Logical Domains 1.3 Release Notes

Contents

Preface

The *Logical Domains 1.3 Release Notes* include information about this release of the software, such as changes for this release, supported platforms, a matrix of required software and patches, and bugs affecting Logical Domains (LDoms) 1.3 software.

Related Documentation

The following table shows the documentation that is available for the LDoms 1.3 release. These documents are available in HTML and PDF formats unless indicated.

TABLE P–1 Related Documentation

Application	Title	Part Number
LDoms 1.3 Software	*Logical Domains 1.3 Administration Guide*	821-0406
	Logical Domains 1.3 Release Notes	821-0404
	Logical Domains 1.3 Reference Manual Solaris 10 Reference Manual Collection ■ drd(1M) man page ■ vntsd(1M) man page	821-0405
LDoms Software Basics	*Beginners Guide to LDoms: Understanding and Deploying Logical Domains Software* (PDF)	820-0832
LDoms Management Information Base (MIB)	*Logical Domains (LDoms) MIB 1.0.1 Administration Guide*	820-2319-10
	Logical Domains (LDoms) MIB 1.0.1 Release Notes	820-2320-10
Solaris OS: Installation and Configuration	Solaris 10 10/09 Release and Installation Collection	N/A

You can find documentation that relates to your server, software, or the Solaris™ OS on `http://docs.sun.com`. Use the Search box to find the documents and the information that you need.

Sun Welcomes Your Comments

Sun is interested in improving its documentation and welcomes your comments and suggestions. Submit your comments at http://www.sun.com/secure/products-n-solutions/hardware/docs/feedback/.

Include the following book title and part number with your feedback: *Logical Domains 1.3 Release Notes*, part number 821-0404-10.

Documentation, Support, and Training

The Sun web site provides information about the following additional resources:

- Documentation (http://www.sun.com/documentation/)
- Support (http://www.sun.com/support/)
- Training (http://www.sun.com/training/)

Typographic Conventions

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

TABLE P–2 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 Solaris OS. Note that the default system prompt that is displayed in command examples varies, depending on the Solaris release.

TABLE P–3   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#`

Logical Domains 1.3 Release Notes

These release notes contain changes for this release, a list of supported platforms, a matrix of required software and patches, and other pertinent information, including bugs that affect Logical Domains (LDoms) 1.3 software.

Note – The Logical Domains 1.3 software is supported on the OpenSolaris™ OS starting with the OpenSolaris 2009.06 release. The Logical Domains 1.3 documentation focuses on the usage of Logical Domains on the Solaris 10 OS. The same Logical Domains features are available for both the Solaris 10 OS and the OpenSolaris OS. However, you might encounter some slight differences when using Logical Domains with the OpenSolaris OS. For more information about the OpenSolaris OS, see the OpenSolaris Information Center.

What's New in This Release

The major changes for this release of LDoms 1.3 software are as follows:

- Support for link-based IPMP. See "Using Link-Based IPMP in Logical Domains Virtual Networking" in *Logical Domains 1.3 Administration Guide*.
- Support for migration of domains that have cryptographic units. See "Migrating Cryptographic Units in an Active Domain" in *Logical Domains 1.3 Administration Guide*.
- Support for CPU dynamic resource management. See "Using Dynamic Resource Management Policies" in *Logical Domains 1.3 Administration Guide*.
- Support for automated migrations. See "Performing Automated Migrations" in *Logical Domains 1.3 Administration Guide*.
- Support for the hostid and mac-addr properties by the ldm set-domain command. See the ldm(1M) man page.
- Support for memory compression that improves migration performance. See "Migrating an Active Domain" in *Logical Domains 1.3 Administration Guide*.
- Support for autosave XML interfaces.

- Support for booting from a disk that is larger than 1 terabyte.
- Bug Fixes

For information about features added to previous versions of the Logical Domains software, see the What's New in Logical Domains Software wiki (`http://wikis.sun.com/display/SolarisLogicalDomains/What%27s+New+in+Logical+Domains+Software`).

System Requirements

This section contains system requirements for running LDoms software.

Supported Platforms

Note – Starting with the Logical Domains 1.3 release, UltraSPARC® T1 platforms are no longer supported. Earlier releases of the Logical Domains software continue to support these platforms.

Logical Domains Manager 1.3 software is supported on the following platforms:

- **UltraSPARC T2 Plus based Servers**
    - Sun SPARC Enterprise® T5140 and T5240 Servers, refer to the *Sun SPARC Enterprise T5140 and T5240 Servers Administration Guide*
    - Sun SPARC Enterprise T5440 Server, refer to the *Sun SPARC Enterprise T5440 Server Administration Guide*
    - Sun Blade™ T6340 Server Module, refer to the *Sun Blade T6340 Server Module Product Notes*
    - Netra™ T5440 Server, refer to the *Sun Netra T5440 Server Product Notes*
- **UltraSPARC T2 based Servers**
    - Sun SPARC Enterprise T5120 and T5220 Servers, refer to the *Sun SPARC Enterprise T5120 and T5220 Servers Administration Guide*
    - Sun Blade T6320 Server Module, refer to the *Sun Blade T6320 Server Module Product Notes*
    - Netra CP3260 Blade, refer to the *Netra CP3260 Board Product Notes*
    - Netra T5220 Server, refer to the *Sun Netra T5220 Server Product Notes*

Required Software and Patches

This section lists the required software and patches for use with LDoms 1.3 software.

Required and Recommended Solaris OS

To use all the features of LDoms 1.3 software, the operating system on all domains should be at least equivalent to the Solaris 10 10/09 OS. This can be either a fresh or upgrade installation of the following:

- OpenSolaris 2009.06 OS
- Solaris 10 10/09 OS

Note – The Logical Domains 1.3 software is supported on the OpenSolaris OS starting with the OpenSolaris 2009.06 release. The Logical Domains 1.3 documentation focuses on the use of Logical Domains on the Solaris 10 OS. The same Logical Domains features are available for both the Solaris 10 OS and the OpenSolaris OS. However, you might encounter slight differences when using Logical Domains with the OpenSolaris OS. For more information about the OpenSolaris OS, see the OpenSolaris Information Center.

The following table shows the patches that are required for older releases of the Solaris 10 OS to have the Logical Domains 1.3 functionality. These patches are included in the Solaris 10 10/09 OS.

TABLE 1–1 Patches for Older OS Versions and Domains Needing a Patch

Patch ID	Control Domain	Service-I/O Domain	Guest Domain
139946-01 (niumx)	X	X	
141054-01 (cnex)	X		
141444-09 (Solaris 10 10/09 feature kernel update)	X	X	X
141514-02 (vntsd)	X		
142055-03 (vlds)	X	X	
142245-01 (ncp Crypto)	X	X	X

Note – This patch list includes the minimum required patch revisions. You can install later revisions of the same patch.

Required Software to Enable LDoms 1.3 Features

To enable all the LDoms 1.3 features, you must be running at least Version 7.2.7 of the system firmware on both UltraSPARC T2 based servers and UltraSPARC T2 Plus based servers. For information about the required Solaris OS, see "Required and Recommended Solaris OS" on page 11.

Minimum Version of Software Required

It is possible to run the LDoms 1.3 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. To take advantage of all features of Logical Domains 1.3, ensure that your logical domains run Solaris 10 10/09. Note that you can run different OS releases in each logical domain on the same system. For those domains that run earlier versions of the OS, you might not have all the features that are available in Logical Domains 1.3. However, an alternate upgrade strategy could be to upgrade the control and service domains to Solaris 10 10/09 or to apply the patches listed in Table 1–1, and to continue running the guest domains at the existing patch level.

Following is a matrix of the minimum versions of software required. The LDoms 1.3 package, SUNWldm, can be applied to a system running at least the following versions of software. 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 1–2   Minimum Versions of Software

Supported Server	System Firmware	Solaris OS
UltraSPARC T2 Plus based servers	7.2.x	Solaris 10 8/07 plus patch ID 127111-08 at a minimum
UltraSPARC T2 based servers	7.2.x	Solaris 10 8/07

Required System Firmware Patches

To take advantage of all features of Logical Domains 1.3, ensure that your server runs at least these revisions of the following system firmware patches:

139439-08   Sun SPARC Enterprise T5120 and T5220 Servers

139440-09   Sun Blade T6320 Server Module

139442-09   Netra T5220 Server

139444-07   Sun SPARC Enterprise T5140 and T5240 Servers

139445-06   Netra T5440 Server

139446-07   Sun SPARC Enterprise T5440 Server

139448-08   Sun Blade T6340 Server Module

Location of LDoms 1.3 Software

You can find the LDoms 1.3 software to download at http://www.sun.com/servers/coolthreads/ldoms/index.jsp.

Note – The Logical Domains 1.3 software no longer comes bundled with SST to provide security services. For more information about SST, see "Optional Software" on page 14.

The `LDoms_Manager-1_3.zip` file that you download contains the following:

- Logical Domains Manager 1.3 software (`SUNWldm.v`)
- `ldm`(1M) man page in the `SUNWldm.v` package that gets installed when the package is installed
- Installation script for Logical Domains Manager 1.3 software (`install-ldm`)
- Logical Domains Management Information Base (`SUNWldmib.v`)
- Physical to Virtual Migration Tool (`SUNWldmp2v`)
- Configuration Assistant GUI (`Configurator.jar`)

The directory structure of the zip file is similar to the following:

```
LDoms_Manager-1_3/
   Install/
              install-ldm
   Legal/
              819-0764-10-2209.pdf
              CDDL.LICENSE
              Ldoms_MIB_1.0.1_Entitlement.txt
              Ldoms_MIB_1.0.1_SLA_Entitlement.txt
              Ldoms_MIB_1.0.1_TranslatedSLA.pdf
              License_Notice_Translated.pdf
   Product/
              Configurator/
                                Configurator.jar
                                README.GUI
              Japanese/
                          README
                          SUNWjldm.v
                          SUNWjldmp2v
              SUNWldm.v
              SUNWldmib.v
              SUNWldmp2v
       README
```

Location of Patches

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

http://sunsolve.sun.com

Location of Documentation

The *Logical Domains 1.3 Administration Guide* and these *Logical Domains 1.3 Release Notes* can be obtained from:

http://docs.sun.com/app/docs/prod/ldoms

The Sun Logical Domains Wiki contains Best Practices, Guidelines, and Recommendations for deploying LDoms software.

http://wikis.sun.com/display/SolarisLogicalDomains/Home

The *Beginners Guide to LDoms: Understanding and Deploying Logical Domains* can be used to get a general overview of Logical Domains software. However, the details of the guide specifically apply to the LDoms 1.0 software release and are now out of date for LDoms 1.3 software. The guide can be found at the Sun BluePrints™ site.

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

Related Software

Optional Software

This section describes software that you can use with the LDoms software.

- **Solaris Security Toolkit (SST) software** can help you secure the Solaris OS in the control domain and other domains. SST is no longer supported by Sun and is no longer bundled with the Logical Domains 1.3 software.

  You can still download and use the following versions of SST to harden your Logical Domains systems:
  - SST 4.2, which was previously bundled with Logical Domains releases, is still available from http://www.sun.com/software/security/jass/.
  - The community-supported version, SST:CE, is available for both the Solaris 10 OS and OpenSolaris OS. You can get information about the project and access the source code from the project page at http://hub.opensolaris.org/bin/view/Project+sst/.

- **Logical Domains Management Information Base (MIB) 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 the *Logical Domains (LDoms) MIB 1.0.1 Release Notes* for more information.

> **Note –** LDoms MIB software for LDoms software works with LDoms 1.0.1 software at a minimum.

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 the software documentation or your platform documentation to find the version number of the software that is available for your version of the LDoms software and your platform.

- **SunVTS** functionality is available in the control domain and guest domains on certain LDoms 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 5.0 User's Guide* (`http://dlc.sun.com/pdf/816-1666-10/816-1666-10.pdf`).

- **Sun Management Center 4.0 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. It uses the Java™ runtime environment and a variant of the Simple Network Management Protocol (SNMP) to provide integrated and comprehensive enterprise-wide management of Sun products and their subsystems, components, 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 server and console. Refer to the *Sun Management Center 4.0 Release Notes* for more information about using Sun Management Center 4.0 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, 1.1, 1.2, and 1.3 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. Starting with the Logical Domains 1.2 release and the Solaris Cluster 11/09 release, you can also manage logical domains as a resource by using the Solaris Cluster failover agent.

- **Sun Ops Center 2.5** enables you to manage physical and virtual system resources. This solution simplifies resource discovery and monitoring, provides operating system and firmware provisioning, performs comprehensive update and patch management, manages virtual environments such as Solaris Containers and Logical Domains, and supports hardware management from power up to production. For more information, see `http://www.sun.com/software/products/opscenter/inside.jsp`.

System Controller Software That Interacts With Logical Domains Software

The following system controller (SC) software interacts with the LDoms 1.3 software:

- **Sun Integrated Lights Out Manager (ILOM) 3.0** firmware is the system management firmware that you can use to monitor, manage, and configure UltraSPARC T2 based server platforms. ILOM is preinstalled on these platforms and can be used on LDoms-supported servers with the Logical Domains Manager 1.3 software enabled. Refer to the *Sun Integrated Lights Out Manager 3.0 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 that you are using. You can find the ILOM platform-specific information within the documentation set that accompanies your system.

- **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 2.0 User's Guide* for more information about this software.

Upgrading to LDoms 1.3 Software

This section shows how to upgrade to LDoms 1.3 software.

Perform the procedure "Upgrade From LDoms 1.0 Software Only" on page 17 if you want to use your existing LDoms 1.0 configurations with LDoms 1.3 software. Existing LDoms 1.0 configurations do *not* work with LDoms 1.3 software.

If you are upgrading from more recent versions of Logical Domains software, see "Upgrade to the Logical Domains 1.3 Software" in *Logical Domains 1.3 Administration Guide*. Such existing LDoms configurations *do* work with LDoms 1.3 software.

▼ Upgrade From LDoms 1.0 Software Only

Existing Logical Domains 1.0 configurations do *not* work with LDoms 1.3 software, so you need to save your Logical Domains 1.0 configurations before the upgrade to use them in LDoms 1.3 software. The following procedure describes a method for saving and rebuilding a configuration using XML constraints files and the `-i` option to the `ldm add-domain` command.

The basic process is to save the constraints information for each domain into an XML file, which can then be re-issued to the Logical Domains Manager after the upgrade to rebuild a desired configuration.

The procedure in this section works for guest domains, not the control domain. Although you can save the control (`primary`) domain's constraints to an XML file, you cannot feed it back into the `ldm add-domain -i` command. However, you can use the resource constraints from the XML file to create the CLI commands to reconfigure your primary domain. See "Rebuilding the Control Domain" in *Logical Domains 1.3 Administration Guide* for instructions on how to translate typical XML output from an `ldm list-constraints -x primary` command into the CLI commands needed to reconfigure a primary domain.

The method that follows does not preserve actual bindings, only the constraints used to create those bindings. This means that, after this procedure, the domains will have the same virtual resources, but will not necessarily be bound to the same physical resources.

1 For each domain, create an XML file containing the domain's constraints.

```
# ldm list-constraints -x ldom > ldom.xml
```

2 List all the logical domain configurations stored on the service processor.

```
# ldm list-config
```

3 Remove each logical domain configuration stored on the service processor.

```
# ldm rm-config config-name
```

4 Disable the Logical Domains Manager daemon (`ldmd`).

```
# svcadm disable ldmd
```

5 Remove the Logical Domains Manager package (`SUNWldm`).

```
# pkgrm SUNWldm
```

6 (Optional) Remove the Solaris Security Toolkit package (`SUNWjass`).

```
# pkgrm SUNWjass
```

7   **Flash update the system firmware.**

For the entire procedure, see "Upgrade System Firmware" in *Logical Domains 1.3 Administration Guide* or "Upgrade System Firmware Without an FTP Server" in *Logical Domains 1.3 Administration Guide*.

8   **Reinstall the Logical Domains Manager.**

See "Installing the Logical Domains Manager" in *Logical Domains 1.3 Administration Guide*.

9   **Reconfigure the** primary **domain manually.**

For instructions, see "Set Up the Control Domain" in *Logical Domains 1.3 Administration Guide*.

10 **Run the following commands for each guest domain's XML file that you created in Step 1.**

```
# ldm add-domain -i ldom.xml
# ldm bind-domain ldom
# ldm start-domain ldom
```

Known Issues

This section contains general issues and specific bugs concerning the LDoms 1.3 software.

General Issues

This section describes general known issues about this release of LDoms software that are broader than a specific bug number. Workarounds are provided where available.

Service Processor and System Controller Are Interchangeable Terms

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

Cards Not Supported

The following cards are *not* supported for this LDoms 1.3 software release:

- 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 1.3, 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.

In Certain Conditions, a Guest Domain's SVM Configuration or Metadevices Can Be Lost

If a service domain is running a version of Solaris 10 OS prior to Solaris 10 10/09 and is exporting a physical disk slice as a virtual disk to a guest domain, then this virtual disk will appear in the guest domain with an inappropriate device ID. If that service domain is then upgraded to Solaris 10 10/09, the physical disk slice exported as a virtual disk will appear in the guest domain with no device ID.

This removal of the device ID of the virtual disk can cause problems to applications attempting to reference the device ID of virtual disks. In particular, this can cause the Solaris Volume Manager (SVM) to be unable to find its configuration or to access its metadevices.

Workaround: After upgrading a service domain to Solaris 10 10/09, if a guest domain is unable to find its SVM configuration or its metadevices, execute the following procedure.

▼ Find a Guest Domain's SVM Configuration or Metadevices

1 **Boot the guest domain.**

2 **Disable the** `devid` **feature of SVM by adding the following lines to the** `/kernel/dr/md.conf` **file:**
```
md_devid_destroy=1;
md_keep_repl_state=1;
```

3 **Reboot the guest domain.**
After the domain has booted, the SVM configuration and metadevices should be available.

4 **Check the SVM configuration and ensure that it is correct.**

5 **Re-enable the SVM** `devid` **feature by removing from the** `/kernel/drv/md.conf` **file the two lines that you added in Step 2.**

6 **Reboot the guest domain.**
During the reboot, you will see messages similar to this:
```
NOTICE: mddb: unable to get devid for 'vdc', 0x10
```

These messages are normal and do not report any problems.

Logical Domain Channels (LDCs) and Logical Domains

There is a limit to the number of LDCs available in any logical domain. For UltraSPARC T2 based platforms, that limit is 512. For UltraSPARC T2 Plus based platforms, that limit is 768. 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. This might also be an issue because of the potentially large number of LDCs that are created for both virtual I/O data communications and the Logical Domains Manager control of the other logical domains.

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 1 LDC to every logical domain, including itself, for control traffic.

3. Each virtual I/O service on the control domain consumes 1 LDC for every connected client of that service.

For example, consider a control domain and 8 additional logical domains. Each logical domain needs the following 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 x 3(3)=45 LDCs in total.

Now consider the case where there are 45 domains instead of 8, and each domain includes 5 virtual disks, 5 virtual networks, and a virtual console. Now the equation becomes:

12 + 46 + 45 x 11=553 LDCs in total.

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

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, see the installation guide for the operating system you are using.

- **Solaris 10 OS.** See "System Requirements and Recommendations" in *Solaris 10 10/09 Installation Guide: Planning for Installation and Upgrade*.

- **OpenSolaris 2009.06 OS.** See "System Requirements" in *Getting Started With OpenSolaris 2009.06*.

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

Booting a Large Number of Domains

You can the boot following number of domains depending on your platform:

- Up to 128 on UltraSPARC T2 Plus based servers
- Up to 64 on UltraSPARC T2 based 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. In cases where 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 the following amount of memory, depending on your platform, so that the guest domains contain an adequate amount of memory:

- 128 Gbytes of memory for UltraSPARC T2 Plus based servers
- 64 Gbytes of memory for UltraSPARC T2 based servers

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 Gbytes is the recommended minimum when running more than 64

domains. 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.

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 that you save the latest configuration that you want to keep.

▼ 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.

▼ 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 Manager rounds up the requested memory allocation to either the next largest 8-Kbyte or 4-Mbyte 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
```

Logical Domain Variable Persistence

Variable updates persist across a reboot, but not across a powercycle, 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 powercycle of the system:

- When the control domain reboots, if there are no bound guest domains, and no delayed reconfiguration in progress, the SC powercycles 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 powercycle the system.

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

- At the OpenBoot prompt
- Using the Solaris OS eeprom(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 that are made by using any of these methods always persist across reboots of the domain. The variable updates also always reflect in any subsequent logical domain configurations that were saved to the SC.

In LDoms 1.3 software, there are a few cases where variable updates do not persist as expected:

- All methods of updating a variable persist across reboots of that domain. However, they do not persist across a powercycle of the system, unless a subsequent logical domain configuration is saved to the SC. The methods of updating a variable include by OpenBoot firmware and by the eeprom and ldm commands. In addition, in the control domain, updates made using OpenBoot firmware persist across a powercycle of the system, that is, even without subsequently saving a new logical domain configuration to the SC.
- 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.

If you are concerned about Logical Domains variable changes, do one of the following:

- Bring the system to the ok prompt and update the variables.
- Update the variables while the Logical Domains Manager is disabled:

```
# svcadm disable ldmd
```
update variables
```
# svcadm enable ldmd
```

- When running Live Upgrade, perform the following steps:

```
# svcadm disable -t ldmd
# luactivate be3
# init 6
```

The following **Bug IDs** have been filed to resolve these issues: **6520041**, **6540368**, **6540937**, and **6590259**.

Sun SNMP Management Agent Does Not Support Multiple Domains

Sun Simple Management Network Protocol (SNMP) Management Agent does not support multiple domains. Only a single global domain is supported.

Containers, Processor Sets, and Pools Are Not Compatible With CPU Power Management

Using CPU dynamic reconfiguration (DR) to power down virtual CPUs does not work with processor sets, resource pools, or the zone's dedicated CPU feature.

When using CPU power management in elastic mode, the Solaris OS guest sees only the CPUs that are allocated to the domains that are powered on. That means that output from the psrinfo(1M) command dynamically changes depending on the number of CPUs currently power-managed. This causes an issue with processor sets and pools, which require actual CPU IDs to be static to allow allocation to their sets. This can also impact the zone's dedicated CPU feature.

Workaround: Set the performance mode for the power management policy.

Fault Management

There are several issues associated with FMA and power-managing CPUs. If a CPU faults when running in elastic mode, switch to performance mode until the faulted CPU recovers. If all faulted CPUs recover, then elastic mode can be used again.

For more information about faulted resources, see the OpenSolaris Fault Management web page (http://wikis.sun.com/display/OpenSolarisInfo/Fault+Management).

Delayed Reconfiguration

When a primary domain is in a delayed reconfiguration state, CPUs are power managed only after the primary domain reboots. This means that CPU power management will not bring

additional CPUs online when the domain is experiencing high-load usage until the `primary` domain reboots, clearing the delayed reconfiguration state.

Domain Migration in Elastic Mode Is Not Supported

Domain migrations are not supported for a source or target machine in elastic mode. If a migration is underway while in performance mode and the power management policy is set to elastic mode, the policy switch is deferred until the migration completes. The migration command returns an error if either the source or target machine is in elastic mode and a domain migration is attempted.

Cryptographic Units

The Solaris 10 10/09 OS introduces the capability to dynamically add and remove cryptographic units from a domain, which is called cryptographic unit dynamic reconfiguration (DR). The Logical Domains Manager automatically detects whether a domain allows cryptographic unit DR, and enables the functionality only for those domains. In addition, CPU DR is no longer disabled in domains that have cryptographic units bound and are running an appropriate version of the Solaris OS.

However, the restriction against enabling power management (PM) elastic mode still applies if there are any domains with cryptographic units bound. This restriction is enforced by the Logical Domains Manager. So, any attempt to change power management's policy to elastic from the SP when there are cryptographic units bound to any domain would be ineffective and is therefore not recommended.

Bugs Affecting LDoms 1.3 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 workaround and a recovery procedure are available, they are specified.

Logical Domains Manager Does Not Validate Disk Paths and Network Devices

Bug ID 6447740: The Logical Domains Manager does not validate disk paths and network devices.

Disk Paths

If a disk device listed in a guest domain's configuration is either non-existent or otherwise unusable, the disk cannot be used by the virtual disk server (`vds`). However, 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= property 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.

▼ Recover From an Errant net-dev Property Specified for a Virtual Switch

1   Issue the ldm set-vsw command with the corrected net-dev property value.

2   Reboot the domain hosting the virtual switch in question.

▼ Recover From an Errant Virtual Disk Service Device or Volume

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.

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 (vds), 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
```

▼ Recover From a Disk Device Being Used by Other Software

1 **Unbind the guest domain.**

2 **Unmount the disk device to make it available.**

3 **Bind the guest domain.**

4 **Boot the domain.**

Hang Can Occur With Guest OS in Simultaneous Operations

Bug ID 6497796: Under rare circumstances, when a Logical Domains variable, such as boot-device, is being updated from within a guest domain by using the eeprom(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.

Behavior of the ldm stop-domain Command Can Be Confusing

Bug ID 6506494: There are some cases where the behavior of the ldm stop-domain command is confusing.

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

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

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

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 by 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.

Logical Domains Manager Forgets Variable Changes After a Power Cycle

Bug ID 6590259: This issue is summarized in "Logical Domain Variable Persistence" on page 23.

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 Service (NIS) or NIS+ naming 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 naming service, you cannot use the Solaris Security Toolkit profile `server-secure.driver` because you might 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.

▼ Recover by Resetting Your System

1 Log in to the system controller by using the `ssh` command.

2 Power off the system.

```
-> stop /SYS
```

3 Power on the system.

```
-> start /SYS
```

4 Log in to the system console.

```
-> start /SP/console
```

5 Boot the system.

```
ok boot -s
```

6   **Edit the file** /etc/shadow**.**

Change the root entry of the shadow file to the following:

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 Worse in a Logical Domain Guest Than in a Non-LDoms Configuration

Bug ID 6486234: 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.

Workaround: For T2 platforms, you can 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 6590259: 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.

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

Bug ID 6540368: This issue is summarized in "Logical Domain Variable Persistence" on page 23 and affects only the control domain.

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 the Fault Management Architecture (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 the fault manager daemon (`fmd`) on the control domain by using this command:

```
primary# svcadm restart fmd
```

Guest Domain With Too Many 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 Configuration Protocol (DHCP), the guest domain can eventually become unresponsive while running network traffic.

Workaround: Set `ip_ire_min_bucket_cnt` and `ip_ire_max_bucket_cnt` to larger values, such as 32, if you have 8 interfaces.

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

The `scadm` Command Can Hang Following an SC or SP Reset

Bug ID 6629230: The `scadm` command on a control domain running at least the Solaris 10 11/06 OS can hang following an SC reset. The system is unable to properly reestablish a connection following an SC reset.

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

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

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 that have 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.

SVM Volumes Built on Slice 2 Fail JumpStart When Used as the Boot Device in a Guest Domain

Bug ID 6687634: If the Sun Volume Manager (SVM) volume is built on top of a disk slice that contains block 0 of the disk, then SVM prevents writing to block 0 of the volume to avoid overwriting the label of the disk.

If an SVM volume built on top of a disk slice that contains 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 that contains block 0 of the disk.

A more generic guideline is that slices that 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 *Logical Domains 1.3 Administration Guide*.

If the Solaris 10 5/08 OS Is Installed on a Service Domain, Attempting a Net Boot of the Solaris 10 8/07 OS on Any Guest Domain Serviced by It Can Hang the Installation

Bug ID 6705823: Attempting a net boot of the Solaris 10 8/07 OS on any guest domain serviced by a service domain running the Solaris 10 5/08 OS can result in a hang on the guest domain during the installation.

Workaround: Patch the miniroot of the Solaris 10 8/07 OS net install image with Patch ID 127111-05.

Logical Domains Manager Can Take Over 15 Minutes to Shut Down a Logical Domain

Bug ID 6742805: A domain shutdown or memory scrub can take over 15 minutes with a single CPU and a very large memory configuration. During a shutdown, the CPUs in a domain are used to scrub all the memory owned by the domain. The time taken to complete the scrub can be quite long if a configuration is imbalanced, for example, a single CPU domain with 512 Gbytes of memory. This prolonged scrub time extends the amount of time it takes to shut down a domain.

Workaround: Ensure that large memory configurations (>100 Gbytes) have at least one core. This results in a much faster shutdown time.

Sometimes, Executing the `uadmin 1 0` Command From an LDoms System Does Not Return the System to the OK Prompt

Bug ID 6753683: Sometimes, executing the `uadmin 1 0` command from the command line of an LDoms system does not leave the system at the OK prompt after the subsequent reset. This incorrect behavior is seen only when the LDoms variable `auto-reboot?` is set to `true`. If `auto-reboot?` is set to `false`, the expected behavior occurs.

Workaround: Use this command instead:

```
uadmin 2 0
```

Or, always run with `auto-reboot?` set to `false`.

Logical Domains Manager Displays Migrated Domains in Transition States When They Are Already Booted

Bug ID 6760933: On occasion, an active logical domain appears to be in the *transition* state instead of the *normal* state long after it is booted or following the completion of a domain migration. This glitch is harmless, and the domain is fully operational. To see what flag is set, check the `flags` field in the `ldm list -l -p` command output, or check the `FLAGS` field in the `ldm list` command, which shows `-n----` for *normal* or `-t----` for *transition*.

Recovery: The logical domain should display the correct state upon the next reboot.

Logical Domains Manager Does Not Start If the Machine Is Not Networked and an NIS Client Is Running

Bug ID 6764613: If you do not have a network configured on your machine and have a Network Information Services (NIS) client running, the Logical Domains Manager will not start on your system.

Workaround: Disable the NIS client on your non-networked machine:

```
# svcadm disable nis/client
```

Migration Can Fail to Bind Memory Even If the Target Has Enough Available

Bug ID 6772089: In certain situations, a migration fails and `ldmd` reports that it was not possible to bind the memory needed for the source domain. This can occur even if the total amount of available memory on the target machine is greater than the amount of memory being used by the source domain.

This failure occurs because migrating the specific memory ranges in use by the source domain requires that compatible memory ranges are available on the target, as well. When no such compatible memory range is found for any memory range in the source, the migration cannot proceed.

Recovery: If this condition is encountered, you might be able to migrate the domain if you modify the memory usage on the target machine. To do this, unbind any bound or active logical domain on the target.

Use the `ldm list-devices -a mem` command to see what memory is available and how it is used. You might also need to reduce the amount of memory that is assigned to another domain.

Migration Does Not Fail If a `vdsdev` on the Target Has a Different Backend

Bug ID 6772120: If the virtual disk on the target machine does not point to the same disk backend that is used on the source machine, the migrated domain cannot access the virtual disk using that disk backend. A hang can result when accessing the virtual disk on the domain.

Currently, the Logical Domains Manager checks only that the virtual disk volume names match on the source and target machines. In this scenario, no error message is displayed if the disk backends do not match.

Workaround: Ensure that when you are configuring the target domain to receive a migrated domain that the disk volume (`vdsdev`) matches the disk backend used on the source domain.

Recovery: Do one of the following if you discover that the virtual disk device on the target machine points to the incorrect disk backend:

- Do the following:
    - Migrate the domain back to the source machine.
    - Fix the `vdsdev` on the target to point to the correct disk backend.
    - Migrate the domain to the target machine again.
- Stop and unbind the domain on the target, and fix the `vdsdev`. If the OS supports virtual I/O dynamic reconfiguration, and the incorrect virtual disk in not in use on the domain (that is, it is not the boot disk and is unmounted), do the following:
    - Use the `ldm rm-vdisk` command to remove the disk.

- Fix the vdsdev.
- Use the ldm add-vdisk command to add the virtual disk again.

Constraint Database Is Not Synchronized to Saved Configuration

Bug ID 6773569: After switching from one configuration to another (using the ldm set-config command followed by a powercycle), domains defined in the previous configuration might still be present in the current configuration, in the inactive state.

This is a result of the Logical Domains Manager's constraint database not being kept in sync with the change in configuration. These inactive domains do not affect the running configuration and can be safely destroyed.

Explicit Console Group and Port Bindings Are Not Migrated

Bug ID 6781589: During a migration, any explicitly assigned console group and port are ignored, and a console with default properties is created for the target domain. This console is created using the target domain name as the console group and using any available port on the first virtual console concentrator (vcc) device in the control domain. If there is a conflict with the default group name, the migration fails.

Recovery: To restore the explicit console properties following a migration, unbind the target domain, and manually set the desired properties using the ldm set-vcons command.

VIO DR Operations Ignore the Force (-f) Option

Bug ID 6703127: Virtual input/output (VIO) dynamic reconfiguration (DR) operations ignore the -f (force) option in CLI commands.

libpiclsnmp:snmp_init() Blocks Indefinitely in open() on primary Domain

Bug ID 6736962: Power Management sometimes fails to retrieve policy from the service processor on LDoms startup after the control domain boots. If CPU power management could not retrieve the power management policy from the service processor, it allows LDoms to start up as expected, but logs the error Unable to get the initial PM Policy - timeout to the LDoms log and remains in performance mode.

Add forceload: drv/ds_snmp to /etc/system, then reboot the control domain.

FMA Status Failures

Bug ID 6759853: The following error message might be written intermittently to the LDoms log when a domain is at the ok prompt:

```
fma_cpu_svc_get_p_status: Can't find fma_cpu_get_p_status routine error
```

Workaround: Boot the domain.

ldmconfig **Might Cause the Root File System of the Control Domain to Become Full and Halt the System**

Bug ID 6848114: ldmconfig can run on a system that does not have file systems of sufficient capacity to contain the virtual disks for the created domains. In this situation, an error message is issued. However, ldmconfig permits you to continue to use the disks that are in /ldoms/disks to deploy the configuration. This situation could cause the root file system of the control domain to become full and halt the system.

Workaround: Do the following:

1. Exit the Configuration Assistant by typing q or by typing Ctrl-C.
2. Add more file systems of adequate capacity.
3. Rerun the ldmconfig command.

Guest Domain Sometimes Fails to Make Proper Domain Services Connection to the Control Domain

Bug ID 6839787: Sometimes, a guest domain that runs at least the Solaris 10 10/08 OS does not make a proper Domain Services connection to a control domain that runs the Solaris 10 5/09 OS.

Domain Services connections enable features such as dynamic reconfiguration (DR), FMA, and power management (PM). Such a failure occurs when the guest domain is booted, so rebooting the domain usually clears the problem.

Workaround: Reboot the guest domain.

ldm**: Autosave Feature Should Identify and Allow the Downloading of Damaged Configurations**

Bug ID 6840800: An otherwise usable corrupted or damaged autosave configuration cannot be downloaded.

Workaround: Use another, undamaged autosave configuration or SP configuration.

ldmd **Dumps Core If a** rm-io **Operation Is Followed by Multiple** set-vcpu **Operations**

Bug ID 6697096: Under certain circumstances, when a ldm rm-io operation is followed by multiple ldm set-vcpu operations, ldmd might abort and be restarted by SMF.

Workaround: After executing an `ldm rm-io` operation on a domain, take care when attempting an `ldm set-vcpu` operation. A single `ldm set-vcpu` operation will succeed, but a second `ldm set-vcpu` operation might cause the `ldmd` daemon to dump core under certain circumstances. Instead, reboot the domain before attempting the second `set-vcpu` operation.

Virtual Network Devices Are Not Created Properly on the Control Domain

Bug ID 6836587: Sometimes `ifconfig` indicates that the device does not exist after you add a virtual network or virtual disk device to a domain. This situation might occur as the result of the `/devices` entry not being created.

Although this should not occur during normal operation, the error was seen when the instance number of a virtual network device did not match the instance number listed in `/etc/path_to_inst` file.

For example:

```
# ifconfig vnet0 plumb
ifconfig: plumb: vnet0: no such interface
```

The instance number of a virtual device is shown under the DEVICE column in the `ldm list` output:

```
# ldm list -o network primary
NAME
primary

MAC
    00:14:4f:86:6a:64

VSW
    NAME         MAC                 NET-DEV DEVICE    DEFAULT-VLAN-ID PVID VID MTU  MODE
    primary-vsw0 00:14:4f:f9:86:f3 nxge0    switch@0 1               1        1500

NETWORK
    NAME    SERVICE             DEVICE    MAC               MODE PVID VID MTU
    vnet1   primary-vsw0@primary network@0 00:14:4f:f8:76:6d      1        1500
```

The instance number (`0` for both the vnet and vsw shown previously) can be compared with the instance number in the path_to_inst file to ensure that they match.

```
# egrep '(vnet|vsw)' /etc/path_to_inst
"/virtual-devices@100/channel-devices@200/virtual-network-switch@0" 0 "vsw"
"/virtual-devices@100/channel-devices@200/network@0" 0 "vnet"
```

Workaround: In the case of mismatching instance numbers, remove the virtual network or virtual switch device. Then, add them again by explicitly specifying the instance number required by setting the id property.

You can also manually edit the /etc/path_to_inst file. See the path_to_inst(4) man page.

Caution – Be aware of the warning contained in the man page that states "changes should not be made to /etc/path_to_inst without careful consideration."

Cannot Connect to Migrated Domain's Console Unless vntsd Is Restarted

Bug ID 6757486: Occasionally, after a domain has been migrated, it is not possible to connect to the console for that domain.

Workaround: Restart the vntsd SMF service to enable connections to the console:

```
# svcadm restart vntsd
```

Note – This command will disconnect all active console connections.

I/O Domain or Guest Domain Panics When Booting From e1000g

Bug ID 6808832: You can configure a maximum of two domains with dedicated PCI-E root complexes on systems such as the Sun Fire T5240. These systems have two UltraSPARC T2+ CPUs and two I/O root complexes.

pci@500 and pci@400 are the two root complexes in the system. The primary domain will always contain at least one root complex. A second domain can be configured with an unassigned or unbound root complex.

The pci@400 fabric (or leaf) contains the onboard e1000g network card. The following circumstances could lead to a domain panic:

- If the system is configured with a primary domain that contains pci@500 and a second domain that contains pci@400

  Note – For some blades, the primary domain (system disk) is on the pci@400 bus by default.

- The e1000g device on the pci@400 fabric is used to boot the second domain

Avoid the following network devices if they are configured in a non-primary domain:

```
/pci@400/pci@0/pci@c/network@0,1
/pci@400/pci@0/pci@c/network@0
```

When these conditions are true, the domain will panic with a PCI-E Fatal error.

Avoid such a configuration, or if the configuration is used, do not boot from the listed devices.

Guest Domain Might Fail to Successfully Reboot When a System Is in Power Management Elastic Mode

Bug ID 6853273: While a system is in power management elastic mode, rebooting a guest domain might produce the following warning messages and fail to boot successfully:

```
WARNING: /virtual-devices@100/channel-devices@200/disk@0:
Sending packet to LDC, status: -1
WARNING: /virtual-devices@100/channel-devices@200/disk@0:
Can't send vdisk read request!
WARNING: /virtual-devices@100/channel-devices@200/disk@0:
Timeout receiving packet from LDC ... retrying
```

Workaround: If you see these warnings, perform one of the workarounds in the following order:

- If the guest domain shows an ok> prompt and accepts input, type reset-all
- From the control domain, issue an ldm stop *domain-name* command, then issue an ldm start *domain-name* command
- Change the Power Management mode to performance mode, stop and start the affected guest domain, and then return to elastic mode

ldm Commands Are Slow to Respond When Several Domains Are Booting

Bug ID 6855079: An ldm command might be slow to respond when several domains are booting. If you issue an ldm command at this stage, the command might appear to hang. Note that the ldm command will return after performing the expected task. After the command returns, the system should respond normally to ldm commands.

Workaround: Avoid booting many domains simultaneously. However, if you must boot several domains at once, refrain from issuing further ldm commands until the system returns to normal. For instance, wait for about two minutes on Sun SPARC Enterprise T5140 and T5240 Servers and for about four minutes on the Sun SPARC Enterprise T5440 Server or Netra T5440 Server.

Spurious `ds_ldc_cb: LDC READ event` **Message Seen When Rebooting the Control Domain or a Guest Domain**

Bug ID 6846889: When rebooting the control domain or a guest domain, the following warning message might be logged on the control domain and on the guest domain that is rebooting:

```
WARNING: ds@0: ds_ldc_cb: LDC READ event while port not up
```

Workaround: You can ignore this message.

Migrated Domain With MAUs Contains Only One CPU When Target OS Does Not Support DR of Cryptographic Units

Bug ID 6904849: With the release of Logical Domains 1.3, a domain can be migrated even if it has one or more cryptographic units bound to it.

In the following circumstances, the target machine will only contain one CPU after the migration is completed:

- Target machine runs Logical Domains 1.2
- Control domain on the target machine runs a version of the Solaris OS that does not support cryptographic unit DR
- You migrate a domain that contains cryptographic units

After migration completes, the target domain will resume successfully and be operational, but will be in a degraded state (just one CPU).

Workaround: Prior to migration, remove the cryptographic unit or units from the source machine that runs Logical Domains 1.3.

Mitigation: To avoid this issue, perform one or both of these steps:

- Install the Logical Domains 1.3 software on the target machine.
- Install patch ID 142245-01 on the control domain of the target machine, or upgrade to at least the Solaris 10 10/09 OS.

`ldm set-vcc` **Prevented When System Is Already in Delayed Reconfiguration Mode**

Bug ID 6852143: When you make an `ldm set-vcc` request while a delayed reconfiguration is in progress, the request is rejected. Normally, this request should be added to the delayed reconfiguration.

Workaround: Do one of the following:

- Reboot the control domain so as to effect the delayed reconfiguration changes, and then run the ldm set-vcc command again.
- Cancel the delayed reconfiguration, run the ldm set-vcc command, and then make the change or changes that triggered the delayed reconfiguration.

Confusing Migration Failure Message for Real Address Memory Bind Failures

Bug ID 6904240: In certain situations, a migration fails with the following error message, and ldmd reports that it was not possible to bind the memory needed for the source domain. This situation can occur even if the total amount of available memory on the target machine is greater than the amount of memory being used by the source domain (as shown by ldm ls-devices -a mem).

```
Unable to bind 29952M memory region at real address 0x8000000
Domain Migration of LDom ldg0 failed
```

Cause: This failure is due the inability to meet congruence requirements between the Real Address (RA) and the Physical Address (PA) on the target machine.

Workaround: Stop the domain and perform the migration as a cold migration. You can also reduce the size of the memory on the guest domain by 128 Mbytes, which might permit the migration to proceed while the domain is running.

An Enabled Resource Managment Policy Might Not Decrease CPU Count As Expected

Bug ID 6908985: The following problem occurs on large domains that have more than 99 virtual CPUs. When utilization is less than the low water mark, dynamic resource management (DRM) will not release virtual CPUs if the total number of virtual CPUs is greater than 99.

ldm Does Not Make Use of Cryptographic Units Added to the Control Domain After Startup

Bug ID 6880106: When the Logical Domains Manager (ldm) starts up, it initializes any cryptographic units that are present in the control domain for use in securing migration operations. If a cryptographic unit is added to the control domain at any point after ldm starts, those cryptographic units are not utilized for migration. This situation might negatively impact the time it takes for a migration operation to complete.

Workaround: Restart ldmd to force it to reinitialize its use of the cryptographic units in the primary domain. Run the following command:

```
# svcadm restart ldmd
```

Warm Migration Can Fail With an `Unknown migration failure` **Message**

Bug ID 6904238: In rare circumstances, you might see a warm migration operation fail with the following message:

```
Unknown migration failure
```

The `ldmd` log file on the source machine shows the following message:

```
warning: Failed to read feasibility response type (9) from
target LDoms Manager
```

This failure can occur when there is a problem migrating the runtime state of the logical domain channels of the guest. This problem has occurred when the migrating domain has an unplumbed virtual network interface or has a sparse memory configuration.

Workaround: If the migrating domain has one or more unplumbed virtual network interfaces, plumb them. If the problem persists, shut down the domain and perform a cold migration.

DRM: Some `tod-begin` **and** `tod-end` **Values Cannot Begin With a Leading Zero**

Bug ID 6909998: You cannot supply values of `08` or `09` for hours, minutes, or seconds for the `tod-begin` and `tod-end` properties. The `08` and `09` values are considered to be invalid octal values.

Workaround: Specify 8 instead of `08` and 9 instead of `09`.

For example, to set the beginning of the day to 08:09:01, specify the value of `tod-begin` as follows:

```
# ldm set-policy tod-begin=8:9:01 name=drm_policy primary
```

Newly Added NIU/XAUI Adapters Are Not Visible to Host OS If Logical Domains Is Configured

Bug ID 6829016: When Logical Domains is configured on a system and you add another XAUI network card, the card is not visible after the machine is powercycled.

Recovery: To make the newly added XAUI visible in the control domain, perform the following steps:

1. **Set and clear a dummy variable in the control domain.**

   The following commands use a dummy variable called `fix-xaui`:

```
# ldm set-var fix-xaui=yes primary
# ldm rm-var fix-xaui primary
```

2. **Save the modified configuration to the SP, replacing the current configuration.**

   The following commands use a configuration name of config1:

   ```
   # ldm rm-spconfig config1
   # ldm add-spconfig config1
   ```

3. **Perform a reconfiguration reboot of the control domain.**

   ```
   # reboot -- -r
   ```

   At this time, you can configure the newly available network or networks for use by Logical Domains.

Dynamically Removing All the Cryptographic Units From a Domain Causes SSH to Terminate

Bug ID 6897743: If all the hardware cryptographic units are dynamically removed from a running domain, the cryptographic framework fails to seamlessly switch to the software cryptographic providers, and kills all the ssh connections.

Recovery: Re-establish the ssh connections after all the cryptograpic units are removed from the domain.

Workaround: Set UseOpenSSLEngine=no in the /etc/ssh/sshd_config file on the server side, and run the svcadm restart ssh command.

Then, all ssh connections will no longer use the hardware cryptograpic units (and thus not benefit from the associated performance improvements), and ssh connections would not be disconnected when the cryptograpic units are removed.

Unexpected Probe-Based IPMP Failures

Bug ID 6888928: If you use probe-based IPMP, the interfaces in the IPMP group might fail abruptly. This might happen shortly after you configure test addresses on the interfaces in the IPMP group for probe-based failure detection. The problem can occur with any network interface, virtual or physical, including Logical Domains virtual network devices.

Workaround: If you still want to use probe-based failure detection, install patch ID 142900-03. Or, you can disable probe-based failure detection by removing the test addresses, and use link-based failure detection. For more information, see IPMP Link-Based Only Failure Detection with Solaris 10 (http://sunsolve.sun.com/search/document.do?assetkey=1-61-211105-1) on SunSolve.

Starting with the Logical Domains 1.3 release, you can configure link-based IPMP for virtual network devices. See "Using Link-Based IPMP in Logical Domains Virtual Networking" in *Logical Domains 1.3 Administration Guide*.

Documentation Errata

This section contains documentation errors that have been found too late to resolve for the LDoms 1.3 release.

Incorrect Parameter Names in the Input/Output Bus Table

Bug ID 6843196: "Input/Output Bus Table (`IOBusTable`)" on page 31 of the *Logical Domains (LDoms) MIB 1.0.1 Administration Guide* shows incorrect parameter names.

`IOBusDevName` should be `IOBusName`, and `IOBusDevPath` should be `IOBusPath`.

`ldmp2v`**(1M): Incorrect Options Shown for the** `ldmp2v prepare -R` *guest-root* **Command**

The `ldmp2v prepare -R` *guest-root* command does **not** support the `-m` *mountpoint*:*size*, `-x no-auto-adjust-fs`, and `-x remove-unused-slices` options.

Resolved Issues

This section lists bugs that have been fixed since the previous LDoms software release.

LDoms 1.3 RFEs and Bugs Fixed in Solaris 10 10/09

The following LDoms requests for enhancements (RFEs) and bugs were fixed for the Solaris 10 10/09 release.

You can track RFEs and bugs that are related to the Solaris, OpenSolaris, and LDoms releases at the OpenSolaris Bug Database.

6520534   vnet and vsw should support link based failure detection for IPMP

6589660   LDC channels should be reset when entering the prom or kmdb

6641483   Niagara crypto drivers need to support the dynamic addition/removal of crypto units

6753219   With Elara Copper card, service domain hangs on reboot

6759718	KEYBOARD_ABORT=alternate set in a guest domain, makes it impossible to "break" the console session
6765355	Intermittent Routed-vsw connectivity issues
6769808	Cannot export a zvol from u5 as single-slice vdisk to u6
6781539	Lack of authorization checking for guest domain console access
6785269	Bad mutex panic in vnet'vgen_ldc_rcv_worker routine on low-memory guest domain
6795836	vd_setup_vd()should handle errors from vd_identify_dev() better
6807726	DS module prints spurious "WARNING: ds@2: <unreg_ack: handle 0x1 in use" to console
6809618	Bad mutex panic in vdds_cleanup_hybrid_res on low memory guest
6813225	LDoms domain services legacy "pri" service does not work correctly with userland DS
6815015	DS invalid handle warning messages seen on creating a large number of domains.
6832654	vnet(7D) deadlocks in vnet_start_resources()
6833994	LDoms domain services module needs to support more than 64 ports
6835623	Hybrid mode vnet panics in nxge while its channel to vswitch is reset
6837770	ldmd fails to start after an SC resetsc with fix for 6813225 installed
6846883	ifconfig unplumb hangs in hybrid io enabled vnet
6847264	Panic BAD TRAP with PM multidomain ldoms load/stress test (PM_13)
6853590	Reboot stops at ok prompt when domain services cannot be initialized
6855530	Failure to store boot command can lead to unexpected reboot behavior
6871750	Batoka paniced when setting up link-aggregation on Batoka

RFEs and Bugs Fixed for LDoms 1.3 Software

The following LDoms 1.3 RFEs and bugs were fixed for the LDoms 1.3 software release:

6715063	Misleading crypto DR error message when CPU DR is not available
6779482	Migration does not cleanup on target if vnet MAC address clashes with existing domain.
6783450	Migration dry-run check should detect inadequate memory.

6813544	Unbinding the domain increases the vcpu count after migration failure due to active psr sets.
6833515	LDoms Zeus autosave should handle current sp config not available case
6838878	"--dry-run" description in "ldm --help" should be made more clear for the users
6839284	Establish expectations for stop timeout of large domains
6839518	migration command should have -p <passwd file> option
6839685	Config AutoRecovery: Cancellation of pending del. reconf does not restore original autosave config.
6841421	Certain memory configurations on VF cause HV to create > 31 memory segments, exceeding support limit
6845614	Config AutoRecovery: Improve warning messages for broken autosave configs.
6846468	Config Autorecovery: 'ldm add-spconfig -r oldcfg newcfg' should leave oldcfg in previous state
6847432	fail to create domain from xml file if firmware is not to up-to-date
6847784	vdisk/vnet/vsw id property should be treat as a constraint
6847859	During migration hostid, failure-policy, and master information is lost
6849667	Allow hostid of an existing domain be modified
6852685	set-vdisk and set-vnet place guest domains in delayed-reconf mode
6854189	ldc-port-initializing issues after a failed add-vdisk call with non-existent back-end path
6855156	migration blocked because sasl_encode64 output buffer is now too small
6857139	Batoka system hang on an elastic mode batoka after set all available cpus to primary domain
6857730	ldmp2v convert should require one of -i and -n
6858386	PM is suspended when any domain is in transition mode
6858840	Incorrect error message reported for illegal id values in add-{vnet|vsw|vdisk} command
6859285	Need to be able to disable power management debug messages in LDoms 1.2 debug build
6865781	Support should be added to migrate domains with crypto units
6866528	XML List command does not get updated statistics
6867358	P2V package is not sun4v specific

6867719	migration can fail between systems connected through multiple networks
6871553	ldmd fails to start with memory range error on Batokas with disabled CMP0.
6872214	LDOM1.2 ldmp2v does not work in non-C locales
6874376	crypto DR requests incorrectly reference parked strands
6874585	ldmp2v collect gets confused by /etc/hostname.*:1 files
6874741	ldmp2v prepare -R option is broken
6874896	ldmp2v prepare -R needs better diagnostics
6879129	ldmp2v returns /usr/sbin/ldmp2v[23]: nop2v: not found
6880668	ldmconfig for i18n LANG
6881814	Need to prevent PM from orphaning crypto units
6882083	Guest domain OS does not boot after Sun Cluster switchover
6882123	Excessive time to timeout a migration attempt to a host that is down
6882871	grammar errors in LDoms error message
6883806	Incorrect handling of invalid host ID by LDOM manager
6884307	LDMD fails to send back response after a timed out stop call
6886191	response structure is not being cleared properly during a XMPP/XML call
6887411	Wrong HV version checking logic
6888351	Following the removal of an existing autosave config, newer configuration changes are not detected.
6888922	Migrating an OBP domain can cause an LDom Manager crash
6892344	ldmd gets stuck making an SNMP call to check PM policy
6895479	ldmconfig exited with invalid vdisk size
6895695	Migration of bound domains owning PCI buses is allowed.
6896007	LDMD should not send events to client who is causing the event
6896233	ldmconfig Best Practices miscounts VCPUs and results in suboptimal cdomVCPUs/maxDoms
6897312	Events clobbering LDM_interface messages
6898749	command "ldmp2v prepare -d" generate core when deal with 2 IP address
6899705	/usr/sbin/ldmconfig script uses stat command when no stat is delivered with solaris 10

6900023   Crypto resource modification fails on OS not capable of crypto DR in elastic mode.

6900730   Modify install-ldm to no longer install SUNWjass but to still configure it if it is installed