Sun™ StorEdge™ LibAgent 2.0 Installation and User's Guide

THE NETWORK IS THE COMPUTER™

Sun Microsystems, Inc.
901 San Antonio Road
Palo Alto, CA 94303-4900 USA
650 960-1300 Fax 650 969-9131

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Contents

Preface

The *Sun StorEdge LibAgent 2.0 Installation and User's Guide* describes how to install and use the Sun™ StorEdge™ LibAgent 2.0 Simple Network Management Protocol (SNMP) agent software.

For information about installing and using the Sun™ StorEdge™ LibMON™ 2.0 software, included on the LibMON CD-ROM, refer to the *Sun StorEdge LibMON 2.0 Installation and User's Guide*.

What is LibAgent?

LibAgent is an SNMP subagent. When installed on a host system to which a library is attached, LibAgent enables you to monitor significant library events through a network management program such as Solstice™ Site Manager™.

Who Should Use This Book

The *Sun StorEdge LibAgent 2.0 Installation and User's Guide* is intended for experienced computer users who are familiar with the Sun™ Solaris™ operating environment and SNMP.

How This Book Is Organized

Chapter 1 provides an overview of LibAgent, including an explanation of the Management Information Base (MIB).

Chapter 2 lists the installation requirements for LibAgent and provides procedures for installing the software.

Chapter 3 describes how to start and stop the LibAgent and how to integrate it with the Solstice Site Manager.

Chapter 4 lists some common problems or errors you may encounter while using LibAgent and provides suggestions for resolving them.

This book concludes with a glossary and an index.

Using UNIX Commands

This document may not contain information on basic UNIX® commands and procedures such as shutting down the system, booting the system, and configuring devices.

See one or more of the following for this information:

- *Solaris 2.x Handbook for SMCC Peripherals*
- AnswerBook™ online documentation for the Solaris 2.*x* software environment
- Other software documentation that you received with your system

Typographic Conventions

TABLE P-1 Typographic Conventions

Typeface or Symbol	Meaning	Examples
`AaBbCc123`	The names of commands, files, and directories; on-screen computer output.	Edit your `.login` file. Use `ls -a` to list all files. `% You have mail.`
`AaBbCc123`	What you type, when contrasted with on-screen computer output.	`% su` `Password:`
AaBbCc123	Book titles, new words or terms, words to be emphasized.	Read Chapter 6 in the *User's Guide.* These are called *class* options. You *must* be `root` to do this.
	Command-line variable; replace with a real name or value.	To delete a file, type `rm` *filename.*

Shell Prompts

TABLE P-2 Shell Prompts

Shell	Prompt
C shell	*machine_name%*
C shell superuser	*machine_name#*
Bourne shell and Korn shell	$
Bourne shell and Korn shell superuser	#

Related Documentation

TABLE P-3 Related Documentation

Application	Title	Part Number
Installation	*Sun StorEdge LibMON 2.0 and Sun StorEdge LibAgent 2.0*	804-6142-xx
Installation	*Sun StorEdge LibMON 2.0 Installation and User's Guide*	805-5045-xx
Installation	*Sun StorEdge LibMON 2.0 Release Notes*	805-5065-xx
Installation	*Sun StorEdge LibAgent 2.0 Release Notes*	805-5103-xx

Online Documentation

An online version of this guide is provided on the LibMON CD-ROM, in the following directory:

/cdrom`/sun_libmon_2_0/Docs/LibAgent/`*locale*`/`

where:

- *cdrom* is the system path name of the CD-ROM drive
- *locale* is the directory that corresponds to the language you wish to use: English (`en_US`) or Japanese (`ja_JP`).

The guide is in HTML format and can be viewed using your Internet browser.

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Please include the part number of your document in the subject line of your email message.

CHAPTER 1

Overview

This chapter provides an overview of the LibAgent software and the Management Information Base (MIB).

LibAgent Architecture

LibAgent is a Simple Network Management Protocol (SNMP) subagent. It communicates with the SNMP Network Manager through the Solstice Enterprise Agents (SEA) master agent. The SEA technology provides a master/subagent framework, which allows LibAgent to run on a server with other SNMP subagents.

LibAgent processes get/set requests for the library and generates SNMP traps when it detects an unusual library event. These traps are sent to the SEA master agent, which forwards them to the SNMP Network Manager via the SNMP trap daemon.

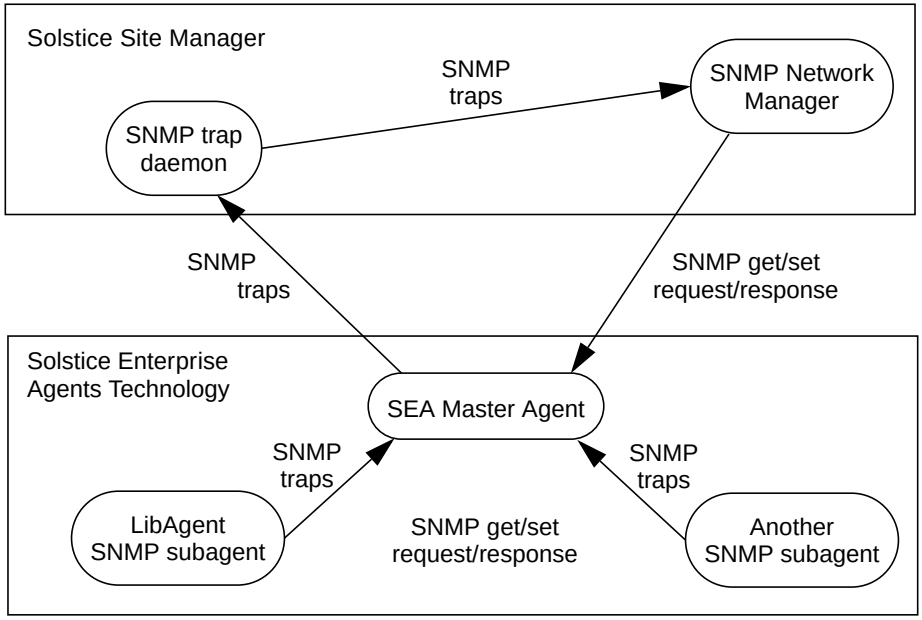

FIGURE 1-1 LibAgent Architecture

LibAgent Management Information Base

The MIB information for each library is maintained in the table “slTable.” Each row in this table manages information for one storage library. You can assign a name and location to each library to simplify library identification when SNMP traps are received by the SNMP network manager.

The following table describes the variables that LibAgent maintains for each managed library and lists the MIB variable name and read / write permission for each variable. The MIB Variable `slDeviceName` is set for each storage library when LibAgent starts, based on the information in the device configuration file for LibAgent.

TABLE 1-1 Library Information

MIB Variable Name	Description	Read/Write Permission
`slDeviceName`	The system device name for the tape library medium changer (robot).	Read only
`slAssignedName`	The logical name for the tape library.	Read / write
`slLocation`	The physical location of the library.	Read / write
`slVendorId`	The vendor ID. This value is set automatically as the result of a SCSI inquiry command.	Read only
`slProdId`	The product ID. This value is set automatically as the result of a SCSI inquiry command.	Read only
`slProdRev`	The firmware revision. This value is set automatically as the result of a SCSI inquiry command.	Read only
`slState`	Indicates whether the library is available or unavailable.	Read only
`slTrapType`	Indicates the type of the trap sent last. If no trap has been sent since the subagent was started, the value is `notrap`.	Read only
`slTrapDescr`	A description of the reason for the last trap sent.	Read only
`slSenseKey`	If available, a sense key associated with the last trap sent. If not available, the value is an empty string.	Read only
`slASC`	If available, a ASC value for the last trap sent. If not available, the value is an empty string.	Read only
`slASCQ`	If available, a ASCQ value for the last trap sent. If no available, the value is an empty string.	Read only

SNMP Traps

The following table describes the enterprise-specific traps LibAgent can generate.

TABLE 1-2 SNMP Enterprise-Specific Traps

Specific Trap Type	Severity	Description
1	Information	A check condition was detected that provides information about the library.
2	Warning	A check condition was detected that provides information about the library that could indicate a problem.
3	Failure	A check condition was detected that provides information about the library that could indicate a hardware failure.
4	Available	The library has returned to an available state.
5	Unavailable	A check condition was detected that caused the library to transition to an unavailable state.

Each enterprise-specific trap generated by LibAgent has the `ENTERPRISE` value `atlp`.

For a description of each MIB variable in the MIB, refer to the MIB text file (`atl.mib`), located in the `/opt/SUNWlagn/etc` directory. LibAgent includes context information in each SNMP trap. If the library becomes unavailable, you can use the Solstice Site Manager Alarm Reports utility to access this information and determine the cause of the library failure.

You can enable or disable each trap independently using the variables described in the following table.

TABLE 1-3 SNMP Trap Enable Variables

MIB Variable Name	Description	Default Value	Read/Write Permission	Controls Specific Trap Type
`slInfoEnable`	Defines whether detected information traps are sent.	Enabled	Read/write	1
`slWarnEnable`	Defines whether detected warning traps are sent.	Enabled	Read/write	2
`slFailEnable`	Defines whether detected failure traps are sent.	Enabled	Read/write	3
`slAvailableEnable`	Defines whether detected library-available state-change traps are sent.	Enabled	Read/write	4
`slUnavailableEnable`	Defines whether detected library-unavailable state-change traps are sent.	Enabled	Read/write	5
`slRepeatTrapEnable`	Defines whether duplicate information, warning and failure traps are sent when a trap condition is detected repeatedly.	Enabled	Read/write	N/A

CHAPTER 2

Installing Sun StorEdge LibAgent

This chapter provides instructions for installing the LibAgent packages from the LibMON CD-ROM, including the Solstice Enterprise Agents (SEA) package.

Once you install the packages, you need to integrate LibAgent with your network management program. This guide provides instructions for integrating LibAgent with Solstice Site Manager (see Chapter 3). If you are using another network management program, refer to the documentation provided with the program for information about integrating an SNMP agent.

Installation Requirements

This section lists the requirements your system must meet before you can install and use LibAgent.

Supported Libraries

LibAgent is designed to support the following tape libraries:

- Sun StorEdge L1000
- Sun StorEdge L1800
- Sun StorEdge L3500
- Sun StorEdge L140
- Sun StorEdge L400
- Sun StorEdge 4mm DDS-3 Autoloader

Sun Hardware Systems

LibAgent is designed to run on the following Sun systems:

- SPARCcenter™ 2000E
- SPARCserver™ 5
- SPARCserver 10
- SPARCserver 20
- SPARCserver 1000E
- Sun Enterprise™ 2
- Sun Enterprise 250
- Sun Enterprise 450
- Sun Enterprise 3000
- Sun Enterprise 3500
- Sun Enterprise 4000
- Sun Enterprise 4500
- Sun Enterprise 5000
- Sun Enterprise 5500
- Sun Enterprise 6000
- Sun Enterprise 6500
- Sun Enterprise 10000

Operating Environment

LibAgent must be run in the Solaris 2.5.1 or 2.6 operating environment.

Disk Space

The following table lists the disk space required to install the LibAgent package and related software.

TABLE 2-1 Disk Space Requirements

Software Component	Space Required	Location
LibAgent	14 MB	`/opt/SUNWlagn`
Solstice™ Enterprise Agents™, Version 1.1	5 MB	various partitions

Memory

You should have at least 64 MB of RAM on the system where LibAgent is installed.

CD-ROM Drive

To install LibAgent, you need a CD-ROM drive connected to your system or to another system on the same network.

Preparing to Install LibAgent

Before installing LibAgent, you must perform the following procedures.

Removing Existing SEA Software

To use LibAgent, you must install Version 1.0.2 of the SEA software on the server where LibAgent is installed. If you have an existing version of SEA software on your system, you must remove it before installing the LibAgent packages.

Perform the procedures in this section if:

- You are using the Solaris 2.6 operating environment. SEA software is distributed with Solaris 2.6. See "To Remove the SEA Software (Solaris 2.6)" on page 10.
- If you are using the Solaris 2.5.1 operating environment and have installed SEA software. See "To Remove the SEA Software (Solaris 2.5.1)" on page 11.

▼ To Remove the SEA Software (Solaris 2.6)

Note – This section explains how to remove the existing SEA software if you are using the Solaris 2.6 operating environment. If you are using the Solaris 2.5.1 operating environment, see "To Remove the SEA Software (Solaris 2.5.1)" on page 11.

---

1. **If you are not currently using SEA, proceed to step 3.**
2. **If you are currently using SEA, copy your configuration files to an alternate directory (not an SEA subdirectory) before removing the SEA package.**

   The configuration files are:

   - `/etc/snmp/conf/enterprises.oid`
   - `/etc/snmp/conf/snmpdx.acl`

   In addition, copy any customized SEA files to the alternate directory.
3. **Become `root` on the server where you plan to install LibAgent.**

```
% su root
password:
#
```

4. **Shut down the SEA processes:**

```
# /etc/init.d/init.snmpdx stop
# /etc/init.d/init.dmi stop
```

5. **Remove the SEA packages:**

```
# pkgrm SUNWmibii
# pkgrm SUNWsadmi
# pkgrm SUNWsasnm
# pkgrm SUNWsnmpd
# pkgrm SUNWsasdk
```

Note – Depending on your configuration, one or more of these packages may not be on your system.

▼ To Remove the SEA Software (Solaris 2.5.1)

Note – This section explains how to remove the existing SEA software if you are using the Solaris 2.5.1 operating environment. If you are using the Solaris 2.6 operating environment, see "To Remove the SEA Software (Solaris 2.6)" on page 10.

Note – If you are using the Solaris 2.5.1 operating environment and have not installed SEA software, skip the procedures in this section and proceed to "To Attach the Library" on page 12.

1. **If you are not currently using SEA, proceed to step 3.**
2. **If you are currently using SEA, copy your configuration files to an alternate directory (not an SEA subdirectory) before removing the SEA package.**

   The configuration files are:

   - `/etc/snmp/conf/enterprises.oid`
   - `/etc/snmp/conf/snmpdx.acl`
   - `/etc/snmp/conf/snmpdx.rsrc`
   - `/etc/snmp/conf/snmpdx.reg`

   In addition, copy any customized SEA files to the alternate directory.
3. **Become `root` on the server where you plan to install LibAgent.**

```
% su root
password:
#
```

4. **Shut down the SEA processes:**

```
# /etc/init.d/init.snmpdx stop
# /etc/init.d/init.dmi stop
```

5. **Remove the SEA packages:**

```
# pkgrm SUNWsacom
# pkgrm SUNWmibii
# pkgrm SUNWsadmi
# pkgrm SUNWsasnm
# pkgrm SUNWsnmpd
# pkgrm SUNWsasdk
```

Note – Depending on your configuration, one or more of these packages may not be on your system.

▼ To Attach the Library

Before you install LibAgent, make sure the tape library or libraries you want to monitor are physically attached to the system. Physically attached means:

- The library is connected to the server by a properly terminated SCSI bus.
- The library is online.
- The library system device (for example, `/dev/snmppt0`) has been created.
- The tape drives within the library are online.
- The tape drive devices (for example, `/dev/rmt/0`) have been created.

For information about these procedures, refer to the *Installation Guide* provided with the library.

▼ To Mount the CD-ROM

Note – If you are installing LibAgent from a local CD-ROM drive, there is no need to mount the CD-ROM; it is mounted automatically by the volume management software when you insert it into the CD-ROM drive.

If you are installing LibAgent from a CD-ROM drive attached to a remote system, you must mount the remote CD-ROM on your local system.

1. **Insert the LibMON CD-ROM into the CD-ROM drive on the remote system.**

   The volume management software on the remote system mounts the CD-ROM automatically.

2. **At the remote system as** `root`**, share the CD-ROM drive:**

```
remote# share -F nfs -o -ro,anon=0 -d “CD-ROM directory” \
/cdrom/sun_libmon_2_0
```

   This line assumes you do not want to restrict access to certain groups. If you want to restrict access, refer to the Solaris `share (1M)` main page for further information.

3. **Become** `root` **on the server where you plan to install LibAgent:**

```
% su root
password:
#
```

4. **Create the** `/cdrom/sun_libmon_2_0` **directory:**

```
local% su root
Password: root-password
local# mkdir /cdrom/sun_libmon_2_0
```

5. **Mount the CD-ROM:**

```
local# mount remote host name:/cdrom/sun_libmon_2_0 \
/cdrom/sun_libmon_2_0
```

Installing LibAgent

This section provides instructions for installing LibAgent.

LibAgent requires certain software patches to ensure optimum performance on your system. Patches are provided on the LibMON CD-ROM. For a list of required patches, see the *Sun StorEdge LibAgent 2.0 Release Notes*.

How the LibMON CD-ROM Is Organized

The LibMON CD-ROM is divided into four second-level directories: `Product`, `Tools`, `Docs`, and `Patches`.

- The `Product` directory contains the installation files for LibAgent and LibMON. It is divided into two directories: `LibAgent` and `LibMON`. The `LibAgent` and `LibMON` directories are divided into subdirectories by language (see TABLE 2-2), then by operating environment.
- The `Tools` directory contains the Apache HTTP Server software package. The Apache HTTP Server package is used in conjunction with LibMON. It is not necessary to install this package to use LibAgent.
- The `Docs` directory contains the README files and online documentation for LibAgent and LibMON. The `Docs` directory is divided into subdirectories by language (see TABLE 2-2).
- The `Patches` directory contains patches required for the LibAgent product.

LibAgent is supported in both English and Japanese. The following table lists the location of the product and documentation files for each language.

TABLE 2-2 Language Directories

Language	Product files located in:	Online documentation files located in:
English	`Product/LibAgent/en_US/`	`Docs/LibAgent/en_US/`
Japanese	`Product/LibAgent/ja_JP/`	`Docs/LibAgent/ja_JP/`

The following illustration shows the organization of the CD-ROM using English (en_US/) as an example.

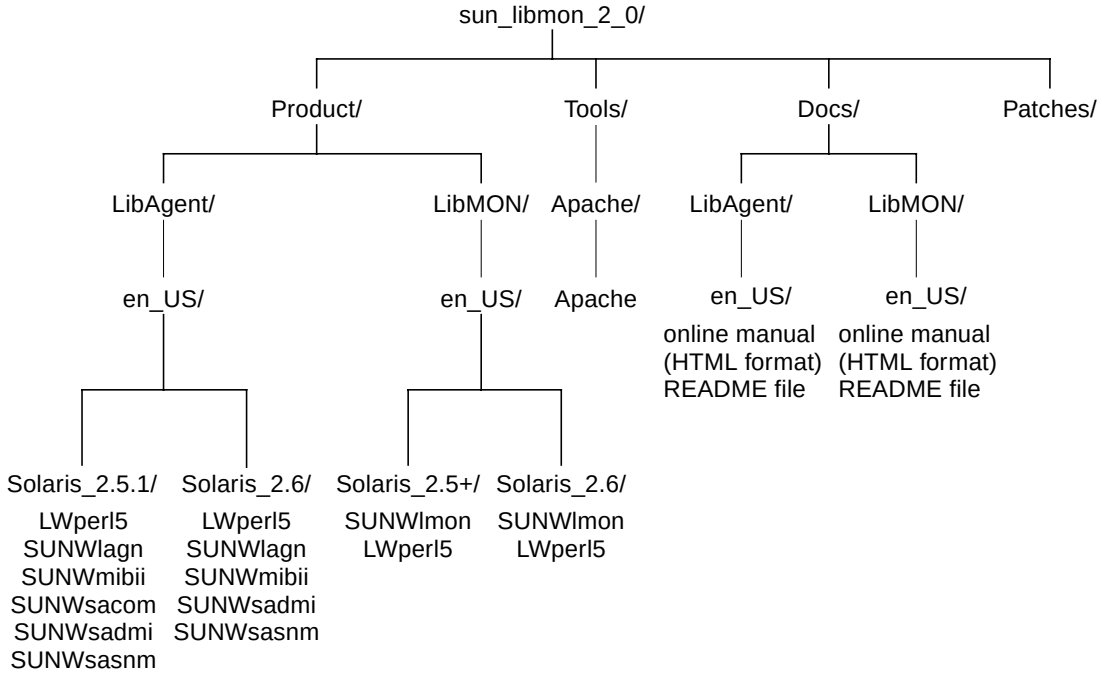

FIGURE 2-1 CD-ROM Organization

▼ To Install the LibAgent Packages

Note – LibAgent is supported in both English and Japanese. The CD-ROM is divided into subdirectories by product, locale for each language, and operating environment. To install a specific language, you must change directories to the desired locale and operating environment, and then run the `pkgadd` script from that directory.

---

1. **Insert the LibMON CD-ROM into the CD-ROM drive.**
2. **Become `root` on the server where you plan to install LibAgent.**

```
% su root
password:
#
```

3. **Change to the installation directory on the CD-ROM:**

```
# cd /cdrom/sun_libmon_2_0/Product/LibAgent/locale/OS Version
```

where:

- *cdrom* is the system path name of the CD-ROM drive you are using to install the software
- *locale* is the directory that corresponds to the language you wish to install: English (`en_US`) or Japanese (`ja_JP`)
- *OS Version* is either `Solaris_2.5.1` (for Solaris 2.5.1) or `Solaris_2.6` (for Solaris 2.6)

4. **Add the `SUNWmibii` package:**

```
# pkgadd -d . SUNWmibii
```

The system starts the installation and displays the following prompt:

```
Do you want to continue with the installation of <SUNWmibii>
[y,n,?]
```

5. **Type** `y` **and press Return.**

   When the installation is complete, the system displays the following prompt:

```
Installation of <SUNWmibii> was successful.
#
```

6. **Add the** `SUNWsasnm` **package:**

```
# pkgadd -d . SUNWsasnm
```

   The system starts the installation and displays the following prompt:

```
Do you want to continue with the installation of <SUNWsasnm>
[y,n,?]
```

7. **Type** `y` **and press Return.**

   When the installation is complete, the system displays the following prompt:

```
Installation of <SUNWsasnm> was successful.
#
```

8. **Add the** `SUNWsadmi` **package:**

```
# pkgadd -d . SUNWsadmi
```

   The system starts the installation and displays the following prompt:

```
Do you want to continue with the installation of <SUNWsadmi>
[y,n,?]
```

9. **Type** `y` **and press Return.**

   When the installation is complete, the system displays the following prompt:

```
Installation of <SUNWsadmi> was successful.
#
```

Caution – The SUNWsacom package is distributed with the Solaris 2.6 operating environment and does not need to be replaced. If you are using the Solaris 2.6 operating environment, do not perform steps 10 and 11. Instead, proceed directly to step 12.

10. **If you are using Solaris 2.5.1, add the SEA** SUNWsacom **package:**

```
# pkgadd -d . SUNWsacom
```

The system starts the installation and displays the following prompt:

```
Do you want to continue with the installation of <SUNWsacom>
[y,n,?]
```

11. **Type** y **and press Return.**

When the installation is complete, the system displays the following prompt:

```
Installation of <SUNWsacom> was successful.
#
```

12. **Add the** LWperl5 **package:**

```
# pkgadd -d . LWperl5
```

Note – If the LWperl5 package is already installed, the system displays a message and does not reinstall the entire package.

When the installation is complete, the system displays the following prompt:

```
Installation of <LWperl5> was successful.
#
```

Note – The `LWperl5` package must be present in order for the `SUNWlagn` package to install correctly. Therefore, you must install the `LWperl5` package before installing the `SUNWlagn` package.

---

13. **Add the** `SUNWlagn` **package:**

```
# pkgadd -d . SUNWlagn
```

The system prompts you:

```
Input installation base directory (Default: /opt) [?,q]
```

14. **Press Return to accept the default directory.**

The system prompts you:

```
Do you want to replace the SNMP Master Agent Configuration files
(Default:yes) [y,n,?,q]
```

Note – If you are using other SEA subagents in addition to LibAgent, you may want to update the SEA configuration files manually rather than letting the `SUNWlagn` package update them automatically.

---

15. **To update the SEA configuration files manually:**

    a. **Type** `n` **and press Return.**

    b. **Follow the prompts on the screen:**

    - When you are prompted for information, accept the default setting.
    - When you are prompted for a yes or no response, select `Yes`.

    c. **Manually configure the SEA to work with LibAgent, referring to "To Configure SEA Manually" on page 21.**

16. **To replace the default SEA configuration files with configuration files that work with LibAgent:**

    a. **Type** `y` **and press Return.**

    The system prompts you to enter the host name of your SNMP Manager.

    b. **Enter the host name of the node to which you want SNMP traps forwarded.**

    The system prompts you:

```
Do you want to install these as setuid/setgid files [y,n,?,q]
```

    c. **Type** `y` **and press Return.**

    The system prompts you:

```
Do you want to continue with the installation of <SUNWlagn> [y,n,?]
```

    d. **Type** `y` **and press Return.**

    When the installation is complete, the system displays the following prompt:

```
Installation of <SUNWlagn> was successful.
#
```

To verify the installation, you must integrate LibAgent with an SNMP network manager. "Using Sun StorEdge LibAgent" on page 25 describes how to integrate and use LibAgent with Sun Solstice Site Manager.

▼ To Configure SEA Manually

Updating the SEA configuration files manually ensures that the files will work both with LibAgent and with any other SEA subagents you are using. You must update the following files on the server where LibAgent is installed:

- `/etc/snmp/conf/enterprises.oid`
- `/etc/snmp/conf/snmpdx.acl`

1. **Add the following line to the end of the** `enterprises.oid` **file:**

```
"atlp"     "1.3.6.1.4.1.2036"
```

2. **Modify the trap structure in the** `snmpdx.acl` **file to include the following entries:**

```
trap-community = SNMP-trap
hosts = snmp_mng_hostname
{
enterprise = "sun"
trap-num = 0, 1, 2-5, 6-16
}
{
enterprise = "atlp"
trap-num = 1-5
}
{
enterprise = "snmp"
trap-num = 0-5
}
```

where *snmp_mng_hostname* is the host name to which you want to forward SNMP traps.

Removing LibAgent

This section provides instructions for removing LibAgent, if it becomes necessary to do so.

▼ To Remove the LibAgent Packages

1. **Become** `root` **on the server where LibAgent is installed.**

```
% su root
password:
#
```

2. **Stop LibAgent:**

```
# /opt/SUNWlagn/STOP-LibAgent
```

3. **Remove the** `SUNWlagn` **package:**

```
# pkgrm SUNWlagn
```

The system prompts you:

```
Do you want to remove this package?
```

4. **Type** `y` **and press Return.**

The system prompts you:

```
Do you want to continue with the removal of this package? [y,n,?,q]
```

5. **Type** `y` **and press Return.**

   The system displays the following prompt:

```
Removal of <SUNWlagn> was successful.
```

6. **Remove the** `LWperl5` **package:**

```
# pkgrm LWperl5
```

Caution – If there are other packages installed that depend on the `LWperl5` package, the system displays a warning message listing the package dependencies. If you see this message, *do not* remove the `LWperl5` package. Type `q` to quit the `pkgrm` operation, then proceed to step 8.

   The system prompts you:

```
Do you want to remove this package?
```

7. **Type** `y` **and press Return.**

   The system displays the following prompt:

```
Removal of <LWperl5> was successful.
```

8. **To remove the SEA packages, see "Removing Existing SEA Software" on page 10.**

CHAPTER 3

Using Sun StorEdge LibAgent

This chapter discusses the following topics:

Starting and Stopping LibAgent

This section describes how to start the Solstice Enterprise Agents (SEA) and LibAgent processes. During LibAgent installation, these processes were configured to start automatically at system startup and to stop automatically when the system is shut down.

Note – The procedures provided in this section assume that you selected the default installation options. These procedures may vary if you customized the installation.

▼ To Start the SEA and LibAgent Processes

1. **Become `root` on the server where LibAgent is installed:**

```
% su root
password:
#
```

2. **Start the SEA processes:**

```
# /etc/init.d/init.snmpdx start
# /etc/init.d/init.dmi start
```

Note – When starting the LibAgent process, make sure no other applications are accessing the medium changer device for monitored storage libraries.

---

3. **Start the LibAgent process:**

```
# /etc/init.d/init.snmpatld start
```

Note – You can also start the LibAgent process using the `START-LibAgent` file, which is located in the `/opt/SUNWlagn` directory.

▼ To Stop the SEA and LibAgent Processes

1. **Become `root` on the server where LibAgent is installed:**

```
% su root
password:
#
```

2. **Stop the LibAgent process:**

```
# /etc/init.d/init.snmpatld stop
```

Note – You can also stop the LibAgent process using the `STOP-LibAgent` file, which is located in the `/opt/SUNWlagn` directory.

---

3. **Stop the SEA processes:**

```
# /etc/init.d/init.dmi stop
# /etc/init.d/init.snmpdx stop
```

Configuring LibAgent

You can configure LibAgent by:

- Adding or removing a library to be monitored
- Changing the poll interval
- Changing the SNMP Network Manager

▼ To Add or Remove a Library

LibAgent maintains a list of managed libraries in the `/opt/SUNWlagn/etc/device.config` file. This file was created automatically when you installed LibAgent. It contains the medium changer device name for each library that was connected at that time. To add or remove a library, you must edit the `device.config` file.

Note – You must restart the LibAgent process to change the storage libraries being monitored by LibAgent.

---

1. **Become `root` on the server where LibAgent is installed:**

```
% su root
password:
#
```

2. **Stop the LibAgent process:**

```
# /opt/SUNWlagn/STOP-LibAgent
```

3. **Identify the medium changer device name for each storage library connected to your server system:**

```
# /opt/SUNWlagn/SCAN-DEVICES
```

This command runs a utility that lists all medium changers attached to the server. The command output lists the device name, product name, adapter, and SCSI ID for each device.

4. **Edit the** `/opt/SUNWlagn/etc/device.config` **file so that each line names one medium changer device for a storage library being monitored.**

   The following is a sample `device.config` file, naming three tape libraries.

```
/dev/snmppt0
/dev/snmppt1
/dev/snmppt2
```

5. **Restart the LibAgent process:**

```
# /opt/SUNWlagn/START-LibAgent
```

▼ To Change the LibAgent Poll Interval

The poll interval defines how often the LibAgent process queries monitored libraries to retrieve updated data and to check for events.

The default poll interval is 300 seconds (5 minutes). You can change this setting using the procedure in this section.

Note – Poll intervals of less than 2 minutes are not recommended, as small intervals may cause poll cycles to overlap, causing errors.

---

1. **Become** `root` **on the server where LibAgent is installed:**

```
% su root
password:
#
```

2. **Stop the LibAgent process:**

```
# /opt/SUNWlagn/STOP-LibAgent
```

3. **Edit the** `file /opt/SUNWlagn/START-LibAgent` **and change the value for** `POLL_INTERVAL` **to the new poll interval (in seconds).**

4. **Restart the LibAgent process:**

```
# /opt/SUNWlagn/START-LibAgent
```

▼ To Change the SNMP Network Manager

To change the SNMP Network Manager to which SNMP traps are forwarded, you must change the SEA configuration files.

1. **Become** `root` **on the server where LibAgent is installed:**

```
%su root
password:
#
```

2. **Stop the LibAgent and SEA processes:**

```
# /opt/SUNWlagn/STOP-LibAgent
# /etc/init.d/init.snmpdx stop
```

3. **Open the** `/etc/snmp/conf/snmpdx.acl` **file.**

4. **Locate the line that defines the host to which SNMP traps are forwarded.**

   This line reads:

```
hosts = hostname
```

   where *hostname* is the host name to which SNMP traps are currently forwarded.

5. **Change the** *hostname* **value to the new host name to which you want SNMP traps forwarded.**

6. **Save and close the** `/etc/snmp/conf/snmpdx.acl` **file.**

7. **Restart the SEA and LibAgent processes:**

```
# /etc/init.d/init.snmpdx start
# /opt/SUNWlagn/START-LibAgent
```

Integrating LibAgent With Solstice Site Manager

Although you can use LibAgent with any network management program, this guide provides integration instructions for Solstice Site Manager only. To integrate LibAgent with another network management program, refer to the documentation for that program.

Note – The SEA master agent cannot run on a node that is running the Solstice Site Manager daemon for Solaris (distributed with Solstice Site Manager). To use LibAgent, you must run the SEA master agent instead.

▼ To Stop the Solstice Site Manager Daemon for Solaris

1. **Become `root` on the server where Solstice Site Manager is installed:**

```
% su root
password:
#
```

2. **Stop the Solstice Site Manager daemon process:**

```
# /etc/rc2.d/K25snmpd stop
```

3. **Rename the system startup file so that it is not restarted at system boot time:**

```
# mv /etc/rc3.d/S25snmpd /etc/rc3.d/OrigS25snmpd
```

▼ To Export the SNMP Subagent

To export LibAgent to the Solstice Site Manager, install the SunNet Manager™ (SNM) schema files (included in the `SUNWlagn` package) into the Solstice Site Manager database.

1. **Become `root` on the server where Solstice Site Manager is installed:**

```
% su root
password:
#
```

2. **Start the Solstice Site Manager SNM console:**

```
# snm
```

3. **Save your existing SNM runtime database to an ASCII file:**

   a. **On the File menu, click Save, and then click Management Database.**

   b. **Select a directory and file name for the database.**

   c. **Click Save.**

4. **Exit the SNM console.**

5. **On the server where LibAgent is installed, locate the SNM schema files:**
   - `/opt/SUNWlagn/etc/atl.mib.oid`
   - `/opt/SUNWlagn/etc/atl.mib.schema`

6. **Copy the SNM schema files (listed above) to the `/opt/SUNWconn/snm/agents` directory on the server where Solstice Site Manager is installed.**

7. **On the server where Solstice Site Manager is installed, restart the SNM console with the `-i` option:**

```
# snm -i
```

8. **Choose the BasicStart option.**

   The SNM console opens.

9. **Reload your saved SNM management database from the ASCII file saved in step 3:**

   a. **On the File menu, click Load, and then click Management Database.**

   b. **Select the file.**

   c. **Click Load.**

10. **Using the mouse, highlight the node where LibAgent is installed and then click the right mouse button.**

    A pop-up menu is displayed.

11. **On the pop-up menu, click Properties.**

    A Properties dialog box opens.

12. **Select StorageLibrary-MIB from the list.**

13. **Click Apply to save your changes and close the Properties dialog box.**

▼ To Perform SNMP Gets

You can use the Solstice Site Manager Set Request tool to examine SNMP MIB variable values.

1. **Become `root` on the server where Solstice Site Manager is installed:**

```
% su root
password:
#
```

2. **Start the SNM console:**

```
# snm
```

3. **Using the mouse, highlight the node where LibAgent is installed and then click the right mouse button.**

   A pop-up menu is displayed.

4. **On the pop-up menu, click Set Request.**

5. **Click StorageLibrary-MIB, and then click slTable.**

   The SNM Set Tool dialog box opens.

Note – To get the current values for the SNMP Trap Enable MIB variables, click slTrapEnable instead of slTable.

6. **Click the Get button to retrieve the current SNMP MIB variable values for the first storage library being monitored.**

Note – To examine the MIB variable values for a specific library instance, enter the instance identifier in the Key field.

▼ To Perform SNMP Sets

Use the Solstice Site Manager Set Request tool to enable or disable trap generation.

1. **Become `root` on the server where Solstice Site Manager is installed:**

```
% su root
password:
#
```

2. **Start the Solstice Site Manager SNM console:**

```
# snm
```

3. **Using the mouse, highlight the node where LibAgent is installed and then click the right mouse button.**

   A pop-up menu is displayed.

4. **On the pop-up menu, click Set Request.**

5. **Click StorageLibrary-MIB, then click slTable.**

   The SNM Set Tool dialog box opens.

Note – To get the current values for the SNMP Trap Enable MIB variables, click slTrapEnable instead of slTable.

6. **Click the Get button to retrieve the current SNMP MIB variable values for the first storage library being monitored.**

Note – To examine the MIB variable values for a specific library instance, enter the instance identifier in the Key field.

7. **In the New Value column, set the preferred MIB variable.**
8. **Press Tab or Return to add the new value to the Set Information list.**
9. **Click the Set button to send the set request to the LibAgent for the selected node.**

   The dialog box displays the message "Set Request of agent 'StorageLibrary-MIB' done successfully."

▼ To Configure SNMP Trap Generation

Use the Solstice Site Manager Set Request tool to enable / disable trap generation.

1. **Become `root` on the server where Solstice Site Manager is installed:**

```
% su root
password:
#
```

2. **Start the Solstice Site Manager SNM console:**

```
# snm
```

3. **Using the mouse, highlight the node where LibAgent is installed and then click the right mouse button.**

   A pop-up menu is displayed.

4. **On the pop-up menu, click Set Request.**
5. **Click StorageLibrary-MIB, then click slTrapEnable.**

   The SNM Set dialog box opens.

6. **Click the Get button to retrieve the current SNMP trap enable values.**
7. **In the New Value column, use the option menus to set each SNMP trap enable value.**
8. **Click the Set button to send the set request to the LibAgent for the selected node.**
9. **To view the updated settings, click the Get button.**

CHAPTER 4

Troubleshooting

This chapter lists common questions you may have while installing and using your LibAgent software. Use this section as a guide to resolve problems encountered while using LibAgent. For a list of error messages and possible solutions, refer to “Error Messages” on page 40.

Common Questions

Traps are not being forwarded to the network manager.

Check the `/etc/snmp/conf/enterprises.oid` file to ensure that it includes the following line:

```
“atlp”     “1.3.6.1.4.1.2036”
```

Check the `/etc/snmp/snmpdx.acl` file to ensure that it includes the following lines in the definition of `trap`:

```
trap-community = SNMP-trap
hosts = SNMP_NETWORK_MANAGER
{
    enterprise = “sun”
    trap-num = 0, 1, 2-5, 6-16
}
{
    enterprise = “atlp”
    trap-num = 1-5
}
{
    enterprise = “snmp”
    trap-num = 0-5
}
```

where *SNMP_NETWORK_MANAGER* is the hostname to which SNMP traps will be forwarded.

Check your network setup to ensure that LibAgent recognizes the node to which SNMP traps will be forwarded.

I am unable to get or set the SNMP values.

Check to ensure that both the following daemons are running on the node where LibAgent is installed:

- `snmmpatld`
- `snmpdx`

There is no StorageLibrary-MIB entry in the Solstice Site Manager node property dialog.

Follow the steps described in “Integrating LibAgent With Solstice Site Manager” on page 31 to export the LibAgent MIB to the Solstice Site Manager product.

There is no entry for my library in the LibAgent slTable.

Ensure that the library is attached, online, and not in use.

Make sure the `/opt/SUNWlagn/etc/device.config` file contains an entry for the library medium changer device. Add an entry if one does not exist.

After changing the file, you must restart the LibAgent process (`snmpatld`):

```
# /opt/SUNWlagn/STOP-LibAgent
# /opt/SUNWlagn/START-LibAgent
```

All SNMP traps generated from LibAgent have the same priority.

The `/var/opt/SUNWconn/snm/snmp.traps` file sets the priority of traps received by Solstice Site Manager. You can edit this file to change the priority of a trap or discard traps that are not useful.

To change any trap priority, add one of the following key words to the end of the appropriate trap:

- `discard`
- `high`

The `/opt/SUNWlagn/etc/atl.mib.traps` file contains entries you can append to the `/var/opt/SUNWconn/snm/snmptraps` file to change the SNMP trap priority.

Use the Solstice Site Manager console to configure how the SNMP traps are displayed.

The `/etc/init.d/init.snmpdx` *file does not exist, so I cannot start the SEA processes needed.*

The `/etc/init.d/init.snmpdx` file is installed as part of the SUNWsacom package of the SEA product. If you are using the Solaris 2.6 operating environment, you must reinstall the SUNWsacom package from the Solaris 2.6 CD-ROM.

The LibAgent process `snmpatld` *crashes when I do an SNMP Get Request.*

Refer to the *Sun StorEdge LibAgent 2.0 Release Notes* and make sure the required patches have been installed.

I am running Solaris 2.6 and accidentally removed the SUNWsacom package.

Mount the Solaris 2.6 CD-ROM and use the `pkgadd` utility to add the `SUNWsacom` package back to your system.

Error Messages

All error messages are written to the `/opt/SUNWlagn/LibAgent.log` file.

TABLE 4-1 LibAgent Error Messages

Error Message	Probable Cause/Recommended Action
`ERROR:Could not find configuration file -` *configuration file name*	One of the LibAgent configuration files, `device.config` or `.persistent.config`, is not in the `/opt/SUNWlagn/etc` directory.
`ERROR:Invalid trap enable value (`*trap enable value*`) - disabling trap`	The `/opt/SUNWlagn/etc/.persistent.config` file contains an invalid trap enable value. The recognized values are disabled (1) or enabled (2). This file is not normally edited by the user.
`ERROR:Invalid trap number (`*trap number*`) - trap definition skipped`	The `/opt/SUNWlagn/etc/.persistent.config` file defines a trap that is not recognized by LibAgent. This file is not normally edited by the user.
`ERROR:IO exception parsing configuration file -` *configuration file name*	An error occurred while processing the named configuration file. Check permissions on the file to ensure that LibAgent has permission to read the file.
`ERROR:IOException writing to config file -` *configuration file name*	An error occurred while processing the named configuration file. Check permissions on the file to ensure that LibAgent has permission to read the file.

TABLE 4-1 LibAgent Error Messages

Error Message	Probable Cause/Recommended Action
`ERROR:No libraries being monitored`	There are no valid entries in the `/opt/SUNWlagn/etc/device.config` file.
`ERROR:Unable to create library in db` *library name*	An attempt to save information in the LibAgent database failed. The location of the LibAgent database is `/var/opt/SUNWlagn/db`. Check the error log for additional information about the database problem.
`ERROR:Unable to open database -` *database directory*	The LibAgent process could not open its database. LibAgent uses a database located in the `/var/opt/SUNWlagn/db` directory. Check the error log for additional information about the database problem.
`Invalid trap enable value` *trap enable value*	The `/opt/SUNWlagn/etc/.persistent.config` file contains an invalid trap enable value. The recognized values are disabled (1) or enabled (2). This file is not normally edited by the user.
`Memory allocation failed`	LibAgent attempted to allocate memory but none was available. Increasing the swap space may alleviate this problem. Restart the LibAgent process: # **`/opt/SUNWlagn/STOP-LibAgent`** # **`/opt/SUNWlagn/START-LibAgent`**
`No libraries being monitored`	There are no valid medium changer device names in the `/opt/SUNWlagn/etc/device.config` file.
`No node associated with device name:` *medium changer device name*	During a poll cycle, information was processed for a new medium changer device name. Restart the LibAgent process: # **`/opt/SUNWlagn/STOP-LibAgent`** # **`/opt/SUNWlagn/START-LibAgent`**
`SNMP sub-agent shutdown`	This is a normal shut down message printed from the LibAgent process.
`SNMP sub-agent started`	This is a normal startup message printed from the LibAgent process.

TABLE 4-1 LibAgent Error Messages

Error Message	Probable Cause/Recommended Action
`Trap enable value expected - got NULL`	There is a trap enable specification in the `/opt/SUNWlagn/etc/.persistent.config` file that does not have a trap enable value. This file is not normally edited by the user.
`Trap type expected - no information`	A trap type is expected but not given in the `/opt/SUNWlagn/etc/.persistent.config` file. This file is not normally edited by the user.
`Unexpected trap enable` *trap value*	The `/opt/SUNWlagn/etc/.persistent.config` file contains a trap that is not recognized by LibAgent. This file is not normally edited by the user.

Glossary

CD-ROM compact disc read-only memory. A type of optical disc, capable of storing large amounts of data.

instance identifier A unique name that identifies a specific instance of a MIB variable.

master agent A process on a manager node that exchanges SNMP protocol messages with the SNMP network managers.

MIB Management Information Base. A hierarchical collection of objects that can be accessed via an SNMP management protocol.

MIB variable The name of an object in a Management Information Base. A MIB variable can also be referenced by its object identifier.

network manager A system that is running network applications and can initiate SNMP set/get requests, receive set/get responses, and receive SNMP traps.

OID object identifier. A number that uniquely identifies an object in a MIB.

poll interval The setting that controls how often LibAgent queries monitored libraries to retrieve updated data and to check for events.

root The UNIX superuser account that overrides file permissions.

SCSI small computer system interface. A parallel interface standard used by many systems for attaching peripheral devices to computers.

SEA Solstice Enterprise Agents.

Solaris A UNIX-based operating environment developed by Sun Microsystems.

SNM SunNet Manager.

SNMP Simple Network Management Protocol. The Internet standard protocol that provides network management service. SNMP works by sending messages, called protocol data units (PDUs), to different parts of a network. SNMP-compliant devices, called agents, store data about themselves in Management Information Bases (MIBs) and return this data to the SNMP requesters.

subagent A process that has access to the management information and provides access to various components within a system. Subagents interact with the master agent using SNMP, but do not interact with the SNMP network managers.

trap A message generated by an SNMP agent that reports an event on a managed system.

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