port 4x PCI Express Infiniband Host Channel Adapter - Low Profile



Caution – If these unsupported configurations are used with LDoms 1.0.3, stop and unbind all logical domains before the control domain is rebooted. Failure to do so can result in a system crash causing the loss of all the logical domains that are active in the system.

The following bug IDs are filed to provide the support for the currently unsupported cards: 6552598, 6563713, 6589192, and 6598882.

Memory Size Requirements

Logical Domains software does not impose a memory size limitation when creating a domain. The memory size requirement is a characteristic of the guest operating system. Some Logical Domains functionality might not work if the amount of memory present is less than the recommended size. For recommended and minimum size memory requirements, refer to the installation guide for the operating system you are using. The default size for a swap area is 512 megabytes. Refer to “System Requirements and Recommendations” in the *Solaris 10 Installation Guide: Planning for Installation and Upgrade*.

The OpenBoot™ PROM has a minimum size restriction for a domain. Currently, that restriction is 12 megabytes. If you have a domain less than that size, the Logical Domains Manager will automatically boost the size of the domain to 12 megabytes. Refer to the release notes for your system firmware for information about memory size requirements.

Booting a Large Number of Domains

As sun4v systems with greater thread counts are released, you can have more domains per system than previous releases:

- Up to 64 in Sun SPARC Enterprise T5120 and T5220 servers
- Up to 128 in Sun SPARC Enterprise T5140 and T5240 servers

If unallocated virtual CPUs are available, assign them to the service domain to help process the virtual I/O requests. Allocate 4 to 8 virtual CPUs to the service domain when creating more than 32 domains.

Since maximum domain configurations have only a single CPU in the service domain, do not put unnecessary stress on the single CPU when configuring and using the domain.

The virtual switch (`vsw`) services should be spread over all the network adapters available in the machine. For example, if booting 128 domains on a Sun SPARC Enterprise T5240 server, create 4 `vsw` services, each serving 32 virtual net (`vnet`) instances. Do not have more than 32 `vnet` instances per `vsw` service, because having more than that tied to a single `vsw` could cause hard hangs in the service domain.

To run the maximum configurations, a machine needs 64 gigabytes of memory (and up to 128 gigabytes in the Sun SPARC Enterprise T5240 server, if possible) so that the guest domains contain an adequate amount of memory. The guest domains require a minimum of 512 megabytes of memory but can benefit from having more than that, depending on the workload running in the domain and the configuration of the domain (number of virtual devices in the domain). Memory and swap space usage increases in a guest domain when the `vsw` services used by the domain provides services to many virtual networks (in multiple domains). This is due to the peer-to-peer links between all the `vnet` connected to the `vsw`.

The service domain benefits from having extra memory. Four gigabytes is the recommended minimum when running more than 64 domains. Start domains serially rather than all at once. Start domains in groups of 10 or less and wait for them to boot before starting the next batch. The same advice applies to installing operating systems on domains.

Logical Domain Channels (LDCs) and Logical Domains

There is a limit to the number of LDCs available in any logical domain. For Sun UltraSPARC T1-based platforms, that limit is 256; for all other platforms, the limit is 512. Practically speaking, this only becomes an issue on the control domain, because the control domain has at least part, if not all, of the I/O subsystem allocated to it, and because of the potentially large number of LDCs created for both virtual I/O data communications and the Logical Domains Manager control of the other logical domains.

Note – The examples in this section are what happens on Sun UltraSPARC T1-based platforms. However, the behavior is the same if you go over the limit on other supported platforms.

If you try to add a service, or bind a domain, so that the number of LDC channels exceeds the limit on the control domain, the operation fails with an error message similar to the following:

```
13 additional LDCs are required on guest primary to meet this
request, but only 9 LDCs are available
```

The following guidelines can help prevent creating a configuration that could overflow the LDC capabilities of the control domain:

1. The control domain allocates 12 LDCs for various communication purposes with the hypervisor, Fault Management Architecture (FMA), and the system controller (SC), independent of the number of other logical domains configured.
2. The control domain allocates one LDC to every logical domain, including itself, for control traffic.
3. Each virtual I/O service on the control domain consumes one LDC for every connected client of that service.

For example, consider a control domain and 8 additional logical domains. Each logical domain needs at a minimum:

- Virtual network
- Virtual disk
- Virtual console

Applying the above guidelines yields the following results (numbers in parentheses correspond to the preceding guideline number from which the value was derived):

$$12(1) + 9(2) + 8 \times 3(3) = 45 \text{ LDCs in total.}$$

Now consider the case where there are 32 domains instead of 8, and each domain includes 3 virtual disks, 3 virtual networks, and a virtual console. Now the equation becomes:

$$12 + 33 + 32 \times 7 = 269 \text{ LDCs in total.}$$

Depending upon the number of supported LDCs of your platform, the Logical Domain Manager will either accept or reject the configurations.

Software That Can Be Used With the Logical Domains Manager

This section details the software that is compatible with and can be used with the Logical Domains software. Be sure to check in the software documentation or your platform documentation to find the version number of the software that is available for your version of LDom software and your platform.

- **SunVTS™** functionality is available in the control domain and guest domains on certain LDom software releases and certain platforms. SunVTS is Sun's Validation Test Suite, which provides a comprehensive diagnostic tool that tests and validates Sun hardware by verifying the connectivity and proper functioning of most hardware controllers and devices on Sun servers. For more information about SunVTS, refer to the *SunVTS User's Guide* for your version of SunVTS.
- **Sun™ Management Center 4.0 Version 3 Add-On Software** can be used only on the control domain with the Logical Domains Manager software enabled. Sun Management Center is an open, extensible system monitoring and management solution that uses Java™ and a variant of the Simple Network Management Protocol (SNMP) to provide integrated and comprehensive enterprise-wide management of Sun products and their subsystem, component, and peripheral devices. Support for hardware monitoring within the Sun Management Center environment is achieved through the use of appropriate hardware server module add-on software, which presents hardware configuration and fault reporting information to the Sun Management Center management server and console. Refer to the *Sun Management Center 4.0 Version 3 Add-On Software Release Notes: For Sun Fire, SunBlade, Netra, and SunUltra Systems* for more information about using Sun Management Center 4.0 Version 3 on the supported servers.

- **Sun™ Explorer Data Collector** can be used with the Logical Domains Manager software enabled on the control domain. Sun Explorer is a diagnostic data collection tool. The tool comprises shell scripts and a few binary executables. Refer to the *Sun Explorer User's Guide* for more information about using the Sun Explorer Data Collector.
- **Solaris™ Cluster** software can be used only on an I/O domain in Logical Domains software releases up through LDoms 1.0.2. In LDoms 1.0.3 software, Solaris Cluster software can be used in a guest domain with some restrictions. Refer to Solaris Cluster documentation for more information about any restrictions and about the Solaris Cluster software in general.

System Controller Software That Interacts With Logical Domains Software

The following system controller (SC) software interacts with the Logical Domains 1.0.3 software:

- **Sun Integrated Lights Out Manager (ILOM) 2.0** firmware is the system management firmware you can use to monitor, manage, and configure Sun UltraSPARC T2-based server platforms. ILOM is preinstalled on these platforms and can be used on the control domain on LDoms-supported servers with the Logical Domains Manager 1.0.3 software enabled. Refer to the *Sun Integrated Lights Out Manager 2.0 User's Guide* for features and tasks that are common to Sun rackmounted servers or blade servers that support ILOM. Other user documents present ILOM features and tasks that are specific to the server platform you are using. You can find the ILOM platform-specific information within the documentation set that accompanies your system.
- **Advanced Lights Out Manager (ALOM) Chip Multithreading (CMT) Version 1.3** software can be used on the control domain on UltraSPARC® T1-based servers with the Logical Domains Manager 1.0.1 software enabled. Refer to “Using LDoms With ALOM CMT” in the *Logical Domains (LDoms) 1.0.3 Administration Guide*. The ALOM system controller enables you to remotely manage and administer your supported CMT servers. ALOM enables you to monitor and control your server either over a network or by using a dedicated serial port for connection to a terminal or terminal server. ALOM provides a command-line interface that you can use to remotely administer geographically distributed or physically inaccessible machines. For more information about using ALOM CMT Version 1.3 software, refer to the *Advanced Lights Out Management (ALOM) CMT v1.3 Guide*.
- **Netra Data Plane Software Suite** is a complete board software package solution. The software provides an optimized rapid development and runtime environment on top of multistrand partitioning firmware for Sun CMT platforms.

The Logical Domains Manager contains some `ldm` subcommands (`add-vdpcs`, `rm-vdpcs`, `add-vdpcc`, and `rm-vdpcc`) for use with this software. Refer to the *Netra Data Plane Software Suite* documentation for more information about this software.

General Notes and Issues

This section contains general notes and issues concerning the Logical Domains 1.0.3 software.

System Controller and Service Processor Are Interchangeable Terms

For discussions in Logical Domains documentation, the terms system controller (SC) and service processor (SP) are interchangeable.

Limited Number of Logical Domain Configurations Can Be Stored on the SC

Currently, there is a limit of 8 configurations for logical domains that can be saved on the system controller using the `ldm add-config` command, not including the `factory-default` configuration.

Cleanly Shutting Down and Power Cycling a Logical Domains System

If you have made any configuration changes since last saving a configuration to the SC, before you attempt to power off or power cycle a Logical Domains system, make sure you save the latest configuration that you want to keep.

▼ To Power Off a System With Multiple Active Domains

1. Shut down and unbind all the non-I/O domains.
2. Shut down and unbind any active I/O domains.

3. Halt the primary domain.

Because no other domains are bound, the firmware automatically powers off the system.

▼ To Power Cycle the System

1. Shut down and unbind all the non-I/O domains.

2. Shut down and unbind any active I/O domains.

3. Reboot the primary domain.

Because no other domains are bound, the firmware automatically power cycles the system before rebooting it. When the system restarts, it boots into the Logical Domains configuration last saved or explicitly set.

Memory Size Requested Might Be Different From Memory Allocated

Under certain circumstances, the Logical Domains (LDMs) Manager rounds up the requested memory allocation to either the next largest 8-kilobyte or 4-megabyte multiple. This can be seen in the following example output of the `ldm list-domain -l` command, where the constraint value is smaller than the actual allocated size:

```
Memory:
          Constraints: 1965 M
          raddr          paddr5          size
          0x1000000      0x291000000      1968M
```

Dynamic Reconfiguration of Virtual CPUs With Cryptographic Units

Currently, there is an issue related to dynamic reconfiguration (DR) of virtual CPUs if a logical domain contains one or more cryptographic (mau) units:

- DR of virtual CPUs is completely disabled on all active logical domains that contain any cryptographic units (Bug ID 6525647).

Split PCI Regresses in FMA Functionality From Non-Logical Domains Systems

Currently, Fault Management Architecture (FMA) diagnosis of I/O devices in a Logical Domains environment might not work correctly. The problems are:

- Input/output (I/O) device faults diagnosed in a non-control domain are not logged on the control domain. These faults are only visible in the logical domain that owns the I/O device.
- I/O device faults diagnosed in a non-control domain are not forwarded to the system controller. As a result, these faults are not logged on the SC and there are no fault actions on the SC, such as lighting of light-emitting diodes (LEDs) or updating the dynamic field-replaceable unit identifiers (DFRUIDs).
- Errors associated with a root complex that is not owned by the control domain are not diagnosed properly. These errors can cause faults to be generated against the diagnosis engine (DE) itself.

Logical Domain Variable Persistence

With domaining enabled, variable updates persist across a reboot, but not across a power cycle, unless the variable updates are either initiated from OpenBoot firmware on the control domain, or followed by saving the configuration to the SC.

In this context, it is important to note that a reboot of the control domain could initiate a power cycle of the system:

- When the control domain reboots, if there are no bound guest domains, and no delayed reconfiguration in progress, the SC power cycles the system.
- When the control domain reboots, if there are guest domains bound or active (or the control domain is in the middle of a delayed reconfiguration), the SC does not power cycle the system.

LDom variables for a domain can be specified using any of the following methods:

- At the OpenBoot prompt
- Using the Solaris OS `eeeprom(1M)` command
- Using the Logical Domains Manager CLI (`ldm`)
- Modifying, in a limited fashion, from the system controller (SC) using the `bootmode` command; that is, only certain variables, and only when in the `factory-default` configuration.

The goal is that, variable updates made using any of these methods always persist across reboots of the domain, and always reflect in any subsequent logical domain configurations saved to the SC.

In Logical Domains 1.0.3 software, there are a few cases where variable updates do not persist as expected:

- With domaining enabled (the default in all cases except the UltraSPARC T1000 and T2000 systems running in `factory-default` configuration), all methods of updating a variable (OpenBoot firmware, `eeprom` command, `ldm` subcommand) persist across reboots of that domain, but not across a power cycle of the system, unless a subsequent logical domain configuration is saved to the SC. In addition, in the control domain, updates made using OpenBoot firmware persist across a power cycle of the system; that is, even without subsequently saving a new logical domain configuration to the SC.
- When domaining is not enabled, variable updates specified through the `eeprom(1M)` command persist across a reboot of the primary domain into the same `factory-default` configuration, but do not persist into a configuration saved to the SC. Conversely, in this scenario, variable updates specified using the Logical Domains Manager do not persist across reboots, but are reflected in a configuration saved to the SC.

So, when domaining is not enabled, if you want a variable update to persist across a reboot into the same `factory-default` configuration, use the `eeprom` command. If you want it saved as part of a new logical domains configuration saved to the SC, use the appropriate Logical Domains Manager command.

- In all cases, when reverting to the `factory-default` configuration from a configuration generated by the Logical Domains Manager, all LDoms variables start with their default values.

The following bug IDs have been filed to resolve these issues: 6520041, 6540368, and 6540937.

Bugs Affecting Logical Domains 1.0.3 Software

This section summarizes the bugs that you might encounter when using this version of the software. The bug descriptions are in numerical order by bug ID. If a recovery procedure and a workaround are available, they are specified.

Format Oddities and Core Dump When Using ZVOL (Bug ID 6363316)

Format oddities and a core dump occur when using the Zettabyte File System (ZFS) Volume Emulation Driver (ZVOL) and when the Logical Domains environment has virtual disks with an extensible firmware interface (EFI) label. Selecting such disks with the `format(1M)` command cause a core dump.

Logical Domains Manager Can Erroneously Assign an Offline CPU to a Logical Domain (Bug ID 6431107)

When the Fault Management Architecture (FMA) places a CPU offline, it records that information, so that when the machine is rebooted the CPU remains offline. The offline designation persists in a non-Logical Domains environment.

However, in a Logical Domains environment, this persistence is not always maintained for CPUs in guest domains. The Logical Domains Manager does not currently record data on fault events sent to it. This means that a CPU in a guest domain that has been marked as faulty, or one that was not allocated to a logical domain at the time the fault event is replayed, can subsequently be allocated to another logical domain with the result that it is put back online.

Logical Domains Manager Should Validate Disk Paths and Network Devices (Bug ID 6447740)

If a disk device listed in a guest domain's configuration is either non-existent, already opened by another process, or otherwise unusable, the disk cannot be used by the virtual disk server (`vds`) but the Logical Domains Manager does not emit any warning or error when the domain is bound or started.

When the guest tries to boot, messages similar to the following are printed on the guest's console:

```
WARNING: /virtual-devices@100/channel-devices@200/disk@0: Timeout
connecting to virtual disk server... retrying
```

In addition, if a network interface specified using the `net-dev=` parameter does not exist or is otherwise unusable, the virtual switch is unable to communicate outside the physical machine, but the Logical Domains Manager does not emit any warning or error when the domain is bound or started.

Recovery:

In the case of an **errant virtual disk service device or volume**, perform the following steps:

1. Stop the domain owning the virtual disk bound to the errant device or volume.
2. Issue the `ldm rm-vdsdev` command to remove the errant virtual disk service device.
3. Issue the `ldm add-vdsdev` command to correct the physical path to the volume.
4. Restart the domain owning the virtual disk.

In the case of an **errant `net-dev=` property specified for a virtual switch**, perform the following steps:

1. Issue the `ldm set-vsw` command with the corrected `net-dev=` property.
2. Reboot the domain hosting the virtual switch in question.

Network Devices

If a disk device listed in a guest domain's configuration is being used by software other than the Logical Domains Manager (for example, if it is mounted in the service domain), the disk cannot be used by the virtual disk server (`vdcs`), but the Logical Domains Manager does not emit a warning that it is in use when the domain is bound or started.

When the guest domain tries to boot, a message similar to the following is printed on the guest's console:

```
WARNING: /virtual-devices@100/channel-devices@200/disk@0: Timeout
connecting to virtual disk server... retrying
```

Recovery: Unbind the guest domain, and unmount the disk device to make it available. Then bind the guest domain, and boot the domain.

Hang Can Occur With Guest OS in Simultaneous Operations (Bug ID 6497796)

Under rare circumstances, when an ldom variable, such as `boot-device`, is being updated from within a guest domain by using the `eeeprom(1M)` command at the same time that the Logical Domains Manager is being used to add or remove virtual CPUs from the same domain, the guest OS can hang.

Workaround: Ensure that these two operations are not performed simultaneously.

Recovery: Use the `ldm stop-domain` and `ldm start-domain` commands to stop and start the guest OS.

The `iostat(1M)` Command Does Not Provide Meaningful I/O Statistics on Domain With Virtual Disks (Bug ID 6503157)

The `iostat(1M)` command does not return any meaningful information when run on a domain with virtual disks. This is because the LDom's `vdisk` client driver (`vdcd`) does not measure I/O activity nor save any info to `kstats` which could be read by the `iostat` command.

Workaround: Gather the I/O statistics on the service domain exporting the virtual disks.

Behavior of the `ldm stop-domain` Command Needs to Be Improved in Some Cases (Bug ID 6506494)

There are some cases where the behavior of the `ldm stop-domain` command is confusing.

If the Solaris OS is halted on the domain; for example, by using the `halt(1M)` command; and the domain is at the prompt `"r)eboot, o)k prompt, h)alt?,"` the `ldm stop-domain` command fails with the following error message:

```
LDom <domain name> stop notification failed
```

Workaround: Force a stop by using the `ldm stop-domain` command with the `-f` option.

```
# ldm stop-domain -f ldom
```

If the domain is at the kernel module debugger, `kmdb(1M)` prompt, then the `ldm stop-domain` command fails with the following error message:

```
LDom <domain name> stop notification failed
```

Recovery: If you restart the domain from the `kmdb` prompt, the stop notification is handled, and the domain does stop.

Cannot Set Security Keys With Logical Domains Running (Bug ID 6510214)

In a Logical Domains environment, there is no support for setting or deleting wide-area network (WAN) boot keys from within the Solaris OS using the `ickey(1M)` command. All `ickey` operations fail with the following error:

```
ickey: setkey: ioctl: I/O error
```

In addition, WAN boot keys that are set using OpenBoot firmware in logical domains other than the control domain are not remembered across reboots of the domain. In these domains, the keys set from the OpenBoot firmware are only valid for a single use.

Certain ldm Subcommands Return Misleading Messages If One or More Arguments Are Missing (Bug IDs 6519049 and 6573220)

Misleading error messages are returned from certain ldm subcommands that take two or more required arguments, if one or more of those required arguments is missing.

For example, if the add-vsw subcommand is missing the *vswitch-name* or *ldom* argument, you receive an error message similar to the following:

```
# ldm add-vsw net-dev=e1000g0 primary
Illegal name for service: net-dev=e1000g0
```

For another example, if the add-vnet command is missing the *vswitch-name* of the virtual switch service with which to connect, you receive an error message similar to the following:

```
# ldm add-vnet mac-addr=08:00:20:ab:32:40 vnet1 ldg1
Illegal name for VNET interface: mac-addr=08:00:20:ab:32:40
```

As another example, if you fail to add a logical domain name at the end of an ldm add-vcc command, you receive an error message saying that the `port-range=` property must be specified.

Recovery: Refer to the *Logical Domains (LDoms) Manager 1.0.3 Man Page Guide* or the ldm man page for the required arguments of the ldm subcommands, and retry the commands with the correct arguments.

Logical Domains Manager Forgets Variable Changes After a Power Cycle (Bug ID 6520041)

This issue is summarized in [“Logical Domain Variable Persistence”](#) on page 13.

When Running Cluster Software, Selecting the `ok` Prompt Upon a Logical Domain Shutdown Can Cause a Panic (Bug ID 6528556)

If Solaris™ Cluster software is in use with Logical Domains software, and the cluster is shut down, the console of each logical domain in the cluster displays the following prompt:

```
r)eboot, o)k prompt, h)alt?
```

If the `ok` prompt (`o` option) is selected, the system can panic.

Workarounds:

- Select `halt` (`h` option) at the prompt on the logical domain console to avoid the panic.
- To force the logical domain to stop at the `ok` prompt, even if the `OpenBoot auto-boot?` variable is set to `true`, follow one of the two following procedures.

▼ To Force the Primary Domain to Stop at the `ok` Prompt

Use this procedure *only* for the primary domain.

1. Issue the following ALOM command to reset the domain:

```
sc> poweron
```

The OpenBoot banner is displayed on the console:

```
Sun Fire T200, No Keyboard  
Copyright 2007 Sun Microsystems, Inc. All rights reserved.  
OpenBoot 4.26.0, 4096 MB memory available, Serial #68100096.  
Ethernet address 0:14:4f:f:20:0, Host ID: 840f2000.
```

2. Issue the following ALOM command to send a break to the domain immediately after the OpenBoot banner displays:

```
sc> break -y
```

The logical domain immediately drops to the `ok` prompt.

▼ To Force All Other Domains to Stop at the ok Prompt

Use this procedure for all logical domains *except* the primary domain.

1. Issue the following command from the control domain to disable the `auto-boot?` variable for the logical domain:

```
# ldm set-var auto-boot?=false domain-name
```

2. Issue the following command from the control domain to reset the logical domain:

```
# ldm start-domain domain-name
```

The logical domain stops at the ok prompt.

3. Issue the following OpenBoot command to restore the value of the `auto-boot?` variable:

```
ok setenv auto-boot? true
```

ZFS Volumes Need to Have the Same Version of Solaris Software Running on the Service Domain and the Guest Domain (Bug ID 6528974)

If a guest domain is running the Solaris 10 OS and using a virtual disk built from a ZFS volume provided by a service domain running the Solaris™ Express or OpenSolaris™ programs, then the guest domain might not be able to access that virtual disk.

The same problem can occur with a guest domain running the Solaris Express or OpenSolaris programs using a virtual disk built from a ZFS volume provided by a service domain running Solaris 10 OS.

Workaround: Ensure that the guest domain and the service domain are running the same version of Solaris software (Solaris 10 OS, Solaris Express, or OpenSolaris).

Page Retirement Does Not Persist in the Logical Domains Environment (Bug ID 6531058)

When a memory page of a guest domain is diagnosed as faulty, the Logical Domains Manager retires the page in the logical domain. If the logical domain is stopped and restarted again, the page is no longer in a retired state.

The `fmadm faulty -a` command shows whether the page from either the control or guest domain is faulty, but the page is not actually retired. This means the faulty page can continue to generate memory errors.

Workaround: Use the following command in the control domain to restart the Fault Manager daemon, `fmd(1M)`:

```
primary# svcadm restart fmd
```

Fault Manager Daemon (`fmd`) Does Not Correctly Recover From a Logical Domain Channel Reset (Bug ID 6533308)

If you reset the system controller while the host is powered on, subsequent error reports and faults are not delivered to the host.

Recovery: Use one of the following methods to recover.

- Restart the `fmd(1M)`:

```
# svcadm disable fmd  
# svcadm enable fmd
```

- Reboot.
- Reload the Encoding Table Management (ETM) module:

```
# fmadm unload etm  
# fmadm load /usr/platform/sun4v/lib/fm/fmd/plugins/etm.so
```

Using the `server-secure.driver` With an NIS Enabled System, Whether or Not LDoms Is Enabled (Bug ID 6533696)

On a system configured to use the Network Information Services (NIS) or NIS+ name service, if the Solaris Security Toolkit software is applied with the `server-secure.driver`, NIS or NIS+ fails to contact external servers. A symptom of this problem is that the `ypwhich(1)` command, which returns the name of the NIS or NIS+ server or map master, fails with a message similar to the following:

```
Domain atlas some.atlas.name.com not bound on nis-server-1.c
```

The recommended Solaris Security Toolkit driver to use with the Logical Domains Manager is `ldm_control-secure.driver`, and NIS and NIS+ work with this recommended driver.

If you are using NIS as your name server, you cannot use the Solaris Security Toolkit profile `server-secure.driver`, because you may encounter Solaris OS Bug ID 6557663, IP Filter causes panic when using `ipnat.conf`. However, the default Solaris Security Toolkit driver, `ldm_control-secure.driver`, is compatible with NIS.

▼ To Reset Your System

1. Log in to the system console from the system controller, and if necessary, switch to the ALOM mode by typing:

```
# #.
```

2. Power off the system by typing the following command in ALOM mode:

```
sc> poweroff
```

3. Power on the system.

```
sc> poweron
```

4. Switch to the console mode at the `ok` prompt:

```
sc> console
```

5. Power on the system.

```
ok boot -s
```

6. Edit the file `/etc/shadow`, and change the first line of the shadow file that has the root entry to:

```
root::6445:::::::::
```

7. Log in to the system and do one of the following:

- Add file `/etc/ipf/ipnat.conf`
- Undo the Solaris Security Toolkit, and apply another driver.

```
# /opt/SUNWjass/bin/jass-execute -ui  
# /opt/SUNWjass/bin/jass-execute -a ldm_control-secure.driver
```

Network Performance Is Substantially Worse in a Logical Domain Guest Than in a Non-LDoms Configuration (Bug ID 6534438)

The virtual networking infrastructure adds additional overhead to communications from a logical domain. All packets are sent through a virtual network device, which, in turn, passes the packets to the virtual switch. The virtual switch then sends the packets out through the physical device. The lower performance is seen due to the inherent overheads of the stack.

Workarounds: Do one of the following depending on your server:

- On Sun UltraSPARC T1-based servers, such as the Sun Fire T1000 and T2000, and Sun UltraSPARC T2+ based servers such as the Sun SPARC Enterprise T5140 and T5240, assign a physical network card to the logical domain using a split-PCI configuration. For more information, refer to “Configuring Split PCI Express Bus to Use Multiple Logical Domains” in the *Logical Domains (LDoms) 1.0.3 Administration Guide*.
- On Sun Ultra SPARC T2-based servers, such as the Sun SPARC Enterprise T5120 and T5220 servers, assign a Network Interface Unit (NIU) to the logical domain.

Logical Domain Time-of-Day Changes Do Not Persist Across a Power Cycle of the Host (Bug ID 6536572)

If the time or date on a logical domain is modified, for example using the `ntpdate` command, the change persists across reboots of the domain but not across a power cycle of the host.

Workaround: For time changes to persist, save the configuration with the time change to the SC and boot from that configuration.

When the Logical Domains Manager is Running, OpenBoot PROM Variables Cannot be Modified by the `eeprom(1M)` Command (Bug ID 6540368)

This issue is summarized in [“Logical Domain Variable Persistence”](#) on page 13.

Errors to Buses in a Split-PCI Configuration Might Not Get Logged (Bug ID 6542295)

During operations in a split-PCI configuration, if a bus is unassigned to a domain or is assigned to a domain but not running the Solaris OS, any error in that bus or any other bus may not get logged. Consider the following example:

In a split-PCI configuration, Bus A is not assigned to any domain, and Bus B is assigned to the primary domain. In this case, any error that occurs on Bus B might not be logged. (The situation occurs only during a short time period.) The problem resolves when the unassigned Bus A is assigned to a domain and is running the Solaris OS, but by then some error messages might be lost.

Workaround: When using a split-PCI configuration, quickly verify that all buses are assigned to domains and are running the Solaris OS.

Emulex-based Fibre Channel Host Adapters Not Supported in Split-PCI Configuration on Sun Fire T1000 Servers (Bug ID 6544004)

The following message appears at the `ok` prompt if an attempt is made to boot a guest domain that contains Emulex-based Fibre Channel host adapters (Sun Part Number 375-3397):

```
ok> FATAL:system is not bootable, boot command is disabled
```

These adapters are not supported in a split-PCI configuration on Sun Fire T1000 servers.

Starting and Stopping SunVTS Multiple Times Can Cause Host Console to Become Unusable (Bug ID 6549382)

If SunVTS™ is started and stopped multiple times, it is possible that switching from the SC console to the host console, using the console SC command can result in either of the following messages being repeatedly emitted on the console:

```
Enter #. to return to ALOM.
```

```
Warning: Console connection forced into read-only mode
```

Recovery: Reset the SC using the `resetsc` command.

Infiniband PCI-X Cards Lost if Control Domain is Rebooted (Bug ID 6551861, 6552598, 6563713, 6589192, and 6625687)

The following Infiniband cards are not supported with LDOMs 1.0.1, 1.0.2, and 1.0.3:

- Sun Dual Port 4x IB Host Channel Adapter PCI-X
- Dual port 4x PCI Express Infiniband Host Channel Adapter - Low Profile

Workaround: If one of these unsupported configurations is used with LDoms software, all logical domains must be stopped and unbound before the `primary` or control domain is rebooted. Failure to do so might result in the device becoming unusable, and the system does not recognize the card.

Do Not Use Control-C From the `prtdiag(1M)` Command (Bug ID 6552999)

Normally, when the verbose (`-v`) option is specified to the `prtdiag(1M)` command in the control domain, additional environmental status information is displayed. If the output of this information is interrupted by issuing a Control-C, the Platform Information and Control Library (PICL) daemon, `picld(1M)`, can enter a state which prevents it from supplying the environmental status information to the `prtdiag` command from that point on, and the additional environmental data is no longer displayed.

Workaround: Restart the `picld(1M)` Service Management Facility (SMF) in the control domain using the following command:

```
# svcadm restart picld
```

Virtual Disks Created From Files Do Not Support EFI Labels (Bug ID 6558966)

If a virtual disk is backed by a file, then this virtual disk cannot be labeled with an EFI label and cannot directly be added in a ZFS pool.

Workaround: The disk has to be labeled with a volume table of contents (VTOC) label using the `format(1M)` command. The disk can be added to a ZFS pool by creating a VTOC label with a slice covering the entire disk (for example, slice 0) and adding that slice to the ZFS pool instead of adding the entire disk. For example, use `zpool create xyzpool c0d1s0` instead of `zpool create xyzpool c0d1`.

Occasionally During a Solaris OS Reboot, You Can Receive an Unsuccessful Read or Write Message (Bug ID 6560890)

Occasionally during a Solaris OS boot, a console message from the Domain Services (ds) module reports that reading or writing from a logical domain channel was unsuccessful. The reason code (131) indicates that the channel has been reset. Following are examples of the console message.

```
NOTICE: ds@1: ldc_read returned 131
WARNING: ds@0: send_msg: ldc_write failed (131):
```

These console messages do not affect the normal operation of the system and can be ignored.

Recovery: None.

Heavy Network Traffic in Guest Domains Can Lead to Solaris Cluster Heartbeat Failures (Bug ID 6561424)

If Solaris Cluster software is installed on a guest logical domain, Solaris Cluster heartbeat packets can get dropped under a heavy network load. This could cause the cluster node to panic.

Recovery: None.

Workaround: None.

Inconsistent Console Behavior When Not Using the Virtual Console (Bug ID 6581309)

Console behavior on the control domain is inconsistent when a graphics device and keyboard are specified for console use. This occurs when the OpenBoot variables `input-device` and `output-device` are set to anything other than the default value of `virtual-console`.

If the control domain is set this way, some console messages are sent to the graphics console and others are sent to the virtual console. This results in incomplete information on either console. In addition, when the system is halted, or a break is sent to the console, control is passed to the virtual console which requires keyboard input over the virtual console. As a result, the graphics console appears to hang.

Workaround: To avoid this problem, use only the virtual console. From the OpenBoot ok prompt, ensure that the default value of `virtual-console` is set for both the `input-device` and variables.

Recovery: Once the graphics console appears hung, do the following:

1. Connect to the virtual console from the system processor to provide the required input.
2. Press Return on the virtual console keyboard once to see the output on the virtual console.

If these solutions do not work for your configuration or if you have further questions, contact Sun Services.

SP `setdate` Command Changes the Solaris OS Date When Using Non-Default Logical Domain Configurations (Bug ID 6586305)

If you use the service processor (SP) `setdate` command after you configure non-default logical domains and save them to the SP, the date on non-default logical domains changes.

Workaround: Configure the SP date using the `setdate` command *before* you configure the logical domains and save them on the SP.

Recovery: If you use the SP `setdate` command after you save the non-default logical domains configurations on the SP, you would need to boot each non-default logical domains to the Solaris OS and correct the date. Refer to the `date(1)` or `ntpdate(1M)` commands in the Solaris 10 OS Reference Manual Collection for more information about correcting the date.

Logical Domains Manager Does Not Retire Resources On Guest Domain After a Panic and Reboot (Bug ID 6591844)

If a CPU or memory fault occurs, the affected domain might panic and reboot. If FMA attempts to retire the faulted component while the domain is rebooting, the Logical Domains Manager is not able to communicate with the domain, and the retire fails. In this case, the `fmadm faulty` command lists the resource as degraded.

Recovery: Wait for the domain to complete rebooting and then force FMA to replay the fault event by restarting `fmd` on the control domain by using this command:

```
# svcadm restart fmd
```

Logical Domains Manager Accepts Multiple Entries of I/O Constraints (Bug ID 6591905)

It is possible to erroneously add duplicate I/O constraints when configuring a logical domain.

Workaround:

1. Show the duplicate entries by using this command:

```
# ldm list -l
```

2. Remove the duplicate I/O entries by using this command:

```
# rm-io bus ldom
```

Console Ports Dynamically Assigned When a Logical Domain Is Bound Become Hard Constraints If the Logical Domains Manager Subsequently Restarts (Bug ID 6596652)

When logical domains are being configured with no specific console port specified for any logical domain, any Logical Domains Manager (which may happen automatically as part of a delayed reconfiguration or LDoms manager exit), may

change the LDOMs Manager console port configuration state from what the user has originally entered. This may result in the following error message when attempting to bind a logical domain:

```
Unable to bind client vcons0
```

Workaround: Check the actual configuration state for the guest which failed to bind using the command:

```
# ldm ls-constraints
```

The output should show that the port constraint in the console matches with one of the bound guests. Use the `ldm destroy` command to completely remove the guest. Create the guest from scratch without any constraint set on the console, or use another console port not currently assigned to any bound guest.

Guest Domain With More Than Four Virtual Networks on the Same Network Using DHCP Can Become Unresponsive (Bug ID 6603974)

If you configure more than four virtual networks (`vnets`) in a guest domain on the same network using the Dynamic Host Protocol (DHCP), the guest domain can eventually become unresponsive while running network traffic.

Recovery: Issue an `ldm stop-domain ldom` command followed by an `ldm start-domain ldom` command on the guest domain (`ldom`) in question.

Workaround: Avoid such configurations.

Fault Management Daemon Dumps Core On a Hardened, Single Strand Control Domain (Bug ID 6604253)

If you run the Solaris 10 11/06 OS and you harden drivers on the primary domain which is configured with only one strand, rebooting the primary domain or restarting the Fault Management daemon (`fmd`) can result in an `fmd` core dump. The `fmd` dumps core while it cleans up its resources, and this does not affect the FMA diagnosis.

Workaround: Add a few more strands into the primary domain. For example,

```
# ldm add-vcpu 3 primary
```

The `set-vcpu` Command Does Not Warn About MAUs Becoming Unreachable On Initial Reconfiguration (Bug ID 6609051)

When removing CPUs from a domain that is in delayed reconfiguration mode, if all the CPUs that are bound to that domain and on the same core are removed, and the Modular Arithmetic Unit (MAU) on that core had also been bound to the same domain, then that MAU becomes orphaned. It is no longer reachable by the domain to which it is bound, nor is it made available to any other domain which has CPUs bound to the same core. In addition, there is no warning or error returned at the time the MAU is orphaned.

Workaround: Remove sufficient MAUs from the domain prior to removing CPUs, so that removing CPUs does not result in MAUs becoming unreachable.

- On UltraSPARC T1-based systems, there is one MAU for every four CPU strands
- On UltraSPARC T2-based systems, there is one MAU for every eight CPU strands

To find out which MAUs are bound to the domain, type:

```
# ldm ls -l ldom
```

To remove MAUs from a domain, type:

```
# ldm rm-mau number ldom
```

Virtual Switch Should Be Selective When Displaying Warnings to the Console (Bug ID 6610700)

The virtual switch (vsw) occasionally displays benign operational messages as either a WARNING or NOTICE. Some of these message are listed as follows and should be ignored as they do not impact the normal operation of the virtual switch.

```
WARNING: vsw0: failed to program addr 0:14:4f:f8:f0:2 for port 13 into device
e1000g2 : err 28

NOTICE: vsw0: switching device e1000g2 into promiscuous mode

NOTICE: vsw0: switching device e1000g2 back to programmed mode

WARNING: vsw1: device (aggr15) does not support setting multiple unicast
addresses

WARNING: vsw1: Unable to setup layer2 switching
```

Recovery: None.

Workaround: None.

Attempting to WAN Boot a Logical Domain Using a Solaris 10 8/07 OS Installation DVD Causes Hang (Bug ID 6624950)

WAN booting a logical domain using a miniroot created from a Solaris 10 8/07 OS installation DVD hangs during a boot of the miniroot.

The scadm Command Can Hang Following an SC or SP Reset (Bug ID 6629230)

The scadm command on a control domain running Solaris 10 11/06 or later can hang following a SC reset. This is caused because the system is unable to properly reestablish a connection following an SC reset.

Recovery: Reboot the host to reestablish connection with the SC.

Workaround: Reboot the host to reestablish connection with the SC.

The `vxdump` Utility Does Not Correctly Export Disks (Bug ID 6637560)

If a physical disk is exported as a virtual disk through the Veritas Dynamic Multipathing (DMP) framework (that is, using `/dev/vx/dmp/cXdXtXs2`), the physical disk is not exported correctly, and it appears as a single slice disk in the guest domain.

Workaround: The physical disk should be exported without using the Veritas DMP framework. The disk should be exported using `/dev/dsk/cXdXtXs2` instead of `/dev/vx/dmp/cXdXtXs2`.

Addition of Virtual Disk or Network Devices Under Delayed Reconfiguration Can Fail (Bug ID 6646690)

If virtual devices are added to an active domain, and virtual devices are removed from that domain before that domain reboots, then the added devices do not function once the domain reboots.

Recovery: Remove and then add the non-functional virtual devices, making sure that all the remove requests precede all the add requests, and then reboot the domain.

Workaround: On an active domain, do not add and remove any virtual devices without an intervening reboot of the domain.

Sometimes Failure to Make Requested Memory Allocation Change Can Cause Logical Domains Manager to Terminate (Bug ID 6648291)

When requesting a change in the memory allocation of a domain (using any of the `add-memory`, `set-memory`, or `rm-memory` subcommands of `ldm`), there are cases in which a failure to make the requested change can result in the Logical Domains Manager terminating. When this happens, the following message is returned on the failed request:

```
Receive failed: logical domain manager not responding
```

SMF then restarts the LDom Manager, and the system is fully functional once it is restarted.

The `ldm panic-domain` Command Returns Incorrect Error Message (Bug ID 6655083)

If the hypervisor rejects an `ldm panic-domain` request (because the domain is already resetting for example), the error message returned by the LDoms Manager is misleading:

```
Invalid LDom ldg23
```

This implies the domain is invalid which is not the case.

LDoms Multidomain Functionality Does Not Support SNMP 1.5.4 on Some Systems (Bug ID 6655981)

LDoms multidomain functionality does not support SNMP 1.5.4 on Sun SPARC Enterprise T5140 and Sun SPARC Enterprise T5240 systems. Only a single global domain is supported.

Simultaneous Net Installation of Multiple Domains Fails When in a Common Console Group (Bug ID 6656033)

Simultaneous net installation of multiple guest domains fails on Sun SPARC Enterprise T5140 and Sun SPARC Enterprise T5240 systems with a common console group.

Workaround: Only net install on guest domains that each have their own console group. This failure is seen only on domains with a common console group shared among multiple net-installing domains.

Guest Loses Virtual Disk Services When Using a Configuration Saved During Delayed Reconfiguration (Bug ID 6659100)

After a delayed reconfiguration on a guest domain and a subsequent power cycle, the guest fails to boot with the following message:

```
Boot device: /virtual-devices@100/channel-devices@200/disk@0 File
and args:
WARNING: /virtual-devices@100/channel-devices@200/disk@0: Timeout
connecting to virtual disk server... retrying
```

This happens when a configuration is saved to the SP while a delayed reconfiguration is pending.

Workarounds: Either do not save the configuration to SP after the delayed reconfiguration is completed and the guest rebooted, or run the following on the primary domain after the guest is rebooted after a delayed reconfiguration:

```
# ldm stop ldom
# ldm unbind ldom
# ldm bind ldom
# ldm start ldom
```

The guest should boot successfully now.

Virtual Disk Channel Should Support the DKIOCPARTITION ioctl (Bug ID 6673364)

On a guest domain, the virtual disk driver does not support the disk control operations partition (DKIOCPARTITION) ioctl. Using this ioctl fails, while it should succeed for disks with an EFI label.

With Solaris Cluster running in an LDom's guest domain, trying to add a virtual disk with an EFI label as a quorum device fails:

```
# scconf -a -q globaldev=d2
scconf: Failed to add quorum device (d2) - unable to scrub the
device.
```

Workaround: With Solaris Cluster running in an LDom's guest domain, only virtual disks with a VTOC label can be added as quorum devices.

Virtual Disk Channel Should Check for Device Being Read-only Upon Opening (Bug ID 6675762)

On a guest domain, when opening a virtual disk for writing, the virtual disk driver does not check if the virtual disk was exported as a read-only device. Thus, opening the device succeeds instead of failing with a read-only file system (EROFS) error.

Instead of failing immediately, applications using a read-only virtual disk character device (`/dev/rdisk/cXdXsX`) for writing fail only when a write command is issued. Applications using a read-only virtual disk block device (`/dev/dsk/cXdXsX`) for writing see errors only if the write is not buffered in the system cache. Therefore, such applications might see write operations completed successfully although the write is not be committed to the device.

Workaround: None.

No External Network Connectivity on Virtual Switch Services Bound to an Aggregated Device (Bug ID 6675887)

If a link aggregation device is being used as the physical device for a virtual switch (vswitch), the vswitch might not be able to open and configure the device. As a result, the client guest domains cannot send and receive network packets to and from the physical network.

Workaround: Add the following line to the `/etc/system` file on the domain with the vswitch, and reboot the domain.

```
set vsw:vsw_mac_open_retries = 1200
```

System Can Occasionally Panic During Reboot If the Virtual Switch Is Configured to Use an Aggregated Network Device (Bug ID 6678891)

Occasionally, a service domain panics during reboot if the virtual switch is configured to use an aggregated network device for external connectivity.

Recovery: Reconfigure the virtual switch to a physical network device using the `ldm set-vsw` command, and then restart the domain.

Workaround: Configure the virtual switch to use a regular physical network device instead of an aggregated network device.

The `sysfwdownload` Utility Takes Significantly Longer to Run While LDoms Is Enabled on UltraSPARC T1-based Systems (Bug ID 6682402)

The `sysfwdownload` utility takes significantly longer to run from within an LDoms environment on systems based on UltraSPARC T1 processors. This happens if you use the `sysfwdownload` utility while LDoms software is enabled.

Workaround: Boot to the `factory-default` configuration with LDoms software disabled before using the utility.

Data Might Not Be Written Immediately to the Virtual Disk Backend If Virtual I/O Is Backed by a File or Volume (Bug ID 6684721)

When a file or volume is exported as a virtual disk, then the service domain exporting that file or volume is acting as a storage cache for the virtual disk. In that case, data written to the virtual disk might get cached into the service domain memory instead of being immediately written to the virtual disk backend. Data are not cached if the virtual disk backend is a physical disk or slice, or if it is a volume device exported as a single-slice disk.

Workaround: If the virtual disk backend is a file or a volume device exported as a full disk, then you can prevent data from being cached into the service domain memory and have data written immediately to the virtual disk backend by adding the following line to the `/etc/system` file on the service domain.

```
set vds:vd_file_write_flags = 0
```

Note – Setting this unable flag will have an impact on performance when writing to a virtual disk, but it does ensure that data are written immediately to the virtual disk backend.

Sometimes, the `prtdiag(1M)` Command Does Not List all CPUs (Bug ID 6686081)

In certain cases, the `prtdiag(1M)` command does not list all the CPUs.

Workaround: For an accurate count of CPUs, use the `psrinfo(1M)` command.

SVM Volumes Built on Slice 2 Fail JumpStart When Used as the Boot Device in a Guest Domain (Bug ID 6687634)

If the SVM volume is built on top of a disk slice containing block 0 of the disk, then SVM prevents writing to block 0 of the volume to avoid overwriting the label of the disk.

If a SVM volume built on top of a disk slice containing block 0 of the disk is exported as a full virtual disk, then a guest domain is unable to write a disk label for that virtual disk, and this prevents the Solaris OS from being installed on such a disk.

Workaround: SVM volumes exported as a virtual disk should not be built on top of a disk slice containing block 0 of the disk.

A more generic guideline is that slices which start on the first block (block 0) of a physical disk should not be exported (either directly or indirectly) as a virtual disk. Refer to “Directly or Indirectly Exporting a Disk Slice” in the *Logical Domains (LDMs) 1.0.3 Administration Guide*.

Occasionally, SPARC Enterprise T2000 Systems Can Hang on Boot If the Virtual Switch Is Configured to Use Sun x8 Express 1/10G Ethernet Adapters (Bug ID 6687871)

Occasionally, SPARC Enterprise T2000 systems can hang on boot if the virtual switch (`vsw`) is configured to use Sun x8 Express 1/10G Ethernet Adapters (`nxge`). The occurrence of this bug might signal broken network hardware. Systems that have broken network interface cards (NICs) exhibit this behavior.

Recovery: Replace the faulty network card.

Workaround: None.

Logical Domains Manager Returns Successful (0) Instead of Failed (1) Exit Code in Some Situations (Bug ID 6689040)

If an attempt to use dynamic reconfiguration to remove CPUs from a domain using the Logical Domains Manager CLI fails (that is, the request to unconfigure the CPUs results in an error being returned from the guest OS) a failure message is reported to the screen, but the exit code of the associated `ldm` subcommand is incorrectly set to 0. This can cause scripts that check the exit status of `ldm` subcommands in order to determine success or failure to incorrectly assume that the command succeeded when in fact it did not.

The `rm-vdsdev` Subcommand Succeeds on Another Domain While Delayed Reconfiguration Operations Are Pending (Bug ID 6692185)

Normally, if a delayed reconfiguration is in progress for a domain, attempts to make configuration changes to any other domain are disallowed to prevent potential problems when the domain under the delayed reconfiguration has its new configuration instantiated. However, attempts to remove volumes from a virtual disk server (using the `ldm rm-vdsdev` command) continue to be allowed, even when another domain is in the process of a delayed reconfiguration.

Since a volume cannot be removed if there are any virtual disks bound to it, even if that binding is part of a delayed reconfiguration, this will not result in any problems when the delayed reconfiguration is instantiated. The only ramification is the unexpected success of the operation.

When a Virtual Disk Device and a Virtual Disk Are in the Same Domain, the `ldm rm-vdsdev` Command Does Not Persist Across Reboots (Bug ID 6693542)

Under certain situations, a restart of the Logical Domains Manager (or a reboot of the control domain) results in virtual disk device (`vdsdev`) information becoming replicated in the constraint database. Once these replicated entries exist in the Logical Domains Manager constraint database, `ldm rm-vdsdev` operations work initially, but do not persist across a subsequent restart of the Logical Domains Manager (or reboot of the control domain); that is, the removed `vdsdev` reappears.

Recovery: It could take multiple cycles of removing the `vdsdev` followed by restarting the Logical Domains Manager to clear out the replicated entries in the database.

Solaris 10 11/06 OS Net Installation Fails on Guest Domain (Bug ID 6698036)

On Sun UltraSPARC T1-based servers, JumpStart™ installations of the Solaris 10 11/06 OS on guest domains can hang sometimes depending on the memory configuration. Typically, this happens on guest domains with 1024 megabytes of memory (+/- 20 megabytes).

Recovery: Stop the domain. Add or remove some memory; for example, 100 megabytes. Attempt the net installation again.

Workaround: If possible, net install the guest domain with the Solaris 10 8/07 OS or later.

LDoms Bugs Fixed for Solaris 10 5/08 OS

The following LDoms bugs were fixed for the Solaris 10 5/08 OS:

- 6416097 Remove bit fields in `vio` messages for portability
- 6434615 `vdisk` needs to support booting/installing from DVDs
- 6437722 `vdisk` should support `USCSICMD ioctl`
- 6437772 `vdisk` should support `mhd` (multihost disk control operations)
- 6469894 `xcall` timeouts should be derived from the machine description
- 6492023 Service domain thread pegged 100% system time
- 6501039 Rebooting multiple guests continuously causes a reboot thread to hang
- 6512526 `RC1a: vntsd` needs to validate the listen-to IP address
- 6514091 `vdisk` server should export volumes as full disks
- 6519849 `vnet` hot lock in `vnet_m_tx` affecting performance
- 6527622 Attempt to store boot command variable during a reboot can time out
- 6528156 Opening devices exclusively from `vds` causes several problems
- 6530331 `vsw` when plumbed and in `prog` mode should write its mac address into HW
- 6531030 `fmd` not replaying page retirement fault events at startup on the primary domain
- 6531266 Link-aggregation with Nemo on `e1000g` primary ldom does not work
- 6531557 `format(1M)` does not work with virtual disks
- 6531913 `vds` can lose access to `vdisk`s built from files located on the root fs
- 6534456 `vntsd` does not recognize a `listen_addr` of 127.0.0.1

6536262 vds occasionally sends out-of-order responses

6539243 LDC prints warning messages on console when running newer Solaris with older SysFw (6.3.x)

6541689 vsw_process_data_dring_pkt doesn't check the return value from allocb

6542560 Implement LDC dcmds and walkers for improved debugging

6543601 intrstat is not supported on an LDom for virtual devices

6544946 Adding nonexistent disk device to single-CPU domain causes hang

6554177 vswitch should verify net-dev property

6556778 vnet does not handle ldc_init failure properly

6557970 Data from OpenBoot PROM is double-copied in vsw driver

6559924 vgen_mdeg_cb fails to release lock properly when error occurs

6563508 prtdiag/prtpicl broken on guest domains on Solaris 10 8/07

6566086 vdc needs an I/O timeout

6571988 cnex should cache target cpuid for each channel

6572885 ldc_init does not properly compute queue length from mtu

6572891 ldc reliable mode does not process ACK packets properly

6573332 Format of MAC address set in vnet and vsw attr packet do not match

6573492 ldc_rx_hdlr always sends CTRL/NACK on seqID mismatch

6573657 vds type-conversion bug prevents raw disk accesses from working

6575050 vds should support unformatted disks

6575216 IO-DOMAIN-RESET: Guests may lose access to disk services (vds) if I/O domain is rebooted

6575608 i_ldc_send_pkt () uses seqID without grabbing Tx lock

6578761 System hangs in ds_cap_fini () and ds_cap_init ()

6578918 Disk image should have a device ID

6581720 IO-DOMAIN-RESET (T2000/T5120/T5220): Guest domain may lose connection to vsw if primary is rebooted

6589682 IO-DOMAIN-RESET (T2000-AA): kern_postprom panic on tavor-pcix configuration (reboot)

6591399 vds prints file lookup error during service domain boot

6591825 ldc_read does not set qhead after processing control pkts

6593231 Domain Services logging facility must manage memory better

6593961 Transmit performance doesn't scale with increasing number of TCP connections in guest domain

6596819 vds does not implement DKIOCFUSHWRITECACHE for files-exported-as-vdisks

6604983 Multicast processing after a channel-reset is broken in vnet

6605716 Halting the system should not override auto-boot? on the next poweron

6607061 vdisk protocol version needs to be bumped up to v1.1

6610044 vsw should mac_register() in attach()

6616313 cnex incorrectly generates interrupt cookies

6616525 ldclist.rwlock could be acquired after it has been destroyed

6620322 The panic occurred when the system was booted on T5120

6621222 Need a tunable to export volumes as single slice disks

6622758 LDC channel statistics are missing in vsw

6627933 Panic in vsw_reclaim_dring while net installing a guest

6630945 vntsd runs out of file descriptors with very large domain counts

6634346 cnex panics if DTrace probes use values which have been destroyed by a call to remove intr

6639934 Recursive mutex_enter panics on vgen_handshake_reset when configuring 17 vnets on a service

6667939 Guest domain panics on boot after installing T127127-08

Bugs Fixed for LDomS 1.0.3 Software

The following LDomS bugs were fixed for the LDomS 1.0.3 software release:

6515615 add-vnet allows creation of virtual network devices with the same MAC addr assigned to another LDom

6517269 CLI: the "Usage:" outputs of `ldm list-services` and `list-constraints` are not consistent

6532201 Automatically assigned MAC address cannot be manually re-assigned to the logical domain

6563513 `ldm list-constraints -x` silently ignores everything that is not a valid LDom

6571091 LDOM manager dies when `svcs` is starting `ldmd_start` due to resource duplication

6580000 `ldm` needs a `set-vdisk` command to update `vdisk` timeout

6580005 XML parser should use `set-vcons` if needed when creating a domain

6582402 IO bus "alias" property is missing in XML `list-bindings`

6589614 Calls to `cons_bind_mem()` should send in a `resp` pointer whenever possible

6591279 Re-enable support for specifying options to VDS volumes

6592847 Implement v3 XML

6592851 MAU tag missing when no crypto units allocated to a domain

6594308 `ldm` needs a `set-vdsdev` command to update `vds` device options

6595398 FMA memory retire code does not translate RA back to PA in `ldmd`

6622205 LDOMs should report domain memory in mega- or gigabytes instead of bytes to avoid overrun

6626770 LDOM disk and network services renamed after 1.0.1 to 1.0.2 upgrade

6627345 `useradd/roleadd -A solaris.ldoms.grant user|role` generates "is not a valid authorization" error

6627904 `ldm ls-devices` does not accept legal arguments

6628063 After file system full error, `ldmd` repeatedly gets fatal error on startup

6649585 Typo in `cancel-reconf` message

6651993 LDOMs Manager aborts when using `set-vcpu` into a guest domain that is in the process of a delayed reconfig

6654736 `add-vsw` command should add a `mode` option for special packet processing

6657785 HV abort after multiple memory config changes under a delayed reconfig

6667621 `ldmd` core dump on `ldm add-domain -i xml_file`

6671117 ldm crash on add-config if in delayed reconfig

6675316 Usage messages for add-vdsev/set-vdsdev options need to be more user friendly

6678085 VCC service provided a fixed range of port numbers and ignored the port number provided by the user

6680451 ldm set-vcc should always trigger a delayed reconfig if the domain is active

6681878 vdisk timeout feature did not kick in when I/O domain service is in halting state

6684612 Guest domain panic on vdc <-> vds handshake

6685297 ldmd reports incorrect memory size if ldm set-mem to a memory size less than existing memory

6688287 CLI help message cleanup

6689234 Don't disallow multiple exports of the same backing store from the same domain

6690733 Bug in set-vnet CLI